

CA Spool™

Customization Guide

Version 12.0



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CA Technologies Product References

This document references the following CA products:

- CA ACF2® for z/OS
- CA Bundl®
- CA Deliver™
- CA Dispatch™
- CA IDMS® /DC
- CA LPD Report Convergence
- CA Output Management Document Viewer
- CA Output Management Web Viewer
- CA Roscoe® Interactive Environment
- CA Spool™
- CA SymDump® System
- CA TCPAccess™ Communications Server for z/OS
- CA Top Secret® for z/OS
- CA View®
- CA XCOM™ Data Transport®

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Documentation Changes

The following documentation updates have been made since the last release of this documentation:

- The following documentation changes were published as Product Documentation Changes (PDCs) and added to this guide:
 - RI35532
 - RI35533
 - RI35610
 - RI35956
 - RI37906
 - RI37907
 - RI42670
 - RI43382
 - RI46068
 - RI50407
 - RI53417
 - RI53493
 - RI54057
 - RI54070
 - RI59516
 - RI69676
 - RI69677
- All instances of '/usr/lpp/caspool/' have been changed to '/cai/caspool/'
- Added new DESTVAL=DYNAPDIP parameter values to enable APD support for DEST=IP:ipaddr.
- Added new DRIVPRMx='LPORT=(111-222,333-444)' parameter to specify TCP/IP source port ranges.
- Changed X2YYDEF MAXTASK parameter maximum value to 20 and default to 5.
- Added new MAILCOMB=FILENAME/GROUPID/USERID parameter to SMTP print driver to send emails with multiple attachments.
- Added new XEQGRPID=JOBID initialization parameter let OUTPUT GROUPID default to JES JobID.
- Added NJE TCP/IP support

- Added procedure to enable CA Spool to connect to FTPS servers
- Added information about user signon through external security
- Moved the user exits topics from this guide to the *Programming Guide*. The user exits are:
 - ESFUSO—SYSOUT Limit Exit Routine
 - ESFUSS—Interface Exit Routine
 - SAF—Security Exit Routines
 - ESFPRIOX—Output Priority
 - ESFSEPAX—VTAM Separator Page
 - ESFMSG0X—Message Processing
 - ESFU006X—VTAM Print Line Exit Routine
 - ESFU008X Automatic Printer Definition Exit Routine
 - ESFU009X—TCP/IP Print User Exit
 - ESFU010X—TCP/IP Separator Page User Exit
 - ESFU011X—TCP/IP LPD User Exit
 - Main Task User Exit Routines

These chapters contain confidential (restricted access) topics that require login to <http://ca.com/support>. Moving these topics to the *Programming Guide* makes the *Customization Guide* publicly accessible. Consequently, you can now access the *Customization Guide* without logging in to <http://ca.com/support>.

- Added procedures to perform these tasks:
 - [Install the Web Interface on z/OS 2.2](#) (see page 89)
 - [Configure the Web Interface to let users convert text files to HTML, PDF, or RTF](#) (see page 93)
- Added DEFTOUSR, a new [email parameter](#) (see page 184) for TCP/IP PrintDirect

Contents

Chapter 1: Customization	19
Subsystem Name.....	20
Defining the Subsystem Name	20
Started Task.....	21
Checkpoint and Spool Data Sets	24
Installation	24
Checkpoint Data Set Name	24
Location.....	25
Space Allocation	25
SPOOL Data Sets.....	25
Location.....	25
Space Allocation	26
Common Storage Modules.....	26
Module Loading Areas	27
Common Storage Modules—Above and Below the 16 MB Line	27
VTAM APPL Control Statement Definition	27
Application ID.....	28
VTAM Generic Resource Name	28
VTAM LOGMODE Entries.....	28
Logon and Session Information.....	28
Session Parameters	29
Display Nodes Only	29
Printer Nodes Only.....	29
NJE Nodes Only	30
VTAM LOGMODE Definitions	30
FCB Considerations.....	31
Channel Skips	32
FCB Extensions	32
Extension Fields.....	33
Security Issues	34
SAF	34
Internal SAF	34
Implementing Security with SAF	34
Control	35
Security Checks	35
External Security Checks	35
How to Use External Security.....	36

Internal Security Checks.....	51
Data Set Class.....	52
Resource Names Format.....	52
Variables.....	53
SAFTYPE Statement.....	54
Examples.....	55
Command Verification.....	56
Command Access.....	56
Authorization Levels.....	56
Default Groups and Nodes.....	57
Internal and External Defaults.....	58
Parameters Example.....	58
Internal SAF.....	59
ESFNETC Interface.....	60
Multi-Access Spool (MAS).....	61
File Queues.....	62
Spool and Checkpoint Data Sets.....	62
Coupling Facility.....	62
Configuration.....	64
Starting MAS.....	64
Initialization Parameter.....	64
Warm Start.....	64
Initialization Parameters.....	65
File Creation and Queuing.....	65
Output Selection Criteria.....	66
Enhanced MAS Support.....	66
EMAS Considerations.....	66
NJE Home Node.....	67
Common NJE Node Name.....	67
Network Owner.....	67
EMAS Sample.....	68
NJE (Network Job Entry) Interface.....	68
NJE Example.....	69
JES2 NJE example.....	70
VM/RSCS SNA NJE example.....	71
JES3 and MVS/BDT Example.....	71
NJE TCP/IP.....	71
Set Up Security for NJE TCP/IP.....	73
XFER Interface.....	75
SYSOUT Allocation Intercept.....	76
Allocation Routines.....	76
Parameters.....	76

Intercepted Subsystem	76
SUBSYS Interface for TSO Users	77
ESFALLOC	77
Virtual Printer Interface	77
Data Collection	77
Printer Definition	78
VTAM Printer Definition	78
LU Type-3 Session Commands	78
LU Type-1 Session Commands	79
Start and Stop Commands	80
CICS Environment.....	80
DFHTCT Table	80
Menu System and Web Interface.....	81
Environments	81
Customization	81
Modules in the Menu System	82
National Language Support.....	82
Installation	83
CICS Installation	83
New CICS Release.....	83
CICS Menu System Startup.....	84
Invoking the Menu System.....	84
CA IDMS/DC Installation	85
TSO/ISPF Installation	85
TSO Installation	86
CA Roscoe Installation.....	86
IMS Installation	87
NATURAL Installation	87
VTAM Installation.....	88
Install the Web Interface on z/OS 2.1 and Earlier Releases	88
Install the Web Interface on z/OS 2.2	89
Customize the Web Interface	92
Configure Web Interface to Let Users Convert Text Files to HTML, PDF, or RTF	93
Configure Web Interface to Let Users Transform AFP Files to PDF	95
Language Support	95
Menu System Customization	95
Changing the Menu System	95
Panel Design.....	95
Customizable Items.....	96
Default Subsystem ID	96
Language Selection	96
Choosing TEXT n.....	97

Modifying Panel Texts.....	97
Changing Menu Functionality	97
Modifying Action Commands.....	98
Panel Layouts	99
Formats	100
Format Creation Example	100
Field Definitions	101
Web Interface Customization	102
PSF (Print Services Facility) Interface	104
FSS Address Spaces	104
Adding Printers to an FSS Address Space	105
Advanced Laser Printer Interface	107
Protocol Converters	107
Background	108
Procedure.....	108
Supported Functions	109
Installing Laser Printer Support.....	110
Troubleshooting	111
Customization	111
Defining Orientation	112
Explicit Orientations.....	112
Laser Support Modules	112
XDEVTPS.....	113
FORMDEF	114
XPxxxxx	115
XCHRxxxx.....	116
XUSERxxx Module	117
\$LPCHAR.....	118
\$LPCMS	120
\$LPDC	123
\$LPDEV	123
\$LPDVP	132
\$LPFDEF.....	134
\$LPFIELD.....	135
\$LPPDEF	137
\$LPPRTL.....	138
\$LPUNIT.....	139
Invoke Medium Map.....	140
Invoke Data Map.....	140
Selection Hierarchies.....	141
IDEX SNA-P 3270 Program Version 01.12	141
Troubleshooting.....	142

IDA LaserJet 3270 Version 18.040* Microcode Version 1.3 APL.....	142
Sample Modules.....	143
GDDM ADMOPUJ Interface.....	144
DDName.....	144
SYSOUT Allocation Intercept.....	145
Printing GDDM Files.....	146
CALL Interface Routines.....	146
AESPRIV.....	146
AESFCICS.....	146
Installing CICS Command Level Interface Module.....	147
Advanced Communication Interface—ESFCOMI.....	147
TSO Sample.....	147
Adding Cleanup for CICS Transactions.....	147
ESFCCLUP and ESFENCLU.....	147
Installing the CICS Clean-Up Routine.....	148
IMS Task Cleanup.....	148
Online Systems.....	148
Update Deck.....	148
NATURAL Interface.....	148
Installing the NATURAL Interface.....	149
NATURAL V8.2.x Installation.....	149
ESFNP231.....	149
Link-Edit Job.....	150
SAP Interface.....	150
SAPSPEI.....	150
SAPSPEX.....	151
SAPSPEX Error Codes and SAP Log.....	151
Installation.....	152
Customizing SAP.....	152
Subsystem Name.....	152
SAP User ID.....	153
DESTID Statement.....	153
DESTID Processing.....	153
DESTID Attribute Assignment.....	154
GSS Interface.....	155
GSS/ISERVE.....	155
Preparation.....	155
Using the Interface.....	156
Address Command.....	156
Condition Codes.....	156
Automatic Printer Definition.....	157
When is APD Invoked?.....	157

Unknown Destinations	158
DESTVAL=DYNAPDIP DEST='IP:ipaddr' APD Support.....	158
ESFPARM Sample Statements	159
APD User Exits	160
REINIT	160
Security Issues	161
Naming Standards	161
Operational Implications.....	161
TCP/IP PrintDirect.....	162
Nameserver/Symbolic Name Resolution	162
CA Spool JCL	163
TCPIP Data File	164
TCP/IP Source Ports.....	165
TCP/IP Print Drivers.....	165
Basic LPR Print Driver	166
LPR PJI Print Driver	167
Basic DSO Print Driver	167
LPR PCL5 Print Driver	168
LPR PJI4 Print Driver	170
PJI5 PrintDirect Driver	173
LCDS Xerox DocuSP Print Driver.....	175
BARR Print Driver	175
IPDS Print Driver.....	176
Data Set Print Driver	176
Email Print Driver	181
SAR Print Driver.....	189
JES Print Driver	192
ESF Print Driver	196
FTP Print Driver	199
XCOM Print Driver.....	208
Connect:Direct Print Driver.....	213
Print Data Encryption.....	219
TCP/IP Printer Node Parameters.....	222
TCP/IP LPD Interface	223
LPR/LPD Protocol	223
Basic LPD Commands	224
LPD Job Commands.....	224
LPD Control File.....	225
TSO LPR, LPQ, and LPRM.....	226
z/OS USS – UNIX System Services	227
Windows LPR, LPQ, LPRM	228
Windows TCP/IP Printing	229

z/OS Printer Port Monitor for Windows	229
AFP Printer Driver for Windows	231
Various UNIX Platforms.....	231
z/OS and JES2/JES3 Print Requests	232
CA View Print Requests	232
CA Deliver Print Requests	232
CA Dispatch Print Requests	233
CA Bundl Print Requests.....	233
CA Spool Print Requests	233
LPD Initialization Parameters	234
ESFPARM	235
Verify the LPD.....	235
CA Service Desk Manager Interface	236
Data Encryption.....	237
Encryption Keys.....	237
Terminology	239
Enable AES Encryption of Reports.....	240
CA Spool Health Checker Interface	242
SPOOL_SPACE_PCT@jobname.....	243
SPOOL_FILE_QUEUE_PCT@jobname.....	244
SPOOL_TCP_ACT@jobname	245
SPOOL_TRANSFRM_ACT@jobname	246
SPOOL_CKPT_ACT@jobname	248
SPOOL_OPT_ENCRYPT@jobname.....	249

Chapter 2: System Modifications 251

Installing Service and Modifications Using SMP/E	251
Installation Jobs.....	251
User Modifications	252
User Versions	252
USERMOD.....	252
User Exits.....	253
Updating Output Translation Tables	253
ESFTRAN	253
ESFSSM—Subsystem Support Module	254
Interface Module Name	254
ESFFSSM—FSI Support Module for PSF.....	254
User Interface Modules.....	254
Loading Routines Dynamically	254
Interface Routines.....	254
Link-edit	255

ESFPRINT—General Print Utility.....	255
Changing Default Values	255

Chapter 3: Initialization 257

System Actions	257
Options and Parameters that affect Initialization.....	257
Initialization Options	258
Initialization Parameters	260
Initialization Statements	260
Syntax Rules	260
System Symbol Substitution	261
LPD Interface	261
Initialization Parameter Statement Descriptions	263
ACQTIME	263
APPLID	264
BACKOUT.....	264
BUFSIZE	265
CHKPTDS.....	265
CID	266
CKPTIME	269
CMBBUFS	270
COMCHAR	270
DEFCLASS.....	271
DEFFCB	271
DEFFORM	271
DEFNODE.....	272
DESTID	275
DESTVAL	307
DYNDISP	307
DYNnje.....	308
DYNprt	308
DYNuser.....	308
DYNvps	309
ESRCODE	309
FILELIM	310
FSSDEF.....	310
GDDMCLA.....	311
GDDMAPPL.....	312
LOADEXIT	312
LOGBUFS	314
LOGCLAS.....	314

LOGDEST	314
LOGHOLD	315
LOGLCNT	315
LOGMENU	315
LPDDEST	316
LPDFILE	324
LPDSERV	327
MAXDORM	336
MAXFSCT	337
MAXFSEQ	337
MAXHOLD	337
MAXGROUP	338
MESSAGE	338
MINDORM	341
MINHOLD	341
MODULES	342
NJE	343
NJENAME	348
NJEOPT	348
NJESERV	349
NODE	350
Node Statement	352
Common Node Parameters	352
Display Node Parameters	355
Printer Node Parameters	358
NUMCMBS	403
NUMFQES	404
OUTLIM	404
PASSWORD	405
PGNLEN	405
PPURGE	405
PRIOxx	406
PRTOPT	406
PURGELIM	408
PURGINT	408
RCVBUFS	409
ROUTCDE	409
SAFAT	409
SAFDEF	411
SAFTYPE	412
SAFUID	413
SAR	414

SDI	415
SECUCALL	415
SECUEXT	416
SECUOPT	416
SID	417
SMF	417
SMFACNT	418
SMFBUFS	418
SMFDSPCH	419
SMFTYPE.....	419
SNABSIZE	420
SNET	420
SPOOLCMP	421
SPOOLDS	421
SPOLENC	422
SUBID	422
SUBS	423
SUBSCLAS	424
SVCCODE	424
SYNCTOL.....	425
Snn	425
TCPLHOST.....	426
TGWARN	427
TRACE	427
USEALIAS	427
USERDEF.....	428
USERZAP	428
WARNTIM.....	429
WTO	429
XEQBUFS	430
XEQGRPID.....	430
XEQOPT	430
XFER	432
XFERCLAS.....	433
XFERDEST	433
XFERNJE.....	434
XFEROPT.....	434
XFERSAPI	436
XFERSEP.....	437
XFERTHCT	437
XFERTIME	437
X2YY	438

X2YYDEF	438
Initialization Feature and Option Summary Table	439

Appendix A: Storage Estimates 447

Checkpoint Data Set Size Calculation	447
Private Area Storage Estimates	448
Virtual Storage Requirements	448
CSA Storage Estimates	451

Appendix B: SMF Records 453

Standard SMF Record Header	453
Record Subtype 0 (00)—Start	455
Record Subtype 1 (01)—Termination	455
Record Subtype 2 (02)—SMF Data Lost	456
Record Subtype 3 (03)—VTAM-session Start	456
Record Subtype 4 (04)—VTAM-Session End	457
Record Subtype 5 (05)—File Open	457
Record Subtype 6 (06)—File Close	458
Record Subtype 7 (07)—File Purge	459
Record Subtype 8 (08)—File Route	459
Record Subtype 9 (09)—File Transfer	461
Record Subtype 10 (0A)—File Reset	461
Record Subtype 11 (0B)—Print End	463
Record Subtype 12 (0C) - File Transformation	464

Chapter 1: Customization

CA Spool lets you customize the product according to the needs of your site after you have installed and verified. This chapter explains all of the available customization options.

This section contains the following topics:

- [Subsystem Name](#) (see page 20)
- [Checkpoint and Spool Data Sets](#) (see page 24)
- [Common Storage Modules](#) (see page 26)
- [VTAM APPL Control Statement Definition](#) (see page 27)
- [VTAM LOGMODE Entries](#) (see page 28)
- [FCB Considerations](#) (see page 31)
- [Security Issues](#) (see page 34)
- [Implementing Security with SAF](#) (see page 34)
- [Multi-Access Spool \(MAS\)](#) (see page 61)
- [Enhanced MAS Support](#) (see page 66)
- [NJE \(Network Job Entry\) Interface](#) (see page 68)
- [XFER Interface](#) (see page 75)
- [SYSOUT Allocation Intercept](#) (see page 76)
- [SUBSYS Interface for TSO Users](#) (see page 77)
- [Virtual Printer Interface](#) (see page 77)
- [Menu System and Web Interface](#) (see page 81)
- [Menu System Customization](#) (see page 95)
- [PSF \(Print Services Facility\) Interface](#) (see page 104)
- [Advanced Laser Printer Interface](#) (see page 107)
- [GDDM ADMOPUJ Interface](#) (see page 144)
- [CALL Interface Routines](#) (see page 146)
- [Advanced Communication Interface—ESFCOMI](#) (see page 147)
- [Adding Cleanup for CICS Transactions](#) (see page 147)
- [IMS Task Cleanup](#) (see page 148)
- [NATURAL Interface](#) (see page 148)
- [NATURAL V8.2.x Installation](#) (see page 149)
- [SAP Interface](#) (see page 150)
- [DESTID Statement](#) (see page 153)
- [GSS Interface](#) (see page 155)
- [Automatic Printer Definition](#) (see page 157)
- [TCP/IP PrintDirect](#) (see page 162)
- [TCP/IP LPD Interface](#) (see page 223)
- [CA Service Desk Manager Interface](#) (see page 236)
- [Data Encryption](#) (see page 237)
- [CA Spool Health Checker Interface](#) (see page 242)

Subsystem Name

The CA Spool subsystem name is specified by the SUBID initialization parameter. This name identifies the subsystem to MVS, and to the primary job-entry subsystem JES2 or JES3.

CA Spool automatically defines the secondary subsystem during the startup. It is not necessary to define the subsystem in an IEFSSNxx member in SYS1.PARMLIB. Initialization of the subsystem always happens during startup.

Defining the Subsystem Name

If you must define the subsystem name in IEFSSNxx, use the following format:

<ESF>, ESFSSIR

- The subsystem name is also used as the destination for CA Spool by the JESTOESF interface. This means that the JES2 or JES3 parameters must also normally be changed if the SUBID parameter is changed.
- The members BQ4JES2 and BQ4JES3 in the CBQ4JCL contain information about how to define the subsystem name to JES2 and JES3.
- The subsystem name is the same as the procedure job used to initialize the system. Although this is not strictly required, it is a recommended practice.

Started Task

The CA Spool system runs as a started task, which is initiated from an MVS console. This requires that a procedure is available in a procedure library known to the primary JES system.

The following is a sample procedure:

```
//CAIQPOOL PROC MEMBER=CAIQPARAM,           * Initialization Parms
//      LOADLIB='CAI.SP00L.CBQ4LOAD',       * CA Spool Load Library
//*     LOADLBC='CAI.SP00L.CE0CLOAD',       * CA Spool C Transformers
//      SASCLIB='CAI.CSARLOAD',           * SAS/C Runtime Library
//      PARMLIB='CAI.CBQ4PARAM',          * Parmlib library
//      OPTION=WARM                       * Start options
//*****
//*                                         *
//*             CA Spool V12.0             *
//*                                         *
//* Tailor the Proc as required by your setup *
//*                                         *
//* Copyright (c) 2014 CA. All rights reserved. *
//*****
//IEFPROC EXEC PGM=ESFMAIN,TIME=1440,REGION=0M,PARM=&OPTION
//STEPLIB DD DISP=SHR,DSN=CEE.SCEERUN      * LE run-time library
//      DD DISP=SHR,DSN=&LOADLIB          * CA Spool Load Library
//*     DD DISP=SHR,DSN=&LOADLBC          * CA Spool C Transformers
//      DD DISP=SHR,DSN=&SASCLIB          * SAS/C Load Library
//*     DD DISP=SHR,DSN=CAI.VIEW.CBRMLoad * CA View Load Library
//*     DD DISP=SHR,DSN=CAI.XCOM.CBGXLOAD * CA XCOM Load Library
//*     DD DISP=SHR,DSN=$CD.LINKLIB       * Connect:Direct Load Lib

//ESFPARM DD DISP=SHR,DSN=&PARMLIB(&MEMBER) * Initialization Parms
//ESFLIST DD SYSOUT=*,OUTLIM=0
//SYSPRINT DD SYSOUT=*
//SYSTEM DD DUMMY
//SYMDUMP DD DUMMY
//*NJESNAP DD SYSOUT=*                   * NJE trace
//*SAPISNAP DD SYSOUT=*                   * SAPI trace
//*SECUSNAP DD SYSOUT=*                   * SAF trace
//*-----*
//* Local IMAGELIB libraries.             *
//*-----*
//IMAGELIB DD DISP=SHR,DSN=SYS1.IMAGELIB
//*     DD DISP=SHR,DSN=**YOUR**.IMAGELIB
//*-----*
//* Local TCPIP.DATA file.                *
//*-----*
//*SYSTCPD DD DISP=SHR,DSN=**YOUR**.TCPIP.DATA.FILE
//*-----*
```

```
/* CA Spool Print formatting resource libraries. *
/*-----*
/*PJLLIB DD DISP=SHR,DSN=**YOUR**.PJL.RESOURCE.LIBRARY
/*PCLLIB DD DISP=SHR,DSN=**YOUR**.PCL.RESOURCE.LIBRARY
/*BINLIB DD DISP=SHR,DSN=**YOUR**.BIN.RESOURCE.LIBRARY
/*OVLYLIB DD DISP=SHR,DSN=**YOUR**.OVLY.RESOURCE.LIBRARY
/*HTMLIB DD DISP=SHR,DSN=**YOUR**.HTML.RESOURCE.LIBRARY
/*MAILLIB DD DISP=SHR,DSN=**YOUR**.MAILBOOK.RESOURCE.LIBRARY
/*-----*
/* CA Spool AFP Transformer libraries. *
/*-----*
/*A2PCPARAM DD DISP=SHR,DSN=CAI.CE0CGEN(A2PCPARAM)
/*A2PCFCOR DD DISP=SHR,DSN=**YOUR**.A2PCFCT <= FONT CORRELATION TABLE
/*A2PCREPT DD SYSOUT=*
/*A2PSPARM DD DISP=SHR,DSN=CAI.CE0CGEN(A2PSPARM)
/*AFPMFCT DD DISP=SHR,DSN=CAI.CE0CGEN(AFPMFCT)
/*A2PSREPT DD SYSOUT=*
/*A2PDPARAM DD DISP=SHR,DSN=CAI.CE0CGEN(A2PDPARAM)
/*A2PDREPT DD SYSOUT=*
/*PSEGPDS DD DISP=SHR,DSN=**PSF**.PSEGLIB
/*FDEFPS DD DISP=SHR,DSN=**PSF**.FDEFLIB
/*PDEFPS DD DISP=SHR,DSN=**PSF**.PDEFLIB
/*OVLYPDS DD DISP=SHR,DSN=**PSF**.OVERLIB
/*FONTPDS DD DISP=SHR,DSN=**PSF**.FONTLIB
/*FONTPDS3 DD DISP=SHR,DSN=**PSF**.FONT300
/*-----*
/* Common FTP, CA XCOM and Connect:Direct userid/password file *
/*-----*
/*NETRC DD DISP=SHR,DSN=&PARMLIB(IQNETRC)
/*-----*
/* CA XCOM libraries. *
/*-----*
/*XCOMCNTL DD DISP=SHR,DSN=CAI.XCOM.CBXGPARM
/*XCOMSYSI DD DISP=SHR,DSN=&PARMLIB(IQXCOMPR)
/*SYSIN01 DD DSN=&SYSIN01,UNIT=SYSDA,SPACE=(TRK,(1,1))
/*LCLDS01 DD DSN=&LCLDS01,UNIT=SYSDA,SPACE=(CYL,(10,10))
/*-----*
/* Connect:Direct libraries. *
/*-----*
/*DMNETMAP DD DISP=SHR,DSN=$CD.NETMAP
/*DMPUBLIB DD DISP=SHR,DSN=$CD.PROCESS
/*DMMSGFIL DD DISP=SHR,DSN=$CD.MSG
/*DMPRINT DD SYSOUT=*
/*
```

The following statements are mandatory:

- The PROC statement is required.
- The EXEC statement is required and must execute the CA Spool main load-module, which is normally assigned the name ESFMAIN.
 - The TIME and REGION parameters are optional system-dependent parameters; specify according to the site standards.
 - Information on how to estimate the CA Spool REGION size is found in the Appendix Storage Estimates.
- The PARM parameter is optional. For more information about the parameter, see the topic *Initialization Options* in the chapter *Initialization* of this guide.
- The STEPLIB DD statement points to the CA Spool load library, the LE run-time library and the SAS/C runtime library. If you are not using the STEPLIB DD statement, these libraries must be in linklist and APF authorized.
 - If you use the C Transformers, include the CEOCLOAD loadlib in the STEPLIB or in linklist.
 - If you use the following interfaces or drivers, include the load libraries from their products in the STEPLIB or in linklist:
 - Direct interface to CA View
 - CA Roscoe menu interface
 - CA XCOM print drivers
 - Connect:Direct print drivers
 - Verify that all loadlibs that CA Spool uses are APF-authorized.
- The ESFPARM DD statement is required and must point to a sequential file (optionally, a member of a PO data set) containing the CA Spool initialization-parameter statements. This file is accessed using the QSAM access method.
- The ESFLIST DD statement is only required if the LIST option is specified during CA Spool start-up.
- The SYSTEM DD statement provides SAS/C error messages. Activate this DD when necessary for debugging.
- The SYMDUMP DD statement is used in conjunction with the CA SymDump System for abend debugging.
- The NJESNAP DD statement is optional. If an NJE statement in startup parameters has TRACE specified, a trace is printed using this statement.
- The SAPI SNAP DD statement is optional. If it is present, this statement is used to write a trace of all SAPI calls. We recommend that you do *not* include this statement, except for debugging purposes.

- The SECUSNAP DD statement is optional. If SECUEXT=SAF is specified and the statement is present in the startup procedure, a trace of all security calls is written using this statement. We recommend that you do *not* include this statement, unless for debugging purposes.
- The IMAGELIB DD statement is an optional statement, which is used to define an alternate FCB imagelib data set, which must be used instead of the standard SYS1.IMAGELIB. CA Spool uses this when loading FCBs and modules for the Advanced Laser Printer Interface. For more information, see the section Advanced Laser Printer Interface.
- The SYSTCPD DD statement points to the optional TCPIP.DATA file.
Note: The use of DCB=BUFNO=n, where n is any number, is not recommended. This can cause increase in storage use and can result in storage abends.
- The PJLLIB DD statement points to the PJJ resource library.
- The PCLLIB DD statement points to the PCL resource library.
- The BINLIB DD statement points to the binary resource library.
- The OVLYLIB DD statement points to the OVLY resource library.
- The HTMLIB DD statement points to the HTML resource library.
- The MAILLIB DD statement points to the email MAILBOOK resource library.

Checkpoint and Spool Data Sets

CA Spool needs one checkpoint data set and one or more spool data sets.

Installation

This checkpoint data set and spool data sets must be permanently allocated as part of the installation process.

Optionally, a secondary checkpoint data set is defined, which is used as a duplex copy of the primary checkpoint data set. This data set is used for manual recovery if the primary checkpoint data set becomes unusable.

Note: See the *Best Practices Guide* for more information regarding the use of the secondary checkpoint data set.

Checkpoint Data Set Name

The name of the data set used for checkpoint is specified in the CHKPTDS initialization statement.

Location

The checkpoint data set can reside on any type of direct access device. The location is specified in the CHKPTDS initialization statement.

It is recommended that you allocate the checkpoint data set on a low impact volume and separate from the spool data sets.

Space Allocation

Allocate the checkpoint data set in cylinders, and in one extent. CA Spool uses only the first extent of the data set for checkpointing and ignores any additional extents. See [Checkpoint Data Set Size Calculation](#) (see page 447) for the formula to use when you calculate the checkpoint data set size.

SPOOL Data Sets

The name of a data set used for spooling is specified in the SPOOLDS initialization statement. The default spool data set name is SYS1.ESFSPOOL.

Notes:

- Multiple spool data sets on one volume are supported.
- 3390-9 DASD and 3390-A DASD are supported.
- DSNTYPE=LARGE spool data set supported to allow spool data sets with up to 1,048,575 tracks (69,905 cylinders).
- You can add new spool data sets to a running CA Spool system. No format start is required; simply specify the new spool data sets in ESFPARM and perform a REINIT.
- Added spool data sets are automatically formatted during REINIT. Multiple spool data sets are formatted in parallel.

Location

Spool data sets can reside on any combination of direct access devices. The spool data sets are specified by SPOOLDS initialization statements.

It is recommended that you allocate the spool data sets on low impact volumes and separate from the checkpoint data sets.

Space Allocation

The pool data sets must be allocated in cylinders, and in one extent. CA Spool uses only the first extent of these data sets for spool space and any additional extents are ignored. The block size must not be too small, because a maximum of eight blocks per track is used. The block size is specified in the BUFSIZE statement.

Common Storage Modules

CA Spool requires that the following modules be placed in commonly-addressable storage:

ESFSSM

Subsystem-support module

ESFUSO

SYSOUT-limit exit routine

ESFUSS

Interface exit routine

ESFSVC

SVC routine

ESFSSM, ESFUSS, and ESFSVC are the default names.

The initialization parameter MODULES statement is used to specify alternative load-module names. This is used if:

- Maintenance has been applied.
- An installation wishes to run several discrete versions of CA Spool.

Normally pointers to the common storage modules are kept. When CA Spool has been stopped and is re-started, the same copies of the modules are used.

There are two ways to force new versions of the modules to be loaded:

- You can issue the REINIT,MODULES,ON command to indicate that CA Spool must load new versions of the modules at the next restart of CA Spool.
- Alternatively, copy the modules to new names and reference the new names on the MODULES statement in the CA Spool parameter deck.

The new modules will be used on restarting CA Spool.

Module Loading Areas

The common storage modules are loaded into any one of the areas as shown in the following:

MLPA

Update or create an IEALPAXx member in SYS1.PARMLIB, and refer to it in the MLPA parameter in IEASYS00, or during IPL. An IPL is necessary.

ELPA

Copy the modules to a program library on the LPA1STxx. An IPL with CLPA is necessary.

ECSA

If the modules cannot be found in MLPA or LPA, CA Spool loads the modules into ECSA during initialization. They are loaded from an APF authorized STEPLIB library, or from a program library on the LNK1STxx.

Common Storage Modules—Above and Below the 16 MB Line

By default, ESFSSSM, ESFUSO, ESFUSS, and ESFSVC are loaded above the 16 MB line. That is in EMLPA, ELPA, or ECSA. However, the individual load modules are loaded below the 16 MB line by changing the RMODE of the load module. This might be necessary if any local modification has been made to the code and these cannot run above the 16 MB line.

VTAM APPL Control Statement Definition

You can define CA Spool to VTAM through an APPL control statement in an application major node definition of SYS1.VTAMLST.

The entry must be defined as follows, assuming that the CA Spool application name is ESF:

```
          VBUILD TYPE=APPL
          .
ESF      APPL AUTH=ACQ,VPACING=7
```

Application ID

Any valid name is assigned as the application ID. If you want to alter the names assigned during installation, the initialization parameter APPLID must also be updated accordingly. If you plan to use the NJE interface, it is important that VPACING is set to a non-zero value. For more information, see the section Defining Application Program Major Nodes in the IBM *ACF/VTAM Planning and Installation Reference* guide.

VTAM Generic Resource Name

If the APPLID parameter is specified in an EMAS complex, it specifies a common VTAM Generic Resource Name for the entire EMAS complex. So VTAM sessions are initiated to any of the EMAS members just by specifying the common VTAM Generic Resource Name in the session request.

When using the VTAM Generic Resource Name through default, VTAM tries to make the session with an EMAS member in the same MVS image. If that is not possible, it uses normal load balancing when passing the session request to one of the active EMAS members.

VTAM LOGMODE Entries

The VTAM logmode entries supply logon and session information, session parameters, display node, printer node, NJE node, and VTAM logmode definitions.

Logon and Session Information

A terminal (logical unit) request to connect to an application program is named a *logon*.

A notification is sent to the application program that a terminal is waiting for the application program to establish connection. When an application program establishes connection with a logical unit, the application program tells ACF/VTAM and the logical unit how to conduct the communication session. This information is in the form of a set of session parameters. These session parameters include the following details:

- Whether the application program sends chained data
- Whether the logical unit sends end-of-bracket commands to the application program

Session Parameters

CA Spool inspects the following session parameters:

- Logical unit type
Specified in the first byte of the PSERVIC operand of the MODEENT macro
- 3270 extended data stream flag
(X'80') in second byte of the PSERVIC operand of the MODEENT macro
- Outbound RU-size
Specified in the second byte of the RUSIZES operand of the MODEENT macro. If no value is specified, the value from the MAXDATA sub-parameter of the NODE parameter is used.

Display Nodes Only

The screen size is set by bytes 7 to 11 (relative to 1) of the PSERVIC operands.

The screen size used depends on the value of byte 11 of the PSERVIC operand. If an undefined screen size is specified, the screen size is set on the basis of the device type specified in the NODE definition.

Printer Nodes Only

In the case of printer nodes, the following logical-unit-profile-1 primary-data-stream flags are set by byte 5 (relative to 1) of the PSERVIC operand:

X'80'

Full base set data stream can be sent. This must be set if the printer is to be supported as an SCS printer (LU type 1). Otherwise, the printer is supported as a 3270 data stream printer (LU type 3).

X'40'

Horizontal-format data stream (SHF) can be sent. This must be set to support the optional print-position indexing byte in an FCB image, or to support MPP = 220 on 3268 printers.

X'20'

Vertical-format data stream (SVF) can be sent. This must be set to let CA Spool automatically set the maximum page length in accordance with the page length in the FCB image.

X'08'

Set-line-density data stream (SLD) can be sent. This must be set to let CA Spool automatically set the lines-per-inch parameter in accordance with the lines-per-inch byte in the FCB image.

X'02'

Bell-control code (BEL) can be sent. This must be set if the audible alarm on the printer must be activated when CA Spool messages are written to the printer.

NJE Nodes Only

It is important that you remember to use non-zero values for PSNDPAC= and SSNDPAC=.

VTAM LOGMODE Definitions

The following section lists various VTAM LOGMODE definitions. For more information on session parameters, see the IBM *ACF/VTAM Planning and Installation Reference and ACF/VTAM Programming* guide.

3270 SDLC Local and Remote

```
S3270  MODEENT LOGMODE=S3270,FMPROF=X'02',TSPROF=X'02',
        PRIPROT=X'71',SECPROT=X'40',COMPROT=X'2000'
```

3276/3278 SNA (Model 2)

```
T3278M2 MODEENT LOGMODE=T3278M2,FMPROF=X'03',TSPROF=X'03',
        PRIPROT=X'B1',SECPROT=X'90',COMPROT=X'3080',
        RUSIZES=X'8786',
        PSERVIC=X'020000000000000000000000200'
```

3287 SNA (With SCS Feature)

```
T3287  M2MODEENT LOGMODE=T3287M2,FMPROF=X'03',TSPROF=X'03',
        PRIPROT=X'B1',SECPROT=X'90',COMPROT=X'3080',
        RUSIZES=X'8586',
        PSERVIC=X'01000000EB0000000000000000'
```

3287 SNA Local/Remote - 3270 Data Streaming (2K Buffer)

```
DSC2K  MODEENT LOGMODE=DSC2K,FMPROF=X'03',TSPROF=X'03',
        PRIPROT=X'B1',SECPROT=X'90',COMPROT=X'3080',
        RUSIZES=X'8787',
        PSERVIC=X'030000000000185018507F00',
        SRCVPAC=X'01'
```

3287 SNA Local/Remote - 3270 Data Streaming (4K Buffer)

```
DSC4K  MODEENT LOGMODE=DSC4K,FMPROF=X'03',TSPROF=X'03',
        PRIPROT=X'B1',SECPROT=X'90',COMPROT=X'3080',
        RUSIZES=X'8787',
        PSERVIC=X'03000000000018502B507F00',
        SRCVPAC=X'01'
```

3262 SNA (With SCS Feature)

```
T3262M13  MODEENT LOGMODE=T3262M13,FMPROF=X'03',TSPROF=X'03',
           PRIPROT=X'B1',SECPROT=X'90',COMPROT=X'3080',
           RUSIZES=X'8586',
           PSERVIC=X'01000000E900000000000000'
```

4245 SNA - SCB Data Compression

To utilize the special 4245 SCB data compression, the printer has to be defined as a 4245 device type and with COMP=YES in ESFPARM. A logmode like the following must be used:

```
T4245  MODEENT LOGMODE=T4245,FMPROF=X'03',TSPROF=X'03',
        PRIPROT=X'B3',SECPROT=X'90',
        COMPROT=X'7080',RUSIZES=X'8586',
        PSERVIC=X'01F00000E900000000000000'
```

NJE Logmode

```
ESFNJE  MODEENT LOGMODE=ESFNJE,FMPROF=X'03',TSPROF=X'03',
        PRIPROT=X'72',SECPROT=X'72',COMPROT=X'4020',
        PSNDPAC=7,SSNDPAC=7,RUSIZES=X'8989'
```

FCB Considerations

CA Spool supports the use of Form Control Buffers (FCB).

Channel Skips

CA Spool simulates channel skips according to the requested FCB. The name of the FCB must be FCB2xxxx, where xxxx is the value specified in the FCB field for files.

When printing on an SCS printer, the length of the FCB is used in an SVF command. The maximum length for 3287 devices is 102, and for other devices it is 127. The format of an FCB-image module is described in the IBM *z/OS DFSMSdfp Advanced Services* guide.

FCB Extensions

In addition to the normal functions of FCBs, some extra facilities are also available in CA Spool:

- For SCS printers the line density is set through the SLD command.
- Normal FCBs can specify 6 or 8 lines per inch.
- In CA Spool 3 or 4 lines per inch is also available. This is specified in the *lines per inch* byte using the following values:
 - X'2n'4 lines per inch
 - X'4n'3 lines per inch
- If the value ASIS is specified for a file without carriage control characters, no control characters are added to the data stream.
- If ESFPRINT is used to create spool files with FCB=ASIS, a dummy ASIS FCB must exist.
- CA Spool supports an extension to the FCB containing data, which is used to set up the printer with SCS commands.

The format of the CA Spool FCB extension is:

```
          $IQFCB  8,8,68,(1,1,7,2,13,3,19,4,25,5,31,6,37,7,43,8)
ESFFCBEX DS    0D
          DC     CL8'ESFEXT'  Identifier
          DC     AL2(198)     MPP max presentation position
          DC     AL1(2)       PPM-Q print quality
          DC     AL1(15)      CPI Character per inch horizontal
          DC     XL1'00'       PPM0 Drawer number for separator pgs
          DC     XL1'00'       PPM1 Drawer number for first page
          DC     XL1'00'       PPM2 Drawer number for second page
          DC     XL1'00'       PPM3 Drawer number for subsequent pgs
          END
```

The \$IQFCB macro is supplied in the CBQ4MAC library and it is used to generate standard MVS formatted FCBs.

Extension Fields

The extension contains the following fields:

ESFEXT

The CA Spool FCB extension must begin with the text ESFEXT. This is a very useful eye-catcher in unformatted listings.

MPP

Maximum print position. The length of this field is 2 bytes. The value must be in the range of 0 - 255. It is sent to the printer in an SHF command.

PPM-q

Print quality. The length of this field is 1 byte. The value must be in the range 0 - 3. It is sent to the printer in the quality field in a PPM command.

- 0—No change
- 1—DP quality
- 2—DP text quality
- 3—NLQ

CPI

Characters per inch. The length of this field is 1 byte. The value must be in the range 0 to 19. It is sent to the printer in the SPD command.

PPMx

Drawer selection. This field is for variables in the PPM SCS command for the 5210. The first half byte contains the FC specification and the second half contains the SD specification. For more information, see the relevant printer programming guide.

Security Issues

The CA Spool security system makes it possible to control access to CA Spool resources (files, printers, and commands). Attempts to access a resource are checked by CA Spool using the security interface selected by the system administrator. CA Spool has a number of security interfaces. Some of these are based on authorization rules defined internally; others interact with external security systems. Security interfaces include:

External Security

The SAF interface uses external security systems.

Internal Security

Internal SAF is the internal interface.

Combined Internal and External Security

You can combine internal and external security. You can use Internal SAF in combination with SAF. The system administrator can enable some users and resources to be defined or changed internally or externally.

SAF

The SAF interface uses the MVS System Authorization Facility to perform authorization checking. RACF, CA ACF2 and CA Top Secret support SAF. This interface can coexist with Internal SAF.

Internal SAF

This interface uses internal definitions to perform authorization checking. The checking is done in the same way as when using SAF and an external security system. This interface can coexist with SAF. You can check resources internally, externally, or both.

Implementing Security with SAF

The following topics describe the security implemented with SAF.

Control

Use of SAF (the System Authorization Facility) normally controls:

- Access to printers, at the node or group level
- Access to files, at the group, node, and user ID level
- Usage of each individual command

Use the internal/external SAF interface, or both to perform checks.

Security Checks

The following statements must be specified in the CA Spool parameters:

```
DYNUSER=100
SECUCALL=USERID
SECUEXT=SAF
SAFDEF
SAFTYPE      1
              .
              .
              .
SAFTYPE      16
```

Note: CA Spool stores certain information about individual user access rights after retrieving it from the external security system. Information stored internally about a user's access rights is purged from CA Spool. This occurs during REINITIALIZATION for all users. It can also occur for individual users when CA Spool needs to reclaim storage to make room for new user definitions.

External Security Checks

The checks against the external security system are made using security resource authorization calls:

```
RACROUTE REQUEST=AUTH,CLASS='DATASET'
```

These checks access the names of nonexistent data sets. These data set names are also referred to as *resource names*. A systems programmer can select alternative classes instead of the previous data set class.

How to Use External Security

As an administrator, you can use an external security product (CA ACF2, CA Top Secret, or RACF) to authorize login and secure data for CA Spool. Users can log in with either a password or password phrase. Customize both CA Spool and the security product to enable this support. For CA Spool, customize the ESFPARM input file. For the security product, customize the security calls that CA Spool issues. Follow this process:

1. In CA Spool, [enable external security](#) (see page 36).
2. In CA Spool, [configure the SAFTYPE statements](#) (see page 37) to secure access to resources.
3. Verify that you understand [the typical types of users and their access rights](#) (see page 38) in CA Spool.
4. Configure your external security product to secure CA Spool:
 - [CA Top Secret](#) (see page 39)
 - [CA ACF2](#) (see page 42)
 - [RACF](#) (see page 48)
5. (Optional) [Enable login using password phrases \(passphrases\)](#) (see page 51).

Enable External Security

To enable external security in CA Spool, specify the following statements in the ESFPARM input configuration file:

```
SECUEXT=SAF  
SAFDEF EXT,CLASS=DATASET
```

"EXT" in the SAFDEF statement specifies external security logins.

Configure the SAFTYPE Statements

CA Spool provides several [SAFTYPE statements](#) (see page 54) in the ESFPARM file to secure access to resources. You can configure any or all of them to use external security, by specifying the EXT,NOINT parameter. Sample statements follow. These statements are the same whether your external security product is CA ACF2, CA Top Secret, or RACF.

```
SAFTYPE 1, 'ESFSECU.FIGR&REQ(6,2).G&GRP(1,7).&UID(0,8).&FNM(0,8)',
          EXT,NOINT
SAFTYPE 2, 'ESFSECU.FIN0&REQ(6,2).&NOD(0,8).&UID(0,8).&FNM(0,8)',
          EXT,NOINT
SAFTYPE 3, 'ESFSECU.FIGR&REQ(6,2).G&GRP(1,7).&FUI(0,8).&FFN(0,8)',
          EXT,NOINT
SAFTYPE 4, 'ESFSECU.FIN0&REQ(6,2).&NOD(0,8).&FUI(0,8).&FFN(0,8)',
          EXT,NOINT
SAFTYPE 5, 'ESFSECU.FIGR&REQ(6,2).G&GRP(1,7).&FUI(0,8).&FNM(0,8)',
          EXT,NOINT
SAFTYPE 6, 'ESFSECU.FIN0&REQ(6,2).&NOD(0,8).&FUI(0,8).&FFN(0,8)',
          EXT,NOINT
SAFTYPE 7, 'ESFSECU.NOGR&REQ(6,2).G&GRP(1,7)', EXT,NOINT
SAFTYPE 8, 'ESFSECU.NON0&REQ(6,2).&NOD(0,8)', EXT,NOINT
SAFTYPE 9, 'ESFSECU.CMND&CMD(0,8)', EXT,NOINT
SAFTYPE 10, 'ESFSECU.AUTH.A2', EXT,NOINT
SAFTYPE 11, 'ESFSECU.AUTH.A3', EXT,NOINT
SAFTYPE 12, 'ESFSECU.AUTH.ALLGR', EXT,NOINT, LOG=NOSTAT
SAFTYPE 13, 'ESFSECU.AUTH.EXCMD', EXT,NOINT, LOG=NOSTAT
SAFTYPE 14, 'ESFSECU.AUTH.GLACC', EXT,NOINT, LOG=NOSTAT
SAFTYPE 15, 'ESFSECU.NOGR&REQ(6,2).G&GRP(1,7)', EXT,NOINT, LOG=NOSTAT
SAFTYPE 16, 'ESFSECU.NON0&REQ(6,2).&NOD(0,8)', EXT,NOINT, LOG=NOSTAT
```

Typical Types of Users and Their Access Rights

Administrators typically create the following types of users and assign the equivalent access rights to CA Spool resources:

- SUPER users can issue all commands, including update, change, and delete commands. SUPER users are fully authorized users. After CA Spool validates that a user is a SUPER user, it performs no further security checks.
- OPER users are operators. They can issue all [Authorization Level 1 and most Authorization Level 2](#) (see page 56) commands except REINIT and SHUTDOWN. OPER users can update, change, and delete resources across multiple network groups.
- JUNIOR users can display all resources in CA Spool, update all printers in the groups 1 and 2, and update all files in groups 1 and 2.

JUNIOR users are supervisors for a department. They can access multiple network groups of printers and their files. JUNIOR users can issue Authorization Level 1 commands in the network groups to which they belong.

- ORDINA users can display and update all printers in group 1. They can browse all files in group 1, but can only update the files.

ORDINA users can access a network group of printers. They can see all files in the same network group, but they can access only the files that they created. ORDINA users also can issue Authorization Level 1 commands in the network groups to which they belong.

- TINY users can display and update the printer (by default, PRT1A) and files for their network group. They can browse and update the files with a destination of that printer.

TINY users can issue level 1 commands for the printers and files for their network group.

Administrators typically define the default group number for the user to match the group number of the printer to which the user's group is assigned.

Administrators make this determination by examining the CAIQPARM DEFNODE and NODE statements for those printers.

The typical users in the previous list are the basis for the users in the “Sample Commands for Defining Users According to Role” in the next three sections. Those sections explain how to secure CA Spool using one of the following external security products:

- [CA Top Secret](#) (see page 39)
- [CA ACF2](#) (see page 42)
- [RACE](#) (see page 48)

Use CA Top Secret to Secure CA Spool

The following procedure shows how to configure CA Top Secret to secure CA Spool. This procedure includes steps for defining users and groups to both products and for defining the CA Spool started task to CA Top Secret. This procedure provides guidelines but is not necessarily comprehensive. See your CA Top Secret administrator to determine whether to perform more customizations for your site.

Important! Before you perform these steps, shut down CA Spool. After you complete these steps, start CA Spool.

To secure CA Spool with Top Secret, follow this process in CA Top Secret:

1. Perform one-time system setup tasks.
2. Define a default group for the userid and assign access rights to the userid.

Perform One-Time System Setup Tasks

Typically, you perform these steps once when you configure CA Spool to work with CA Top Secret.

1. Enter the following commands to define CA Spool (ESF) as a facility to CA Top Secret:

```
TSS MODI FAC(USERnn=NAME=ESF)
TSS MODI FAC(ESF=RES)
TSS MODI FAC(ESF=MODE=mode)
```

USERnn

Specifies a user-defined facility in CA Top Secret that is not in use.

mode

Typically specifies FAIL in a production environment.

2. Enter the following commands to create the CA Spool started task ACID as a Master Facility:

```
TSS CREATE(CASPOOL) TYPE(USER) NAME('CA SPOOL REGION ACID')
DEPT(dept) MASTFAC(ESF) FAC(STC) PASS(xxxx,0)
```

Note: The ACID associated with the CA Spool address space runs as a Top Secret Facility. We recommend that you give all started task ACIDs a password and OPTIONS(4) in the CA Top Secret parameter file.

3. Enter the following commands to define CA Spool to OMVS:

```
TSS ADD(CASPOOL) UID(n) HOME(/) OMVSPGM(/bin/sh)
TSS ADD(CASPOOL) GROUP(OMVSGRP) DFLTGRP(OMVSGRP)
TSS MODIFY OMVSTABS
```

4. Enter the following command to define CA Spool to the started task table in CA Top Secret:

```
TSS ADD(STC) PROCNAME(CASPOOL) ACID(CASPOOL)
```

5. Enter the following command to secure the ESFSECU high-level data set. This command adds ESFSECU as a department in the CA Top Secret DSN resource:

```
TSS ADD(dept) DSN(ESFSECU.)
```

Define a Default Group and Assign Access Rights

Define a default group for the userid and assign the userid access rights to CA Spool resources. Repeat these steps each time that you grant a user access to CA Spool.

To log in to CA Spool, users require the following access:

- Access to the Facility associated with the CA Spool job or task
- Access to the SAFTYPE resources for the ACID role
- A group or node that is defined in the INSTDATA field of their ACID. CA Spool requires that a userid have *both* valid CA Top Secret login credentials *and* associated INSTDATA. Userids must meet one of the following requirements:
 - Have INSTDATA information that relates to the associated group (G000000x and ESFDGRP(x)).
 - Have either SUPER authority or access to the entry in the INSTDATA.

To meet these requirements, first define a default group for the userid in its installation data. Next, assign the userid access rights to the ESFSECU resources in the DSN resource class. Use the following steps as models:

1. Grant the userid access to the CA Spool facility (ESF) by entering the following commands:

```
TSS ADD(USER001) FAC(ESF)
```

```
TSS ADD(USER002) FAC(ESF)
```

USER001 and USER002 are sample userids.

2. Associate the GROUP G0000001 with userids USER001 and USER002 by entering the following commands:

```
TSS ADD(USER001) INSTDATA('ESFDGRP(1)')
```

```
TSS ADD(USER002) INSTDATA('ESFDGRP(1)')
```

The INSTDATA parameter ESFDGRP(1) specifies the default group of G0000001.

3. Grant users the required access rights to log in to CA Spool. Use one of the following options:
 - Make the user a SUPER type user. For example, make USER002 a SUPER type user by entering the following command:


```
TSS PERMIT(USER002) DSN(ESFSECU.) ACCESS(UPDATE)
```

 This command grants access to all resources. This command also provides update authority to all the SAFTYPE records.
 - Grant the user access to its associated group or node. For example, make USER001 an ordinary user by associating it with the default group from the INSTDATA GRP1, as follows:


```
TSS PERMIT(USER001) DSN(ESFSECU.NOGR++.G0000001) ACCESS(UPDATE)
```

 This TSS command provides the login authority that the following SAFTYPE 15 record requires:


```
SAFTYPE 15, 'ESFSECU.NOGR&REQ(6,2).G&GRP(1,7)',EXT,NOINT
```
4. Define users according to role. Assign access rights to the users to meet the requirements of the [SAFTYPE statement](#) (see page 54) that you want. Use the following sample commands as models.

Sample Commands for Defining Users According to Role

The following sample Top Secret commands illustrate how to define users with the appropriate authorizations for [their type and access rights](#) (see page 38). Use the following examples as models.

Verify that the resource to which you grant access matches its appropriate SAFTYPE external entry. For a detailed explanation, see the example for the ORDINA user ORDINA01.

To define the SUPER user SUPER01, use the following commands as a model:

```
TSS ADD(SUPER01) FAC(ESF)
TSS ADD(SUPER01) INSTDATA('ESFDGRP(1)')
TSS PERMIT(SUPER01) DSN(ESFSECU.) ACCESS(UPDATE)
```

To define the OPER user OPER01, use the following commands as a model:

```
TSS ADD(OPER01) FAC(ESF)
TSS ADD(OPER01) INSTDATA('ESFDGRP(1)')
TSS PERMIT(OPER01) DSN(ESFSECU.) ACCESS(UPDATE)
TSS PERMIT(OPER01) DSN(ESFSECU.CMND.REINIT) ACCESS(NONE)
TSS PERMIT(OPER01) DSN(ESFSECU.CMND.SHUTDOWN) ACCESS(NONE)
```

To define the JUNIOR user JUNIOR01, use the following commands as a model:

```
TSS ADD(JUNIOR01) FAC(ESF)
TSS ADD(JUNIOR01) INSTDATA('ESFDGRP(1)')
TSS PERMIT(JUNIOR01) DSN(ESFSECU.AUTH.GLACC) ACCESS(READ)
TSS PERMIT(JUNIOR01) DSN(ESFSECU.AUTH.ALLGR) ACCESS(READ)
TSS PERMIT(JUNIOR01) DSN(ESFSECU.NOGR++.G0000001) ACCESS(UPDATE)
TSS PERMIT(JUNIOR01) DSN(ESFSECU.NOGR++.G0000002) ACCESS(UPDATE)
TSS PERMIT(JUNIOR01) DSN(ESFSECU.FIGR++.G0000001.JUNIOR.) ACCESS(UPDATE)
TSS PERMIT(JUNIOR01) DSN(ESFSECU.FIGR++.G0000002.JUNIOR.) ACCESS(UPDATE)
TSS PERMIT(JUNIOR01) DSN(ESFSECU.CMND.) ACCESS(READ)
```

To define the ORDINA user ORDINA01, use the following commands as a model:

```
TSS ADD(ORDINA01) FAC(ESF)
TSS ADD(ORDINA01) INSTDATA('ESFDGRP(1)')
TSS PERMIT(ORDINA01) DSN(ESFSECU.NOGR++.G0000001) ACCESS(UPDATE)
TSS PERMIT(ORDINA01) DSN(ESFSECU.FIGR++.G0000001.) ACCESS(READ)
TSS PERMIT(ORDINA01) DSN(ESFSECU.FIGR++.G0000001.ORDINA.) ACCESS(UPDATE)
TSS PERMIT(ORDINA01) DSN(ESFSECU.CMND.) ACCESS(READ)
```

To define the TINY user TINY01, use the following commands as a model:

```
TSS ADD(TINY01) FAC(ESF)
TSS ADD(TINY01) INSTDATA('ESFDGRP(1)')
TSS PERMIT(TINY01) DSN(ESFSECU.NONO++.PRT1A) ACCESS(UPDATE)
TSS PERMIT(TINY01) DSN(ESFSECU.FINO++.PRT1A.TINY.) ACCESS(UPDATE)
TSS PERMIT(TINY01) DSN(ESFSECU.CMND.) ACCESS(READ)
```

Use CA ACF2 to Secure CA Spool

CA SPOOL users require a valid CA ACF2 logon ID (LID) and password combination to log in to CA Spool under CA ACF2. CA ACF2 does not support the concept of INSTDATA or DATA with a LID. Therefore, no INSTDATA is associated with ACF2 LIDs.

To secure CA Spool with CA ACF2, follow this process in CA ACF2:

1. Perform one-time system setup tasks.
2. Define users according to role.

Perform One-Time System Setup Tasks

1. Create an ACF2 logon ID (LID) to be associated with the CA Spool address space. This LID must specify the MUSASS attribute, because CA Spool allows multiple users to be signed on to the product simultaneously.

Note: See the *CA-ACF2 Administration Guide* for information about the MUSASS attribute.

2. Assign a site-defined type code to this resource class by creating a CLASMAP record.

Note: See the *CA-ACF2 Administration Guide* for information about CLASMAP records.

CA-Spool issues a resource validation call for the ESF resource during login to the product. This resource is in the APPL resource class. The type code of this resource class is APP.

3. Use the following commands to define the APP resource:

```
SET C(GS0)
INSERT CLASMAP.APPL RESOURCE(APPL) RSRCTYPE(APP)
```

4. If these resource records are resident, use the following operator command to rebuild the rules:

```
F ACF2,REFRESH(INFODIR)
```

Defining Users According to Role

Define users according to role, to grant them access rights to CA Spool resources. Repeat these steps each time that you grant a user access to CA Spool.

1. Create a resource rule record for adding LIDs.

Use the following sample commands as models. These commands control access to this CA-Spool resource using the default type code of APP. These commands specify users USER001 through USER005 as examples.

```
ACF
SET RESOURCE(APP)
COMPILE *
$KEY(ESF) TYPE(APP)
UID(USER001) SERVICE(READ) ALLOW
UID(USER002) SERVICE(READ) ALLOW
UID(USER003) SERVICE(READ) ALLOW
UID(USER004) SERVICE(READ) ALLOW
UID(USER005) SERVICE(READ) ALLOW
END
STORE
END
```

2. Rebuild the APP resource class with the recently added userids. Use the following operator command as a model:

```
F ACF2,REBUILD(APP)
```

3. Define the user according to role. Use the following sample commands as models. These commands specify users USER001 through USER005 (created in the previous steps) as examples.

Sample Commands for Defining Users According to Role

The following sample CA ACF2 commands illustrate how to define users according to role with the appropriate authorizations for [their type and access rights](#) (see page 38). Use the following examples as models.

Verify that the resource to which you grant access matches its appropriate SAFTYPE external entry. For a detailed explanation, see the example for the ORDINARY LID.

SUPER LID

To define the SUPER LID USER002 for use with CA-ACF2 access rule for the ESFSECU resources, use the following rule:

```
ACF
SET RULE
COMPILE
$KEY(ESFSECU)
$OWNER('SUPER CA Spool LID')
- UID(USER002) R(A) W(A)
END
STORE
END
```

(Optional) To make the resource rules for the user resident, rebuild the Rule in storages. Use the following command:

```
F ACF2,RELOAD(ESFSECU)
```

ORDINARY LID

To define the LID USER001 with ordinary access to the CA Spool jobs, use the following rule:

```
ACF
SET RULE
COMPILE
$KEY(ESFSECU)
$OWNER('Ordinary CA Spool LID')
- UID(USER001)
NOGR%.G0000001      UID(USER001) R(A) W(A)
FIGR%.G0000001      UID(USER001) R(A)
FIGR%.G0000001.USER001 UID(USER001) R(A) W(A)
CMND                 UID(USER001) R(A)
END
STORE
END
```

Each resource to which you grant access must match its appropriate SAFTYPE external entry. For example, consider this statement:

```
NOGR%.G0000001      UID(USER001) R(A) W(A)
```

This statement matches the following SAFTYPE external entry statement:

```
SAFTYPE 7, 'ESFSECU.NOGR&REQ(6,2).G&GRP(1,7)',EXT,NOINT
```

(Optional) To make the resource rules for the user resident, rebuild the Rule in storages. Use the following command:

```
F ACF2,RELOAD(ESFSECU)
```

OPERATOR LID

To define the LID USER003 with operator access to the CA Spool jobs, use the following rule:

```
ACF
SET RULE
COMPILE
$KEY(ESFSECU)
$OWNER('OPERator CA Spool LID')
- UID(USER003)
NOGR%.G0000003      UID(USER003) R(A) W(A)
FIGR%.G0000001      UID(USER003) R(A)
FIGR%.G0000001.USER003 UID(USER003) R(A) W(A)
CMND.REINIT         UID(USER003)
CMND.SHUTDOWN       UID(USER003)
CMND                 UID(USER003) R(A)
END
STORE
END
```

(Optional) To make the resource rules for the user resident, rebuild the Rule in storages. Use the following command:

```
F ACF2,RELOAD(ESFSECU)
```

JUNIOR LID

To define the LID USER004 with junior access to the CA Spool jobs, use the following rule:

```
ACF
SET RULE
COMPILE
$KEY(ESFSECU)
$OWNER('JUNIOR CA Spool LID')
- UID(USER004)
NOGR%.G0000001      UID(USER004) R(A) W(A)
NOGR%.G0000002      UID(USER004) R(A) W(A)
FIGR%.G0000001      UID(USER004) R(A) W(A)
FIGR%.G0000001.USER004 UID(USER004) R(A) W(A)
FIGR%.G0000002      UID(USER004) R(A) W(A)
FIGR%.G0000002.USER004 UID(USER004) R(A) W(A)
AUTH.GLACC          UID(USER004) R(A)
AUTH.ALLGR          UID(USER004) R(A)
END
STORE
END
```

(Optional) To make the resource rules for the user resident, rebuild the Rule in storages. Use the following command:

```
F ACF2,RELOAD(ESFSECU)
```

TINY LID

To define the LID USER005 with tiny access to the CA Spool jobs, use the following rule:

```
ACF
SET RULE
COMPILE
$KEY(ESFSECU)
$OWNER('TINY CA Spool LID')
- UID(USER005)
NOGR%.G0000003      UID(USER005) R(A) W(A)
FIGR%.G0000001      UID(USER005) R(A)
FIGR%.G0000001.USER005 UID(USER005) R(A) W(A)
NONO%.PRT1A        UID(USER005) R(A) W(A)
FINO%.PRT1A.TINY   UID(USER005) R(A) W(A)
END
STORE
END
```

(Optional) To make the resource rules for the user resident, rebuild the Rule in storages. Use the following command:

```
F ACF2,RELOAD(ESFSECU)
```

Use RACF to Secure CA Spool

The following procedure shows how to configure RACF to secure CA Spool. This procedure includes steps for defining users and groups to both products and for defining the CA Spool started task to CA Top Secret. This procedure provides guidelines but is not necessarily comprehensive. See your RACF administrator to determine whether to perform more customizations for your site.

Important! Before you perform these steps, shut down CA Spool. After you complete these steps, start CA Spool.

To secure CA Spool with RACF, follow this process in RACF:

1. Perform one-time system setup tasks.
2. Define users according to role.

Perform One-Time System Setup Tasks

1. Define the ESF APPL for the CA Spool address space, using the following command:

```
RDEFINE APPL ESF
```


- Define the CA Spool dataset resources to match your EXTERNAL SAFTYPE record resources. Use the following commands as models:

```

ADDSD 'ESFSECU.**'                                GENERIC
ADDSD 'ESFSECU.AUTH.GLACC'                        GENERIC
ADDSD 'ESFSECU.AUTH.ALLGR'                        GENERIC
ADDSD 'ESFSECU.CMND.*'                            UACC(READ)  GENERIC
ADDSD 'ESFSECU.CMND.REINIT'                       UACC(NONE)  GENERIC
ADDSD 'ESFSECU.CMND.SHUTDOWN'                     UACC(NONE)  GENERIC
ADDSD 'ESFSECU.NOGR%.G0000001'                    GENERIC
ADDSD 'ESFSECU.NOGR%.G0000002'                    GENERIC
ADDSD 'ESFSECU.NONO%.PRT1A'                       GENERIC
ADDSD 'ESFSECU.FIGR%.G0000001.**'                 GENERIC
ADDSD 'ESFSECU.FIGR%.G0000001.JUNIOR.*'           GENERIC
ADDSD 'ESFSECU.FIGR%.G0000001.ORDINA.*'           GENERIC
ADDSD 'ESFSECU.FIGR%.G0000002.JUNIOR.*'           GENERIC
ADDSD 'ESFSECU.FINO%.PRT1A.TINY.*'                 GENERIC

```

Define Users According to Role

Define users according to role, to grant them access rights to CA Spool resources. Repeat these steps each time that you grant a user access to CA Spool.

For login, CA Spool requires that a userid have *both* valid RACF login credentials *and* associated DATA, as follows:

- Access to the APPL associated with the CA Spool job or task.
- Userids must be a SUPER type user or have access given to the group or node associated with their userid.

CA Spool makes EXTERNAL checks to see if the user has SUPER authority or access to the entry in the DATA.

CA Spool checks for DATA information for the GRP_x associated with the CA Spool userid.

- Access to the SAFTYPE resources for their SAFTYPE role

To meet these requirements, first associate userids to groups. Next, assign the access rights to the userids. Use the following steps as models:

- Associate userids to groups. For example, to associate GROUP1 with userids USER001 and USER002, enter the following commands:

```

ALTUSER USER001 DATA('ESFDGRP(1)')
ALTUSER USER002 DATA('ESFDGRP(1)')

```

Parameter ESFDGRP(1) relates to the default group of G0000001.

- Define additional users according to role. Assign access rights to the users to meet the requirements of the [SAFTYPE statement](#) (see page 54) that you want. Use the following examples as models.

Sample Commands for Defining Users According to Role

The following sample RACF commands illustrate how to define users with the appropriate authorizations for [their type and access rights](#) (see page 38). Use the following examples as models.

Verify that the resource to which you grant access matches its appropriate SAFTYPE external entry. For a detailed explanation, see the example for the ORDINA userid USER001.

To define the SUPER userid SUPER01, use the following commands as a model:

```
PERMIT 'ESF' CLASS(APPL) ID(SUPER01) ACCESS(READ)
ALTUSER SUPER01 DATA('ESFDGRP(1)')
PERMIT 'ESFSECU.**' ID(SUPER01) ACCESS(UPDATE)
```

To define an OPER userid OPER01, use the following commands as a model:

```
PERMIT 'ESF' CLASS(APPL) ID(OPER01) ACCESS(READ)
ALTUSER OPER01 DATA('ESFDGRP(1)')
PERMIT 'ESFSECU.**' ID(OPER01) ACCESS(UPDATE)
PERMIT 'ESFSECU.CMND.REINIT' ID(OPER01) ACCESS(READ)
PERMIT 'ESFSECU.CMND.SHUTDOWN' ID(OPER01) ACCESS(READ)
```

To define a JUNIOR userid JUNIOR1, use the following commands as a model:

```
PERMIT 'ESF' CLASS(APPL) ID(JUNIOR1) ACCESS(READ)
ALTUSER JUNIOR1 DATA('ESFDGRP(1)')
PERMIT 'ESFSECU.AUTH.GLACC' ID(JUNIOR1) ACCESS(READ)
PERMIT 'ESFSECU.AUTH.ALLGR' ID(JUNIOR1) ACCESS(READ)
PERMIT 'ESFSECU.NOGR%.G0000001' ID(JUNIOR1) ACCESS(UPDATE)
PERMIT 'ESFSECU.NOGR%.G0000002' ID(JUNIOR1) ACCESS(UPDATE)
PERMIT 'ESFSECU.FIGR%.G0000001.JUNIOR.*' ID(JUNIOR1) ACCESS(UPDATE)
PERMIT 'ESFSECU.FIGR%.G0000002.JUNIOR.*' ID(JUNIOR1) ACCESS(UPDATE)
```

To define an ORDINA userid USER001, use the following commands as a model:

```
PERMIT 'ESF' CLASS(APPL) ID(USER001) ACCESS(READ)
ALTUSER USER001 DATA('ESFDGRP(1)')
PERMIT 'ESFSECU.NOGR%.G0000001' ID(USER001) ACCESS(UPDATE)
PERMIT 'ESFSECU.FIGR%.G0000001.**' ID(USER001) ACCESS(READ)
PERMIT 'ESFSECU.FIGR%.G0000001.ORDINA.*' ID(USER001) ACCESS(UPDATE)
```

To define a TINY userid TINY01, use the following commands as a model:

```
PERMIT 'ESF' CLASS(APPL) ID(TINY) ACCESS(READ)
ALTUSER TINY01 DATA('ESFDGRP(1)')
PERMIT 'ESFSECU.NONO%.PRT1A' ID(TINY) ACCESS(UPDATE)
PERMIT 'ESFSECU.FINO%.PRT1A.TINY.*' ID(TINY) ACCESS(UPDATE)
```

Enable Login Using Password Phrases

Administrators can configure the CA Spool VTAM login screen to allow users to log in using password phrases (passphrases). Password phrase login is valid *only* when the CA Spool is configured for external security. To enable password phrase login, set PWPHRASE=YES on the SAFDEF statement in the ESFPARM configuration file. A sample statement follows:

```
SAFDEF EXT,CLASS=DATASET,PWPHRASE=YES
```

Valid values for the PWPHRASE parameter are YES or NO (the default).

If you enable password phrases, users can log in to CA Spool using their userid in combination with either a password or a password phrase.

Users complete the following fields on the CA Spool VTAM login screen:

- Userid – Users can enter 1-8 characters.
- Password – Users can enter 1-100 characters.
 - If users enter 1-8 characters, CA Spool attempts a password login.
 - If users enter 9 or more characters, CA Spool attempts a password phrase login.
- (If Applicable) Group/Node– Users can enter 1-8 characters.

Note: The ESFPARM file may contain a parameter that specifies XEQOPT=12. This specification allows for three separate 8-byte fields for Userid, Password, and Group/Node on the VTAM login screen. This specification is disabled automatically if you enable password phrases.

Internal Security Checks

Checks against the internal security system are made in exactly the same manner as for the external security system. The only difference is that an internal CA Spool system routine is used.

Data Set Class

If the data set class is used, it is not necessary to define any new resource classes to the external security system. Since the RACROUTE macro is used, all security checks go through the System Authorization Facility. This is why this CA Spool security method is called SAF, instead of using the name of a specific security product.

The definitions in the external security system are made in the same way as real data sets when the data set class is used. If RACF is used, this means using ADDSD and PERMIT commands. If a user must have access to similarly-named resources, generic data set names are used.

If RACF or CA ACF2 is used as the external security package and a large number is specified for the DYNUSER parameter and CLASS=DATASET is specified on the SAFDEF statement, the use of LSQA could become excessive.

Be aware of the following:

- A RACROUTE REQUEST=AUTH for CLASS=DATASET sent to RACF causes all profile names with that high-level qualifier to be read into Subpool 225.
- The same request to CA ACF2 6.1 causes a rule of up to 4 KB to be read into Subpool 255. In CA ACF2 6.2, that rule is 32 KB.
- If DYNUSER is set to a high value in either environment, the storage use continues to grow until the DYNUSER value is reached.

We recommend that you specify DYNUSER as less than 100 or use a class other than DATASET for CA Spool security definitions.

For CA ACF2, if an INFODIR is specified, a directory with all of the rules for that resource type (class) is built in ECSA.

For RACF, a RACLIST'ed general resource class causes a copy of the profile names with the access list to be built in ECSA.

Resource Names Format

This section describes the resource names that are used when checking user access in ESF. Some of these resource names contain a group value or node name, which work in pairs, and access is given to the entire group or to the individual node. The user specifies the format of the resource names by coding name skeletons, which contain both fixed text and variables. A maximum of five qualifiers are allowed in a resource name definition.

Variables

In the following list, each variable is shown as an & (ampersand), followed by a 3-character identification, a zero offset index, and the length. Each variable is 8-bytes, but trailing zeros are removed.

&REQ

Indicates the value of SECREQ from the \$IQSECPM macro

This identifies which type of request is being checked. The value of &REQ is decimal, as opposed to the values defined in \$IQSECPM.

&GRP

Indicates the group number of the resource being accessed

&NOD

Indicates the node name of the resource being accessed

&UID

Indicates the caller's user ID

&FUI

Indicates the user ID of the file being accessed

&FNM

Indicates the caller's filename

&FFN

Indicates the file name of the file being accessed

&CMD

Indicates the command issued

The format and contents of these resource names is specified on the SAFTYPE statement.

SAFTYPE Statement

The ID value from the SAFTYPE statement and the default name parameter are listed below:

- 1, ESFSECU.FIGR&REQ(6,2).G&GRP(1,7).&UID(0,8).&FNM(0,8)
File create. Group check.
- 2, ESFSECU.FINO&REQ(6,2).&NOD(0,8).&UID(0,8).&FNM(0,8)
File create. Node check.
- 3, ESFSECU.FIGR&REQ(6,2).G&GRP(1,7).&FUI(0,8).&FFN(0,8)
Modify existing file. Group check.
- 4, ESFSECU.FINO&REQ(6,2).&NOD(0,8).&FUI(0,8).&FFN(0,8)
Modify existing file. Node check.
- 5, ESFSECU.FIGR&REQ(6,2).G&GRP(1,7).&FUI(0,8).&FNM(0,8)
Route existing file. Group check.
- 6, ESFSECU.FINO&REQ(6,2).&NOD(0,8).&FUI(0,8).&FFN(0,8)
Route existing file. Node check.
- 7, ESFSECU.NOGR&REQ(6,2).G&GRP(1,7)
Modify node. Group check.
- 8, ESFSECU.NONO&REQ(6,2).&NOD(0,8)
Modify node. Node check.
- 9, ESFSECU.CMND&CMD(0,8)
Native command being issued, but not a menu command.
- 10, ESFSECU.AUTH.A2
Only used to maintain Version 10 compatibility.
- 11, ESFSECU.AUTH.A3
Only used to maintain Version 10 compatibility.
- 12, ESFSECU.AUTH.ALLGR
Users are enabled to operate across groups in one action: for example, to display nodes from different groups.
If you let a user access type 12, you must also provide read access to type 14.

- 13, ESFSECU.AUTH.EXCMD
An extended native command is issued.
- 14, ESFSECU.AUTH.GLACC
User has global access to all groups. If this access is granted, it cannot also be restricted with specific definitions.
If you allow a user access to type 14, you must also allow read access to type 12.
- 15, ESFSECU.NOGR&REQ(6,2).G&GRP(1,7)
All printers in the group are displayed by the user if the user does not specify a group or node and DEFGROUP=NO is specified on the USERDEF statement.
- 16, ESFSECU.NONO&REQ(6,2).&NOD(0,8)
This printer is displayed by the user if the user does not specify a group or node and DEFGROUP=NO is specified on the USERDEF statement.

Examples

The following examples are based on a CA Spool system using the SAFTYPE statements shown earlier. These statements correspond to the default setting if no SAFDEF/SAFTYPE statements are present.

If a certain user is found to have global access to CA Spool resources (for example, full access to SAFTYPEs 12, 13, and 14), no further checking is done. In the following examples, it is assumed that CA Spool has determined that users do not have global access to the system.

Example 1: Create a File for a Printer

User ADAM attempts to create a file for printer HPBARCDE with a filename of BARCODES. HPBARCDE is defined in group number 8.

CA Spool checks the SAFTYPE 1 statement to see if access is allowed for UPDATE to resource ESFSECU.FIGR00.G0000008.ADAM.BARCODES. If it is not allowed, the access for UPDATE to ESFSECU.FINO00.HPBARCDE.ADAM.BARCODES is checked based on the SAFTYPE 2 statement.

Example 2: Change a File Destination

User BERTA attempts to change the destination (route) of the file that was created in example 1 to HPOTHER. HPOTHER is defined in group number 22.

CA Spool checks, based on the SAFTYPE 3 statement, to see if access for UPDATE to resource ESFSECU.FIGR23.G0000008.ADAM.BARCODES is allowed. If it is not allowed, the access for UPDATE to ESFSECU.FINO23.HPBARCDE.ADAM.BARCODES is checked based on the SAFTYPE 4 statement.

If user BERTA is allowed to modify the existing file, a check is made to determine if this user is allowed to route a file to destination HPOTHER. CA Spool performs checks based on the SAFTYPE 5 statement, whether access for UPDATE to resource ESFSECU.FIGR18.G0000022.ADAM.BARCODES is allowed. If this is not allowed, access for UPDATE to ESFSECU.FINO18.HPOTHER.ADAM.BARCODES is checked against the SAFTYPE 6 statement.

Depending on the capabilities of the external security system being used, and on individual requirements, system administrators can set up generic profile definitions in their security system. In this way, multiple users are allowed access to multiple groups using just a single profile definition in the security system. Some examples of how to define profiles in RACF or internal SAF are provided later in this section.

Command Verification

The command verification contains two checks:

- Does the user have sufficient authorization?
Each command has a minimum authorization. When a user who does not have the required authorization issues a command, the command is not allowed.
- Is the user allowed to issue that specific command?
The check is done for READ access against the resource name described by SAFTYPE ID 9.

Command Access

It is both recommended and the normal practice to allow all commands for all users. This is done by giving access to data sets starting with securpf.CMND.** globally. Normally, the check based on ESFSECU.AUTH.EXCMD gives the appropriate set of commands available for each user. If some users must be restricted further, then specific commands are disallowed for those users.

Authorization Levels

The following table lists the commands and the authorization levels required to be able to use them:

Command	Level	Command	Level	Command	Level
ABEND	2—Extended	HF	1—Normal	R	1—Normal
AF	1—Normal	HS	2—Extended	REINIT	2—Extended
B	1—Normal	HX	2—Extended	RF	1—Normal

Command	Level	Command	Level	Command	Level
C	1—Normal	I	1—Normal	S	1—Normal
CF	1—Normal	LOGOFF	1—Normal	SC	2—Extended
CHKPT	2—Extended	LSYS	2—Extended	SHUTDOWN	2—Extended
D	1—Normal	M	1—Normal	SNET	2—Extended
DA	1—Normal	P	1—Normal	SS	2—Extended
DC	2—Extended	PC	2—Extended	SX	2—Extended
DF	1—Normal	PD	2—Extended	T	1—Normal
DS	2—Extended	PF	1—Normal	TF	1—Normal
DX	2—Extended	PFSS	2—Extended	TNET	2—Extended
E	1—Normal	PNET	2—Extended	TV	2—Extended
ESYS	2—Extended	HT	2—Extended	WRITELOG	2—Extended
F	1—Normal	ST	2—Extended	Z	1—Normal

Default Groups and Nodes

You can define a default group or node. Defaults are used for:

- Ordinary users are limited to their default group or node, when they are using the menu system without specifying a group or node.
- If they do not need to access other resources, they do not have to use the RG and RN functions of the menu system. This means that ordinary users do not have to be aware of the group concept in CA Spool.
- When a user writes a file with a shared printer as the destination, the user's defaults are used to determine to which shared printer the file is to be queued.

Internal and External Defaults

Defaults are defined in the external security system or in the CA Spool internal SAF interface.

In the external security system, defaults are defined in the installation data for each user or connected group. The installation data string is searched for the keywords ESFDGRP and ESFPRT. The value must be entered in parentheses following the keyword.

The following examples show how to define defaults when using RACF:

```
ALTUSER  ORDINA DATA('ESFDGRP(1)')
ALTUSER  TINY   DATA('ESFPRT(PRT1A)')
ALTGROUP GROUP1 DATA('ESFPRT(PRT1A)')
```

In the internal SAF interface, defaults are defined using the DPRINTER or DGROUP parameter on the SAFUID statement.

Parameters Example

This is an example of part of the CA Spool parameters:

```
DYNUSER=50
SECUCALL=USERID
SECUEXT=SAF
SAFDEF
SAFTYPE 1
      .
      .
      .
SAFTYPE 16
```

Internal SAF

This is an internal SAF interface example of how to define users to CA Spool:

```
SAFUID SUPER, LABEL=SUPER
SAFUID OPER, LABEL=(SUPER, OPER)
SAFUID JUNIOR, LABEL=JUNIOR
SAFUID ORDINA, LABEL=ORDINA, DGROUP=1
SAFUID TINY, LABEL=TINY
SAFAT SUPER, DATASET=ESFSECU.**, ACCESS=UPDT
SAFAT OPER, DATASET=ESFSECU.CMND.REINIT, ACCESS=NONE
SAFAT OPER, DATASET=ESFSECU.CMND.SHUTDOWN, ACCESS=NONE
SAFAT JUNIOR, DATASET=ESFSECU.AUTH.GLACC, ACCESS=READ
SAFAT JUNIOR, DATASET=ESFSECU.AUTH.ALLGR, ACCESS=READ
SAFAT JUNIOR, DATASET=ESFSECU.NOGR%%.G0000001, ACCESS=UPDT
SAFAT JUNIOR, DATASET=ESFSECU.NOGR%%.G0000002, ACCESS=UPDT
SAFAT JUNIOR, DATASET=ESFSECU.FIGR%%.G0000001.&.*, ACCESS=UPDT
SAFAT JUNIOR, DATASET=ESFSECU.FIGR%%.G0000002.&.*, ACCESS=UPDT
SAFAT JUNIOR, DATASET=ESFSECU.CMND.*, ACCESS=READ
SAFAT ORDINA, DATASET=ESFSECU.NOGR%%.G0000001, ACCESS=UPDT
SAFAT ORDINA, DATASET=ESFSECU.FIGR%%.G0000001.&.*, ACCESS=UPDT
SAFAT ORDINA, DATASET=ESFSECU.FIGR%%.G0000001.** , ACCESS=READ
SAFAT ORDINA, DATASET=ESFSECU.CMND.*, ACCESS=READ
SAFAT TINY, DATASET=ESFSECU.NONO%%.PRT1A, ACCESS=UPDT
SAFAT TINY, DATASET=ESFSECU.FINO%%.PRT1A.&.*, ACCESS=UPDT
SAFAT TINY, DATASET=ESFSECU.CMND.*, ACCESS=READ
```

Authorizations Established

In the previously mentioned examples:

- The user named SUPER has access to do everything possible in CA Spool.
- The user named OPER has one restriction, not allowed to issue the REINIT and SHUTDOWN commands.
- The user named JUNIOR is allowed to display all resources in CA Spool, update all printers in the groups 1 and 2, and update all files in groups 1 and 2 with that user ID.
- The user named ORDINA is allowed to display and update all printers in group 1. Can browse all files in group 1, but can only update the files with that user ID.
- The user named TINY is allowed to display and update the printer named PRT1A. Allowed to browse and update the files with a destination of PRT1A with that user ID.

ESFNETC Interface

The ESFNETC interface lets a program issue commands on behalf of a display terminal. When SECUEXT=SAF is specified in the parameters for CA Spool, a user must have update access to the display terminal to get a command queued for processing.

This is a RACF example of how to define users to CA Spool:

```
RDEFINE APPL ESF
ADDSD 'ESFSECU.**'                                GENERIC
ADDSD 'ESFSECU.NONO.DISP1A'                       GENERIC
PERMIT 'ESF' CLASS(APPL) ID(SUPER) ACCESS(READ)
PERMIT 'ESFSECU.**' ID(SUPER) ACCESS(UPDATE)
PERMIT 'ESFSECU.NONO.DISP1A' ID(SUPER) ACCESS(NONE)
PERMIT 'ESF' CLASS(APPL) ID(OPER) ACCESS(READ)
PERMIT 'ESFSECU.**' ID(OPER) ACCESS(UPDATE)
PERMIT 'ESFSECU.NONO.DISP1A' ID(OPER) ACCESS(UPDATE)
```

An internal SAF interface example of how to define users to CA Spool:

```
SAFUID SUPER,LABEL=SUPER
SAFUID OPER,LABEL=OPER
SAFAT OPER,DATASET=ESFSECU.** ,ACCESS=UPDT
SAFAT SUPER,DATASET=ESFSECU.** ,ACCESS=UPDT
SAFAT SUPER,DATASET=ESFSECU.NONO.DISP1A ,ACCESS=NONE
```

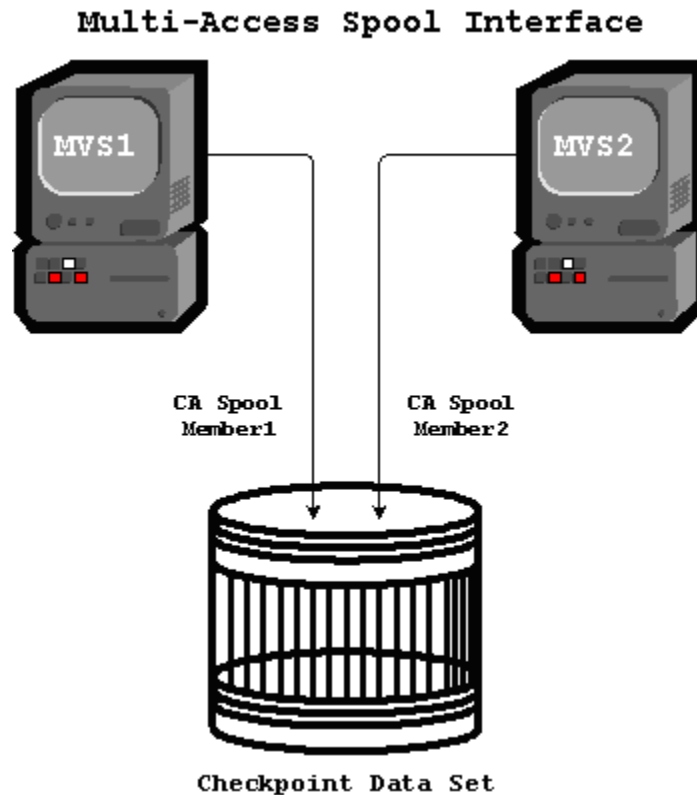
Authorizations Established

In the above example:

- The user named SUPER has access to do everything possible in CA Spool, except issuing commands through the ESFNETC interface.
- The user named OPER has no restrictions.

Multi-Access Spool (MAS)

Previous sections describe how CA Spool functions in a single system that is operating under a single copy of the MVS control program. But it is also possible to operate from 2 to 32 such systems, as members of a Multi-Access Spool (MAS) configuration.



The operation of each system in the configuration is independent, and includes all functions that apply to a single CA Spool system.

Each CA Spool system can control the creation and maintenance of spool files, schedule output for print processing, and communicate with operators and communication-interface users. However, all spool and checkpoint data sets are shared by all systems in the configuration.

File Queues

The systems logically share a common CA Spool file queue. If one system in the configuration fails, the others can continue processing from the common queue because all systems are functionally the same. Only work in process on the failed system is interrupted. This work is recovered by a warm start of the failed system while other systems continue processing, or by operator command on one of the other systems.

Spool and Checkpoint Data Sets

Shared DASD hardware features are used to access all the spool and checkpoint data sets. A copy of the file queue and other status information (for example, spool space allocation maps) is written to the data set for possible warm start, as with a single CA Spool system. This information is available to all systems, one at a time, as needed.

If a Coupling Facility Structure is not used for communication, then RESERVE/RELEASE channel commands and a checkpoint lock are used to prevent simultaneous referencing and updating of information kept in the data set.

Each system in the configuration must have at least one channel path to each volume containing checkpoint or spool data sets, and these devices must be specified as shared during MVS system generation. It is recommended that each CPU in a multiprocessor configuration have a channel path to each shared volume.

Coupling Facility

If all the members in a MAS complex have access to the same Coupling Facility, we recommend that you use a Coupling Facility Structure for communication. All changes to the file queue are exchanged to the other MAS members through the Coupling Facility.

The MAS member with the lowest system number automatically becomes the CKPT owner, which is responsible for writing all changes to the checkpoint data set(s). The other MAS members are updated through the Coupling Facility, so they have no need to access the checkpoint data set, so RESERVE/RELEASE is avoided.

CA Spool supports System-Managed CF Structure Rebuild. If the Coupling Facility is switched to a backup Coupling Facility, the operating system copies the old structure data to the new structure, providing a planned reconfiguration capability.

CA Spool supports System-Managed CF Structure Duplexing, so a backup copy of the CA Spool CF structure is automatically maintained on a secondary coupling facility. In case of failure, the system can automatically switch to the duplex copy of the CF structure and continue running with no disruption or performance degradation.

To use a Coupling Facility Structure

1. Update your Coupling Facility Policy Data set to reflect the definition of the Coupling Facility structure and run the Administrative Data Utility as follows:

```
//CFRMUPDT JOB ...
/*
//STEP1 EXEC PGM=IXCMIAPU
//SYSPRINT DD SYSOUT=*
//SYSABEND DD SYSOUT=*
//SYSIN DD *

        DATA TYPE(CFRM) REPORT(YES)

        DEFINE POLICY NAME(**policy**) REPLACE(YES)

                CF NAME(**couplet1**)
                ...
        ...

        STRUCTURE NAME(**ESF_STRUCT**) SIZE(8192)
                PREFLIST(**couplet1**)
        ...

/*
```

Note: The required size of the structure for CA Spool within the Coupling Facility may change when the CFLEVEL changes. IBM's web site provides a CFSIZER utility that can be used to determine the correct size at the current CFLEVEL.

The following values can be used on the OEM page of that utility:

- List Headers - 8
 - Lock Table Entry Count - 8
 - Maximum Number of Data Elements per Entry - 64
 - Adjunct Data - No
 - Reference Option - None
 - Maximum Number of List Entries - 1
 - Maximum Number of Data Elements - 64
 - Data Element Size Descriptor - ELEMCHAR
 - Data Element Size Value - 2
2. Specify the Coupling Facility structure name on the primary CHKPTDS statement as follows:


```
CHKPTDS NUM=1,DSNAME=SYS1.ESFCHKPT,STRNAME=**ESF_STRUCT**
```
 3. Restart all members in the MAS/EMAS complex.

Configuration

To use the Multi-Access Spool (MAS) feature, the initialization parameters CHKPT and SPOOL must specify the same volumes for all systems in the configuration. To make the common spool and checkpoint data compatible, all systems must also specify the same values for the BUFSIZE, MAXFSEQ, NUMFQES, and *Snn* initialization parameters. For operational consistency, it is recommended that all 3270 VTAM devices be given unique node names over the whole configuration.

Starting MAS

Before the configuration is started, the TOD clocks on each system must be synchronized with a single time source. Because this synchronization is externally performed and subject to error, the initialization parameter SYNCTOL is provided to specify the maximum error (in seconds) which CA Spool must assume. If the synchronization error is greater than SYNCTOL, then CA Spool is not able to detect certain illegal operator actions. This includes, for example, performing a cold start with other systems active. Equally, certain legal operator actions (for example, a warm start after system failure) might be disallowed if attempted before SYNCTOL seconds have elapsed since system failure.

Initialization Parameter

The members of the configuration are specified by the *Snn* initialization parameter. For example:

```
S1 SID=A158
S2 SID=B158
```

This defines a two-system configuration, where A158 and B158 are the SMF system IDs set during the IPL of the systems (or overridden by the SID initialization parameter). One system must initially do a CA Spool cold start with no other systems active, and must define all members of the configuration. Other members join operations by a warm start and must also specify identical *Snn* parameters. A cold start is required to change or add members of the configuration. If only one or no *Snn* parameter is specified, CA Spool operates as a single system.

Warm Start

There are three types of warm start:

- If the operator specifies a warm start, and CA Spool detects that no other members of the configuration are active, a *total-configuration warm start* is performed, and all in-process work is recovered as in a single system.

- A warm start is performed when warm start is specified and other members of the configuration are active. The warm-starting system joins the active configuration and recovers only work in process on the system at the time of failure, if any. Restart for another system is performed when a system has failed and cannot be immediately warm-started.
- The system operator enters the ESYS command on any active member of the configuration. In-process work on the specified system is recovered and made available for selection by other members of the configuration, subject to system affinity for restart as discussed in the following section.

Initialization Parameters

The algorithm for using the common CA Spool queues and other information in the SYS1.ESFCHKPT data set is determined by the MINHOLD, MAXHOLD, MINDORM, and MAXDORM initialization parameters. These need not be the same for all systems in the configuration and must be set according to characteristics such as the number of members in the configuration, relative CPU speeds, and response requirements.

File Creation and Queuing

In a Multi-Access Spool (MAS) configuration, files can enter the common queue from any system in the configuration. Unless special actions are taken, files are eligible for processing on any system in the configuration. Individual files are given affinity to a single system in the configuration. If the affinity of a file is to a specific system in the configuration, it can only be selected for processing by the system specified.

System affinity is useful if, for example, the node names of the output devices are not unique over the whole configuration.

- The display-file (DF) command indicates (by SMF system ID) the system in which a file is active, or the systems eligible to process a queued file.
- The reset-file (TF) command permits affinities of files with a given affinity to be changed.
- The list-systems (LSYS) command displays the status of all systems in the configuration.

If a failed system is unavailable, the operator can change affinity with the TF command to attempt restart on another system.

Output Selection Criteria

Eligible devices select output work without regard to which system in the configuration they are attached to. Selection criteria are output class, setup (as in single systems), and system affinity.

Enhanced MAS Support

In an MAS environment it is often preferable to let one of the systems handle all printer sessions; to do this, start the VTAM interface on one system only.

This method has the disadvantage that users who are communicating with the other systems cannot see the real status of the printers, since they always have the status drained.

The principle of the EMAS support is that one system handles all printer sessions, and all printer commands in the other systems are sent to this system through an NJE connection. The commands are then executed and the replies sent back to the originating system and presented to the user. In this way the user always sees the real status of the printer in the network owning system.

EMAS Considerations

To implement EMAS, there are some conditions, which must be observed:

- The printer definitions must be identical on all systems.
- Each system must have an NJE connection to all other systems in the EMAS configuration.
- Each *Snn* parameter definition must specify the NJE name of the corresponding EMAS member.
- The users must be defined to the security system in the network owning CA Spool system.

NJE Home Node

The following rules decide which of the NJE definitions are considered to be the home node:

- When an EMAS member is started, it determines its member number by finding the *Snn* statement, which matches the specified SID parameter; can be defaulted from the SMF-provided system ID.
- The NJENAME sub-parameter of the matching *Snn* statement points to the NJE home node for the EMAS member.
- The APPL sub-parameter and NJE nodename of the NJE home node is used as the VTAM APPLID and local NJE node name by the EMAS member.

Note: CA Spool does not permit a home node to be re-initialized while the system is running.

Common NJE Node Name

To simplify NJE network configurations it is possible to operate an EMAS complex as one NJE node using a common NJE node name. This requires that a common VTAM Generic Resource name has been defined to the EMAS complex, so VTAM sessions to any of the EMAS members are initiated by making a session to the VTAM Generic Resource name.

If a VTAM Generic Resource name is defined and the NJENAME parameter is specified in the EMAS complex, the NJENAME parameter specifies a common NJE node name for the entire EMAS complex. Other external NJE nodes then just need one NJE connection to the EMAS complex. This NJE connection must specify the common NJENAME as the NJE node name and the common VTAM Generic Resource name as APPLID.

The members in an EMAS complex communicate using NJE connections. For these private NJE connections the individual Home Node NJE name and VTAM APPLID are being used.

Network Owner

The first CA Spool system started becomes the network owner. If this system is shut down or its VTAM interface is closed, the lowest numbered active EMAS member becomes by default the network owner.

The NETOWNER parameter on the SNET, PNET, and TNET commands is used to explicitly select the system, which must take over the role as the network owner.

NJE connections are configured so all the EMAS network owners try to start these NJE connections.

EMAS Sample

The following sample illustrates how an EMAS complex is configured to act as one NJE node to the outside NJE network using a VTAM Generic Resource name and a common NJE node name. Cloning support is being used to define the JES2 APPLID.

For example:

APPLID=AESF	Common VTAM Generic Resource Name
NJENAME=ESF	Common EMAS NJE Node Name
NJE JES2,	JES2 Node Name
APPL=A&SYSCLONE.JES2,	JES2 VTAM application
SRNUM=7,	number of sysout receivers
STNUM=7,	number of sysout transmitters
SNABSIZE=4096,	RUSIZE to be used in this session
ISTATUS=ACTNETO	
NJE NESF01,APPL=AESF01,ISTATUS=ACTNETO	
NJE NESF02,APPL=AESF02,ISTATUS=ACTNETO	
NJE NESF03,APPL=AESF03,ISTATUS=ACTNETO	
NJE NESF04,APPL=AESF04,ISTATUS=ACTNETO	
S1 SID=S001,NJENAME=NESF01	
S2 SID=S002,NJENAME=NESF02	
S3 SID=S003,NJENAME=NESF03	
S4 SID=S004,NJENAME=NESF04	

NJE (Network Job Entry) Interface

The NJE (Network Job Entry) interface is used to transfer spool files between CA Spool and other NJE nodes, such as JES2, JES3, VSE/POWER, VM/RSCS, CA Connect, and other CA Spool systems.

Standard JCL statements are used to send from JES2/JES3, and POWER. All the data set options such as CHARS, FORMDEF, PAGEDDEF, PRMODE, are preserved.

CA Spool is able to handle up to seven transmitters and receivers at the same time on each NJE node. CA Spool defines the number of receivers and transmitters for each NJE node.

CA Spool only supports SNA, not BSC. This means that JES3 must have MVS/BDT version 2 installed, as native JES3 has no support for SNA. VM/370 RSCS must be at least Version 2, Release 1. VSE/POWER must be at least Version 2, Release 2.

For more information about the VTAM APPL statement, see CA Spool Subsystem Name.

NJE Example

APPLID=CMAESF	CA Spool VTAM application name
NJENAME=ESF	CA Spool NJE name
XFER=NO	disable XFER interface
XFERNJE=JES2	primary spooling system connection
NJE JES2,	node name
APPL=CMAJES2,	VTAM application name
JRNUM=2,	number of job receivers
SRNUM=7,	number of sysout receivers
JTNUM=2,	number of job transmitters
STNUM=7,	number of sysout transmitters
SNABSIZE=2048,	RUSIZE to be used in this session
PURGE=YES,	purge file after transmission
COMBINE=JESDS,	combine JES datasets
NOTIFY=YES,	send notify messages
PSWRECE=CMA2JES2,	password to be verified
PSWSEND=CMAESF,	password to be sent
ISTATUS=ACTIVE	
NJE JES3,	node name
APPL=CMAJES3,	VTAM application name
JRNUM=1,	number of job receivers
SRNUM=1,	number of sysout receivers
JTNUM=1,	number of job transmitters
STNUM=1,	number of sysout transmitters
ISTATUS=ACTIVE	
NJE RSCS,	node name
APPL=CMARSCS,	VTAM application name
JRNUM=1,	number of job receivers
SRNUM=1,	number of sysout receivers
JTNUM=1,	number of job transmitters
STNUM=1,	number of sysout transmitters
ISTATUS=ACTIVE	
NJE POWER,	node name
APPL=CMAPOWER,	VTAM application name
JRNUM=1,	number of job receivers
SRNUM=1,	number of sysout receivers
JTNUM=1,	number of job transmitters
STNUM=1,	number of sysout transmitters
ISTATUS=INACTIVE	POWER insists on starting the connection
NJE ESFA,	node name
APPL=CMAESFA,	VTAM application name
JRNUM=3,	number of job receivers
SRNUM=3,	number of sysout receivers
JTNUM=3,	number of job transmitters
STNUM=3,	number of sysout transmitters
ISTATUS=ACTIVE	

NODE	RSOFT01A,4224,	printer name
	GROUP=1,	group number
	ALIAS=R1	printer alias name

JES2 NJE example

NJEDEF	DELAY=120,	Max. Msg Delay Time
	JRNUM=1,	Number of Job Receivers
	JTNUM=1,	Number of Job Xmitters
	LINENUM=10,	Number of Lines for NJE
	NATNUM=20,	Number of possible Inter-Connects
	NODENUM=10,	Max. Number of Nodes
	OWNNODE=1,	The Number of this Node
	PATH=1,	Number of Paths/Alternate
	SRNUM=1,	Number of Sysout Recvrs
	STNUM=1	Number of Sysout Xmtrs
LOGON1	APPLID=CMAJES2	APPLID
APPL(CMAJES2),	COMPACT=0,	
	NODE=0001,	NJE Node Number
	REST=0	Session Resistance
APPL(CMAESF),	COMPACT=0,	
	NODE=0002,	NJE Node Number
	REST=0	Session Resistance
NODE(0001)	NAME=JES2	Node Name
NODE(0002)	COMPACT=0,	No Compaction
	NAME=ESF,	Node Name
	AUTH=(DEV=NO,	
	JOB=NO,	No Job Authority at this node
	SYSTEM=NO,	No System Authority at this node
	NET=NO),	No Network Authority at this node
	REST=0,	Nodal Resistance
	PATHMGR=NO	
CONNECT	NODEA=0001,	Node Numbers on 'A' end
	MEMBA=1,	Member Numbers on 'A' end
	NODEB=0002,	Node Numbers on 'B' end
	MEMBB=1	Member Numbers on 'B' end
DESTID	NAME=RSOFT01A,	Optional printer name
	DEST=N2R1	Remote 1 in node 2 (ESF)

VM/RSCS SNA NJE example

```

*
*      LINK LINK  VIRT      SPOOL  KEEP  QUEUE  DP LU-   LOG  AUTO
*      ID  TYPE ADDR  *  CLASS  SLOTS TYPE    NAME  MODE START
*
LINK ESF  SNANJE *  *  *      2    PRI  *  CMAESF *  AST
*
*      LINK parm
*      ID
*
PARM ESF  ST=2 TA=1

```

JES3 and MVS/BDT Example

```

*   JES3 NJE definition:
    NJERMT,NAME=ESF,TYPE=SNA,...
*   BDT definition:
    BDTNODE,N=ESF,APPL=CMAESF,BUFSZ=4096,
    LU=05,TYPE=NJE

```

NJE TCP/IP

CA Spool supports NJE connections to remote NJE nodes over TCP/IP. To enable NJE TCP/IP support in CA Spool, complete these tasks:

- Use the [NJESERV statement](#) (see page 349) to define the NJE TCP/IP server.
- Add the TCPHOST parameter to any [NJE statement](#) (see page 343) that uses TCP/IP instead of SNA.

NJE TCP/IP Example

```

NJESERV
  TCPPORT=4711

NJE
  JES2NJE,
  TCPHOST=jes2host,
  TCPPORT=175,
  TCPTLS=NO

NJE
  JES3NJE,
  TCPHOST=jes3host,
  TCPPORT=175,
  TCPTLS=NO

```

JES2 NJE TCP/IP Example

```
NETSERV(1)
  SOCKET=JES2NJE

SOCKET (JES2NJE)
  NODE=01,
  IPADDR=jes2host,
  PORT=175

SOCKET (ESFNJES)
  NODE=02,
  IPADDR=esfhost,
  PORT=4711

NODE(01)
  NAME=JES2NJE,
  PATHMGR=YES

NODE(02)
  NAME=ESFNJE,
  PATHMGR=NO

LINE(1-10)
  UNIT=TCP
```

JES3 NJE TCP/IP Example

```
NETSERV,
  NAME=JES3S001,
  SYSTEM=JES3,
  HOSTNAME=jes3host,
  PORT=175

SOCKET,
  NAME=ESFNJES,
  NETSERV=JES3S001,
  NODE=ESFNJE,
  HOSTNAME=esfhost,
  PORT=4711

NJERMT,
  NAME=JES3NJE,
  HOME=YES

NJERMT,
  NAME=ESFNJE,
  HOME=NO,
  TYPE=TCPIP
```


Set Up Security for NJE TCP/IP

You can use the Secure Socket Layer (SSL) or Transport Layer Security (TLS) protocol to encrypt the CA Spool data that is transmitted through NJE over TCP/IP. This technique uses Application Transparent-Transport Layer Security (AT-TLS), which secures all SSL/TLS definitions through TCP/IP and security profiles. This technique requires updates in the following entities: your security software, the TCP/IP configuration for your operating system, JES2 or JES3 (whichever you use), and CA Spool.

Important! We strongly recommend securing connections with TLS instead of SSL.

Note: For general information about AT-TLS, see the *IBM z/OS Communications Server: IP Configuration Guide*. For information about Policy Agent and AT-TLS statements see the *IBM z/OS Communication Server: IP Reference Guide*.

Follow this process:

1. In your security software, perform these tasks:
 - a. Define a keyring for the CA Spool started task.
 - b. Generate the certificates.
 - c. Add these certificates to the keyring.

Note: For information to perform these tasks, see the documentation for your security software, for example, CA Top Secret, CA ACF2, or IBM RACF.
2. Update the TCP/IP configuration for your operating system, as follows. Here, *your operating system* means the computer on which CA Spool is installed.
 - Set up a Policy Agent.
 - Verify that CA Spool is defined as an AT-TLS controlling application in the AT-TLS policy file in the Policy Agent. A sample AT-TLS policy file follows these steps.
3. Perform one of the following actions:
 - In JES2, specify SECURE=YES in the SOCKET(xxxxxxxx) statement for the NJE node that connects to CA Spool.
 - In JES3, specify TLS=YES in the NJERMT statement for the NJE node that connects to CA Spool.
4. In CA Spool, specify TCPTLS=YES in the NJE statement for the NJE node that transmits data over TCP/IP.

When the connection is initiated and NJE control records are exchanged between CA Spool and the remote NJE node, the secure environment is established by AT-TLS and the remaining communication is secured.

Sample TTLS Policy File

You can use the following sample TTLS policy file as a model.

```

TTLSRule                               ESFNJE-Client
{
  LocalAddr                             ALL
  RemoteAddr                             ALL
  LocalPortRange                         1024 65535
  RemotePortRange                         2252
  Direction                              Outbound
  Priority                                254
  TTLSGroupActionRef                     gESF
  TTLSEnvironmentActionRef               eActESFNJEClient
}
TTLSRule                               ESFNJE-Server
{
  LocalAddr                             ALL
  RemoteAddr                             ALL
  LocalPortRange                         4711
  RemotePortRange                         1024 65535
  Direction                              Inbound
  Priority                                254
  TTLSGroupActionRef                     gAct1
  TTLSEnvironmentActionRef               eActESFNJEServer
}
TTLSGroupAction                         gESF
{
  TTLSEnabled                             On
  Trace                                   7
}
TTLSEnvironmentAction                   eActESFNJEClient
{
  HandshakeRole                           Client
  EnvironmentUserInstance                  0
  TTLSKeyringParmsRef                     keyESF
  TTLSCipherParmsRef                       cipher1~Default_Ciphers
  TTLSEnvironmentAdvancedParmsRef         eAdvESFNJE
  CtraceClearText                          Off
}
TTLSEnvironmentAction                   eActESFNJEServer
{
  HandshakeRole                           Server
  EnvironmentUserInstance                  0
  TTLSKeyringParmsRef                     keyESF
  TTLSCipherParmsRef                       cipher1~Default_Ciphers
  TTLSEnvironmentAdvancedParmsRef         eAdvESFNJE
  CtraceClearText                          Off
}

```


The following example assumes that CA Spool has access to all JES files:

```
XFERSAPI=YES
RDEFINE JESSPOOL ** UACC(NONE)
PERMIT ** CLASS(JESSPOOL) ID(ESF) ACCESS(UPDATE)
```

```
XFERSAPI=NO
RDEFINE JESSPOOL ** UACC(NONE)
PERMIT ** CLASS(JESSPOOL) ID(ESF) ACCESS(ALTER)
```

ESFTOJES allocates spin-off data sets under the CA Spool started task. The selected files to be transferred to JES are files with destinations recognized as JES destinations.

SYSOUT Allocation Intercept

This interface receives control instead of the JES allocation routine and checks to determine if DD SYSOUT allocations (JCL or dynamic) match the criteria specified with the SUBS/SUBSCLAS parameters.

Allocation Routines

If the SUBS/SUBSCLAS criteria are met, the allocation is changed to a DD SUBSYS allocation to the CA Spool subsystem. Otherwise, control is passed to the JES allocation routine to let it perform the allocation.

Parameters

Only parameters specified explicitly on the DD statement are compared with the SUBS/SUBSCLAS parameters. The interface is only activated if the SUBS parameter specifies one of the following values:

ALL	CLASS	DESTCLAS
APD	DEST	SUBID

Intercepted Subsystem

When the interface is activated, CA Spool starts under the intercepted JES subsystem. The intercepted subsystem is not changed, even if CA Spool is subsequently started under control of another subsystem at a later time.

For more information, see the chapter SYSOUT Allocation Intercept in the *System Guide*.

SUBSYS Interface for TSO Users

The CA Spool link library contains the TSO command processor ESFALLOC; online HELP information is also provided for TSO users in member HLPALLOC.

ESFALLOC

This command lets TSO users dynamically allocate a CA Spool file as a SYSOUT or SYSIN data set.

The member HLPALLOC in the CA Spool CBQ4OPTN library is used to add this HELP information to the SYS1.HELP data set.

For more information, see the chapter SYSOUT Allocation Intercept, and the chapter Calling ESFALLOC in the *Programming Guide*.

Virtual Printer Interface

The Virtual Printer Interface lets CA Spool take responsibility for physical printing from other TP monitors, without changing application programs or modifying the TP monitor.

Data Collection

The Virtual Printer Interface is used to collect data sent by a TP-monitor (for example, CICS or IMS) to a VTAM-attached printer. The collected data is stored as a CA Spool file.

This interface lets CA Spool act as a secondary logical unit, emulating an LU type 1 or 3 printer in session with a TP monitor. Virtual printers are active in several sessions, concurrently. The same virtual printer can be LU type-1 in one session, and LU type-3 in another session.

Printer Definition

Before a virtual printer is used, it has to be defined in both CA Spool and in VTAM. The following JCL shows a CA Spool NODE definition for a virtual printer named VPSVRT01:

```
NODE PTEST001,  
     3287,  
     GROUP=1,  
     CLASS=A,  
     FCB=6,  
     FORM=STD,  
     VPS=VPSVRT01,  
     VPSFILE=CHAIN
```

VTAM Printer Definition

This is the corresponding VTAM definition for the virtual printer VPSVRT01.

```
          VBUILD TYPE=APPL  
          .  
VPSVRT01 APPL AUTH=ACQ,DLOGMOD=DSC4K  
          .
```

The virtual printer is coupled with a physical printer by specifying the name of the virtual printer in the VPS sub-parameter of the printer NODE definition.

In the example, CA Spool opens a VTAM ACB with the name VPSVRT01, to which other TP monitors can establish a printer session. The VPSFILE sub-parameter specifies when CA Spool is to close the resulting spool file. The FORM, FCB, and CLASS attributes of the resulting spool file are taken from the corresponding sub-parameters of the printer NODE definition.

LU Type-3 Session Commands

The following 3270 commands are supported for LU type-3 sessions:

- CR hex('0D')— Carriage return
- EM hex('19')—End of message
- EUA hex('12')—Erase unprotected to address
- FF hex('0C')—Form feed

- FM hex('1C')—Field mark
- IC hex('13')—Insert cursor
- NL hex('15')—New line
- SF hex('1D')—Start field
- SBA hex('11')—Set buffer address
- RA hex('3C')—Repeat to address
- SFE hex('29')—Start field extended

LU Type-1 Session Commands

The following 3270 commands are supported for LU type-1 sessions:

- VCS hex('04')—Vertical channel select
- HT hex('05')—Horizontal tab
- GE hex('08')—Graphic escape
- VT hex('0B')—Vertical tab
- CR hex('0D')—Carriage return
- FF hex('0C')—Form feed
- ENP hex('14')—Enable presentation
- NL hex('15')—New line
- BS hex('16')—Back space
- EM hex('19')—End of message
- IRS hex('1E')—Inter-record separator
- IND hex('24')—Inhibit presentation
- LF hex('25')—Line feed
- SA hex('28')—Set attribute
- BEL hex('2F')—Bell
- TRN hex('35')—Transparent
- SHF hex('2BC1')—Set horizontal format
- SVF hex('2BC2')—Set vertical format
- SLD hex('2BC6')—Set line density
- SPD hex('2BD20029')—Set print density
- PPM hex('2BD20048')—Page presentation media

Start and Stop Commands

To start and stop a single virtual printer:

```
S,VPSVRT01[,V]    start virtual printer  
P,VPSVRT01[,V]    stop virtual printer
```

To start and stop all virtual printers:

```
SNET,VPS    start all virtual printers  
PNET,VPS    stop all virtual printers
```

CICS Environment

In a session between CICS and a virtual printer, CICS is always the primary LU and the virtual printer is the secondary LU. This means that it is CICS which supplies the BIND image.

DFHTCT Table

In CICS, the BIND parameters are generated inside the DFHTCT table on the basis of the following parameters:

CICS DFHTCT:	SYS1.VTAMLST:	ESFPARM:
DFHTCT TYPE=TERMINAL,	VSYSR01 APPL	NODE RSYSR01,
TRMIDNT=PRO1,	AUTH=ACQ,	VPS=VSYSR01,
NETNAME=VSYSR01,	VPACING=3	VPSFILE=BRACKET
-	-	-
TRMTYPE= (1)		
BUFFER= (2)		
RUSIZE= (3)		
RUSIZE= (3)		
CHNASSY= (4)		
BRACKET= (5)		

Parameter Details

The BIND parameters from the DFHTCT table in the previous section are as follows:

```
TRMTYPE = 3270P           => LU0 - not supported by VPI.  
        = LUTYPE3        => LU3 - supported.  
        = SCSVRT         => LU1 - supported.  
BUFFER  = Size of buffer sent to the secondary LU contains as many as  
        possible RUs chained together. Maximum 4000 Bytes.  
RUSIZE  = Size of RU to be sent to secondary LU.  
CHNASSY = YES - Allows chaining of RUs in buffers.  
BRACKET = YES - Recommended together with VPSFILE=BRACKET.
```

Menu System and Web Interface

This section describes the environments and activities required to install and customize the menu system and web interface.

Environments

The CA Spool menu system operates under CICS, CA IDMS, TSO/ISPF, TSO, CA Roscoe, IMS, NATURAL, and directly under VTAM.

The CA Spool web interface is a special version of the CA Spool menu system that runs on a z/OS web server on the same MVS image as CA Spool. An HTML presentation layer converts the 3270 data-stream into HTML on the fly.

Customization

All help texts and error messages in the menu system are contained in the source member ESFHTEXT, and can easily be changed. The layout of the printer and file displays is defined in the ESFHPARM module source and is easily changed. It is also possible to change the position of the separate fields and their headings and attributes (input/output field, highlight, color, reverse video). For more information, see the Menu System Customization section in this chapter.

Modules in the Menu System

The CA Spool menu system consists of the following modules:

ESFHTSO

Displays panels for TSO users (source)

ESFHISPF

Displays panels for ISPF users (source)

ESFHIMS

Displays panels for IMS users (source)

ESFHCICS

Displays panels for CICS users (source)

ESFHIDMS

Displays panels for CA IDMS users (source)

ESFHESF

Displays panels for VTAM menu (source)

ESFHCI

Communicates with one of the above modules and the CA Spool address space (load)

ESFHBROW

File browse module (load)

ESFHPARM

Contains panel layouts (source)

ESFHTEXT

Contains fixed texts (source)

ESFHWAIT

Wait routines for all environments (source)

National Language Support

By default, the CA Spool menu system supports the following languages:

Danish	German	Swedish
English	Italian	
French	Spanish	

You can customize the language to be included in the menu system load-module based on your requirements. Other languages can also be employed. For more information, see the Menu System Customization section in this chapter.

Installation

To install the menu system

Define a communication channel in the CA Spool parameter deck (ESFPARM data set) with the generic name MENU.

```
CID MENU,USMR=NO,MAXPORT=10,OPENTYPE=U
```

Define the users in your external security package, or internally in CA Spool. For more information, see the Security Issues section.

CICS Installation

To install the menu system in the CICS environment

1. If you are running a version of CICS earlier than TS 3.1.0, add the following line after the &ESFCICS SETB statement in BQ4JCICS:

```
&CTS310 SETB 0 1=CICS 310 or higher
```

2. Run the job BQ4JCICS, if not already done during CA Spool installation.
3. Define the program and transaction for the CA Spool CICS menu interface into the desired RDO group using CICS program DFHCSDUP:

```
DEFINE PROGRAM(ESFMCICS) GROUP(ESF) LANGUAGE(ASSEMBLER)
DEFINE TRANSACTION(ESFM) GROUP(ESF) PROGRAM(ESFMCICS) TWASIZE(0)
TASKDATALOC(BELOW) TASKDATAKEY(USER)
```

Add the RDO group to your CICS startup list (the SIT parameter GRPLIST=).

4. Copy the ESFMCICS load-module from the CA Spool load library to a library within the DFHRPL concatenation in the CICS startup JCL deck.

Note: When installing CICS support on to a CA Spool task that has already been started, the modules loaded into the CSA must be reinitialized by issuing the "REINIT,MODULES,ON" command followed by a recycle of the CA Spool started task.

New CICS Release

The BQ4JCICS job must be run again if a new version or release of CICS is installed on the system. For instructions about how to modify and run this job, see the first two steps in the preceding section, CICS Installation.

CICS Menu System Startup

The CICS menu system is started in either of two ways:

- By entering the transaction ID directly on an empty CICS screen.
- By invoking it from another CICS transaction or program.

Invoking the Menu System

When the CA Spool menu system is invoked from another CICS program, it supports transfer of information to the menu system. This means that any menu screen is activated directly from the other transaction, including setting of owner prefix, printer prefix, and so on.

Note: The invocation must be done using XCTL to the menu system program with a common area as specified in the following table:

Offset (decimal)	Length	Description
000	008	Reserved. Must be initialized to X'00'.
008	004	Restart transaction code. Must name a CICS transaction to invoke the menu system. It is used to regain control after giving control to CICS waiting for the user to enter new information.
012	004	New transaction code. If this field is non-blank, the value specified is used as "next-transaction-ID" when the menu system terminates.
016	008	Program name. If this field is non-blank and the new transaction code is blank, the CA Spool menu system will XCTL to this program when it terminates.
024	002	Command. If this field is non-blank it is used as a command for the CA Spool menu system, such as F/FA/P/PS/PB.
026	008	Related node. In this field is non-blank it is used as a related node equivalent to specifying RN xxxxxxxx. It must be 8-characters long, padded with spaces.
034	006	Related group. If this field is non-blank it must be numeric with leading zeros. The value indicates the related group equivalent to specifying RG 999.
040	008	Owner prefix. If this field is non-blank it is used as the owner prefix equivalent to specifying OP xxxxxxxx. The field must be 8-characters long and padded with spaces.
048	008	Printer prefix. If this field is non-blank it is used as the printer prefix equivalent to specifying PP xxxxxxxx. The field must be 8-characters long and padded with spaces.

Offset (decimal)	Length	Description
056	004	Subsystem name. If this field is non-blank it is used as the subsystem name equivalent to specifying SUB xxxx. The field must be 4-characters long and padded with spaces.
060	008	NJE name. If this field is non-blank it is used as the NJE name equivalent to specifying NJE xxxxxxxx. The field must be 8-characters long and padded with spaces.
068	002	Length of user field. This field must be a binary half word indicating the length of the following field.
070	—	User field. If the previous field specifies a length greater than zero, this field is passed as COMMAREA to the new transaction or new program, which gains control when the CA Spool menu system terminates.

CA IDMS/DC Installation

To install the menu system in the CA IDMS/DC environment

1. Run the job BQ4JIDMS, if not already done during installation of CA Spool.
2. Define a suitable CA IDMS transaction pointing to the ESFMIDMS load-module.

TSO/ISPF Installation

To install the menu system under TSO/ISPF

1. Copy the EHCPAN11 panel from the CA Spool CBQ4PNL0 library to a library within the ISPLIB concatenation in your TSO logon procedure.
2. Copy the EHCROW CLIST from the CA Spool CBQ4CLS0 library to a library within the SYSPROC concatenation in your TSO logon procedure.

Note: CLIST EHCROW contains a UNIT=VIO reference for the allocation of a temporary dataset to be used for browsing. Clients must verify that UNIT=VIO is a valid DASD allocation UNIT at their site, and if not, must change UNIT=VIO to a valid DASD type.

3. Copy the ESFMENU CLIST from the CA Spool CBQ4CLS0 library to a library within the SYSPROC concatenation in your TSO logon procedure.

You can start the TSO/ISPF menu system by invoking CLIST ESFMENU with the CA Spool subsystem name as parameter:

```
%ESFMENU ESF
```

where the operand ESF is the name of the subsystem you want to activate. You can also hard code a subsystem name in the CLIST.

Note: The ISPF menu interface supports dynamic screen sizes. The screen width limit is 132. The number of rows can be any number as long as the total screen area, row * columns, is less than 11880.

TSO Installation

To install the menu system in the TSO environment, copy the ESFMTSO load-module from the CA Spool link library to your TSO command library.

To start up, enter the following command:

```
ESFMTSO
```

CA Roscoe Installation

To install the menu system in the CA Roscoe environment

1. Run BQ4JROSC, if not already done, during CA Spool installation.
2. Copy the ESFMTSO load-module from the CA Spool load library to a library within the ETSOLIB concatenation in the CA Roscoe startup deck.
3. Update the CA Roscoe eligible program list to include the ESFMTSO member as a CP-routine.
4. Make the ROETSAPI module from the CA Roscoe load library available to the CA Spool task using STEPLIB or linklist.

To start up, issue the command:

```
CALL ESFMTSO
```

IMS Installation

To install the menu system in the IMS environment

1. Run the job BQ4JIMS, if not already done during installation of CA Spool.
2. Define the program and transaction to IMS:

```
APPLCTN PSB=ESFMIMS,PGMTYPE=(TP,,1)
TRANSACT CODE=ESFMIMS,MODE=SINGL,SEGNO=400,SEGSIZE=0,
          PRTY=(03,05,00040),PROCLIM=(1,99),SPA=(18000,DASD),
          MSGTYPE=MULTSEG
```

Be sure that the used PSB and PSBW buffer pool sizes are at least 2700 bytes.

3. Copy the ESFMIMS load-module from the CA Spool link library to a library accessible to the IMS message region in which it must execute.

Note: IMS preload is currently not supported for ESFMIMS.

4. Run the job BQ4JPSB to generate a PSB for the menu system.
5. Run the job BQ4JACB to generate an ACB for the menu system.

NATURAL Installation

To install the menu system under NATURAL

1. Run the job BQ4JNALD to load the NATURAL program into the Natural system file.
2. Add the name ESFHCI to the static list in the NATPARM module and assemble it.
3. Make the following changes to your NATURAL link job:

- Add the DD statement:

```
//SESFLNK DD DSN=dsname,DISP=SHR"
```

dsname is the name of your CA Spool link library.

- Add the following include statement:

```
INCLUDE SESFLNK(ESFHCI)
```

To invoke the NATURAL menu system, enter **ESFM** on the NATURAL command line.

VTAM Installation

To install the menu system in the VTAM environment

1. Copy the ESFMESF load-module from the CA Spool link library to a library accessible to the CA Spool started task.
2. If you have changed the name of the ESFMESF load module, verify that the new name of the load-module is reflected by the ESFMESF keyword on the MODULES statement in the ESFPARM data set.

Install the Web Interface on z/OS 2.1 and Earlier Releases

Under z/OS 2.1 and earlier releases, the CA Spool web interface runs as a native CGI gateway program under the z/OS Domino HTTP server. This server is part of the z/OS base product for z/OS 2.1 and earlier releases. For information to configure the z/OS HTTP server, see the *z/OS HTTP Server Planning, Installing, and Using* guide.

Follow these steps:

1. Customize your web server environment variables file installed in `/cai/caspool/httpd.envvars` as needed. This file can work without changes.
2. Customize your web server configuration file in `/cai/caspool/httpd.conf`:
 - The `HostName` variable must specify the TCP/IP domain name of the MVS system where the web server is running.
 - The `Port` variable must specify the TCP/IP port number for use by the web server.
3. Customize the `CBQ4PROC(CAIQWEB)` JCL procedure member as needed and copy it to an active PROCLIB library.
4. Use an MVS 'S CAIQWEB' command to start the web server.
5. Enter the following line in a web browser to invoke the CA Spool web interface. Use the `Hostname` and `Port` values defined in Step 2.
`http://**HostName**:**port**/caspool/esfweb`
6. (Optional) [Customize the web interface for your environment](#) (see page 92).

Install the Web Interface on z/OS 2.2

Under z/OS 2.2, the CA Spool web interface runs as a native CGI gateway program under the z/OS Apache HTTP server. This server is part of the z/OS 2.2 base product.

Note: For information to configure the z/OS HTTP server, see the IBM Redpaper *IBM HTTP Server on z/OS: Migrating from Domino-powered to Apache-powered*.

To install the CA Spool web interface on z/OS 2.2, follow this process:

1. Review and verify the assumptions.
2. Install the Apache HTTP server.
3. Confirm that the Apache HTTP server is installed correctly.
4. Configure the Apache server to work with CA Spool Web Interface.
5. Create a started task to run the z/OS HTTP Apache server.
6. Start and stop the z/OS HTTP Apache server.
7. (Optional) [Customize the web interface for your environment](#) (see page 92).

Step 1: Review and Verify the Assumptions

1. Review and verify the following assumptions:
 - The product code for IBM HTTP Server powered by Apache is located at `/usr/lpp/IHSA/V8R5`.
 - The installation directory for CA Spool is in your home directory, for example, `/cai/caspool`.

If your environment uses a different value, specify that value instead as you perform the steps that follow.

Step 2: Install the Apache HTTP Server

1. Create an installation directory for the server configuration files, for example:

```
cd /cai/caspool
mkdir webserv
```

2. Change the directory to the HTTP Server product directory:

```
cd /usr/lpp/IHSA/V8R5/.31bit
```

3. Run the installer program, `bin/install_ihs`, to perform these tasks:
 - Install the HTTP Server product files in your home directory
 - Perform the initial configuration
 - Create symbolic links from your home directory to the product directory

Use these parameters to run the installer program:

- The installation directory for the configuration files
- The non-SSL port for the web server; select a port other than the default port of 80; for example, 8081 or 8082

For example:

```
./bin/install_ihs /cai/caspool/websrv 8081
```

Step 3: Confirm That the Apache HTTP Server Is Installed Correctly

1. Change to the server's installation directory:

```
cd /cai/caspool/websrv
```
2. Run these commands to verify that the Apache HTTP Server was successfully installed:

```
apachectl -v
apachectl configtest
```
3. Review the output. For a successful installation, the output appears similar to the following example:

```
# bin/apachectl -v
Server version: IBM_HTTP_Server/8.5.5.2 (Unix)
Server built: Jul 11 2014 18:07:04
# bin/apachectl configtest
Syntax OK
```

Step 4: Configure the Apache Server to Work with CA Spool Web Interface

1. Customize your web server configuration file for the Apache server. To enable CA Spool Web interface on the new server, customize the following example for your environment, and add it to the end of your `/cai/caspool/websrv/conf/httpd.conf` file:

```
# SAF (RACF) authorization
# -----
# SAF authentication is provided by the mod_authnz_saf
# module. The mod_authz_default and mod_auth_basic modules
# provide basic authentication and authorization support
# which is needed in mod_authnz_saf configurations.
LoadModule authnz_saf_module modules/mod_authnz_saf.so
```

```

# =====
# CA Spool Web Interface
# -----
<Location /caspool/>
  AuthName "CA Spool"
  AuthType Basic
  AuthBasicProvider saf
# CA Spool requires an authorized user
  Require valid-user
  SAFRunAs %%CLIENT%%
# No translation by default for location /caspool/
  CharsetSourceEnc IBM-1047
  CharsetDefault IS08859-1
</Location>
# CA Spool help is in EBCDIC
<Location /caspool/help/EN_US/>
  CharsetSourceEnc IBM-1047
  CharsetDefault IS08859-1
</Location>
#
# Map URIs to directories
ScriptAlias /caspool/esfweb          /cai/caspool/esfweb
ScriptAliasMatch /caspool/ESF*       /cai/esfweb
Alias      /caspool/castyles.css     /cai/caspool/castyles.css
Alias      /caspool/images           /cai/caspool/images
Alias      /caspool/swap              /cai/caspool/swap
# =====

```

Step 5: Create a Started Task to Run the z/OS HTTP Apache Server

1. Customize the CBQ4PROC(CAIQWEBA) JCL procedure member as needed and copy it to an active PROCLIB library.
2. Define the user ID for CAIQWEBA.
3. Define a RACF (or other SAF) STARTED rule to map the CAIQWEBA started task to the user ID.

Step 6: Start and Stop the z/OS HTTP Apache Server

1. Use an MVS 'S CAIQWEBA' command to start the z/OS HTTP Apache Web Server.
2. Go to SYSLOG and search for messages issued by the CAIQWEBA STC until you find the following message:

STC51452 00000094 IHS is active. Use jobname CAIQWEBx for MVS commands.

Remember the assigned jobname CAIQWEBx.

3. Verify that the Apache HTTP Server is running successfully by loading the default CA Spool Web Interface web page with the host name or IP address of your z/OS system and the defined port number.

For example:

`http://**HostName**:**port**/caspool/esfweb`

4. Use an MVS 'P CAIQWEBx' command to stop the Web Server.

Customize the Web Interface

To customize the web interface, modify the default initial configuration of the \$esfweb.ini USS HFS file, which contains the following configuration parameters.

Note: The Web Interface module reads this configuration file from the same directory where the module resides. However, you can change this default by creating an environment variable, ESF_WEBINI, and specifying an alternate directory and name, for example, ESF_WEBINI = /usr/lpp/config/\$esfweb.ini.

```
#
#   CA Spool Web Interface ini file
#
ESF_ID=ESF           Default ESF Subsystem Name
ESF_TEXT=0          Default Text Language (0 - 6)
#                   0 - English
#                   1 - German
#                   2 - French
#                   3 - Spanish
#                   4 - Italian
#                   5 - Swedish
#                   6 - Danish
ESF_FORM=0          Default Panel Format
```

```

ESF_SCRZ=2          Default Screen Size:
#                  2 - 1024 x 768
#                  3 - 1152 x 864
#                  4 - 1280 x 1024
ESF_PRTX=1          Printer Index (0=OFF, 1=ON)
ESF_ACMD=1          Action Commands (0=OFF, 1=ON)
ESF_NCMD=1          Native Commands (0=OFF, 1=ON)
ESF_TRAC=0          Web Trace (0=OFF, 1=ON)
ESF_PRTM=1          Printer Metrics (0=OFF, 1=ON)
ESF_WIND=2          Separate Window (0=No, 1=Yes,
#                  2=Multiple)
ESF_MBAR=0          Window Menu Bar (0=No, 1=Yes)
ESF_ASIS=0          Windows Viewer (0=No, 1=Yes)
ESF_A2PD=0          View AFP as PDF (0=No, 1=Page,
#                  2=Line, 3=All, 4=A2PDREPT)
# If the AFP-to-PDF Transformers is being used to view AFP as PDF the
# A2PDPARM FDOOutput = must point to the Web Interface SWAP directory.
#
ESF_T2YY=1          View Text as (0=3270, 1=PDF,
#                  2=HTML, 3=RTF)
# If ESF_T2YY>0 the ESFPARM T2PD, T2HT and T2RT DEFNODE definitions
# must be updated to point to the Web Interface SWAP directory.
#
ESF_IPAD=2          Printer TCP/IP Address (0=Hyperlink,
#                  1=Static Text, 2=Editable Text)
ESF_TIME=0          Time Display (0=GMT, 1=Local)
ESF_AUTO=10         Auto Display (0=OFF, 1-255 Seconds)
#
ESF_SCLU=0          Swap cleanup (0=OFF, 1-999 Min.)
ESF_BCLU=0          Browse cleanup (0=OFF, 10-999 Sec.)
#
#NJE-WEB Nje-Node=HTTPHost:HTPPport
#NJE_WEB A31IESF1=usilca31:8080
#NJE_WEB A11IESF1=usilca11:8080

```

Note: ESF_IPAD allows a change in access to the options that are displayed. Hyperlink is the default option whether ESF_IPAD is set or not. ESF_IPAD=1 allows access to the options Hyperlink and Static Text. ESF_IPAD=2 allows access to all options, Hyperlink, Static Text, and Editable Text.

Configure Web Interface to Let Users Convert Text Files to HTML, PDF, or RTF

Follow these steps to configure the CA Spool Web Interface to transform text files into PDF, HTML, or RTF automatically when users open them to browse them:

1. Open the CAIQPOOL/ESFPARM file and verify that it specifies the following parameter:

```
X2YY START=YES
```

2. Open the default parameters member, CAI.CBQ4PARAM(CAIQPARAM). Locate the following DEFNODE statements, and verify that each TCPHOST points to the swap directory. Use the following statements as models.

```
DEFNODE T2PD,TEXT2PDF,TCPDRIV=DISKH,TRANS=C037T19U,  
TCPHOST='PATH=/CAI/swap,FILENAME=*.PDFLB'
```

```
DEFNODE T2HT,TEXT2HTM,TCPDRIV=DISKH,TRANS=C037T19U,  
TCPHOST='PATH=/CAI/swap'
```

```
DEFNODE T2RT,TEXT2RTF,TCPDRIV=DISKH,TRANS=C037T19U,  
TCPHOST='PATH=/CAI/swap'
```

3. Open the httpd.conf file.

This file is the web server configuration file for CA Spool web interface. By default, this file is installed in the /CAI/caspool directory. If the file does not exist there, you likely specified a custom location for the file during the installation. Review your SMP/E Apply output to find the location of the file.

- a. Find or add the following PASS statement:

```
Pass /caspool/swap/* /cai/caspool/swap/*
```

- b. Leave the first value (/caspool/swap/*) unchanged.
- c. For the second value, specify the path to the swap directory.

4. Locate the \$esfweb.ini file.

This file is the web server initialization file for the CA Spool web interface. By default, this file is installed in the /CAI/caspool directory. If the file does not exist there, you likely specified a custom location for the file during the installation. Review your SMP/E Apply output to find the location of the file.

5. Verify that the \$esfweb.ini file is accessible by the web server, as follows:

- a. Enter the ls -l command:

```
ls -l $esfweb.ini
```

- b. Verify that the permission level is 755 or 777.

6. Open the \$esfweb.ini file and update the value of the ESF_T2YY parameter to 1, 2 or 3, as follows:

```
ESF_T2YY=2      View Text as  (0=3270, 1=PDF,  
#              2=HTML, 3=RTF) ESF_A2PD=1
```

The value that you specify becomes the default format for web interface users to view text files. For example, if you specify 2, then, by default, when web interface users open text files, the files are automatically converted to HTML format.

7. Start the CA Spool Web Interface and open the Options menu. Verify that the View Text files option is set according to your specifications in the previous step.
8. Inform web interface end users that they can optionally override the default setting by selecting a different value in the View Text files option on their Options menus.

Configure Web Interface to Let Users Transform AFP Files to PDF

You can configure the CA Spool Web Interface to let users transform AFP files to PDF format automatically when users open the files to browse them.

For instructions, see the *Java Transformers Administration Guide* or the *AFP Transformers Administration Guide*.

Language Support

The menu system permits up to 10 different languages from which you can select the desired one. As each of these languages contains large text portions, it is recommended to include only the languages that you require at your installation.

Your users can select the languages, by issuing a command `TEXT n` in the menu system, where *n* is a number between 0 and 9. You can decide which value to use for which language. The language with the value zero is the default language for startup. If no language included is assigned the value zero, the menu system does not start.

Menu System Customization

You can customize the menu system to meet your specific requirements.

Changing the Menu System

You can change menu items by setting an option on or off in a source module, for example, including texts in different languages. Other changes require major updates to the source modules, for example, having different panel layouts. All changes to source modules are controlled by SMP/E, so that any change to the menu system must be created in the form of a USERMOD for SMP/E.

Panel Design

The panels have been designed so that the first and last five lines of each panel (headings and footings) are described in the ESFHTEXT module. This module includes separate modules (macros) with fixed texts for each of the languages chosen by you. The variable portion of each panel (that is, between headings and footings) is described in the ESFH Parm member. This module describes each panel in up to 10 different formats defined by you. By default one format is included, which is described in the Menu System Customization section of the "Customization" chapter. The text part of the panels is included in separate modules (macros) for each of the languages you have chosen.

Customizable Items

Any of the following can be customized:

Action commands	Language support
Changing Menu Functionality	Modify panel text
Default subsystem ID	Panel layouts

Default Subsystem ID

The default subsystem ID is set by changing the variable &ESFID in source module \$ESFxxx. The xxx identifies the environment in which the menu system is running, one module for each environment. The variable &ESFID must be set to the 4-character ID of the CA Spool subsystem, which must be the default. You can also change the subsystem ID online by a command in the menu system, if necessary.

Language Selection

To select a language to be included in the menu system, set the appropriate language variable in macro \$ESFLANG to 1. To exclude the language, set the variable to 0.

The following table shows the relationship between the language variables and the macros containing the language-specific text:

Language	Variable	Text Module	Parm Module
English	&ESFENGL	ESFHTXT0	ESFHPRM0
German	&ESFGERM	ESFHTXT1	ESFHPRM1
French	&ESFFREN	ESFHTXT2	ESFHPRM2
Spanish	&ESFSPAN	ESFHTXT3	ESFHPRM3
Italian	&ESFITAL	ESFHTXT4	ESFHPRM4
Swedish	&ESFSWED	ESFHTXT5	ESFHPRM5
Danish	&ESFDANI	ESFHTXT6	ESFHPRM6

Choosing TEXT *n*

In each of the ESFHTXT x and ESFHPRM x modules, you can select the value on the TEXT n menu command activates the module contents.

To associate a language with a specific TEXT n value, set the appropriate text variable (&TXT $xxxx$) in the source module \$ESFLANG to the required value. Each value (0-9) must only be assigned once, and the value 0 must be used to identify the default language. If no default language is identified, the menu system does not start up.

You must assign the same TEXT n value to both the ESFHTXT x and ESFHPRM x modules in the same language.

Modifying Panel Texts

In addition to selecting different languages, you can also make other changes to the texts. This is done by changing the text portions in the ESFHPRM x and ESFHTXT x modules for the requisite languages, in accordance with the table in the Language Selection section.

Note: Change the text portion *only*; the remaining data in the modules is vital to the functionality of the menu system.

Changing Menu Functionality

ESFHPRM includes three bytes that can contain flags that change the menu system. The flags are set for each language separately in the ES n HOPTS section of ESFHPRM. These flags are global settings that affect every user of the language for which they are set. By default, no flag is active.

An SMP usermod must be used to change the value of these option bytes.

Field	Name	Bit	Function
OPT1	OPT1USER	0	The action field might not be accessible for all files listed on the menu for users that do not have full access. File actions are only permitted for files whose file name or creating userid is equal to the current userid.
	OPT1CMD	1	Disallows the ability to enter native commands from the menu (/DS, for example)
	OPT1NEWO	2	If a file command is entered to change the owner of a file (file name), the file destination is changed to the value specified and the owner is not changed

Field	Name	Bit	Function
	OPT1REST	3	Combined Printer/File displays for printers defined with REST=NO include all of the files in the group
	OPT1ALIA	4	Displays the alias name in the Destination field and the node name in the Alias field of the panels This option is recommended if USEALIAS=YES is specified in ESFPARM.
	OPT1NOFT	5	Moves the command line to the top of the menu and removes the footer lines to increase the size of the list of items displayed
	OPT1APPL	6	Displays the APPLID at the far left of the first header line of the VTAM MENU system, replacing the literal Spool.
	OPT1ZSYS	7	Displays the &SYSNAME system symbol value at the far left of the first header line of the TSO/CICS/IDMS/IMS MENU systems, replacing the literal Spool.
OPT2	OPT2MNOD	0	Enable use of initial maximum node count in the Printer menu. On system initialization, the total number of nodes is saved. Further actions in the Printer menu do not result in the calculation of a new total number of nodes.
	OPT2PPVP	1	Include printers whose virtual or alias names match the DEST filter when building the Printer menu display.
	OPT2PPRE	2	Allow the Dest filter from the Printer Menu to be propagated to the Prt Name filter on the Virtual Printer Menu automatically. If the Prt Name filter on the Virtual Printer menu is altered, it will be used. An additional Printer Prefix command or a manual change to the Dest filter on the Printer menu will resynchronize the values again.
OPT3	OPT3PART	0	Disables Partial Print commands while browsing files
	OPT3LV	1	At entry to Browse, use Logical View
	OPT3FEV	2	Enable non-authorized users to see the Virtual Printer Panel

Modifying Action Commands

The Action commands can be modified according to your needs. The Action commands are placed in the ESFHPRMx modules as separate CSECTs. Each of the CSECTs must end with a DC X31'FF' to indicate end-of-table.

CSECT	Panels Affected
ESFHFACT	File display panels.

CSECT	Panels Affected
ESFHPACT	Printer display panels.
ESFHNACT	NJE display panels.
ESFHVACT	Virtual printer display panels.

Each action command is built over a skeleton:

DC	Function
CL1'Q'	CA Spool command to be issued. This value must never be changed.
CL6'ESF888'	Expected reply to command. This value must never be changed.
CL1'W'	Action command entered by the user
XL1'06'	Length of command alias
CL8'SESAME'	Command alias

When a user enters the action command W or SESAME, the menu system issues the CA Spool command Q for whatever item was displayed on the line where the action command was entered and verify that the response is an ESF888 message.

Panel Layouts

You can define what the panels in the menu system look like. You can control the following:

- Which fields to include on the panels
- Order in which the fields are presented
- Length of each field
- Which fields can be modified
- Colors of the fields

You can define up to 10 different layouts for each panel. The users can select the layouts by using the command `FORMAT n` in the menu system, where *n* is a value between 0 and 9. Zero is the default, which is used when the menu system is started. You define which value to assign to each format.

Formats

The ESFHPARM source module consists of a separate CSECT for each panel.

CSECT	Panel
ESFHFFLD	File Display
ESFHPFLD	Printer display
ESFHNFLD	NJE display
ESFHNEXT	Extended NJE display
ESFHVFLD	Virtual printer display
ESFHVEXTE	Extended virtual printer display

Note the following:

- Each of these panels is defined in up to 10 different formats.
- At the beginning of each CSECT, 10 FORMAT-pointers point to each of these formats.
- By default, the 10 pointers point to the primary format.
- To create a new format, the pointers at the beginning of the CSECT must be changed to point to the formats you define. The first pointer points to format 0, the second to format 1, and so on. You must then create the new format.
- The Action field on each menu is fixed. The file sequence number on the file menu (FILESEQ) and the Dest on the printer menu (PRTNAME) are also fixed. These fields cannot be moved or removed.

Format Creation Example

The following example illustrates creation of a new panel format. At the beginning of CSECT ESFHFFLD, the 10 format-pointers all point to a label called ES0HFFLD. This effectively means that all formats (0-9) all use the panel layout described after label ES0HFFLD. To add a new format, for example, format 1, you must change the second pointer at the top of the CSECT to point to the new format; for example, ES1HFFLD. A new label ES1HFFLD must then be created, followed by the field definitions for the new format.

Field Definitions

Each format consists of a number of field definitions. The structure of each field is shown in the following table:

Length	Function
2-bytes	Field identifier. Each field available to a panel has a unique identifier.
2-bytes	Start position on a line of the panel.
2-bytes	Length of the field.
1-byte	Attribute of the field as normally displayed.
1-byte	Attribute of the field when the file/device is active.
1-byte	Attribute of the field when in modified or extended modified mode.
1-byte	Attribute for the filtering criteria field associated with this field.
4-bytes	Pointer to the field containing the column heading text for the field.

The Action field must remain first field on every panel. The file sequence (FILESEQ) on the file menu and the Dest (PRTNAME) on the printer menu must remain as the second fields on those menus. The order in which the remaining fields are described does not matter, if they conform to the above description. It is, however, far more readable if the fields are described in the order in which they appear on the panel.

Web Interface Customization

After general menu system customization has been done, additional defaults and settings can be made for the web interface by setting the values in the supplied \$esfweb.ini USS HFS file.

The following settings can be overridden by individual users on the Options page in the web interface:

ESF_ID

Sets the default Subsystem ID for web interface users.

ESF_TEXT

Sets the default language. The language must have been made available by modifying the \$ESFLANG macro to set this default in the web interface.

ESF_FORM

Sets the default menu format.

ESF_SCRZ

Sets the default screen size.

ESF_PRTX

Determines if the Printer Index Frame is built as a default for all users.

ESF_ACMD

Determines if a drop-down menu of file or printer commands is available as a default for each user.

ESF_NCMD

Determines if Native command support is available as a default for each user.

ESF_TRAC

Determines if WEBTRACE files are created for all users as a default. WEBTRACE files are used by CA Spool support as a debugging tool. This must only be set as a default when requested by CA Spool support.

ESF_PRTM

Determines whether the Printer Metrics tab is displayed to all users as a default.

ESF_WIND

Sets the default for all users in regards to whether separate windows are opened when browsing files.

ESF_MBAR

If ESF_WIND is not zero, determines if the browser's menu bar is presented in the new window as a default.

ESF_ASIS

Determines if, by default, binary files, files whose FCB is set to ASIS, are passed to windows to be viewed by a local viewer whose file associations match the PRMODE of the file. For example, a file with FCB=ASIS and PRMODE=PCL would launch a previously installed PCL viewer instead of viewing the PCL commands in the file.

ESF_A2PD

Determines if, by default, CA Spool's AFP to PDF transformer is called to automatically transform files in the web interface. This can be set to act on PRMODE=LINE file, PRMODE=PAGE files, all files or no files. In addition, it can be set to generate transform log which is written to the A2PDREPT DD statement in the CA Spool Proc.

Additional changes to the PDF transform parameter file, A2PDPARM, are required to write the output of the transform to the web interface swap directory.

Note: For instructions about the required format of the FdOutput parameter, see the *AFP Transformer Administration Guide*.

The X2YY statement in the ESFPARM file must have START=YES specified.

ESF_T2YY

Determines if CA Spool's Text to PDF/RTF/HTML wrapper support is used to display text files as a default.

Additional changes to the PATH parameter on the DEFNODE statements in the ESFPARM file for T2PD, T2HT and T2RT are required. The PATH parameter must specify the Swap directory in use by the web interface.

The X2YY statement in the ESFPARM file must have START=YES specified.

ESF_IPAD

Determines if the TCP/IP Host Address field on the Printer Menu is static text, a hyperlink, or editable text.

The following settings cannot be overridden by individual users on the Options page in the web interface:

ESF_TIME

Sets the format for the Time display on each page of the web interface as either local or GMT.

ESF_AUTO

Sets the time interval in seconds that is used when the AUTOREFRESH tab is selected.

ESF_SCLU

Determines how many minutes a session management file can be unused before it is deleted. It is the number of minutes before it can be assumed that the browser session is no longer active.

Cleanup is performed by the web Interface itself, so in periods where the web interface is not used, no file cleanup is performed. Any action by any user triggers an analysis of all the allocated swap files.

ESF_BCLU

Determines how many seconds a temporary browse file, created due to the use of the ESF_A2PD or ESF_T2YY options in \$esfweb.ini, can be unused before it is deleted. It is the number of seconds before it can be assumed that the entire data has been sent to the browser.

NJE_WEB

Maps a Spool NJE node to a corresponding Spool HTTP web server running on the same NJE connected LPAR. When Enterprise Wide Web Interface is used for file viewing, a URL pointing to the web server which must be used to launch the corresponding file is generated. When a printer name is clicked to get printer details, the request is automatically routed to the printer-owning CA Spool system to get the status of the printer.

PSF (Print Services Facility) Interface

To support VTAM and channel-attached printers managed by Print Services Facility (PSF), the following steps are necessary:

1. Define one or more functional subsystems (FSS) to CA Spool.

For more information, see the FSSDEF initialization parameter in the chapter Initialization.

2. Specify the associated FSS for each PSF managed printer. One FSS is associated with one or more printers.

For more information, see the NODE initialization parameter in the chapter "Initialization".

FSS Address Spaces

Each FSS runs in its own address space. The CA Spool module ESFFSSM must be available to this address space in an authorized library. The FSS address spaces are started automatically when the first associated printer is started. The NODE parameters ACQUIRE and RELEASE are used to determine when a printer must connect/disconnect to the FSS. The FSS address spaces are shut down when the CA Spool network interface is halted using the PNET, TNET, or PFSS commands.

Adding Printers to an FSS Address Space

The maximum number of printers that can be connected to an FSS address space is determined when the address space is started. If printers are added to a running FSS with the REINIT command, shut down the FSS and start it again to update this information. This procedure is necessary for both VTAM-managed and channel-attached printers. For more information about the JCL needed to start the PSF address space, see the *PSF System Programmer's Guide for MVS*.

Setup Example #1

The following example shows how to set up an IBM 3812 as a PSF printer driven by CA Spool.

The CA Spool definitions for the IBM 3812-2 printer:

```
FSSDEF ESFFSS,PROC=ESF3812
NODE   RSOF01A,3812,GROUP=1,CLASS=A8,FSS=ESFFSS,
       ACQUIRE=WORK,PURGE=NO,RETAIN=8,
       SETUP=NO,SEP=1,AUTO=YES,REST=YES
```

Setup Example #2

The corresponding PSF procedure to support the IBM 3812-2 printer:

```
//ESF3812 PROC
//STEP01 EXEC PGM=APSPPIEP,REGION=4M
//STEPLIB DD DSN=SYS1.SYS.LOAD,DISP=SHR
//JOBHDR OUTPUT PAGEDEF=A4L8, /* JOB SEPARATOR PAGEDEF */
// FORMDEF=A4,CHARS=GT12 /* JOB SEPARATOR FORMDEF @H3C*/
//JOBTLR OUTPUT PAGEDEF=A4L8, /* JOB SEPARATOR PAGEDEF */
// FORMDEF=A4,CHARS=GT12 /* JOB SEPARATOR FORMDEF @H3C*/
//DSHDR OUTPUT PAGEDEF=A4L8, /* DS SEPARATOR PAGEDEF */
// FORMDEF=A4,CHARS=GT12 /* DS SEPARATOR FORMDEF @H3C*/
//MSGDS OUTPUT PAGEDEF=A4H6, /* MESSAGE DATASET PAGEDEF */
// FORMDEF=A4,CHARS=GT12 /* MESSAGE DATASET FORMDEF @H3C*/
//FONT01 DD DISP=SHR,DSN=SYS1.FONTLIBB
//PSEG01 DD DISP=SHR,DSN=SYS1.PSEGLIB
//OLAY01 DD DISP=SHR,DSN=SYS1.OVERLIB
//PDEF01 DD DISP=SHR,DSN=SYS1.PDEFLIB
//FDEF01 DD DISP=SHR,DSN=SYS1.FDEFLIB
//RSOF01A CNTL
//RSOF01A PRINTDEV FONTDD=*.FONT01, /* FONT LIBRARY DD */
```

```

//          OVLYDD=* .OLAY01,          /* OVERLAY LIBRARY DD          */
//          PSEGDD=* .PSEG01,          /* SEGMENT LIBRARY DD          */
//          PDEFDD=* .PDEF01,          /* PAGEDEF LIBRARY DD          */
//          FDEFDD=* .FDEF01,          /* FORMDEF LIBRARY DD          */
//          JOBHDR=* .JOBHDR,          /* JOB HEADER SEPARATOROUTPUT  */
//          JOBTRLR=* .JOBTRLR,        /* JOB TRAILER SEPARATOROUTPUT */
//          DSHDR=* .DSHDR,            /* DATA SET HEADER SEPARATOR  */
//          MESSAGE=* .MSGDS,          /* MESSAGE DATA SET OUTPUT    */
//          PAGEDEF=A4L8,              /* DEVICE PAGEDEF DEFAULT      */
//          FORMDEF=A4,                 /* DEVICE FORMDEF DEFAULT      @H3C*/
//          CHARS=(GT12,                /* DEVICE                        */
//          GT12,GT12,GT12),           /* DEFAULT FONT SET            */
//          PMSG=YES,                   /* ACCUMULATE DATA SET MESSAGES */
//          TRACE=NO,                   /* CREATE INTERNAL TRACE       @H3C*/
//          FAILURE=WCONNECT,           /* PSF ACTION ON PRINTER FAILURE*/
//          TIMEOUT=REDRIVE,            /* PSF ACTION ON TIMEOUT       */
//          DISCINTV=60,                /* DISCONNECT INTERVAL IN SECOND*/
//          APPLID=ESF3812,              /* VTAM APPLICATION PGM NODE NAM*/
//          LOGMODE=PSF3812,            /* VTAM LOGON MODE TABLE ENTRY */
//          MGMTMODE=IMMED,             /* PRINTER MANAGEMENT MODE     */
//          LUNAME=RSOFT01A             /* VTAM LOGICAL UNIT NAME      */
//RSOFT01A ENDCNTL

```

The ESFFSSM load module must be accessible from an authorized STEPLIB data set.

Setup Example #3

The corresponding SYS1.VTAMLST definitions for the IBM 3812-2 printer:

```

LOCAL380 VBUILD TYPE=LOCAL
RL032745 PU    CUADDR=380,          LOCAL SNA CONTROLLER      -
                DISCNT=NO,          -
                PUTYPE=2,            -
                MODETAB=MODETEST,    -
                SSCPFM=USSSCS,       -
                ISTATUS=ACTIVE,      -
                MAXBFRU=42
RSOFT01A LU    LOCADDR=03,          -
                ISTATUS=ACTIVE,      -
                DLOGMOD=L13268M2,    -
                VPACING=1

```

Setup Example #4

The LOGMODE=PSF3812 used in the PSF procedure:

```

*
*      3812 PSF-SUPPORT
*

PSF3812  MODEENT LOGMODE=PSF3812,FMPROF=X'03',TSPROF=X'03', X
PRIPROT=X'B1',SECPROT=X'B0',COMPROT=X'7080', X
RUSIZES=X'85C7', X
PSERVIC=X'01400001000000001000000', X
PSNDPAC=X'02',SRCVPAC=X'02', X
SSNDPAC=X'00'

```

Advanced Laser Printer Interface

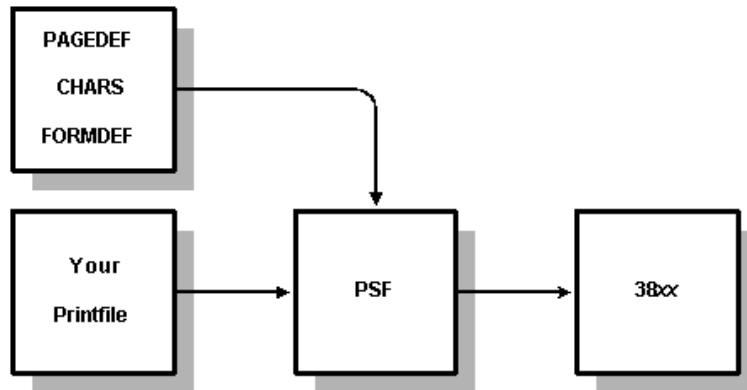
CA Spool provides a general interface to support desktop Laser printers. These are also called personal Laser printers. Sample code is provided for HP-LaserJet and Xerox 4045 printers, and it is possible to use it for other printers.

Protocol Converters

The CA Spool Laser printer interface handles Laser printers connected to an IBM 3274 or 3174 through a protocol converter, to an SNA Gateway, or through TCP/IP. These printers must support a Position cursor absolute command taking X and Y coordinates as parameters, which excludes most matrix printers.

Background

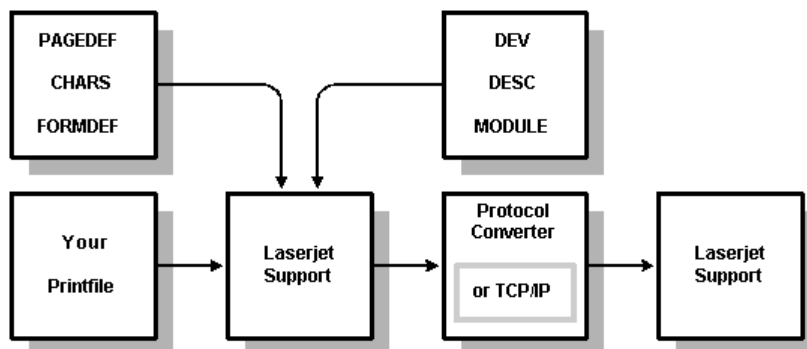
When you create a print file in line format for an AFP printer (IBM 3820 or 3812, for example), you can request formatting by directly specifying the PAGEDEF, FORMDEF, and CHARS parameters, or by using default values. At printing time, PSF creates a formatted data stream using your print file and formatting modules loaded according to your parameters. These modules can be default PSF modules, or installation-written modules.



Procedure

When you create a print file for a Laser printer, use the PAGEDEF and FORMDEF parameters to specify formatting, and the CHARS parameter to specify the fonts.

At printing time, the Advanced Laser interface creates a formatted data stream using your print file and formatting modules loaded from IMAGELIB according to your parameters. These modules could be the samples supplied, or installation-written modules. They are not AFP modules, but they do provide functions similar to some of the functions provided by AFP modules.



If you define PAGEDEFS, FORMDEFS, and CHARS, which specify formatting similar to real AFP definitions, most line mode prints can be handled on printers supported by this interface as well as on AFP printers, and print files can be routed to either type. It is not possible to print formatted composed-text files; only line data files are supported.

Supported Functions

The following lists some examples of supported functions:

- TRC characters are supported.
This makes it possible to print four different fonts controlled by the TRC character. For example, SCRIPT files formatted for the 3800 model 1 using up to four fonts can be printed on printers supported by this interface.
- Multiple copy groups can be defined in each FORMDEF.
The Invoke Medium Map control record in a file can be used to select copy groups.
- Multiple page formats can be defined in each PAGEDEF.
The Invoke Date Map control record in a file can be used to select page formats.
- Multiple print lines can be defined in one PAGEFORMAT or PAGEDEF.
This can be used for multiple printing, such as printing several logical pages on a single physical piece of paper.
- Fields can be defined within a print line.
This allows:
 - Printing different parts of one record at different positions on the paper
 - Printing different parts of one record using different fonts
 - Printing fixed text not present in the file
- Masks to determine whether files must be deleted when the printer has finished using them.
Performance can be improved by keeping modules in storage.

Installing Laser Printer Support

To install Laser printer support

1. Define each printer with the NODE statement in the start-up parameters, as follows:
 - The device type must be XX-xxxxx in the NODE or DEFNODE statements of the CA Spool start-up parameters. The xxxxx can be any characters.
 - Use one device type for each combination of a printer model and a protocol converter model. If the device type is unknown to CA Spool, it must be defined using the DEFNODE statement. For more information, see the DEFNODE section and the NODE section in this chapter.
2. The parameters USEREXIT=LINE or USEREXIT=PAGE must not be specified. If specified, they are not supported.

USEREXIT=FILE and USEREXIT=ASESSION can be used to send data to the printers.
3. Update the module XDEVTYPS, which is supplied in CAI.CBQ4OPTN.

The module contains an entry for each device type.
4. If you updated the XDEVTYPS module, make matching updates in all sample FORMDEF, PAGEDEF, and CHARS modules.
5. Assemble and link the modules.

Note: The job BQ4JXXLS in CAI.CBQ4JCL can be used for this. The data set into which the load-modules are linked can be either SYS1.IMAGELIB, or another load library, which is allocated on an IMAGELIB DD statement in the CA Spool start-up procedure.
6. Restart CA Spool.
7. Run the job XLASDEMO in CAI.CBQ4OPTN.

This job creates a print file in CA Spool. The printer must print two pages of text. When the text directs you to enter one or more CA Spool commands, do so, get the new print from the printer, and continue reading the text in the new copy.
8. Try to print using the PAGEDEFs, FORMDEFs and CHARS supplied as samples.

Troubleshooting

If you experience problems during testing of the LaserJet support, consider the following possible sources of errors:

- The protocol converter parameters might be unsuitable for the Laser printer support.
- In general, the converter must use as few features as possible, since the formatting must be done by the Laser printer support.
- The entry for your device in the XDEVTYPS module might not match the functions in the converter and printer.
- If your protocol converter or printer cannot function as the sample formatting modules were designed, it is probably necessary to change some modules.

Customization

When you have installed and tested the sample formatting modules, additional modules can be created. It is possible to define:

- New formats, using the orientation, line spacing, and offset in the PAGEDEFs. It is good practice to define PAGEDEFs corresponding to already-used FCBs.
- Modules to select fonts located in cartridges in the printer
- Overlays instead of using preprinted forms

If the device type definitions supplied in XDEVTYPS in the samples cannot be used as is, it is necessary to have good working knowledge of how the printer and the protocol converter work to change these definitions. Similarly, defining more complex new definitions as FORMDEFs with overlays, new fonts, and other definitions, which make it necessary to specify a new specific printer command, does require some knowledge of the devices involved.

After the device types are set up to work properly with the devices used, more simple definitions such as PAGEDEFs with a new size or line spacing, can be created without much knowledge of the devices.

Defining Orientation

In general, the orientation is defined as:

PORTRAIT

The horizontal edges of paper are the short ones, and the vertical edges are the long ones. Just like the orientation of the pages in this guide.

LANDSCAPE

When looking at a piece of paper, the horizontal edges are the long ones, and the vertical edges are the short ones.

Explicit Orientations

Each FORMDEF and each PAGEDEF has an orientation explicitly defined, and there are four possible orientations.

In the CA Spool FORMDEFs, the orientation specifies how the paper is fed through the printer. This is independent to how the final print appears.

PORTRAIT

Paper is fed through the printer parallel to its long edges.

LANDSCAPE

Paper is fed through the printer parallel to its short edges.

In the CA Spool PAGEDEFs, the orientation of the printing is specified.

PORTRAIT

Lines are printed parallel to the short edges of the paper.

LANDSCAPE

Lines are printed parallel to the long edges of the paper.

In the interface macros, some parameters start with PP, PL, LP, LL, POPO, POLA, LAPO, or LOLA. This indicates that the parameter applies to a certain combination of orientations from the FORMDEF and PAGEDEF.

Laser Support Modules

The modules described in this guide are not normally exact matches of the modules supplied in CBQ4OPTN. This is because the software modules are much more frequently updated than the guide. Browse through the CBQ4OPTN modules in preference to examining the samples in the guide.

XDEVTYPS

The XDEVTYPS module contains an entry for each device type. Each entry describes a combination of a printer type and a protocol converter type. The XDEVTYPS module also contains masks, which are used to determine if a module must be deleted from storage when no longer needed. The module can also be kept, to save re-loading it the next time it is used.

XDEVTYPS Macros

The following macros are used in the XDEVTYPS module:

\$LPDVP

Names device type for all macro calls until next \$LPDVP macro

\$LPDEV

Describes the characteristics of a device type

\$LPCMS

Defines command skeletons to construct commands which make the printer do certain tasks such as reset the printer, or move the printer's logical cursor. The sequence must be in alphabetic order of the parameters on the \$LPDEV macro call that selected them.

XDEVTYPS Macros Example

The following shows an example of XDEVTYPS macro use:

```
XDEVTYPS  $LPDVP DEVICE=XX-XEROX
          $LPDEV PPYDIR=UP,PLCHNXY=YES,PLCHPOS=TOP,FBOLDN=YES,
          FBOLDF=YES,ABS0=YES,RESET=YES,FontSEL=YES
*          COMMAND FOR ABSOLUTE POSITIONING
          $LPCMS CMDTYPE=TEXT,DATA1='1Ba',TYPE1=C
          $LPCMS CMDTYPE=X
          $LPCMS CMDTYPE=TEXT,DATA1=',',TYPE1=C
          $LPCMS CMDTYPE=Y
          $LPCMS CMDTYPE=TEXT,DATA1="C20D0A",TYPE1=C,
          DATA2='0D0C',TYPE2=X,DATA3=' ',TYPE3=C
          $LPCMS END=YES
*          COMMAND FOR STOP BOLDING
          $LPCMS CMDTYPE=TEXT,DATA1="1Bp",TYPE1=C
          $LPCMS END=YES
*          COMMAND FOR START BOLDING
          $LPCMS CMDTYPE=TEXT,DATA1="1Bb",TYPE1=C
          $LPCMS END=YES
```

```
*          COMMAND FOR SELECTING A FONT NUMERICALLY
$LPCMS CMDTYPE=TEXT,DATA1="1B',TYPE1=C
$LPCMS CMDTYPE=NUM $LPCMS END=YES
*          COMMAND TO RESET PRINTER
$LPCMS CMDTYPE=TEXT,DATA1="1B+X'C20D0A',TYPE1=C,
      DATA2='0D0C',TYPE2=X,DATA3=' ',TYPE3=C
$LPCMS END=YES
$LPDVP DEVICE=XX-HPIDA
$LPDEV POPO=YES,POLA=YES,ABS0=YES,RESET=YES
*          COMMAND FOR ABSOLUTE POSITIONING
$LPCMS CMDTYPE=TEXT,DATA1="1B*p',TYPE1=C
$LPCMS CMDTYPE=X
$LPCMS CMDTYPE=TEXT,DATA1='x',TYPE1=C
$LPCMS CMDTYPE=Y
$LPCMS CMDTYPE=TEXT,DATA1='Y' ',TYPE1=C,
      DATA2='0D0C',TYPE2=X,DATA3=' ',TYPE3=C
$LPCMS END=YES
*          COMMAND FOR FDEF=LAND PDEF=LAND
$LPCMS CMDTYPE=TEXT,DATA1="1B',TYPE1=C,
      DATA2='50',TYPE2=X,DATA3='1100E',TYPE3=C
$LPCMS END=YES
*          COMMAND FOR FDEF=LAND PDEF=PORT
$LPCMS CMDTYPE=TEXT,DATA1="1B',TYPE1=C,
      DATA2='50',TYPE2=X,DATA3='1000E',TYPE3=C
$LPCMS END=YES
*          COMMAND TO RESET PRINTER
$LPCMS CMDTYPE=TEXT,DATA1="1BE',TYPE1=C
$LPCMS END=YES
$LPDVP END=YES
END
```

FORMDEF

A FORMDEF describes the physical paper characteristics, and defines where the logical page must be positioned on the physical paper. It can include commands to generate an overlay instead of using pre-printed forms. Multiple FORMDEFs can be defined within the same module for the same device type. Each is then referred to as a *COPYGROUP*, and can be selected by the Invoke Medium Map control record in a file. FORMDEF modules are named XFxxxx.

FORMDEF Macros

The following macros are used in the XFxxxxxx module:

\$LPDVP

Names the device type for all macro calls until the next \$LPDVP macro.

\$LPFDEF

Specifies the orientation of the paper, and the distance to the PAGEDEF.

\$LPCMS

Defines command skeletons for commands to be executed at file initiation.

These commands can be used to create an overlay.

```
XFA10110 $LPDVP DEVICE=XX-XEROX
          $LPFDEF ACROSS=50,DOWN=50,UP=150,BACK=50
          $LPFDEF END=YES
*
          $LPDVP DEVICE=XX-HPIDA
          $LPFDEF ACROSS=50,DOWN=100,UP=150,BACK=50
          $LPFDEF END=YES
          $LPDVP END=YES
          END
```

XPxxxxxx

The XPxxxxxx module contains a PAGEDEF named xxxxxx. A PAGEDEF defines the size of a logical page, and includes information used to position the data from the files on the logical page. Multiple PAGEDEFs can be defined within the same module for the same device type. Each is then referred to as a *PAGEFORMAT*, and can be selected by the Invoke Data Map control record in a file.

XPxxxxxx Macros

The following macros are used in the XPxxxxxx module:

\$LPDVP

Names the device type for all macro calls until the next \$LPDVP macro.

\$LPPDF

Defines a PAGEDEF or PAGEFORMAT. The logical page size and orientation are specified as parameters.

\$LPPRTL

Creates a print line in the PAGEDEF. A print line defines where on a logical page to print one or more records. A print line includes a channel (if specified by the invoker), a position relative to the PAGEDEF, the distance between lines, and a repeat count. When a request for a channel skip is issued, the print lines within the current PAGEDEF are searched, and the first one containing the requested channel is used to position the data on the PAGEDEF.

\$LPCMS

Defines command skeletons for commands to be executed at file initiation. The command skeletons must be ordered according to the alphabetic order of the parameters on the \$LPPDF macro call which selected them.

```
XPA06462 $LPDVP DEVICE=XX-XEROX
          $LPPDEF ORIENT=PORT,WIDTH=2450,HEIGHT=3200
          $LPPRTL CHAN='1',COUNT=64,ACROSS=0,DOWN=39,
                LINESP=50
          $LPPRTL END=YES
          $LPPDEF END=YES
*
          $LPDVP DEVICE=XX-HPIDA
          $LPPDEF ORIENT=PORT,WIDTH=2450,HEIGHT=3200
          $LPPRTL CHAN='1',COUNT=64,ACROSS=0,DOWN=39,
                LINESP=50
          $LPPRTL END=YES
          $LPPDEF END=YES
          $LPDVP END=YES
          END
```

XCHRxxxx

The XCHRxxxx module contains a font definition named xxxx. For each device type, one or more font elements are present. Each font element is valid for one or more orientations (combinations of orientation in FORMDEF and PAGEDEF). When a font is to be selected or assigned a number, the font elements for the relevant device type are searched until one is found which supports the present orientation.

XCHRxxxx Macros

The following macros are used in the XCHRxxxx module:

\$LPDVP

Names the device type for all macro calls until the next \$LPDVP macro.

\$LPCHAR

Defines a font element, which contains valid orientations, how to select the font, width, height, and baseline position.

\$LPCMS

Defines command skeletons for commands to select a font, or to assign a number to a font.

```

XCHRG12 $LPDVP DEVICE=XX-XEROX
    $LPCHAR SELECT=NUMBER,POPO=YES,LALA=YES,
        CHARSP=25,LINESP=50,BASELIN=11
    $LPCMS CMDTYPE=TEXT,TYPE1=C,DATA1="1B+'
    $LPCMS CMDTYPE=NUM
    $LPCMS CMDTYPE=TEXT,TYPE1=C,DATA1='Titan12iso-P'C20D0A',
        TYPE2=X,DATA2='0D0C',TYPE3=C,DATA3='''
    $LPCMS END=YES
    $LPCHAR SELECT=NUMBER,POLA=YES,LAPO=YES,
        CHARSP=24,LINESP=50,BASELIN=11
    $LPCMS CMDTYPE=TEXT,TYPE1=C,DATA1="1B+'
    $LPCMS CMDTYPE=NUM
    $LPCMS CMDTYPE=TEXT,TYPE1=C,DATA1='XCP12.5iso-L'C20D0A',
        TYPE2=X,DATA2='0D0C',TYPE3=C,DATA3='''
    $LPCMS END=YES
    $LPCHAR END=YES
*
    $LPDVP DEVICE=XX-HPIDA
    $LPCHAR SELECT=DIRECT,POPO=YES,LALA=YES,POLA=YES,LAPO=YES,
        CHARSP=25,LINESP=50,BASELIN=11
    $LPCMS CMDTYPE=TEXT,TYPE1=C,DATA1="1B(s0p12h10v0s0b6T'
    $LPCMS END=YES
    $LPCHAR END=YES
    $LPDVP END=YES
END

```

XUSERxxx Module

XUSERxxx modules can be used to store overlays or fonts permanently in the printer's memory. These modules contain user commands, which can be sent by calling the Laser interface from ESFU006X. For example, see member XXLSUSER in CBQ4OPTN.

XUSERxxx Macros

The following macros are used in the XUSERxxxx module:

\$LPDVP

Names the device type for all macro calls until the next \$LPDVP macro.

\$LPCMS

Defines command skeletons for the commands which are sent.

```
XUSER000 $LPDVP DEVICE=XX-XEROX
          $LPCMS CMDTYPE=TEXT,TYPE1=C,DATA1='DATA FOR HP-IDA'
          $LPCMS END=YES
*
          $LPDVP DEVICE=XX-HPIDX
          $LPCMS CMDTYPE=TEXT,TYPE1=C,DATA1='DATA FOR XX-HPIDX'
          $LPCMS END=YES
*
          $LPCDVP END=YES
```

\$LPCHAR

The \$LPCHAR macro is used to define a font element.

```
$LPCHAR BASELIN=<99 | 11>,
        CHARSP=<99 | 30>,
        END=<YES | NO>,
        FBOLD=<YES | NO>,
        LINESP=<99 | 50>,
        NORMAL='xxx',
        LALA=<YES | NO>,
        LAPO=<YES | NO>,
        POLA=<YES | NO>,
        POPO=YES | NO>,
        SELECT=<DIRECT | NUMBER >
```

&LPCHAR Parameters

This section defines the &LPCHAR parameters.

BASELIN

This parameter specifies the baseline distance from the bottom. For most printers, the text is written with the baseline in the current position. The default value is 11.

CHARSP= 99|30

This parameter specifies the distance the logical cursor is moved to the right when a character is printed. The default value is 30.

END=YES|NO

This parameter indicates the end of a chain of font elements, as follows:

- YES—If END=YES is specified, this must be the only parameter specified.
- NO—(Default) This is a normal invocation of the macro.

FBOLD=YES|NO

This parameter indicates whether the font is bold:

- YES—This font is bold, but not a true bold font. In reality, another font is selected and the printer is switched into bold mode.

Note: If FBOLD=YES is specified, the NORMAL parameter must be specified as well.

- NO—(Default) This is not a false bold font.

LINESP=99|50

This parameter specifies the height of the font. The default value is 50.

NORMAL='xxxx'

If FBOLD=YES is specified, the NORMAL parameter must also be specified. It names the normal font to be selected at the same time as bold is turned on.

LALA=YES|NO

This parameter specifies a valid orientation:

- YES—This font element is valid for FORMDEF orientation landscape and PAGEDEF orientation landscape.
- NO—(Default) This font element is not valid for FORMDEF orientation landscape and PAGEDEF orientation landscape.

LAPO=YES|NO

This parameter specifies a valid orientation:

- YES—This font element is valid for FORMDEF orientation landscape and PAGEDEF orientation portrait.
- NO—(Default) This font element is not valid for FORMDEF orientation landscape and PAGEDEF orientation portrait.

POLA=YES|NO

This parameter specifies a valid orientation:

- YES—This font element is valid for FORMDEF orientation portrait and PAGEDEF orientation landscape.
- NO—(Default) This font element is not valid for FORMDEF orientation portrait and PAGEDEF orientation landscape.

POPO=YES|NO

This parameter specifies a valid orientation:

- YES—This font element is valid for FORMDEF orientation portrait and PAGEDEF orientation portrait.
- NO—(Default) This font element is not valid for FORMDEF orientation portrait and PAGEDEF orientation portrait.

SELECT=NUMBER|DIRECT

This parameter specifies how a font is selected:

- NUMBER—(Default) This font is selected by a number. Later in the present XCHRxxxx, a command skeleton to assign a number to this font must be coded.
- DIRECT—This font is selected directly by a command. Later in the present XCHRxxxx, a command skeleton to select this font must be coded.

\$LPCMS

The \$LPCMS macro is used to define a command skeleton element. One command skeleton is composed of a number of skeleton elements. An invocation of \$LPCMS with END=YES must be done after the last skeleton element. A command skeleton can be made up of fixed text alone, or fixed text mixed with variable data (to be inserted by the Laser interface).

An example of a fixed text only skeleton is the RESET command in the XDEVTYPE module. An example of a mixed skeleton is the ABSOLUTE POSITIONING command in the XDEVTPS module. It has the two coordinates as variables.

```
$LPCMS BREAK=<YES | NO>,
  CMDTYPE=<TEXT>,
    <NUM          >
    <X            >
    <Y            >
  DATA1='data1',
  DATA2='data2',
  DATA3='data3',
  DATA4='data4',
  DATA5='data5',
  DIV=<99 | 1>,
  END=<YES | NO>,
  DIV=<99 | 1>,
  TYPE1=<C | X>,
  TYPE2=<C | X>,
  TYPE3=<C | X>,
  TYPE4=<C | X>,
  TYPE5=<C | X>
```

\$LPCMS Parameters

This section describes the &LPCMS parameters.

CMDTYPE=TEXT|NUM|X|Y

The parameter effects are:

- **TEXT**—(Default) Specifies text which is part of the element. At least one of the **DATAn** and **TYPE_n** pairs must be specified.
- **NUM**—Specifies a variable numeric, which is inserted by the Laser interface.
- **X**—Specifies a variable X value, which is inserted by the Laser interface.
- **Y**—Specifies a variable Y value, which is inserted by the Laser interface.

DATAn

This parameter is the data part of the DC statement. Together with **TYPE_n**, this parameter results in a DC statement, which is part of a **TEXT** type skeleton element. Quotes must be included. The default value is **NONE**.

DIV=99|1

If the units used for the numeric in this skeleton element are different from the units used for this device in general (sizes, offsets, spacing, and so on), the number inserted as a result of this skeleton element is multiplied by the value specified in the MULT parameter, and the result is divided by the value specified in this parameter.

This parameter is used only if CMDTYPE was specified as NUM, X, or Y.

The default value is 1.

END=YES|NO

The parameter effects are:

- YES—Ends the skeleton of this command. If END=YES is specified this must be the only parameter
- NO—(Default) This is a normal invocation of the macro.

KEEP=ON|OFF|NO

The parameter effects are:

- ON—Marks the start of a block, which the interface must keep within the same VTAM buffer if possible.
- OFF—Marks the end of a block, which the interface must keep within the same VTAM buffer if possible. If a block is bigger than 256 bytes, the interface might be unable to keep the data within one VTAM buffer.
- NO—(Default) Used for middle skeleton elements.

MULT

If the units used for the numeric in this skeleton element are different from the units used for this device in general (sizes, offsets, spacing, and so on), the number inserted as a result of this skeleton element is multiplied by the value specified in this parameter, and the result is divided by the value specified in the DIV parameter.

This parameter is used only if CMDTYPE is specified as NUM, X, or Y.

TYPE n

Together with DATA n this parameter results in a DC statement, which is part of a TEXT type skeleton element. This parameter is the type used in the DC statement.

\$LPDC

The \$LPDC macro is used to include data in the laser interface. It works with other macros.

When a macro needs to include some data, it can be specified in one or more \$LPDC statements instead of being a parameter in the first macro.

```
$LPDC TYPE=X/C,
      TEXT='text'
```

\$LPDEV

The \$LPDEV macro is used to describe a device type in the XDEVTYPS module.

```
$LPDEV ABSO=<YES | NO>,
      CHARS=xxxx,
      FBOLDF=<YES | NO>,
      FBOLDN=<YES | NO>,
      FDEF=xxxxxx,
      FONTSEL=<YES | NO>,
      LALA=<YES | NO>,
      LAPO=<YES | NO>,
      LLCHNX=<YES | NO>,
      LLCHPOS=<BASELINE>,
          <TOP>
          <BOTTOM>
      LLXDIR=<LEFT | RIGHT>,
      LLXORG=<PAPER | MARGIN>,
      LLYDIR=<UP | DOWN>,
      LLYORG=<PAPER | MARGIN>,
      LPCHNX=<YES | NO>,
      LPCHPOS=<BASELINE>,
          <TOP>
          <BOTTOM>
      LPXDIR=<LEFT | RIGHT>,
      LPXORG=<PAPER | MARGIN>,
      LPYDIR=<UP | DOWN>,
      LPYORG=<PAPER | MARGIN>,
      PDEF=xxxxxx,
      PLCHNX=<YES | NO>,
      PLCHPOS=<BASELINE>,
          <TOP>
          <BOTTOM>
```

```

PLXDIR=<LEFT | RIGHT>,
PLXORG=<PAPER | MARGIN>,
PLYDIR=<UP | DOWN>,
PLYORG=<PAPER | MARGIN>,
POLA=<YES | NO>,
POPO=<YES | NO>,
PPCHNXY=<YES | NO>,
PPCHPOS=<BASELINE>,
        <TOP>
        <BOTTOM>
PPXDIR=<LEFT | RIGHT>,
PPXORG=<PAPER | MARGIN>,
PPYDIR=<UP | DOWN>,
PPYORG=<PAPER | MARGIN>,
RESET=<YES | NO>,
SPACE11=<99 | 30>,      X
SPACE12=<99 | 25>,      X
SPACE13=<99 | 20>

```

\$LPDEV Parameters

This section describes the &LPDEV parameters.

ABSO=NO|YES

The parameter effects are:

- NO—No absolute positioning command skeleton present.
- YES—(Default) Command skeleton for absolute positioning is present for device type. Yes must always be specified or defaulted.

CHARS

This parameter names the default font for this device type. The default is GT12.

FBOLDF=YES|NO

The parameter effects are:

- YES—Command skeleton to end bold mode on the printer present.
- NO—(Default) No command skeleton to end bold mode on the printer present.

FBOLDN=YES|NO

The parameter effects are:

- YES—A command skeleton to start bold mode on the printer is present.
- NO—(Default) No command skeleton to start bold mode on the printer is present.

FDEF

This parameter names the default FORMDEF for this device type. The default is A10110.

FONTSEL=YES|NO

The parameter effects are:

- YES—A command skeleton to select fonts by an assigned number is present.
- NO—(Default) No command skeleton to select fonts by an assigned number is present.

LALA=YES|NO

This parameter specifies a valid orientation:

- YES—A command skeleton to be used at file initiation for FORMDEF orientation landscape and PAGEDEF orientation landscape is present.
- NO—(Default) No command skeleton to be used at file initiation for FORMDEF orientation landscape and PAGEDEF orientation landscape is present.

LAPO=YES|NO

This parameter specifies a valid orientation:

- YES—Command skeleton to be used at file initiation for FORMDEF orientation landscape and PAGEDEF orientation portrait present.
- NO—(Default) No command skeleton to be used at file initiation for FORMDEF orientation landscape and PAGEDEF orientation portrait is present.

LLCHNXY=YES|NO

The parameter effects are:

- YES—The X and Y parameters have changed places in the position absolute command for this device type for FORMDEF orientation landscape and PAGEDEF orientation landscape.
- NO—(Default) The X and Y parameters are in their normal places in the position absolute command for this device type for FORMDEF orientation landscape and PAGEDEF orientation landscape.

LLCHPOS=BASELINE|BOTTOM|TOP

The parameter effects are:

- **BASELINE**—(Default) Characters are written with the baseline from the logical cursor position for FORMDEF orientation landscape and PAGEDEF orientation landscape.
- **BOTTOM**—Characters are written with the bottom of the character from the logical cursor position for FORMDEF orientation landscape and PAGEDEF orientation landscape.
- **TOP**—Characters are written with the top of the character from the logical cursor position for FORMDEF orientation landscape and PAGEDEF orientation landscape.

LLXDIR=LEFT|RIGHT

The parameter effects are:

- **LEFT**—When positioning the logical cursor, the X-values increase when going left for FORMDEF orientation landscape and PAGEDEF orientation landscape.
- **RIGHT**—(Default) When positioning the logical cursor, the X-values increase when going right for FORMDEF orientation landscape and PAGEDEF orientation landscape.

LLXORG=PAPER|MARGIN

The parameter effects are:

- **PAPER**—(Default) When positioning the logical cursor, the X-values are counted from the edge of the paper for FORMDEF orientation landscape and PAGEDEF orientation landscape.
- **MARGIN**—When positioning the logical cursor, the X-values are counted from a margin set by an initial command (PAGEDEF would be appropriate) for FORMDEF orientation landscape and PAGEDEF orientation landscape.

LLYDIR=UP|DOWN

The parameter effects are:

- **UP**—When positioning the logical cursor, the Y-values increase when going UP for FORMDEF orientation landscape and PAGEDEF orientation landscape.
- **DOWN**—(Default) When positioning the logical cursor, the Y-values increase when going DOWN for FORMDEF orientation landscape and PAGEDEF orientation landscape.

LLYORG=PAPER|MARGIN

The parameter effects are:

- **PAPER**—(Default) When positioning the logical cursor, the Y-values are counted from the edge of the paper for FORMDEF orientation landscape and PAGEDEF orientation landscape.
- **MARGIN**—When positioning the logical cursor, the Y-values are counted from a margin set by an initial command (PAGEDEF would be appropriate) for FORMDEF orientation landscape and PAGEDEF orientation landscape.

LPCHNXY=YES|NO

The parameter effects are:

- **YES**—The X and Y parameters have changed places in the position absolute command for this device type for FORMDEF orientation landscape and PAGEDEF orientation portrait.
- **NO**—(Default) The X and Y parameters are in their normal places in the position absolute command for this device type for FORMDEF orientation landscape and PAGEDEF orientation portrait.

LPCHPOS=BASELINE|BOTTOM|TOP

The parameter effects are:

- **BASELINE**—(Default) Characters are written with the baseline from the logical cursor position for FORMDEF orientation landscape and PAGEDEF orientation portrait.
- **BOTTOM**—Characters are written with the bottom of the character from the logical cursor position for FORMDEF orientation landscape and PAGEDEF orientation portrait.
- **TOP**—Characters are written with the top of the character from the logical cursor position for FORMDEF orientation landscape and PAGEDEF orientation portrait.

LPXDIR=LEFT|RIGHT

The parameter effects are:

- **LEFT**—When positioning the logical cursor, the X-values increase when going left for FORMDEF orientation landscape and PAGEDEF orientation portrait.
- **RIGHT**—(Default) When positioning the logical cursor, the X-values increase when going right for FORMDEF orientation landscape and PAGEDEF orientation portrait.

LPXORG=PAPER|MARGIN

The parameter effects are:

- PAPER—(Default) When positioning the logical cursor, the X-values are counted from the edge of the paper for FORMDEF orientation landscape and PAGEDEF orientation portrait.
- MARGIN—When positioning the logical cursor, the X-values are counted from a margin set by an initial command (PAGEDEF would be appropriate) for FORMDEF orientation landscape and PAGEDEF orientation portrait.

LPYDIR=UP|DOWN

The parameter effects are:

- UP—When positioning the logical cursor, the Y-values increase when going UP for FORMDEF orientation landscape and PAGEDEF orientation portrait.
- DOWN—(Default) When positioning the logical cursor, the Y-values increase when going DOWN for FORMDEF orientation landscape and PAGEDEF orientation portrait.

LPYORG=PAPER|MARGIN

- PAPER—(Default) When positioning the logical cursor, the Y-values are counted from the edge of the paper for FORMDEF orientation landscape and PAGEDEF orientation portrait.
- MARGIN—When positioning the logical cursor, the Y-values are counted from a margin set by an initial command (PAGEDEF would be appropriate) for FORMDEF orientation landscape and PAGEDEF orientation portrait.

PDEF

Names the default PAGEDEF for this device type. The default is A06462.

PLCHNXY=YES|NO

The parameter effects are:

- YES—The X and Y parameters have changed places in the position absolute command for this device type for FORMDEF orientation portrait and PAGEDEF orientation landscape.
- NO—(Default) The X and Y parameters are in their normal places in the position absolute command for this device type for FORMDEF orientation portrait and PAGEDEF orientation landscape.

PLCHPOS=BASELINE|BOTTOM|TOP

The parameter effects are:

- **BASELINE**—(Default) Characters are written with the baseline from the logical cursor position for FORMDEF orientation portrait and PAGEDEF orientation landscape.
- **BOTTOM**—Characters are written with the bottom of the character from the logical cursor position for FORMDEF orientation portrait and PAGEDEF orientation landscape.
- **TOP**—Characters are written with the top of the character from the logical cursor position for FORMDEF orientation portrait and PAGEDEF orientation landscape.

PLXDIR=LEFT|RIGHT

The parameter effects are:

- **LEFT**—When positioning the logical cursor, the X-values increase when going left for FORMDEF orientation portrait and PAGEDEF orientation landscape.
- **RIGHT**—(Default) When positioning the logical cursor, the X-values increase when going right for FORMDEF orientation portrait and PAGEDEF orientation landscape.

PLXORG=PAPER|MARGIN

The parameter effects are:

- **PAPER**—(Default) When positioning the logical cursor, the X-values are counted from the edge of the paper for FORMDEF orientation portrait and PAGEDEF orientation landscape.
- **MARGIN**—When positioning the logical cursor, the X-values are counted from a margin set by an initial command (PAGEDEF would be appropriate) for FORMDEF orientation portrait and PAGEDEF orientation landscape.

PLYDIR=UP|DOWN

The parameter effects are:

- **UP**—When positioning the logical cursor, the Y-values increase when going UP for FORMDEF orientation landscape and PAGEDEF orientation landscape.
- **DOWN**—(Default) When positioning the logical cursor, the Y-values increase when going DOWN for FORMDEF orientation portrait and PAGEDEF orientation landscape.

PLYORG=PAPER|MARGIN

The parameter effects are:

- PAPER—(Default) When positioning the logical cursor, the Y-values are counted from the edge of the paper for FORMDEF orientation portrait and PAGEDEF orientation landscape.
- MARGIN—When positioning the logical cursor, the Y-values are counted from a margin set by an initial command (PAGEDEF would be appropriate) for FORMDEF orientation portrait and PAGEDEF orientation landscape.

POLA=YES|NO

The parameter effects are:

- YES—A command skeleton to be used at file initiation for FORMDEF orientation portrait and PAGEDEF orientation landscape is present.
- NO—(Default) No command skeleton to be used at file initiation for FORMDEF orientation portrait and PAGEDEF orientation landscape is present.

POPO=YES|NO

The parameter effects are:

- YES—A command skeleton to be used at file initiation for FORMDEF orientation portrait and PAGEDEF orientation portrait is present.
- NO—(Default) No command skeleton to be used at file initiation for FORMDEF orientation portrait and PAGEDEF orientation portrait is present.

PPCHNXY=YES|NO

The parameter effects are:

- YES—The X and Y parameters have changed places in the position absolute command for FORMDEF orientation portrait and PAGEDEF orientation portrait.
- NO—(Default) The X and Y parameters are in their normal places in the position absolute command for FORMDEF orientation portrait and PAGEDEF orientation portrait.

PPCHPOS=BASELINE|BOTTOM|TOP

The parameter effects are:

- BASELINE—(Default) Characters are written with the baseline from the logical cursor position for FORMDEF orientation portrait and PAGEDEF orientation portrait.
- BOTTOM—Characters are written with the bottom of the character from the logical cursor position for FORMDEF orientation portrait and PAGEDEF orientation portrait.
- TOP—Characters are written with the top of the character from the logical cursor position for FORMDEF orientation portrait and PAGEDEF orientation portrait.

PPXDIR=LEFT|RIGHT

The parameter effects are:

- **LEFT**—When positioning the logical cursor, the X-values increase when going left for FORMDEF orientation portrait and PAGEDEF orientation portrait.
- **RIGHT**—(Default) When positioning the logical cursor, the X-values increase when going right for FORMDEF orientation portrait and PAGEDEF orientation portrait.

PPXORG=PAPER|MARGIN

The parameter effects are:

- **PAPER**—(Default) When positioning the logical cursor, the X-values are counted from the edge of the paper for FORMDEF orientation portrait and PAGEDEF orientation portrait.
- **MARGIN**—Logical cursor X-values are counted from margin set by initial command (for example, PAGEDEF) for FORMDEF orientation portrait and PAGEDEF orientation portrait.

PPYDIR=UP|DOWN

The parameter effects are:

- **UP**—When positioning the logical cursor, the Y-values increase when going UP for FORMDEF orientation portrait and PAGEDEF orientation portrait.
- **DOWN**—(Default) Logical cursor Y-values increase DOWN for FORMDEF orientation portrait and PAGEDEF orientation portrait.

PPYORG

The parameter effects are:

- **PAPER**—(Default) When positioning the logical cursor, the Y-values are counted from the edge of the paper for FORMDEF orientation portrait and PAGEDEF orientation portrait.
- **MARGIN**—When positioning the logical cursor, the Y-values are counted from a margin set by an initial command (PAGEDEF would be appropriate) for FORMDEF orientation portrait and PAGEDEF orientation portrait.

RESET=YES|NO

The parameter effects are:

- **YES**—(Default) A command skeleton to reset the printer is present. Yes must always be specified or defaulted.
- **NO**—No command skeleton to reset the printer is present.

SPACE11

This parameter specifies the width of special space X'11'. The default value is 30.

SPACE12

This parameter specifies the width of special space X'12'. The default value is 25.

SPACE13

This parameter specifies the width of special space X'13'. The default value is 20.

\$LPDVP

The \$LPDVP macro is used in all modules to name the device types, and to separate data for each device type.

In the XDEVTPS module, the \$LPDVP macro is also used to specify a select mask and a reject mask for each of the four types of modules:

- Device Type
- FORMDEF
- PAGEDEF
- Font

If a mask contains an * (asterisk) in any position, the letter in the same position of the module name is defined to be a match without regard to its value. Otherwise, the characters in the mask must be equal to the characters in the same position in the module name to match.

When the use-count of a module reaches zero (that is, no printer is using it), the name of the module is compared to the appropriate select mask from the last time the XDEVTPS module was loaded.

If the name does not match, the module is kept in storage. If the name does match, it is now compared to the reject mask. If there is a match, the module is kept in storage; if not, it is deleted.

```
$LPDVP CBPRINT=<GEN | NOGEN>,  
      CHR1= <'xxxxxxx'>  
           <'XCHR****'>  
      CHR2= <'xxxxxxx'>  
           <'XCHR****'>  
      DEVICE= XX-xxxxx,  
      DEVM1= <'xxxxxxx'>  
           <'XD*****'>
```

```

DEVM2= <'xxxxxxxx'>
        <'XD.....'>
END=    <YES | NO>,
DFM1=  <'xxxxxxxx'>
        <'XF*****'>
DFM2=  <'xxxxxxxx'>
        <'XF.....'>
PDFM1= <'xxxxxxxx'>
        <'XP*****'>
PDFM2= <'xxxxxxxx'>
        <'XP.....'>

```

§LPDVP Parameters

This section describes the &LPDVP parameters.

CBPRINT=GEN|NOGEN

The parameter effects are:

- GEN—(Default) Macro expansion is printed in the assembler listing.
- NOGEN—Macro expansion is not printed in the assembler listing.

CHRM1=xxxxxxxx

This parameter selects a mask for font modules. The default value is XCHR****

CHRM2=xxxxxxxx

This parameter rejects a mask for font modules. The default value is XCH...

DEVICE =xxxxxxxx

This parameter provides a device type name. There is no default value.

DEVM1=xxxxxxxx

This parameter selects a mask for device type modules. The default value is XCHR****.

DEVM2=xxxxxxxx

This parameter rejects a mask for device type modules. The default value is XD...

END=YES|NO

The parameter effects are:

- YES—Ends this module. If END=YES is specified, this must be the only parameter specified.
- NO—(Default) This is a normal invocation of the macro.

FDFM1

The parameter effect is to select a mask for FORMDEF modules. The default value is XF****.

FDFM2

The parameter effect is to reject a mask for FORMDEF modules. The default value is XF....

PDFM1

The parameter effect is to select a mask for PAGEDEF modules. The default value is XP****.

PDFM2

The parameter effect is to reject a mask for PAGEDEF modules. The default value is XP....

\$LPFDEF

The \$LPFDEF macro is used in the FORMDEF modules to describe the FORMDEF or COPYGROUP for each device type.

The four offsets (ACROSS, BACK, DOWN, and UP) are used in the position absolute command, if the appropriate xxORG on the \$LPDEV was specified as PAPER. Two of the offsets are used in the calculations for a position command. The offsets are determined by how the position absolute command of the printer must be used for the present orientation.

```
$LPFDEF ACROSS=<999 | 300>,  
        BACK=<999 | 300>,  
        CMD=<YES | NO>,  
        DOWN=<999 | 300>,  
        NAME=<xxxxxxxx | formdefname>,  
        END=<YES | NO>,  
        ORIENT=<PORT | LAND>,  
        UP=<999 | 300 >
```

\$LPFDEF Parameters

This section describes the &LPFDEF parameters.

ACROSS=999|300

This parameter is the offset to the PAGEDEF. The default value is 300.

BACK=999|300

This parameter is the offset to the PAGEDEF. The default value is 300.

CMD=YES|NO

The parameter effects are:

- YES—A command skeleton is present to be used at file initiation.
- NO—(Default) No command skeleton is present to be used at file initiation.

DOWN=999|300

The parameter is the offset to the PAGEDEF. The default value is 300.

END=YES|NO|NAME

The parameter effects are:

- YES—Ends this chain of FORMDEFs for this device type. If END=YES is specified, this must be the only parameter specified.
- NO—(Default) This is a normal invocation of the macro.
- NAME=xxxxxxx|formdef

This parameter selects a COPYGROUP with an Invoke Medium Map control record. The default value is FORMDEF name

ORIENT=PORT|LAND

The parameter effects are:

- PORT—(Default) Orientation for this FORMDEF for the device type is portrait.
- LAND—Orientation for this FORMDEF for the device type is landscape.

UP=999|300

This parameter specifies the offset to the PAGEDEF. The default value is 300.

\$LPFIELD

The \$LPFIELD macro is used to specify different processing of fields within one record. These fields can be placed in different positions, or they can be printed in different fonts. A field can also be fixed text instead of data from the file.

```
$LPFIELD ACROSS=<999 | 0>,
          DOWN=<999 | 300>,
          FONT=<xxxxxxxx>,
          LENGTH=<99 | 1>,
          START=<99 | 1>,
          TEXT=YES/NO
```

\$LPFIELD Parameters

This section describes the &LPFIELD parameters.

ACROSS=999|0

This parameter specifies the offset from the current print line position on the logical page. The default value is 0.

DOWN=999|300

This parameter specifies the offset from the current print line position on the logical page.

FONT=xxxxxxx

This parameter specifies the name of the font in which the field is printed. This parameter does not have a default value.

LENGTH=99|1

This parameter specifies the length of the field. If TEXT is specified, LENGTH must not be specified. The default value is 1.

START=99|1

This parameter specifies the position in the record where the field starts. Control characters and TRC characters are *not* included in the count. If TEXT is specified, START must not be specified. The default value is 1.

TEXT=YES|NO

The fixed text is defined immediately after \$LPFIELD, using ordinary assembly language DC instructions. Valid values are:

- YES—Means that this field contains fixed text. The text is contained in one or more \$LPDC macros following this one. START or LENGTH must not be specified.
- NO—(Default) Means that this field does not contain fixed text.

\$LPPDEF

The \$LPPDEF macro is used in the PAGEDEF modules to specify a PAGEDEF or PAGEFORMAT for a device type.

```
$LPPDEF END=<YES | NO>,
        FONT1=<'xxxx' | ' ' >
        FONT2=<'xxxx' | ' ' >
        FONT3=<'xxxx' | ' ' >
        FONT4=<'xxxx' | ' ' >
        HEIGHT=<9999 | 1>,
        LAND=<YES | NO>,
        NAME=<xxxx | pagedefname>,
        ORIENT=<PORT | LAND>,
        PORT=<YES | NO>,
        WIDTH=<9999 | 1 >
```

\$LPPDEF Parameters

This section describes the &LPPDEF parameters.

END=YES|NO

The parameter effects are:

- YES—Ends this chain of PAGEDEFs for this device type. If END=YES is specified, this must be the only parameter specified.
- NO—(Default) This is a normal invocation of the macro.

FONTn

This parameter specifies the font to be used for this PAGEDEF. See the selection hierarchies below. The default value is SPACES.

HEIGHT=9999|1

This parameter specifies the height of PAGEDEF for device type. The default value is 1.

LAND=YES|NO

The parameter effects are:

- YES—A command skeleton is to be used at file initiation, if FORMDEF orientation is landscape, is present.
- NO—(Default) No command skeleton is to be used at file initiation, if FORMDEF orientation is landscape, is present.

NAME

This parameter selects a PAGEFORMAT in an Invoke Data Map control record. The default value is PAGEDEF Name.

ORIENT=PORT|LAND

The parameter effects are:

- PORT—(Default) Orientation for this PAGEDEF for the device type is portrait.
- LAND—Orientation for this PAGEDEF for the device type is landscape.

PORT=YES|NO

The parameter effects are:

- YES—A command skeleton to be used at file initiation, if FORMDEF orientation is portrait, is present.
- NO—(Default) No command skeleton to be used at file initiation, if FORMDEF orientation is portrait, is present.

WIDTH=9999|1

This parameter specifies the width of PAGEDEF for device type. The default value is 1.

\$LPPRTL

The \$LPPRTL macro is used to define print lines in the PAGEDEF modules. These are used to determine where to print the lines, and how many lines to be printed on each page. A chain of print lines can be defined for one PAGEDEF for one device type.

```
$LPPRTL ACROSS=<999 | 300>,
        CHAN=<'x' | ' ' >
        COUNT=<999 | 40 >
        DOWN=<999 | 300 >
        END=<YES | NO >
        FONT=<'xxxx' | ' ' >,>,
        LINESP=<99 | 50 >
```

\$LPPRTL Parameters

This section describes the &LPPRIL parameters.

ACROSS=999|300

This parameter specifies a position relative to the PAGEDEF for the first line in this print line. The default value is 300.

CHAN='x'|' '

This parameter specifies a channel to be used when a skip to channel is to be performed. The default value is SPACE.

COUNT=999|40

This parameter specifies the number of records from the file, which can be printed within this print line definition.

DOWN=99|300

This parameter specifies a position relative to the PAGEDEF for the first line in this print line.

END=YES|NO

The parameter effects are:

- YES—Ends this chain of print lines. If END=YES is specified, this must be the only parameter specified.
- NO—(Default) This is a normal invocation of the macro.

FONT='xxx'|' '

This parameter specifies a font to be used for this print line. See selection hierarchies below. The default value is SPACES.

LINESP=99|50

This parameter specifies a vertical spacing done between lines in this print line. This parameter does not have a default value. If LINESP=0 is specified, CA Spool does not add any Printer Control Language commands to the file that is being processed. This allows files that have embedded Printer Control Language commands to print based on user-supplied commands and not under the control of CA Spool added commands.

\$LPUNIT

The \$LPUNIT macro is used to specify the offsets, spacing, and sizes in units different to those used on the printer.

```
$LPUNIT MULT=<99 | 1>,
          DIV=<99 | 1 >
```

&LPUNIT Parameters

This section describes the &LPUNIT parameters.

MULT=99|1

All the offsets, spacing, and sizes are multiplied by this parameter and divided by the DIV parameter at assembly time. The default value is 1.

DIV=99|1

All the offsets, spacing, and sizes are multiplied by the MULT parameter and divided by this parameter at assembly time. The default value is 1.

Invoke Medium Map

The Invoke Medium Map control record can be used to select a COPYGROUP in the current FORMDEF. A COPYGROUP can be thought of as a sub-FORMDEF. This command switches between multiple COPYGROUPs in a single FORMDEF. The format of the Invoke Medium Map control record is:

Length	Value	Description
1	X'5A'	Start of control records.
2	X'0010'	Control record length.
3	X'D3ABCC'	Identifies control record type as Invoke Medium Map.
1	X'00'	Reserved.
2		Assigns a sequence number. Not used by CA Spool.
8		COPYGROUP name; left justified and padded with spaces.

Invoke Data Map

The Invoke Data Map control record can be used to select a PAGEFORMAT in the current PAGEDEF. A PAGEFORMAT can be thought of as a sub-PAGEDEF. This command switches between multiple PAGEFORMATs in a single FORMDEF.

The format of the Invoke Data Map control record is:

Length	Value	Description
1	X'5A'	Start of control records.
2	X'0010'	Control record length.
3	X'D3ABCA'	Identifies control record type as Invoke Data Map.
1	X'00'	Reserved.
2		Assigns a sequence number. Not used by CA Spool.
8		PAGEFORMAT name; left justified, padded with spaces.

Selection Hierarchies

The hierarchy for selecting the FORMDEF to use is:

1. File definition.
2. Device type default. (\$LPDEV)

The hierarchy for selecting which PAGEDEF to use is:

1. File definition
2. File definition FCB value

The hierarchy for selecting which fonts to use is:

1. Print line fonts (\$LPPRTL)
2. Pagedef fonts (\$LPPDEF)
3. File definition
4. Device type default (\$LPDEV)

IDEX SNA-P 3270 Program Version 01.12

This describes one of the protocol converters used during development of the samples. Some of the options set are:

- CI—(10 characters per inch)
- CL—(132 characters per line)
- LI—(6 lines per inch)
- LP—(0)
- 9—(Emulate 3287)
- 12—(Trigger is set to 79, but could have been any printable character, as long as it matches HDEVTYPS)
- 13—(Trigger output is 00)
- 14—(Debug is yes)
- 16—(Transparent IBM)
- 17—(Output optimization is on)
- 18—(Suppress off)
- 19—(Buffer size 0, which is AUTO)
- 20—(FF after hardcopy is on)

The pseudo-bold in the device driver *must be* disabled.

Troubleshooting

If you encounter problems, consider the following:

- CL—If the logical line length is exceeded, the protocol converter sends CR and LF to the printer. This happens if printer escape sequences and data exceed the CL value.
- LP—If the logical page length is exceeded, the protocol converter sends FF. This can happen if printer escape sequences and print data exceed the PL value.
- Output optimization does not cause problems with the samples, but try to disable if you create your own formatting modules and experience problems.
- Pseudo-bold must be disabled. In version 01.12 it must be disabled in the device driver, but in newer versions it can be disabled by option 37.

IDA LaserJet 3270 Version 18.040* Microcode Version 1.3 APL

This describes one of the protocol converters used during development of the samples. The protocol converter is a built-in type. Some of the options set are:

Option	Setting	Option	Setting
1	4. Buffer size is 3440 characters.	30	0.
2	6 lines per inch.	31	0.
3	10 characters per inch.	32	0.
4	1. Single spacing.	33	0.
5	130 lines per page.	34	1.
6	132 characters per line.	35	0. No form-feed (line count)
7	1. Dual case.	36	0.
9	0.	37	1.
10	0.	38	1.
11	1.	39	0.
12	1.	44	0. Do not suppress.
13	0.	46	12.
14	0.	47	1. ESC xx sent as X'xx'.
25	0. No form-feed before local copy.	48	3D. Escape code is 3D (79 EBCDIC)
26	1. Form-feed after local copy.	49	0.
28	0.	50	0.

Option	Setting	Option	Setting
29	0.		

Sample Modules

The following provides a description of the samples supplied with the Laser support.

The XDEVTPS module:

- XX-XEROX—A XEROX 4045 printer connected through an IDEX SNA-P 3270 protocol converter.
- XX-HPIDA—HP LaserJet Series II printer connected through an IDA 3270 protocol converter.
- XX-HPLU1—HP LaserJet printer connected through an SNA LU1 Gateway using SCS Transparency.
- XX-HPTCP—HP LaserJet printer connected through TCP/IP.

Formdef	Description	Overlay
A10110	Standard FORMDEF.	No
DEMO	Special demo FORMDEF.	Yes

The following table lists the PAGEDEFs and related characteristics:

Pagedef	Orientation	Width 0.003"	Height 0.003"	Count	Across 0.003"	Down 0.003"	LPI
A06462	Portrait	2450	3200	64	0	39	6.0
A08682	Portrait	2450	3200	86	0	31	8.3
DEMO	Portrait	2100	2000	40	0	39	6.0
V04863	Landscape	3200	2382	48	0	39	6.2
V06483	Landscape	3200	2382	64	0	33	8.3
V06683	Landscape	3200	2382	66	280	33	8.6
W12883	Landscape	3200	2382	64	0	31	8.3
				64	1601	31	8.3

The following table shows font information:

Font	Pitch	Description	XX-XEROX	XX-HPIDA
CB10	10	Bold	No	Yes
CB12	10	Bold	Yes	Yes
CI10	10	Italic	No	Yes
CI12	12	Italic	No	Yes
CR10	10	Normal	No	Yes
CR12	12	Normal	Yes	Yes
GB10	10	Bold	No	Yes
GB12	12	Bold	Yes	Yes
GI10	10	Italic	No	Yes
GI12	12	Italic	No	Yes
GT10	10	Normal	No	Yes
GT12	12	Normal	Yes	Yes
GT16	16	Normal	No	Yes

GDDM ADMOPUJ Interface

This section describes the tasks required to use CA Spool with the GDDM Print Utility ADMOPUJ to print GDDM print files on VTAM-attached 3270 printers. Note that GDDM can also produce AFPDS or PostScript output files, which can be printed by CA Spool on AFP or PostScript printers respectively.

In GDDM V2.1 and later, it is possible to specify that print files will be written to a sequential data set or a JES SYSOUT data set. These facilities can be used to write the print file into CA Spool.

A GDDM nickname to be used for writing to CA Spool must be added to the GDDM definitions. (The ADMADFT module or the ADMDEFS data set.) For more information about nicknames and the PRINTDST parameter, see the *GDDM Installation Guide*.

DDName

Writing to a pre-allocated ddname gives full control over spool file attributes. A spool file has to be allocated before starting a GDDM session, which is the recommended way to print GDDM graphics from CA Spool.

The PRINTDST processing option in the nickname must specify that the output is to be written to a sequential file. It must specify a DDname to which GDDM writes the output. This ddname has to be allocated to a CA Spool file before starting a GDDM session. This could be done by using the SUBSYS JCL statement in the GDDM procedure, or by issuing an ESFALLOC command.

The nickname could be defined as:

```
ADMMNICK NAME=ESF,PROCOPT=((PRINTDST,*,ddname))
```

ESF is the nickname and *ddname* is the ddname that is allocated using the ESFALLOC or SUBSYS DD statement. To print GDDM graphics, the users specify the nickname as a printer name.

The SUBSYS DD statement or the ESFALLOC parameters define the attributes for the SPOOL file.

SYSOUT Allocation Intercept

The easiest way to route GDDM output files to CA Spool is through SYSOUT Allocation Intercept.

A GDDM nickname must be specified to route the output to a dynamically allocated JES SYSOUT data set. CA Spool then intercepts this SYSOUT allocation.

The nickname could be defined as follows:

```
ADMMNICK NAME=DESPRT1,PROCOPT=((PRINTDST,X,DESPRT1))
```

where X is the GDDMCLA defined in the CA Spool parameter deck.

In the CA Spool parameter file, the following parameters are defined to activate SYSOUT allocation intercept:

- SUBS=CLASS
- SUBSCLAS=X
- XFERCLAS=X

where X is the same letter as the GDDMCLA defined in the CA Spool parameter deck.

The XFERCLAS parameter is defined to make CA Spool pick files from the JES spool if the CA Spool system was unavailable at allocation time.

Printing GDDM Files

The GDDM print files are passed to the GDDM utility program ADMOPUJ to perform the printing. This means that CA Spool printer commands like cancel-printer and repeat-printer are not available while the file is being printed by ADMOPUJ. CA Spool file commands, like requeue-file and route-file, are available as usual.

Two CA Spool parameters are used to support GDDM print files. The GDDMCLA parameter specifies which output class must be used to recognize GDDM files. The GDDMAPPL parameter specifies which VTAM application name must be used by the ADMOPUJ program. This name must also be specified in the VTAM network definition.

If the GDDM load library is not on the link list, it must be added as a STEPLIB to the CA Spool procedure and it must be APF authorized. ADMSYMBL and ADMDEFS DD statements must be added if necessary.

CALL Interface Routines

To access CA Spool from application programs, calls must be made to an interface routine. Two interface routines are available, AESPRIV and AESFCICS.

Aliases are provided for all entry points in the interface routines, allowing the routines to be dynamically loaded during program execution, if desired.

AESPRIV

AESFPRIV supports all the call functions. If you are using CICS support, this module also contains alternate entry points to all the service routines needed under CICS. The module AESFPRIV is shipped as an object module in the CA Spool library, so the programmer can link-include it from this data set.

AESFCICS

AESFCICS supports all the call functions from a CICS Command Level program.

Installing CICS Command Level Interface Module

To install the CICS command level interface module AESFCICS

1. Copy the module AESFCICS from the CA Spool CBQ4LOAD library to a library defined in your CICS procedure through the DFHRPL DD statement.
2. Define the program into the desired RDO group using CICS program DFHCSDUP:

```
DEFINE PROGRAM(AESFCICS) GROUP(ESF) LANGUAGE(ASSEMBLER)
```

Advanced Communication Interface—ESFCOMI

The Advanced Communication Interface is available through the call-interface entry point ESFCOMI in the AESFPRIV module.

TSO Sample

The CAI.CBQ4OPTN data set contains a sample program, TSOCESEF, which uses this interface. With this program, a command is passed to CA Spool, and the response is presented. Sample assembly and link jobs are available in CBQ4OPTN members ASMTSOCE and LNKTSOCE. Also contained in CBQ4OPTN is a user-contributed CA Roscoe monitor routine named RSSCESF0, which uses the Advanced Communication Interface.

Adding Cleanup for CICS Transactions

This section describes the activities required to install the CICS cleanup routine.

The CICS cleanup routine performs CA Spool cleanup (that is, closes open files and communication channels) for a specific terminal user if:

- CICS task is abnormally terminated
- Transaction ID is being changed
- No transaction ID is specified

ESFCCLUP and ESFENCLU

The cleanup facility consists of two parts:

- A task-related user-exit program (ESFCCLUP)
- A program (ESFENCLU) used to enable the user exit

Installing the CICS Clean-Up Routine

To install the cleanup facility

1. Copy the modules ESFCCLUP and ESFENCLU from the CA Spool CBQ4LOAD library to a library defined in your CICS procedure through the DFHRPL DD statement.

2. Define the program into the desired RDO group using CICS program DFHCSDUP:

```
DEFINE PROGRAM(ESFCCLUP) GROUP(ESF) LANGUAGE(ASSEMBLER) RESIDENT(YES)
```

```
DEFINE PROGRAM(ESFENCLU) GROUP(ESF) LANGUAGE(ASSEMBLER) RESIDENT(YES)
```

3. Add the following entry to the CICS PLTPI:

```
ESFENCLU DFHPLT TYPE=ENTRY,PROGRAM=ESFENCLU
```

IMS Task Cleanup

CA Spool provides a task cleanup routine, which can be called by an application program to close all files opened by the task. This is *not* recommended for normal close processing because one or more of the last records written can be lost.

Online Systems

Task cleanup is primarily for use by online systems which link to user applications. If the user application fails to close one or more spool files, then the online system can call the task cleanup routine. This forces a close of all the files currently opened by programs under the MVS TCB.

Update Deck

CA Spool provides an update deck to the IMS MPP controller DFSPCC20. This is located in the CA Spool CBQ4OPTN library in member DFSPCC20.

The \$IQSSVT macro in the CA Spool source library is required during reassembly of the DFSPCC20 module. If this update is not applied, the spool files left open are not closed until the entire message region is stopped.

NATURAL Interface

This interface lets the NATURAL terminal user running under CICS, IMS, TSO, COMPLETE, or batch, create multiple reports using DISPLAY or WRITE NATURAL verbs, qualified by a printer number. A screen hardcopy is also provided. NATURAL V8.2.x is supported.

Installing the NATURAL Interface

To install the interface

1. Update NATPARM.
2. Customize and assemble the NATURAL interface-parameter module.
3. Update and run the link-edit job for the NATURAL executable load-module.

NATURAL V8.2.x Installation

Update and run the NATPARM installation job as follows:

1. Enter the following to include USER Access Method support:

```
NTPRM: HCAM=USER
```

2. Optionally, specify default hardcopy destination:

```
NTPRM: HCDEST=prt-dest
```

3. Select USER Access Method Support for print and work files.

You can specify optional default printer parameters DEST=, FORMS=, NAME=, COPIES= and CLASS=.

```
NTPRINT (1-31),AM=USER,OPEN=OBJ,CLOSE=CMD
```

4. Add the names ESFATTRB and ESFNATCL to the CSTATIC list.

```
NTPRM CSTATIC=(ESFATTRB, ESFNATCL)
```

5. Assemble and link-edit the NATPARM module using your existing JCL.

ESFNP231

Customize the ESFNP231 module, which contains:

- List of assembled constants used by the ESFNATU program
- Routine to assign default attributes to CA Spool files

The following default values are set:

```
&FORM=STD,DEFAULT FORM NUMBER
&FCB=6,                                DEFAULT FCB NAME
&DEST=$$NODEST,                        DEFAULT DESTINATION NAME
&OUTLIM=0,                              DEFAULT OUTPUT LIMIT
&COPY=1,                                DEFAULT COPY COUNT
&OWNER=NATURAL,                         DEFAULT OWNER NAME
&ESF=ESF,                               DEFAULT ESF SUBSYSTEM NAME
&PGNAME='**FROM NATURAL**',            DEFAULT PROGRAMMERS NAME
&CLASS=A                                DEFAULT OUTPUT CLASS
```

Define the NATURAL printer number, which must be used as the hardcopy printer. By default, printer number 1 is used.

The routine to assign default attributes is included in the module as a sample routine. You can make any changes to the code, as long as the register conventions and the routine entry name are preserved.

Link-Edit Job

Update and run the NATURAL Nucleus link-edit job as follows:

1. Add the following DD statements to your link job:

```
//NATLIB DD DSN=*****.NATxxx.LOAD
//ESFLIB DD DSN=CAI.CBQ4LOAD
```

2. Add the following Include statements to your link job:

```
INCLUDE NATLIB(NATAMUSR)
INCLUDE ESFLIB(ESFNA231)
```

3. Link-edit the NATURAL Nucleus using the updated link job.

SAP Interface

The CA Spool SAP interface is used in conjunction with the application known as the R/2 System, produced by the German company SAP AG. The R/2 System is an integrated and online set of accountancy, manufacturing, sales administration, and personnel applications. The SAP R/2 system maintains its own print spool, but support for calling external spooling systems was introduced in Version 4.3G. This support is provided as two exit points in the R/2 code.

Two exits, SAPSPEI and SAPSPEX, are delivered by SAP for the JES2 spool, and by CA for CA Spool. These exits copy the output from SAP R/2 transactions directly into CA Spool, instead of to the SAP print spool. The CA Spool menu system can be used to view the reports, and so on.

SAPSPEI

The SAPSPEI print initialization exit validates the primary destination. This is done by using the CA Spool ESFSTAT application programming interface. If this call accepts the printer destination as a valid printer, the exit creates parameter lists for the printing exit SAPSPEX, and returns to SAP. If the printer is considered invalid, the exit sets return code=4, and exits to SAP. This forces SAP to use the SAP spool.

Two SAP tables are read to provide further information for the ESFOPEN parameter list. Table 022B is read to find the printer type for the output. If it is indicated as IPDS, table 022I is read. This table provides the FORMDEF, PAGEDEF, and CHARS information for the ESFOPEN parameter list.

SAPSPEX

The SAPSPEX exit performs creation of the CA Spool files. It is called by, and is a part of, the SAP spool writer. This exit accepts the following request codes on entry:

- **O**—Open file
- **W**—Write print data
- **C**—Close file

If an error occurs during open, write, or close processing, return code 4 is set.

SAPSPEX Error Codes and SAP Log

Processing errors cause printing to be abnormally terminated, so an entry is made in the SAP log. This exit logs the following errors:

Oxxx

ESFOPEN call has failed with a STATUS=PE. xxx indicates which field in the ESFOPEN parameter list is in error.

OPxx

ESFOPEN call has failed. xx is the status code returned.

WRxx

ESFWRIT call has failed. xx is the status code returned.

CLxx

ESFCLOS call has failed. xx is the status code returned.

NOEP

SAPSPEX exit is unable to locate the entry point for ESFOPEN. This is probably caused by not including the CA Spool call interface routines (AESFPRIV) during link-edit.

NOFI

SAPSPEX exit is called with the W request type, but no file has yet been opened.

NOPA

SAPSPEX exit is called, but the parameter lists created by the SAPSPEI exit could not be found.

NOST

Pointer passed from exit SAPSPEI to exit SAPSPEX points to invalid storage. This means that printing of the file is abnormally terminated.

Installation

To activate and customize the two exits, run BQ4JSAP. After running the job, two useable load modules are found in the CBQ4LOAD library:

- SAPSPEI is a load module of its own.
- SAPSPEX must be linked into the SAPSPWR load module.

The SAPSPEI exit is assembled and link-edited as a separate load-module. The SAPSPEX exit is also assembled and link-edited as a separate load-module. This is then link-edited into the SAPSPWR load-module.

When linking the exits, the CA Spool call interface routines must also be included. Add the following statement to the SYSIN file in the link-edit job:

```
INCLUDE ESFLIB(AESFPRIV)
```

Add a DD-card called ESFLIB that points to the CA Spool link library. See the SAP documentation for details on how to assemble and link-edit the exits.

Customizing SAP

Part of the customization is done when activating the interface by running BQ4JSAP. If your customization requirements are more advanced, update SAPSPEX and SAPSPEI and install your updates as a usermod.

You might need to customize the exits; this depends on your CA Spool system setup.

Subsystem Name

The subsystem name is hard-coded in both exits using a macro variable &SUBID. The default value is ESF.

If this is not the subsystem ID (SUBID) of your CA Spool system, change it in both exits.

SAP User ID

You only need to know about this section, if you chose to use SAP user IDs when you ran the BQ4JSAP job.

CA Spool normally picks up the user ID of anyone accessing CA Spool. But SAP users do not usually sign on to CICS before starting SAP. This means that CA Spool cannot identify the correct SAP user ID of the caller.

You can solve this problem by allowing the caller (that is, the SAP exits) to provide the user ID directly in the parameter lists for the specific calls. But providing your own user ID does *not* ensure proper security checking, so only APF-authorized programs are allowed to do this. SAP transactions do not run APF-authorized, so to be able to specify the user ID, an option must be applied to the CA Spool system.

For this purpose, the following option is available: Specify XEQOPT=11 in the ESFPARM data set.

DESTID Statement

The DESTID statement can be used to assign default values for various spool file attributes, to overwrite the specified spool file attributes, and to create multi-destination spool files. The spool file selection can be based on generic user ID, generic destination, output class, and generic owner name parameters.

Do not confuse the CA Spool DESTID facility with the DESTID statement that can be defined in the JES2 initialization deck.

DESTID Processing

CA Spool DESTID processing has two phases:

- File selection
- Attribute assignment

Files can be selected according to the value of one or more of these file attributes:

- User ID
- Destination
- Class
- Filename

Selection can be based on full or generic attribute values. The four selection attributes are ordered hierarchically. If a file matches certain selection criteria, no further search is performed. If, for example, a DESTID statement with user ID (QUSERID=) matches the current file, no DESTID statements for destination, class, or filename are considered. If multiple DESTID statements within a single selection criteria match current file attributes, fully specified values take precedence over generically specified values.

DESTID Attribute Assignment

There are two parts to the process of attribute assignment:

- Default attribute assignment
This occurs when no value is previously specified during file creation.
- Forced attribute assignment
This occurs regardless of any value previously specified during file creation.

DESTID processing is performed *twice* for each file during ESFOPEN and ESFCLOSE. Most file attributes can be changed during both phases; but some only during one. See the "Initialization" chapter in this guide for individual attribute details.

Note: XEQOPT=20 can be used to bypass the DESTID FDEST merge at file CLOSE time. Other DESTID file attributes, such as CLASS and HOLD, continue to be processed during ESFCLOSE.

Example 1

ESFPARM has:

```
DESTID QUSERID=ABC*, FDEST=MYPRINT  
DESTID QCLASS=X, FDEST=DUMMY
```

Files in CLASS X are queued for the destination called DUMMY.

Files with user ID that have ABC as the first three characters are queued for destination MYPRINT, even if they have class X. This is because a matching user ID takes priority over a matching class.

Example 2

ESFPARM has:

```
DESTID QUSERID=ABC*, FDEST=(JES2.* ,*)
```

Files for destinations that have ABC in the first three characters of their names are queued for two destinations, as follows: 'JES2.*' causes the files to be queued for transmission to the original destination at the JES2 NJE node; the (*) is the other destination, the original destination of the file.

Example 3

ESFPARM has:

```
DESTID QDEST=MYPR*, QUSERID=ABC*, FCLASS=Z
DESTID QCLASS=Z, QDEST=MYPRT1, FCLASS=B, FHOLD=YES
DESTID QCLASS=Z, QDEST=MYPRT2, FCLASS=C
```

Files for destinations named MYPR as the first four characters, having user IDs starting with ABC, are requeued to class Z.

Files for class Z and destination MYPRT1 are requeued for class B, and are placed in held status. Files for class Z and destination MYPRT2 are requeued for class C. Files moved to CLASS=Z, due to the first DESTID statement, are processed as determined by the two last DESTID statements encountered during close processing.

This technique makes a two-level file selection possible; this can be especially useful to enable special DESTID processing for a large number of subsets of files.

GSS Interface

Global SubSystem (GSS) is produced by CA's MVS Integration Services, and offers software that performs across CA product families. CA Spool native commands can be issued from a GSS IMOD.

GSS/ISERVE

The GSS/ISERVE task processes requests by executing IMODs. IMODs are REXX-based programs that can monitor, automate, and regulate system activities. The IMOD facility also lets you create, modify, and execute IMODs.

The CA Spool interface consists of an ADDRESS environment, which allows native commands to be issued through an ADDRESS command.

Preparation

To prepare GSS/ISERVE for CA Spool

1. Move the module.

Ensure that the CA Spool communication module ESFGSSAD is available. This module can be found in the CBQ4LOAD and must be accessible from the GSS/ISERVE task, either through the linklist or through a STEPLIB DD-card.

2. Modify the GSS parameter file.

In a parameter file allocated to the PARMLIB DDname, add the following line:

```
ADDRESS XPSPOOL ESFGSSAD 15 /* CA Spool */
```

3. Define a communication channel in the CA Spool parameter deck with the generic name GSS:

```
CID GSS,USMR=NO,OPENTYPE=U,MAXPORT=5
```

Using the Interface

Identify command destination. To direct the command to the correct CA Spool subsystem, set the two relevant REXX variables:

```
XPSPOOL.SUBSYS: (The subsystem name to receive the command)  
XPSPOOL.NJENODE: (The NJE destination to process the command)
```

Address Command

The format of the ADDRESS command is:

```
ADDRESS XPSPOOL command
```

or

```
ADDRESS XPSPOOL  
'command1'  
'...'  
'commandn'
```

The output lines from the command are placed on the REXX stack, where they can be pulled by the IMOD.

Condition Codes

After each command issued, the RC variable is set to one of the following codes:

- -3—CA Spool command environment could not be found.
- -1—REXX variables could not be obtained.
- 0—Everything is fine.

- 20—Error occurred in the stack routine.
- 28—Language processor could not be found.
- 32—Internal error. Report this to your local CA Support Center.
- Other—Internal error. Report this to your local CA Support Center.

In the case of errors when executing a CA Spool command, its return code is set to 0, and error messages are placed on the stack as output from the command.

For example, the following IMOD issues a DF command to subsystem ESF9, determines the number of response lines, pulls the response lines, and prints them on the screen.

```

/* REXX                                                    */
/* Sample XPSPOOL/ISERVE GREXX exec                        */
Address XPSPOOL      /* Set the host command env */
XPSPOOL.SUBSYS = 'ESF9' /* Set the Subsystem name */
XPSPOOL.NJENODE = ''  /* Set the NJE node name */
'DF'                  /* List all files */
NumRecs = Queued()    /* Get the number of records*/
Do i = 1 to NumRecs  /* Pull each record */
  Parse Pull Record /* off of the queue */
  Say Record         /* and print it */
End

```

Automatic Printer Definition

Automatic Printer Definition (APD) ends the need to explicitly define printers to CA Spool. CA Spool automatically adds printer definitions whenever files are created for any unknown printer destinations. This feature is called Automatic Printer Definition (APD).

When is APD Invoked?

The Automatic Printer Definition process is invoked whenever:

- An attempt to create a file for a destination not defined to CA Spool is encountered. In effect, an "attempt to create a file" is made whenever a user application or a CA Spool internal component issues ESFOPEN.
- Files for destinations not defined in ESFPARM are found during a CA Spool WARM start.

- Files for destinations not defined in ESFPARM are found during a CA Spool REINIT.
- A member of an (E/)MAS configuration detects that a file for an unknown destination has been created by another member of the (E/)MAS configuration.
- A route file (RFnnnn) command issued to alter the destinations for an existing file finds an undefined destination.

Unknown Destinations

When an attempt is made to create a file for an unknown destination, CA Spool invokes Automatic Printer Definition to determine whether the destination must be added as a printer node to enable the file to be created.

This functionality requires that the parameter DESTVAL in the CA Spool parameter deck (ESFPARM) is set to DYNAMIC or DYNAPDIP.

Whenever APD is invoked, CA Spool searches for applicable printer attributes for the printer node to be added. In essence, it finds the DEFNODE definition with the best match between the destination name and the DEFNODE APDNODE= parameter value. The APDNODE parameter value can be made a wildcard. These DEFNODE printer attributes are then used to define the printer.

To make any changes to DEFNODE statements in relation to dynamic printers, issue the REINIT command.

If no match is found, the DEFNODE PRINTER statement is used as a model for the new mode.

DESTVAL=DYNAPDIP DEST='IP:ipaddr' APD Support

The DESTVAL=DYNAPDIP initialization parameter activates special DEST='IP:ipaddr' APD - Automatic Printer Definition support for DEST='IP:ipaddr' printers. For non-DEST='IP:ipaddr' dynamically added printers, initialization works as if DESTVAL=DYNAMIC was specified.

The DESTVAL=DYNAPDIP support works with the following CA Spool input interfaces:

- DD SUBSYS interface
- SYSOUT allocation intercept with SUBS=CLASS/DEST/DESTCLAS and SUBSCLAS=
- XFERSAPI=YES/THREAD if XFERXCLAS=, XFERDEST= and XFEROPT=6
- NJE interface using DEST='nodename.IP:ipaddr'

When output with DEST='IP:ipaddr' is received using one of the supported CA Spool input interfaces, a corresponding APD printer is automatically defined (if not already defined).

DEST='IP:123.456.789.012' is converted into a unique printer name starting with #, followed by seven alphanumeric characters.

DEST='IP:*hostname*' is converted into a most often unique printer name starting with #, followed by seven alphanumeric characters.

The DEST='IP:*hostname*' parameter is saved as a print file attribute and used during printing.

The maximum supported value for the DEST='IP:ipaddr' parameter is 64 characters, where the first three characters are the IP: prefix.

Defining DEFNODE with APDNODE=#* assigns default printer attributes to DYNAPDIP added printers.

A DYNAPDIP added printer is automatically deleted when no more files are queued to the printer.

When all DYNPRT printers are in use, the SYSOUT allocation intercept of DEST='IP:ipaddr' output is halted and DEST='IP:ipaddr' output is not intercepted. When a DYNPRT printer frees up, the interface restarts.

REINIT does not delete DYNAPDIP added printers, but REINIT of DYNAPDIP added printers are supported.

ESFPARM Sample Statements

The following example shows some typical APD DEFNODE sample statements:

```
DEFNODE HPLU1,XX-HPLU1, ... APDNODE=HP%P*
DEFNODE SCS,3287, ... ,APDNODE=HP*
DEFNODE PRINTER,3287, ...
```

In this example, any printer added with a name that begins with "HP" and has "P" as the fourth character inherits the attributes of DEFNODE HPLU1.

Printer names starting with "HP" but without "P" as the fourth character inherit the attributes of DEFNODE SCS. Other printers that are added inherit the DEFNODE PRINTER attributes.

The following example shows some other APD DEFNODE sample statements:

```
DEFNODE DYNTCPIP,DYNTCPIP,APDNODE=#*,GROUP=1,
PURGE=NO,ACQUIRE=TIME,RELEASE=NOWORK,
TCPHOST=DUMMY,TCPDRIV=LPRET,TCPPORT=515
```

In this example, DEFNODE DYNTCPIP is used as a model for printers dynamically created by files that specify DEST='IP:ipaddr' in JCL OUTPUT statement, if DESTVAL=DYNAPDIP is specified.

APD User Exits

CA Spool can affect and control the outcome of APD (Automatic Printer Definition) processing by means of user exit ESFU008X or the user exit specified on the UEX008 parameter of the LOADEXIT statement in the CA Spool parameter file. These exits are invoked every time an APD process runs. The ESFU008 exit can modify any attributes in the TDCE control block that is used to define the printer. These exits are invoked after the DEFNODE has been found and attributes inserted into the TDCE control block, but before the printer is defined.

Implementation of ESFU008X must be reentrant code that is link edited into the ESFMAIN load module. Implementation of an exit defined on the UEX008 parameter of the LOADEXIT statement must be reentrant code. It is not link edited into the ESFMAIN module.

Both the UEX008 version and the ESFU008X exits have access to the set of printer attributes selected by APD. This set of attributes is mapped by the \$IQTDC macro in CBQ4MAC. The exits can also access the attributes of the file that causes the APD process to run. This set of attributes is mapped by the \$IQFQE macro in CBQ4MAC.

Based on this information, the exit might:

- Allow APD to proceed, possibly after modifying one or more printer attributes.
- Change the name of the destination. This forces APD to restart the process of looking up printer attributes.
- Reject the definition of the new printer.

Note: For more information about the use of the UEX008 exit definition and ESFU008X, see the *Programming Guide*.

REINIT

All nodes added by APD are deleted during REINIT processing. If one or more files were queued for any of the printer nodes, this node automatically is added again during the same REINIT. Any changes made to a DEFNODE statement are reflected on any printers added by APD after a REINIT command has been issued. This is because all APD definitions are first deleted and then added again (if required) during REINIT processing.

Security Issues

A printer node added by APD is protected in exactly the same way as nodes added to ESFPARM. A node is only added if the userid of the file creation request has permission to create files for the group or node concerned. The exit defined by UEX008 and ESFU008X can determine to reject APD processing based on any available information.

Naming Standards

APD currently only offers the selection of printer node attributes (for example, device type) based on the name of the destination. This might limit its effectiveness in environments that do not enforce naming standards that can be used to deduce information about the printer type. In such environments, the APD exit can be used to obtain information about which attributes to set from some external information repository.

Operational Implications

The following information might help to optimize operations at some installations:

XFERDEST

XFERDEST=YES/FORCE processing takes place for destinations defined to CA Spool both through ESFPARM and Automatic Printer Definition. Creation of a SYSOUT file in JES for an unknown destination does not cause APD to be invoked.

SUBS=DEST & SUBS=DESTCLAS

SUBS=DEST and SUBS=DESTCLAS processing occurs for destinations that are defined to CA Spool using both ESFPARM and Automatic Printer Definition. Creation of a JES SYSOUT file for an unknown destination does not invoke APD.

SUBS=APD

SUBS=APD processing occurs for destinations that are defined to CA Spool through both ESFPARM and Automatic Printer Definition. Creation of a JES SYSOUT file to an unknown destination invokes APD.

DYNPRT=

When APD adds a printer, it uses a free entry in the storage pool for adding printers during the life of a CA Spool task. When a printer is dynamically defined, it uses a node from the pool of extra printers that the DYNPRT statement allocates. DYNPRT must be high enough to hold all dynamically defined printers at any time. If no more printers can be added, the following message is issued:

```
ESF122 NODE xxxxxxxx - NO MORE NODES CAN BE DEFINED
```

You can issue a REINIT to reclaim storage from printer definitions for which no more files are queued.

Route File Command

If an `RFnnnn,ND=` command involves an unknown destination, APD processing is invoked.

TCP/IP PrintDirect

To fully utilize the PJL4/PJL5 print driver support, see the *HP 5021-0380 Printer Job Language – Technical Reference Manual*.

To fully utilize the PCL5 print driver support, see the *HP LaserJet Printer Commands - PCL* in your HP LaserJet user's reference guide; for example, *C2010-90901 HP LaserJet 4Si Printer – User's Reference Manual*.

Nameserver/Symbolic Name Resolution

In a TCP/IP environment, interacting processes are uniquely identified to each other by a combination of IP address and port number. Port numbers are inherently defined as part of the various protocols, but a system administrator must explicitly assign the IP addresses.

IPv4 addresses are 32-bit addresses represented in dotted-decimal format (for example, 123.456.789.0). IPv6 addresses are 128-bit addresses represented in colon-hexadecimal format (for example 2001:DB8::8:800:200C:4).

Symbolic names can also be defined in a one-to-one relationship with IP addresses, letting users reference destinations with symbolic names such as "First.floor.print.room" or "UTAH.Sales," rather than using raw IP addresses.

TCP/IP name resolution is used as follows:

- To determine the symbolic name of the local host (that is, the MVS mainframe) so that the request can be identified to the receiving LPD.
- To find the IP address of the receiving host (that is, the one running LPD) or printer, in the event that users specify a symbolic name for the destination.

CA Spool JCL

Consider activating one or more of the following DD statements to the JCL procedure for CA Spool:

```

//*-----*
//*  CA Spool Print formatting resource libraries.          *
//*-----*
//*PJLLIB  DD  DISP=SHR,DSN=**YOUR** .PJL.RESOURCE.LIBRARY
//*PCLLIB  DD  DISP=SHR,DSN=**YOUR** .PCL.RESOURCE.LIBRARY
//*BINLIB  DD  DISP=SHR,DSN=**YOUR** .BIN.RESOURCE.LIBRARY
//*OVLYLIB DD  DISP=SHR,DSN=**YOUR** .OVLY.RESOURCE.LIBRARY
//*HTMLIB  DD  DISP=SHR,DSN=**YOUR** .HTML.RESOURCE.LIBRARY
//*MAILLIB DD  DISP=SHR,DSN=**YOUR** .MAILBOOK.RESOURCE.LIBRARY

```

Note: The TCPSEVR, TCPRESO, and TCPHOST datasets and the ESFLPRP module are no longer being used.

The optional PJLLIB, PCLLIB, BINLIB, OVLYLIB, HTMLIB and MAILLIB resource libraries must be allocated as RECFM=VB partition data sets, with, for example, LRECL=259 and BLKSIZE=2594.

PJLLIB might contain predefined FCB, Form, and Chars PJL commands in EBCDIC, which are automatically included in front of the print data if option F is specified for print driver PJL4 or PJL5.

PCLLIB might contain predefined FCB, Form, and Chars PCL commands, which are automatically included in front of the print data, if option F is specified for print driver PCL5 or option G is specified for print driver PJL, PJL4, PJL5, or PCL5. Also option g (lowercase) activates auto include of existing FCB, Form and Chars PCLLIB resource members for print drivers LPR ,DSO ,PJL, PJL4, PJL5, and PCL5. Commands are entered in EBCDIC. An asterisk or blank in column 1 indicates a comment line. A blank terminates the command string on each line. Data after the first blank is ignored. DEVICE statements are supported. PCL and Non PCL commands can exist in the same PCLLIB member.

BINLIB can contain predefined FCB, Form, and Chars binary printer commands in ASCII, which are automatically included in front of the print data, if print driver option B is specified.

OVLYLIB can contain predefined Form binary PCL commands in ASCII, which are included as an automatic page overlay, if print driver option O is specified.

HTMLIB can contain predefined HTMLFORM or FORM specified HTML skeletons used included by the Email print driver if MSGTYPE=HTML is specified.

MAILLIB can contain predefined MAILBOOK or Writer specified email parameters included by the Email print driver.

TCP/IP Data File

The SYSTCPD DD statement lets you pre-allocate your TCPIP.DATA file to eliminate the overhead of performing dynamic allocation of this file for every print request.

You can use the SYSTCPD DD statement to test a new TCPIP.DATA data set before putting it into production. It lets you to replace the installation default TCPIP.DATA file with your version.

Note: The use of DCB=BUFNO=n, where n is any number, is not recommended. This can increase storage use and result in storage abends.

Your TCPIP data file can include the following definitions.

TCPIPJOBNAME	<tcpip_proc>
HOSTNAME	<host_name>
DOMAINORIGIN	<origin>
NSINTERADDR	<IP-address_of_nameserver>
NSPORTADDR 53	
RESOLVEVIA UDP	
RESOLVERTIMEOUT 30	
RESOLVERUDPRETRIES 1	
DATASETPREFIX	<dsprefix>

TCP/IP Source Ports

The RFC 1179 Line Printer Daemon Protocol specifies that the target port is 515, and the source port must be in the range 721 to 731, inclusive. Ports cannot be reused until after 1 minute; a printer is limited to receive 11 print files per minute. To work around this problem, most printers and printer servers allow use of other source ports. Ports are selected using the following communication options:

- **A**—Expand the source ports range to 721-1023, instead of the default LPD source ports range of 721-731.
- **E**—Have TCP/IP automatically assign an ephemeral (short-lived) source port.

Installations can have certain port ranges reserved for printing. You can control the port ranges using the LPORT parameter on the printer's DRIVPRM1-4 parameters, as follows:

```
DEFNODE LPR, TCP-LPR, DRIVPRM1='LPORT=(1300-1349,1600-1699,721-731)',  
        TCPDRIV=LPR, CLASS=ALL, ACQUIRE=WORK, RELEASE=NOWORK  
NODE HP6L, LPR, GROUP=3
```

TCP/IP Print Drivers

The various TCP/IP print features are packed as print drivers, which can be selected at the printer node level. The following TCP/IP print drivers are currently supported:

- Basic LPR print driver
- Basic DSO print driver
- LPR PJI print driver
- LPR PCL5 print driver
- LPR PJI4 print driver
- PJI5 PrintDirect driver
- LCDS Xerox DocuSP print driver
- BARR print driver
- IPDS print driver
- Data Set print driver
- Email print driver
- SAR print driver
- JES print driver

- ESF print driver
- FTP print driver
- CA XCOM print driver
- Connect:Direct print driver

Basic LPR Print Driver

The basic TCP/IP LPR print driver supports FCB-controlled formatting of ASA and machine carriage control print files and print data translation. This driver supplies translation tables for many EBCDIC code pages to Microsoft Windows 3.1, and Latin 1. This driver also supports the Advanced Laser Printer Interface, partial print, SCS transparency, data compression, and separator page user exit.

Activate this support by specifying TCPDRIV=LPR in the printer node definition. If TCPDRIV is not defined for a printer that has TCPHOST defined, TCPDRIV=LPR is the default.

To configure the behavior of the LPR print driver, use communications options, protocol options, and the following formatting options:

- **B**—Includes the existing FCB and the Form and Chars BINLIB resource members before the print file. Includes the RESET BINLIB member after the print file.
- **F**—Lets LINECNT or FCB page length specify the number of lines to be printed per page for NOCC files and single page ASA files.
- **3**—Uses existing VPS resources to control the formatting of text files.
- **g**—Includes the existing FCB, Form, and Chars PCLLIB resource members before the print file. Includes the RESET member after the print file.

Commands are entered in EBCDIC.

An asterisk or blank in column 1 indicates a comment line. A blank terminates the command string on each line. Data after the first blank is ignored. DEVICE statements are supported. PCL and Non PCL commands can exist in the same PCLLIB member.

- **r**—Includes the existing PCLLIB, PJLLIB, or BINLIB members that match a file's Remote Destination, Writer Name, or Form Name before the print file. Includes the RESET member after the print file.

An asterisk or blank in column 1 indicates a comment line. A blank terminates the command string on each line. Data after the first blank is ignored. DEVICE statements are supported.

Note: For more information about how this option interacts with other TCPDRIV options, see the description of the 'r' option in the Initialization chapter.

LPR PJI Print Driver

Some HP LaserJet-compatible printers need to be informed about the printer language of the subsequent print data to be able to print it. To do this, send a PJI ENTER LANGUAGE command to the printer.

Activate this support by specifying TCPDRIV=PJI in the printer node definition. This specification does the following:

- Performs the same functions as the standard LPR printer driver
- Sends a 'PJI ENTER LANGUAGE = PCL' command, before the ESFU010X start separator page exit call
- If PRMODE=PS file, sends a 'PJI ENTER LANGUAGE = POSTSCRIPT' command after the ESFU010X start separator page exit call, but before the data file
- If PRMODE=PS file, sends a 'PJI UEL' command after the data file, but before the ESFU010X end separator page exit call
- Sends a 'PJI ENTER LANGUAGE = PCL' command before the ESFU010X end separator page exit call
- Sends a 'PJI UEL' command after the ESFU010X end separator page exit call

Basic DSO Print Driver

Some TCP/IP-attached printers, in addition to the LPR/LPD protocol, also support a simple protocol for receiving one buffer of raw print data at a time over port 9100 or other ports. HP calls this protocol for TCP/IP Direct Mode printing. Other vendors call this protocol Reverse Telnet, Direct Sockets Interface, TCP/IP Stream protocol, or TCP/IP socket gateway.

If your printer supports bi-directional PJI, then use the PJI5 print driver instead of the DSO print driver.

Activate this support by specifying TCPDRIV=DSO in the printer node definition; this performs the same functions as the standard LPR printer driver.

LPR PCL5 Print Driver

Not all HP LaserJet-compatible printers have PCL support. To better utilize these non-PJL printers, specify PCL based automatic print formatting.

Activate this support by specifying TCPDRIV=PCL5 on the printer node definition; this does the following:

1. Performs the same functions as the standard LPR printer driver
2. If the F—auto format print driver option is specified using TCPDRIV, the following happens after the ESFU010X start separator exit call, but before the data file is sent:

- A PCL RESET command is sent.
- For both binary and text files, if the FORM PCL resource is found in the PCLLIB library, it is sent before the data file.

If the FORM resource is not found in PCLLIB, the file class is checked for simplex/duplex specification. If the file class is S, a Simplex print PCL command is added. If the file class is D, a Duplex print PCL command is added.

- FCB for text files:

If the FCB PCL resource is found in the PCLLIB library, it is sent. If the FCB resource is not found, formatting PCL commands are automatically built and sent based on the following algorithms:

- If no Max Print Position (MPP) is specified through the FCB extension and the LRECL of the file is less than 319, this LRECL is used as the MPP.
- If no Characters Per Inch (CPI) value is specified through the CHARS parameter or the FCB extension, the CPI defaults to 12 if the MPP is less than or equal to 90; if the MPP is greater than 90, the CPI is calculated as $MPP/10.0$.
- If MPP/CPI is less than 7.20, a portrait orientation PCL command is sent; otherwise a Landscape Orientation PCL command is sent; otherwise a Landscape Orientation PCL command is sent.
- For text files, the default maximum number of lines per page (MPL) is the number of lines per page in the FCB. For NOCC files with a LINECOUNT parameter specified, the MPL is the LINECOUNT value.
- A line spacing PCL command is sent to best match the current MPL.

- CHARS for text files:

Only the first CHARS in the CHARS set is used by the TCP/IP PCL5 print driver. If this CHARS PCL resource is found in the PCLLIB library, it is sent. If the CHARS resource is not found in PCLLIB, font selection PCL commands are automatically built and sent based on the following values:

Value	Font
CB00 to CB29	4099 Courier Bold

Value	Font
CE00 to CE29	4099 Courier
CI00 to CI29	4099 Courier Italic
CR00 to CR29	4099 Courier
GB00 to GB29	4099 Courier Bold
GL00 to GL29	4099 Courier
GT00 to GT29	4099 Courier
OB00 to OB29	4102 Letter Gothic Bold
OR00 to OR29	4102 Letter Gothic
PR00 to PR29	4099 Courier
RT00 to RT29	4099 Courier Bold
SI00 to SI29	4099 Courier Italic
ST00 to ST29	4099 Courier
LP17	0000 Line Printer 16.67/8.5

Other values produce unpredictable results.

- The value of the last two numeric characters is used as the CPI (pitch).
- PCL commands are sent to select the requested primary font family, (pitch, style, and stroke) and to select the symbol set Windows 3.1, Latin 1.

3. A PCL RESET command is sent after the data file and before the ESFU010X end separator page exit call.

Notes:

- The PCL resources searched in PCLLIB are the file's FORM, FCB, and CHARS values prefixed with 'FORM', 'FCB2', and 'CHAR' respectively. Therefore, if a file is created with FORM=STD, FCB=8, and CHARS=CR12, the matching resource names in PCLLIB are 'FORMSTD', 'FCB28', and 'CHARCR12' respectively.
- A PCL resource member must contain valid PCL commands in EBCDIC preceded by an EBCDIC escape character (<esc>=X'27'). For example, when FCB=6 is a file attribute, you can add the PCL resource member FCB26 to the PCLLIB library, as follows:

```
<esc>&l00
```

```
<esc>&l6D
```

- To support different printer capabilities, a PCL resource member can contain multiple sets of PCL commands selected by the device type of the printer node. These PCL command sets must be separated and identified by special DEVICE=device type statements. For example, enter the default PCL command set first, followed by a special PCL command set for device type 'HPLJ5SI':

```
<esc>&L00  
<esc>&L6D  
DEVICE=HPLJ5SI  
<esc>&L00  
<esc>&L8D
```

LPR PJL4 Print Driver

Many HP LaserJet-compatible printers support an extended set of PJL, which allow job separation, print job configuration, and printer configuration.

Activate this extended PJL support by specifying TCPDRIV=PJL4 in the printer node definition; this does the following:

1. Performs the same functions as the LPR PJL printer driver support.
2. A 'PJL JOB NAME = "File: 999999 Name: [set the File Name variable] Userid: <userid>" command and a 'PJL RDYMSG DISPLAY ="[set the File Name variable] 999999"' command are sent after the ESFU010X start separator page exit call.
3. If the F - auto format print driver option is specified using TCPDRIV, the following happens, after the PJL JOB and RDYMSG commands, but before the data file is sent:
 - For both binary and text files, if the FORM PJL resource is found in the PJLLIB library, it is sent before the data file.

If the FORM resource is not found in PJLLIB, the file class is checked for simplex/duplex specification. If the file class is S, a Simplex print PJL command is added. If the file class is D, a Duplex print PJL command is added.
 - FCB for text files:

If the FCB PJL resource is found in the PJLLIB library, it is sent.

If the FCB resource is not found in PJLLIB, formatting PJL commands are automatically built and sent based on the following algorithms:
 - If no Max Print Position (MPP) is specified using the FCB extension and the LRECL of the file is less than 319, the LRECL is used as the MPP.
 - If no Character Per Inch (CPI) is specified using either the CHARS parameter or the FCB extension, the CPI defaults to 12 if the MPP is less than or equal to 90.

If the MPP is greater than 90, the CPI is calculated as MPP/10.0.

- If MPP/CPI is less than 7.2, a 'PJM SET ORIENTATION = PORTRAIT' command is sent; otherwise a 'PJM SET ORIENTATION = LANDSCAPE' command is sent.
- For text files, the default Max Lines per page (MPL) is the number of lines per page value in the FCB of the file. For NOCC files with a LINECOUNT parameter specified, the LINECOUNT value is the value of the MPL.
- Send a 'PJM SET FORMLINES = <MPL>' command to set the maximum number of lines per page.

■ CHARS for text files:

Only the first CHARS in the CHARS set is used by the TCP/IP PJL4 print driver.

If this CHARS PJL resource is found in the PJLLIB library, it is sent.

If the CHARS resource is not found in PJLLIB, font selection PJL commands are automatically built and sent based on the following values:

Value	Font
CB00 to CB29	4099 Courier Bold
CE00 to CE29	4099 Courier
CI00 to CI29	4099 Courier Italic
CR00 to CR29	4099 Courier
GB00 to GB29	4099 Courier Bold
GL00 to GL29	4099 Courier
GT00 to GT29	4099 Courier
OB00 to OB29	4102 Letter Gothic Bold
OR00 to OR29	4102 Letter Gothic
PR00 to PR29	4099 Courier
RT00 to RT29	4099 Courier Bold
SI00 to SI29	4099 Courier Italic
ST00 to ST29	4099 Courier
LP17	0000 Line Printer 16.67/8.5

Other values produce unpredictable results.

- The value of the last two numeric characters is used as the CPI (pitch).
 - The corresponding 'PJM LPARM:PCL FONTNUMBER=<nnn>' command, 'PJM LPARM:PCL PITCH=<CPI>' command, and 'PJM LPARM:PCL SYMSET=WINL1' command are sent.
 - A 'PJM SET FORMLINES = <MPL>' command to set the maximum number of lines per page is sent.
- If any of the USERDATA fields in the file starts with '@PJM', they're sent as PJM commands before the data file.
 - A 'PJM EOJ NAME = "File: 999999 Name: [set the File Name variable] Userid: <userid>"' command and a 'PJM RDYMSG DISPLAY = " "' command are sent before the ESFU010X end separator page exit call.

Note the following:

- The PJM resources searched in PJMLIB are the file's FORM, FCB, and CHARS values prefixed with 'FORM', 'FCB2', and 'CHAR' respectively. Therefore, if a file is created with FORM=STD, FCB=8, and CHARS=CR12, the matching resource names are 'FORMSTD', 'FCB28', and 'CHARCR12' respectively.
- A PJM resource member must contain valid PJM commands in EBCDIC. For example, when FCB=6 is a file attribute, PJM resource member FCB26 is added to the PJMLIB library as follows:

```
@PJM SET ORIENTATION = PORTRAIT  
@PJM SET FORMLINES = 51
```
- To support different printer capabilities, a PJM resource member can contain multiple sets of PJM commands selected by the device type of the printer node. These PJM command sets must be separated and identified by special DEVICE=device type statements.

For example, first enter the default PJI command set followed by a special PJI command set for device type 'HPLJ5SI', as follows:

```
@PJI SET ORIENTATION = PORTRAIT
```

```
@PJI SET FORMLINES = 51
```

```
DEVICE=HPLJ5SI
```

```
@PJI SET ORIENTATION = PORTRAIT
```

```
@PJI SET FORMLINES = 52
```

- You can modify the default configuration of a printer by sending PJI INITIALIZE, RESET, and DEFAULT PJI commands to the printer. For example, when the form attribute of a file is FORM=DEF0 PJI, you can use resource member FORMDEF0 to reset the PJI default environment variables to their factory default values, as follows:

```
@PJI SET ORIENTATION
```

PJI5 PrintDirect Driver

Some HP LaserJet-compatible printers support PJI status read-back from the printer to the host. This support can be used to query the printer configuration and printer status information, and to receive unsolicited printer and print job status information. This bi-directional PJI support is utilized to implement the CA Spool TCP/IP PrintDirect support.

Activate this PJI status read-back support by specifying TCPDRIV=PJI5 on the printer node definition; this does the following:

1. Performs the same functions as the LPR PJI4 print driver support.
2. Before the ESFU010X start separator page exit call, 'PJI USTATUS' commands are sent to allow the printer to send unsolicited device, job, and page status messages. The initial status of the printer device is obtained from the printer.

3. During the sending of the data file, only 5 - 10 pages at a time are sent to the printer to avoid overloading the printer buffer; the following events are also occurring:
 - Each time a physical page is completed, the count of pages printed is updated for display on the Menu system Printer panel.
 - Each time the number of pages specified by the printer node CKPTPGS parameter has been physically printed, the file print status is checkpointed.
 - If a PJI unsolicited printer device attendance message is received from the printer, it is written to the ESFLOG and saved so that it can be displayed on the Menu System Printer panel.
 - If a printer device attendance message indicates operator intervention, the printer status is changed to Intervention Required; printing is halted until the intervention has been cleared or until the printer times out.
 - If a restart, forward-space, or backspace printer command is received, the printing is interrupted and restarted at the requested page in the file.
4. After the file has been printed and after the ESFU010X end separator page exit call, a 'PJI USTATUSOFF' command is sent to turn off all unsolicited status messages.

Note the following:

- Printer responses to PJI DQUIRE, INQUIRE, and INFO commands, can be saved as a TCP/IP trace file, as a PJI trace file, or as a PJI Info file. The PJI Info file is not opened until the first DQUIRE, INQUIRE, or INFO response is received.

To obtain information about the type of printer used, the amount of memory available, and the number of pages printed by the print engine, specify printer node TCPDRIV=PJL5I. For example, when FORM=INFO is a file attribute, you can use the PJI resource member FORMINFO to query the printer, as follows:

```
@PJI INFO ID
```

```
@PJI INFO MEMORY
```

```
@PJI PAGECOUNT
```

- The INFTRACE spool file resulting from using the previously mentioned FORMINFO PJI resource with an HP LaserJet 4 printer is as follows:

```
Printer: HP69File:1995Name: SUBSPJL4
```

```
@PJI INFO ID
```

```
"LASERJET 4"
```

```
@PJI INFO MEMORY
```

```
TOTAL=1445960
```

```
LARGEST=1418556
```

```
@PJI INFO PAGECOUNT
```

```
"?"
```

LCDS Xerox DocuSP Print Driver

The LCDS print driver routes Line Conditioned Data Stream (LCDS) print files to Xerox DocuSP printers over the TCP/IP network using the LPR/LPD protocol. If the printer definition includes TCPPORT=9000-9999, the Direct Socket (DSO) protocol is used.

To insure accurate transmission and interpretation of the LCDS data, this print driver automatically converts carriage control to machine carriage control, adds carriage control information (if it is missing), includes the FCB, and adds record length information per record.

To Send LCDS Print Files

To send CA Spool print files in LCDS format to a Xerox DocuSP printer, perform the following steps:

1. Define a new CA Spool printer with TCPDRIV=LCDS.
2. Add appropriate TCPHOST, TCPVRT, and TCPVRT parameters.
3. Queue the print files to this new LCDS printer.

If you specify a TCPVRT=value in the range of 9000 to 9999, then the DSO protocol is used. If not, then the LPR/LPD protocol is used.

For more information about defining printers, see the chapter Initialization.

Samples

The following is a sample LCDS LPR printer node definition:

```
DEFNODE LCDSLPR, DOCU-180, TCPDRIV=LCDS, TCPVRT=515, CLASS=A,
        ACQUIRE=WORK, RELEASE=NOWORK
NODE HP6L, LCDSLPR, TCPHOST=ip-address, TCPVRT=1p, GROUP=2
```

The following is a sample LCDS DSO printer node definition:

```
DEFNODE LCSDSO, DOCU-180, TCPDRIV=LCDS, TCPVRT=9100,
        CLASS=A, ACQUIRE=WORK, RELEASE=NOWORK
NODE HP6L, LCSDSO, TCPHOST=ip-address, GROUP=2
```

BARR Print Driver

The BARR print driver routes print files in the 'Mainframe IP Record Format' to BARR printers over the TCP/IP network using the LPR/LPD protocol. To insure accurate transmission and interpretation of the print data, this print driver automatically converts carriage control to machine carriage control, adds carriage control information if missing and adds record length information per record.

To send print files to a BARR printer

1. Define a new CA Spool printer with TCPDRIV=BARR.
2. Add appropriate TCPHOST, TCPVRT, and TCPVPORT parameters.
3. Queue the print files to this new BARR printer.

For more information about defining printers, see the Initialization chapter.

Samples

The following is a sample BARR printer node definition:

```
DEFNODE BARRLPR,BARR-01,TCPDRIV=BARR,CLASS=A,  
        ACQUIRE=WORK,RELEASE=NOWORK  
NODE HP6B,BARRLPR,TCPHOST=ip-address,TCPVRT=1p,GROUP=2
```

IPDS Print Driver

The IPDS print driver prints IPDS files with PRMODE=PAGE and FCB=ASIS using the TCP/IP direct sockets carrying protocol.

Non-IPDS files are printed using the DSO print driver.

To send CA Spool IPDS print files to a TCP/IP attached IPDS printer

1. Define a new CA Spool printer TCPDRIV=IPDS.
2. Add appropriate TCPHOST and TCPVPORT parameters.
3. Queue the IPDS print files to this new IPDS printer.

For more information about defining printers, see the Initialization chapter.

Samples

The following is a sample IPDS printer node definition:

```
DEFNODE IPDSDSO,IPDS-DSO,TCPDRIV=IPDS,TCPVPORT=9100,SEP=0,CLASS=A,  
        ACQUIRE=WORK,RELEASE=NOWORK  
NODE HP6I,IPDSDSO,TCPHOST=ip-address,GROUP=2
```

Data Set Print Driver

Use this print driver to automatically copy CA Spool print files, including PDF, HTML, and RTF wrapped text files, into MVS data sets or USS HFS files for further processing. The stored print files are, by default, exact copies of the CA Spool print files. It stores text reports in EBCDIC without translation and with preservation of carriage control information.

You can use print driver option D together with one of the existing print drivers to have the complete output data-stream written to an MVS data set or a USS HFS file. By default, data is formatted and translated to ASCII and PCL/PJL or you can include the binary printer commands on the stored output file to print as a binary file.

You can have the output written to an existing sequential/partitioned MVS data set or USS HFS file, automatically allocated to a new data set or HFS file, or appended to an existing data set or file. GDG data sets are supported. The MEMBER parameter specifies the relative GDG number to use. SMS support is included.

You can specify data set and file disposition, and JCL allocation attributes:

- On the printer level using the 64-byte TCPHOST parameter.
- On the printer level using the 4*60=240 bytes DRIVPRM1-4 parameters.
- On the print file level using the 4*60=240 byte OUTPUT ADDRESS parameter.

You can specify the above using JCL or have it be automatically assigned using CA Spool DESTID definitions.

Note: TCPHOST parameter is processed first, DRIVPRM1-4 parameters second and OUTPUT ADDRESS parameter is processed third.

If you specify the data set parameter more than once, then the *last* specification is used.

If the TCPHOST parameter is *not* used to specify data set parameters, then you *must* specify a dummy TCPHOST parameter to use the data set print driver.

You can automatically generate unique identifying names; that is, you can specify that output data set names, member names, and HFS file names be synthesized from userid, destination, file name, file number, date, time, job number, job name, job class, job step, proc step, DD name, and fixed text.

To Copy Print Files Unmodified

To copy print files unmodified to MVS data sets or HFS files, you define a new CA Spool printer driver with TCPDRIV=DISK and queue the print files to the new DISK printer.

To Copy Print Files as Complete Output Data-Streams

To copy print files to MVS data sets or to copy them to HFS files as complete output data streams, define a new CA Spool printer that specifies driver option D in the TCPDRIV parameter. For example, define TCPDRIV=PCL5FD and Queue the print files to the new printer.

JCL Parameters

You can specify the following JCL parameters, separated by commas, using the printer node TCPHOST parameter and using the OUTPUT ADDRESS parameters of the file:

```
DSNAME=data-set-name [.PDF/.PDFL/.HTML/.RTF],  
MEMBER={member-name / 0 / +1 / -1},  
DISP=NEW|MOD|OLD|SHR,  
UNIT=device-type,  
VOLSER=volume-serial-number,  
RECFM=F|V,  
LRECL=99999,  
DATACLAS=SMS-data-class-name,  
MGMTCLAS=SMS-management-class-name,  
STORCLAS=SMS-storage-class-name,  
PATH=HFS-file-name [.PDF/.PDFL/.HTML/.RTF],  
PATHMODE=SIRUSR/,SIWUSR/,SIXUSR/,SIRWXU/,SIRGRP/,SIWGRP/,SIXGRP/  
        ,SIRWXG/,SIROTH/,SIWOTH/,SIXOTH/,SIRWXO/,SISUID/,SIGSID
```

PATH includes the complete remote target directory and file name. The maximum value is 118 characters.

Note: DISP=MOD is not supported for PDS members.

Text PDF/PDFL/HTML/RTF Wrapping

If an input text file with a DSNAME or PATH filename extension equal to PDF, PDFL, HTML, or RTF is selected, the file is automatically formatted and converted into the specified data-stream as it is being written to disk. PDFL specifies that linearized PDF must be generated.

The formatting and paper size, orientation, and font style (family, pitch, style, and stroke weight) are controlled by the file's Form, Chars, channel skips, and maximum record length. The default line spacing is 6 LPI, allowing 43 lines per page in landscape and 60 lines per page in portrait. If the lines per page in the data file is higher, LPI and lines per page are automatically adjusted.

Both TCPDRIV option H - page length auto formatting, which is the default, and TCPDRIV option F - FCB-length based auto formatting, are supported.

If the RTF wrapper is used and the input file's form attribute matches FORM=A4*, the output is formatted to A4 paper size.

If the input file's form attribute matches FORM=LET*, the output is formatted to letter paper size.

Note: Separator pages are not supported for files created using CA Spool's Text Wrapping support. ESFU010X is not called for files of this type.

Replacement Variables

To dynamically generate the corresponding unique names, specify the following replacement variables anywhere in the DSNAME, MEMBER, and PATH parameters:

&UID

Userid of the print file creator.

&NOD

Print file destination name.

&FNM

Print file name.

&FNO

Print file number.

&PRM

Print file print-mode.

&DAY

Current date in *Dyymmdd* format.

&JUL

Current date in Julian *Dyyddd* format.

&TIM

Current time in *Thhmmss* format.

&TTL

File Output Title.

&JOB

Jobname of the print file creator.

&JID

Job, STC or TSU id of the print file creator.

&JST

Job step name of the print file creator.

&PST

Proc step name of the print file creator.

&DDN

DD name of the print file creator.

&CLS

Print file class.

&TTL

File output title.

You can specify that only part of the replacement variable be used by specifying offset and length in brackets after the variable. For example, if you enter:

```
&UID(1,4)
```

you have specified that only characters 2 through 5 of the file creator's name are to be used.

If you do not specify JCL parameters, the following default JCL parameters are used:

```
DSNAME=&UID.&NOD.&FNM.&FNO,DISP=NEW
```

Samples

A sample data set printer node definition follows:

```
DEFNODE DISK1,DISK-01,TCPDRIV=DISK,
        CLASS=ALL,
        ACQUIRE=WORK,
        RELEASE=NOWORK
NODE HP6D,DISK1,
     TCPHOST=DISK,
     DRIVPRM1='DSNAME=PUBLIC.&FNM.&FNO,DISP=NEW',
     GROUP=2
```

A sample data set DESTID definition follows:

```
DESTID QDEST=HP6D,QFNAME=SV11*,
       FADDRESS1='DSNAME=UCHPD.DISPATCH.&JUL.&TIM',
       FADDRESS2='UNIT=SYSALLDA,VOLSER=WORK01,DISP=NEW'
```

Email Print Driver

Use this print driver to automatically distribute CA Spool print files, including PDF, HTML, and RTF wrapped text files, by email directly to users' mailboxes for viewing and printing.

The Email print driver provides support for:

- Attaching print files as text, PDF, PCL, Word, Excel, and other file formats
- Automatic conversion of text files into PDF, HTML, or RTF files when they are sent through email
- HTML-based email message body formatting including multiple fonts, colors and image support
- Web Link support

Consequently, the email message includes *a link to the CA Spool file*, rather than the CA Spool file as an attachment. When the user clicks the Web Link, the CA Spool file automatically appears, through the CA Spool Web Interface.

- Control over recipients (including cc and bcc) subject line, and attachment file name
- Automatic creation of unique identifying names for recipient, subject, and attachment
- The OUTPUT statement email parameters MAILTO, MAILCC, MAILBCC, MAILFROM, MAILFILE and REPLYTO are supported

The email print driver can connect:

- *Directly* to a LAN-based email server such as Microsoft Exchange Server, Lotus Notes, or Novell GroupWise
- *Indirectly* through a z/OS-based IBM TCP/IP or TCPAccess SMTP server

You can specify the email subject, message body, recipients, copy recipients, blind copy recipients, and email attachment file name using the standard OUTPUT statement email parameters MAILTO, MAILCC, MAILBCC, MAILFROM, MAILFILE and REPLYTO. The SUBSYS, NJE and XFER interfaces convert these parameters to the corresponding CA Spool email parameters and store them as OUTPUT USERDATA parameters.

Or you can specify the email subject, message body, recipients, copy recipients, blind copy recipients, and email attachment file name at the printer level using the 4*60=240 bytes DRIVPRM1-4 parameters and at the print file level using the 4*60=240 bytes OUTPUT ADDRESS parameter and the 16*60=960 bytes OUTPUT USERDATA parameter, and through a predefined MAILBOOK or Writer specified MAILLIB email parameter members and inline first in the print file before the print data.

You can use CA Spool DESTID definitions to automatically assign OUTPUT ADDRESS parameters.

Inline email parameters are accepted on the first 16 records of the print file. A completely blank line terminates the search for inline email parameters previous to the 16th record. When passing email parameters inline, the carriage control attribute determines the column where the parameters must begin. Email parameters within files whose carriage control attribute is A or M must begin in column 2. Email parameters within files without a carriage control attribute, NOCC files, must begin in column 1. Inline email parameters are limited to 60 characters per line.

The inline email parameters MSGSTART=>> and <<MSGEND= support longer messages, message lines up to 252 bytes and blank lines. MSGSTART=>> and <<MSGEND= must be coded on separate lines above and below the inline message they delimit.

Note: The printer node DRIVPRM1-4 parameters are processed first, OUTPUT ADDRESS parameters are processed second, OUTPUT USERDATA parameters are processed third, MAILLIB email parameter members are processed fourth, and inline email parameters are processed last. If you specify email parameters more than once, then the last specification is used with the exception of TO=, CC= and BCC=. Values for TO=, CC= and BCC= are combined from all of the possible sources. If MSG= is passed as an inline email parameter, it must be the last parameter specified.

MAILLIB PDS members can be used to supply addressing information for the SMTP driver. The MAILLIB PDS is searched for a member equal to the MAILBOOK=mail-book-member value. The first 64 records of up to 60 bytes may contain any email parameters except for MSGSTART=>> and <<MSGEND=. If MAILBOOK= is not specified, the Remote Dest or Writer file attribute, if specified, is used for searching the MAILLIB PDS for a match.

You can have unique identifying names automatically by specifying that email subject, recipient, and attachment file names be synthesized from userid, destination, file name, file number, print-mode, origin host name, date, time, job number, job name, job class, job step, proc step, DD name, and fixed text.

Formatting messages with HTML

Formatting of email HTML messages can be controlled as follows:

- Imbed a completely formatted HTML message first in the CA Spool file enclosed within MSGSTART=>> and <<MSGEND= email parameters. The message between MSGSTART=>> and <<MSGEND= is assumed to be completely formatted if it starts with <HTML>.

Symbolic variables &DAT and &LNK can be used to have the date and Web Link name included in the message.

- If the CA Spool file does not contain a completely formatted inline HTML message, the specified HTMLFORM or the file's form code is looked up in the HTMLIB library. If found, and starting with <HTML>, it is assumed to contain a completely formatted HTML message.

HTMLIB HTML skeleton members can be used to give CA Spool files sent through email a common look and feel.

Symbolic variables &DAT, &LNK and &MSG are replaced with the date, Web Link name as specified by the WEBLINK parameter and message text specified inline or using the OUTPUT statement ADDRESS or USERDATA parameters, respectively.

- If HTMLFORM is not specified and there is no HTML member matching the form attribute of the file, a hard coded HTML skeleton containing &DAT and &MSG is used. The date and message text specified inline or by OUTPUT statement ADDRESS or USERDATA parameters are included. If the WEBLINK email parameter is specified, &LNK symbolic parameter is added to the skeleton to have an Attachment Web Link to the report data automatically added.
- CBQ4OPTN member IQHTSAMP provides instructions for a demonstration of HTML message formatting and Web Link support.
- All messages are translated according to the TRANS printer node parameter setting, if any is specified.

Default: The standard IBM C EBCDIC-to-ASCII translate table is used.

Web Link Support

Reports do not have to be physically shipped to email inboxes. Instead, a Web link URL to a report can be included in an email message. When the link is clicked the report will automatically be viewed through the CA Spool Web Interface. The user has to provide a valid userid and password if the report is being viewed for the first time.

If you are using CA Spool's AFP-to-PDF transformer and you have specified that AFP files must be viewed as PDF files, when you click the link the file will be automatically converted to PDF and Acrobat Reader will be launched in a new Web Browser Window.

To specify that AFP files must be viewed as PDF documents, update \$esfweb.ini parameter ESF_A2PD to 1, 2 or 3. The \$esfweb.ini file can be found in the USS directory specified in your SMP/E proc and must be accessible by the Web Server.

Customization of the A2PDARM dataset is also necessary. You must update the FdOutput parameter to contain the name of the swap directory used by the CA Spool Web Interface:

```
FdOutput='/cai/caspool/swap'
```

An email containing a Web Link to a CA Spool file automatically expires when the file retention expires in CA Spool.

To Email Print Files

To email CA Spool print files

1. Define a new CA Spool printer with TCPDRIV=SMTP.
2. Point TCPHOST and TCPPORT to the SMTP mail server.
3. Queue the print files to the new SMTP printer.

You can specify the default email domain name using the TCPPRRT parameter. The default email domain name is automatically appended to email addresses without domain names (no@domain).

For more information about defining printers, see the chapter Initialization.

Email Parameters

You can specify the following email parameters, separated by commas, using the printer's DRIVPRM1+4 parameters, the MAILBOOK or Writer specified MAILLIB email parameter members, the file's OUTPUT ADDRESS and OUTPUT USERDATA parameters or inline first in the print file *before* the print data:

```
FROM=from-address,  
REPLYTO=reply-to-address,  
TO=to-address,to-address1,to-address2, ... ,to-addressn,  
CC=cc-address,cc-address1,cc-address2, ... ,cc-addressn,  
BCC=bcc-address,bcc-address1,bcc-address2, ... ,bcc-addressn,  
SUBJECT=subject,  
FILENAME=attachment-file-name[.PDF/.PDFL/.HTML/.RTF/.MSG],  
MSGTYPE=[TEXT | HTML],  
WEBLINK=web-link-name,  
WEBHOST=web-interface-host-name,  
WEBPORT=web-interface-port,  
HTMLFORM=html-skeleton-form,  
MAILSTAT=[YES | NO | DELAY | FAILURE | SUCCESS],  
MAILBOOK= mail-book-member,  
MAILCOMB=[FILENAME | GROUPID | USERID],  
DEFTOUSR=YES|NO,  
MSGSTART=>> - start of inline message  
<<MSGEND= - end of inline message  
MSG=message-body-text-lines - must be the last parameter coded
```

- MSGTYPE=[TEXT | HTML]—specifies if the message body must be Plain Text or HTML. The default is TEXT.
- WEBLINK=link-name—specifies the displayed name of the URL Link as shown in the HTML message body.
- WEBHOST=host-name—specifies the host name where the CA Spool Web Interface is active. The default is the local host name.

- **WEBPORT=Port**—specifies the port used by the CA Spool Web Interface. The default is 80.
 - **HTMLFORM=Form**—specifies the name of the HTML skeleton to be included from HTMLIB. The default is the file's form code.
 - **MAILSTAT=YES/NO/DELAY/FAILURE/SUCCESS**—Email Delivery Status Notifications.
 - **MAILCOMB=FILENAME/GROUPID/USERID**—Sends an email with all queued files as attachments that have same the FILENAME, GROUPID or file creator's USERID and have same TO=, CC= and BCC= email parameters. If XEQGRPID=JOBID and MAILCOMB=GROUPID are specified, all files created by a batch job with the same TO=, CC= and BCC= email parameters, are sent as one email with multiple file attachments.
 - **DEFTOUSR=YES|NO** Specifies the action to perform when an email has no TO= value defined:
 - **YES** - Sends the email to the userid that created the email.
 - **NO** - Holds the email.
- Default: YES

The CA Spool transformers support most email parameters as inline data in the print file before the data is transformed. However, the following exceptions exist:

- The CA Spool Java Transformers do not support the MAILCOMB and DEFTOUSR parameter as inline data.
- The CA Spool C Transformers do not support the MAILCOMB, DEFTOUSR, MAILSTAT and MAILBOOK parameters as inline data.
- **MSG=message-body-text-lines**—If this parameter is passed as an inline email parameter, it must be the last parameter coded.

The email is formatted as follows, for both MSGTYPE=HTML and MSGTYPE=TEXT (the default):

- The first non-blank character on each line generates a new line.
- If any line of the MSG parameter extends to column 60, no new lines are generated. Data from the next line continues immediately after the character in column 60 from the previous line.
- The maximum length of FROM, REPLYTO, SUBJECT, FILENAME, WEBLINK and WEBHOST is 60 characters. The full 60 character length can be achieved through continuation on a second line.
- If MSG= is specified with MSGSTART=>> and <<MSGEND=, the message body contains the MSG= data followed by the data between MSGSTART=>> and <<MSGEND=.

- If MSG= is specified with a FILENAME that uses a .MSG extension, such as FILENAME=&FNM.MSG, the message body contains the MSG= data followed by the data in the CA Spool file.
- If MSGSTART=>> and <<MSGEND= are specified with a FILENAME that uses a .MSG file extension, such as FILENAME=&FNM.MSG, the message body contains the data between MSGSTART=>> and <<MSGEND= and the file is attached as a .TXT attachment.

Replacement Variables

You can use the following replacement variables anywhere in the FROM, TO, CC, BCC, SUBJECT, and FILENAME parameters and anywhere in a HTML skeleton to have appropriate unique names dynamically generated:

&UID

Print file creator's userid.

&NOD

Print file destination name.

&FNM

Print file name.

&FNO

Print file number.

&PRM

Print file print-mode.

&HST

Origin host name.

&DAY

Current date in *Dyymmdd* format.

&JUL

Current date in Julian *Dyyddd* format.

&TIM

Current time in *Thhmmss* format.

&JOB

Print file creator's Jobname.

&JID

Print file creator's Job, STC or TSU id.

&JST

Print file creator's job step name.

&PST

Print file creator's proc step name.

&DDN

Print file creator's DD name.

&CLS

Print file class.

&TOD

Current time in *Thhmmss* format.

&DAT

Include the current date in 'mm dd, yy' format. E.g. March 7, 2006.

&DAW

Include the current weekday in '*aaa, dd mmm, yyyy*' format. E.g. Mon, 28 Mar 2006.

&MSG

Include message text specified inline or by using the OUTPUT statement ADDRESS or USERDATA parameters.

If first message line starts with a '<' the message is assumed to be in HTML format. If not, a simple line by line HTML formatting is performed.

If message starts with '<HTML>' it is assumed to be a completely formatted HTML message and no HTMLIB FORM search will be performed.

&LNK

Include Web Link name and URL to the report data.

You can select to include only part of the replacement variables by specifying offset and length in brackets after the replacement variable. For example:

```
&UID(1,4)
```

specifies that only characters 2 through 5 of the file creator's userid are to be used.

If you do not specify email parameters, the file is sent by email to the file creator's mailbox by default. The default values are:

```
FROM=&UID@&TCPVRT  
TO=&UID@&TCPVRT  
SUBJECT=File:99999 name: cccccc - programmer's name field  
FILENAME=&FNM.&PRM
```

Text PDF/PDFL/HTML/RTF Wrapping

If an input text file with a FILENAME extension equal to PDF, PDFL, HTML or RTF is selected, the file is automatically formatted and converted into the specified data-stream when the file is sent as an email attachment. PDFL generates a Linearized PDF

The formatting and paper size, orientation, and font style (family, pitch, style, and stroke weight) are controlled by the file's Form, Chars, channel skips, and max record length. The default line spacing is 6 LPI, allowing 43 lines per page in landscape and 60 lines per page in portrait. If the lines per page in the data file is higher, LPI and lines per page are automatically adjusted.

Both TCPDRIV option H - page length auto formatting, which is the default, and TCPDRIV option F - FCB-length based auto formatting, are supported.

If the RTF wrapper is used and the input file's form attribute matches FORM=A4*, the output is formatted to A4 paper size.

If the input file's form attribute matches FORM=LET*, the output is formatted to letter paper size.

Note: Separator pages are not supported for files created using CA Spool's Text Wrapping support. ESFU010X is not called for files of this type.

Samples

The following is a sample email printer node definition:

```
DEFNODE EMAIL1,EMAIL-01,  
TCPDRIV=SMTP,CLASS=ALL,ACQUIRE=WORK,RELEASE=NOWORK  
NODE HP6M,EMAIL1,TCPHOST=USILDAMY,TCPPOINT=25,TCPPOINT=CA.COM,GROUP=2,  
DRIVPRM1='MAILSTAT=YES'
```

The following is a sample email DESTID definition, which automatically converts text files to PDF attachments:

```
DESTID QDEST=Hp6M, QFNAME=SV20*,  
FADDRESS1='TO=USER01, USER02',  
FADDRESS2='SUBJECT=FILE &FNO - &FNM',  
FADDRESS3='FILENAME=&FNM.PDF'
```

The following is a sample print file with inline email parameters:

```

Spool   (ABCNI20 )      Browse File      Lin   1 of   9
Sub ESF1 Nje           RN           RG      RU      Col   1 of  80
                                           Pag   1 of   1

File  4565 Dest HP6M   Name SVINLINE
-----
TO=ABCNI20@CA.COM
SUBJECT=test af . Ø Å og ..å
MSG=Hi Niels
dette er en inline test af . Ø Å og ..å
/Mvh Niels

//OUT1  OUTPUT CLASS=W,DEST=HPA9,PRMODE=PAGE           00035037
//OUT2  OUTPUT CLASS=A,DEST=DNCHGNPE,PRMODE=PAGE      00036037
//OUT3  OUTPUT CLASS=W,DEST=HP60,PRMODE=PAGE,FORMDEF=P610 00037037
-----
Command ==>
F1=Help F3=End F4=Return F5=Rfind F7=Up F8=Down F10=Left F11=Right

```

Sending Email Using CA TCPaccess

To send CA Spool emails using CA TCPaccess SMTP Service, configure CA TCPaccess SMTP so that the CA TCPaccess SMTP mail server creates output using the same destination as the CA TCPaccess SPOOL#4 mail spooler. Incoming emails are then automatically queued for the CA TCPaccess USMTP – SMTP mail sender.

The following is an extract of a CA TCPaccess SMTP configuration file:

```

SMTP CYCLE(3 10 96)
  DIVERT(X 9999999)
  MX
  PATH(SNSTCP.V2.EMAIL1U)
  REMOTE(SM1U)
  ROUTE(A SM1U)
  RETURN(Y LOCAL)

```

SAR Print Driver

Use this print driver to automatically write all types of CA Spool print files, including PDF/HTML/RTF wrapped text files, directly into a CA View report database for archiving and viewing using the CA View 3270 online interface or using CA Output Management Web Viewer. Users can also view these files through Acrobat Reader, a web browser, or Microsoft Word.

The SAR print driver provides support for:

- Text reports stored in EBCDIC without translation and with preservation of carriage control information
- Automatic conversion of text files into PDF, HTML or RTF files while being written to a CA View report database

You can specify CA View report attributes and processing options:

- On the printer level using the 64-byte TCPHOST parameter
- On the printer level using the 4*60=240 bytes DRIVPRM1-4 parameters
- On the print file level using the 4*60=240-byte OUTPUT ADDRESS parameter

You can specify this using JCL or have it be automatically assigned using CA Spool DESTID definitions.

Note: The TCPHOST parameter is processed first, DRIVPRM1-4 parameters second and the OUTPUT ADDRESS parameter is processed last.

If you specify a CA View parameter more than once, then the *last* specification is used.

If the TCPHOST parameter is *not* used to specify CA View parameters, then you *must* specify a dummy TCPHOST parameter to use the SAR print driver.

You can automatically generate unique identifying names; that is, you can specify that the CA View report name must be synthesized from userid, destination, file name, file number, date, time, job number, job name, job class, job step, proc step, DD name, and fixed text.

To Copy Print Files Unmodified

To copy CA Spool print files unmodified to CA View, define a new CA Spool printer driver with TCPDRIV=SAR and without any TRANS= parameter, and queue the print files to the new SAR printer.

JCL Parameters

You can specify the following JCL parameters, separated by commas, using the printer node TCPHOST parameter and using the file's OUTPUT ADDRESS parameters:

```
FILENAME=file-name[.PDF/.PDFL/.HTML/.RTF],  
AM=SAR, (or TCPDRIV=SAR)  
SAR=CA View-database-name
```

Replacement Variables

You can specify the following replacement variables anywhere in the FILENAME parameter to have appropriate unique names dynamically generated:

&UID

Print file creator's userid

&NOD

Print file destination name

&FNM

Print file name

&FNO

Print file number

&PRM

Print file print-mode

&DAY

Current date in *Dyymmdd* format

&JUL

Current date in Julian *Dyyddd* format

&TIM

Current time in *Thhmss* format

&JOB

Print file creator's Jobname.

&JID

Print file creator's Job, STC or TSU id.

&JST

Print file creator's job step name.

&PST

Print file creator's proc step name.

&DDN

Print file creator's DD name.

&CLS

Print file class.

You can specify that only part of the replacement variable be used by specifying offset and length in brackets after the variable. For example, if you enter:

`&JID(1,4)`

you have specified that only characters 2 through 5 of the file creator's name are to be used.

Text PDF/PDFL/HTML/RTF Wrapping

If an input text file with a FILENAME extension of PDF, PDFL, HTML or RTF is selected, the file is automatically formatted and converted into the specified data-stream as it is being written to CA View. PDFL generates a linearized PDF.

The formatting and paper size, orientation, and font style (family, pitch, style, and stroke weight) are controlled by the file's Form, Chars, channel skips, and max record length. The default line spacing is 6 LPI, allowing 43 lines per page in landscape and 60 lines per page in portrait. If the lines per page in the data file is higher, LPI and lines per page are automatically adjusted.

Both TCPDRIV option H - page length auto formatting, which is the default, and TCPDRIV option F - FCB-length based auto formatting, are supported. If the RTF wrapper is used and the input file's FORM=A4*, the output will be formatted to A4 paper size, and if the input file's FORM=LET*, the output will be formatted to letter paper size.

Note: Separator pages are not supported for files created using CA Spool's Text Wrapping support. ESFU010X is not called for files of this type.

Samples

A sample SAR printer node definition follows:

```
DEFNODE VIEW1,VIEW-01,TCPDRIV=SAR,
      CLASS=ALL,
      ACQUIRE=WORK,
      RELEASE=NOWORK
NODE HP6DSAR,VIEW1,
      TCPHOST=VIEW,
      DRIVPRM1='SAR=CAVIEW.DATABASE',
      GROUP=2
```

The following sample DESTID definition automatically converts text files to PDF and writes the PDF files to the CA View report database:

```
DESTID QDEST=HP6DSAR,QFNAME=SV11*,
      FADDRESS1='FILENAME=&FNM.PDF'
```

JES Print Driver

Use this print driver to automatically write all types of CA Spool print files, including PDF/HTML/RTF wrapped text files, directly into CA Dispatch, CA Deliver, CA Bundl, or JES. These text files can then be converted to PDF/HTML/RTF reports before they are stored in CA Dispatch, CA View, and CA Bundl. From here they can be viewed using CA OM Web Viewer using Acrobat Reader, the native web browser, or Microsoft Word.

The JES print driver provides support for:

Text reports stored in EBCDIC without translation and with preservation of carriage control information

- Automatic conversion of text files into PDF, HTML or RTF files while being written to CA Dispatch, CA Deliver, CA Bundl, or JES

You can specify JES report attributes and processing options:

- On the printer level using the 64-byte TCPHOST parameter
- On the printer level using the 4*60=240 bytes DRIVPRM1-4 parameters
- On the print file level using the 4*60=240 byte OUTPUT ADDRESS parameter

You can specify this using JCL or have it be automatically assigned using CA Spool DESTID definitions.

Note: The TCPHOST parameter is processed first, DRIVPRM1-4 parameters second and the OUTPUT ADDRESS parameter is processed last.

If you specify a JES parameter more than once, then the *last* specification is used.

If the TCPHOST parameter is *not* used to specify JES parameters, then you *must* specify a dummy TCPHOST parameter to use the JES print driver.

You can automatically generate unique identifying names; that is, you can specify that the JES job name must be synthesized from userid, destination, file name, file number, date, time, job number, job name, job class, job step, proc step, DD name, and fixed text.

To Copy Print Files Unmodified

To copy CA Spool print files unmodified to JES, define a new CA Spool printer driver with TCPDRIV=JES and without any TRANS= parameter, and queue the print files to the new JES printer.

JCL Parameters

You can specify the following JCL parameters, separated by commas, using the printer node TCPHOST parameter and using the file's OUTPUT ADDRESS parameters:

```
FILENAME=file-name[.PDF/.PDFL/.HTML/.RTF],
AM=JES          (or TCPDRIV=JES)
```

Replacement Variables

You can specify the following replacement variables anywhere in the FILENAME parameter to have appropriate unique names dynamically generated:

&UID

Print file creator's userid

&NOD

Print file destination name

&FNM

Print file name

&FNO

Print file number

&PRM

Print file print-mode

&DAY

Current date in *Dyyymmdd* format

&JUL

Current date in Julian *Dyyddd* format

&TIM

Current time in *Thhmmss* format

&JOB

Print file creator's Jobname.

&JID

Print file creator's Job, STC or TSU id.

&JST

Print file creator's job step name.

&PST

Print file creator's proc step name.

&DDN

Print file creator's DD name.

&CLS

Print file class.

You can specify that only part of the replacement variable be used by specifying offset and length in brackets after the variable. For example, if you enter:

```
&UID(1,4)
```

You have specified that only characters 2 through 5 of the file creator's name are to be used.

Text PDF/PDFL/HTML/RTF Wrapping

If an input text file with a FILENAME extension equal to PDF, PDFL, HTML or RTF is selected, the file is automatically formatted and converted into the specified data-stream as it is being written. PDFL specifies that Linearized PDF must be generated.

The formatting and paper size, orientation, and font style (family, pitch, style, and stroke weight) are controlled by the file's Form, Chars, channel skips, and max record length. The default line spacing is 6 LPI, allowing 43 lines per page in landscape and 60 lines per page in portrait. If the lines per page in the data file is higher, LPI and lines per page are automatically adjusted.

Both TCPDRIV option H - page length auto formatting, which is the default, and TCPDRIV option F - FCB-length based auto formatting, are supported. If the RTF wrapper is used and the input file's FORM=A4*, the output will be formatted to A4 paper size, and if the input file's FORM=LET*, the output will be formatted to letter paper size.

Note: Separator pages are not supported for files created using CA Spool's Text Wrapping support. ESFU010X is not called for files of this type.

Samples

A sample JES printer node definition follows:

```
DEFNODE JES1,JES-01,TCPDRIV=JES,
        CLASS=ALL,
        ACQUIRE=WORK,
        RELEASE=NOWORK
NODE HP6DJES,JES1,
     TCPHOST='DUMMY',
     GROUP=2
```

The following sample DESTID definition automatically converts text files to HTML and writes the HTML files to JES:

```
DESTID QDEST=HP6DJES,QFNAME=SV11*,  
      FADDRESS1=' FILENAME=&FNM.HTML '
```

ESF Print Driver

Use this print driver to automatically write all types of CA Spool print files, including PDF/HTML/RTF wrapped text files, directly into the same or another CA Spool system.

The ESF print driver provides support for:

- Text reports stored in EBCDIC without translation and with preservation of carriage control information
- Automatic conversion of text files into PDF, HTML or RTF files while being written to a CA Spool system

You can specify ESF report attributes and processing options:

- On the printer level using the 64-byte TCPHOST parameter
- On the printer level using the 4*60=240 bytes DRIVPRM1-4 parameters
- On the print file level using the 4*60=240 byte OUTPUT ADDRESS parameter

You can specify this using JCL or have it be automatically assigned using CA Spool DESTID definitions.

Note: The TCPHOST parameter is processed first, DRIVPRM1-4 parameters second and the OUTPUT ADDRESS parameter is processed last.

If you specify an ESF print driver parameter more than once, then the *last* specification is used. If the TCPHOST parameter is *not* used to specify ESF parameters, then you *must* specify a dummy TCPHOST parameter to use the ESF print driver.

You can automatically generate unique identifying names; that is, you can specify that the ESF file name must be synthesized from userid, destination, file name, file number, date, time, job number, job name, job class, job step, proc step, DD name, and fixed text.

To Copy Print Files Unmodified

To copy CA Spool print files unmodified to a CA Spool system, define a new CA Spool printer driver with TCPDRIV=ESF and without any TRANS= parameter, and queue the print files to the new ESF printer.

JCL Parameters

You can specify the following JCL parameters, separated by commas, using the printer node TCPHOST parameter and using the file's OUTPUT ADDRESS parameters:

```
FILENAME=file-name[.PDF/.PDFL/.HTML/.RTF],  
AM=ESF, (or TCPDRIV=ESF)  
ESF=CA Spool-Subsystem-name
```

Replacement Variables

You can specify the following replacement variables anywhere in the FILENAME parameter to have appropriate unique names dynamically generated:

&UID

Print file creator's userid

&NOD

Print file destination name

&FNM

Print file name

&FNO

Print file number

&PRM

Print file print-mode

&DAY

Current date in *Dyyymmdd* format

&JUL

Current date in Julian *Dyyddd* format

&TIM

Current time in *Thhmmss* format

&JOB

Print creator's creates Jobname.

&JID

Print file creator's Job, STC, or TSU id.

&JST

Print file creator's job step name.

&PST

Print file creator's proc step name.

&DDN

Print file creator's DD name.

&CLS

Print file class.

You can specify that only part of the replacement variable be used by specifying offset and length in brackets after the variable. For example, if you enter:

```
&UID(1,4)
```

you have specified that only characters 2 through 5 of the file creator's name are to be used.

Text PDF/PDFL/HTML/RTF Wrapping

If an input text file with a FILENAME extension equal to PDF, PDFL, HTML or RTF is selected, the file is automatically formatted and converted into the specified data-stream as it is being written to CA Spool. PDFL generates linearized PDF.

The formatting and paper size, orientation, and font style (family, pitch, style, and stroke weight) are controlled by the file's Form, Chars, channel skips, and max record length. The default line spacing is 6 LPI, allowing 43 lines per page in landscape and 60 lines per page in portrait. If the lines per page in the data file is higher, LPI and lines per page are automatically adjusted.

Both TCPDRIV option H - page length auto formatting, which is the default, and TCPDRIV option F - FCB-length based auto formatting, are supported. If the RTF wrapper is used and the input file's FORM=A4*, the output will be formatted to A4 paper size, and if the input file's FORM=LET*, the output will be formatted to letter paper size.

Note: Separator pages are not supported for files created using CA Spool's Text Wrapping support. ESFU010X is not called for files of this type.

Samples

A sample ESF printer node definition follows:

```
DEFNODE ESF1,ESF-01,TCPDRIV=ESF,  
        CLASS=ALL,  
        ACQUIRE=WORK,  
        RELEASE=NOWORK
```

```
NODE HP6DESF,ESF1,  
      TCPHOST=ESF1,  
      DRIVPRM1='ESF=ESF1',  
      GROUP=2
```

The following sample DESTID definition automatically converts text files to RTF and writes the RTF files to CA Spool:

```
DESTID QDEST=HP6DESF,QFNAME=SV11*,  
      FADDRESS1='FILENAME=&FNM.RTF'
```

FTP Print Driver

Use this print driver to automatically FTP transfer all types of CA Spool print files, including PDF/HTML/RTF wrapped text files, directly to a remote FTP server for further processing.

The FTP print driver provides support for:

- Text reports stored in EBCDIC without translation and with preservation of carriage control information
- Automatic conversion of text files into PDF, HTML or RTF files while being transferred to a remote FTP server.

You can specify FTP report attributes and processing options:

- On the printer level using the using the 4*60=240 bytes DRIVPRM1-4 parameters.
- On the print file level using the 4*60=240 byte OUTPUT ADDRESS parameters.

You can specify this using JCL or have it be automatically assigned using CA Spool DESTID definitions.

If you specify an FTP print driver parameter more than once, then the *last* specification is used.

You can automatically generate unique identifying names; that is, you can specify that the FILENAME= *remote-file-name* must be synthesized from userid, destination, file name, file number, date, time, job number, job name, job class, job step, proc step, DD name, and fixed text.

NETRC Data Set

The NETRC data set provides you with an alternative to specifying your userid and password as FTP parameters when you want to FTP to a remote host.

To use the NETRC data set you need to activate the following DD statement in the JCL procedure for CA Spool:

```
//*-----*  
//* Common FTP, CA XCOM and Connect:Direct userid/password file *  
//*-----*  
//NETRC DD DISP=SHR,DSN=&PARMLIB(IQNETRC)
```

The supplied CBQ4PARAM(IQNETRC) sample contains the following sample definitions:

```
*  
* Common FTP, CA XCOM and Connect:Direct userid/password file  
*  
machine ftp.com login userid1 password pass1  
machine 111.222.33.44 login uesrid2 password pass2  
machine XCOM.IPNAME.com login uesrid3 password pass3  
machine XCOMLUX login uesrid4 password pass4  
machine XCOMGROUPx login uesrid5 password pass5  
machine ConnectDirect login uesrid6 password pass6
```

If no FTPUSER and FTPPASS parameters are specified on a FTP request, the remote FTP machine is looked up in the NETRC data set. If the machine is found, its password is used.

If the FTPUSER is specified without FTPPASS, the FTP machine and the FTPUSER is looked up in the NETRC data set. If the machine is found, its password is used.

If the NETRC data set is used, it must be secured against unauthorized read and write access.

Transfer Print Files to a Remote FTP Server

To transfer CA Spool print files to a remote FTP server

1. Define a new CA Spool printer with TCPDRIV=FTP.
2. Point TCPHOST and TCPPORT to the remote FTP server.
3. Create new CA Spool print files with FILENAME, FTPUSER and FTPPASS parameters specified via OUTPUT ADDRESS parameters to the new FTP printer.

Transfer Files to a Remote FTPS Server

Use the CA Spool FTP print driver to transfer files to a remote FTP server that requires SSL/TLS for file transfers.

Follow these steps:

1. Securely export the certificate for the remote server to a system running CA Spool.

Note: For instructions to export the certificate, see the documentation for the security software for the server.

2. Add the server certificate to a keyring of the userid that is assigned to the CA Spool task.

Note: For instructions to create a keyring for a user and to add a certificate stored in a dataset, see the documentation for the security software for your environment. If the server certificate is not self-signed, add a signer's Certification Authority (CA) certificate to the keyring.

3. Copy the sample FTP.DATA file from TCPIP.SEZAINST(FTCDATA) to a data set of your choice. To specify the location of FTP.DATA, use the `DRIVPRMx='FTPDATA=data.set.name'` option of the NODE statement. An example follows:

```
NODE FTPS,TCPIP,TCPDRIV=FTP,TCPPORT=21,TCPHOST=ftps.domain.com
      DRIVPRM1='FTPDATA=FTP.DATA'
```

4. Open the FTP.DATA file for editing and add or modify the following statements.

```
SECURE_MECHANISM  TLS                ; Sends AUTH TLS command
KEYRING           esfuid/keyring name ; Specifies keyring name
SECURE_DATACONN  PRIVATE             ; Client requires data to be
transferred enciphered
```

If the CA Spool NODE parameter specifies either the `TCPDRIV=FTPT` or `TCPDRIV=FTPe` option, the following line is written to FTP client log:

```
ESF Using 'FTP.DATA' for local site configuration parameters
```

Note: For more information about FTP.DATA file statements, see the *z/OS Communications Server: IP Configuration Reference*. For more information about how to use AT-TLS and how to implement FTP client authentication using certificates, see the *z/OS Communications Server: IP Configuration Guide*: see the section for customizing the FTP server for Transport Layer Security (TLS). For information to diagnose Secure Socket Layer (SSL) function return codes, see the *z/OS Cryptographic Services System SSL Programming Guide*.

Important! We strongly recommend securing connections with TLS instead of SSL.

CA Top Secret Example

This example explains how to export the certificate of an FTP server and add it to CA Spool started task userid. This example applies if CA Top Secret is the security software for your environment.

1. Enter the following command to export the certificate to a dataset to transfer to the client:

```
TSS EXPORT(FTPD) DIGICERT(FTPDCERT) DCDSN('FTPS.SERVER.CERT')
```

2. Enter the following commands to add the server certificate to the userid for the CA Spool task:

```
TSS ADDTO(CASPOOL) DIGICERT(FTPDCERT) DCDSN('FTPS.SERVER.CERT')
TSS REPLACE(CASPOOL) DIGICERT(FTPDCERT) TRUST
```

3. Enter the following command to create the keyring for the CA Spool task userid:

```
TSS ADD(CASPOOL) KEYRING(ESFRING) LABLRING(ESFRING)
```

4. Add the FTP server certificate to the keyring for the CA Spool task userid:

```
TSS ADDTO(CASPOOL) KEYRING(ESFRING) RINGDATA(CASPOOL,FTPDCERT) DEFAULT -
USAGE(PERSONAL)
```

5. If the server certificate is not self-signed, export the Certification Authority (CA) certificate of the signer and add it to the keyring, as follows:

Enter the following command at the server:

```
TSS EXPORT(CERTAUTH) DIGICERT(CACERT) DCDSN('FTPS.SERVER.CACERT')
```

Enter the following commands at the client:

```
TSS ADDTO(CERTAUTH) DIGICERT(CACERT) DCDSN('FTPS.SERVER.CACERT')
TSS ADDTO(CASPOOL) KEYRING(ESFRING) RINGDATA(CERTAUTH,CACERT) - USAGE(CERTAUTH)
```

6. Enter the following commands to permit CA Spool to work with digital certificates:

```
TSS ADDTO(deptacid) IBMFAC(IRR.)
```

```
TSS PER(CASPOOL) IBMFAC(IRR.DIGTCERT.GENCERT) ACC(UPDATE)
```

```
TSS PER(CASPOOL) IBMFAC(IRR.DIGTCERT.LISTRING) ACC(UPDATE)
```

```
TSS PER(CASPOOL) IBMFAC(IRR.DIGTCERT.LIST) ACC(UPDATE)
```

Note: For more information about CA Top Secret commands and keywords, see the *CA Top Secret Command Functions Guide*.

CA ACF2 Example

This example explains how to export the certificate of an FTP server and add it to CA Spool started task userid. This example applies if CA ACF2 is the security software for your environment.

1. Enter the following command to export the certificate to a dataset to transfer to the client:

```
ACF
EXPORT FTPD DSNAME('FTPS.SERVER.CERT') LABEL(FTPDCERT)
```

2. Enter the following commands to add the server certificate to the CA Spool task userid:

```
ACF
SET PROFILE(USER) DIV(CERTDATA)
INSERT CASPOOL.suffix DSNAME('FTPS.SERVER.CERT') LABEL(FTPDCERT) TRUST
```

3. Enter the following command to create the keyring for the CA Spool task userid:

```
ACF
SET PROFILE(USER) DIV(KEYRING)
INSERT CASPOOL.suffix RINGNAME(ESFRING)
```

4. Add the FTP server certificate to the keyring for the CA Spool task userid:

```
ACF
CONNECT CERTDATA(CASPOOL.suffix) LABEL(FTPDCERT) KEYRING(CASPOOL.suffix) +
RINGNAME(ESFRING) USAGE(PERSONAL) DEFAULT
```

5. If the server certificate is not self-signed, export the Certification Authority (CA) certificate of the signer and add it to the keyring, as follows:

Enter the following command at the server:

```
ACF
EXPORT CERTAUTH DSNAME('CHQA.SERVER.CACERT') LABEL(CACERT)
```

Enter the following commands at the client:

```
ACF
SET PROFILE(USER) DIV(CERTDATA)
INSERT CERTAUTH.suffix DSNAME('FTPS.SERVER.CACERT') LABEL(CACERT) TRUST
CONNECT CERTDATA(CERTAUTH.suffix) LABEL(CACERT) KEYRING(CASPOOL.suffix) +
RINGNAME(ESFRING) USAGE(CERTAUTH)
```

6. Enter the following commands to permit CA Spool to work with digital certificates:

```
ACF
SET RESOURCE(FAC)
COMPILE * STORE
$KEY(IRR) TYPE(FAC)
DIGTCERT.GENCERT UID(*****CASPOOL) SERVICE(READ,UPDATE) ALLOW
DIGTCERT.LIST UID(*****CASPOOL) SERVICE(READ,UPDATE) ALLOW
DIGTCERT.LISTRING UID(*****CASPOOL) SERVICE(READ,UPDATE) ALLOW
END
```

```
STORE
F ACF2,REBUILD(FAC)
```

Note: For more information about CA ACF2 commands and keywords, see the *CA ACF2 for z/OS Command Reference Guide*.

RACF Example

This example explains how to export the certificate of an FTP server and add it to CA Spool started task userid. This example applies if RACF is the security software for your environment.

1. Enter the following command to export the certificate to a dataset to transfer to the client:

```
RACDCERT EXPORT(LABEL('FTPDCERT')) ID(FTP) DSN('FTPS.SERVER.CERT')
```

2. Enter the following commands to add the server certificate to the CA Spool task userid:

```
RACDCERT ID(CASPOOL) ADD('FTPS.SERVER.CERT') WITHLABEL('FTPDCERT') TRUST
```

3. Enter the following command to create the keyring for the CA Spool task userid:

```
RACDCERT ID(CASPOOL) ADDRING(ESFRING)
```

4. Add the FTP server certificate to the keyring for the CA Spool task userid:

```
RACDCERT ID(CASPOOL) CONNECT(ID(CASPOOL) LABEL('FTPDCERT') RING(ESFRING) +
USAGE(PERSONAL))
```

5. If the server certificate is not self-signed, export the signer's Certification Authority (CA) certificate and add it to the keyring, as follows:

Enter the following command at the server:

```
RACDCERT EXPORT(LABEL('CACERT')) CERTAUTH DSN('FTPS.SERVER.CACERT')
```

Enter the following commands at the client:

```
RACDCERT CERTAUTH ADD('FTPS.SERVER.CACERT') WITHLABEL('CACERT') TRUST
RACDCERT ID(CASPOOL) CONNECT(CERTAUTH LABEL('CACERT') RING(ESFRING) +
USAGE(CERTAUTH))
```

6. Enter the following commands to permit CA Spool to work with digital certificates:

```
RDEFINE FACILITY IRR.DIGTCERT.LISTRING UACC(NONE)
RDEFINE FACILITY IRR.DIGTCERT.LIST UACC(NONE)
RDEFINE FACILITY IRR.DIGTCERT.GENCERT UACC(NONE)
PERMIT IRR.DIGTCERT.LISTRING CL(FACILITY) ID(CASPOOL) ACCESS(UPDATE)
PERMIT IRR.DIGTCERT.LIST CL(FACILITY) ID(CASPOOL) ACCESS(UPDATE)
PERMIT IRR.DIGTCERT.GENCERT CL(FACILITY) ID(CASPOOL) ACCESS(UPDATE)
SETROPTS RACLIST(FACILITY) REFRESH
```

Note: For more information about RACF commands and keywords, see the *IBM z/OS Security Server RACF Command Language Reference*.

FTP Print Files Unmodified

To transfer CA Spool print files unmodified to a remote FTP server, define a new CA Spool printer driver with TCPDRIV=FTP and without any TRANS=parameter, and queue the print files to the new FTP printer.

JCL Parameters

You can specify the following JCL parameters, separated by commas, using the file's OUTPUT ADDRESS parameters:

```
PATH=remote-directory,  
FILENAME=remote-file-name[.PDF/.PDFL/.HTML/.RTF],  
FTPUSER= remote-userid,  
FTPPASS= remote-password,  
FTPACCT= remote-account-info,  
FTPAUTH= NEVER|GSSAPI|TLS  
FTPDATA= FTP.DATA file  
DSNAME=temp-data-set-name,  
DISP=NEW|MOD|OLD|SHR,  
UNIT=device-type,  
VOLSER=volume-serial-number,  
RECFM=F|V,  
LRECL=99999,  
DATACLAS=temp-data-set-SMS-data-class-name,  
MGMTCLAS=temp-data-set-SMS-management-class-name,  
STORCLAS=temp-data-set-SMS-storage-class-name,  
AM=FTP, (or TCPDRIV=FTP)
```

PATH and FILENAME are combined to form the complete remote target directory and file name. This extends the value used to a maximum of 106 characters.

Replacement Variables

You can specify the following replacement variables anywhere in the FILENAME, FTPUSER, FTPPASS, FTPACCT and DSNAME parameters to have appropriate unique names dynamically generated:

&UID

 Userid of the print file creator

&NOD

 Print file destination name

&FNM

Print file name

&FNO

Print file number

&PRM

Print file print-mode

&DAY

Current date in *Dyymmdd* format

&JUL

Current date in Julian *Dyyddd* format

&TIM

Current time in *Thhmmss* format

&JOB

Jobname of the print file creator

&JID

Job, STC or TSU id of the print file creator

&JST

Job step name of the print file creator

&PST

Proc step name of the print file creator

&DDN

DD name of the print file creator

&CLS

Print file class

You can specify that only part of the replacement variable be used by specifying offset and length in brackets after the variable. For example, if you enter:

`&JID(1,4)`

you have specified that only characters 2 through 5 of the file creator's name are to be used.

If you do not specify JCL parameters, the following default JCL parameter are used:

```
FTPUSER=&UID
FILENAME=&UID.&NOD.&FNM.&FNO
DSNAME=&UID.&NOD.&FNM.&FNO,DISP=NEW
```

Wrapping for Text, PDF, PDFL, HTML, and RTF

If the FILENAME extension of an input text file equals PDF, PDFL, HTML or RTF, the file is automatically formatted and converted into the specified data-stream before it is transferred. PDFL generates Linearized PDF.

The formatting and paper size, orientation, and font style (family, pitch, style, and stroke weight) are controlled by the Form, Chars, channel skips, and max record length of the file. The default line spacing is 6 LPI, allowing 43 lines per page in landscape and 60 lines per page in portrait. If the lines per page in the data file is higher, LPI and lines per page are automatically adjusted.

Both of the following are supported: TCPDRIV option H - page length auto formatting (the default) and TCPDRIV option F - FCB-length based auto formatting.

If the RTF wrapper is used and FORM=A4* in the input file, the output is formatted to A4 paper size. If FORM=LET* in the input file, the output is formatted to letter paper size.

Note: Separator pages are not supported for files that you create using CA Spool Text Wrapping support. ESFU010X is not called for files of this type.

Samples

A sample FTP printer node definition follows:

```
DEFNODE FTP1,FTP-01,TCPDRIV=FTP,
      CLASS=ALL,
      ACQUIRE=WORK,
      RELEASE=NOWORK
NODE HP6DFTP,FTP1,
      TCPHOST=ftp.com,
      TCPPORT=21,
      DRIVPRM1='DSNAME=PUBLIC.&UID.&NOD.&FNO',
      GROUP=2
```

The following sample DESTID definition automatically converts text files to PDF and transfers the PDF files to the remote FTP host:

```
DESTID QDEST=HP6DFTP,QFNAME=SV11*,
      DADDRESS1='FTPUSER=anonymous,FTPPASS=guest',
      FADDRESS2='FILENAME=/tmp/&UID/&FNM.PDFL'
```

XCOM Print Driver

Use this print driver to automatically transfer all types of CA Spool print files, including PDF/HTML/RTF wrapped text files, using CA XCOM Data Transport directly to remote XCOM servers running on various platforms for further processing.

The XCOM print driver provides support for:

- Text reports stored in EBCDIC without translation and with preservation of carriage control information
- Automatic conversion of text files into PDF, HTML or RTF files while being transferred to a remote XCOM server.

You can specify XCOM report attributes and processing options:

- On the printer level using the 64-byte TCPHOST parameter.
- On the printer level using the using the 4*60=240 bytes DRIVPRM1-4 parameters.
- On the print file level using the 4*60=240 byte OUTPUT ADDRESS parameter

You can specify this using JCL or have it be automatically assigned using CA Spool DESTID definitions.

Note: TCPHOST parameter is processed first, DRIVPRM1-4 parameters second and OUTPUT ADDRESS parameter is processed third.

If you specify an XCOM print driver parameter more than once, then the *last* specification is used. If the TCPHOST parameter is *not* used to specify XCOM parameters, then you *must* specify a dummy TCPHOST parameter to use the XCOM print driver.

You can automatically generate unique identifying names; that is, you can specify that the FILENAME= *remote-file-name* must be synthesized from userid, destination, file name, file number, date, time, job number, job name, job class, job step, proc step, DD name, and fixed text.

XCOM CA Spool JCL

To use the XCOM print driver you need to add the following DD statements to the JCL procedure for CA Spool:

```
//STEPLIB DD
//          DD DISP=SHR,DSN=CAI.XCOM.CBGXLOAD
. . .
//*-----*
//* Common FTP, CA XCOM and Connect:Direct userid/password file *
//*-----*
```



```
//NETRC DD DISP=SHR,DSN=&PARMLIB(IQNETRC)
//*-----*
//* CA XCOM libraries. *
//*-----*
//XCOMCNTL DD DISP=SHR,DSN=CAI.XCOM.CBXGPARAM
//XCOMSYSI DD DISP=SHR,DSN=&PARMLIB(IQXCOMPR)
//SYSIN01 DD DSN=&SYSIN01,UNIT=SYSDA,SPACE=(TRK,(1,1))
//LCLDS01 DD DSN=&LCLDS01,UNIT=SYSDA,SPACE=(CYL,(10,10))
```

XCOM SYSIN01 Parameters

Sample XCOM SYSIN01 parameters are supplied in member IQXCOMPR in CBQ4PARAM. During XCOM file transfer these parameters are merged with the CA Spool specified XCOM parameters and written to DD SYSIN01 for processing by CA XCOM.

NETRC Data Set

The NETRC data set provides you with an alternative to specifying your userid and password as XCOM parameters when you want to use CA XCOM to transfer a file to a remote CA XCOM server.

The supplied CBQ4PARAM(IQNETRC) sample contains the following sample definitions:

```
*
* Common FTP, CA XCOM and Connect:Direct userid/password file
*
machine ftp.com login userid1 password pass1
machine 111.222.33.44 login uesrid2 password pass2
machine XCOM.IPNAME.com login uesrid3 password pass3
machine XCOMLUx login uesrid4 password pass4
machine XCOMGROUPx login uesrid5 password pass5
machine ConnectDirect login uesrid6 password pass6
```

If no USERID or PASSWORD parameters are specified on a XCOM request, the remote XCOM IPNAME.LU or GROUP parameter is looked up in the NETRC data set. If it is found, the corresponding login userid and password are used.

If the USERID is specified without a PASSWORD the remote XCOM IPNAME.LU or GROUP parameter and the USERID is looked up in the NETRC data set and if found the corresponding password will be used.

If the NETRC data set is used it must be secured against unauthorized read and write access.

To Transfer Print Files

To transfer CA Spool print files to a remote XCOM server

1. Define a new CA Spool printer with TCPDRIV=XCOM.
2. Define TCPHOST=DUMMY.
3. Create new CA Spool print files with FILENAME, USERID and PASSWORD parameters specified via OUTPUT ADDRESS parameters to the new XCOM printer.

To Transfer Print Files Unmodified

To transfer CA Spool print files unmodified to a remote XCOM server, define a new CA Spool printer driver with TCPDRIV=XCOM and without any TRANS=parameter, and queue the print files to the new XCOM printer.

JCL Parameters

You can specify the following JCL parameters, separated by commas, using the file's OUTPUT ADDRESS parameters:

```
PATH=remote-directory,  
FILENAME= remote-file-name[.PDF/.PDFL/.HTML/.RTF],  
USERID= remote-userid,  
PASSWORD= remote-password,  
ACBNAME= local-ACBNAME,  
DOMAIN= remote-domain,  
GROUP= remote-GROUP,  
IPNAME= remote-IP-host,  
IPPORT= remote-IP-port,  
LU= remote-LU,  
DISP=NEW|OLD,  
AM=XCOM (or TCPDRIV=XCOM)
```

PATH and FILENAME are combined to form the complete remote target directory and file name. This extends the value used to a maximum of 106 characters.

Replacement Variables

You can specify the following replacement variables anywhere in the FILENAME, USERID, and PASSWORD parameters to have appropriate unique names dynamically generated:

&UID

Userid of the print file creator

&NOD

Print file destination name

&FNM

Print file name

&FNO

Print file number

&PRM

Print file print-mode

&DAY

Current date in *Dyymmdd* format

&JUL

Current date in Julian *Dyyddd* format

&TIM

Current time in *Thhmmss* format

&JOB

Jobname of the print file creator

&JID

Job, STC or TSU id of the print file creator

&JST

Job step name of the print file creator

&PST

Proc step name of the print file creator

&DDN

DD name of the print file creator

&CLS

Print file class

You can specify that only part of the replacement variable be used by specifying offset and length in brackets after the variable. For example, if you enter:

```
&UID(1,4)
```

you have specified that only characters 2 through 5 of the file creator's name are to be used.

If you do not specify JCL parameters, the following default JCL parameter are used:

```
USERID=&UID  
FILENAME=&UID.&NOD.&FNM.&FNO
```

Text PDF/PDFL/HTML/RTF Wrapping

If an input text file with a FILENAME extension equal to PDF, PDFL, HTML or RTF is selected, the file is automatically formatted and converted into the specified data-stream as it is being written to disk. PDFL specifies that Linearized PDF must be generated.

The formatting and paper size, orientation, and font style (family, pitch, style, and stroke weight) are controlled by the file's Form, Chars, channel skips, and max record length. The default line spacing is 6 LPI, allowing 43 lines per page in landscape and 60 lines per page in portrait. If the lines per page in the data file is higher, LPI and lines per page are automatically adjusted.

Both TCPDRIV option H - page length auto formatting, which is the default, and TCPDRIV option F - FCB-length based auto formatting, are supported. If the RTF wrapper is used and the input file's FORM=A4*, the output will be formatted to A4 paper size, and if the input file's FORM=LET*, the output will be formatted to letter paper size.

Note: Separator pages are not supported for files created using CA Spool's Text Wrapping support. ESFU010X is not called for files of this type.

Samples

The following is a sample XCOM printer node definition:

```
DEFNODE XCOM1,XCOM-01,TCPDRIV=XCOM,  
        CLASS=ALL,  
        ACQUIRE=WORK,  
        RELEASE=NOWORK  
NODE HP6DXCOM,XCOM1,  
      TCPHOST='ACBNAME=XCOM',  
      DRIVPRM1='IPNAME=111.222.333.44',  
      GROUP=2
```

The following sample DESTID definition automatically converts text files to PDF and transfers the PDF files to a remote XCOM host:

```
DESTID QDEST=HP6DXCOM,QFNAME=SV11*,
      DADDRESS1=' USERID=RUSERID,PASSWORD=RPASSWORD',
      FADDRESS2=' FILENAME=PUBLIC.&UID.&FNM.&FNO.PDF'
```

Connect:Direct Print Driver

Use this print driver to automatically transfer all types of CA Spool print files, including PDF/HTML/RTF wrapped text files, using Sterling Commerce's Connect:Direct file transfer product to remote Connect:Direct servers running on various platforms for further processing.

The Connect:Direct print driver provides support for:

- Text reports stored in EBCDIC without translation and with preservation of carriage control information
- Automatic conversion of text files into PDF, HTML or RTF files while being transferred to a remote Connect:Direct server.

You can specify Connect:Direct report attributes and processing options:

- On the printer level using the 64-byte TCPHOST parameter.
- On the printer level using the using the 4*60=240 bytes DRIVPRM1-4 parameters.
- On the print file level using the 4*60=240 byte OUTPUT ADDRESS parameter

You can specify this using JCL or have it be automatically assigned using CA Spool DESTID definitions.

Note: TCPHOST parameter is processed first, DRIVPRM1-4 parameters second and OUTPUT ADDRESS parameter is processed third.

If you specify an Connect:Direct print driver parameter more than once, then the *last* specification is used. If the TCPHOST parameter is *not* used to specify Connect:Direct parameters, then you *must* specify a dummy TCPHOST parameter to use the Connect:Direct print driver.

You can automatically generate unique identifying names; that is, you can specify that the FILENAME= *remote-file-name* must be synthesized from userid, destination, file name, file number, date, time, job number, job name, job class, job step, proc step, DD name, and fixed text.

Connect:Direct CA Spool JCL

To use the Connect:Direct print driver you need to add the following DD statements to the JCL procedure for CA Spool:

```
//STEPLIB DD
//          DD DISP=SHR,DSN=$CD.LINKLIB      * Connect:Direct Load Lib
. . .
//*-----*
//* Common FTP, CA XCOM and Connect:Direct userid/password file *
//*-----*
//NETRC DD DISP=SHR,DSN=&PARMLIB(IQNETRC)
. . .
//*-----*
//* Connect:Direct libraries. *
//*-----*
//DMNETMAP DD DISP=SHR,DSN=$CD.NETMAP
//DMPUBLIB DD DISP=SHR,DSN=$CD.PROCESS
//DMMSGFIL DD DISP=SHR,DSN=$CD.MSG
//DMPRINT DD SYSOUT=*
```

NETRC Data Set

The NETRC data set provides you with an alternative to specifying your user_id and password as Connect:Direct parameters when you want to use Connect:Direct to transfer a file to a remote Connect:Direct server.

The supplied CBQ4PARAM(IQNETRC) sample contains the following sample definitions:

```
*
* Common FTP, CA XCOM and Connect:Direct userid/password file
*
machine ftp.com          login userid1 password pass1
machine 111.222.33.44   login uesrid2 password pass2
machine XCOM.IPNAME.com login uesrid3 password pass3
machine XCOMLUx         login uesrid4 password pass4
machine XCOMGROUPx     login uesrid5 password pass5
machine ConnectDirect   login uesrid6 password pass6
```

If no USERID or PASSWORD parameters are specified on a Connect:Direct request, the PNODE - local node parameter is looked up in the NETRC data set. If it is found, the corresponding login userid and password are used.

If the USERID is specified without a PASSWORD, the PNODE - local node parameter and the USERID are looked up in the NETRC data set. If they are found, the corresponding password is used.

If you use the NETRC data set, secure it against unauthorized read and write access.

To Transfer Print Files

To transfer CA Spool print files to a remote Connect:Direct server

1. Define a new CA Spool printer with TCPDRIV=C:D.
2. Define TCPHOST=DUMMY.
3. Create new CA Spool print files with FILENAME, USERID and PASSWORD parameters specified via OUTPUT ADDRESS parameters to the new Connect:Direct printer.

Default Proc for Connect:Direct transfers

The default proc for Connect:Direct file transfers is COPY. The default proc for binary transfers of files such as those created by CA Spool's wrapper support or those specifying FCB=ASIS is COPYCF.

Binary Transfers

If the target destination of a binary transfer is not a mainframe, TOENVIR=NT is required. If the target destination of a binary transfer is a mainframe, TOENVIR=NT must not be specified.

To Transfer Print Files Unmodified

To transfer CA Spool print files unmodified to a remote Connect:Direct server, define a new CA Spool printer driver with TCPDRIV=C:D and without any TRANS= parameter, and queue the print files to the new Connect:Direct printer.

JCL Parameters

You can specify the following JCL parameters, separated by commas, using the file's OUTPUT ADDRESS parameters:

```
PATH=remote-directory,  
FILENAME= remote-file-name[.PDF/.PDFL/.HTML/.RTF],  
USERID= local-userid,  
PASSWORD= local-password,  
PROC= procedure-name,  
PNODE= local-node,  
SNODE= target-node,  
SNODEID= target-node-userid,  
SNODEPW= target-node-password,  
TOENVIR=NT,  
LU= remote-LU,  
DSNAME=temp-data-set-name,  
DISP=NEW|MOD|OLD|SHR,  
UNIT=device-type,  
VOLSER=volume-serial-number,  
RECFM=F|V,  
LRECL=99999,  
DATACLAS=temp-data-set-SMS-data-class-name,  
MGMTCLAS=temp-data-set-SMS-management-class-name,  
STORCLAS=temp-data-set-SMS-storage-class-name,  
AM=C:D (or TCPDRIV=C:D)  
CDSYSOPT= p1/p2/p3
```

PATH and FILENAME will be combined to form the complete remote target directory and file name. This extends the value used to a maximum of 106 characters.

For binary transfers, if the COPYCF proc is not specified or taken as a default, the &DSN1 and &DSN2 variables will be passed to the custom proc for optional use. They will have the same values as what would have been passed to a non-binary transfer. This may also help in the formation of a long directory structure and file name combination.

Up to 50 characters of data can be passed using the CDSYSOPT parameter.

For example,

```
DRIVPRM1=' CDSYSOPT=DATATYPE=text/XLATE=yes/STRIP.BLANKS=yes '
```

or

```
DESTID QDEST=CDDEST1,FLRECL=133,  
FADDRESS1=' USERID=USER0001,PASSWORD=ABCD ',  
FADDRESS2=' FILENAME=TARGET.FILE ',  
FADDRESS3=' DSNAME=TEMP.FILE ',  
FADDRESS4=' CDSYSOPT=XLATE.TBL(TABLE02.CDX) '
```


Separate multiple SYSOPTS values with a '/'. Embedded blanks are not supported. Free form parameters containing '/' are not supported. Both instances will yield unexpected results and are unlikely to send the file.

CDSYSOPT= is not supported and ignored for binary file transfers.

In most cases, it is required to use a unique process to take advantage of the CDSYSOPT parameter. The data in the CDSYSOPT parameter is passed as &SYSOPTS to Connect:Direct and the '/' delimiters are changed to blanks. The default COPY process does not expect to have an &SYSOPTS variable passed to it and ignores it. A new process must be built similar to this COPY process to facilitate passing the required data:

```

PROCXLT PROCESS SNODE=BSBABC1234 -
          CLASS=4 &DISP=RPL
STEP01 COPY FROM (DSN=&DSN1 DISP=SHR -
          PNODE) -
          TO (DSN=&DSN2 -
          DISP=&DISP -
          SNODE -
          SYSOPTS=&SYSOPTS) -
          COMPRESS EXT

```

This example is for illustration only. See Connect:Direct support for questions regarding the specific syntax.

Add the new process name to the PROC=parameter, to pass the name to the C:D print driver.

Replacement Variables

You can specify the following replacement variables anywhere in the FILENAME, USERID and PASSWORD parameters to have appropriate unique names dynamically generated:

&UID

Userid of the print file creator

&NOD

Print file destination name

&FNM

Print file name

&FNO

Print file number

&PRM

Print file print-mode

&DAY

Current date in *Dyyymmdd* format

&JUL

Current date in Julian *Dyyddd* format

&TIM

Current time in *Thhmmss* format

&JOB

Jobname of the print file creator

&JID

Job, STC or TSU id of the print file creator

&JST

Job step name of the print file creator

&PST

Proc step name of the print file creator

&DDN

DD name of the print file creator

&CLS

Print file class.

You can specify that only part of the replacement variable be used by specifying offset and length in brackets after the variable. For example, if you enter:

```
&JID(1,4)
```

you have specified that only characters 2 through 5 of the file creator's name are to be used.

If you do not specify JCL parameters, the following default JCL parameter are used:

```
USERID=&JID  
FILENAME=&JID.&NOD.&FNM.&FNO
```

Wrapping for Text, PDF, PDFL, HTML, and RTF Files

If an input text file with a FILENAME extension of PDF, PDFL, HTML or RTF is selected, the file is automatically formatted and converted into the specified data-stream as it is being transferred to a remote Connect:Direct server.

PDFL generates linearized PDF.

The formatting and paper size, orientation, and font style (family, pitch, style, and stroke weight) are controlled by the file's Form, Chars, channel skips, and max record length. The default line spacing is 6 LPI, allowing 43 lines per page in landscape and 60 lines per page in portrait. If the lines per page in the data file is higher, LPI and lines per page are automatically adjusted.

Both TCPDRIV option H - page length auto formatting, which is the default, and TCPDRIV option F - FCB-length based auto formatting, are supported. If the RTF wrapper is used and the input file's FORM=A4*, the output will be formatted to A4 paper size, and if the input file's FORM=LET*, the output will be formatted to letter paper size.

Note: Separator pages are not supported for files created using CA Spool's Text Wrapping support. ESFU010X is not called for files of this type.

Samples

The following is a sample Connect:Direct printer node definition:

```
DEFNODE CD,CD-01,TCPDRIV=C:D,
      CLASS=ALL,
      ACQUIRE=WORK,
      RELEASE=NOWORK
NODE HP6DCD,CD,
     TCPHOST=' PNODE=CD450DE1, SNODE=CD450DE1 ',
     DRIVPRM1=' DSNAME=PUBLIC.&UID.&NOD.&FNO ',
     GROUP=2
```

The following is a sample DESTID definition, which causes matching text files automatically converted to PDF before being transferred to a remote Connect:Direct server:

```
DESTID QDEST=HP6DCD,QFNAME=SV11*,
      DADDRESS1=' USERID=LUSERID,PASSWORD=LPASSWORD ',
      FADDRESS2=' FILENAME=PUBLIC.&UID.&FNM.&FNO.PDF '
```

Print Data Encryption

Advanced Encryption Standard (AES) Rijndael print data encryption is supported. It lets you send print data securely encrypted over the public TCP/IP network. This encryption prevents unauthorized reading or use of the data.

Each piece of data of a print file is encrypted by the IBM Integrated Cryptographic Service Facility (ICSF) before it is sent over TCP/IP. ICSF is part of the z/OS base product.

Add the ICSF load library CSF.SCSFMODE0 to the LNKST or to the CA Spool STEPLIB concatenation.

To activate print data encryption, specify the 16/24/32 bytes hexadecimal encryption key using the printer node KEY parameter, and specify printer TCPDRIV option '4'.

Capella's SecureDIMM card

Capella's SecureDIMM II (Dual Inline Memory Module) card supports (AES) Rijndael decryption on selected Hewlett-Packard (HP) printer models. This means that CA Spool can send print data securely over the public TCP/IP network to remote HP printers. SecureDIMM uses 16 bytes persistent encryption keys.

The SecureDIMM package includes a Printed SecureDIMM User Guide and a SecureDIMM CD which contains:

- The **CryptTst.prn** test file, which prints a picture of a Volkswagen if the encryption card functions.
- The **aesCrypt** Utility to encrypt a file and to change the printer encryption key.
- **Windows** SecureDIMM Print Driver Extension used to specify the encryption key and enable encryption.

The following is a sample print data encryption HP printer node definition:

```
DEFNODE PJL5,HP-PJL5
NODE    HP65,PJL5,TCPPORT=9100,TCPHOST=731.225.65.331,TCPDRIV=PJL5F4,
        KEY=010102030405060708090a0b0c0d0e0f,
        GROUP=1
```

To change or reset a Capella SecureDIMM card decryption key, create and print a CA Spool file named AESCRYPT as follows:

```
/*
//01  OUTPUT CLASS=A,DEST=HP6,
//    USERDATA=(-C,                                -C / -R
//          000102030405060708090A0B0C0D0E0F,  OLD-KEY
//          010102030405060708090A0B0C0D0E0F)  NEW-KEY
//STEP1 EXEC PGM=IEBGENER
//SYSPRINT DD SYSOUT=*
//SYSUT2   DD SUBSYS=(ESF,A,AESCRYPT),OUTPUT=*.01
//SYSIN    DD DUMMY
//SYSUT1   DD *
====> Encryption Key changed. Call 99 999 999 <====
/*
```

CA LPD Support

The CA Spool LPD Interface supports decryption of (AES) Rijndael encrypted print data, so that you can send print files securely over the public TCP/IP network to remote CA Spool systems. The CA Spool LPD Interface supports 16/24/32 bytes persistent encryption keys.

A sample print data encryption CA LPD printer node definition follows:

```
DEFNODE LPR,HP-LPR
NODE    HP6X,LPR,TCPPRT=JESX,TCPHOST=MVSHOST2,TCPDRIV=LPR4,
        GROUP=1,ACQUIRE=WORK,TCPPORT=515,RELEASE=NOWORK,
        KEY=F0F1F2F3F4F5F6F7F0F1F2F3F4F5F6F7F0F1F2F3F4F5F6F7
```

The corresponding CA LPD LPDDEST definition follows:

```
LPDDEST QDEST=JESX,FAM=JES,F0PTS=DGU4
        FDEST=LOCAL,
        FKEY=F0F1F2F3F4F5F6F7F0F1F2F3F4F5F6F7 F0F1F2F3F4F5F6F7F0F1F2F3F4F5F6F7
```

IPSec Support

Data sent from CA Spool to printers and print servers can be encrypted by Internet Protocol Security (IPSec) if the target node supports it. IPSec is a standard suite of protocols by Internet Engineering Task Force (IETF) that provides data authentication, integrity, and confidentiality as data is transferred between communication points across IP networks. No changes are required to CA Spool to enable IPSec. The IPSec function in z/OS is provided by z/OS Communication Server since z/OS V1R7.

For more information, see these guides:

- z/OS Communications Server: IP Configuration Guide
- IBM RedBook: IBM z/OS V2R1 Communications Server TCP/IP Implementation Volume 4: Security and Policy-Based Networking
- The printer documentation provided by the manufacturer

TCP/IP Printer Node Parameters

The following parameters are supported for TCP/IP-attached printers:

```
NODE nodename,  
device-type,  
GROUP=nnnn,  
ACQUIRE=NO |WORK |TIME |SNET,  
ALIAS=cccccccc,  
AUTO=YES | NO,  
CKPTPGS=nnnn,  
CLASS=c1...cn,  
COMP=YES | NO,  
DRIVPRM1=cccccccccccccccc,  
DRIVPRM2=cccccccccccccccc,  
DRIVPRM3=cccccccccccccccc,  
DRIVPRM4=cccccccccccccccc,  
ENDFF=NO | YES,  
FCB=cccc,  
FILTER=c,  
FORM=cccc,  
INITFF=NO | FILE,  
LINECNT=nnn,  
LOCATION=cccccccccccccccc,  
NJEDEST=cccccccc,  
OUTLIM=nnnnnnn,  
PURGE=YES | NO,  
RELEASE=NO | NOWORK,  
REST=YES | NO | PRINTER,  
RETAIN=nnnnn,  
SEP= 0 - 9,  
SEPOPT=nn,  
SHARED=NO | YES | MASTER,  
TCPDRIV=cccccccccc,  
TCPHOST=cccccccccccccccc,  
TCPPOINT=nnnn,  
TCPPOINT=cccccccccccccccc,  
TIMEOUT=nnnnn,  
TRANS=cccccccc,  
TRANSFORM=cccccccccc,  
USEFCB=FILE | PRINTER,  
USEREXIT= BSESSION | ASESSION,  
USEREXNO=n,  
USERPARM=cccccccccccccccc,  
VPS=cccccccc,  
VPSCAPPL=cccccccc,
```

```
VPSERROR=ERROR | BLANK | IGNORE | NULL | PASS,  
VPSFILE= CHAIN | BRACKET | nnnnnn,  
VPSFNFF=YES | NO,  
VPSMPP=NEW | OLD,  
VPSOPT=nn,  
VPSMPP=nnn,  
VPSTRACE= *ALL | ccccccc,  
WS=CLASS|FORM|FCB|PRIO|AGE|GROUP
```

TCP/IP LPD Interface

This section:

- Introduces the LPR/LPD protocol
- Explains how to implement it on various platforms
- Explains how to use the LPD Interface to receive print requests from various platforms and pass the requests to CA Spool and other CA Output Management products

LPR/LPD Protocol

The Berkeley versions of the Unix (TM) operating system provide line printer spooling with a collection of programs:

Lpr

Assign to queue

Lpq

Display the queue

Lprm

Remove from queue

Lpc

Control the queue

These programs interact with an autonomous process called the line printer daemon, which makes up the LPR/LPD protocol.

The section that follows describes the basic LPD commands, the LPD Job commands, and the LPD Control file. See the RFC 1179 for complete information.

Basic LPD Commands

The verbs in the command names must be interpreted as statements made to the daemon. Thus, the command "Print any waiting jobs" is an imperative to the line printer daemon to which it is sent. A new connection must be made for each command to be given to the daemon.

The following LPD commands are used:

01—Print any waiting jobs

This command starts the printing process if it is not already running.

02—Receive a printer job

A second level of commands controls receiving a job. The daemon is given commands by sending them over the same connection.

03—Send queue state (short)

If the user names or job numbers or both are supplied, then only those jobs for those users or with those numbers are sent.

04—Send queue state (long)

If the user names or job numbers or both are supplied, then only those jobs for those users or with those numbers are sent.

05—Remove jobs

This command deletes the print jobs from the specified queue, which are listed as the other operands. If only the agent is given, the command is to delete the currently active job.

LPD Job Commands

LPD job commands are processed when the line printer daemon has received a receive job command; note that the daemon continues to process commands until the connection is closed.

These commands are as follows:

01—Abort job

No operands must be supplied. This subcommand removes any files, which have been created during this "Receive job" command.

02—Receive control file

The control file must be an ASCII stream with the ends of lines indicated by ASCII LF. The total number of bytes in the stream is sent as the first operand. The name of the control file is sent as the second operand. The next data received over the same TCP connection are the intended contents of the control file.

03—Receive data file

The data file might contain any 8-bit values.

The total number of bytes in the stream can be sent as the first operand, otherwise the field must be cleared to 0. Interpretation of the contents of the data file is determined by the contents of the corresponding control file.

LPD Control File

This section discusses the format of the lines in the control file, which is sent to the line printer daemon. Each line of the control file consists of a single, printable ASCII character, which represents a function to be performed when the file is printed. Interpretation of these command characters is case-sensitive. The rest of the line, after the command character, is the command's operand. No leading white space is permitted after the command character. The line ends with an ASCII new line.

Those commands, which have a lower case letter as a command code, are used to specify an printing request and are often referred to as filters. These filter commands are not included in the list that follows, as they are no longer used as originally designed.

The LPD control file commands, which use upper case, are used to describe parametric values or background conditions. Some commands must be included in every control file; these are 'H' (responsible host) and 'P' (responsible user). Additionally, there must be at least one lower case command to produce any output.

The commands are as follows:

C (Class for banner page)

This command sets the class name to be printed on the banner page.

H (Host name)

This command specifies the name of the host, which is to be treated as the source of the print job. The command must be included in the control file.

I (Indent Printing)

This command specifies the number of columns the remote system indents the output when you specify **f** or **p** as the value of filter.

J (Job name for banner page)

This command sets the job name to be printed on the banner page. The job name is conventionally used to display the name of the file or files, which were "printed".

L (Print banner page)

This command causes the banner page to be printed.

M (Mail When Printed)

This entry causes mail to be sent to the user given as the operand at the host specified by the 'H' entry when the printing operation ends (successfully or unsuccessfully).

N (Name of source file)

This command specifies the name of the file from which the data file was constructed.

P (User identification)

This command specifies the user identification of the entity requesting the printing job. This command must be included in the control file.

T (Title for pr)

This command provides a title for a file, which is to be printed.

U (Unlink data file)

This command indicates that the specified file is no longer needed. Note that this command must only be used for data files.

W (Width of output)

This command limits the output to the specified number of columns for the 'f', 'l', and 'p' commands. The width count operand must be all decimal digits. It can be silently reduced to some lower value. The default value for the width is 132.

X (Extended print options)

Extended Infoprint Server print attributes. This command can be used to specify additional print attributes corresponding to the z/OS OUTPUT statement parameters.

TSO LPR, LPQ, and LPRM

You can print reports, documents, and listings completely independent of where the job or process that created them was executed by routing the data sets to a remote host for printing.

The following four TSO TCP/IP commands are provided for remote printing:

LPR

Prints a data set on a remote printer. A variety of options enable you to specify how and where the data set is printed.

LPQ

Lets you query a printer queue on a remote printer. You can query a printer queue for a specific job, a specific user ID, or all the jobs in a remote printer queue.

LPRM

Removes a job from a printer queue on a remote host.

LPRSET

Specifies remote printer and remote host names when they are not specifically included in the Line Print commands.

The LPQ and LPRM commands can only be used against CA Spool managed printer queues.

z/OS USS – UNIX System Services

The standard z/OS USS - UNIX System Services LP command can be used to send or write a previously formatted file to a JES SYSOUT data set. The standard *lp* command uses existing JES printer facilities. The standard USS *lpstat* and *cancel* commands are recognized, but their functions are not supported.

The CA Spool LPD interface includes enhanced z/OS UNIX System Services shell printing commands, which provide more function than the standard USS printing commands. These enhanced commands facilitate the porting of UNIX applications to z/OS UNIX System Services:

lp

Sends files for printing to CA LPD or CA Spool running on the local z/OS system or a remote z/OS system. The files can be UNIX files or traditional MVS data sets, such as sequential data sets and partitioned data sets.

lpstat

Queries the status of CA Spool printers and print jobs.

cancel

Cancels CA Spool print requests, if the print file has not yet been selected for printing.

Windows LPR, LPQ, LPRM

If you are using the standard Windows system, be aware of the following printing considerations:

TCP/IP Network Printing Support

This support allows Windows to print directly over the network using TCP/IP. Select this option if you want to print to UNIX print queues or TCP/IP printers that are connected directly to the network, or if you want UNIX computers on the network to print to Windows print servers. To activate this support, select Microsoft TCP/IP Printing on the Network Service list in the Services Properties.

Creating an LPR-Compatible Printer

You can use the standard Windows print manager to create a TCP/IP LPR printer in the same way that you create any other printer to be used on a Windows network by using the following settings:

1. In the Print Destinations dialog, select the LPR Print Monitor.
2. In the Add LPR Compatible Printer dialog, specify the LPD Host name or IP address and the printer queue name.

Any print driver can be used, but with a report management product it might be a good idea to use the Generic Text driver or the AFP print driver.

LPR Command

From a command prompt, the LPR command can be used to print a file to a computer running an LPD server. Use the following syntax:

```
lpr -SServer -PPrinter [-CClass] [-JJobname] [-OOption] filename
```

where:

-S*server*

Specifies the name or IP address of the remote LPD.

-P*Printer*

Specifies the name of the printer for the desired queue.

-C*Class*

Specifies the content of the banner page for the class.

-J*Jobname*

Specifies the name of this job.

-O*Option*

Indicates the type of file. The default is a text file.

Filename

Specifies the name of the file to be printed.

LPQ Command

From a command prompt, the LPQ command can be used to obtain printer queue status information from a remote LPD server. Use the following syntax:

```
lpq -SServer -PPrinter [-l]
```

where:

-SServer

Specifies the name or IP address of the remote LPD.

-PPrinter

Specifies the name of the printer for the desired queue.

-l

Specifies that a detailed status must be given.

The LPQ command can only be used against CA Spool managed printer queues.

Windows TCP/IP Printing

Using the Printer Port Monitor for Windows, you can print from your Windows Server 2003, Windows Server 2008, Windows Vista (Business Edition, Enterprise Edition), Windows XP, or Windows 7 system to the LPD Interface. Using the AFP Printer Driver for Windows, you can have all your Windows applications produce AFP output files.

z/OS Printer Port Monitor for Windows

The Printer Port Monitor lets you print from Windows applications to any CA LPD printer queue that you have defined to your Windows system.

To specify additional job attributes

1. On the z/OS Printer Port Configuration panel, select the Options button to access a panel where you can specify additional job attributes. By default, these attributes apply to every job you send to this printer.
2. Optionally, you can enter name and address information, which is assigned to each print job in the Separator Sheet box.
3. Optionally, you can specify additional print attributes in the Job Attributes field.
4. To specify different print attributes for some jobs, click the Prompt for Attributes When Printing check box.

Note: Generic print queues defined in the LPD parameters are not listed.

The following print attributes and their corresponding z/OS OUTPUT statement parameters are currently supported:

Print Attribute	OUTPUT Statement Parameter
address-text=	ADDRESS=
building-text=	BUILDING=
chars=	CHARS=
copies=	COPIES=
department-text=	DEPT=
duplex=	DUPLEX=
form-definition=	FORMDEF=
forms=	FORMS=
hold=	OUTDISP=
input-tray-number=	INTRAY=
jes-priority=	PRTY
name-text=	NAME=
output-bin-number=	OUTBIN=
overlay-back=	OVERLAYB=
overlay-front=	OVERLAYF=
page-definition=	PAGEDEF=
print-error-reporting=	DATAACK=
print-queue-name=	PRTQUEUE=
printer-ip-address=	DEST=IP:
resource-library=	USERLIB=
room-text=	ROOM=
shift-out-shift-in=	PRMODE=
table-reference-characters=	TRC=
title-text=	TITLE=
x-image-shift-back=	OFFSETXB=
x-image-shift-front=	OFFSETXF=
y-image-shift-back=	OFFSETYB=
y-image-shift-front=	OFFSETYF=

Print Attribute	OUTPUT Statement Parameter
forms-control-buffer=	FCB=
jes-node=	DEST=
jes-writer=	WRITER=
notify=	NOTIFY=
Output-class=	CLASS=

AFP Printer Driver for Windows

This printer driver lets you print to AFP printers. It creates output files in AFP format. These files contain documents, overlays, or page segments.

Note: Be aware that this is an IBM print product; you must contact IBM for additional information. Both the Printer Port Monitor for Windows and the AFP Printer Driver for Windows software and installation instructions can be downloaded from the IBM Web site.

Various UNIX Platforms

To print from a UNIX system, you can either configure a remote LPR printer queue or use standard printing commands. See the documentation for each remote system for the syntax of the commands.

During configuration of the remote LPR printer queue, specify the host name or IP address of the LPD server as the host name. Specify the name of the target printer queue as the queue name.

After configuring the remote LPR printer queue, specify the name of the remote queue on the used LPR or LP command.

LPR and LP

You can use the LPR command or the LP command to submit a print request to a remote LPD server. From an AIX system, you can also use the ENQ and QPRT commands.

LPQ and LPSTAT

You can use the LPQ command or the LPSTAT command to query the names, locations, and descriptions of printers and to query the status of a print request. From an AIX system, you can also use the QSTAT command.

LPRM and CANCEL

You can use the LPRM command or the CANCEL command to remove a job from a printer queue on a remote LPD server.

Note: The LPQ, LPSTAT, LPRM and CANCEL commands can only be used against CA Spool managed printer queues.

z/OS and JES2/JES3 Print Requests

Incoming print requests can be routed to the JES2 or JES3 spooling systems as dynamically allocated SYSOUT data sets. If the print request specifies extended print attributes, these print attributes are passed on to JES2 or JES3 using dynamic OUTPUT statement allocation.

The incoming print requests can be stored as EBCDIC text, AFP, PCL or binary print files. Configuration parameters can be used to specify how the LPR control file lines must be mapped into JCL parameters such as DDname, destination, output class and writer name.

Standard CA Deliver, CA Dispatch, and CA Spool pre-spool intercept support can redirect the SYSOUT data sets before they are written to the JES spool.

CA View Print Requests

Incoming print requests can be written directly to a CA View database or be written to JES and then picked up by the CA View post-spool interface or received from CA Spool through the direct CA Spool to CA View interface. The incoming print requests can be stored as EBCDIC text, AFP, PCL, or binary print files.

Configuration parameters can be used to specify how the LPR control file lines must be mapped into JCL parameters such as report name, user ID, destination, output class, and writer name. If the print request specifies extended print attributes, these print attributes are passed on to CA View.

AFP print requests are directed to JES or CA Spool, which pass them on through the SARFSS interface so they can be processed by ACIF before they are written to a CA View database.

CA Deliver Print Requests

Incoming print requests are directed to the JES2 or JES3 spool as dynamically allocated SYSOUT data sets, which the standard CA Deliver pre-spool support intercepts and processes. The incoming print requests are EBCDIC text, AFP, PCL, or binary print files.

Configuration parameters specify how to map the LPR control file lines into JCL parameters such as DDname, destination, output class and writer name.

CA Dispatch Print Requests

Incoming print requests are directed to the JES2 or JES3 spool as dynamically allocated SYSOUT data sets, which the standard CAIENF Spool Interface (ENFSPL) pre-spool support intercepts and processes. The incoming print requests are EBCDIC text, AFP, PCL, or binary print files.

Configuration parameters are used to specify how the LPR control file lines must be mapped into JCL parameters such as DDname, destination, output class, and writer name.

CA Bundl Print Requests

Incoming print requests are routed to the JES2 or JES3 spool as dynamically allocated SYSOUT data sets, which the standard CA Bundl post- spool support picks up and processes. The incoming print requests are EBCDIC text, AFP, PCL, or binary print files.

Configuration parameters specify how to map the LPR control file lines into JCL parameters such as DDname, destination, output class, and writer name.

CA Spool Print Requests

Incoming print requests are written directly to CA Spool for printing or distribution. The incoming print requests are stored as EBCDIC text, AFP, PCL, or binary print files.

Configuration parameters specify how to map the LPR control file lines into JCL parameters such as file name, user ID, destination, output class, and writer name. If the print request specifies extended print attributes, these print attributes are mapped into standard CA Spool print attributes.

The standard LPQ and LPSTAT commands are used to display the print files queued to a CA Spool managed printer queue. The standard lprm and cancel commands are used to purge a print file queued to a CA Spool managed printer queue.

LPD Initialization Parameters

The LPD Interface uses the following types of initialization statements:

- The LPDSERV statement specifies all the general characteristics of the LPD, and the default values for the various LPDDEST parameters.

```

LPDSERV MAXTASK=20,      Max concurrent sessions      (DEFAULT)
      TCPPORT=515,      LPD Listen Port number      (DEFAULT)
      TCPNS=YES,        TCP/IP Name Server          (DEFAULT)
      DAM=JES,          Default Access Method
(DEFAULT)
*   DESF=,              Default CA Spool Subsystem
*   DSAR=,              Default CA View Database
      DNAME=&N,          Default File Name          (DEFAULT)
      DUSERID=&P,        Default File Userid        (DEFAULT)
      DCLASS=A,         Default File Class         (DEFAULT)
*   DDEST=,            Default File Destination
*   DDDNM=,            Default File DD-name
*   DWRITER=,          Default File Writer name
      DOPTS=D,          Default LPD Options          (DEFAULT)
*   DCPTAB=,           Default Translate Table
*   DTRACE=,           Default is no Tracing
*   DEXIT=,            Default is no User Exit call
      DTIMEOUT=120      Default Session Timeout      (DEFAULT)

```

- The LPDDEST statement specifies the LPD processing parameters for a given printer queue or a group of printer queues all having the same common printer queue name prefix.

```

LPDDEST QDEST=TEST*,    Printer queue name or prefix
*   QHOST=,             Optional origin Host Id
      FAM=JES,           Access Method
(DEFAULT)
*   FESF=,             CA Spool Subsystem
*   FSAR=,             CA View Database
*   FNAME=,            File Name
*   FUSERID=,          File Userid
      FCLASS=A,         File Class          (DEFAULT)
      FDEST=LOCAL,     File Destination
      FDDNM=&N,         File DD-name
      FWRITER=&N,       File Writer name
      FOPTS=E,          LPD Options
*   FCPTAB=,           Translate Table
      FTRACE=DATA,     Trace data send and received
*   DEXIT=,            No User Exit call
      FTIMEOUT=120     Session Timeout          (DEFAULT)

```

- The LPDFILE statement identifies a print request based on printer queue name, origin host, requestor's user ID and source file name. The statement also assigns report identification attributes for use by a CA Output Management product.

ESFPARM

To use the LPD interface to CA Spool defined printers using IBM's TCP/IP for MVS, add the following LPDSERV definition to ESFPARM:

```
LPDSERV MAXTASK=20,      LPD INTERFACE                      (DUMMY)
          TCPPOPT=515,   LPD LISTEN PORT NUMBER          (DEFAULT)
          TCPNS=YES,     TCP/IP NAME SERVER              (DEFAULT)
          DAM=ESF        DEFAULT ACCESS METHOD            (MODIFIED)
```

Verify the LPD

To verify that the LPD Interface has been successfully configured, do the following:

1. Stop any other LPD in your MVS system listening on TCP/IP port number 515.
2. Verify that TCP/IP port number 515 has not been reserved for another job in the TCP/IP PROFILE data set that is currently in use.
3. Restart CA Spool with the updated ESFPARM configuration. When the LPD interface is successfully started, the following message is displayed:

```
ESF7001 LPD interface started on port: 515
```

4. Display the LPD Interface status by entering the following CA Spool command:

```
DS,LPD
```

The LPD interface responds with the following messages:

```
ESF7070                      CA LPD V12.0 INC00
ESF7071 Total sessions:  0 Active sessions:  0 Max sessions:  0
ESF7072 LPR requests:    0 LPQ requests:      0 LPRM requests:  0
ESF7073 ESF files:       0 SAR files:         0 JES files:         0
ESF7074 Text files:      0 AFP files:         0 PCL files:         0
ESF7075 Bin files:       0 PS files:         0
ESF7076 Total bytes:    0 Total records:     0 Total pages:     0
ESF7079
```

5. To send a print request to the LPD interface, issue the following native TSO command:

```
LPR 'SYS1.PROCLIB(CALPD)' (P TEST1 H **MVSHOST** NOCC
```

After the LPD interface receives the print file, it writes the following message on the ESFLOG:

```
ESF7100 ESF File      4391 SYS1PROC (TEST1 /*userid*) from
          **MVSHOST** - 23 Text records received
```

You can now use the menu system to browse and print the received print file.

6. Display the LPD interface status by entering the following CA Spool command:

```
DS,LPD
```

The LPD interface responds with the following messages:

```
ESF7070 CA LPD V12.0 INC00
ESF7071 Total sessions: 1 Active sessions: 0 Max sessions: 0
ESF7072 LPR requests: 1 LPQ requests: 0 LPRM requests: 0
ESF7073 ESF files: 1 SAR files: 0 JES files: 0
ESF7074 Text files: 1 AFP files: 0 PCL files: 0
ESF7075 Bin files: 0 PS files: 0
ESF7076 Total bytes: 1894 Total records: 23 Total pages: 0
```

7. Stop the LPD interface by entering a PNET command:

```
PNET,LPD
```

When the LPD is drained, it terminates with the following message:

```
ESF7002 LPD interface terminated
```

CA Service Desk Manager Interface

The CA Service Desk Interface enables CA Spool to automatically open service desk issues in the CA Service Desk Manager database.

CA Spool uses CA SDI/med services to interface with the CA Soap server task to open a service desk issue based on a CA Spool message id.

After installing and configuring CAISDI/med and CAISDI/soap and activating those tasks, add SDI=YES to your CA Spool parameter file to enable the interface.

To open a service desk issue when a specific CA Spool message is issued, add SDIREQ=YES to the MESSAGE statement for that message number or range of message numbers.

User exit ESFMSG0 will be called previous to making the request to open a service desk issue when EXIT=YES is coded on the MESSAGE open a service desk issue when EXIT=YES is coded on the MESSAGE statement.

The text of the service desk issue can be updated or the service desk request can be skipped using this exit.

If you want to update the description field, it is currently limited to 1000 characters. All but one of any imbedded trailing blanks will be removed from the description by the CA SDI/med task. The value x'0D' can be used to indicate a new line for formatting purposes.

Data Encryption

Protecting your data is of utmost importance. Customers that store credit card data must abide by PCI compliance. One of the most important factors in this compliance is to provide optimum security—*data at rest must be encrypted through strong encryption*.

The following sections explain what happens during the encryption process and provide brief definitions of the new terms.

Encryption Keys

CA Spool integrates with the IBM CPACF and ICSF services for encryption. You can activate encryption using an initialization parameter.

The process is as follows:

1. Based on a client specified interval, key labels and encryption keys are written to the ICSF Key Store Data Set (CKDS).
2. A Call is sent to ICSF to obtain a proper key.
3. CPACF or ICSF is invoked to perform the AES encryption.

Encryption Keys Considerations and Warnings

Note the following:

- When you are using the encryption feature, it is important that you take *regular backups* of your ICSF Key Store Data set (CKDS).
Important! *Loss or corruption of your CKDS can result in a complete data loss of all encrypted reports.*
- If you have configured a CA Spool MAS/EMAS complex and are sharing spool datasets between multiple LPARs or computers, *you must share the SAME CKDS data set on all LPARs or computers.*

Using multiple CKDS data sets for a CA Spool MAS/EMAS complex can result in a partial data loss where reports are readable on some computers and not readable on others.

- If you want to use encryption and you are not running a Sysplex Environment (where the CKDS data set is shared across the Plex), do not configure a CA Spool MAS/EMAS complex.
- *If you are sharing the ICSF CKDS dataset between multiple z/OS systems, the ICFS SYSPLEXCKDS(YES,FAIL(xxx)) parameter MUST be specified in the ICFS installation options data set. This allows newly created keys to be shared with other running ICFS systems. Without this parameter, the ICSF in-memory copy of the CKDS will be out of sync between the systems and result in reports being encrypted with one key and later incorrectly decrypted with another key. When this occurs, the original keys are replaced with keys from another system. Reports using the original keys can no longer be decrypted.*
- When the encryption feature is enabled, all report data are encrypted on both disk and tape. This includes the CA Spool ESFSTP backup /restore unloaded disk and tape datasets.

Important! CA Spool *does not keep* a local copy of the encryption key; it stores a clear 256-bit encryption key in the ICSF Key store (CKDS). CA Spool only accesses the CKDS through the ICSF services – it does not require any security permissions to access this data set. We recommend that you use your external security package to prevent unauthorized browsing of the CKDS data set.

We recommend that all EMAS/MAS members use the same set of initialization parameters.

CA Spool uses ICFS as a key store.

Supported Cryptographic Hardware

Two cryptographic hardware choices are available for use on various systems:

- Cryptographic Coprocessor Facility (CCF) - A standard component on z900 and a no-cost option for z800. On z800 and z900 systems, ICSF requires CCF.
- CP Assist for Cryptographic Functions (CPACF) - A standard component on z9, z10, and z196 and a no-cost option for z890 and z990

Other available cryptographic hardware components do not necessarily improve encryption performance, as described in the following list:

- Peripheral Component Interconnect (PCI)-based coprocessors (PCICC, PCIXCC, and Crypto Express2), which provide secure key storage, hardware hashing, and SSL support.
- PCI-based accelerators (PCICA, Crypto Express2 configured in accelerator mode), which provide high performance SSL assistance.

Note: Because CA Spool uses a clear key, it does not require the use of the Cryptographic Express2 coprocessor (CEX2C). To run ICSF without a CEX2C coprocessor, you need ICFS release FMID HCR7751 or higher.

If you are running an older release of ICSF, you must purchase a CEX2C co-processor because older releases of ICSF required that hardware to initialize the CKDS data set.

Encrypt the Data

The encryption process is as follows:

1. Encryption is turned on by the `SPOOLENC=YES/nnn` startup parameter.
2. When CA Spool collects reports, it encrypts report data when written to disk if the `SPOOLENC=YES/nnn` parameter is specified.
3. Depending on your hardware, encryption is done using the Advanced Encryption Standard (AES) with 128-bit or 256-bit keys.

Note: If you activate the PCI encryption option, all data written to disk and tapes become unreadable. Thus if a tape gets lost, it is not readable.

Decrypt the Data

The decryption process might be needed if you want to view or print data from a 3270 or web interface.

The decryption process is as follows:

1. When an encrypted CA Spool report is read, the report data is decrypted when read from disk or tape.
2. Depending on your hardware, decryption is done using the Advanced Encryption Standard (AES) with 128-bit or 256-bit keys.

Encryption and Decryption Software Considerations

Be aware that if you use z/OS software encryption and decryption, the time the CPU uses to encrypt or decrypt data will increase the CPU time consumed by the job or started task.

Our tests have shown that encryption using the Crypto Assist Facility (CPACF) has the smallest amount of overhead.

Terminology

AES

Advanced Encryption Standard

Asymmetric key

A different key is used for encryption and decryption. Also known as a public key and a private key.

CKDS

ICSF Cryptographic Key Data Set is the storage vehicle for symmetric keys

CPACF

Central Processor Assist for Cryptographic Functions

DSS

Data Security Standard

IBM CPACF and ICSF services

ICSF

Integrated Cryptographic Service Facility

MSM

CA Mainframe Software Manager

PAX

UNIX file system archive file

PCI

Payment Card Industry

PCI compliance

Meeting the standards that were created to help organizations that process card payments by preventing credit card fraud through increased controls around data and its exposure to compromise

Symmetric Key

Same key is used for both decryption and encryption

Enable AES Encryption of Reports

You can now enable AES encryption of reports stored in CA View, CA Dispatch, CA Bundl, or in CA Spool.

To set up encryption in CA Spool

1. Determine the IBM hardware that is in use.

2. Review the encryption information.

z9 hardware from IBM supports only 128-bit AES; however, the z10 hardware supports 256-bit AES.

Also, note the following conditions:

- If z9 and a hardware assist board are present, encrypt/decrypt using 128 bits and the CPACF instruction set (hardware).
- If z9 and no hardware assist board is present, ICSF is named (software encrypt/decrypt) using 256-bit AES.
- If z10 or z196 and a hardware assist board are present, encrypt/decrypt using 256 bits and the CPACF instruction set (hardware).
- If z10 or z196 and no hardware assist board is present, ICSF is named (software encrypt/decrypt) using 256-bit AES.

Notes:

- For CPACF, the assembly language instruction used (hardware encrypt/decrypt) is *KM* with a parameter list specifying encrypt or decrypt, among other things.
- For ICSF, software AES encrypt/decrypt the functions named are *CSNBSYE* and *CSNBSYD*.

3. Set the SPOOLENC initialization parameter and restart CA Spool.

4. (Optional) Update the ESFSPTP backup-restore utility encryption parameter.

Set your encryption preference in the EXEC statement. This parameter specifies whether an ESFSPTP backup data set must be AES encrypted or not.

ENCRYPT=YES | *nnn* | NO

- YES—Backup data set is encrypted with encryption key interval 365.
Encrypt=yes - encryption is enabled and a new key is created for every 365 days (once a year).
- *nnn*—Backup data set is encrypted with specified encryption key interval 1 – 365 days.
For example, ENCRYPT=30 requires a new key for every 30 days. Any non-zero number less than 366 is supported.
- NO —Encryption is not enabled. The backup data set is not encrypted if ESFSPTP is executed from an APF authorized library and the userid of the requestor has read access to SAFTYPE 12, 13 and 14.

Note: If ENCRYPT is not specified, encryption defaults to the SPOOLENC= parameter value for the specified SUBSYS= CA Spool subsystem.

CA Spool Health Checker Interface

CA Spool is now integrated with the IBM Health Checker for z/OS through the CA Health Checker Common Service, and automatically checks for the following potential problems:

SPOOL_SPACE_PCT@jobname

Monitors space in the CA Spool data sets to ensure that sufficient spool space is available to allow for more spool files.

SPOOL_FILE_QUEUE_PCT@jobname

Monitors file queue elements in use, to ensure that sufficient free file queue elements are available to allow for more spool files.

SPOOL_TCP_ACT@jobname

Monitors number of concurrent active TCP/IP subtasks to warn if the maximum of 128 subtasks is being reached.

SPOOL_TRANSFRM_ACT@jobname

Monitors number of concurrent active Transformer subtasks to warn if the maximum number of Transformer subtasks is being reached.

SPOOL_CKPT_ACT@jobname

Warns if the CA Spool system has not updated the checkpoint within the CKPTIME= specified time interval.

Warns if the CA Spool EMAS/MAS complex member has not been able to get access to the checkpoint within the WARNTIM= specified time interval.

SPOOL_OPT_ENCRYPT@STCname

Warns that CA Spool has detected a setting of SPOOLENC=YES, but encryption hardware is not installed on this computer.

CA Spool can encrypt and decrypt reports without encryption hardware, but emulating encryption hardware is CPU intensive, and it is more efficient to run all archiving and browsing tasks for encrypted databases on a computer that supports hardware encryption.

The product owner for all CA Spool health checks is CA_SPOOL.

Evaluating the conditions reported by these health checks helps ensure proper product performance.

SPOOL_SPACE_PCT@jobname

Description

This health check monitors space in the CA Spool data sets to help ensure that sufficient spool space is available to allow for more spool files.

This condition is checked periodically every five minutes, and reports a medium severity health check exception if the threshold is exceeded.

Best Practice

Consider adding an additional CA Spool data set as follows:

1. Allocate a new CA Spool data set.
2. Add a new SPOOLDS statement to ESFPARM defining the new CA Spool dataset.
3. Issue a REINIT command to activate the new CA Spool data set.

Note: You can also try to free spool space by purging spool files that have already printed or by issuing the PD - Purge Done command to purge all printed spool files at once.

Parameters Accepted

THRESHOLD(nn%)

Specifies the threshold queue percentage. nn is a number from 0 through 100, inclusive.

Default: Taken from the CA Spool initialization parameter TGWARN.

Debug Support

No

Verbose Support

No

Reference

For more information about CA Spool dataset allocations, see the *Customization Guide*.

Messages

Normal: ESFH011I

Exception: ESFH012E

SPOOL_FILE_QUEUE_PCT@jobname

Description

This health check monitors file queue elements in use, to help ensure that sufficient free file queue elements are available to allow for more spool files.

This condition is checked periodically every five minutes, and reports a medium severity health check exception if the threshold is exceeded.

Best Practice

Consider increasing the NUMFQES initialization parameter to allow for more files in your CA Spool system. This process requires a COLD start and must be performed in an 'off-hours' timeframe, as follows:

1. Drain CA Spool system.
2. Run ESFSPTP utility to back up spool files.
3. Increase the NUMFQES initialization parameter.
4. Restart CA Spool with COLD option.
5. Run ESFSPTP utility to restore old spool files.

Note: You can also try to free file queue elements by purging spool files that have already printed or by issuing the PD - Purge Done command to purge all printed spool files at once.

Parameters Accepted

THRESHOLD(nn%)

Specifies the threshold queue percentage. nn is a number from 0 through 100, inclusive.

Default: Taken from the CA Spool initialization parameter TGWARN.

Debug Support

No

Verbose Support

No

Reference

For more information about CA Spool dataset allocations, see the *Customization Guide*.

Messages

Normal: ESFH021I

Exception: ESFH022E

SPOOL_TCP_ACT@jobname

Description

This health check monitors number of concurrent active TCP/IP subtasks to warn if the maximum of 128 subtasks is being reached.

This condition is checked periodically every five minutes, and reports a medium severity health check exception if the threshold is exceeded.

Best Practice

Use the CA Spool Web Interface or 3270 Menu System Printer panel to filter on printers in 'Intervention Required' status to locate printers needing manual intervention.

Check the ESFLOG for printers which repeatedly fail to print.

Parameters Accepted

THRESHOLD(nn%)

Specifies the threshold queue percentage. nn is a number from 0 through 100, inclusive.

Default: Taken from the CA Spool initialization parameter TGWARN.

Debug Support

No

Verbose Support

No

Reference

For more information, see the *Operations and Commands, Messages, and Customization* guides.

Messages

Normal: ESFH031I

Exception: ESFH032E

SPOOL_TRANSFRM_ACT@jobname

Description

This health check monitors number of concurrent active internal Transformer subtasks, AFP Transformers subtasks, and text wrapper subtasks to warn if the maximum number of Transformer subtasks is being reached.

Files being transformed externally by the Java Transformers do not count toward the maximum number of Transformer subtasks.

This condition is checked periodically every five minutes, and reports a medium severity health check exception if the threshold is exceeded.

Best Practice

Set X2YY MAXFILES to from 5 through 10. A number higher than 10 does not increase throughput, but only increases the virtual storage usage below the 16 Mb-line.

Note: For more information, see X2YY MAXFILES Check.

To allow for concurrent transformations remove TRANSFRM option R, which causes a transformation report to be produced for each transformation.

Specify the AFP transformer parameter CacheSize. If CacheSize is set to, for example, "CacheSize=10M" up to 10Mb of AFP resources are stored in memory to avoid reading the same resource members from the AFP resource libraries repeatedly. This dramatically reduces the I/O and CPU usage.

Use BUFSIZE=27998 to reduce I/O and CPU overhead to read transformer input files and write corresponding transformer output files.

Specify TRANSFRM option B to have multiple PCL, PostScript, and PDF commands buffered into output records to reduce CPU usage.

Parameters Accepted

THRESHOLD(nn%)

Specifies the threshold queue percentage. nn is a number from 0 through 100, inclusive.

Default: Taken from the CA Spool initialization parameter TGWARN.

Debug Support

No

Verbose Support

No

Reference

For more information, see the *Operations and Commands, Messages, and Customization* guides.

Messages

Normal: ESFH041I

Exception: ESFH042E

SPOOL_CKPT_ACT@jobname

Description

This health check warns if the CA Spool system has not updated the checkpoint within the CKPTIME= specified time interval or if the CA Spool EMAS/MAS complex member has not been able to get access to the checkpoint within the WARNTIM= specified time interval.

This condition is checked periodically every two minutes, and reports a severe severity health check exception if the threshold is exceeded.

Best Practice

In a single CA Spool system, try to issue a 'DS' command to display the current CA Spool status. If no response is received the CA Spool system is non-operational. Report the problem to your system programmer immediately.

In a CA Spool EMAS/MAS, locate the member system that is monopolizing the checkpoint and issue a 'DS' command against that system. If no response is received that CA Spool member system is non-operational. Report the problem to your system programmer immediately.

Parameters Accepted

WARNTIME(*nnn*)

Specifies in seconds the maximum time interval that a CA Spool system is allowed not have control over checkpoint dataset. *nnn* is a number from 1 through 999, inclusive.

Default: Taken from the CA Spool initialization parameter CKPTIME for single systems and from WARNTIME for CA Spool MAS/EMAS complexes. Default CKPTIME is 60 seconds and default WARNTIME is 10 seconds.

Debug Support

No

Verbose Support

No

Reference

For more information, see the *Operations and Commands, Messages, and Customization* guides.

Messages

Normal: ESFH051I

Exception: ESFH052E

Exception: ESFH053E

SPOOL_OPT_ENCRYPT@jobname

Description

This health check warns if CA Spool has detected a setting of SPOOLENC=YES, but encryption hardware is not installed on this computer.

If CP Assist for Cryptographic Functions (CPACF) status is absent, the optimum encryption hardware is not available for use in encryption processing. Be aware that CA Spool can encrypt and decrypt reports without encryption hardware, but emulating encryption hardware is very CPU intensive and will use CPU resources that might be needed for production applications.

This could potentially delay those applications.

Best Practice

Important! We recommend that all CA Spool systems with activated encryption be run on a computer that supports hardware encryption.

System Programmer Response

For optimal encryption performance, use the CPACF hardware in your system. If you do not have CPACF enabled, contact IBM to determine if the no-cost CPACF option can be made available for your system.

Note: CPACF is a standard component on z9, z10, and z196 and a no-cost option for z890 and z990 processors.

To disable encryption, remove the SPOOLENC=YES setting and restart CA Spool.

Parameters Accepted

None

Reference

For more information, see the *Operations and Commands, Messages, and Customization* guides.

Messages

Normal: ESFH061I

Exception: ESFH062E

Chapter 2: System Modifications

This chapter describes the system modification considerations. CA Spool is installed as a fully operational system requiring no modifications. Sample exit routines enable individual installations to enforce local standards. Sample exit routines are supplied in the CBQ4SRC library and can be modified.

This section contains the following topics:

[Installing Service and Modifications Using SMP/E](#) (see page 251)

[User Exits](#) (see page 253)

[Updating Output Translation Tables](#) (see page 253)

[ESFSSM—Subsystem Support Module](#) (see page 254)

[ESFFSSM—FSI Support Module for PSF](#) (see page 254)

[User Interface Modules](#) (see page 254)

[ESFPRINT—General Print Utility](#) (see page 255)

Installing Service and Modifications Using SMP/E

A number of jobs are supplied to use when installing service to CA Spool under SMP/E. These jobs are *not* executable; you can use the jobs as models.

Installation Jobs

The following jobs in CBQ4JCL must be modified each time they are used:

Job	Usage
BQ4JFREC	RECEIVE a SYSMOD.
BQ4JFAPC	APPLY CHECK a SYSMOD.
BQ4JFAP	APPLY a SYSMOD.
BQ4JRES	RESTORE a SYSMOD.
BQ4JREJ	REJECT a SYSMOD.

You must not assemble or link modules into the CA Spool libraries or make any source updates. SMP must be used to do these tasks.

If it is necessary to assemble a module, the output must be placed in a user load library to be used as LKLIB in a USERMOD supplying the module.

User Modifications

The following jobs are supplied in CBQ4JCL to use as models when installing user modifications to CA Spool using SMP/E:

Job	Usage
BQ4JUREC	RECEIVE a user modification.
BQ4JUAP	APPLY a user modification.
BQ4JUAPC	APPLY CHECK a user modification.

User Versions

To install a user version of one of the modules supplied as source code:

1. Create and RECEIVE a USERMOD using the BQ4JUREC job as a model.

The SYSMOD ID must be of the format SC99888, where:

- SC—Indicates the letters "SC."
- 99—Indicates CA Spool version number.
- 888—Indicates the numeric identifier selected by the user.

USERMOD must PRE (prerequisite) all service applied to the source. Information is obtained by listing the SRC entry in the target zone. SYSMODs listed as RMID and UMIDs have updated the module. If RMID is the original FUNCTION, it must not be included in the PRE list.

1. Run APPLY CHECK, using job BQ4JUAPC as a model.
2. Run APPLY, using job BQ4JUAP as a model.

USERMOD

To install service to a module, which is modified by a USERMOD:

1. RESTORE the USERMOD, using job BQ4JRES as a model.
 - a. Install the service.
 - b. Rework and install the USERMOD again, as described earlier.

User Exits

CA Spool provides the following user exits:

- ESFUSO—SYSOUT Limit Exit Routine
- ESFUSS—Interface Exit Routine
- SAF—Security Exit Routines
- ESFPRIOX—Output Priority
- ESFSEPAX—VTAM Separator Page
- ESFMSG0X—Message Processing
- ESFU006X—VTAM Print Line Exit Routine
- ESFU008X Automatic Printer Definition Exit Routine
- ESFU009X—TCP/IP Print User Exit
- ESFU010X—TCP/IP Separator Page User Exit
- ESFU011X—TCP/IP LPD User Exit
- Main Task User Exit Routines

Note: For information about these user exits, see the *Programming Guide*.

Updating Output Translation Tables

The non-executable main program module ESFTRAN contains the translation tables used by CA Spool when physical printing is performed on VTAM-attached and TCP/IP-attached printers.

ESFTRAN

The ESFTRAN facility is described under the TRANS subparameter of the NODE parameter.

ESFTRAN also contains the translation tables used by the LPD interface. See the documentation of the LPDSERV DCPTAB= and LPDDEST FCPTAB= parameters.

You can update these tables and add new tables to meet your requirements. The module exists in the CBQ4SRC library.

ESFSSM—Subsystem Support Module

The CA Spool system requires a subsystem interface module in the link-pack area.

Interface Module Name

The name of the CA Spool subsystem-support module does not have to be ESFSSM.

The name is specified by the SSSM parameter on the MODULES statement in the CA Spool initialization deck.

ESFFSSM—FSI Support Module for PSF

To support PSF, the ESFFSSM module must be available to PSF in an authorized library.

User Interface Modules

To access the CA Spool system from application programs, calls are issued to an interface routine provided by the CA Spool system.

Loading Routines Dynamically

If the program loads the routines dynamically, these modules must either be linked with the calling program using the linkage-editor INCLUDE statement, or be available to the application program load-module at execution time.

Interface Routines

Two interface routines are available:

- AESFPRIV, which supports all the call functions
For CICS, this module also contains alternate entry points to all the service routines
- AESFCICS, which supports all the call functions from CICS Command Level programs

Link-edit

These modules are distributed in load-module format in the CA Spool CBQ4LOAD data set.

To support the linkage-editor autocall facility and the dynamic subroutine loading offered by some compilers, the target library version is assigned aliases.

These correspond to all available entry points in the AESFPRIV interface module.

ESFPRINT—General Print Utility

The print utility program ESFPRINT is distributed in the CA Spool CBQ4LOAD data set.

The member ESFPPARM, supplied in the source library, contains default parameter values and options used by ESFPRINT.

Changing Default Values

To change the supplied default values or options according to the installation standards, you must:

1. Use BQ4JUREC to add new, or update existing, ESFPPARM source code supplied in CBQ4SRC.
2. Run BQ4JUAPC and BQ4JUAP to install the changes.

Chapter 3: Initialization

This chapter explains how to specify the options and statements involved in initialization, and how CA Spool performs initialization under different starting conditions. The final section is a summary table of all the initialization statements.

This section contains the following topics:

[System Actions](#) (see page 257)

[Initialization Options](#) (see page 258)

[Initialization Parameters](#) (see page 260)

[Initialization Parameter Statement Descriptions](#) (see page 263)

[Initialization Feature and Option Summary Table](#) (see page 439)

System Actions

Initialization is the series of operations CA Spool performs each time it starts to get the system ready for file processing.

During each initialization, CA Spool:

- Loads the CA Spool routines and initializes buffer queues
- Locates and initializes all checkpoint and spool volumes
- Initializes internal tables and the subsystem interface

Options and Parameters that affect Initialization

Initialization is affected by a set of initialization *options* and *parameters*:

- Options are processed when CA Spool is started; these initialization options let you specify:
 - CA Spool COLD or WARM start
 - Whether to have a printout of the initialization data set
 - Forced formatting of the spool volumes
 - CA Spool system logging
 - Rebuilding the file queue

- Parameters are read during CA Spool execution and are defined as a data set in the CA Spool procedure. Initialization parameters define the CA Spool functions and device defaults are to be overridden. These parameters specify:
 - Local and remote device characteristics
 - Spool and checkpoint control parameters
 - Security control parameters
 - Changes to the various CA Spool default settings

Initialization Options

The Initialization Options can be specified as:

- Parameters on the EXEC statement in the CA Spool procedure (PARM=)
- Options specified at the console

If these options are not specified on the EXEC statement, CA Spool requests them from the operator by issuing the WTOR message:

```
*xx ESF000 SPECIFY OPTIONS FOR V12.0 INC00
```

The operator can then enter options in standard OS reply format (see also System Start). Note that the options can be entered in upper or lower case, but must be separated by commas.

If conflicting options are entered (for example, WARM, COLD), the option last entered overrides the others.

If the options are specified on the EXEC statement, CA Spool suppresses the SPECIFY OPTIONS message, and completes initialization without operator intervention. For more information about coding the EXEC statement, see the CA Spool Procedure in the chapter Customization.

The following table shows all of the initialization options and their defaults:

Option	Purpose	Effect
FORMAT	To start CA Spool when new spool data sets are allocated.	All existing spool data sets are physically formatted, and a COLD start is performed.

Option	Purpose	Effect
COLD	To start CA Spool empty.	Files are purged, and data about spool data sets deleted. If an unformatted spool data set detected, FORMAT is performed implicitly; note that unformatted spool data sets cannot always be detected.
WARM	To re-start CA Spool from the point where it was previously stopped.	CA Spool continues to process files using the status they had when the system was stopped. If a damaged file queue is detected, BUILDQ is implicitly performed. Note that CA Spool cannot always detect that the file queue needs rebuilding. WARM is the default.
U	Alias for WARM.	
Null	Alias for WARM.	
BUILDQ	To rebuild the file queue after abnormal termination.	File queue is rebuilt, and a WARM start is performed.
LIST	To copy the contents of the initialization data set and error messages during initialization.	LIST output is directed to the file allocated to the DDname ESFLIST.
NOLIST	To specify that CA Spool is not to copy the statements in the initialization data set, nor any error messages that occur during initialization.	This does not affect system log entries. NOLIST is the default.
LOG	To generate and maintain a CA Spool log.	LOG output to a JES spin-off SYSOUT data set allocated DDname ESFLOG.nn. LOG is the default.
NOLOG	To not maintain system log file.	
SCAN	To find errors in the initialization parameters.	CA Spool scans the initialization parameters for syntax errors, and terminates. All initialization options, except LIST/NOLIST, are ignored.

Initialization Parameters

The initialization data set specified by the ESFPARM JCL statement in the CA Spool procedure contains the initialization parameters.

All the parameter statements are coded on card image records, and form a sequential data set or a member of a partitioned data set.

Initialization Statements

The initialization statements let you specify the functions and device characteristics CA Spool uses during execution. These statements and parameters are fully described below and in the Summary Table.

Changes to any statements marked with an asterisk (*) in the Summary Table require a CA Spool COLD or FORMAT start. For more information, see Initialization Feature and Option Summary Table.

Syntax Rules

The following syntax rules apply to the coding of most initialization statements:

- Any columns between 1 and 71 can contain data; columns 72 to 80 are ignored.
- Records with blanks in columns 1 through 71, or an asterisk (*) in column 1, are ignored.
- The statement keyword must start in column 1. Only one statement can be coded per record, although several parameters can be coded on the same record.
- Simple statements consist of the name, followed by an equal sign (=), and then the value.
- A statement name is separated from the parameters by at least one blank; commas separate parameters.
- Parameters can be continued on successive records; a comma followed by a blank indicates continuation. Comments cannot be continued.
- Parameters cannot contain embedded blanks. The first blank terminates the parameter statement, and the rest of the record is considered to contain comments.
- Character specifications, unless otherwise noted, can include any alphanumeric or national characters or the period (.).
- Numeric values cannot exceed 8 digits in length.
- A parameter data set is terminated at end-of-file.

System Symbol Substitution

To allow the use of the same configuration for all members in an EMAS complex (cloning), automatic System Symbol substitution is supported for the following selected System-defined static System Symbols:

&SYSCclone

The 1- to 2- character ID of the system.

&SYSNAME

The 1- to 8- character name of the system

&SYSPLEX

The name of the sysplex

&SID

SMF specified system ID

For example, on a system with &SYSCclone=12 the initialization statement 'NJE JES2,APPL=A&SYSCclone.JES2' is automatically translated to 'NJE JES2,APPL=A12JES2' before processing.

Note: System Symbol Substitution is not supported in the LPDSERV, LPDDEST and LPDFILE statements.

LPD Interface

The LPD Interface uses dynamic value parameters to support automatic output file attribute assignment of information passed as control lines in the received control file, or from an extracted data header line in the first received data buffer.

If a control line, or the data header line contains multiple words separated by blanks or special characters, it can be broken down into individual *selectable* words.

Dynamic Value Syntax

When the documentation for an LPDSERV/LPDDEST/LPDFILE parameter specifies *&xno/* any of the following formats can be used:

&x / &xn / &xno / &xno|

where:

&

The & subparameter specifies that dynamic value assignment must be used.

X

The *x* subparameter specifies which of the following input control lines or data header lines must be used:

- C—Class name for banner page
- H—Origin host name
- J—Job name for banner page
- L—User name for banner page
- M—User name for completion email
- N—Name of source file
- P—Requestor's user identification
- T—Title for formatted print file
- D—Extracted data header from the first data buffer

N

The optional *n* subparameter specifies which word within the control line parameter must be used. If the *n* subparameter is not specified, format &*x* is being used, alphanumeric characters are copied from the input control line to the output file attribute.

If specified, the *n* subparameter has the following meaning:

- 1—Use first control line word value.
- 2—Use second control line word as value if present, else use first word.
- 3—Use third control line word as value if present, else use preceding word.
- 4—Use fourth control line word as value if present, else use preceding word.
- 5—Use fifth control line word as value if present, else use preceding word.
- 9—Use last control line word as value.
- 8—Use the control line word that is one previous to the last control line word as value, if present.
- 7—Use the control line word that is two previous to the last control line word as value, if present.
- 6—Use the control line word that is three previous to the last control line word as value, if present.
- 0—Use the last control line word as value unless it is a commonly used file extension like DOC or TXT. In that case, the preceding word is used.

O

The optional *o* subparameter specifies the offset; this is where the copying of alphanumeric characters from the input control line word to the output file attribute is to begin.

L

The optional */* subparameter specifies the number of alphanumeric characters to be copied from the specified input control line word to the output file attribute.

Note: The *&xno/* parameter can be specified up to four times per LPDSERV/LPDDEST/LPDFILE parameter.

Examples

Syntax Sample Code	Interpretation
FNAME=&P	Use the control line P user ID as the output filename.
FNAME=&N0	Use the last word in control line N as the output filename, unless it is a commonly used file extension.
FNAME=&P102&P152 &F1	Set the output file name to the first character 1-2 and 6-7 of control line P user ID followed by first control line N word.
FHEADER='Job Name : , FNAME=&D1, FWRITER=&D1	Let a data header line start after first occurrence of string 'Job Name : ' in the first data buffer, if found. Set the output file name and writer name to the first word within the data header line.

Initialization Parameter Statement Descriptions

This section describes the Initialization parameter statements including their defaults and options.

ACQTIME

Syntax

ACQTIME=*nnnn*

Description

This statement specifies the interval, in minutes, between each scan of the file queue to find files ready to be printed on printers defined with ACQUIRE=TIME/NQTIME.

If ACQTIME=0 or no printers are defined with ACQUIRE=TIME|NQTIME, no scan of the file queue is performed.

The lower limit is 0 and the upper limit is 1,440. The default value is 10.

APPLID

Syntax

APPLID=ccccccc

Description

This statement specifies the VTAM application name that the installation has assigned. The name must be one to eight characters and must match the name defined to VTAM.

Note the following:

- In an EMAS complex the VTAM application name is obtained from the NJE home node pointer by the matching *Snn* statement.
- In an EMAS complex the APPLID statement specifies a common VTAM Generic Resource Name for the entire EMAS complex.

The default value is ESF in non-EMAS complex. In EMAS complex the default value is none.

BACKOUT

Syntax

BACKOUT=YES | NO | HOLD

Description

This statement specifies whether dynamic backout must be activated.

- YES—All files opened by an application for output processing are automatically closed and purged if the program abnormally terminates.
- NO—(Default) Do not activate dynamic backout.
- HOLD—All files opened by an application for output processing are automatically closed and held if the program abnormally terminates.

BUFSIZE

Syntax

BUFSIZE=*nnnnn*

Description

This statement specifies the size of each spool buffer as a decimal number of bytes.

CA Spool does not support more than 8 spool blocks per track, so the BUFSIZE parameter specified must not be less than the track size divided by 8. Be aware that a change to this statement requires a FORMAT start.

The lower limit is 2,000 or track size /8 and the upper limit is 32,768. The default value is 6,518.

CHKPTDS

Syntax

```
CHKPTDS NUM=n,  
        DSNAME=cccccccc  
        [ ,VOL=cccccc]  
        [ ,STRNAME=cccccccccc]
```

Description

This statement specifies the data set name, and optionally the volume serial number, of a CA Spool checkpoint data set. Up to 2 CHKPTDS statements, numbered by the NUM parameter from 1 to 2, can be specified.

Note: If VOL is not specified, the system catalog locates the data set name.

CHKPTDS Parameters

NUM=*n*,

This parameter specifies the SPOOLDS data set number as a value from 1 to 2, which must be unique

DSNAME=*cccccccc*,

This parameter specifies a 1 to 44-character name to be used as the checkpoint data set name.

VOL=cccccc,

This optional parameter specifies the volume serial number of the CA Spool checkpoint data set.

If VOL is not specified, the system catalog is used to locate the CHKPTDS data set name. If this value is not found in the catalog, the system defaults to VOL=SPOOL0.

STRNAME=ccccccccc,

This optional parameter specifies the Coupling Facility Structure name to be used for MAS/EMAS communication using the Coupling Facility.

If this value is not specified or if it is a non-MAS system, the Coupling Facility is not used.

This parameter does not have a default value.

Note: For more information about defining the CA Spool structure within the Coupling Facility, see the Coupling Facility section under the topic Multi-Access Spool (MAS).

CID

Syntax

```
CID cidname,  
  AUTH= 1 | 2 | 3,  
  GROUP=nnnn,  
  ISTATUS=START | STOP,  
  MAXPORT=nn,  
  OPENTYPE=A | U,  
  PASSWORD=cccccccc,  
  RCVLIM=16 | nn,  
  SNDLIM=16 | nn,  
  USMR=NO | YES,  
  XFERLIM=16 | nn
```

Description

The CID statement specifies the characteristics of a communication channel.

We strongly recommend that you avoid specifying any value for AUTH and GROUP. These parameters are maintained only to ensure backward compatibility; set OPENTYPE = U, and SECUCALL.

For more information about communication channels and the use of the Advanced Communication Interface, see the chapter Application Program Facilities in the *Programming Guide*.

CID Parameters

This section describes the CID parameters:

cidname,

This required parameter specifies the full or generic name of a communication channel.

The *cidname* must be:

- Alphanumeric and from 1 - 8 characters for a full channel name
- Alphanumeric and from 1 - 4 characters for a generic channel name

This parameter does not have a default value.

See also the MAXPORT parameter, discussed later in this section.

AUTH = 1 | 2 | 3,

This parameter specifies the authorization level associated with this communication channel; values are as follows:

- 1—(Default) Gives ordinary user level.
- 2—Gives system operator level.
- 3—Gives supervisor level, which means ordinary user level extended to display all files and all nodes in the system.

GROUP=*nnnn*,

This optional parameter defines the number of the network group to which this communication channel is related. The upper limit is MAXGROUP if specified else 99,999.

Note the following:

- If you specify AUTH=1, then this parameter causes the communication channel to be logically connected to the specified network group, and all messages sent to this network group are also sent to the user of this communication channel.
- If you specify AUTH=2, then this parameter has no meaning.
- If the communication channel is to be dynamically associated to various CA Spool network groups, this parameter must be omitted or set to zero. During opening of the communication channel, the CA Spool network group number must be supplied exactly or indirectly as the group to which a specified node belongs.

The default value is 0.

ISTATUS=START | STOP,

This parameter specifies whether this communication channel must be initially started.

If you specify ISTATUS=STOP, then the communication channel cannot be opened by a communication user program until the channel is started by the system operator.

The default value is START.

MAXPORT=nnnn,

This parameter specifies the maximum number of users who can use this communication channel concurrently. The value of MAXPORT can range from 1 - 9999.

Note:

- If this parameter is specified, the *cidname* is considered to be a generic communication channel name, and the *cidname* must be only 1 - 4 characters in length.
- CA Spool allocates a communication interface block (CIB) for each port requested during initialization. It also assigns a channel name consisting of the generic *cidname* appended with a numeric sequence number from 1 to the value of MAXPORT, causing the channel name to be a total of 8 characters in length.
- If this parameter is specified, the communication system user must specify that a generic channel name will be used when the channel is opened. If this is done, CA Spool assigns a free communication port in the pool defined by the generic name and returns the full channel name to the issuer of the open channel request.

This parameter does not have a default value.

OPENTYPE=A | U,

This parameter specifies the values that can be entered in the TYP field in the COMI parameter list.

Options are as follows:

- A—(Default) All the values are allowed in the TYP field in the COMI parameter list.
- U—If this value is specified, U is the only value, which can be specified in TYP field in the COMI parameter list. Other values result in a PE error.

Be aware that the *cidname* is considered to be a full channel name and only one communication interface block (CIB) is allocated.

PASSWORD=ccccccc,

This parameter specifies an optional password to be associated with this communication channel.

If specified, the password must be a 1- to 8-character alphanumeric string. The user of this communication channel must supply this password when the channel is opened.

This parameter does not have a default value.

RCVLIM=16 | nn,

This parameter specifies the maximum number of concurrent outstanding receive requests the communication channel can have, in the range 0 - 65535. If a value of 0 is specified, there is no limit on the number of concurrent receive requests. The default value is 16.

SNDLIM=16 | nn,

This parameter specifies the maximum number of concurrent outstanding send requests the user of this communication channel might have.

The value can range from 0 - 65535. If a value of 0 is specified, there is no limit to the number of concurrent pending send requests. The default value is 16.

USMR=NO | YES,

The USMR (unsolicited message receiver) parameter specifies whether the user of this communication channel must receive unsolicited messages, that is, messages not related to a specific user. The default value is NO.

XFERLIM=16 | nn,

This parameter specifies the number of data transfer buffers to be allocated when the communication channel opens.

The value of XFERLIM can range from 1 - 32 and must be considered carefully because the buffers are allocated in ECSA subpool 241 common storage. Each data transfer buffer occupies 168 bytes of storage. The default value is 16.

CKPTIME

Syntax

CKPTIME=nnnn

Description

This parameter specifies, in seconds, the interval at which certain checkpoints of CA Spool information are taken for WARM start. Checkpoints are taken, for example, when a file changes its status in the CA Spool file queue.

The time interval specified is a maximum checkpoint time for a non-shared CA Spool system (that is a non-MAS, single-member configuration).

The lower limit is 10 and the upper limit is 300. The default value is 60 seconds.

CMBBUFS

Syntax

CMBBUFS=*nnnn*

Description

This parameter specifies the number of internal console message/command buffers that are provided for CA Spool.

The number of buffers must be sufficient to accommodate all outstanding operator requests and still allow message processing to continue. Severe system degradation can occur if the value of CMBBUFS is too small.

The lower limit is 50 and the upper limit is 65,535. The default value is 500 or the number of network nodes defined, whichever is greater.

COMCHAR

Syntax

COMCHAR=*c*

Description

This parameter specifies a special character to identify CA Spool commands from MCS consoles.

If a command from an MCS system console begins with the character specified for COMCHAR, CA Spool assumes that it is a CA Spool command and attempts to process it. The value specified must be a special character that is not used as the first character of any command from any other subsystem that can be operating concurrently with CA Spool.

Range	Meaning
X'4B' - X'50'	. < (+ &
X'5A' - X'61'	! \$ *) ; ÿ - /

Range	Meaning
X'6B' - X'6F'	, % _ > ?
X'7A' - X'7C'	: # @
X'7E' - X'7F'	= ð

This parameter does not have a default value.

DEFCLASS

Syntax

DEFCLAS=c

Description

This parameter specifies the output class to be used during file creation if none is specified in the ESFOPEN parameter list, and if the default output class cannot be obtained from the NODE definition of the printer destination. The default value is A.

DEFFCB

Syntax

DEFFCB=cccc

Description

This parameter specifies the FCB name to be used during file creation if none is specified in the ESFOPEN parameter list, and if the default FCB name cannot be obtained from the NODE definition of the printer destination. The default value is STD.

DEFFORM

Syntax

DEFFORM=cccccccc

Description

This parameter specifies the form number to be used during file creation if none is specified in the ESFOPEN parameter list, and if the default form number cannot be obtained from the NODE definition of the printer destination. The default value is STD.

DEFNODE

Syntax

DEFNODE

Description

Note: The DEFNODE statement has the same basic parameters, display node parameters, and printer node parameters as the NODE statement. See the NODE statement for specific information about any of those parameters.

Basic Parameters

model-name,
device-type,
GROUP=*nnnn*,
MAXDATA=*nnnn*,
SNABSIZE=*nnnn*

Display Node Parameters

AUTH=1 | 2 | 3,
BID | NOBID,
MODE=CONSOLE | MENU,
PASSWORD=*cccccccc*,
RDQUERY=NOLIST,
TIMEOUT=*nnnn*,
USMR=YES | NO | GROUP | SEVERE,
WRAP | NOWRAP

Printer Node Parameters

ACQUIRE=NO | WORK | NQWORK | TIME | NQTIME | SNET | NQSNET,
ADR=*cccc*,
APDNODE=*cccccccc*,
AUTO=YES | NO,
BRACKETS=FILE | BLOCK | SESSION | NO,
CHAIN=NO | YES,
CKPTPGS=*nnnn*,
CLASS=*c1...cn*,
COMP=NO | YES,
DRIVPRM1=*cccccccccccccccc*,
DRIVPRM2=*cccccccccccccccc*,
DRIVPRM3=*cccccccccccccccc*,
DRIVPRM4=*cccccccccccccccc*,
DUPLEX= NO | YES | TUMBLE,
ENDFF=YES | NO,

FILTER=c,
 FCB=cccc,
 FORM=cccccccc,
 FSS=cccccccc,
 FSSNPRO=nnnn,
 INITFF=SVF | FILE | OPENSESS | NO,
 INTRAY=nnn,
 KEY=xxxxxxxxxxxxxxxxxx,
 LINECNT=nnn,
 LOCATION=cccccccc,
 LOGMODE=cccccccc,
 MPP1CR=NEW | OLD,
 MPP1NL=NEW | OLD,
 NJEDEST=cccccccc,
 NOSETUP,
 OUTBIN=nnn,
 OUTLIM=nnnnnnn,
 PRESEL=NO | YES | DELAY,
 PSFOPT=nn,
 PURGE=YES | NO,
 RDQUERY=BIND | YES | NO,
 RELEASE=NO | NOWORK,
 RELREQ=N | D | I | NOWORK,
 REST=YES | NO | PRINTER,
 RETAIN=nnnnn,
 SAFF=NO | YES,
 SCSRESET=NO | YES | FILE,
 SEP= 0 | 1 | 2,
 SEPAEXIT=n,
 SEPOPT=nn,
 SETUP= STANDARD | FCB | FORM | NO | MANUAL,
 SHARED=NO | YES | MASTER,
 SIMLOGON= QALL | QSESSLIM | QNOTENAB,TCPDRIV=cccccccccc,
 TCPHOST=cccccccccccccccc,
 TCPPORT=nnnn,
 TCPprt=cccccccccccccccc,
 TIMEOUT=nnnnn,
 TRANS=cccccccc,
 TRANSFRM=cccccccccc,
 USEFCB=FILE | PRINTER,
 USEREXIT= BSESSION | ASESSION | FILE | PAGE | LINE,
 USERXNO=n,
 USERPARM=cccccccccccccccc,
 USM=NO | YES,
 VFC | VFC0 | VFC1 | VFC2 | VFC3 | VFC4 | VFC5 | VFC6 | VFC7 | NOVFC,

```
VPSCAPPL=cccccccc,  
VPSERROR=ERROR | BLANK | IGNORE | NULLPASS,  
VPSFILE= CHAIN | BRACKET | nnnnnn,  
VPSFNFF=YES | NO,  
VPSMPP=NEW | OLD,  
VPSOPT=nn,  
VPSMPP=nnn,  
VPSTRACE= *ALL | cccccccc,  
WS= CLASS | FORM | FCB | PRIO | AGE | GROUP,  
XFERNODE= BOTH | NODE | ALIAS | OFF  
X2YY=cccccccc
```

The DEFNODE Parameter

This optional parameter defines a model device type, which can be specified as the device type in subsequent NODE parameter definitions.

Note: See the NODE statement for a full description of parameters.

Nodes using the model device type specification obtain the node attributes specified in the DEFNODE definition for the specified model device type.

The DEFNODE facility can be used to define a set of installation-dependent model device types, which can be used during definition of all network nodes. In this way, you typically only have to specify a node name, a model device type, and a network group number on each NODE definition.

The model device type name must be a 1 - 8-alphanumeric character string. Two special model device types are available

Device Mode	Defines the default values for all	Device Type
DISPLAY	Display Terminals	3278-2
PRINTER	Printer Terminals	3287

Note the following:

- The parameters specified on the DEFNODE PRINTER statement are copied to all other printer NODE statements.
- The parameters specified on the DEFNODE DISPLAY statement are copied to all other display NODE statements before processing the parameters for the specific NODEs. This means that the DEFNODE parameters are considered the defaults; you can override these defaults by specifying other values on the NODE statements.

Other Use of DEFNODE

The DEFNODE parameter can also be used to define installation-specific device types.

If the device type in a DEFNODE definition does not specify a known device type, then it is assumed that it is a new printer device type.

If DESTVAL=DYNAMIC is specified, the APDNODE parameter can be used to set the node attributes for the printer when it is dynamically added. APDNODE can be 1 to 8 characters long. An asterisk (*) at the end indicates a generic parameter, and a percent sign (%) indicates a wildcard, which substitutes any character in any position.

If DESTVAL=DYNAPDIP is specified, define a DEFNODE with APDNODE=#* to assign default printer attributes to these DYNAPDIP automatically added printers.

When a print file is created for an unknown printer destination, the printer is automatically added using the attributes from the DEFNODE with the best match between the unknown printer destination and the APDNODE name. If no match is found, the printer is added using attributes from the DEFNODE PRINTER statement.

Every time a printer is dynamically defined, it uses one node from the pool of extra printers allocated by the DYNPRT statement. DYNPRT must consequently be set high enough to hold all dynamically defined printers at any given time.

If the printer pool becomes exhausted, a REINIT command can help. The command removes all DESTVAL=DYNAMIC dynamically defined printers, and defines again only the printers for which spool files exist.

Note: The REINIT command does not remove DESTVAL=DYNAPDIP dynamically defined printers. These printers are removed automatically when no files are queued to them.

Any changes to the DEFNODE statements can be also activated for the DESTVAL=DYNAMIC and DESTVAL=DYNAPDIP dynamic printers by doing a REINIT.

The default value is the same as for the NODE parameter.

DESTID

Syntax

DESTID

Selection Parameters

QUSERID=cccccccc | cccc*,
QDEST=cccccccc | cccc*,
QCLASS=c | *,
QFNAME=cccccccc | cccc*,

Default Value Assignment Parameters:

DABNDISP=W | H | K | L | P,
DACCOUNT=cccccccc,
DADDRESS1=cccccccccccc,
DADDRESS2=cccccccccccc,
DADDRESS3=cccccccccccc,
DADDRESS4=cccccccccccc,
DBUILD=cccccccccccc,
DCC=A | M,
DCHARS=(ccc1,ccc2,ccc3,ccc4),
DCLASS=q,
DCODEPAG=cccccccc,
DDATACHK=B | U | C | P,
DDEPARTM=cccccccccccc,
DDPAGLBL=YES | NO,
DFCB=cccc,
DFORM=cccccccc,
DFORMDEF=cccccc,
DGROUPID=cccccccc,
DLINECNT=nnn,
DLRECL=nnnn,
DNAME=cccccccccccc,
DNORDISP=W | H | K | L | P,
DNOTNODE=cccccccc,
DNOTUSER=cccccccc,
DOUTLIM=nnnnnnnn,
DPAGEDEF=cccccc,
DPGNAME='cccccc',
DPIMSG=YES | NO,
DPIMSGCN=nnn,
DRECFM=F | V,
DRETAIN=nnnn,
DROOM=cccc,
DROOMID=cccccccccccc,
DSARPROC=B | A | X | N,
DSECLAB=cccccccc,
DSID=cccc,
DSYSAREA=YES | NO,
DTITLE=cccccccccccc,
DTRC=YES | NO,
DUSRLIB1=cccccccccccc,

```

DUSRLIB2=cccccccccc,
DUSRLIB3=cccccccccc,
DUSRLIB4=cccccccccc,
DUSRLIB5=cccccccccc,
DUSRLIB6=cccccccccc,
DUSRLIB7=cccccccccc,
DUSRLIB8=cccccccccc,

DWRITER=cccccccc,

```

Forced Value Assignment Parameters

```

FABNDISP=W | H | K | L | P,
FACCOUNT=cccccccc,
FADDRESS1=cccccccccc,
FADDRESS2=cccccccccc,
FADDRESS3=cccccccccc,
FADDRESS4=cccccccccc,
FBUILD=cccccccccc,
FCC=A | M,
FCHARS=(ccc1,ccc2,ccc3,ccc4),
FCLASS=q,
FCODEPAG=cccccccc,
FCOPIES=nnn,
FDATACHK=B | U | C | P,
FDEPARTM=cccccccccc,
FDEST=(dest1.rmtdest1.rmtwrt1,&DST.&RMT,&WTR,....)
FDPAGLBL=YES | NO,
FEOF= YES | NO,
FFCB=cccc,
FFNAME=cccccccc,
FFORM=cccccccc,
FFORMDEF=cccccc,
FGROUPID=cccccccc,
FHOLD= YES | NO,
FLINECNT=nnn,
FLRECL=nnnnn,
FNAME=cccccccccc,
FNORDISP=W | H | K | L | P,
FNOTNODE=cccccccc,
FNOTUSER=cccccccc,
FOUTLIM=nnnnnnnn,
FPAGEDEF=cccccc,
FPGNAME='cccccc',

```

FPIMSG=YES | NO,
FPIMSGCN=*nnn*,
FPRIO=*nn*,
FPRMODE=*cccccccc*,
FPURGE= YES | NO,
FRECFM=F | V,
FRETAIN=*nnnn*,
FROOM=*cccc*,
FROOMID=*cccccccccccc*,
FSARPROC=B | A | X | N,
FSECLAB=*cccccccc*,
FSID=*cccc*,
FSYSAREA=YES | NO,
FTITLE=*cccccccccccc*,
FTRC=YES | No,
FUSERID=*cccccccc*,
FUSRLIB1=*cccccccccccc*,
FUSRLIB2=*cccccccccccc*,
FUSRLIB3=*cccccccccccc*,
FUSRLIB4=*cccccccccccc*,
FUSRLIB5=*cccccccccccc*,
FUSRLIB6=*cccccccccccc*,
FUSRLIB7=*cccccccccccc*,
FUSRLIB8=*cccccccccccc*,

DESTID Statement Description

The description of the DESTID statement is divided into three sections:

- Selection parameters
- Default value assignment parameters
- Forced value assignment parameters

Many new parameters are identified this way. For more information, see the DESTID section in this chapter.

Selection Parameters

This section describes the DESTID selection parameters.

QUSERID= *cccccccc* / *cccc**,

This optional parameter specifies the highest priority selection criteria for spool files. A full user ID *cccccccc* from 1 to 8 characters or a generic user ID from 1 to 7 characters followed by an asterisk * can be specified. This parameter does not have a default value.

QDEST= ccccccc / cccc*,

This optional parameter specifies the second highest priority selection criteria for spool files. A full destination name *ccccccc* (from 1 - 8 characters) or a generic destination name (from 1 - 7 characters followed by an asterisk ***) can be specified. This parameter does not have a default value.

QCLASS=c,

This optional parameter specifies the third highest priority selection criteria for spool files. You can specify an output class in the range of A – Z, 1 - 9, or *** for all classes. Not specifying a QCLASS= parameter is the same as specifying QCLASS=*. This parameter does not have a default value.

QFNAME= ccccccc / cccc*,

This optional parameter specifies the lowest priority selection criteria for spool files. You can specify a full filename, *ccccccc* (from 1-8 characters) or a generic filename (from 1-7 characters followed by an asterisk ***). There is no default value.

Default Value Assignment Parameters

This section describes the DESTID default value assignment parameters:

DABNDISP

Syntax

DABNDISP=W | H | K | L | P,

Description

(Optional) Specifies the default abnormal file disposition. This parameter applies if the ESFOPEN parameter list does not specify the abnormal file disposition.

Options:

- W—Prints and purges the file.
- H—Holds the file. If the file is released, it is printed and purged.
- K—Prints and keeps the file.
- L—Holds the file. If the file is released, it is printed and kept.
- P—Purges the file without printing it.

Default: None

DACCOUNT

Syntax

DACCOUNT=cccccccc,

Description

This optional parameter supplies a 1-8 character default account number. This parameter applies if the ESFOPEN parameter list specifies no account number.

Default: None

DADDRESSn

Syntax

DADDRESSn='cccccccccccc',

Description

(Optional) Specifies default address information. This parameter applies if the ESFOPEN parameter list specifies no ADDRESS n parameter.

The DADDRESS n is 1-60 EBCDIC text characters of address information of the receiver of this file, where n can be 1-4, for example, DADDRESS3.

Default: None

DBUILD

Syntax

DBUILD='cccccccccccc',

Description

This optional parameter can be used to supply default BUILDING which is used if no BUILDING parameter is specified in the ESFOPEN parameter list. The DBUILD is 1-60 EBCDIC text characters of building identification of the receiver of this file. There is no default value.

DCC

Syntax

DCC=A | M

Description

(Optional) Specifies specifies whether to default the or Carriage Control (CC) attribute to A or M.

Default: None

DCHARS

Syntax

DCHARS=(ccc1, ccc2, ccc3, ccc4) ,

Description

This optional parameter can be used to supply up to 4 default fonts, which are used if no CHARS is specified in the ESFOPEN parameter list. There is no default value.

DCLASS

Syntax

DCLASS=q,

Description

This optional parameter can be used to supply a default output class, which is used if no output class is specified in the ESFOPEN parameter list. There is no default value.

DCODEPAG

Syntax

DCODEPAG=cccccccc,

Description

(Optional) Specifies the default CODEPAGE name. This parameter applies if the ESFOPEN parameter list specifies no CODEPAGE name.

The DCODEPAG is 1-8 alphanumeric characters.

Default: None

DDATACHK

Syntax

DDATACHK=B | U | C | P,

Description

This optional parameter can be used to supply a default DATACHK parameter for PSF which is used if no DATACHK parameter is specified in the ESFOPEN parameter list.

Options are as follows:

- B—BLOCK means print-positioning and invalid-character errors are not reported.
- U—UNBLOCK means print-positioning and invalid-character errors are reported.
- C—BLKCHAR means invalid-character errors are not reported.
- P—BLKPOS means print-positioning errors are not reported.

There is no default value.

DDEPARTM

Syntax

DDEPARTM='cccccccccccc',

Description

(Optional) Specifies default DEPARTMENT identification. This parameter applies if the ESFOPEN parameter list specifies no DEPT parameter.

The DDEPARTM is 1 to 60 EBCDIC text characters that specify the department of the receiver of this file.

Default: None

DDPAGLBL

Syntax

DDPAGLBL=Y | N,

Description

This optional parameter can be used to supply default DPAGELBL (data page labeling) parameter for PSF which is used if no DPAGELBL parameter is specified in the ESFOPEN parameter list.

Options are as follows:

- Y—Print the security label on each printed page.
- N—Do not print the security label on each printed page.

There is no default value.

DFCB

Syntax

DFCB=cccc,

Description

This optional parameter can be used to supply a default FCB, which is used if no FCB parameter is specified in the ESFOPEN parameter list. There is no default value.

DFORM

Syntax

DFORM=cccccccc,

Description

This optional parameter can be used to supply a default form number, which is used if no form number is specified in the ESFOPEN parameter list. There is no default value.

DFORMDEF

Syntax

DFORMDEF=cccccc,

Description

This optional parameter can be used to supply a default FORMDEF name, which is used if no FORMDEF is specified in the ESFOPEN parameter list. There is no default value.

DGROUPID

Syntax

DGROUPID=ccccccc,

Description

This optional parameter can be used to supply default GROUPID which is used if no GROUPID is specified in the ESFOPEN parameter list. The DGROUPID is 1 - 8 alphanumeric characters. There is no default value.

DLINECNT

Syntax

DLINECNT=nnn,

Description

This optional parameter can be used to supply a default LINECNT which is used if no LINECNT parameter is specified in the ESFOPEN parameter list.

The lower limit is 0 and the upper limit is 255. There is no default value.

DLRECL

Syntax

DLRECL=nnnnn,

Description

(Optional) Specifies the default LRECL. This parameter applies if the ESFOPEN parameter list specifies no LRECL.

Lower limit: 0

Upper limit: 32767

Default: None

DNAME

Syntax

DNAME='cccccccccc',

Description

This optional parameter can be used to supply a default NAME which is used if no NAME is specified in the ESFOPEN parameter list. The DNAME parameter is 1 - 60 EBCDIC text characters containing the preferred name for the file. There is no default value.

DNORDISP

Syntax

DNORDISP=W | H | K | L | P,

Description

(Optional) Specifies the default normal file disposition. This parameter applies if the ESFOPEN parameter list specifies no normal file disposition.

Options:

- W—Prints and purges the file.
- H—Holds the file. If the file is released, it is printed and purged.
- K—Prints and keeps the file.
- L—Holds the file. If the file is released, it is printed and kept.
- P—Purges and prints the file.

Default: None

DNOTNODE

Syntax

DNOTNODE=ccccccc,

Description

This optional parameter can be used to supply a default NOTIFY node name which is used if no NOTIFY node name is specified in the ESFOPEN parameter list. The DNOTNODE is 1-8 alphanumeric characters. There is no default value.

DNOTUSER

Syntax

DNOTUSER=cccccccc,

Description

This optional parameter can be used to supply default NOTIFY user ID which is used if no NOTIFY user ID is specified in the ESFOPEN parameter list. The DNOTUSER is 1 to 8 alphanumeric characters. There is no default value.

DOUTLIM

Syntax

DOUTLIM=nnnnnnnn,

Description

This optional parameter can be used to supply a default output limit which is used if no output limit is specified in the ESFOPEN parameter list.

The lower limit is 1 and the upper limit is 16,777,215. There is no default value.

DPAGEDEF

Syntax

DPAGEDEF=cccccc,

Description

This optional parameter can be used to supply a default PAGEDEF name which is used if no PAGEDEF parameter is specified in the ESFOPEN parameter list. There is no default value.

DPGNAME

Syntax

DPGNAME='cccccccccccccccc',

Description

This optional parameter can be used to supply a default programmer's name which is used if no programmer's name is specified in the ESFOPEN parameter list. There is no default value.

DPIMSG

Syntax

DPIMSG=Y | N,

Description

(Optional) Specifies the default PIMSG parameter for PSF. This parameter applies if the ESFOPEN parameter list specifies no PIMSG parameter.

Options:

- Y—Print all messages from the PSF functional subsystem
- N—Print only severe messages from the PSF functional subsystem

Default: None

DPIMSGCN

Syntax

DPIMSGCN=*nnn*,

Description

This optional parameter can be used to supply default PIMSG count parameter which is used if no PIMSG count parameter is specified in the ESFOPEN parameter list. The PIMSG count must be in the range 0-999 and specifies the number of errors that are allowed before printing is cancelled. There is no default value.

DRECFM

Syntax

DRECFM=F | V,

Description

This optional parameter can be used to supply default file RECFM which is used if no file RECFM is specified in the ESFOPEN parameter list. Options are as follows:

- F—Specifies fixed RECFM.
- V—Specifies variable RECFM.

There is no default value.

DRETAIN

Syntax

DRETAIN=nnnn,

Description

This optional parameter can be used to supply a default retain time in hours which is used if no retain time parameter is specified in the ESFOPEN parameter list.

The lower limit is -1 and the upper limit is 8,760. There is no default value.

DROOM

Syntax

DROOM=cccc,

Description

This optional parameter can be used to supply a default room number which is used if no room number is specified in the ESFOPEN parameter list. There is no default value.

DROOMID

Syntax

DROOMID='cccccccccccc',

Description

This optional parameter can be used to supply default ROOM identification which is used if no ROOM identification is specified in the ESFOPEN parameter list. The DROOMID is 1-60 EBCDIC text characters of room identification of the receiver of this file. There is no default value.

DSARPROC

Syntax

DSARPROC=B | A | X | N,

Description

(Optional) Specifies the default SAR processing option for the ESF to SAR interface. This parameter applies if the ESFOPEN parameter list specifies no SAR processing option.

Options:

- B—Backs up the file into SAR and prints it.
- A—Archives the file into SAR at purge time.
- X—Transfers the file to SAR for further processing.
- N—Performs no SAR processing on the file.

Default: None

DSECLAB

Syntax

DSECLAB=cccccccc,

Description

This optional parameter can be used to supply a default SECLABEL for PSF which is used if no SECLABEL is specified in the ESFOPEN parameter list. The DSECLAB is a 1 to 8 alphanumeric or national character security label name. There is no default value.

DSID

Syntax

DSID=cccc,

Description

This optional parameter can be used to supply a default system identifier which is used if no system identifier is specified in the ESFOPEN parameter list. There is no default value.

DSYSAREA

Syntax

DSYSAREA=Y | N,

Description

This optional parameter can be used to supply a default SYSAREA parameter for PSF which is used if no SYSAREA parameter is specified in the ESFOPEN parameter list.

Options are as follows:

- Y—Reserve space for a system area on each printed page for the security label.
- N—Do not reserve space for a system area on each printed page.

There is no default value.

DTITLE

Syntax

DTITLE='cccccccccccc',

Description

This optional parameter can be used to supply a default TITLE which is used if no TITLE is specified in the ESFOPEN parameter list. The DTITLE is a 1 - 60 EBCDIC text character description of the file. There is no default value.

DTRC

Syntax

DTRC=YES | NO

Description

(Optional) Specifies the default TRC value. This parameter applies if the ESFOPEN parameter list specifies no TRC value.

Default: None

DUSRLIBn

Syntax

DUSRLIBn=cccccccccccc,

Description

(Optional) Specifies the default USERLIB data set names for PSF. This parameter applies if the ESFOPEN parameter list specifies no USERLIBn parameter.

The DUSRLIBn is a 1 to 44 EBCDIC text character data set name, where *n* can be 1-8, for example, DUSRLIB5.

Default: None

DWRITER

Syntax

DWRITER=ccccccc,

Description

(Optional) Specifies the default writer name. This parameter applies if the ESFOPEN parameter list specifies no writer name.

Default: None

Forced Value Assignment Parameters

This section describes of all the forced value assignment parameters.

FABNDISP

Syntax

FABNDISP=W | H | K | L | P,

Description

(Optional) Specifies the default abnormal file disposition for the selected spool files.

Options:

W—Prints and purges the file.

H—Holds the file. If the file is released, it is printed and purged.

K—Prints and keeps the file.

L—Holds the file. If the file is released, it is printed and kept.

P—Purges and prints the file.

Default: None

FACCOUNT

Syntax

FACCOUNT=cccccccc,

Description

This optional parameter can be used to supply a 1 to 8 character account number, which is assigned to the selected spool files. There is no default value.

FADDRESn

Syntax

FADDRESn='cccccccccc',

Description

(Optional) Specifies the address information for the selected spool files.

The FADDRESn is the 1-60 EBCDIC text character address information of the receiver of this file, where *n* can be 1-4.

Default: None

FBUILD

Syntax

FBUILD='cccccccccc',

Description

This optional parameter can be used to supply a BUILDING identification, which is assigned to the selected spool files. The FBUILD is a 1-60 EBCDIC text character building identification of the receiver of this file. There is no default value.

FCC

Syntax

FCC=A | M

Description

This optional parameter can be used to control if the CC should be forced to A or M. There is no default value.

FCHARS

Syntax

FCHARS=(ccc1,ccc2,ccc3,ccc4),

Description

This optional parameter can be used to supply up to four fonts, which are assigned to the selected spool files. There is no default value.

FCLASS

Syntax

FCLASS=q,

Description

This optional parameter can be used to supply an output class, which is assigned to the selected spool files. There is no default value.

FCODEPAG

Syntax

FCODEPAG=cccccccc,

Description

This optional parameter can be used to supply a CODEPAGE name, which is assigned to the selected spool files. The FCODEPAG is 1-8 alphanumeric characters. There is no default value.

FCOPIES

Syntax

FCOPIES=nnn,

Description

This optional parameter can be used to supply a copy count, which is assigned to the selected spool files.

The lower limit is 1 and the upper limit is 255. There is no default value.

FDATACHK

Syntax

FDATACHK=B | U | C | P,

Description

This optional parameter can be used to supply a DATACHK parameter for PSF, which is assigned to the selected spool files, as follows:

- B—BLOCK means print-positioning and invalid-character errors are not reported.
- U—UNBLOCK means print-positioning and invalid-character errors are reported.
- C—BLKCHAR means invalid-character errors are not reported.
- P—BLKPOS means print-positioning errors are not reported.

There is no default value.

FDEPARTM

Syntax

FDEPARTM='cccccccccccc',

Description

(Optional) Specifies a DEPARTMENT identification for the selected spool files.

The FDEPARTM is a 1-60 EBCDIC text character department identification of the receiver of this file.

Default: None

FDEST

Syntax

FDEST= (dest1.rmtdest1.rmtwrt1,&DST.&RMT.&WTR,.....)

Description

(Optional) Specifies up to 1000 destinations for the selected spool files, as follows:

- Symbolic parameters for the original file: &DST (primary destination), &RMT (remote destination), and &WTR (remote writer names).

You can use these parameters in any routing position.

- Depending on the attributes of a file, &RMT, WTR, or both could resolve to a blank value. If FDEST routing uses a symbolic that resolves to blanks, the following rules apply:
 - In the first level, the FDEST primary (original) destination remains.
 - In the second and third levels, blanks indicate the resulting file attribute for remote destination, remote writer, or both.

The following table shows the combinations:

FDEST Input	Resulting file destination
D1.R1.W1	D1.R1.W1
D1.R1.*	D1.R1.DST
D1.*.W1	D1.DST.W1
D1.*.*	D1.DST.RMT
*.R1.W1	DST.R1.W1
.R1.	DST.R1.RMT
..W1	DST.RMT.W1
..*	DST.RMT.WTR

Default: None

FDPAGLBL

Syntax

FDPAGLBL=Y | N,

Description

This optional parameter can be used to supply a DPAGELBL (data page labeling) parameter for PSF, which is assigned to the selected spool files.

Options are as follows:

- Y—Print the security label on each printed page.
- N—Do not print the security label on each printed page.

There is no default value.

FEOF

Syntax

FEOF= YES | NO,

Description

This optional parameter can be used to control if end-of-file status must be set on the selected spool files during close processing. There is no default value.

FFCB

Syntax

FFCB=cccc,

Description

This optional parameter can be used to supply an FCB name, which is assigned to the selected spool files. There is no default value.

FFNAME

Syntax

FFNAME=cccccccc,

Description

This optional parameter can be used to supply a filename, which is assigned to the selected spool files. There is no default value.

FFORM

Syntax

FFORM=cccccccc,

Description

This optional parameter can be used to supply a form number, which is assigned to the selected spool files. There is no default value.

FFORMDEF

Syntax

FFORMDEF=cccccc,

Description

This optional parameter can be used to supply a FORMDEF name, which is assigned to the selected spool files. There is no default value.

FGROUPID

Syntax

FGROUPID=cccccccc,

Description

This optional parameter can be used to supply a GROUPID, which is assigned to the selected spool files. The FGROUPEID is 1 - 8 alphanumeric characters. There is no default value.

FHOLD

Syntax

FHOLD= YES | NO

Description

(Optional) Specifies whether to hold the selected spool files during close processing. This parameter applies only during ESFCLOS processing.

Default: None

FLINECNT

Syntax

FLINECNT=nnn,

Description

This optional parameter can be used to supply a LINECNT value, which is assigned to the selected spool files.

The lower limit is 0 and the upper limit is 255. There is no default value.

FLRECL

Syntax

FLRECL=*nnnnn*,

Description

(Optional) Set the LRECL for the selected spool files.

Lower Limit: 0

Upper Limit: 32767

Default: None

FNAME

Syntax

FNAME=*cccccccccccc*,

Description

This optional parameter can be used to supply a NAME, which is assigned to the selected spool files. The FNAME parameter is 1 - 60 EBCDIC text characters containing the preferred name for the file. There is no default value.

FNORDISP

Syntax

FNORDISP=W | H | K | L | P,

Description

(Optional) Specifies the normal file disposition for the selected spool files.

Options:

W—Prints and purges the file.

H—Holds the file. If the file is released, it is printed and purged.

K—Prints and keeps the file.

L—Holds the file. If the file is released, it is printed and kept.

P—Purges and prints the file.

Default: None

FNOTNODE

Syntax

FNOTNODE=ccccccc,

Description

This optional parameter can be used to supply a NOTIFY node name, which is assigned to the selected spool files. The FNOTNODE is 1-8 alphanumeric characters. There is no default value.

FNOTUSER

Syntax

FNOTUSER=ccccccc,

Description

This optional parameter can be used to supply a NOTIFY user ID, which is assigned to the selected spool files. The FNOTNODE is 1-8 alphanumeric characters. There is no default value.

FOUTLIM

Syntax

FOUTLIM=nnnnnnnn

Description

This optional parameter can be used to supply an output limit, which is assigned to the selected spool files.

The lower limit is 1 and the upper limit is 16,777,215. There is no default value.

FPAGEDEF

Syntax

FPAGEDEF=cccccc,

Description

This optional parameter can be used to supply a PAGEDEF name, which is assigned to the selected spool files. There is no default value.

FPGNAME

Syntax

FPGNAME='cccccccccccccccc',

Description

This optional parameter can be used to supply a programmer's name, which is assigned to the selected spool files. A maximum of 255 characters can be used. There is no default value.

FPIMSG

Syntax

FPIMSG=Y | N,

Description

(Optional) Specifies the default PIMSG parameter for PSF, for the selected spool files:

- Y—Print all messages from the PSF functional subsystem
- N—Print only severe messages from the PSF functional subsystem

Default: None

FPIMSGCN

Syntax

FPIMSGCN=*nnn*,

Description

This optional parameter can be used to supply default PIMSG count parameter, which is assigned to the selected spool files. The PIMSG count must be in the range 0 - 999 and specifies the number of errors allowed before printing is cancelled. There is no default value.

FPRIO

Syntax

FPRIO=*nn*,

Description

(Optional) Specifies an output priority for the selected spool files.

Lower limit: 0

Upper limit: 15

Default: None

To change both the destination and the priority of a file, use two DESTID statements, as follows:

- In the first statement, use FDEST=value to change the destination.
- In the second statement, use FPRIO=value to change the priority. This statement must reference the new destination as the QDEST.

FPRMODE

Syntax

FPRMODE=*cccccccc*,

Description

This optional parameter can be used to supply a PRMODE process-mode name, which is assigned to the selected spool files. There is no default value.

FPURGE

Syntax

FPURGE= YES | NO,

Description

(Optional) Specifies whether to purge the selected spool files when they are permanently closed. This attribute is considered only during ESFCLOS processing.

Default: None

FRECFM

Syntax

FRECFM=F | V,

Description

This optional parameter can be used to supply a file RECFM, which is assigned to the selected spool files.

Options are as follows:

- F—Specifies a fixed RECFM.
- V—Specifies a variable RECFM.

There is no default value.

FRETAIN

Syntax

FRETAIN=*nnnn*,

Description

This optional parameter can be used to supply a retain time in hours, which is assigned to the selected spool files.

The lower limit is -1 and the upper limit is 8,760. There is no default value.

FROOM

Syntax

FROOM=*cccc*,

Description

This optional parameter can be used to supply a room number, which is assigned to the selected spool files. There is no default value.

FROOMID

Syntax

FROOMID='cccccccccc',

Description

This optional parameter can be used to supply a ROOM identification, which is assigned to the selected spool files. The FROOMID is a 1-60 EBCDIC text character room identification of the receiver of this file. There is no default value.

FSARPROC

Syntax

FSARPROC=B | A | X | N,

Description

This optional parameter can be used to supply a SAR processing option for the ESF to SAR interface, which is assigned to the selected spool files.

Options are as follows:

- B—Specifies that the file will be backed up into SAR before it is printed.
- A—Specifies that the file will be archived into SAR at purge time.
- X—Specifies that the file will be transferred to SAR for further processing.
- N—Specifies that no SAR processing will be performed on this file.

There is no default value.

FSECLAB

Syntax

FSECLAB=ccccccc,

Description

This optional parameter can be used to supply a SECLABEL for PSF, which is assigned to the selected spool files. The FSECLAB is a 1-8 alphanumeric or national character security label name. There is no default value.

FSID

Syntax

FSID=cccc ,

Description

(Optional) Assigns a system identifier to the selected spool files.

Default: None

FSYSAREA

Syntax

FSYSAREA=Y | N,

Description

This optional parameter can be used to supply a SYSAREA parameter for PSF, which is assigned to the selected spool files.

Options are as follows:

- Y—Reserve space for a system area on each printed page for the security label.
- N—Do not reserve space for a system area on each printed page.

There is no default value.

FTITLE

Syntax

FTITLE='cccccccccccc' ,

Description

This optional parameter can be used for a TITLE, which is assigned to the selected spool files. The FTITLE is 1-60 EBCDIC text character description of the file. There is no default value.

FTRC

Syntax

FTRC=YES |NO

Description

(Optional) Specifies whether to force the TRC attribute on or off, for the selected files.

Default: None

FUSERID

Syntax

FUSERID=cccccccc,

Description

(Optional) Assigns a user ID name to the selected spool files.

First, the security system validates that the original USERID is authorized to create the file. Next, if the original USERID is authorized, the new USERID value is assigned.

Default: None

FUSRLIBn

Syntax

FUSRLIBn=cccccccccccc,

Description

(Optional) Specifies USERLIB data set names for PSF, for the selected spool files.

The FUSRLIB n is a 1-44 EBCDIC text character data set name where n can be 1-8.

Default: None

DESTVAL

Syntax

DESTVAL=YES | NO | DYNAMIC | DYNAPDIP

Description

This statement specifies whether validation of the destination of a file being created or re-routed is performed, or if the printer destination must be automatically created.

Options are as follows:

- YES—(Default) CA Spool only allows printer node names, their aliases, or JES2 or JES3 destinations to be specified as file destinations.
- NO—No validation of the file destination is performed
- DYNAMIC—Any unknown printer destination is automatically created.
- DYNAPDIP – Any unknown printer with a DEST='IP:ipaddr' destination is automatically created.

To assign attributes to these automatically created printer definitions, use DEFNODE statements. The DEFNODE with the best match between the unknown printer destination and the APDNODE parameter on the DEFNODE statement is used.

To assign default printer attributes to printers automatically added by DYNAPDIP, define a DEFNODE with APDNODE=#*.

DYNDISP

Syntax

DYNDISP=*nnnn*

Description

This statement specifies the number of display terminals that can be defined automatically to the system, or added to the parameter deck and activated with the REINIT command.

This statement effectively specifies the number of resources that can be added to a running system, either dynamically or during REINIT.

The lower limit is 0 and the upper limit is 65,535.

The default value is 10.

DYNNJE

Syntax

DYNNJE=*nnnn*

Description

This statement specifies the number of NJE definitions that can be added to the parameter deck and activated with the REINIT command. This statement effectively specifies the number of resources that can be added to a running system, either dynamically or during REINIT.

The lower limit is 0 and the upper limit is 65,535. There is no default value.

DYNPRT

Syntax

DYNPRT=*nnnn*

Description

This statement specifies the number of printer terminals that can be added to the parameter deck and activated with the REINIT command. This statement effectively specifies the number of resources that can be added to a running system, either dynamically or during REINIT.

Lower limit: 0

Upper limit: 65535

Default: 10

DYNUSER

Syntax

DYNUSER=*nnnn*

Description

This statement specifies the number of internal user control blocks to be allocated.

When all the control blocks are used, the one that has not been referenced for the longest time is reused. Internal control blocks keep information in storage to reduce calls to the external security system.

The lower limit is 0 and the upper limit is 65535.

The default value is 10.

DYNVPS

Syntax

DYNVPS=*nnnn*

Description

This statement specifies the number of virtual printers that can be added to the parameter deck and activated with the REINIT command. This statement effectively specifies the number of resources that can be added to a running system, either dynamically or during REINIT.

Lower limit: 0

Upper limit: 65535

Default: 10

ESRCODE

Syntax

ESRCODE=*nnn*

Description

This statement specifies an ESR (extended SVC router) type-4 SVC route code to be used by CA Spool.

The system administrator responsible for the MVS system must decide which SVC number must be used.

Note:

- If both the ESRCODE and SVCCODE statements are specified, the ESRCODE definition is used and the SVCCODE definition is ignored.
- During startup CA Spool verifies whether the specified ESR number in the ESR table points to a valid CA Spool SVC routine.

- If the ESR table entry corresponding to the specified ESR number is not in use, CA Spool dynamically loads the SVC routine module specified using the SVC parameter on the MODULES statement, into the CSA and updates the ESR table entry to point to it.
- If an installation wants to pre-load the CA Spool SVC routine into the PLPA during IPL, the supplied ESFSVC module has to be renamed to the SVC module name matching the specified ESR number and made accessible using LPALSTxx or MLPA. For example, if ESRCODE=241 specified, then the corresponding CA Spool SVC module name must be IGX00241.

The lower limit is 200 and the upper limit is 255.

There is no default value.

FILELIM

Syntax

FILELIM=*nnnn*

Description

Specifies the number of hours to retain files that have been marked as printed.

No automatic purge takes place if the value is 0.

Lower limit: 0

Upper limit: 8760

Default: 10

FSSDEF

Syntax

FSSDEF
fsname,
AUTOSTOP=YES|NO,
ESFFSSM=xxxxxxx,
PROC=xxxxxxx

Description

Specifies the characteristics of a functional subsystem (FSS). The FSSDEF statement must be defined before it can be referenced in a NODE definition.

FSSDEF Parameters

This section describes the FSSDEF parameters.

***fssname*,**

(required) Specifies the name of the functional subsystem. The *fssname* must be alphanumeric, 1 to 8 characters. There is no default value.

AUTOSTOP= YES | NO

Specifies whether the FSS address space is to be automatically stopped if all printers attached to the FSS are drained. Valid values are:

- YES—Stop the FSS address space when all attached printers are drained.
- NO—(Default) Do not stop the FSS address space when all attached printers are drained.

ESFFSSM=xxxxxxx,

Specifies the name of the functional subsystem support module. The default value is ESFFSSM.

PROC=xxxxxxx

This parameter specifies the procedure used to start the functional subsystem. The default value is ESFPSF.

GDDMCLA

Syntax

GDDMCLA=x

Description

Specifies the output class for the GDDM interface. GDDM prints files with this output class. The GDDM interface is inactive if this statement is not specified.

Default: None

GDDMAPPL

Syntax

GDDMAPPL=xxxxxxxx

Description

Specifies the VTAM application name for the GDDM interface.

Default: ESFGDDM

LOADEXIT

Syntax

```
LOADEXIT UEX000=esfu000,  
          UEX003=esfu003,  
          UEX006=esfu006,  
          UEX007=esfu007,  
          UEX008=esfu008,  
          UEX009=esfu009,  
          UEX010=esfu010,  
          UEX011=esfu011  
          UEX012=esfu012  
          UEXPRI0=esfprio  
          UEXMSG0=esfmsg0  
          UEXSEP=esfsepa0  
          UEXSEC4=esfsecu4  
          UEXSEC5=esfsecu5
```

LOADEXIT Parameters

This section defines the LOADEXIT parameters.

UEX000=esfu000

Defines the name of a user defined standalone exit that is called by ESFU000X.
There is no default.

UEX003=esfu003

Defines the name of a user defined standalone exit that is called by ESFU003X.
There is no default.

UEX006=esfu006

Defines the name of a user defined standalone exit that is called by ESFU006X.
There is no default.

UEX007=esfu007

Defines the name of a user defined standalone exit that is called by ESFU007X.
There is no default.

UEX008=esfu008

Defines the name of a user defined standalone exit that is called by ESFU008X.
There is no default.

UEX009=esfu009

Defines the name of a user defined standalone exit that is called by ESFU009X.
There is no default.

UEX010=esfu010

Defines the name of a user defined standalone exit that is called by ESFU010X.
There is no default.

UEX011=esfu011

Defines the name of a user defined standalone exit that is called by ESFU011X.
There is no default.

UEX012=esfu012

Defines the name of a user defined standalone exit that is called by ESFU012X.
There is no default.

UEXPRIO=esfprio

Defines the name of a user defined standalone exit that is called by ESFUPRIOX.
There is no default.

UEXMSG0=esfmsg0

Defines the name of a user defined standalone exit that is called by ESFMSG0X.
There is no default.

UEXSEP=esfsepa0

Defines the name of a user defined standalone exit that is called by ESFSEPAX.
There is no default.

UEXSEC4=esfsecu4

Defines the name of a user defined standalone exit that is called by ESFSEC4X.
There is no default.

UEXSEC5=esfsecu5

Defines the name of a user defined standalone exit that is called by ESFSEC5X.
There is no default.

LOGBUFS

Syntax

LOGBUFS=*nnnn*

Description

Specifies the number of internal log file buffers to allocate.

Note: If you specify the NOLOG option, this statement does not apply.

Default: 500

Lower limit: 50

Upper limit: 65535

LOGCLAS

Syntax

LOGCLAS=*c*

Description

This parameter specifies the output class to be assigned to the CA Spool log file SYSOUT data sets.

This statement has no meaning if the NOLOG option is specified. The class specified must be in the range A-Z or 0-9. The default value is A.

LOGDEST

Syntax

LOGDEST=*aaaaaaaa*

Description

Specifies the output destination for the CA Spool log file SYSOUT data sets.

Note: If you specify the NOLOG option, the LOGDEST statement does not apply.

Default: None

LOGHOLD

Syntax

LOGHOLD=YES | NO

Description

This parameter specifies whether the CA Spool system log SYSOUT data sets must be held at unallocation.

Note: This statement has no meaning if the NOLOG option is specified.

The default value is NO.

LOGLCNT

Syntax

LOGLCNT=*nnnn*

Description

Specifies the output line count per page for the CA Spool log file SYSOUT data sets.

Note: If you specify the NOLOG option, this statement does not apply.

Default: 42

Lower Limit: 1

Upper Limit: 16,777,215

LOGMENU

Syntax

LOGMENU=NODISPRT

Description

Prevents responses to Display commands, issued on behalf of menu system users, from appearing in the CA Spool log file.

Note: If you specify the NOLOG option, this statement does not apply.

Default: None

LPDDEST

Syntax

```
LPDDEST QDEST=[ ccccccc | cccc* ],
        QHOST=[ ccccccc | cccc* ],
        FAM=[ JES | ESF | SAR | DUMMY | NO ],
        FESF=cccc,
        FSAR=cccccccc,
        FSARMODE=[ SAR | EXP ],
        FNAME=[ &xno | ccccccc ],
        FUSERID=[ &xno | ccccccc ],
        FCLASS=[ &xno | c ],
        FDEST=[ &xno | ccccccc ],
        FLRECL= nnnn,
        FFORM=[ &xno | ccccccc ],
        FDDNM=[ &xno | ccccccc ],
        FWRITER=[ &xno | ccccccc ],
        FHEADER=[ nnnn | ccccccc ],
        FJOBNAME=[ &xno | ccccccc ],
        FTITLE=[ &xno | ccccccc ],
        FKEY=xxxxxxxxxxxxxxxx,
        FOPTS=[ D|A|B|E|F|L|P|S] [C] [G] [J] [N] [O] [Q] [R] [U] [V] [X] [Y] [Z] [4],
        FCPTAB=cccccccc,
        FCPOUT=cccccccc,
        FTIMEOUT=[ nnnn ],
        FTRACE=[ DATA | ALL ],
        FEXIT=[ CONTROL | DATA | ALL ],
        FFIEXT=[ &M9 | &xno | ccc ],
        FOUTLIM=[ 99999 | 99999K | 99999M ],
        FVAEXT=EXT1|...|EXTn,
        FINVEXT=EXT1|...|EXTn
```

Description

The LPDDEST statement specifies the LPD processing parameters for a given printer queue or a group of printer queues; all of which have the same common printer queue name prefix.

LPDDEST Parameters

This section describes the LPDDEST parameters:

QDEST= ccccccc | cccc*

This parameter specifies an exact target printer queue name *ccccccc* or a generic printer queue name *cccc** for which this LPDDEST parameter set is used. When a print request is received, the best matching LPDDEST parameter set is used. The best match on QDEST takes precedence over a match on QHOST. There is no default value.

QHOST= cccccc | cccc*

This parameter specifies an exact origin host name `ccccc` or a generic origin host name `cccc*` for which this LPDDEST parameter set is used. When a print request is received, the best matching LPDDEST parameter set is used. The best match on QDEST takes precedence over match on QHOST. There is no default value.

FAM= JES | ESF | SAR | DUMMY | NO

This parameter specifies the Access Method to be used for incoming print requests.

Valid values are:

- JES—Print files are written to JES SYSOUT files
- ESF—Print files are written to CA Spool
- SAR— Print files are written to CA View
- DUMMY— Print files are received and discarded (thrown away)
- NO—Print files are rejected.

The default value is taken from LPDDEST

FESF= cccc

This parameter specifies the CA Spool subsystem name to be used. The default value is taken from LPDSERV.

FSAR=ccccccc

This parameter specifies the CA View database to be used. The CA View database name must be a 1 to 17 character alphanumeric string. The default value is taken from LPDSERV.

FSARMODE= SAR | EXP

This parameter specifies the CA View user mode to be used. The default value is taken from LPDSERV.

Valid values are:

- SAR—mode can retrieve any archived SYSOUT or any archived CA Deliver reports for viewing and printing.
- EXP—CA Deliver mode allows you access to only reports archived from CA Deliver that are accessible to your distribution identifier (DIST ID).

FNAME= &xnol | cccccc

This parameter specifies the output file name for incoming print requests. The file name must be a 1-to 32-character alphanumeric string. For JES and ESF output files, only the first 8 characters are used.

Valid values are:

- *&xnof*—This syntax can be used to select a given part of any control file line as the file name.
- *ccccccc*—This syntax can be used to assign a specific output file name.

Note: For JES and ESF output files, only the first 8 characters are used.

The default value is taken from LPDSERV.

FUSERID= *&xnof* | *ccccccc*

This parameter specifies the user ID for incoming print requests. The user ID must be a 1-to 8-character alphanumeric string.

Valid values are:

- *&xnof*—This syntax can be used to select a given part of any control file line as the user ID.
- *ccccccc*—This syntax can be used to assign a specific user ID.

The default value is taken from LPDSERV.

FCLASS= *&xnof* | *c*

This parameter specifies the output class to be used for incoming print requests.

Valid values are:

- *&xnof*—This syntax can be used to select a given part of any control file line as the output class.
- *c*—This syntax can be used to assign a specific output class.

The default value is taken from LPDSERV.

FDEST= *&xnof* | *ccccccc*

This parameter specifies the output file destination name for incoming print requests; the destination name must be a 1-to 8-character alphanumeric string.

Valid values are:

- *&xnof*—This syntax can be used to select a given part of any control file line as the destination name.
- *ccccccc*—This syntax can be used to assign a specific destination name.

The default value is taken from LPDSERV.

FLRECL= *nnnn*

(Optional) Forces this LRECL value when a file is written.

FFORM= &xnoI | ccccccc

This parameter specifies the output file form-name for incoming print requests. The form-name must be a 1-to 8-character alphanumeric string. Note that, for JES output files, only the first four characters of the form name are used.

Valid values are:

- *&xnoI*—This syntax can be used to select a given part of any control file line as the form-name.
- *ccccccc*—This syntax can be used to assign a specific form-name. The default value is taken from LPDSERV.

FDDNM= &xnoI | ccccccc

This parameter specifies the output DDname for incoming print requests. This parameter can be used to pass a unique file name to JES using the DDname parameter; the DDname must be a 1-to 8-character alphanumeric string.

Valid values are:

- *&xnoI*—This syntax can be used to select a given part of any control file line as the output DDname.
- *ccccccc*—This syntax can be used to assign a specific output DDname.

The default value is taken from LPDSERV.

FWRITER= &xnoI | ccccccc

This parameter specifies the output writer name for incoming print requests. This parameter can be used to pass a unique file name to JES using the writer parameter. The writer name must be a 1-to 8-character alphanumeric string.

Valid values are:

- *&xnoI*—This syntax can be used to select a given part of any control file line as the output writer name.
- *ccccccc*—This syntax can be used to assign a specific output writer name.

The default value is taken from LPDSERV.

FHEADER= nnnn | ccccccc

This parameter specifies where the data header line &D in the first received data buffer starts. The data header can be used for dynamic extracting of file attributes from the data file.

Valid values are:

- *nnnn*—This syntax specifies the data header line offset. If a numeric value (nnnn) is specified, the search for the data header line begins at offset nnnn into the first data buffer.
- *ccccccc*—This syntax specifies the search string within the first data buffer. The data header line starts after the first occurrence of the search string. If the search string is not found, the data header line starts at offset 0.

The default value is taken from LPDSERV.

FJOBNAME= *&xnof* | *ccccccc*

This parameter specifies the job name for incoming print requests without the J – Job name for banner page specified. The job name must be a 1-8 character alphanumeric string.

Valid values are:

- *&xnof*—This syntax can be used to select a given part of any other control file line as the default job name.
- *ccccccc*—This syntax can be used to assign a specific default job name.

The default value is taken from LPDSERV.

FTITLE= *&xnof* | *ccccccc*

This parameter specifies the title for incoming print requests without the T—Title for print file specified. The title must be a 1-60 character alphanumeric string.

Valid values are:

- *&xnof*—This syntax can be used to select a given part of any other control file line as the default job name.
- *ccccccc*—This syntax can be used to assign a specific default job name.

The default value is taken from LPDSERV.

FKEY= *xxxxxxxxxxxxxxxxxxxx*

This parameter specifies the 32/48/64 hexadecimal encryption key to be used to decrypt incoming AES Rijndael encrypted print data.

The default value is taken from LPDSERV.

FOPTS= [*D* | *A* | *B* | *E* | *F* | *L* | *P* | *S*] [*C*] [*G*] [*J*] [*N*] [*O*] [*Q*] [*R*] [*U*] [*V*] [*X*] [*Y*] [*Z*] [*4*]

This parameter specifies the file type and various processing options for incoming print requests.

Select one of the following to specify the file type:

- *D*—Automatic file type detection; the first 32 KB of data received are analyzed to set file type A, E, P or B
- *A*—Incoming file is processed as an AFP print file

- B—Incoming file is processed as a Binary print file
- E—Incoming file is processed as a Text print file
- F—Incoming file is processed as a PDF print file
- L—Incoming file is processed as if it contains EBCDIC line data
- P—Incoming file is processed as a PCL print file
- S—Incoming file is processed as a PostScript file

(Optional) Select one or more of the following options:

- C—Applies when the D option is specified. Processes the incoming file as a PCL print file if any PCL commands exist in the first 32 KB of data.
- G—Specifies that overwrite records from Windows generic/text files must be combined into one record.
- J—Assigns unique job name without assigning unique userid at the same time like the U option.
- N—Specifies that a NOCC output file must be written.
- O—Specifies that receive of empty files are allowed.
- Q—Specifies that PRMODE=File-Extension is set for JES SYSOUT files, so it can be picked up by CA Dispatch.
- R—Specifies that each incoming PCL command must be written to a separate record in output PCL print files.
- U—Assigns the value of DNAME/FNAME as the job name. Also assigns the user ID of the sender as the creator of the JES SYSOUT files.
- V— Specifies that ASCII AFP data must automatically be translated to EBCDIC AFP data.
- X— Specifies that incoming PJJ commands must be excluded in output Text and PCL print files.
- Y—Specifies that incoming PJJ commands and PCL commands must be excluded in output Text print files.
- Z—Specifies that an early ACK must be send, to receive control file command, if data file received before control file.
- 4—Allows incoming print data to be AES Rijndael encrypted.

The default is taken from LPDSERV.

FCPTAB= cccccc

This parameter specifies the translate table (located in ESFTRAN) to be used for ASCII to EBCDIC data translation for incoming text files. The following entries are available in the default translate table module:

ccccccc	ASCII in CodePage	EBCDIC out CodePage
12521140	1252—Windows Latin 1	1140—USA, Canada
12521141	1252—Windows Latin 1	1141—Austria, Germany
12521142	1252—Windows Latin 1	1142—Denmark, Norway
12521143	1252—Windows Latin 1	1143—Finland, Sweden
12521144	1252—Windows Latin 1	1144—Italy
12521145	1252—Windows Latin 1	1145—Spain, Latin America
12521146	1252—Windows Latin 1	1146—UK
12521147	1252—Windows Latin 1	1147—France
12521148	1252—Windows Latin 1	1148—International

The default value is taken from LPDSERV.

FCPOUT= ccccccc

Specifies the AFP EBCDIC CodePage to be specified in the AFP EBCDIC output file if the V option is used. There is no default value.

FTIMEOUT= 120 | nnnn

This parameter specifies the maximum time interval (in seconds) to wait for incoming data from the remote TCP/IP host before the session is terminated.

The lower limit is 1 and the upper limit is 9999. The default value is taken from LPDSERV.

FTRACE= DATA | ALL

This parameter specifies whether tracing must be used for incoming print requests.

Valid values are:

- DATA—All data received and sent are traced.
- ALL—All data received and sent are traced; all opens, writes and closes to output files are also traced.

The default value is taken from LPDSERV. The CONTROL parameter that was available in previous releases has been removed.

FEXIT= CONTROL / DATA / ALL

This parameter specifies whether the LPD user exit must be called for incoming print requests.

Valid values are:

- CONTROL—The user exit is called when an LPD command, an LPD job command, or a control file is received.
- DATA—The user exit is called whenever data is received or sent (as with FEXIT=CONTROL).
- ALL—The user exit is called for every open, write, and close output file request (as with FEXIT=DATA).

The default value is taken from LPDSERV.

FFIEXT= &N9 | &xnol | ccc

This parameter specifies the file extension for incoming print requests.

Valid values are:

- &N9—Use last source file name word as file extension.
- &xnol—This syntax can be used to select a given part of any control file line as the default file extension.
- ccc—This syntax can be used to assign a specific file extension.

The default is taken from LPDSERV.

FOUTLIM= 99999 | 9999K | 9999M

This parameter specifies the maximum file size allowed in bytes, KB or MB.

- 99999—Maximum allowed file size in bytes.
- 99999K—Maximum allowed file size in KB.
- 99999M—Maximum allowed file size in MB.

The default is taken from LPDSERV.

FVALEXT= EXT1/.../EXTn

This parameter specifies the file extensions that the LPD Interface accepts. Valid file extensions must be separated with '/', and the parameter length cannot exceed 60 characters. If an invalid file extension is received, the print request is cancelled.

The default is taken from LPDSERV.

FINVEXT= EXT1/.../EXTn

This parameter specifies the file extensions that the LPD Interface rejects. Invalid file extensions must be separated with '/', and the parameter length cannot exceed 60 characters. If an invalid file extension is received, the print request is cancelled.

The default is taken from LPDSERV.

LPDFILE

Syntax

```
LPDFILE QDEST=[ ccccccc | cccc* ],
        QHOST=[ ccccccc | cccc* ],
        QUSERID=[ ccccccc | cccc* ],
        QNAME=[ ccccccc | cccc* ],
        FNAME=[ &xnoł | ccccccc ],
        FUSERID=[ &xnoł | ccccccc ],
        FCLASS=[ &xnoł | c ],
        FDEST=[ &xnoł | ccccccc ],
        FFORM=[ &xnoł | ccccccc ],
        FDDNM=[ &xnoł | ccccccc ],
        FWRITER=[ &xnoł | ccccccc ],
        FHEADER=[ nnnn | ccccccc ],
        FFIEXT=[ &N9 | &xnoł | ccc ],
        FVALEXT=EXT1/.../EXTn,
        FINVEXT=EXT1/.../EXTn
```

Description

The LPDFILE statement can be used to identify a specific print request based on the printer queue name, origin host, requestor's user ID and source file name, and to assign specific report identification attributes for use by a report management product.

LPDFILE Parameters

This section describes the LPDFILE parameters:

QDEST= ccccccc | cccc*

This parameter specifies the exact target printer queue name *ccccccc* or a generic printer queue name *cccc** for which this LPDFILE parameter set is used.

When a print request is received, the best matching LPDDEST/LPDFILE parameter set is used. Best match on QDEST takes precedence over match on QHOST, QUSERID, and QNAME. There is no default value.

QHOST= ccccccc | cccc*

This parameter specifies the exact origin host name *ccccccc* or a generic origin host name *cccc** for which this LPDFILE parameter set is used.

When a print request is received, the best matching LPDDEST/LPDFILE parameter set is used. A match on QDEST takes precedence over a match on QHOST.

There is no default value.

QUSERID= ccccccc | cccc*

This parameter specifies an exact requestor's user ID name *ccccccc* or a generic user ID name *cccc** for which this LPDFILE parameter set is used.

When a print request is received, the best matching LPDDEST/LPDFILE parameter set is used. A match on QDEST takes precedence over a match on QHOST, which takes precedence over a match on QUSERID.

There is no default value.

QNAME= ccccccc / cccc*

This parameter specifies exact source file name ccccccc or a generic source file name cccc* for which this LPDFILE parameter set is used.

When a print request is received, the best matching LPDDEST/LPDFILE parameter set is used. A match on QDEST takes precedence over a match on QHOST, which takes precedence over a match on QUSERID, which takes precedence over a match on QNAME.

There is no default value.

FNAME= &xnoI / ccccccc

This parameter specifies the output file name for incoming print requests. The file name must be a 1-to 12-character alphanumeric string. For JES and ESF output files, only the first eight characters are being used.

Valid values are:

- *&xnoI*—This syntax can be used to select a given part of any control file line as the file name.
- *ccccccc*—This syntax can be used to assign a specific output file name.

The default value is taken from LPDSERV.

FUSERID= &xnoI | ccccccc

This parameter specifies the user ID for incoming print requests; the user ID must be a 1-to 8-character alphanumeric string.

Valid values are:

- *&xnoI*—This syntax can be used to select a given part of any control file line as the user ID.
- *ccccccc*—This syntax can be used to assign a specific user ID.

The default value is taken from LPDSERV.

FCLASS= &xnoI | c

This parameter specifies the output class to be used for incoming print requests.

Valid values are:

- *&xnoI*—This syntax can be used to select a given part of any control file line as the output class.
- *c*—This syntax can be used to assign a specific output class.

The default value is taken from LPDSERV.

FDEST= &xnof | ccccccc

This parameter specifies the output file destination name for incoming print requests; the destination name must be a 1-to 8-character alphanumeric string.

Valid values are:

- *&xnof*—This syntax can be used to select a given part of any control file line as the destination name.
- *ccccccc*—This syntax can be used to assign a specific destination name.

The default value is taken from LPDSERV.

FDDNM= &xnof | ccccccc

This parameter specifies the output DDname for incoming print requests; the DDname must be a 1-to 8-character alphanumeric string. This parameter can be used to pass a unique file name to JES using the DDname parameter.

Valid values are:

- *&xnof*—This syntax can be used to select a given part of any control file line as the output DDname.
- *ccccccc*—This syntax can be used to assign a specific output DDname.

The default value is taken from LPDSERV.

FFORM= &xnof | ccccccc

This parameter specifies the output file form-name for incoming print requests. The form-name must be a 1-to 8-character alphanumeric string. Note that for JES output files, only the first four characters of the form-name are used.

Valid values are:

- *&xnof*—This syntax can be used to select a given part of any control file line as the form-name.
- *ccccccc*—This syntax can be used to assign a specific form-name.

The default value is taken from LPDSERV.

FWRITER= &xnof | ccccccc

This parameter specifies the output writer name for incoming print requests; the writer name must be a 1-to 8-character alphanumeric string. This parameter can be used to pass a unique file name to JES through the writer parameter.

Valid values are:

- *&xnof*—This syntax can be used to select a given part of any control file line as the output writer name.
- *ccccccc*—This syntax can be used to assign a specific output writer name.

The default value is taken from LPDSERV.

FHEADER= *nnnn* | *ccccccc*

This parameter specifies where the data header line &D in the first received data buffer starts. The data header can be used for dynamic extracting of file attributes from the data file.

Valid values are:

- *nnnn*—This syntax specifies the data header line offset. If a numeric value (*nnnn*) is specified, the search for the data header line begins at offset *nnnn* into the first data buffer.
- *ccccccc*—This syntax specifies the search string within the first data buffer. The data header line starts after the first occurrence of the search string. If the search string is not found, the data header line starts at offset 0.

The default value is taken from LPDSERV.

FFIEXT= &N9 | &xno1 | *ccc*

This parameter specifies the file extension for incoming print requests. Valid values are:

- &N9—Use last source file name word as file extension.
- &xno1—This syntax can be used to select a given part of any control file line as the default file extension.
- *ccc*—This syntax can be used to assign a specific file extension.

The default is taken from LPDSERV.

FVALEXT= *EXT1*/.../*EXTn*

This parameter specifies the file extensions that the LPD Interface accepts. Valid file extensions must be separated with '/', and the parameter length cannot exceed 60 characters. If an invalid file extension is received, the print request is cancelled.

The default is taken from LPDSERV.

FINVEXT= *EXT1*/.../*EXTn*

This parameter specifies the file extensions that the LPD Interface rejects. Invalid file extensions must be separated with '/', and the parameter length cannot exceed 60 characters. If an invalid file extension is received, the print request is cancelled.

The default is taken from LPDSERV.

LPDSERV

Syntax

```
LPDSERV MAXTASK=[ 20 | nnnn ],
          TCPPOINT=[ 515 | nnnn ],
          TCPNS=[ YES | NO ],
          LPRM=[ YES | NO ],
```

```
PORTVAL=[ NO | YES | SUPV ],
HOSTVAL=[ NO | YES ],
DAM=[ JES | ESF | SAR | DUMMY | NO ],
DESF=cccc,
DSAR=cccccccc,
DSARMODE=[ SAR | EXP ],
DNAME=[ &N | &xnol | cccccccc ],
DUSERID=[ &P | &xnol | cccccccc ],
DCLASS=[ A | &xnol | c ],
DLRECL=nnnn,
DDEST=[ &xnol | cccccccc ],
DFORM=[ &xnol | cccccccc ],
DDNM=[ &xnol | cccccccc ],
DWRITER=[ &xnol | cccccccc ],
DHEADER=[ nnnn | cccccccc ],
DJOBNAME=[ &xnol | cccccccc ],
DTITLE=[ &xnol | cccccccc ],
DKEY=xxxxxxxxxxxxxxxx,
DOPTS=[ D|A|B|E|F|L|P|S] [C] [G] [J] [N] [O] [Q] [R] [U] [V] [X] [Y] [Z] [4],
DCPTAB=cccccccc,
DCPOUT=cccccccc,
DTIMEOUT=[ 120 | nnnn ],
DTRACE=[ DATA | ALL ],
DEXIT=[ CONTROL | DATA | ALL ],
DFIEXT=[ &N9 | &xnol | ccc ],
DOUTLIM=[ 99999 | 99999K | 99999M ],
DVALEXT=EXT1|...|EXTn,
DINVEXT=EXT1|...|EXTn
```

Description

The LPDSERV statement specifies the general characteristics of the LPD Interface and the default values for the various LPDDEST parameters.

LPDSERV Parameters

This section describes the LPDSERV parameters.

MAXTASK= 20 | nnnnn

This parameter specifies the maximum number of concurrent TCP/IP LPD sessions. The lower limit is 1 and the upper limit is 9999. The default value is 20.

TCPPORT= 515 | nnnnn

This parameter specifies the TCP/IP port number on which the LPD Interface listens for session requests. If not specified, the LPD looks up the printer service in the TCP/IP Service File. If not found, the LPD defaults to use port number 515.

The lower limit is 1 and the upper limit is 65535. The default value is 515.

TCPNS= YES | NO

This parameter specifies whether a TCP/IP Name Server must be used to translate IP addresses into symbolic host names.

Valid values are:

- YES—(Default) Call the Name Server to try to translate the IP addresses.
- NO—Use the IP addresses

LPRM= YES | NO

This parameter specifies whether LPRM/CANCEL commands against CA Spool printer queues are allowed or not.

Valid values are:

- YES—(Default) Allow LPRM/CANCEL commands against CA Spool printer queues.
- NO—Reject LPRM/CANCEL commands against CA Spool printer queues.

PORTVAL= NO | YES | SUPV

This parameter specifies whether the requestor's source port must be validated or not.

Valid values are:

- NO—(Default) Source port is not validated.
- YES—Validate source port is in the range 721 to 731 inclusive.
- SUPV—Validate source port is in the range 721 to 1023 inclusive.

HOSTVAL= NO | YES

This parameter specifies whether a requestor's IP address, defined to the TCP/IP Name Server, must be validated or not.

Valid values are:

- NO—(Default) Skip validation of requestor's IP address.
- YES—Validate that requestor's IP address is defined to the TCP/IP Name Server.

DAM= JES | ESF | SAR | DUMMY | NO

This parameter specifies the Default Access Method (DAM) to be used for incoming print requests.

Valid values are:

- JES—(Default) Print files are, by default, written to JES SYSOUT files
- ESF—Print files are, by default, written to CA Spool

- SAR—Print files are, by default, written to CA View
- DUMMY—Print files are, by default, received and discarded (thrown away)
- NO—Print files are, by default, rejected

DESF= cccc

This parameter specifies the default CA Spool subsystem name to be used. If a value is not specified, the default subsystem name is the CA Spool subsystem name.

DSAR= ccccccc

This parameter specifies the default CA View database to be used. The CA View database name must be a 1 to 17-character alphanumeric string. There is no default value.

DSARMODE= SAR | EXP

This parameter specifies the default CA View user mode.

- SAR—mode can retrieve any archived SYSOUT or any archived CA Deliver reports for viewing and printing.
- EXP—CA Deliver mode lets you access reports archived from CA Deliver that are accessible to your distribution identifier (DIST ID).

DNAME= &n | &xnof | ccccccc

This parameter specifies the default output file name for incoming print requests. The file name must be a 1 to 32-character alphanumeric string. For JES and ESF output files, only the first 8 characters are used.

Valid values are:

- &n—(Default) Specifies that the first 32 alphanumeric characters of the 'N – Name of source file' control file line are to be used
- &xnof—This syntax is used to select a given part of any control file line as the default file name
- ccccccc—This syntax can be used to assign a specific default output file name.

DUSERID= &P | &xnof | ccccccc

This parameter specifies the default user ID for incoming print requests. The user ID must be a 1 to 8 character alphanumeric string. The default value is &P.

DCLASS= A | &xnof | c

This parameter specifies the default output class to be used for incoming print requests for the following:

- JES output files—The default output class is A
- ESF output files—The default is to not specify any output class, so that the printer-dependent CA Spool output class default is used

- SAR output files—The default is to not specify any output class

Valid values are:

- A—The default output class for JES files
- *&xnoI*—This syntax can be used to select a given part of any control file line as the default output class.
- *c*—This syntax can be used to assign a specific default output class

DLRECL= nnnn

Specifies the default LRECL value to use when a file is written.

DDEST= &xnoI | ccccccc

This parameter specifies the default output file destination name for incoming print requests; the destination name must be a 1 to 8-character alphanumeric string for one of the following:

- JES output files—The default is to not specify any SYSOUT destination
- ESF output files—The default is to use the printer queue name of the incoming print request as the destination name
- SAR output files—The default is to not specify any destination name

Valid values are:

- **&xnoI**—This syntax can be used to select a given part of any control file line as the default destination name.
- **ccccccc**—This syntax can be used to assign a specific default destination name.

DFORM= &xnoI | ccccccc

This parameter specifies the default output file form name for incoming print requests. The form name must be a 1-to 8-character alphanumeric string.

Note:

- For JES output files, only the first four characters of the form name are used. The default is to not specify any SYSOUT form name.
- For ESF output files, the default is to not specify any form name.
- For SAR output files, the default is to not specify any form name.

Valid values are:

- *&xnoI*—This syntax can be used to select a given part of any control file line as the default form name.
- *ccccccc*—This syntax can be used to assign a specific default form name.

DDDNM= &xnoI | ccccccc

This parameter specifies the default output DDname for incoming print requests. The DDname must be a 1 to 8-character alphanumeric string

This parameter can be used to pass a unique file name to JES using the DDname parameter as follows:

- *&xnof*—This syntax can be used to select a given part of any control file line as the default DDname.
- *ccccccc*—This syntax can be used to assign a specific default DDname

There is no default value.

DWRITER= *&xnof* | *ccccccc*

This parameter specifies the default output writer name for incoming print requests. The writer name must be a 1 to 8-character alphanumeric string

This parameter can be used to pass a unique file name to JES using the writer parameter, as follows:

- *&xnof*—This syntax can be used to select a given part of any other control file line as the default writer name
- *ccccccc*—This syntax can be used to assign a specific default writer name

There is no default value.

DHEADER= *nnnn* | *ccccccc*

This parameter specifies where the data header line &D in the first received data buffer per default starts. The data header can be used for dynamic extracting of file attributes from the data file.

- *nnnn*—This syntax specifies the default data header line offset. If a numeric value (nnnn) is specified, the search for the data header line begins at offset nnnn into the first data buffer.
- *ccccccc*—This syntax specifies the default search string within the first data buffer. The data header line starts after the first occurrence of the search string. If the search string is not found, the data header line starts at offset 0.

The default value 0 implies the first 132 characters of the first data buffer.

DJOBNAME= *&xnof* | *ccccccc*

This parameter specifies the default job name for incoming print requests without the J—Job name for banner page specified. The job name must be a 1-8 character alphanumeric string.

Valid values are:

- *&xnof*—This syntax can be used to select a given part of any other control file line as the default job name.
- *ccccccc*—This syntax can be used to assign a specific default job name.

There is no default value.

DTITLE= *&xnoj* | *cccccccc*

This parameter specifies the default title for incoming print requests without the T – Title for print file specified. The title must be a 1-60 character alphanumeric string.

Valid values are:

- *&xnoj*—This syntax can be used to select a given part of any other control file line as the default job name.
- *cccccccc*—This syntax can be used to assign a specific default job name.

There is no default value.

DKEY= *xxxxxxxxxxxxxxxxxxxx*

This parameter specifies the default 32/48/64 hexadecimal encryption key to be used to decrypt incoming AES Rijndael encrypted print data.

There is no default value.

DOPTS= *D* | *A* | *B* | *E* | *F* | *L* | *P* | *S* [*C*] [*G*] [*J*] [*N*] [*O*] [*Q*] [*R*] [*U*] [*V*] [*X*] [*Y*] [*Z*] [*4*]

This parameter specifies the default file type and various processing options for incoming print requests.

Specify the default file type by selecting one of the following:

- *D*—(Default) Automatic file type detection; the first 32 KB bytes of data received are analyzed to set file type A, B, E, F, P, or S.
- *A*—Incoming file is processed as an AFP print file
- *B*—Incoming file is processed as a Binary print file
- *E*—Incoming file is processed as a Text print file
- *F*—Incoming file is processed as a PDF print file
- *L*—Incoming file is processed as if it contains EBCDIC line data
- *P*—Incoming file is processed as a PCL print file
- *S*—Incoming file is processed as a PostScript file

(Optional) Select one or more of the following options:

- *C*—Applies when the *D* option is specified. Processes the incoming file as a PCL print file if any PCL commands exist in the first 32 KB of data.
- *G*—Specifies that overwrite records from Windows Generic/Text files must be combined into one record.
- *J*—Assigns unique job name without assigning unique userid at the same time like the *U* option.
- *N*—Specifies that a NOCC output file must be written.
- *O*—Specifies that receive of empty files is allowed.

- Q—Specifies that PRMODE=File-Extension is set for JES SYSOUT files, so it can be picked up by CA Dispatch.
- R—Specifies that each incoming PCL command must be written to a separate record in output PCL print files.
- U—Assigns the value of DNAME/FNAME as the job name. Also assigns the user ID of the sender as the creator of the JES SYSOUT files.
- V—Specifies that ASCII AFP data must automatically be translated to EBCDIC AFP data.
- X— Specifies that incoming PJL commands must be excluded in output Text and PCL print files.
- Y—Specifies that incoming PJL commands and PCL commands must be excluded in output Text print files.
- Z—Specifies that an early ACK must be sent to receive control file commands, if the data file is received before the control file.
- 4—Allows incoming print data to be AES Rijndael encrypted.

The default is D.

DCPTAB= cccccc

This parameter specifies the default translate table (located in ESFTRAN) that will be used for ASCII to EBCDIC data translation for incoming text files.

The following entries are available in the default translate table module:

ccccc	ASCII In CodePage	EBCDIC Out CodePage
12521140	1252—Windows Latin 1	1140—USA, Canada
12521141	1252—Windows Latin 1	1141—Austria, Germany
12521142	1252—Windows Latin 1	1142—Denmark, Norway
12521143	1252—Windows Latin 1	1143—Finland, Sweden
12521144	1252—Windows Latin 1	1144—Italy
12521145	1252—Windows Latin 1	1145—Spain, Latin America
12521146	1252—Windows Latin 1	1146—UK
12521147	1252—Windows Latin 1	1147—France
12521148	1252—Windows Latin 1	1148—International

The default value is the standard IBM C ASCII-to-EBCDIC translate table.

DCPOUT= ccccccc

Specifies the default AFP EBCDIC CodePage specified in the AFP EBCDIC output file if the V option is used. There is no default value.

DTIMEOUT= 120 | nnnnn

This parameter specifies the default maximum time interval (in seconds) to wait for incoming data from the remote TCP/IP host before the session is terminated.

The lower limit is 1 and the upper limit is 9999. The default value is 120.

DTRACE= DATA | ALL

This parameter specifies the default tracing used for incoming print requests.

Valid values are:

- DATA—All data received and sent is traced
- ALL—All data received and sent and all files opened are traced; all data written and files closed are traced

The default value is no tracing. The CONTROL parameter that was available in previous releases has been removed.

DEXIT= CONTROL | DATA | ALL

This parameter specifies the default calls to the LPD user exit for incoming print requests.

Valid values are:

- CONTROL—The user exit is called when an LPD command, LPD job command, or a control file is received.
- DATA—The user exit is called with DEXIT=CONTROL, as well as whenever some data is received or sent.
- ALL—The user exit is called with DEXIT=DATA, as well as for all open, write, and close output file requests.

The default value is no user exit calls

DFIEXT= &N9 | &xno1 | ccc

This parameter specifies the default file extension for incoming print requests.

Valid values are:

- &N9—(Default) Use last source file name word as file extension.
- &xno1—This syntax can be used to select a given part of any control file line as the default file extension.
- ccc—This syntax can be used to assign a specific default file extension.

DOUTLIM= 99999 | 9999K | 9999M

This parameter specifies the default maximum file size allowed in bytes, kilobytes or megabytes. The default value is no file limit.

- 99999—Maximum allowed file size in bytes
- 99999K—Maximum allowed file size in KB
- 99999M—Maximum allowed file size in MB

DVALEXT= EXT1/.../EXTn

This parameter specifies the default the file extensions that the LPD Interface accepts. Valid file extensions must be separated with '/', and the parameter length cannot exceed 60 characters. If an invalid file extension is received, the print request is cancelled. The default is no file extension validation.

DINVEXT= EXT1/.../EXTn

This parameter specifies the default the file extensions that the LPD Interface rejects. Invalid file extensions must be separated with '/', and the parameter length cannot exceed 60 characters. If an invalid file extension is received, the print request is cancelled. The default is no file extension validation.

MAXDORM

Syntax

MAXDORM=*nnnn*

Description

This parameter specifies the maximum length of time (in hundredths of second) that a member of a MAS configuration is to refrain from attempting to gain control of the shared queues.

When processors are active in CA Spool, this statement has little meaning because control of the shared queues is frequently requested. However, when CA Spool is idle, this statement ensures that CA Spool periodically looks in the shared queues for work that is eligible for processing and that another member of the configuration can have placed there.

Note: If the value specified for MAXDORM is too small, excessive system time can be expended in unnecessary attempts to re-acquire the queue. However, if the value specified is too large, the start of certain functions and the responses to certain display commands can be delayed.

The lower limit is 10 and the upper limit is 6000. The default value is 200 (2 seconds).

MAXFSCT

Syntax

MAXFSCT=*nnnn*

Description

This parameter specifies the maximum number of file status control table entries allowed for cross-memory status requests.

The size of the FSCT must be considered carefully because the control table is allocated in the common storage area.

The lower limit is 48 and the upper limit is 1000. The default value is 100.

MAXFSEQ

Syntax

MAXFSEQ=*nnnn*

Description

This parameter specifies the maximum file sequence number, which CA Spool can assign to a spool file.

The value must not be less than the value of the NUMFQES statement. If it is, the value of NUMFQES is used. If a value is greater than 65535, then all user programs using the call interfaces have to be updated to V10.0 or V11.0 parameter list formats.

Note: A change to this statement requires a CA Spool COLD start. The lower limit is 1 and the upper limit is 999,999. The default value is 9999.

MAXHOLD

Syntax

MAXHOLD=*nnn*

Description

This parameter specifies the maximum length of time (in hundredths of a second) a member of a Multi-Access Spool (MAS) configuration maintains control of the shared queues after gaining control of them.

If work is pending when control over the shared queues is obtained, or if a checkpoint request is received during the MINHOLD interval, the shared queues are held in the specified MAXHOLD interval, else the shared queues are held in the specified MINHOLD interval. Therefore, members that are busy hold the shared queues longer than members that are not busy.

The lower limit is 1 and the upper limit is 6000. The default value is 10 (0.1 second)

MAXGROUP

Syntax

MAXGROUP=*nnnnnnnn*

Description

This parameter specifies the highest network group number that can be assigned using the REINIT command.

The value must not be less than the highest allocated group number. If it is, the highest value used in any GROUP = statement in ESFPARM is used. Ensure a reasonably large number of groups is defined to minimize performance problems related to the internal structure of CA Spool. Use group numbers in strict consecutive sequence; for example, 1, 2, 3, and so on in preference to 100, 200, 300, and so on.

The lower limit is 0 and the upper limit is 99999. The default value is the highest allocated group number +10.

MESSAGE

Syntax

MESSAGE

message number,
TYPE=NORMAL | SEVERE,
WTO=YES | NO | NOLOG,
ESFLOG=YES | NO,
SCREEN=YES | NO,
CID=YES | NO,
EXIT=YES | NO,
SDIREQ=YES | NO,
ROUTCDE=(*x,x,x,x*.....)

Description

The MESSAGE statement is used to specify the way the message is to be processed.

You only have to code a MESSAGE statement for the messages you want to change. You can specify more than one MESSAGE statement. If several MESSAGE statements are valid for the same message number, the statements are processed in the order in which they are specified.

Any parameter specified is valid until explicitly changed by another similar parameter.

MESSAGE Parameters

This section describes the MESSAGE parameters.

message number

This parameter defines the number of the message to be processed. This number can be specified in one of two ways; as a 4-digit number specifying that only one message must be processed, or as two 4-digit numbers separated by a hyphen to specify a range of messages. For example, 123 to indicate message ESF123 or 123-200 to indicate messages ESF123 through ESF200.

The lower limit is 0 and the upper limit is 9999. There is no default value.

TYPE=NORMAL | SEVERE

This parameter defines the form in which the message is presented.

Valid values are:

- NORMAL—The message is presented in normal intensity.
- SEVERE—The message is presented in highlighted intensity.

There is no default value.

WTO=YES | NO | NOLOG

This parameter defines whether the message is to be sent to the MVS console (YES) or (NO).

- YES—Send the message to the MVS console and system log.
- NO—Do not send the message to the MVS console or system log.
- NOLOG—The message is sent to the MVS console but is not to be logged on the hardcopy log (that is, SYSLOG).

There is no default value.

Note: The WTO statement overrides this parameter.

ESFLOG=YES | NO

This parameter defines whether the message must be logged on the ESFLOG.

- YES—Log the message on the ESFLOG.
- NO—Do not log the message on the ESFLOG.

This parameter has no meaning if the NOLOG option has been specified. This parameter can be overridden by the LOGMENU parameter. There is no default value.

When considering the NOLOG startup option or when combining ESFLOG=NO with WTO=NO or NOLOG (the default), be aware it is possible that messages necessary to debug a problem condition will not be available.

SCREEN=YES | NO

This parameter defines whether the message must be broadcast to active display nodes.

- YES—Broadcast the message to active display nodes.
- NO—Do not broadcast the message to active display nodes.

If you specify YES, the message is sent to all active display nodes with AUTH=2.

If the message concerns a specific node, it is also sent to all active display nodes in the same network group as the specific node.

There is no default value.

CID=YES | NO

This parameter defines whether the message must be broadcast to active communication channels.

- YES—Broadcast the message to active communication channels.
- NO—Do not broadcast the message to active communication channels.

If you specify YES, the message is sent to all active channels with AUTH=2. If the message concerns a specific node, it is also sent to all active channels in the same network group as the node. Messages are not broadcast to channels with USMR=NO.

There is no default value.

EXIT=YES | NO

Defines whether the message processing exit (ESFMSG0) must be called for this message.

- YES—Call ESFMSG0 for this message.
- NO—Do not call ESFMSG0 for this message.

If you specify YES, the exit ESFMSG0 must be present in the ESFMAIN load-module.

There is no default value.

SDIREQ = YES | NO

This parameter defines whether a Service Plus Help desk issue must be opened when this message is issued.

- Yes—Open a Service Plus HelpDesk issue.
- No—Do not open a Service Plus HelpDesk issue.

This parameter has no meaning if SDI=NO has been specified or is taken as a default.

ROUTCDE=(x,x,x,x.....)

This parameter defines which routing codes are to be assigned to the message. You can assign up to 16 routing codes to each message. If more than one code is to be assigned, they must be in parenthesis and separated by commas.

The lower limit is 1 and the upper limit is 16. The default value is the value specified by statement ROUTCDE.

MINDORM

Syntax

MINDORM=*nnn*

Description

This parameter specifies the minimum time (in hundredths of a second) a member of a Multi-Access Spool (MAS) configuration must wait after releasing control of the shared queues before again attempting to gain control of them.

This statement is used to prevent one member of a MAS configuration from monopolizing control of shared queues.

The lower limit is 0 and the upper limit is 3000. The default value is 0 (0 seconds).

MINHOLD

Syntax

MINHOLD=*nnn*

Description

This parameter specifies the minimum length of time (in hundredths of a second) a member of a Multi-Access Spool (MAS) configuration must maintain control of the shared queues after gaining control of them

This statement is provided to minimize the thrashing that could occur with the shared queues in a pure contention environment (one in which all members of the configuration specify MINHOLD=0). Setting this statement to a high value can immobilize other configuration members.

If work is pending when control over the shared queues is obtained, or if a checkpoint request is received during the MINHOLD interval, the shared queues are held in the specified MAXHOLD interval, else the shared queues are held in the specified MINHOLD interval. Therefore, members that are busy hold the shared queues longer than members that are not busy.

The lower limit is 0 and the upper limit is 3000. The default value is 1 (0.01 second).

MODULES

Syntax

```
MODULES SSSM=esfssm,  
        USS=esfuss,  
        USO=esfuso,  
        MENU=esfmesf,  
        SAR=esfsar,  
        SARPAM=sarpam,
```

MODULES Parameters

This section defines the Modules parameters.

SSSM=esfssm

This parameter defines the name of the subsystem support common storage module. The default value is ESFSSM.

USS=esfuss

This parameter defines the name of the user interface exit common storage module. The default value is ESFUSS.

USO=esfuso

This parameter defines the name of the SYSOUT limit common storage module. The default value is ESFUSO.

MENU=esfmesf

This parameter defines the name of the VTAM menu system load-module. The default value is ESFMESF.

SAR=esfsar

This parameter defines the name of the program to be attached when a file is to be transferred to SAR. The default value is ESFSAR.

SARPAM=sarpam

This parameter defines the name of the SAR interface module. The default value is SARPAM.

NJE

Syntax

```
NJE nodename,
    APPL=cccccccc,
    JRNUM=0-7,
    JTNUM=0-7,
    SRNUM=0-7,
    STNUM=0-7,
    ISTATUS= ACTIVE | INACTIVE | TIME | ACTNETO | TIMENETO,
    SID=cccc,
    TIMEOUT=tt,
    SNABSIZE=ssss,
    PURGE=YES | NO,
    SECUID=uuuuuuuu,
    COMBINE=NO | JESDS | JOB | GROUPID,
    NOTIFY=YES | NO,
    TRACE,
    PACING=n,
    PSWSEND=cccccccc,
    PSWRECE=cccccccc,
    TCPHOST=cccccccccccccccc,
    TCPPORT=n,
    TCPTLS=NO | YES,
    SELHOLD=YES | NO
```

NJE Parameters

This section describes the purpose and usage of the NJE parameters.

***nodename*,**

Defines the NJE node name that identifies the node in the NJE network. The *nodename* can be up to eight alphanumeric characters in length.

APPL=cccccccc

Specifies the VTAM application name identifier that is used to establish a session. *cccccccc* can be up to eight alphanumeric characters. If APPL is not specified, the system defaults to the NJE *nodename*.

JRNUM=*n*

Specifies the number of job receivers to be allocated to this NJE node. *n* is an integer that specifies the maximum number of input job streams allowed to be concurrently active on this NJE node; it must match the value JTNUM on the system defined by this NJE statement. JRNUM can range from 0 to 7. The default value is 1.

JTNUM=*n*

Specifies the number of job transmitters to be allocated to this NJE node. *n* is an integer that specifies the maximum number of output job streams allowed to be concurrently active on this NJE node; it must match the value JRNUM on the system defined by this NJE statement. JTNUM can range from 0 to 7. The default value is 1.

SRNUM=*n*

Specifies the number of SYSOUT receivers to be allocated to this NJE node. *n* is an integer that specifies the maximum number of SYSOUT receiver streams allowed to be concurrently active on this NJE node; it must match the value STNUM on the system defined by this NJE statement. SRNUM can range from 0 to 7. The default value is 1.

STNUM=*n*

Specifies the number of SYSOUT transmitters to be allocated to this NJE node. *n* is an integer that specifies the maximum number of SYSOUT transmitter streams allowed to be concurrently active on this NJE node; it must match the value SRNUM on the system defined by this NJE statement. STNUM can range from 0 to 7. The default value is 1.

ISTATUS=ACTIVE | INACTIVE | TIME | ACTNETO | TIMENETO

Specifies whether the NJE interface must try to establish a session with the subsystem defined in the *nodename*. Valid values are:

- **ACTIVE**—(Default) The NJE interface tries to establish a session with the subsystem defined in the *nodename*.
- **INACTIVE**—The NJE interface does not try to establish a session with the subsystem defined in the *nodename*.
- **TIME**—If specified, and a session does not exist, ESNJE tries to establish a session every time that ACQTIME expires.
- **ACTNETO**—If specified in an EMAS complex, the NJE interface tries to establish a session with the NJE node, if and when it becomes the EMAS network owner.
- **TIMENETO**—If specified in an EMAS complex and a session does not exist, the NJE interface tries to establish a session with the NJE node every time that ACQTIME expires, if and when it becomes the EMAS network owner.

Note: To specify ISTATUS=TIMENETO in an EMAS complex that uses VTAM generic resource, follow the setup instructions for Enhanced MAS Support in the *Best Practices Guide*. Otherwise, the product may issue nuisance error messages.

SID=cccc

Specifies the SID for which this NJE connection must be defined. If the current SID does not match, the NJE definition is discarded. There is no default value.

TIMEOUT=tt

Specifies the number of seconds to wait for a reply to a command. When the timeout value expires, the NJE interface routes all responses to the command to the ESFLOG.

Note: If the session partner is another CA Spool system, the value is forced to 20.

Range: 1-20

Default: 2

(TCP/IP Only) For NJE connections that use TCP/IP, the interface multiplies the timeout value by 100 and uses the new value to determine how long to wait before timing out the partner node. By default, the interface waits 200 seconds (100 x 2 seconds) for a send or receive function over TCP/IP to complete successfully. If the timeout is exceeded, the CA Spool NJE session is drained. Because of the method that TCP/IP and Netserv use to buffer data, the timer does not necessarily begin when the partner node crashes or becomes unavailable.

SNABSIZE=ssss

Specifies the RUSIZE size and buffer size to be used in this session

ssss can range from 512 to 4096 bytes.

PURGE=YES | NO

Specifies whether the NJE interface must purge files after successful transmission (YES or NO). The default value is YES.

SECUID=uuuuuuuu

Specifies the user ID to be attached to an inbound command which has no user ID attached. The default value is N\$\$NJEUID.

COMBINE=NO | JESDS | JOB | GROUPID

Specifies whether the NJE interface must combine each data set in the receiving data stream into one CA Spool file, if possible (JOB or NO), or only the JES data sets (JESDS).

IF GROUPID is specified, then data sets with the same group ID are combined into one CA Spool file, if possible. Data sets without GROUPID are considered as one.

The decision to combine the data sets is based on all of the values in the Distribution, PSF and SAR sections of the Open parameter list being equal. For details about the information contained in these sections of the Open parameter list, see the System Guide.

The default value is NO.

NOTIFY=YES | NO

Specifies whether the NJE interface must send an ESF371 message to the other subsystem after successful file transmission (YES or NO). The default value is YES.

TRACE

If TRACE is specified on the NJE TCP/IP node and an NJESNAP DD statement is found in the ESF procedure, all inbound and outbound activity on the defined NJE node is traced.

If TRACE is specified on the NJE TCP/IP node and an NJETRACE DD statement is found in the ESF procedure all inbound and outbound activity of NJE TCP/IP subtask is traced.

Default: None

Note: Only one NJE node is traced at a time.

PACING=*n*

Specifies the pacing value to be used in the Bind. The lower limit is 0 and the upper limit is 63. The default value is 3.

PSWSEND=*cccccccc*

Specifies a 1-to 8-character password that the NJE partner is required to send at session initialization time. There is no default value.

PSWRECE=*cccccccc*

Specifies a 1-to 8-character password received from the NJE partner at session initialization time. There is no default value.

If NJEOPT=9 is specified, the PSWRECE parameter specifies an 8-character generic NJE APPLID mask.

The generic mask has 8 characters with values of +,%, -, where

+ = must match

% = do not care

- = remove that position from the compare

This mask is used to compare the incoming VTAM BIND against the defined NJE APPLID names in this system.

Example 1

The following example shows an NJE node defined in IQPARM:

```
NJE EMAS1,APPL=AIESF,PSWRECE=+- -++++%, ISTATUS=INACTIVE
```

This means that CA Spool with NJE node EMAS1 accepts an NJE bind from APPLIDs such as AaaIESFb. The characters represented by 'aa' are removed before checking the APPLID name, and the character represented by 'b' is bypassed.

Example 2

Following is another example:

```
NJE SCP0ESF,APPL=SCP0ESF,ISTATUS=ACTNETO,PSWRECE=+++%+++%
```

This means that CA Spool with NJE node SCPOESF accepts an NJE bind from APPLIDs such as SCPbESFb. The characters represented by 'b' can be any value.

If NJEOPT=9 is specified, it disables the normal use of PSWSEND, which is used in the verification process.

Note: Changing the value in PSWRECE and PSWSEND requires restarting CA Spool.

REINIT does not work and does NOT give any warnings.

SPECIAL REMARKS: Each NJE statement falling into this category can only handle one NJE connection.

TCPHOST=hostname

Connects to the NJE node using TCP/IP. Specify one of the following values for the *hostname*:

- The IP address
- The symbolic name, which can include mixed case alphanumeric and special characters

Maximum length: 64 characters

Default: None

TCPPORT=n

Specifies the TCP/IP port number of the NJE TCP/IP server.

Range: 1 - 65535

Defaults:

- 175 for TCPTLS=NO
- 2252 for TCPTLS=YES

TCPTLS=NO | YES

Specifies whether SSL/TLS is used for this NJE node.

Default: NO

SELHOLD=YES | NO

Specifies whether held files must be selected for transfer to this NJE node (YES or NO). The default value is NO.

NJENAME

Syntax

NJENAME=cccccccc

Description

This parameter specifies the NJE node name that the installation has assigned to the CA Spool system.

Note the following:

- The NJENAME identifies the CA Spool system in the NJE network and must be used in the JCL DEST statement. The name must be one to eight characters.
- In an EMAS complex the NJE node name is obtained from the NJE home node pointer by the matching *Snn* statement.
- In an EMAS complex the NJENAME statement specifies a common NJE node name for the entire EMAS complex.
- Default: The VTAM application name specified in the APPLID statement in non-EMAS complex. In EMAS complex, the default is none.
-

NJEOPT

Syntax

NJEOPT=*nn*

Description

This parameter specifies special NJE processing options.

Valid values are:

- **1**—Transmit class B spool files as punch SYSOUT data sets.
- **2**—If the spool file is received at an undefined destination, retry with DEST=\$NODEST instead of returning a CANCEL command.
- **3**—Do not check to see if the node name in the NJE signon record matches the coded node name on the NJE statement.
- **4**—For a file targeted to NJEDEST defined printers, set the primary file destination to the remote destination after the file is transmitted or held.

- **5**—If USEALIAS=YES, allow the files sent to an alias name in the format *Rxxxxxxx* (where *xxxxxxx* is numeric) to retain their original *Rxxxxxxx* destination, instead of using the corresponding printer node name.
- **6**—Bypass file priority as a consideration when transmitting spool files; this significantly reduces CPU time usage if many files are waiting for transmission.
- **7**—Set the account number to the execution node name instead of the network account number.
- **8**—Do not hold files received that were created with OUTDISP=HOLD.
- **9**—Activate generic NJE APPLID support. The NJE PSWRECE parameter specifies a NJE APPLID mask to validate incoming NJE session requests.
To bypass an NJE node validation check, NJEOPT=3 must also be specified. For values of PSWRECE, see the NJE statement earlier in this chapter.
- **10**—If the file is specified without destination or writer name, use the value from FORM= parameter as destination.
- **11**—Process the datasets like COMBINE=NO if the LRECL of a dataset is greater than the LRECL of the first dataset opened.
- **12**—Move NJE Origin node name to the USERID field.
- **13**—Retain /*JOBPARM LINECT=0 in CA Spool instead of changing it to 255.

NJESERV

Syntax

```
NJESERV
      TCPPORT=n
```

Description

Specifies a network server for NJE TCP/IP communication.

Parameters

TCPPORT=n

Specifies the TCP/IP port number on which the NJE TCP/IP server listens for session requests.

Range: 1 - 65535

Default: 4711

NODE

Syntax

```
NODE nodename,  
  
    device-type,  
  
    GROUP=nnnn,  
  
    MAXDATA=nnnn,  
  
    SNABSIZE=nnnn
```

Display node parameters

```
AUTH=1 | 2 | 3,  
BID | NOBID,  
MODE=CONSOLE | MENU  
PASSWORD=cccccccc,  
RDQUERY=NOLIST,  
TIMEOUT=nnnn,  
USMR=YES | NO | GROUP | SEVERE,  
WRAP | NOWRAP
```

Printer Node Parameters

```
ACQUIRE=NO | WORK | NQWORK | TIME | NQTIME | SNET | NQSNET,  
ADR=cccc,  
ALIAS=cccccccc,  
AUTO=YES | NO,  
BRACKETS=FILE | BLOCK | SESSION | NO,  
CHAIN=NO | YES,  
DRIVPRM1=cccccccccccccccc,  
DRIVPRM2=cccccccccccccccc,  
DRIVPRM3=cccccccccccccccc,  
DRIVPRM4=cccccccccccccccc,  
DUPLEX= NO | YES | TUMBLE,  
CKPTPGS=nnnn,  
CLASS=c1...cn,  
COMP=NO | YES,  
ENDFF=YES | NO,  
FCB=cccc,  
FILTER=c,  
FORM=cccccccc,  
FSS=cccccccc,  
FSSNPRO=nnnn,  
INITFF=SVF | FILE | OPENSESS | NO,  
INTRAY=nnn,  
KEY=xxxxxxxxxxxxxxxxxx,
```

LINECNT=*nnn*,
LOCATION=*cccccccc*,
LOGMODE=*cccccccc*,
MPP1CR=NEW | OLD,
MPP1NL=NEW | OLD,
NJEDEST=*cccccccc*,
NOSETUP,
OUTBIN=*nnn*,
OUTLIM=*nnnnnnn*,
PRESEL=NO | YES | DELAY,
PSFOPT=*nn*,
PURGE=YES | NO,
RDQUERY=BIND | YES | NO,
RELEASE=NO | NOWORK,
RELREQ=N | D | I | NOWORK,
REST=YES | NO | PRINTER,
RETAIN=*nnnnn*,
SAFF=NO | YES,
SCSRESET=NO | YES,
SEP= 0 | 1 | 2,
SEPAEXIT=*n*,
SEPOPT=*nn*,
SETUP=STANDARD | FCB | FORM | NO | MANUAL,
SHARED=NO | YES | MASTER,
SIMLOGON= QALL | QSESSLIM | QNOTENAB,
TCPDRIV=*cccccccccc*,
TCPHOST=*cccccccccccccccc*,
TCPPORT=*nnnn*,
TCPprt=*cccccccccccccccc*,
TIMEOUT=*nnnnn*,
TRANS=*cccccccc*,
TRANSFRM=*ccccooooo*,
USEFCB=FILE | PRINTER,
USEREXIT= BSESSION | ASESSION | FILE | PAGE | LINE,
USERXNO=*n*,
USERPARM=*cccccccccccccccc*,
USM=NO | YES,
VFC | VFC0 | VFC1 | VFC2 | VFC3 | VFC4 | VFC5 | VFC6 | VFC7 | NOVFC,
VPS=*cccccccc*,
VPSCAPPL=*cccccccc*,
VPSERROR=ERROR | BLANK | IGNORE | NULL | PASS,

```
VPSFILE= CHAIN | BRACKET | nnnnnn,
VPSFNFF=YES | NO,
VPSMPP=NEW | OLD,
VPSOPT=nn,
VPSMPP=nnn,
VPSTRACE= *ALL | ccccccc,
WS= CLASS|FORM|FCB|PRIO|AGE|GROUP,
XFERNODE= BOTH | NODE| ALIAS| OFF
X2YY=ccccccc
```

Node Statement

The NODE statement specifies the characteristics of a display or printer node, which is to be defined for CA Spool processing.

The description of the NODE statement is divided into the following three sections:

- Common node parameters
- Display node parameters
- Printer node parameters

Common Node Parameters

This section describes the common node parameters.

nodename,

The nodename parameter is required and specifies the VTAM name of the display or printer node. There is no default value.

device type,

The device type parameters are required and define the device type of the display or printer node. There is no default value.

The device type specified could be the model name of a previous DEFNODE definition, or one of the following device types:

Device Type	Node Type	Comments
3277-2	Display	Display Terminal
3278-1	Display	
3278-2	Display	
3278-3	Display	
3278-4	Display	

Device Type	Node Type	Comments
3278—5	Display	
3279—2	Display	Color Display
3279—3	Display	
3279—2L	Display	
3279—3L	Display	
3262	Printer	Line Printer
3268	Printer	Matrix Printer
3284	Printer	
3286	Printer	
3287	Printer	
3288	Printer	Line Printer
3289	Printer	
3770	Printer	SNA Remote Station
3800—3	Printer	AFP Printer
3812	Printer	
3816	Printer	
3820	Printer	
3825	Printer	
3827	Printer	
3835	Printer	
3900	Printer	
4028	Printer	
4214	Printer	Matrix Printer
4224	Printer	
4234	Printer	Line Printer
4245	Printer	
5210	Printer	Text Printer
6262	Printer	Line Printer
6670	Printer	Inform. Distrib.
7436	Printer	Text Printer

Device Type	Node Type	Comments
AGFA—400	Printer	AGFA 400
CT—9380	Printer	Centronic 9380
CT—9380E	Printer	With EVFU
FCB9xxxx	Printer	Move FCB name in as PAGEDEF to force A2PC transformation
HP—IDA	Printer	V9.0 HP-LaserJet
HP—IDEX	Printer	V9.0 HP-LaserJet
HP—2686	Printer	HP-LaserJet 2686
HP—2686D	Printer	HP-LaserJet 2686 with drawers
HP-2686X	Printer	HP-LaserJet 2686 extended
OCE—xxxx	Printer	Generate extra line with PAGEDEF=PAGEDEF=x-x,FO RMDEF=x-x,FCB=x-x
VERSATEC	Printer	Plotter (MPP=180)
X—2700	Printer	XEROX 2700
XX—HPIDA	Printer	HP-LaserJet printer
XX—XEROX	Printer	Xerox 4045 laser printer

GROUP=nnnnn,

This *required* parameter specifies the network group number in which this node must be defined. The lower limit is 1 and the upper limit is MAXGROUP if specified else 99,999 during startup and MAXGROUP during REINIt. There is no default value.

MAXDATA=nnnn,

This parameter specifies the maximum size of buffers that can be sent to the node, if the outbound RUSIZE is not specified during session initialization.

If the RUSIZE outbound field in the bind image is non-zero, the size of the largest request unit (RU) that can be sent to this node is calculated on the basis of this, and it overwrites any MAXDATA specification.

The lower limit is 256 and the upper limit is 32,767. The default value is the value specified for the SNABSIZE statement.

SNABSIZE=nnnn,

This parameter specifies the size of the data area of each VTAM transmission buffer in bytes.

The lower limit is 256 and the upper limit is 32,767. The default value is the value specified in the global SNABSIZE statement.

Note: For the SNABSIZE statement for a printer node, we recommend that you define a size equal to the size of the physical printer buffer.

Display Node Parameters

We recommend that you do *not* define display nodes in the parmdeck. Instead, use the DYNDISP statement to define a number of display nodes to be used dynamically.

AUTH

Syntax

AUTH=1 | 2 | 3,

Description

The AUTH statement is valid for display nodes only and specifies the authorization level of the operator terminal. Valid values are:

- 1—(Default) Provides ordinary user level
- 2—Provides system operator level
- 3—Provides supervisor level, which means ordinary user level plus authorization to display all files and all nodes in the system

BID

Syntax

BID | NOBID,

Description

This parameter specifies whether the CA Spool system must send a BID request to this node to obtain permission to send a message.

This statement is valid only for SNA display devices (SLUTYPE 2), and is ignored for all other devices.

The default value is BID.

MODE

Syntax

MODE=CONSOLE | MENU,

Description

This parameter specifies whether the menu system must be automatically invoked when logging on to CA Spool from a display terminal. Valid values are:

- CONSOLE—(Default) The menu system is not invoked.
- MENU—The menu system is automatically invoked. When exiting the menu system, the display terminal automatically logs off.

PASSWORD

Syntax

PASSWORD=ccccccc | \$\$USERID,

Description

This parameter specifies an optional password to be associated with this display node. If specified, the password must be a 1 to 8-character alphanumeric string. Valid values are:

- ccccccc—The user is prompted for this password when the display node is logged on to the CA Spool system.
- \$\$USERID—If specified, the user is prompted for a valid user ID/password when the display node is logged on.

There is no default value.

RDQUERY

Syntax

RDQUERY=NOLIST,

Description

This parameter specifies that a Read Partition Query structured field request instead of a Read Partition Query List request must be send to a display node.

The Read Partition Query request is only issued if the 3270 Extended Data Stream flag (BINSEDS) is on in the used logmode.

The default value is the Use Read Partition Query List request.

TIMEOUT

Syntax

TIMEOUT=nnnnn,

Description

This parameter specifies the interval (in seconds) after which CA Spool terminates the session between the terminal and the system if there is no text transmission in either direction during the period.

The default value is 0; this default value indicates that the session is not terminated due to lack of transmissions and the terminal is not logged off.

USMR

Syntax

USMR= YES | NO | GROUP | SEVERE,

Description

This parameter specifies whether or not unsolicited messages must be sent to the defined display terminal. Valid values are:

- YES—(Default) All unsolicited messages are sent to the display terminal.
- NO—No unsolicited messages are sent to the display terminal.
- GROUP—Only unsolicited messages to the network group to which the display terminal is connected are sent, even if the terminal is defined with AUTH=2.
- SEVERE—Only severe unsolicited messages are sent to the display terminal.

WRAP/NOWRAP

Syntax

WRAP | NOWRAP

Description

This parameter specifies whether this display device must initially operate in automatic wraparound mode (WRAP or NOWRAP). Valid values are:

- WRAP—(Default) If this option is specified (or allowed to default), CA Spool automatically wraps around from the bottom line to the top line when the screen is full.
- NOWRAP—CA Spool waits for operator intervention or a one-minute timeout before the next message is written on the top line.

Printer Node Parameters

This section describes the printer node parameters.

ACQUIRE

Syntax

ACQUIRE=NO | WORK/NQWORK | TIME/NQTIME | SNET/NQSNET

Description

This parameter specifies whether there must be an automatic attempt to start a session with the printer and when that attempt must be made. Valid values are:

- WORK/NQWORK—Whenever a print file is ready to be printed on this printer.
- TIME/NQTIME—Fixed time intervals, defined by the ACQTIME statement, when a file is waiting to print on this printer or whenever a new print file is ready to print on this printer.

Note: When ACQUIRE=TIME is specified in combination with the FSSNPRO parameter on a TCP/IP connected printer, retry timeout support is enabled.

If no files have been printed successfully within the FSSNPRO specified time, the printer is automatically changed to use ACQUIRE=WORK. If the printer successfully prints a new file at a later time, it is automatically changed back to use ACQUIRE=TIME. The printer node ACQUIRE mode, if changed to ACQUIRE=WORK, by Retry TIMEOUT support will be preserved across REINIT command processing.

- SNET/NQSNET—When the CA Spool network is started.

Note: Be aware that if NQSNET, NQWORK, or NQTIME are specified, the start printer session request is not queued, and the session is only initiated if the printer is immediately available.

ADR

Syntax

ADR=cccc,

Description

This parameter specifies the unit address in EBCDIC of channel attached printers. This statement is only relevant for PSF-managed non-SNA printers. There is no default value.

ALIAS

Syntax

ALIAS=cccccccc,

Description

This parameter lets you assign an alternate name to the printer node.

The alias name must be a 1-to 8-character alphanumeric string. If the same printer is defined more than once in the same network group, a unique alias name is required.

There is no default value.

AUTO

Syntax

AUTO=YES | NO,

Description

This parameter specifies whether the printer must operate in automatic file selection mode. Valid values are:

- YES—(Default) The printer selects print files if they are queued in the output class(es) currently serviced by the printer, even if their setups (form and FCB) do not match. The printer will, of course, first select files with a matching setup.
- NO—The printer only selects files with setup (form, FCB, and output class) matching the setup currently serviced by the printer. For more information, see SETUP= STANDARD / FCB / FORM / NO.

BRACKETS

Syntax

BRACKETS=FILE | BLOCK | SESSION | NO,

Description

This parameter specifies the bracket-control mode (begin-bracket (BB) and end-bracket (EB)) to be used in the network session. Valid values are:

- FILE—(Default) A print file is started with a begin-bracket (BB) and terminated with an end-bracket (EB) indicator. BRACKETS=FILE must be specified if the printer is configured to operate in shared mode and with between-bracket printer sharing.
- BLOCK—Each data RU chain contains both BB and EB indicators.
- SESSION—A VTAM printer session is started with a BB indicator and terminated with an EB indicator.
- NO—BB and EB indicators are not used at all.

CHAIN

Syntax

CHAIN=YES | NO,

Description

This parameter specifies how chaining of data sent to this node must take place. Valid values are:

- YES—A new RU chain is started each time a checkpoint is taken (see the CKPTPGS statement).
Note: CHAIN=YES must only be used for LU1 and LU4 printers. It is generally recommended to use CHAIN=YES on LU1 and LU4 printers.
- NO—(Default) If NO is specified and MAXDATA is not specified, each chain has a length equal to the SNABSIZE statement.

CKPTPGS

Syntax

CKPTPGS=*nnnn*,

Description

This parameter specifies the number of pages (1 to 999) to be printed before each checkpoint is taken. A value that is too low forces excessive checkpointing and causes severe performance degradation. The lower limit is 1 and the upper limit is 999. The default value is 10.

CLASS

Syntax

CLASS=*c1 cn*,

Description

This parameter specifies the output classes, in priority sequence, to be processed initially by this printer.

Each class specification consists of a single character in the range A to Z or 0 to 9. A maximum of eight classes can be specified. The first class in the output class list becomes the default output class for files for this printer destination. If more than eight classes are needed, code CLASS=ALL to select all classes.

The default value is A.

COMP

Syntax

COMP= YES | NO,

Description

This parameter specifies whether compression of data sent to this node must take place. The default value is NO.

DRIVPRM1

Syntax

DRIVPRM1=cccccccccccccccc,

Description

This parameter can be used to specify 1 to 60 characters print driver parameters enclosed in quotes. There is no default value.

DRIVPRM2

Syntax

DRIVPRM2=cccccccccccccccc,

Description

This parameter can be used to specify 1 to 60 characters print driver parameters enclosed in quotes. There is no default value.

DRIVPRM3

Syntax

DRIVPRM3=cccccccccccccccc,

Description

This parameter can be used to specify 1 to 60 characters print driver parameters enclosed in quotes. There is no default value.

DRIVPRM4

Syntax

DRIVPRM4=cccccccccccccccc,

Description

This parameter can be used to specify 1 to 60 characters print driver parameters enclosed in quotes. There is no default value.

DUPLEX

Syntax

DUPLEX= NO | YES | TUMBLE,

Description

This parameter specifies if this printer per default must print on one side only or on both sides. It is supported by print driver PCL5, PJL4 and PJL5. The default DUPLEX parameter can be overwritten by the DUPLEX parameter on the OUTPUT JCL statement.

There is no default value.

- NO— Specifies to print on one side only.
- YES— Specifies to print on both sides of the sheets bound on the long side of the sheet.
- TUMBLE— Specifies to print on both sides of the sheets bound on the short side of the sheet.

ENDFF

Syntax

ENDFF= YES | NO,

Description

This parameter specifies whether a printed file must be followed by a final form feed. This parameter can be used on VTAM-attached printers and TCP/IP-attached printers using the LPR or DSO print drivers.

- YES—(Default) Final form feed is sent.
- NO—No final form feed is sent.

FCB

Syntax

FCB=cccc,

Description

This parameter specifies the forms-control-buffer image name to be initially simulated on this printer.

cccc is the forms-control-buffer (FCB) identifier (1 to 4 alphanumeric characters) that resides in SYS1.IMAGELIB.

For more information about how to add FCBs to SYS1.IMAGELIB, see the chapter Data Management in the *OS/VS2 System Programming Library*.

Note: All image names used by CA Spool are prefixed by FCB2; the specified FCB name becomes the default FCB for files for this printer destination.

The default value is 6.

FILTER

Syntax

`FILTER=c,`

Description

This parameter specifies which filter code the file is printed with; the filter code is used as the print command in the LPR/LPD protocol.

Note the following:

- The following filter codes are defined, but not supported by all LPD implementations: c, d, f, g, k, l, n, o, p, r, t, and v.
- Filter values can be written in both uppercase and lowercase, but they are changed to lowercase before use.
- The default for line data files is 'f'; the default for PRMODE=PAGE and FCB=ASIS files is 'l.'

If c, d, g, n, t, or v is used, no EBCDIC to ASCII translation takes place.

Note: For PRMODE=PAGE and FCB=ASIS files, the filter code 'l' is always used no matter what filter code is specified.

FORM

Syntax

`FORM=cccccccc,`

Description

This parameter specifies the form identifier (1 to 8 alphanumeric characters) of the form that is assumed to be initially mounted on this printer.

The specified form number becomes the default form for files for this printer destination.

The default value is STD.

FSS

Syntax

FSS=ccccccc,

Description

This parameter specifies that the printer is to be managed by the functional subsystem with the name *ccccccc*.

Note: This FSS must have been defined with the FSSDEF statement.

The NODE name is used by CA Spool as the reference to the PRINTDEV JCL statements in the FSS procedure

There is no default value.

FSSNPRO

Syntax

FSSNPRO=*nnnn*,

Description

This parameter specifies the non-process-runout (NPRO) time interval, in seconds (0-3600).

The NPRO time interval is that time interval during which output remains in the paper path but has not reached the stacker. After the NPRO time specification has elapsed, the functional subsystem directs the page-mode printer to force the output to the stacker.

The default value is 0.

Note:

- The FSSNPRO parameter is ignored for non-channel-attached PSF printers.
- FSSNPRO=0 specifies that a timer-based NPRO is not to be used.
- FSSNPRO can also be used in combination with ACQUIRE=TIME for TCP/IP connected printers that are not driven by PSF to provide retry timeout support. For more information, see the ACQUIRE node parameter.

INITFF

Syntax

INITFF= NO | OPENSESS | SVF | FILE,

Description

This parameter specifies whether to send initial form feeds to VTAM-attached printer:
Valid values are:

- NO—No initial form feed is sent, and it is assumed that the printer is already placed at the top of form before the print is started.
- OPENSESS—An initial form feed is sent immediately after the session is established, to place the printer at the top of form. You can use this facility to obviate problems caused by applications, which can leave the printer in an undefined state.
- SVF—(Default, for VTAM-attached printers) A form feed is sent every time a file with the appropriate FCB statement is selected for printing.
- FILE—An initial form feed is sent every time a new file is selected for printing.

INITFF=FILE is also supported on TCP/IP-attached printers using the LPR or DSO print drivers, to have an initial form feed sent every time a new file is selected for printing.

INTRAY

Syntax

INTRAY= *nnn*,

Description

This parameter specifies the default paper source number *nnn* in the range from 1 to 255. It is supported by print driver PCL5, PCL4 and PCL5. The default INTRAY parameter can be overwritten by the INTRAY parameter on the OUTPUT JCL statement. There is no default value.

KEY

Syntax

KEY= xxxxxxxxxxxxxxxxxxxx

Description

This parameter specifies the 32/48/64 hexadecimal encryption key. Use this when encrypting (AES Rijndael encryption) print data while it is being sent to TCP/IP-attached printers or to remote CA LPD or CA Spool LPD interface. To activate encryption, specify the TCPDRIV option '4'.

LINECNT

Syntax

LINECNT=*nnn*,

Description

This parameter specifies the maximum number of lines to be printed per page. Valid values are:

- The LINECNT parameter can be overwritten by the LINECNT specified on a spool file.
- If LINECNT=0 then no automatic skipping to top of new page is in effect.

The lower limit is 0 and the upper limit is 255. The default value is 0.

LOCATION

Syntax

LOCATION=ccccccccccccccc,

Description

This parameter specifies the printer location/description. 1 to 16 characters of information is displayed on the CA Spool Menu System Printer panel. There is no default value.

LOGMODE

Syntax

LOGMODE=cccccccc,

Description

This optional parameter specifies the name of an alternate LOGMODE table entry to be used as the bind image for the VTAM session.

The specified logmode is only used when CA Spool is starting the session through a VTAM simlogon request.

The logmode is not used if the CA Spool logon exit is scheduled because CA Spool is defined as the controlling VTAM application.

There is no default value.

MPP1CR

Syntax

MPP1CR=NEW | OLD,

Description

This parameter specifies how the printer is expected to react if a carriage return (CR) is executed at MPP plus 1. Valid values are:

- **NEW**—(Default) CA Spool assumes that the printer does not initiate a CRLF, and that the next print position would be the first print position on the current line.
To obviate this, CA Spool inserts a NL command in the data stream, when printing is to be continued on the next line; this is the default action for all device types, except for the 3284, 3286 and 3288.
- **OLD**—CA Spool assumes that the printer does initiate a CRLF, and that the next print position is the first print position on the current line plus 1; this is the default action for 3284, 3286 and 3288.

Note: The settings for this parameter and MPP1NL must be set to the same value:

- Normal Default: NEW
- Default for 3284, 3286 and 3288: OLD

MPP1NL

Syntax

MPP1NL=NEW | OLD,

Description

This parameter specifies how the printer is expected to react if a new line (NL) is executed at MPP plus 1.

Valid values are:

- **NEW**—(Default) No automatic NL is executed, so the next print position is at the first print position of the current line plus 1. This is the default for all device types, except for 3284, 3286 and 3288.
- **OLD**—An automatic NL is executed so the next print position is at the first print position on the current line plus 2. This is the default action for 3284, 3286 and 3288.

Note: The settings for this parameter and MPP1CR are set to the same value:

- Normal Default: NEW
- Default for 3284, 3286 and 3288: OLD

NJEDEST

Syntax

NJEDEST=,

Description

This parameter specifies that files created for the node must be requeued to the specified destination. The alias (if present and USEALIAS=YES is specified) or the node name is used as the writer name in the file. There is no default value.

NOSETUP

Syntax

NOSETUP,

Description

This parameter specifies that printer setup messages (ESF422) must not be sent to the printer itself but only to the active display stations and communication channels belonging to the same CA Spool network group. There is no default value.

OUTBIN

Syntax

OUTBIN= *nnn*,

Description

This parameter specifies the default printer output bin identifier number *nnn* in the range from 1 to 255. It is supported by print driver PCL5, PCL4 and PCL5. The default OUTBIN parameter can be overwritten by the OUTBIN parameter on the OUTPUT JCL statement. There is no default value.

OUTLIM

Syntax

OUTLIM=*nnnn*,

Description

This parameter specifies the default output limit for files being created to this printer node. If this statement is not specified, the default output limit is taken from the installation specified default OUTLIM statement.

The lower limit is 1,000 and the upper limit is 16,777,215. The default value is the value specified in the OUTLIM statement.

Note: An OUTLIM of 2,147,438,647 can be put into effect by specifying OUTLIM=16777215 and XEQOPT=23.

PRESEL

Syntax

PRESEL=NO | YES | DELAY,

Description

This parameter specifies whether pre-selection must be used on printers controlled by a functional subsystem.

Valid values are:

- NO—(Default) Only one file at a time is selected by the printer.
- YES—Multiple files can be selected.
- DELAY—One file is selected by PSF at a time. Multiple files can be active at the same time.

PSFOPT

Syntax

PSFOPT=*nn*,

Description

This parameter specifies special FSS printer processing.

Valid values are:

- PSFOPT=1—Generation of separator pages can be controlled as follows:
 - SEP=0—No Separator pages are generated.
 - SEP=1—Only a HEADER Separator page is generated.
 - SEP=2—Only a TRAILER Separator page is generated.
 - SEP=3—BOTH HEADER and TRAILER Separator pages are generated.
- PSFOPT=2—COPYMARK=DATASET; increment the copy marks or offset stacking on a file boundary.
- PSFOPT=3—MARK=YES specifies (for a non-impact printer) that there is marking on the edge of the separator page.
- PSFOPT=4—Display pages/lines read as pages/lines printed.
- PSFOPT=5—Early release of data set support, therefore, a file is released as soon as it has been read; not recommended.
- PSFOPT=6—COPYMARK=COPIES increment the copy marks or offset stacking on a copy boundary.
- PSFOPT=7—The Job Id will be passed to PSF instead of the CA Spool file number for placement on the PSF separator page.
- PSFOPT=8—non-APF records will be passed to FSS without trailing blanks.

PURGE

Syntax

PURGE=YES | NO,

Description

Specifies whether printed files must be queued for purge processing, or retained for the number of hours specified by the FILELIM statement. The default value is YES.

RDQUERY

Syntax

RDQUERY=BIND | YES | NO,

Description

This parameter specifies whether a read partition query command must be issued to obtain printer characteristics. Valid values are:

- BIND—(Default) The read partition query command is issued during session establishment, if the logmode specifies that read partition query is supported.
- NO—The read partition query command is not used.
- YES—The read partition query command is issued during session establishment.

Note: These characteristics can include printer buffer size, information about SCS support for set line density (SLD), set print density (SPD), select print quality (PPM), select forms control (FC), and source drawer (SD).

RELEASE

Syntax

RELEASE=NO | NOWORK,

Description

This parameter specifies whether to automatically terminate sessions with this printer when no more print files are waiting to be printed on this printer (NOWORK or NO). The default value is NO.

RELREQ

Syntax

RELREQ=N | D | I | NOWORK,

Description

This parameter specifies the action to be taken when a release request is scheduled by VTAM for the node being defined. Valid values are:

- N—(Default) The request is ignored.
- D—The session is terminated when the work, which is currently active, has been completed.

- I—The work currently active is interrupted, and the session is terminated.
- NOWORK—The session is terminated when no more files are waiting to be printed on this printer.

REST

Syntax

REST=YES | NO | PRINTER,

Description

This parameter specifies whether this printer node must operate in restricted file selection mode.

Valid values are:

- YES—(Default) The printer only selects print files with a destination name matching the node name or alias name of the printer.
- NO—The printer assumes that all files queued to the network group in which the printer is defined are available for selection, and then selects them.

Note: If printer node defined with the ACQUIRE=TIME and the ACQTIME interval expires, only the file destination printer is checked, not the other printers in the network group.

- PRINTER—For a printer defined more than once in the same network group, the printer selects all print files with a destination name matching the node name of the printer, or any of the alias names.

RETAIN

Syntax

RETAIN=*nnnnn*,

Description

This parameter specifies the number of hours files must be retained after they are printed; if this parameter is not present, the value specified in FILELIM is used.

The lower limit is 0 and the upper limit is 8,760. The default value is the value specified in FILELIM.

SAFF

Syntax

SAFF=YES | NO,

Description

This parameter specifies whether form feed control sequences are to be sent stand alone in a print buffer. Valid values are:

- NO—(Default) Form feed control sequences can be placed anywhere in a print buffer.
- YES—Form feed control sequences are sent stand alone in a print buffer.

SCSRESET

Syntax

SCSRESET=FILE | YES | NO

Description

This parameter specifies if and when SCS reset commands, which reset the printer parameters to the operator-specified values, must be sent.

Valid values are:

- FILE—The supported SVF, SHF, SLD, and SPD SCS reset commands are sent to the printer after each file has been printed.
- YES—The reset commands are sent just before the session is terminated.
- NO—(Default) No SCS commands to reset the printer are sent.

SEP

Syntax

SEP=0 | 1 - 9,

Description

This parameter specifies the number of separator pages to print before and after each print file. For TCP/IP printers, the SEP= options and the resulting separator pages are as follows:

- 0—No separator page
- 1 - (Default) No separator page; however, for LPR printers, a print banner command is sent to the LPD
- 2*—A start separator page
- 3*—An end separator page
- 4*—Both a start and an end separator page
- 5*—A start separator page with an extra form feed before the data file
- 6*—An end separator page with an extra form feed after the data file
- 7*—Both a start and an end separator page with an extra form feed before the data file and after the data file
- 8—A beginning banner page is produced only when the creating JOBID for the file to be printed is different from the creating JOBID of the previous file printed on the same TCP/IP printer.
- 9—No separator page. Add an extra first record and send it to the printer as:
`PAGEDEF=xxxxxx, FORMDEF=xxxxxx, FCB=xxxx<CRLF>`

*The following effects occur if you include *both* the [SEPOPT](#) (see page 376)=10 option and a SEP option from 2-7 in the Printer Node parameter:

- The separator page is produced in the alternate format specified by SEPOPT=10.
- The following SEP options have the same effect:
 - 2 and 5: start separator page in the alternate format
 - 3 and 6: end separator page in the alternate format
 - 4 and 7: both a start and an end separator page in the alternate format

SEPAEXIT

Syntax

SEPAEXIT=*n*,

Description

This parameter specifies the number of the separator page exit to be used for this printer. The number *n* specified is appended as: ESFSEPA*n*. The lower limit is 0 and the upper limit is 9. The default value is 0, which implies ESFSEPA0.

SEPOPT

Syntax

SEPOPT=*nn*,

Description

This parameter specifies special banner page print options for TCP/IP printers. Note that this parameter can be specified multiple times for the same printer node. The valid values are:

- 1—The banner page generated will be suitable for landscape printing, with respect to the number of lines. The content of the banner page will be identical to the standard banner page, but it will have fewer blank lines.
- 2—The banner page generated is not translated from EBCDIC to ASCII, and is printable on some LCDS Xerox printers.

If used with TCPDRIV=DISK/XCOM/FTP/C:D, form feeds match the carriage control attribute assigned to the file that is being processed. For CC=A, the form feeds are written as x'F1'. For CC=M, the form feeds are written as x'8B' in the beginning separator pages and x'89' in the end separators. All other lines in CC=M files have x'09' assigned as carriage control.
- 3—The JES JOBID will be used on the banner page, instead of the normally used, CA Spool File number.
- 4—A banner page will be generated only for Initial file prints; no banner page will be generated for file Reprints, Restarts, or Partial prints. The banner pages for Newcopy and Browse Partial Print requests will not be bypassed.
- 5—Banner page print lines will have a syntax that will allow them to be printed on LCDS printers. In some cases, it can be necessary to specify both SEPOPT=2 and SEPOPT=5 to print banner pages on LCDS printers.
- 6—The first 20 characters of the OUTPUT Statement Preferred Name field will be placed on the TCP/IP banner page after the Programmer Name line.

- 7—Include PJL resources from PJLIB that match FORM, FCB and CHARS to be sent before the separator page when TCPDRIV=PJL5 is specified. Include PCL resources from PCLLIB that match FORM, FCB and CHARS to be sent before the separator page when TCPDRIV=PCL5 is specified.
- 8—Add two byte length prefix to each line of the separator pages when the first four characters of TCPDRIV are BARR (TCPDRIV=BARR).
- 9—For TCPDRIV=LCDS convert ASA files to Machine Code write and skip or space commands instead of skip or space and write without spacing commands.
- 10—Choose an alternate separator page format.

If you use SEPOPT=10, any other specified SEPOPTS are ignored.

If you include *both* SEPOPT=10 *and* a separator page (SEP) option from 2-7 in the Printer Node parameter, [the effect of the SEP option changes](#) (see page 375).

Note: The purpose of adding this alternate format is to supply separator page logic in ESFU010 that is separate from the main code path. This option provides the ability to modify the separator page format without the need to imbed new code within the code that supports the rest of CA Spool's specialized SEPOPT processing.

Additional form feeds, other carriage control and formatting PCL can be added within the TSALT constants IN ESFU010. Short PCL formatting strings can be added inline by reviewing the comments within the SEPOPT=10 code in ESFU010. By default, SEPOPT=10 creates a separator with block letters for the file name and Job id. In addition, a 25 line detail box is written containing information on the file being printed. The detail box is 79 characters wide. File attributes are written starting in column 18 so that 60 character Output statement fields will fit within the box. In ESFU010, conditional assembly variable &NOBLOCK can be set to bypass the creation of the block letter sections of the separator. This will occur when &NOBLOCK is set to 1.

SETUP

Syntax

SETUP = STANDARD | FCB | FORM | NO | MANUAL,

Description

This parameter specifies when the printer enters setup processing. Valid values are:

- STANDARD—(Default) The printer enters setup processing if the selected new file has a different FORM or a different FCB.

If STANDARD is specified for an SCS printer with both SVF and SLD support specified in the used LOGMODE entry, the printer only enters setup processing if the new file has a different FORM specified.

- FCB—The printer only enters setup processing if the new selected file has a different FCB.

If FCB is specified for an SCS printer with both SVF and SLD support specified in the used LOGMODE entry, the printer never enters setup processing.

- FORM—The printer only enters setup processing if the new selected file has a different FORM.
- NO—The printer never enters setup processing.
- MANUAL—Files are not selected for the printer until their class, form and FCB match those defined on the printer. When selection does occur, the printer simply begins printing; that is, no setup processing occurs.

SHARED

Syntax

SHARED=NO | YES | MASTER,

Description

This parameter specifies if a printer is shared. A *shared printer* is a printer that is defined more than once.

Note: If the printer is defined as a shared printer, the use of alias names is required.

Valid values are:

- NO—(Default) The printer is only allowed to be defined once.
- YES—The printer can be defined any number of times.
- MASTER—This definition of the printer is the only one that is able to print spool files.

SIMLOGON

Syntax

SIMLOGON=QALL | QSESSLIM | QNOTENAB,

Description

This parameter specifies when a printer session request must be queued if the printer is not immediately available.

Note: This statement is only supported for ACF/VTAM V2 or higher.

Valid values are:

- QSESSLIM—The session request is only queued if the printer is at session limit, which means that the printer is in session with another VTAM application.
- QNOTENAB—The session request is only queued if the printer is not enabled, which means that the printer is temporarily unavailable.
- QALL—The session request is queued if the printer is at session limit or is not enabled.

There is no default value.

Note: If SIMLOGON is not specified, the session request is queued if the printer is at session limit or is not enabled, just in the same way as if SIMLOGON=QALL was specified.

TCPDRIV

Syntax

TCPDRIV=ccccccccc,

Description

This parameter specifies the TCP/IP printer driver name and options that can be used to select various levels of TCP/IP printer support as follows:

Parameter	Printer Support
TCPDRIV=LPR	Selects the basic LPR print driver
[A] [E] [N] [Q] [R] [W]	+ Communication options
[C] [D] [J] [L] [S] [U] [X] [Y] [Z] [0] [1] [2] [5] [6]	+ Protocol options
[b] [g] [n] [p] [r] [w]	
[B] [F] [3]	+ Formatting options
[T] [9]	+ Trace options

Parameter	Printer Support
TCPDRIV=DSO [A] [E] [N] [Q] [R] [W] [D] [J] [L] [S] [X] [5] [g] [r] [B] [F] [3] [4] [T] [9]	Selects the basic DSO print driver + Communication options + Protocol options + Formatting options + Trace options
TCPDRIV=PCL5 [A] [E] [N] [Q] [R] [W] [C] [D] [J] [L] [S] [U] [X] [Y] [Z] [0] [1] [2] [5] [6] [b] [g] [n] [r] [w] [B] [F] [G] [H] [O] [3] [4] [i] [T] [9]	Selects the LPR PCL5 print driver + Communication options + Protocol options + Formatting options + Trace options
TCPDRIV=PJL [A] [E] [N] [Q] [R] [W] [C] [D] [J] [L] [S] [U] [X] [Y] [Z] [0] [1] [2] [5] [6] [b] [g] [n] [p] [r] [w] [B] [G] [O] [3] [4] [T] [P] [9]	Selects the LPR PJL print driver + Communication options + Protocol options + Formatting options + Trace options
TCPDRIV=PJL4 [A] [E] [N] [Q] [R] [W] [C] [D] [J] [L] [S] [U] [X] [Y] [Z] [0] [1] [2] [5] [6] [b] [g] [n] [p] [r] [w] [B] [F] [G] [H] [K] [O] [3] [4] [T] [P] [9]	Selects the LPR PJL4 print driver + Communication options + Protocol options + Formatting options + Trace options
TCPDRIV=PJL5 [A] [E] [N] [Q] [R] [W] [J] [L] [S] [V] [X] [5] [8] [g] [r] [B] [F] [G] [K] [O] [3] [4] [T] [P] [I] [9]	Selects the PJL5 print driver + Communication options + Protocol options + Formatting options + Trace options
TCPDRIV=LCDS [A] [E] [N] [Q] [R] [W] [C] [D] [X] [Y] [Z] [1] [2] [5] [6] [7] [n] [p] [w] [B] [T] [9]	Selects the Xerox DocuSP LCDS print driver + Communication options + Protocol options + Formatting options + Trace options

Parameter	Printer Support
TCPDRIV=BARR [A] [E] [N] [Q] [R] [W] [C] [D] [X] [Y] [Z] [1] [2] [5] [6] [7] [p] [n] [w] [B] [T] [9]	Selects the BARR print driver + Communication options + Protocol options + Formatting options + Trace options
TCPDRIV=IPDS [A] [E] [N] [Q] [R] [W] [D] [T] [9]	Selects the IPDS print driver + Communication options + Protocol options + Formatting options + Trace options
TCPDRIV=DISK - [J] [S] [5] [B] [F] [H] [T]	Selects the data set print driver + Communication options + Protocol options + Formatting options + Trace options
TCPDRIV=SMTP [A] [E] [N] [Q] [R] [W] [J] [S] [5] [B] [F] [H] [T] [9] [x]	Selects the email print driver + Communication options + Protocol options + Formatting options + Trace options
TCPDRIV=SAR - [J] [S] [5] [B] [F] [H] [T]	Selects the SAR print driver + Communication options + Protocol options + Formatting options + Trace options
TCPDRIV=JES - [J] [S] [5] [B] [F] [H] [T]	Selects the JES print driver + Communication options + Protocol options + Formatting options + Trace options
TCPDRIV=ESF - [J] [S] [5] [B] [F] [H] [T]	Selects the ESF print driver + Communication options + Protocol options + Formatting options + Trace options

Parameter	Printer Support
TCPDRIV=FTP	Selects the FTP print driver
-	+ Communication options
[J] [S] [5]	+ Protocol options
[B] [F] [H]	+ Formatting options
[T] [e]	+ Trace options
TCPDRIV=XCOM	Selects the XCOM print driver
-	+ Communication options
[J] [S] [5]	+ Protocol options
[B] [F] [H]	+ Formatting options
[T]	+ Trace options
TCPDRIV=C:D	Selects the C:D print driver
-	+ Communication options
[J] [S] [5]	+ Protocol options
[B] [F] [H]	+ Formatting options
[T] [e]	+ Trace options
TCPDRIV=DUMMY	Selects the DUMMY print driver
-	+ Communication options
-	+ Protocol options
-	+ Formatting options
-	+ Trace options

Valid values are:

- **A**—Try source port 721-1023, instead of just trying the default LPD source ports 721-731.
- **B**—Activates auto include of existing FCB, Form and Chars BINLIB resource members.
- **C**—If multi copy file processed, send only one copy of file in the data file and multiple print commands in the control file.
- **D**—Write the output data stream to a disk data set.
- **E**—Have TCP/IP automatically assign an ephemeral (short-lived) source port in the range 1024-5000.
- **F**—Activates auto include and auto formatting for print drivers PJL4, PJL5, and PCL5. For the standard LPR driver and the DSO driver, activates support of LINECNT or FCB page length for NOCC files and for single page ASA files. Activates FCB-based auto formatting if the text wrappers are used for print drivers DISK, SMTP, SAR, JES, ESF, FTP, XCOM and C:D.

- **G**—Activates auto include of existing FCB, Form and Chars PCLLIB resource members for print driver PJJ, PJJ4, PJJ5, and PCL5. Commands are entered in EBCDIC. An asterisk or blank in column 1 indicates a comment line. A blank terminates the command string on each line. Data after the first blank is ignored. DEVICE statements are supported. PCL and Non-PCL commands can exist in the same PCLLIB member.
- **H**—Activates auto include and auto formatting for print drivers PJJ4 and PCL5 in the same way as option F, except that the FCB page length is not used. Instead it defaults to 6LPI, allowing 43 lines/page in Landscape and 60 lines/page in Portrait. If the number of lines per page in the data file is higher, the used LPI and lines/page is automatically adjusted.

Activates max page length based auto formatting if the text wrappers are used for print drivers DISK, SMTP, SAR, JES, ESF, FTP, XCOM and C:D.
- **I**—Generates (per print request), an output spool file named INFTRACE with all PJJ DQUIRE, INQUIRE, and INFO status read back information received

The output file is not opened until some read back information for these three types of PJJ command is received.
- **J**—Carriage control characters are treated as data and the 'r' filter is used.
- **K**—Include EBCDIC PCL commands if found at the bottom of a PJJLIB resource member, as well as all formatting provided by the "F" option.
- **L**—Leave trailing blanks in the data stream. If X'19' (3270 EOM) is found in the file, replace it with X'0D0A' and truncate the rest of the record.
- **N**—Use non-blocking sends, which improves Cancel/Interrupt command support and printer TIMEOUT= support. This option must not be used for LPD print servers as it can slow down the data transfer.
- **O**—If Form PCL member found in the OVLYLIB library, include it as an automatic page overlay on every printed page.
- **P**—Generates (per print request) a PJJ buffer trace of all PJJ commands sent and all PJJ status read back information received into an output spool file named PJJTRACE.
- **Q**—Bind TCP/IP session from the TCPLHOST=Local-IP-Address specified internet address.
- **R**—Resets the TCP/IP connection immediately when a session is closed.
- **S**—Suppress CC and TRC characters in print records if present.
- **T**—Generates (per print request) a TCP/IP buffer trace of all data sent and received into an output spool file named TCPTRACE.
- **U**—Sends the data file before the LPR control file; this supports VAX, Ultrix, and other systems that require the data file to be sent before the control file.

- **V**—Enables PJL Verbose support, so unsolicited device status for all status changes plus notification of all PJL parser warnings and errors are reported.
- **W**—Delay next session request in the FSSNPRO= specified number of seconds.
- **X**—Skips VTAM Transparency support and treats strings containing x'35' as normal data.
- **Y**—Activates EPS Extended Class support, so an extended class parameter is included in the control file. Extended class parameter format:

```
"Cc:room:CH=chars:FC=fcb:LC=999:F=forms:ID=JOB99999  
:ACCOUNT=cccc:DEST=dest:FORMDEF=cccc:PAGEDEF=cccc  
:JOBN=jobname:PRMODE=ccccccc:WRITER=ccccccc"
```
- **Z**—Activates the use of long 6 digit job numbers.
- **0**—Send multiple copies as individual data files, but only if the U option is also specified.
- **1**—Count the number of bytes in the print file before starting the printer session.
- **2**—Skip byte counting, use a very high byte count.
- **3**—Include VPS Start Printer command string *before* the print file, and VPS End Printer command string *after* the print file. The VPS resource library must be added to the CA Spool proc's STEPLIB DD concatenation. The WRITER name or the FORM name is used to select the correct member from the VPS resource library.

If USERPARM=BAN=*mbr* is specified on the node statement, the command strings contained in *mbr* is included before, after, or both the CA Spool separator page.
- **4**—Enable AES Rijndael print data encryption.
- **5**—Print file as EBCDIC PCL if ASA file with lrecl=253 and first record starts with "1" and contains string "<esc>E<esc>".
- **6**—Override NODE parameter TCPVRT with the writer name from the ESFOPEN fields @OPGRDST or @OPGRWTR. These fields can be modified by user exit ESFU009.
- **7**—Pass the creating userid in the P control file line or the LCDS job header instead of the FORM name.
- **8**—Flush common PCL commands from the data stream when restarting an interrupted PCL data stream on a printer using the PJL5 driver. Commands beginning with X'1B2A70', X'1B2670' and X'1B2A62' will be removed.
- **9**—Generate Resolver trace.

- **b**—Add a blank between consecutive form feeds. This format is required for some VIPP printers.
- **e**—Create a sysout file trace of the data written by the FTP api or cause the DMPRINT dd to be used to write api messages for the C:D api. This option skips the need to create a TCPTRACE file in cases where the amount of data in the CA Spool file is large and the data is not part of the reason that debugging is required.
- **g**—Activates auto include of existing FCB, Form and Chars PCLLIB resource members for print drivers LPR ,DSO ,PJL, PJL4, PJL5, and PCL5. Commands are entered in EBCDIC. An asterisk or blank in column 1 indicates a comment line. A blank terminates the command string on each line. Data after the first blank is ignored. DEVICE statements are supported. PCL and Non PCL commands can exist in the same PCLLIB member.
- **i**—Use the JCL Output Statement INTRAY and the NODE DRIVPRMn BINn paramters to determine the numeric value to use in the PCL Paper Source command that is added ahead of the data file. The INTRAY value is correlated to the corresponding BINn parameter and the numeric value specified in the BINn is used in the PCL Paper Source command. If no matching BINn parameter is specified, the number in the INTRAY parameter is used in the PCL Paper Source command. This applies only to the PCL5 driver.
- **n**—Do not send the LPR control file as part of the LPR print session. The target node is responsible for routing the file to the correct print queue.
- **p**—Pass the FORM name in the P control file line instead of the file creating userid.
- **r**—Automatic include of existing PCLLIB, PJLLIB or BINLIB members that match a file's Remote Destination, Writer Name or Form Name before the print file, and the RESET member after the print file. An asterisk or blank in column 1 indicates a comment line. A blank terminates the command string on each line. Data after the first blank is ignored. DEVICE statements are supported.

A member whose name matches the Remote Destination is used, if found. If no match is found, a member whose name matches the Writer is used. If no match is found, a member whose name matches the Form Name, up to 8 characters in length, is used.

Automatic formatting does not take place when the 'r' option is used. Options that provide automatic formatting such as 'F' and 'H' are ignored when the 'r' option is specified with any of the PCL or PJL print drivers. The F option for the LPR and DSO drivers that provides page length support works in conjunction with the 'r' option. The 'K' option's support of additional PCL commands specified at the end of PJLLIB members works in conjunction with the 'r' option. However, the automatic formatting that the 'K' option provides does not occur when the 'r' and 'K' options are used together.

To search BINLIB for members whose names match a file's Remote Destination, Writer or Form Name attribute, the 'B' option must be specified with the 'r' option.

- **w**—Pass the file max LRECL as the *width* of output in the W control line.
- **x**—Displays the response from the SMTP server after the message is sent.

Note: some SMTP servers respond with just "OK", while others can contain additional information like the mail message ID.

Options T, P, and I are mutually exclusive on the same TCPDRIV parameter. Options A and E are mutually exclusive on the same TCPDRIV parameter.

The default value is LPR.

TCPHOST

Syntax

TCPHOST=cccccccccccccc,

Description

Specifies the symbolic name or the IP address of the target TCP/IP host.

This value can have a maximum length of 64 characters and can include mixed case alphanumeric and special characters.

TCPPORT

Syntax

TCPPORT=nnnn,

Description

Specifies the TCP/IP port number of the targeted print server or printer; it overwrites the printer port number specified in the TCP/IP service file.

If you use the LCDS print driver and specify TCPPORT=9000-9999, then the DSO protocol is used rather than the LPR/LPD protocol.

The lower limit is 0 and the upper limit is 65535. The default for nodes using TCPDRIV=LPR|PCL5|PJL|PJL4 is 515. The default for nodes using TCPDRIV=PJL5|DSO is 9100.

TCPVRT

Syntax

TCPVRT=cccccccccccccc,

Description

This parameter specifies the name of the printer known by the remote TCP/IP host. This value can have a maximum length of 32 characters and can include mixed case alphanumeric and special characters.

Default for TCPDRIV=LPR/PCL5/PJL/PJL4: is the spool file writer name if specified, else if USEALIAS=YES the printer alias name, else the printer node name.

TIMEOUT

Syntax

TIMEOUT=nnnnn,

Description

For TCP/IP printers, this parameter specifies the maximum time interval (in seconds) to wait for a response from the remote TCP/IP host or printer before the session is terminated.

The default value is 0, which means that printer sessions never time out.

TRANS

Syntax

TRANS=ccccccc,

Description

This parameter specifies the name of a translate table (located in ESFTRAN) to be used by the printer for data translation.

The following entries are available in the default translate table module:

Translate Table	Translation
IBMTRAN1	3271/3272 + 3274 attachment
IBMTRAN2	3274/3276 attachment

Translate Table	Translation
ITT	ITT charset
STAND	Stansaab Danish charset
STANN	Stansaab Norwegian charset
APL3274	Special APL/Text feature charset (3274)
APLTRANS	Alias to APL3274.
APLAGFA	APL charset to be used with AGFA-400
TEXTTRAN	All control characters to blanks
ASCII	EBCDIC to ASCII translate table.
ASCIITCP	EBCDIC to ASCII where all non-printable characters becomes ASCII spaces.
ASC2ASC	ASCII to ASCII – data unchanged
EBC2EBC	EBCDIC to EBCDIC – data unchanged
C037T19U – US English	CodePage 037 19U W31 Latin 1
C273T19U – Austria/German	CodePage 273 19U W31 Latin 1
C274T19U – Belgian	CodePage 274 19U W31 Latin 1
C277T19U – Danish/Norwegian	CodePage 277 19U W31 Latin 1
C278T19U – Finnish/Swedish	CodePage 278 19U W31 Latin 1
C280T19U – Italian	CodePage 280 19U W31 Latin 1
C282T19U – Portuguese	CodePage 282 19U W31 Latin 1
C284T19U – Spanish	CodePage 284 19U W31 Latin 1
C285T19U – UK English	CodePage 285 19U W31 Latin 1
C297T19U – French	CodePage 297 19U W31 Latin 1
C500T19U – International	CodePage 297 19U W31 Latin 1
C037T858 – US English	EBCDIC T1V10037 to ASCII T1000858
C273T858 – Austria/Germany	EBCDIC T1V10273 to ASCII T1000858
C277T858 – Danish/Norwegian	EBCDIC T1V10277 to ASCII T1000858
C278T858 – Finnish/Swedish	EBCDIC T1V10278 to ASCII T1000858
C280T858 – Italian	EBCDIC T1V10280 to ASCII T1000858
C284T858 – Spanish	EBCDIC T1V10284 to ASCII T1000858
C285T858 – UK English	EBCDIC T1V10285 to ASCII T1000858

Translate Table	Translation
C297T858 – French	EBCDIC T1V10297 to ASCII T1000858
C500T858 – International	EBCDIC T1V10500 to ASCII T1000858
C424T15Q – Hebrew	EBCDIC T1000424 to ASCII T1000916
VPSSXLTE	EBCDIC to EBCDIC
VPSSXAPL	EBCDIC to EBCDIC
VPSSXASC	EBCDIC to ASCII
ESFSXLTE	EBCDIC to EBCDIC
ESFSXAPL	EBCDIC to EBCDIC
ESFSXASC	EBCDIC to ASCII
EBC2EBC	EBCDIC to EBCDIC - no translation
ESFCHINB	DBCS CHINESE BIG 5
ESFCHINS	DBCS CHINESE SIMPLY
ESFCHINT	DBCS CHINESE TRADITIONAL
JAPANK	DBCS JAPAN (KATAKAN)
JAPANDB	DBCS JAPAN (COMB-EXT)
JAPANKE	DBCS JAPAN (KATAKAN-EXT)
JAPANLE	DBCS JAPAN (LATIN-EXT)

Defaults

Default for VTAM-attached printer: No translation is to take place.

Default for TCP/IP-attached printers: The standard IBM C EBCDIC-to-ASCII translate table is used.

TRANSFRM

Syntax

TRANSFRM=ccccooooo,

Description

This parameter specifies the transformation and transformer options to be used for files created to this printer where:

- **cccc**—Specifies one of the following data stream transformations:
 - TRANSFRM=A2AF— AFP to AFP Transformation
 - TRANSFRM=A2IM— AFP to Image Transformation
 - TRANSFRM=A2ME— AFP to Metacode Transformation
 - TRANSFRM=A2PC—AFP to PCL Transformation
 - TRANSFRM=A2PD—AFP to PDF Transformation
 - TRANSFRM=A2PS—AFP to PostScript Transformation
 - TRANSFRM=A2PA— AFP to PDF/A Transformation
 - TRANSFRM=A2TI— AFP to TIFF Transformation
 - TRANSFRM=A2HT— AFP to Web Transformation
 - TRANSFRM=M2AF— Metacode to AFP Transformation
 - TRANSFRM=M2IM— Metacode to Image Transformation
 - TRANSFRM=M2ME— Metacode to Metacode Transformation
 - TRANSFRM=M2PC — Metacode to PCL Transformation
 - TRANSFRM=M2PS — Metacode to PostScript Transformation
 - TRANSFRM=M2PD — Metacode to PDF Transformation
 - TRANSFRM=M2PA— Metacode to PDF/A Transformation
 - TRANSFRM=M2TI— Metacode to TIFF Transformation
 - TRANSFRM=M2HT— Metacode to Web Transformation
 - TRANSFRM=P2AF— PDF to AFP Transformation
 - TRANSFRM=P2IM— PDF to Image Transformation
 - TRANSFRM=P2ME— PDF to Metacode Transformation
 - TRANSFRM=P2PC— PDF to PCL Transformation
 - TRANSFRM=P2PS— PDF to PostScript Transformation

- TRANSFRM=P2PD— PDF to PDF Transformation
 - TRANSFRM=P2PA— PDF to PDF/A Transformation
 - TRANSFRM=P2TI— PDF to TIFF Transformation
 - TRANSFRM=P2HT— PDF to Web Transformation
 - TRANSFRM=C2AF— PCL to AFP Transformation
 - TRANSFRM=C2IM— PCL to Image Transformation
 - TRANSFRM=C2ME— PCL FP to Metacode Transformation
 - TRANSFRM=C2PC— PCL to PCL Transformation
 - TRANSFRM=C2PS— PCL to PostScript Transformation
 - TRANSFRM=C2PD— PCL to PDF Transformation
 - TRANSFRM=C2PA— PCL to PDF/A Transformation
 - TRANSFRM=C2TI— PCL to TIFF Transformation
 - TRANSFRM=C2HT— PCL to Web Transformation
 - TRANSFRM=I2AF— TIFF to AFP Transformation
 - TRANSFRM=I2IM— TIFF to Image Transformation
 - TRANSFRM=I2ME— TIFF to Metacode Transformation
 - TRANSFRM=I2PC— TIFF to PCL Transformation
 - TRANSFRM=I2PS— TIFF to PostScript Transformation
 - TRANSFRM=I2PD— TIFF to PDF Transformation
 - TRANSFRM=I2PA— TIFF to PDF/A Transformation
 - TRANSFRM=I2TI— TIFF to TIFF Transformation
 - TRANSFRM=I2HT— TIFF to Web Transformation
- **ooooo**—Specifies one or more of the following transformer options:
 - A— Map AFP outline fonts into corresponding AFP raster fonts.
 - B—Store output records into a buffer equal to the CA Spool buffer size (see the BUFSIZE parameter) to reduce overhead.
 - C—Force the transformation of single chars files.
 - D—Delimit output records by adding a CR LF (carriage return/line feed) after each output record written.
 - E—Translate all output records to EBCDIC; the default is to write all output records in ASCII.
 - F—Force the Position=Relative transformer parameter specification.

- G— Reverse Logical Page Orientation. Change Portrait to Reverse Portrait and Landscape to Reverse Landscape.
- I—If DISK, SAR or JES print driver write transformer output directly to DISK, SAR or JES dataset.
- J— Specifies that AFP-to-PDF DocBreak and e-Books PDF documents must be written as individual output files.
- K—Keep input file after transformation; do not transform held files.
- L—Force the Native=Yes transformer parameter specification.
- O—Replaces all low values in non-AFP (X'5A') records with dots.
- P—Add the 'PJM ENTER LANGUAGE= <PCL | PostScript>' command first in the transformer output file.
- Q—Qualify files by class before queuing them for transformation. If a file is created in a class that is not defined as a class the printer will print, the file will not be transformed at file close time. If that file is updated to be in a class the printer will print or if the file's class is added to the list the printer will print, it will be queued for transformation.
- R—Produce a detailed A2PCREPT/A2PSREPT/A2PDREPT Transformation Report.
Note: When using this option, only one transformation is performed at a time.
- S—specifies that the AFP-to-PDF output must be written to the HFS specified by the A2PDARM FdOutput parameter. This option is set automatically by the CA Spool Web Interface.
- T—Force the transformation of all AFP and text files.
- U—Delimit output records by adding an LF (line feed) after each output record written.
- W—Force the Position=Word transformer parameter specification.
- X—Activate special Danish AFP-to-PDF e-Books transformation support.
- Y— Allows files with transformation warnings to print. Files are not held. The AFP-to-PCL transformer prints an extra page with highest warning message.
- Z— Allows files with transformation errors to print. Files are not held. The AFP-to-PCL transformer prints an extra page with highest error message.
- 1—Delay queuing files for transformation until they are selected for print. Usually, files are transformed as soon as they are closed permanently at creation time. Option 1 can be used to ensure files are sent to their destination in the same sequence in which they were created. All file priorities must be equal on printers using the 1 option. If the WS parameter is used to exclude priority from the process of selecting work for the printer, FCB must be included as part of the WS parameter, for example, WS=FCB/AGE.

- 2—The MAXCPU value coded on the X2YY statement is compared to the number of pages in the file and the bigger number is used as the MAXCPU value for the transformation.

Note: This option does not apply to Page mode files.

- 9— Suppress initial x'8B' Skip to channel 1 for PRMODE=PAGE files. These initial x'8B' can have been added by CA View if the CA View Feature 9 is not turned on.

There is no default value.

For more information, see the *AFP Transformers Administration Guide*.

USEFCB

Syntax

USEFCB=FILE | PRINTER,

Description

This parameter specifies if the FCB used during printing must be taken from the file specification or from the printer definition.

Valid values are:

- FILE—(Default) The FCB of the file is used during printing.
- PRINTER—The current FCB specification on the printer is used during printing instead of the FCB of the file.

USEREXIT

Syntax

USEREXIT=BSESSION | ASESSION | FILE | PAGE | LINE,

Description

This parameter specifies whether or not the VTAM printer user exit ESFU006 must be invoked for this printer.

Valid values are:

- BSESSION—The printer user exit is invoked just before the printer session is established and just after the printer session has been terminated.
- ASESSION—In addition to the BSESSION user exit calls, the printer user exit is invoked just after the printer session is established and just before the printer session is terminated.

- FILE—In addition to the ASESSION user exit calls, then the printer user exit is invoked twice for each file. It is invoked just before the printing begins and just after printing the last page including any separator pages.
- PAGE—In addition to the FILE user exit calls, the printer user exit is invoked at the top of each new page.
- LINE—In addition to the PAGE user exit calls, the printer user exit is invoked just before each line is printed.

For more information, see the parameter USEREXNO.

There is no default value.

USEREXNO

Syntax

USEREXNO=*n*,

Description

This parameter specifies the number of the printer user exit to be used for this printer; the number *n* specified is appended as: ESFU006*n*.

The exception is for *n* = 0 which implies ESFU006 (which is also the default printer user exit), if USEREXNO is not specified.

The lower limit is 0 and the upper limit is 9. The default value is 0, which implies ESFU006.

USERPARAM

Syntax

USERPARAM=cccccccccccccc,

Description

This parameter can pass 1 to 16 characters of information to the printer user exit. There is no default value.

The USERPARAM parameter is used for supplying information for various operations. If all of the following are true:

- XEQOPT=1 is set
- OUTLIM=value exceeded
- The USERPARAM contains one or more slashes

CA Spool knows that USERPARM is used for the DEST, CLASS, FCB, and FORM parameters for a file that is over the OUTLIM limit.

To use the default values of DEST=LOCAL, FORM=STD, FCB=6, and CLASS=Z, nothing must be specified in the USERPARM field. If you want to use values different from the default, then you must specify them, using the slashes as delimiters. To retain the original value of any of the fields, specify an '*' for that field.

For example,

```
USERPARM=U123///5.
```

If any of the three conditions are not true, then CA Spool knows the information is available to the printer user exit when the file prints.

The printer user exit is ESFU009 for IP printers and ESFU006 for VTAM printers.

For TCP/IP-connected printers, use the "USERPARM=Lpor:88888-99999" syntax to explicitly specify the local source port to bind from.

Alternatively, use the "DRIVPRMx='LPORT=(8888-9999)'" parameter to specify local source port ranges to bind from.

USM

Syntax

```
USM=YES | NO,
```

Description

This parameter is applicable to Stan-Saab printers only and specifies whether the unsolicited message feature is available.

If YES is specified, the USM character X'2F' is included in every transmission block, thereby preventing local copy during the print processing. The default value is NO.

VFC

Syntax

VFC | VFC0 | VFC1 | VFC2 | VFC3 | VFC4 | VFC5 | VFC6 | VFC7 | NOVFC

Description

Specifies the vertical forms or form feed control to be used on this printer; if VFC or VFC0 is specified, form feed uses a single form feed character. Only VFC1, VFC5, VFC7 and NOVFC are supported for TCP/IP printers. VFC5 and VFC7 are not supported for VTAM printers.

Valid values are:

VFC1-Form feed is performed using the following control sequence for VTAM printers:

- X'0D' (Carriage Return)
- X'0C' (Form Feed)
- X'40' (Space)
- X'0D' (Carriage Return)

Note: On most non-SCS VTAM printers, VFC1 is the best choice.

VFC1-Form feed is performed using the following control sequence for TCP/IP printers:

- X'0D' (Carriage Return)
- X'0C' (Form Feed)
- X'20' (Space)
- X'0D' (Carriage Return)

VFC2-Form feed is performed using the following control sequence:

- X'15' (New Line)
- X'0C' (Form Feed)
- X'40' (Space)
- X'15' (New Line)

VFC3-Form feed is performed using the following control sequence:

- X'15' (New Line)
- X'0C' (Form Feed)
- X'40' (Space)
- X'0D' (Carriage Return)

VFC4-Form feed is performed using the following control sequence:

- X'0C' (Form Feed)
- X'0D' (Carriage Return)

VFC5-Form feed is performed using the following control sequence:

- X'0D' (Carriage Return)
- X'0C' (Form Feed)
- X'0D' (Carriage Return)

Note: VFC5 is only supported on TCP/IP printers.

VFC6-An additional line feed is added to each page of an email attachment that is assigned a '.txt' file extension.

Note: VFC6 is supported only on Nodes using the SMTP driver. If the Linecnt assigned to the file is 0, an attachment that is assigned a file extension of .txt will be formatted the same way the file exists in CA Spool with the exception of an extra line feed at the end of each page.

VFC7-Form feed is performed using the following control sequence:

- X'0D' (Carriage Return)
- X'0A' (Line Feed)
- X'0C' (Form Feed)

Note: VFC7 is supported only on TCP/IP printers. Line feed sequence X'0A' is used when VFC7 parameter is defined instead of default line feed sequence X'0D0A'.

NOVFC-No form feed control is used and the vertical forms control is simulated by line spacing when used for VTAM printers. This is the default for VTAM printers.

For TCP/IP printers using the LPR or DSO drivers, if Linecnt assigned to the file is 0 and ENDDFF=NO is specified, multiple CR+NL's will be added to align printing at the page boundary specified by the FCB length.

For Nodes using the SMTP driver, if the Linecnt assigned to the file is 0, an attachment that is assigned a file extension of '.txt' will be formatted the same way the file exists in CA Spool.

Note: These parameters must not be specified for SCS printers. For SCS VTAM printers, a form feed (X'0C') followed by a carriage return (X'0D') is used. The default value is NOVFC (for non-SCS VTAM printers only).

VPS

Syntax

VPS=cccccccc,

Description

This parameter specifies the virtual printer name (VTAM application name). There is no default value; this indicates that no virtual printer support is available for this node.

VPSCAPPL

Syntax

VPSCAPPL=cccccccc,

Description

This parameter specifies which application the virtual printer interface is to use as a controlling application. The virtual printer tries to maintain a session with the controlling application.

Note: If the REQUEST SESSION is unsuccessful or the session terminates, the virtual printer interface retries every 10 seconds, but only the first session error is reported in the ESFLOG. There is no default value.

VPSError

Syntax

VPSError=ERROR | BLANK | IGNORE | NULL | PASS

Description

This parameter specifies how to react, if the virtual printer receives invalid 3270 data.

Valid values are:

- ERROR—(Default) Return sense code 1003 to the application using the virtual printer.
- BLANK—Replace the invalid character with a blank.
- IGNORE—Suppress the invalid character.
- NULL—Replace the invalid character with X'00' value.
- PASS—Store the invalid character as they are received.

VPSFILE

Syntax

VPSFILE=CHAIN | BRACKET | *nnnnnn*,

Description

This parameter specifies when CA Spool must open/start a new spool file.

Valid values are:

- CHAIN—One CA Spool file is open from begin-chain to the last RU on the chain.
- BRACKET—One CA Spool file is open from begin-bracket (BB) to end-bracket (EB).
- *nnnnnn*—The maximum number of seconds a CA Spool file can be open without receiving any records. If that period of time is exceeded without receipt of a record, the file is closed.

There is no default value; this indicates that there is one file per session.

VPSFNFF

Syntax

VPSFNFF=YES | NO,

Description

This parameter specifies how the virtual printer is expected to react if a form feed is received last in an incoming print file. This parameter applies to LU1 and LU3 virtual printers.

Valid values are:

- YES—A skip to channel 1 record is written to the resulting spool file.
- NO—(Default) The final form feed is ignored.

VPSMPP

Syntax

VPSMPP=NEW | OLD,

Description

This parameter specifies how the virtual printer is expected to react if a new line (NL) is executed at MPP plus 1.

Valid values are:

- NEW—(Default) No automatic NL is executed, so the next print position is at the first print position of the current line plus 1.
- OLD—An automatic NL is executed, so the next print position is at the first print position of the current line plus 2.

VPSOPT

Syntax

VPSOPT=*nn*,

Description

This parameter specifies special virtual printer processing options.

Valid values are:

- 1—Store both the received graphic escape character and the graphic character in the print record.
- 2—Suppress page eject for formatted LU3 print requests.
- 3—Ignore Change Direction in End-Bracket RU, so files from BOSVTAM are closed if VPSFILE=BRACKET.
- 4—Let SVF set current line to top margin.
- 5—Eliminate initial double form-feed for some LU1 applications.
- 6—Allow same printer node name and VPS name for TCP/IP-attached and FSS-attached printers.
- 7—The 3270 EOM command (X'19') is treated as an NL (new line) command for LU1 devices.
- 8—The 3270 Bell command (X'2F') is retained in the data stream.
- 10—Preserve 3270 LU3 EOM (X'19') in a CA Spool file.
- 11—Restrict processing to CR, LF, FF and EOM when processing an unformatted LU3 datastream. The VPSERROR parameter determines what will happen to other formatting commands.
- 12—If the target address of a Repeat-to-Address command is prior to the current address, the buffer is cleared from the current address to the end, and from the start to the target address is also cleared. This is correct 3270 behavior. VPSOPT=12 will support that RA only clears to the end of the buffer.
- 13—Skip final CR+LF if TCPDRIV=LPR/DSO with ENDDFF=NO.
- 14—The 3270 command ProgramTab (X'05') is used for tabulation.

- 16—For LU3 only write the amount in the buffer that has been used to avoid extra blank lines.
- 17—For LU3 ignore SF intensity flags if a Start Field command indicates that a field must be dark or highlighted.
- 18—For LU3, bypass resetting VPSPMPP to standard 3270 line length such as 40, 64, 80 or 132 but keep and use the VPSPMPP value from the DEFNODE/NODE definition.
- 19—Write first file record with ASA carriage control '+' instead of '1'.
- 20—Force FF and x'0D25' to be written.
- 21—Add support for lrecl = (BUFSIZE - 53) bytes.
- 22—Add trace for each LU1/LU3 write.
- 23—Write all blank lines coming from LU1 and LU3 virtual printers into the CA Spool file. Do not use carriage controls to skip the addition of blank lines; instead, write each blank line. For LU3 virtual printers, do not skip blank lines at the end of a file.
- 24—Do not skip the horizontal tab stop when the string ends immediately before it. Also, do not skip the horizontal tab stop in column 1.

VPSPMPP

Syntax

VPSPMPP=*nnn*,

Description

This parameter specifies default physical maximum print position for the virtual printer. It can be overwritten with a SHF SCS command in the incoming data. The lower limit is 1 and the upper limit is 252. The default value is 132.

VPSTRACE

Syntax

VPSTRACE=*cccccccc* | *ALL

Description

This parameter specifies that a session is to be traced.

Valid values are:

- `ccccccc`—The name of the session to be traced.
- `*ALL`—All sessions are traced.

Note: The trace facility can also be controlled by the TV command. A CA Spool file is automatically created to contain the output from the trace. The *filename* of this file is VPSTRACE and the file is queued to the physical printer.

There is no default value.

WS

Syntax

WS= CLASS / FORM / FCB / PRIO / AGE / GROUP,

Description

This parameter specifies the work selection criteria for this printer. This work selection includes which file attributes are to be considered, and the order in which they must be considered when searching for files to be printed next.

Valid values are:

- `CLASS`—The class position each candidate file occupies in the current printer output CLASS output list is considered.
- `FORM`—Consideration is given to whether candidate files match the current printer FORM.
- `FCB`—Consideration is given to see if the candidate files match the current printer FCB.
- `PRIO`—The priority of the candidate file is taken into consideration.
- `AGE`—The age of the candidate files is taken into consideration, and it must be specified as the last WS parameter.
- `GROUP`—All files belonging to the same output group for a given printer are printed together.

Note: One or more selection criteria can be specified, separated by slashes (/); the order of the selection criteria specifies the priority.

The default value is CLASS/FORM/FCB/PRIO/AGE.

XFERNODE

Syntax

XFERNODE= BOTH | NODE | ALIAS | OFF

Description

When XFERDEST=YES/FORCE/DEST/WRITER is specified, this parameter allows Node names and Alias names to be excluded from XFERDEST requests.

Valid values are:

- NODE – issue XFERDEST request using only the Node name.
- ALIAS – issue XFERDEST request using only the Alias name.
- OFF – skip XFERDEST request completely for this printer.
- BOTH – issue XFERDEST request for both the Node name and the Alias name.

The default value is BOTH.

X2YY

Syntax

X2YY=cccccccc,

Description

This parameter specifies that the transformation must be performed by the Transformer functional subsystem FSS with the name cccccccc.

Note: This X2YY must have been defined with the X2YYDEF statement.

There is no default value.

NUMCMBS

Syntax

NUMCMBS=nnnn

Description

This parameter specifies the number of cross-memory command buffers to allocate.

These command buffers are used to queue commands entered from MVS system consoles to the CA Spool system. The value of NUMCMBS must be considered carefully because these buffers are allocated in the common storage area.

The lower limit is 5 and the upper limit is 50. The default value is 5.

NUMFQES

Syntax

NUMFQES=*nnnn*

Description

This parameter specifies the number of file queue elements (FQEs) to be allocated in the CA Spool file queue; also see the topic MAXFSEQ.

The lower limit is 100 and the upper limit is 999,999. The default value is 500.

Note: A change to this parameter requires a CA Spool COLD start.

OUTLIM

Syntax

OUTLIM=*nnnn*

Description

This parameter specifies the output limit to be used by default. If an output file exceeds its output limit, it is abended with User abend 722, depending on the ESFUSO exit routine.

The lower limit is 1,000 and the upper limit is 16,777,215. The default value is 5,000.

Note: An OUTLIM of 2,147,438,647 can be put into effect by specifying OUTLIM=16777215 and XEQOPT=23.

PASSWORD

Syntax

PASSWORD=cccccccc

Description

This parameter specifies the optional VTAM application password, which can be defined in the APPL definition in VTAM. There is no default value.

PGNLEN

Syntax

PGNLEN=*nnn*

Description

This parameter specifies the length of the programmer's name field in current environment.

The lower limit is 16 and the upper limit is 255. The default value is 16.

PPURGE

Syntax

PPURGE= YES | NO

Description

If a file is explicitly purged, this parameter specifies whether a file's spool blocks on the spool data sets must be physically overwritten with binary ones.

Note: If PPURGE=YES and a file is explicitly purged, either by a purge file command, or because it has been printed on a printer defined with PURGE=YES, or the file's retain time is -1, the file is overwritten. The default value is NO.

PRIOxx

Syntax

`PRIOxx=nnnn`

Description

This statement defines the association between the output scheduling priorities and the quantity records of output, where:

- **xx**—Is the priority index value which can range from 0 to 15
- **nnnn**—Defines a number of output lines to be associated with the priority index

When an output file is permanently closed, the priority routine scans the priority table from PRIO15 to PRIO0, and assigns the priority of the file. Note that this priority is determined as the priority index number of the PRIO statement defining the next higher number of output records.

The lower limit is 0 and the upper limit is 16,777,215. Defaults are as follows:

PRIO0 = 16777215	PRIO6 = 16777215	PRIO12 = 16777215
PRIO1 = 16777215	PRIO7 = 16777215	PRIO13 = 15000
PRIO2 = 16777215	PRIO8 = 16777215	PRIO14 = 5000
PRIO3 = 16777215	PRIO9 = 16777215	PRIO15 = 2000
PRIO4 = 16777215	PRIO10 = 16777215	
PRIO5 = 16777215	PRIO11 = 16777215	

PRTOPT

Syntax

`PRTOPT=nn`

Description

This parameter specifies special line printer options; these options change the way CA Spool performs printing. Valid values are:

- **1**—Assume channel 1 is always placed in line 1, even if the FCB specifies something else.
- **2**—Do not hold the file after an error in the GDDM session.

- 3—Suppress all form feeds, except ASA skip to channel 1, if INITFF=NO specified on the printer. Only skip to channel 1 is supported, all other channel skips can cause unpredictable results.

This parameter is obsolete. INITFF= and ENDDFF= must be used on the DEFNODE statement to control the beginning and ending form feeds for a report.
- 4—Change LU1 compression to use 6 tab settings at 20, 40, 60, 80, 100 and 120.
- 5—Do not send SHF and SVF SCS commands, unless the current FCB contains an ESF FCB extension.
- 6—When a file has been printed, change its destination to reflect the printer used if printer defined with REST=NO.
- 7—If the programmer's name field byte 2 contains Y, the file is always printed on the printer specified as the file destination, even if there are unrestricted printers in the network group.
- 8—Treat \$\$ in the first or the last part of the form number as wildcard characters.
- 9—Send an FMH-1 select destination for each spool file printed on a 3770 defined printer.
- 10—Change ESFSEPA0 and ESFSEPA2 to produce a full ending banner page.
- 11—Suppress all data in the input records that exceeds the current MPP value. The used MPP can be specified through the special ESF FCB extension.
- 12—Change the LU1 compression to use tab settings every five columns: 5, 10, 15, 20, 125, 130.
- 13—Send the SCS setup commands to SCS printers before each file is printed, instead of just when the FCB setup is changed.
- 14—In case of intervention required write message ESF423 PRINTER xxxxxxxx IS RESTARTED AFTER INT REQ, PLEASE CHECK THE OUTPUT AND REMOVE DUPLICATE PAGES on printer.
- 16—Change placement of text in the Advanced Laser Printer Interface, if the previous line or field length (excluding trailing blanks) is 17, 18 or 19 characters in length.
- 17—Activate limited SETUP=FORM support for TCP/IP-attached printers. Only SETUP=FORM is supported. PRTOPT=8 and NOSETUP are not supported. No ESF422 setup message is sent to the printer or to the display stations in the same group.
- 19—Causes print time file selection to be based upon priorities greater than 15, if the printer node has a WS=PRIO specification.
- 20—Bypass verification of SCS support in the logmode of LU1 printers. Support of all SCS commands will be assumed.
- 24—If file FCB not found use printer's default FCB.

PURGELIM

Syntax

PURGELIM=*nnnn*

Description

This parameter specifies the number of hours that files, which have not been printed, must be retained.

This statement ensures that files, which are not printed, do not remain in the system indefinitely.

Note: The retention time specified in the FILELIM or RETAIN statement is added to the PURGELIM statement. If a value of 0 is specified, files, which are not printed, are not purged.

The lower limit is 0 and the upper limit is 8,760. The default value is 0.

PURGINT

Syntax

PURGINT=*nnn*

Description

This parameter specifies the interval, in seconds, between each scan of the file queue in order to find files to be purged.

Files can be:

- Printed files, subject to the current setting of the FILELIM and RETAIN statement.
- Non-printed files, subject to the PURGELIM statement.

The lower limit is 0 and the upper limit is 86,400. The default value is 180.

RCVBUFS

Syntax

RCVBUFS=*nnnn*

Description

This parameter specifies the number of VTAM receive-any buffers to be allocated and maintained by CA Spool.

The lower limit is 0 and the upper limit is 65,535. The default value is the number of network nodes defined.

ROUTCDE

Syntax

ROUTCDE=(*C1,C2, ,Cx*)

Description

This parameter specifies the routing codes to be assigned to unsolicited CA Spool messages, which are broadcast using the MVS MCS facility.

The routing code values C1 to Cx must be in the range of 1 to 16, separated by commas and optionally enclosed in parentheses.

The default value is (2,11).

SAFAT

Syntax

```
SAFAT groupname,  
      DATASET=dsname,  
      ACCESS= NONE | READ | UPDT
```

Description

This parameter defines resource access tables to be used by the internal SAF interface. Some examples can be found in the "Customization" chapter, in the Implementing Security with SAF section.

SAFAT Parameters

This section describes the SAFAT parameters.

Groupname

This parameter is used to group a number of SAFAT statements. Note that all SAFAT statements with the same group name are considered to be one access table; the access tables are referred to in the SAFUID statements. There is no default value.

DATASET=*dsname*

The DATASET statement names the resource; the format must follow standard MVS data set naming conventions.

The data set name does not refer to a real data set. It is a symbolic name, which gives access to resources in CA Spool. The names, which are checked, can be found in the "Customization" chapter, in the Implementing Security with SAF section.

Note: When a check is made for a data set name and more than one definition matches, the least generic definition is used.

The following generic symbols can be used when naming the data sets:

&

User ID of the user trying to access a resource is inserted instead of the &.

%

Any character matches a %.

The rest of the qualifier matches.

The rest of the resource name matches.

There is no default value.

ACCESS= NONE | READ | UPDT

This parameter defines the level of access given by the SAFAT statement. There is no default value.

SAFDEF

Syntax

```
SAFDEF INT | NOINT  
        EXT | NOEXT  
        CLASS=class  
        PWPHRASE= YES | NO
```

Description

This parameter defines whether security logons must be performed against the ESF internal security system; it also defines the resource class to use for an external security system.

For more information, see the Security and CA Spool section in the chapter Customization.

SAFDEF Parameters

This section describes the SAFDEF parameters and their defaults, if any.

INT | NOINT

This parameter specifies whether logons must be made against the ESF internal security system. The default value is NOINT.

EXT | NOEXT

This parameter specifies whether logons must be made against the external security system. The default value is EXT.

CLASS=*class*

This parameter names the resource class to be used in the external security system. The default value is CLASS=DATASET.

PWPHRASE= YES | NO

CA Spool allows password phrase signon through an external security system when PWPHRASE=YES.

Valid external security systems are CA ACF2, CA Top Secret, and RACF.

Note: Password phrase signons are *not* valid for internal security.

The default is NO.

SAFTYPE

Syntax

```
SAFTYPE id,  
'name',  
    INT | NOINT,  
    EXT | NOEXT,  
    LOG=ASIS | NOSTAT
```

Description

A number of different types of resource names are checked whenever users attempt access to ESF resources. Each has a corresponding SAFTYPE to define processing.

SAFTYPE Parameters

This section describes the SAFTYPE parameters and their defaults, if any.

Id

This parameter specifies the number that identifies this SAFTYPE. Valid values are:

- 1—File create, access by network group number,
- 2—File create, access by node name,
- 3—File access, by network group number,
- 4—File access, by node name,
- 5—File route access, by network group number,
- 6—File route access, by node name,
- 7—Node access, by network group number,
- 8—Node access, by node name,
- 9—command use,
- 10—AUTH=2,
- 11—AUTH=3,
- 12—Access all groups (GROUP=0),
- 13—Allow operator commands,
- 14—Access to all groups,
- 15—User, display by network group number
- 16—User, display by node name

There is no default value.

'name'

This parameter specifies the resource name skeleton. There is no default value.

INT | NOINT

This parameter specifies whether internal ESF security checking is to be performed for this SAFTYPE. The default value is NOINT.

EXT | NOEXT

This parameter specifies whether external security checking is to be performed for this SAFTYPE. The default value is EXT.

LOG=ASIS | NOSTAT

This parameter specifies whether access violations must be logged. ASIS means yes, NOSTAT means no. The default value is ASIS.

SAFUID

Syntax

```
SAFUID userid,
      LABEL=(access-table,access-table-2,...),
      DGROUP=default-group,
      DPRINTER=default-prt,
      PASSWORD=password
```

Description

This parameter defines users to the internal SAF interface. For more information and some examples of how to use this statement, see the Security section in the chapter Customization.

SAFUID Parameters

This section describes the SAFUID parameters and their defaults, if any.

Userid

This parameter identifies one or more users. Note that it is possible to define a number of users in one statement by using a generic definition. Generic definition symbols are as follows:

- %—Any character matches.
- *—The rest of the user ID matches.

There is no default value.

LABEL=access-table

This parameter names one or more access tables which are to be used for user IDs covered by the current SAFUID statement. Access tables are defined using SAFAT. There is no default value.

DGROUP=default-group

This parameter assigns a default group to users defined by the current SAFUID statement. There is no default value.

DPRINTER=default-prt

This parameter assigns a default printer to users defined by the current SAFUID statement. There is no default value.

PASSWORD=password

This parameter defines a password to users defined by the current SAFUID statement.

If both EXT and INT are specified in the SAFDEF statement, do not specify a password here.

There is no default value.

SAR

Syntax

```
SAR NAME=sarbase,  
    START=YES | NO,  
    MAXFILES=n,  
    ADD$WTR=YES | NO
```

SAR Parameters

This section describes the SAR parameters and their defaults, if any.

NAME=sarbase

This parameter defines the name of the SAR database that is to be used by the SAR interface. There is no default value.

START=YES | NO

This parameter specifies whether the SAR interface is to be started automatically when ESF is started. There is no default value.

MAXFILES=n

This parameter specifies the number of files that can be transferred concurrently by the SAR interface. There is no default value.

ADD\$WTR=YES | NO

This parameter indicates if a remote destination is to be used for the CA Spool file. Valid values are:

- YES—If a remote destination exists on the CA Spool file, it is used as the report ID unless the remote destination begins with a \$. If so, the CA View report ID consists of the original CA Spool filename with the value after the \$ appended to it, up to a total of 12 characters.
- NO—The original CA Spool filename is used as the CA View report ID.

There is no default value.

SDI

Syntax

SDI=YES | NO

Description

This parameter specifies whether Service Desk interface must be started during initialization. The default value is NO.

SECUCALL

Syntax

SECUCALL=USERID

Description

This parameter specifies that the security exit must be invoked on the basis of the caller's user ID. The only valid value is USERID, which specifies that the security exit must be invoked on the basis of the caller's user ID, as picked up by the ESFUSS interface user exit. This provides full security.

SECUEXT

Syntax

SECUEXT=SAF

Description

Specifies that the security checks against the internal or external security system are done as data set access checks through the System Authorization Facility, and as checks against the internal SAF definitions.

SECUOPT

Syntax

SECUOPT=*nn*

Description

This parameter specifies special security options; these options change the way CA Spool performs security checking.

- In general, we recommend that you *not* use SECUOPT.
- The SECUEXT=SAF facility has been developed to support most of the functions that were provided by SECUOPT.
- The following options are available:
 - 1—Provides support for generic user IDs. The last four bytes of the user ID being checked are changed to spaces, and the request is checked again using the resulting value as user ID.
 - 6—Allows all externally SAF defined users to access all CA Spool groups; they are considered to have AUTH=1, and their default group is 1.
 - 8—Lets all users create files in all groups.
 - 9—Lets all users perform open output initial and open output modify to any file destination.
 - 10—Let ESFSECU4 use MSGSUPP=YES (suppress WTOs) on RACROUTE VERIFY and AUTH calls, where no password checking is being done. Using MSGSUPP=YES will not affect the logging of security violations to SMF.

- 11—Enable access to the Virtual Printer Menu for non-authorized users. A usermod to update ESFHPARM to set OPT3 bit OPT3FEV is also required.
- 12—Provide user ability to handle all reports that are queued for printers that the user has security authorization to handle. This is called User Related View.
- 13—For printers defined with NJEDEST=NJE node use file's remote destination if valid as default file group.

There is no default value.

SID

Syntax

SID=cccc

Description

This parameter specifies a four-character alphanumeric system ID to be used in place of the one provided by SMF.

This statement can be required to WARM start CA Spool on a system with a differently SMF-defined system ID, or to WARM start on the same system following an IPL with different SMF specifications. For a CA Spool WARM start, this specification must match that last used in starting CA Spool.

The default value is SMF-provided system ID.

SMF

Syntax

SMF=YES | NO | SUBTYPES

Description

This parameter specifies whether CA SPOOL will create user SMF records within the range of 128 to 255 with 200 being the default. The default value is NO. If you specify SMF=YES | SUBTYPES, you will get user SMF records, either type 200 by default, or the type specified by SMFTYPE=, within the range of 128 to 255. Specifying SUBTYPES will cause CA SPOOL to create SMF records that have standard IBM subtype headers. Specifying SUBTYPES also implies YES.

SMFACNT

Syntax

SMFACNT OFFSET=Offset,LENGTH=Length

Description

This parameter determines what part of the JOB Account Number to use as the CA Spool file account number.

Offset

Specifies the offset of the desired Account Number data in the Account Number field that is passed to CA Spool.

The maximum offset is 60.

Length

Specifies the length of the desired Account Number data.

The maximum length is 8 characters.

The default value is:

SMFACNT OFFSET=0,LENGTH=8

Note: If the offset, or the offset plus the length, exceeds the length of the Account Number field that is passed to CA Spool, no Account Number information is stored.

SMFBUFFS

Syntax

SMFBUFFS=*nnnn*

Description

This parameter specifies the number of internal SMF recording buffers to allocate.

The lower limit is 1 and the upper limit is 32,767. The default value is 25.

SMFDSPCH

Syntax

SMFDSPCH = 6 | 144

Description

This parameter specifies that SMF Type 144 records are cut when a file created by CA Dispatch has been printed on a VTAM-attached or TCP/IP-attached printer. Specify 6 when CA Dispatch Release 11 or higher is in use. Specify 144 when previous releases of CA Dispatch are in use.

Note: This statement controls whether these records are cut; the SMF=YES/NO statement has no effect on whether these records are cut. SMFTYPE=6 will cause SMFDSPCH=6 to be ignored. SMFDSPCH=6 and SMFDSPCH=144 can both be specified at the same time.

SMFTYPE

Syntax

SMFTYPE=*nnn* | 6 | SP6

Description

This parameter tells CA Spool what SMF records to create and what record type should be used for CA SPOOL user SMF records. This parameter can be specified twice. Once to tell CA SPOOL to create SMF TYPE 6 records similar to what JES2 creates and the other to specify the record type for CA SPOOL to use for its user SMF records.

Valid values are:

- 6—SMF Type 6; JES2-like Output Writer records must be produced when a file has been printed on a VTAM or TCP/IP printer.

Note: This statement controls whether these records are cut; the SMF=YES/NO statement has no effect on whether these records are cut. SMFTYPE=SP6 overrides this value if both are specified.

- SP6—SMF Type 6; CA Spool Type 6 records must be produced when a file has been printed on a VTAM or TCP/IP printer. These records are similar to the records created when SMFTYPE=6 is specified. The value of the Subsystem Generating Id, SMF6SBS, is set to 'SP'. The rest of the record uses standard IBM SMF Type 6 Output Writer sections, including the JES2 Common Extension and the Second Extension - APA Section. The APA Section contains only the Formdef and Pagedef assigned to the file. The APA Section can be used to distinguish files that could have been transformed using CA Spool's Transformer interface options from other files and to do chargeback based on the names of the Formdef and Pagedef. The JES2 Common Extension contains the PROC name, STEP name, DDNAME, PRMODE and SECLABEL file attributes.

Note: This statement controls whether these records are cut; the SMF=YES/NO statement has no effect on whether these records are cut. SMFTYPE=SP6 overrides SMFTYPE=6 if both are specified.

- *nnn*—The OS SMF record number for SMF recording of CA Spool events. The lower limit is 128 and the upper limit is 255. The default value is 200.

Note: SMF=YES or SMF=SUBTYPES must also be specified.

SNABSIZE

Syntax

SNABSIZE=*nnnn*

Description

This parameter specifies the size of the data area of each VTAM transmission buffer in bytes.

The lower limit is 256 and the upper limit is 32,767. The default value is 1,024.

SNET

Syntax

SNET=YES | NO

Description

This parameter specifies whether VTAM network interface must be started during initialization. The default value is NO.

SPOOLCMP

Syntax

SPOOLCMP=NO | YES | MBLOCKS

Description

This parameter specifies whether spool data compression must be used as default, if it is not specified in the ESFOPEN statement list. Valid values are:

- NO—(Default) No spool data compression is performed unless it is requested in the ESFOPEN statement list.
- YES—All spool files, with a record length less than 251 bytes are compressed in the spool data sets. If compression is activated, expect a reduction in DASD space usage and I/O activity, and an increase in CPU time.
- MBLOCKS—The first spool block of each spool file is not compressed, unless specified in the ESFOPEN statement list. All additional spool blocks are compressed, so that only spool files exceeding approximately 100 records are compressed.

SPOOLDS

Syntax

```
SPOOLDS NUM=nnn,  
        NAME=cccccccc [, ]  
        [VOL=cccccc]
```

Description

This parameter specifies the data set number and name, and optionally the volume serial, of a CA Spool data set.

If VOL is not specified, the data set name is located through the system catalog. A maximum of 255 SPOOLDS statements, numbered using the NUM parameter from 1 to 255 and increased by 1 per SPOOLDS, can be specified.

SPOOLDS Parameters

This section describes the SPOOLDS parameters and their defaults, if any.

NUM=*nnn*,

This parameter specifies the SPOOLDS data set number as a value from 1 to 255, which must be unique. The default value is 1.

DSNAME=cccccccc,

This parameter specifies the 1-to 44-character name to be used as the data set name. The default value is SYS1.ESFPOOL.

VOL=cccccc,

This optional parameter specifies the volume serial number of the CA Spool data set. If not specified, the SPOOLDS data set name is located using the system catalog. If not found in the catalog, the system defaults to VOL=SPOOL0. The default value is SPOOL0.

SPOOLENC

Syntax

SPOOLENC=NO | YES | *nnn*

Description

This parameter specifies whether spool data should be encrypted or not. Valid values are:

- NO—(Default) No spool data compression encryption is performed.
- YES—All spool files are encrypted with encryption key interval 365 days.
- *nnn*—All spool files are encrypted with specified encryption key interval 1 – 365 days.

SUBID

Syntax

SUBID=cccc

Description

This parameter specifies the 1-to 4-character subsystem name identifying this subsystem to the environment.

If the SUBID parameter is changed, this must also be reflected in the JES2 or JES3 initialization statements, if specified there. The default value is ESF.

SUBS

Syntax

SUBS=YES | NO | SUBID | CLASS | DEST | DESTFRST | DESTCLAS | ALL | APD

Description

This parameter specifies whether subsystem support is enabled or disabled during CA Spool initialization, and which criteria are used to intercept SYSOUT allocation.

This statement can be specified as many times as required. Valid values are:

- YES—(Default) Honor explicit SUBSYS allocations and allow reading and writing of spool files.
- NO—Disable all reading and writing of spool files.
- SUBID—Intercept SYSOUT requests with destination equal to the CA Spool SUBID.
- CLASS—Intercept SYSOUT requests with a class equal to one of the classes in the SUBSCLAS statement.
- DEST—Intercept SYSOUT requests with destination equal to a CA Spool defined printer.
- DESTFRST—Changes the way SUB=DEST and SUBS=DESTCLAS works.

With the addition of SUBS=DESTFRST the primary DEST, if specified, is used to determine if CA Spool intercepts the SYSOUT allocation. If DEST is not specified, writer name is used.

SUBS=DESTFRST does not turn on any SYSOUT allocation interfaces. It must be used in addition to SUBS=DEST or SUBS=DESTCLAS.

- DESTCLAS—Intercept SYSOUT requests with destinations equal to a CA Spool defined printer and with a class equal to one of the classes in the SUBSCLAS statement.
- ALL—SUBID, CLASS and DEST are all in effect.
- APD—Invoke Automatic Printer Definition support. Only printer destinations that are not known to CA Spool or JESx are added. To use this support, specify: SUBS=APD and SUBS=DEST/DESTCLAS/ALL and DESTVAL=DYNAMIC or DESTVAL=DYNAPDIP.

SUBSCLAS

Syntax

SUBSCLAS=c1...cn

Description

This parameter specifies the output classes in JES2 or JES3, which are intercepted and redirected to the SUBSYS interface.

Each class specification consists of a single character in the range A to Z, or 0 to 9. Up to eight output classes can be specified.

Note: Output class interception requires SUBS=CLASS or SUBS=DESTCLAS to be specified.

There is no default value.

SVCCODE

Syntax

SVCCODE=nnn

Description

This statement specifies either a user SVC number to be used by CA Spool. The system administrator responsible for the MVS system must decide which SVC number must be used.

The lower limit is 200 and the upper limit is 255. The default value is 255.

Note:

- If both the ESRCODE and SVCCODE statements are specified, the ESRCODE definition is used and the SVCCODE definition is ignored.
- During startup CA Spool verifies if the specified SVC number in the SVC table points to a valid CA Spool SVC routine.
- If the SVC table entry corresponding to the specified SVC number is not in use, CA Spool dynamically loads the SVC routine module, specified using the SVC parameter on the MODULES statement, into the CSA and updates the SVC table entry to point to it.

- If an installation wants to pre-load the CA Spool SVC routine into the PLPA during IPL, the supplied ESFSVC module has to be renamed to the SVC module name matching the specified SVC number and made accessible using LPALSTxx or MLPA. For example, if SVCCODE=241 is specified, then the corresponding CA Spool SVC module name must be IGC0024A.

SYNCTOL

Syntax

SYNCTOL=*nnn*

Description

This parameter specifies, in seconds, the time interval that must elapse before one CA Spool system in a Multi-Access Spool (MAS) configuration is assumed not to be operating.

This statement allows for imprecise synchronization of TOD clocks (caused by human intervention) in a Multi-Access Spool (MAS) environment.

Actions such as COLD start, WARM start, or ESYS operator commands are rejected unless the time stamps of affected systems in the shared checkpoint record are greater than the current time minus this statement.

The lower limit is 0 and the upper limit is 600 (10 minutes). The default value is 300 (5 minutes).

Snn

Syntax

Snn
SID=*cccc*,
NJENAME=*cccccccc*

Description

The *Snn* statement is required to identify each system in a Multi-Access Spool (MAS) configuration.

The initialization data set for each system must contain the *Snn* statements of all systems in the configuration. Systems are numbered consecutively from one to thirty-two (S1-S32).

For example, if there are three systems (A158, B158, C158) in the configuration, the initialization data set for each system would contain the following statements:

```
S1 SID=A158
S2 SID=B158
S3 SID=C158
```

The system identifier is specified by the following parameters:

Snn Parameters

This section describes the system identifier parameters and their defaults, if any.

SID=cccc

This parameter specifies the system identifier; *cccc* is the four-character alphanumeric name that was generated as the system management facility (SMF) system ID for this system.

Default: For a single system configuration, the system identifier for S1 defaults to the generated SMF system ID. For Multi-Access Spool (MAS) configurations, the system ID's must be specified for each system, and no default is permitted.

NJENAME=cccccccc

This optional parameter specifies the NJENAME of the system. If this parameter is used, it must be specified on all the *Snn* definitions, and all members of the configuration must have NJE connection to all the other systems.

Note: This parameter is used in EMAS systems.

TCPLHOST

Syntax

```
TCPLHOST=cccccccc
```

Description

This parameter specifies the 1-16 character Local IP-Address to bind from if the TCP/IP print driver option Q is specified.

TGWARN

Syntax

TGWARN=*nnn*

Description

This parameter specifies the threshold percentage of spool space that causes the message ESF087 *xxx* % SPOOL UTILIZATION to be issued by CA Spool.

Note: A value of 0 indicates that every use of spool space is reported, and a value of 101 indicates that no message is issued.

The lower limit is 0 and the upper limit is 101. The default value is 80.

TRACE

Syntax

TRACE ENTRIES=*nnnn*

Description

This parameter specifies the size of the internal trace table where *nnnn* is a numeric value specifying the number of 16-byte trace table entries to be allocated.

The lower limit is 512 and the upper limit is 4096. The default value is 512.

USEALIAS

Syntax

USEALIAS=NO | YES | ALL

Description

This parameter specifies whether the alias name of a printer must be used instead of the VTAM name of the printer.

Valid values are:

- NO—(Default) CA Spool uses the node name of the printer.

- YES—CA Spool uses the alias name of the printer in the following situations, if present:
 - When a printer has an NJEDEST parameter specified and a value is assigned to a writer name.
 - If PROPT=6 is specified; therefore, when a file has been printed, its destination has to reflect the printer used.
 - When a file is received from the XFER interface and it was selected by XFERCLAS= or XFERDEST=.
- ALL—In addition to the actions that are taken for USEALIAS=YES, CA Spool also uses the alias name of the printer in the CA Spool subtype 11 and JES type 6 SMF records.
- The same substitution is made in most of the messages that have to do with print sessions and printing.

USERDEF

Syntax

```
USERDEF DEFGROUP=YES|NO
```

Description

USER DEFGROUP determines what a user can display when a related group or node has not been entered.

Options are as follows:

- YES—(Default) The users see printers and files in the default group.
- NO—The users only see permitted printers, and files they have created.

USERZAP

Syntax

```
USERZAP=nnn
```

Description

This statement is used to activate a given optional userzap; the value *nnn* specifies the number of the optional userzap to activate.

You must supply a USERZAP statement for each optional userzap, which is to be activated.

The lower limit is 1 and the upper limit is 128. There is no default value.

WARNTIM

Syntax

WARNTIM=*nnn*

Description

This parameter specifies, in hundredths of a second, the time interval from the first denied request for access to the shared queues of a member of a Multi-Access Spool (MAS) configuration to the time that configuration assumes the member controlling the queues to be down.

When this situation occurs, CA Spool issues the ESF070 message indicating a lockout situation, and resets the timer interval to the WARNTIM value.

The lower limit is 500 (5 seconds) and the upper limit is 15,000 (2 ½ minutes). The default value is 1,000 (10 seconds).

WTO

Syntax

WTO=ALL | SEVERE

Description

This parameter specifies whether all WTO messages must be sent out to the MVS console.

Valid values are:

- ALL—(Default) All WTO messages are sent to the MVS console.
- SEVERE—Only severe WTO messages are sent to the MVS console.

Note: We recommend that you avoid using this statement and instead use the MESSAGE statement. For more information, see the MESSAGE description.

XEQBUFS

Syntax

XEQBUFS=*nnnn*

Description

This parameter specifies the number of spool buffers to be allocated to the CA Spool cross-memory request processor. This processor handles all writing and reading of spool files.

To reduce the I/O activity on the spool data sets and to keep the CA Spool service times at a minimum, an adequately large spool buffer pool must be specified.

We recommend that you allocate two spool buffers per open spool file. The default value of 10 spool buffers is sufficient for 5 active open spool files at the same time.

The lower limit is 4 and the upper limit is 65,535. The default value is 20.

XEQGRPID

Syntax

XEQGRPID=JOBID

Description

This parameter specifies to use the JES Jobid as the default GROUPID if no OUTPUT statement GROUPID is specified.

- JOBID – The file creator's JES Jobid is the default GROUPID

XEQOPT

Syntax

XEQOPT=*nn*

Description

This parameter specifies special XEQ processing options.

Valid values are:

- 1—If the output limit has been exceeded, change the file destination, form, FCB or class as specified through the USERPARM parameter on the printer NODE definition. USERPARM=dest/form/fcb/class can be specified. If USERPARM is not specified, the system defaults to LOCAL and class Z. If an '*' is specified for any of the USERPARM fields then the original value of that field is retained.

Note: The OUTLIM value specified at the printer NODE level must not exceed the value specified on the global OUTLIM parameter for this option to have the desired effect.

- 2—Route \$\$NODEST files to LOCAL in class Z.
- 3—Hold the file if the printer node output limit has been exceeded.
Note: The OUTLIM value specified at the printer NODE level must not exceed the value specified on the global OUTLIM parameter for this option to have the desired effect.
- 4—If a file is opened with a destination equal to the NJENAME, the writer name is used as the destination.
- 5—Truncate trailing bytes containing binary zeroes (X'00') during ESFWRITE calls.
- 6—Disallow use of unqualified DF commands for authorized users.
- 7—Always allocate file sequence numbers in ascending order.
- 8—Automatically purge files, which have been opened for output and closed, but contain no records (that is, empty files).
- 9—Set PRMODE (PAGE) for files with LRECL>252/253, if not already set.
- 10—Force PRMODE (PAGE) for files with LRECL>252/253, even if it is already set.
- 11—Allow CICS tasks to supply the user ID and account number when creating spool files.
- 12—Use enhanced CA Spool VTAM Console Sign-on Prompt Format.
- 13—Force LRECL 252/253 if PRMODE=LINE or PRMODE has not been specified..
- 14—Force PRMODE(PAGE) for files with LRECL>252/253, if they are targeted for an FSS printer.
- 15—Send a "ESF831 END-OF-DISPLAY" message at the end of the response for D,*ACT, D,*ALL and D,G=x display commands.
- 16—For files with LRECL<=253, copy the max LRECL to field FQELRECL.
- 17—Perform REINIT of printer node parameters modifiable on the Menu system: CLASS, FCB, FORM, NJEDEST, SEP and TRANS, if another NODE parameter is also updated.
- 18—Let the PURGELIM= parameter causing ONLY HELD NON-PRINTED files be purged.
- 19—Move FCB name in as PAGEDEF to force A2PC transformation.

- 20—Bypass the DESTID FDEST merge at file Close time. Other DESTID file attributes, such as CLASS or HOLD, continue to be processed.
- 21—Force FQELRECL, the file's LRECL at open time, to be used for formatting instead of FQEMRECL, the length of the longest data record within the file.
- 22—Bypass sort of printer nodes in ascending order.
- 23—Use OUTLIM of 2,147,438,647 when combined with OUTLIM=16777215.
- 24—Perform REINIT of printer node parameters modifiable on the Menu system: CLASS, FCB, FORM, NJEDEST, SEP and TRANS, even if no other NODE parameter is also updated.
- 25—Open and close up to 255 virtual printer ACB's at a time and skip cleanup of virtual printer ACB's if SHUTDOWN,F command is used.
- 26—Issue message 'ESF799 JOBN ooooooooo TRANSFERRED VIA SUBSYS TO ssss DESTINATION dddddddd FILE nnnnnn' if files are created via the SUBSYS interface or the Call interface.
- 27—If the OUTPUT JCL statement NAME parameter is specified copy it to the programmer's name field.
- 28—Allows CICS applications to write files record lengths up to the size of the CA Spool BUFSIZE. Files with LRECL values greater, than the BUFSIZE will have to be assigned a PRMODE value of PAGE using a DESTID statement, or, by using XEQOPT=9 or 10. An ESFOPEN RC=10 will result, if the LRECL exceeds the BUFSIZE and the PRMODE is not set to PAGE.
- 29—Monitor SYSOUT Allocation Intercept response time and issue message ESF538 if CA Spool has not responded to an allocation request within 60 seconds.
- 30—Set the lrecl to the largest possible value that the BUFSIZE parameter will permit when the PRMODE for incoming files is blank or equal to LINE. That value is equal to the BUFSIZE minus the fixed portion of each Spool buffer that is used by CA Spool to store information about its format and contents. This option takes precedence over XEQOPTs 9, 10, 13 and 14.

XFER

Syntax

XFER=YES | NO | ESFTOJES | JESTOESF | XFERCLAS

Description

This parameter specifies whether the Automatic File Transfer interfaces are activated during CA Spool initialization.

Valid values are:

- YES—(Default) Both Automatic File Transfer interfaces are activated during initialization.
- NO—Both Automatic File Transfer interfaces are drained during initialization.
- ESFTOJES—Only the ESF-to-JES file transfer interface is activated during CA Spool initialization.
- JESTOESF—Only the JES-to-ESF file transfer interface is activated during CA Spool initialization.
- XFERCLAS—Only the XFERCLAS part of the JES-to-ESF file transfer interface is activated during CA Spool initialization.

XFERCLAS

Syntax

XFERCLAS=c1...cn

Description

This parameter specifies the output classes in the primary spooling system (JES2 or JES3), which is automatically transferred to CA Spool.

All output in the specified output classes is transferred to CA Spool, even if the output destination is not CA Spool.

Each class specification consists of a single character in the range A to Z or 0 to 9. If XFERSAPI=YES up to thirty-six classes can be specified, else up to eight classes can be specified. The JESTOESF transfer-by-class is inactive if this statement is not specified, but the transfer-by-destination is still active.

There is no default value.

XFERDEST

Syntax

XFERDEST=NO | YES | FORCE | DEST | WRITER

Description

This parameter specifies whether the transfer-by-destination interface must be used.

Valid values are:

- NO—(Default) The Transfer-by-destination interface is disabled.
- YES—During startup, CA Spool determines which printers or printer alias names are also known by JES. Files to these JES-defined printers are automatically transferred to CA Spool.
- FORCE—CA Spool asks for output files to all defined printers and printer alias names without checking to see if they are defined in JES first.
- DEST—CA Spool asks for output files with destination equal to all defined printers and printer alias names without checking to see if they are defined first in JES.
- WRITER—CA Spool asks for output files with a writer name equal to all defined printers and printer alias names without checking to see if they are defined in JES first.

XFERNJE

Syntax

XFERNJE=ccccccc

Description

This parameter specifies the NJE node name of the primary JES2 or JES3 subsystem.

If the ESFTOJES file transfer interface is halted, spool files with valid JES destinations are transferred to specified XFERNJE node. The name must be one to eight characters. There is no default value.

XFEROPT

Syntax

XFEROPT=*nn*

Description

This parameter specifies special XFER processing options.

Valid values are:

- 1—Suppress the first forced skip to channel 1 in the output data set received from JES.
- 2—Split all SYSOUT data sets, except JESDS, into separate spool files.
- 3—Force LRECL=253 for all files transferred from JES.

- 4—Save the JES job number in the programmer's name field.
- 5—Always transfer files to valid JES destinations, even if these destinations are known to CA Spool.
- 6—Perform file selection on both destination and XFERCLAS at the same time.
- 7—Perform file selection on both XFERCLAS and form number STD/STD at the same time.
- 8—Suppress the JES destination validation check.
- 9—Disable OUTLIM processing for PSO interface. (obsolete)
- 10—Use maximum LRECL as LRECL for spool file.
- 11—Do not purge the transferred file from the JES queue after transfer (XFERSAPI only).
- 12—Files with variable-length records received through XFER and with PRMODE=PAGE maintain their size and are not padded with blanks.
- 13—Files with an LRECL greater than 253 retain their original LRECL value even if they do not have PRMODE=PAGE.
- 14—Used in combination with XFERCLAS and XFERDEST=WRITER to select files whose FORM attribute (DD statement) or FORMS attribute (Output statement) matches a CA Spool printer node (XFERSAPI only).
- 15—Files created with Output Statement parameter OUTDISP=HOLD are placed in HELD status when they reach CA Spool using XFERSAPI. XFEROPT=15 causes OUTDISP=HOLD to be ignored and the files to be available for print immediately (XFERSAPI only).
- 16—An ESF765 RC=OL (Output Limit Exceeded) error will cause the JES Job and its associated SYSOUT datasets to be placed into HOLD. The CA Spool file created up to the point of the ESF765 RC=OL error will also be HELD (XFERSAPI Only).
- 17—In a JES3 environment, JES3 writer held files, and non-held files, will be selected for transfer to CA Spool using the JESTOESF interface (XFERSAPI only).
- 18—Used in combination with XFEROPTs 6 and 14 to request sysout in the classes defined on the NODE statement CLASS parameter instead of the XFERCLAS classes. Changes to the list of SAPI input classes for each printer can be made by updating the printer classes in the menu interface. It can also be done by using the RESET PRINTER command (T,nodename,Q=). Previously, the Class list on a printer only determined the class of files that were to be printed on the output side of CA Spool processing. When XFEROPT=18 is specified, any change to the class list will affect both the input side, by changing what the SAPI interface will request, and the output side, by changing what will be selected to send to the printer.

- 19—Let the OUTPUT JCL statement DEST parameter take precedence over the DD JCL statement DEST parameter.
- 20—No conversion of Machine carriage control to ASA carriage control will be done. SYSOUT files with different carriage control can be combined into one CA Spool file if all other file attributes are the same. This option applies only if XFERSAPI=YES is specified.
- 21—Include the output statement parameters of each file when determining whether files should be combined. When XFEROPT=21 is specified with XFERSAPI=YES, a new file's output statement parameter values must match the current file's output statement parameter values or the files will not be combined.
Note: The record length of each file is considered when determining whether files can be combined. If XFEROPT=10 is used with XFEROPT=21, files with like attributes could still be written separately.
- 22—When XFEROPT=11 is specified, files created using the XFERSAPI interface are not purged from the JES queue after transfer. XFEROPT=22 changes the OUTDISP of the transferred sysout data to be HOLD if XFEROPT=11 is also specified.
- 23—When the FORM name passed from JES to the SAPI interface is equal to the DEFFORM in the ESFPARM file, do not use that form name on the open request for the file. This allows either a DESTID or the NODE FORM parameter to provide the default FORM name. If no DESTID or NODE FORM is defined, the DEFFORM value is used.
- 24—When XFERSAPI=YES is specified, an ESF772 message is issued during the initial start of the JESTOESF interface. The message gives the total number of unique SAPI requests that are being made each XFERTIME interval. This number can be used to estimate the additional storage use if XFERSAPI=THREADS and is selected as the transfer method.

There is no default value.

XFERSAPI

Syntax

XFERSAPI=YES | THREADS

Description

This parameter specifies whether requests made by the SAPI (SYSOUT API) interface will be done sequentially or they will be threads based.

Valid values are:

- YES—(Default) SAPI is used to retrieve files from JES.
- Threads-SAPI threads processing will be used to retrieve files from JES.

XFERSEP

Syntax

XFERSEP= 0 | 1 | 2

Description

This parameter specifies the number of separator pages to be printed between each file transferred to the controlling JES2 or JES3 system. The default value is 1.

XFERTHCT

Syntax

XFERTHCT=*nnnnn*

Description

This parameter specifies the maximum number of SAPI threads to allow. If this number is exceeded at initialization or during REINIT, threads processing will be bypassed and XFERSAPI=YES will be used.

The lower limit is 1 and the upper limit is 99,999. The default value is 5000. Please see the XFER Interface chapter of the System Guide for more information on SAPI threads processing.

XFERTIME

Syntax

XFERTIME=*nnn*

Description

This parameter specifies, in seconds, the maximum time interval between inquiries to JES for output data sets.

JES normally activates the JESTOESF interface immediately an output data set is ready. This allows CA Spool to query JES for output data sets.

The lower limit is 10 (10 seconds) and the upper limit is 18,000 (300 minutes). The default value is 60 (1 minute).

X2YY

Syntax

```
X2YY  
START=YES|NO,  
MAXFILES=nn,  
MAXCPU=nnnn
```

X2YY Parameters

This section describes the X2YY parameters and their defaults, if any.

START=YES | NO

Specifies whether to start the Transformer Interface automatically during CA Spool initialization.

Default: NO

MAXFILES=*nn*

Defines the maximum number of files for the *sum* of both of the following processes:

- Files concurrently being transformed by the AFP transformers
- Files concurrently being text-wrapped

Note: Files being transformed by the Java transformers do *not* count.

Default: 10

If MAXFILES greater than 10 is specified, CA Spool does not start and an ESF005 PARAMETER STATEMENT IS INVALID message is issued.

MAXCPU=*nnnn*

Specifies the maximum CPU time limit in seconds per transformation.

Default: 60

X2YYDEF

Syntax

```
X2YYDEF  
  fsname,  
  PROC=xxxxxxx,  
  MAXTASK=nn,  
  DEFAULT=NO | YES | A2PC | A2PS | A2PD | BC0CA
```

Description

This statement specifies the characteristics of a X2YY functional subsystem (FSS). The X2YYDEF statement must be defined before it can be referenced in a NODE definition.

fssname,

Specifies the name of the functional subsystem, the fssname parameter is required. The fssname must be alphanumeric, 1 to 8 characters. There is no default value.

PROC=xxxxxxx

Specifies the procedure used to start the functional subsystem. There is no default value.

MAXTASK=nn

Defines the maximum number of files that can be transformed concurrently by the X2YYDEF. The default value is 5 and the maximum value is 20.

DEFAULT= NO | YES | A2PC | A2PS | A2PD | BCOCA

Specifies whether this X2YYDEF per default must take care of AFP transformations or not. Valid values are:

- NO — (Default) Do not default to this X2YYDEF for AFP transformations.
- YES — Default to this X2YYDEF for all AFP transformations.
- A2PC — Default to this X2YYDEF for all A2PC transformations.
- A2PS — Default to this X2YYDEF for all A2PS transformations.
- A2PD — Default to this X2YYDEF for all A2PD transformations.
- BCOCA - Default to this X2YYDEF for all retries of CA Spool C-based (non-Java) AFP transformations that fail with AFPP-207-W: Barcode objects are not supported.

Initialization Feature and Option Summary Table

The following table summarizes all the initialization features and options:

Note: Changes to any statements marked with an asterisk (*) require a CA Spool COLD or FORMAT start.

Option	Specifies
ACQTIME	In minutes, the interval at which CA Spool tries to start printers with ACQUIRE=TIME / NQTIME specified and files waiting to be printed
APPLID	Application name used by CA Spool to interface to VTAM

Option	Specifies
BACKOUT	Whether dynamic backout is to be supported
* BUFSIZE	Size, in bytes, of each spool buffer
* CHKPTDS	Data set name of the CA Spool checkpoint data set
CID	Generic or full identification name of a communication channel
CKPTIME	In seconds, the interval at which certain checkpoints of CA Spool information are taken for WARM start
CMBBUFS	Number of CA Spool console message buffers to be allocated
COMCHAR	Character that is used to identify CA Spool commands from local system consoles
DEFCLAS	Default output class used for SUBSYS and ESFPRINT requests
DEFFCB	Default FCB to be used for SUBSYS and ESFPRINT requests
DEFORM	Default forms number to be used for SUBSYS and ESFPRINT requests
DEFNODE	Default node definition
DESTID	Default or forced spool file attributes for selected spool files
DESTVAL	Whether validation of file destinations is performed
DYNDISP	Number of display terminals that can be added with the REINIT command in one CA Spool session
DYNNJE	Number of NJE connections that can be added with the REINIT command in one CA Spool session
DYNPRT	Number of printers that can be added with the REINIT command in one CA Spool session
DYNUSER	Number of user definitions that can be added with the REINIT command in one CA Spool session
DYNVPS	Number of virtual printers that can be added with the REINIT command in one CA Spool session
ESRCODE	ESR SVC route code to be used by CA Spool
FILELIM	Number of hours that files must be retained if they are marked as printed
FSSDEF	Characteristics of a functional subsystem (FSS)
GDDMCLA	Output class that is used by the GDDM interface
GDDMAPPL	Application name to be used by GDDM to interface with VTAM
LOADEXIT	Defines the names of user defined standalone exits

Option	Specifies
LOGBUFS	Number of CA Spool system log file buffers to be allocated This statement has no meaning if the NOLOG option is specified.
LOGCLAS	Output class that CA Spool is to use for its system log output files This statement has no meaning if the NOLOG option is specified.
LOGHOLD	Whether the CA Spool system log file data set must be held after unallocation
LOGLCNT	Line count per page to be used on the CA Spool system log file This statement has no meaning if the NOLOG option is specified.
LOGMENU	If responses to 'D' commands issued by the menu system, must be disabled in the CA Spool log file This statement has no meaning if the NOLOG option is specified.
LPDDEST	LPD Interface printer queue
LPDFILE	LPD Interface print request
LPDSERV	LPD Interface
MAXDORM	In hundredths of a second, the maximum time a member of a Multi-Access Spool (MAS) configuration can refrain from attempting to access the shared queues
MAXFCT	Maximum number of file status control table entries CA Spool allows in each cross-memory status request
* MAXFSEQ	Maximum file sequence number which can be assigned to a spool file
MAXGROUP	Maximum network group number which can be assigned using the REINIT command
MAXHOLD	In hundredths of a second, the maximum time a member of a Multi-Access Spool (MAS) configuration must maintain control of the shared queues after accessing them
MESSAGE	Way in which messages are to be processed, allowing the user to specify different processing options for different messages, including the possibility of suppressing messages

Option	Specifies
MINDORM	In hundredths of a second, the minimum time a member of a Multi-Access Spool (MAS) configuration must wait after releasing control of the shared queues before it again attempts to access them
MINHOLD	In hundredths of a second, the minimum time a member of a Multi-Access Spool (MAS) configuration must maintain control of the shared queues after accessing them
MODULES	Subsystem support and user exit module names
NJE	Characteristics of an NJE connection
NJENAME	NJE node name identifying this CA Spool system to the NJE network
NJEOPT	Various special NJE options to be activated
NODE	Characteristics of a VTAM network node
NUMCMBS	Number of CA Spool cross-memory command buffers to be allocated
* NUMFQES	Number of CA Spool file queue elements to be allocated
OUTLIM	Default output limit for CA Spool spool files
PASSWORD	VTAM application password to be used by CA Spool if one is required
* PGNLEN	Length of the programmer's name to be used by this CA Spool subsystem
PPURGE	Physical overwrite of purged spool files
PRIOxx	Output priority to be assigned to a given file according to the number of output records
PRTOPT	Various special line printer options to be activated
PURGELIM	Number of hours that files must be retained if they are not marked as printed
PURGINT	Number of seconds CA Spool must wait between each scan of the file queue when searching for files to be purged according to the FILELIM specification
RCVBUFS	Maximum number of outstanding VTAM receive any requests CA Spool is to maintain
ROUTCDE	MVS console routing codes to be assigned to unsolicited WTO messages
SAFAT	Resource names to be used by the internal SAF interface

Option	Specifies
SAFDEF	Internal or external security system characteristics
SAFTYPE	Resource name types for SAF interface
SAFUID	Users to internal SAF interface
SAR	SAR interface characteristics
SDI	Whether Service Desk interface must be started during initialization.
SECUCALL	Whether security exit must be invoked on the basis of the filename or the caller's user ID
SECUEXT	Whether an external security system must be used and, if so, which one
* SID	System ID to be used in place of the ID provided by SMF
SMF	Whether CA Spool must record system events in the SMF data set
SMFBUFS	Number of CA Spool SMF buffers to be allocated
SMFTYPE	SMF record type to be assigned to the CA Spool SMF records
SNABSIZE	Size of each CA Spool VTAM communication buffer data area
SNET	Whether the VTAM network interface must be started during CA Spool initialization
SPOOLCMP	Whether the spool data compression must be automatically activated
SPOOLDS	Data set name of the CA Spool spool data set(s), and optionally volume serial name
SPOOLENC	Spool data encryption
SUBID	1 to 4 character subsystem name identifying this subsystem to the operating system
SUBS	Whether the SUBSYS interface must be started during CA Spool initialization
SUBSCLAS	SYSOUT classes which are intercepted by the SUBSYS interface
SVCCODE	ESR SVC route code or the user SVC number to be used by CA Spool
SYNCTOL	In seconds, the time interval a member of a Multi-Access Spool (MAS) configuration can remain dormant before another member of the configuration considers it inactive

Option	Specifies
* Sn	Characteristics of a member of a Multi-Access Spool (MAS) configuration
TCPLHOST	Specifies the 1-16 character Local IP-Address to bind from if the TCP/IP print driver option Q is specified.
TGWARN	Threshold percentage use of spool space that causes CA Spool to issue a spool utilization message
TRACE	Whether CA Spool internal trace must be started and if so, how many trace table entries are to be allocated
USEALIAS	Whether printer name or alias name must be used
USERDEF	User definition
USERZAP	Whether a given optional userzap must be active
WARNTIM	In hundredths of a second, the time interval from the first denied request for access to the shared queues of a member of a Multi-Access Spool (MAS) configuration to the time that configuration assumes the member controlling the queues to be down
WTO	Whether all WTO messages must be sent out to the MVS operator console
XEQBUFS	Number of spool buffers to be allocated to the CA Spool cross memory request processor
XEQOPT	Various special XEQ options to be activated
XFER	Whether the Automatic File Transfer interfaces must be started during CA Spool initialization
XFERCLAS	SYSOUT classes in the primary JES2 or JES3 system which are automatically transferred to CA Spool
XFERDEST	Whether file transfer by printer destination must be activated
XFEROPT	Various special XFER options to be activated
XFERSAPI	Select SAPI processing option to JES2 or JES3
XFERSEP	Number of separator pages to be produced before each file is transferred to the primary JES2 or JES3 system
XFERTIME	Maximum interval between checks for output waiting for transfer
X2YY	Whether Transformer Interface must be started during CA Spool initialization
X2YYDEF	Characteristics of a X2YY functional subsystem (FSS)

Note: Changes to any statements marked with an asterisk (*) require a CA Spool COLD or FORMAT start.

Appendix A: Storage Estimates

This appendix explains how to estimate the size of the CA Spool checkpoint data set, the size of the private area (REGION parameter), the partition size required to start CA Spool, and the amount of CSA storage permanently allocated to CA Spool when it is active.

This section contains the following topics:

[Checkpoint Data Set Size Calculation](#) (see page 447)

[Private Area Storage Estimates](#) (see page 448)

[CSA Storage Estimates](#) (see page 451)

Checkpoint Data Set Size Calculation

You can calculate the number of cylinders required for CA Spool checkpoint data set.

To calculate the number of cylinders required for checkpoint data set

1. Calculate the length of the master track-allocation map:
Number of spool volumes * 20 + total number of spool tracks allocated (rounded up to a multiple of 4) + 8.
2. Calculate the number of 4 KB blocks required to hold the master allocation map (round up if necessary):
Divide the result from Step 1 with 4096.
3. Calculate number of checkpoint data set tracks required to hold the 4 KB blocks. Round this up to a whole number of cylinders:
Divide the result from Step 2 with 12.
4. Calculate the length of the file queue:
 $NUMFQES * (256 + PGNLEN) + 32$
5. Calculate the number of 4 KB blocks required to hold the file queue:
Divide the result from Step 4 with 4096.
6. Calculate the number of checkpoint data set tracks required to hold these 4 KB blocks. Round this up to a whole number of cylinders.
Divide the result from Step 5 with 12.

7. Calculate the total number of checkpoint cylinders required, as the number of cylinders for the allocation map (result from step 3), plus the number of cylinders for the file queue (result from step 6), plus one cylinder.

Note: A whole number of cylinders must be allocated on a cylinder boundary.

Example

The checkpoint data set is allocated on a 3390 disk. Each 3390 disk track holds up to twelve 4 KB data blocks. The number of tracks in the spool dataset is 6000. The default programmer's name length (PGNLEN) is 16. NUMFQES is 3000.

1. $20+6000+8=6028$
2. $6028/4096 \Rightarrow 2$ 4 KB data blocks
3. $2/12 \Rightarrow 1$ checkpoint track required for the master allocation map. Rounded up to 1 cylinder.
4. $3000*(256+16)+32 = 816032$
5. $816032/4096 \Rightarrow 200$ 4 KB data blocks
6. $200/12=17 \Rightarrow 17$ checkpoint tracks required for the file queue. Rounded up to 2 cylinders.
7. $1+2+1=4$ checkpoint cylinders required on a 3390 disk.

Private Area Storage Estimates

The estimated private area virtual storage required for CA Spool is the sum of the storage for the individual categories listed in the following section.

Virtual Storage Requirements

The virtual storage is page-able. All sizes must be rounded up to a multiple of 8. Sizes are indicated in bytes.

Program Storage

This value represents the size (in bytes) of the modules for all programs and processors supplied as part of the CA Spool subsystem itself, not including the subsystem interface modules in the Link pack area or CSA. Can be found in the linkage-editor output from the CA Spool main module.

Program Storage = 560,000

Control Blocks for Subtasks

These values are for the control blocks, data areas, and work spaces associated with the CA Spool subtasks.

VTAM ACB = _____ 96 _

FCB load-modules:

(Only approximated value calculated)

Number of printer nodes * = _____

Average FCB-module size

Common Control Blocks

File Queue:

NUMFQES * (256 + PGNLEN) + 32 = _____

File-queue Index:

MAXFSEQ * 20 = _____

= _____

Master Track-allocation Map:

Length of the map = Number of spool volumes * 24 +
Total number of spool tracks allocated + 8.

The Master Track-allocation Map area is obtained on a page boundary and is a multiple of 4 KB. Because of this, the length of the area is length of map rounded up to nearest 4 KB boundary.

= _____

Spool Allocation Table:

Number of spool volumes * 68 + 4 = _____

Checkpoint Program Package:

$928 + 64 * ((\text{length of Master Track-allocation Map} / 4096 \text{ (round up if any remainder)}) + 12)$ = _____

= _____

DASD Control Blocks:

$(1 + \text{number of spool volumes}) * 200$

SMF Buffers:

SMFBUFS * (144 + PGNLEN)

SNA Buffers:
 RCVBUFS * 488 = _____

Internal Command and Message Buffers:
 (CMBBUFS + 7) / 8 + CMBBUFS * 152 = _____
 = _____

Interface Control Elements:
 Number of network nodes defined * 144 = _____

Log-file Buffers:
 LOGBUFS * 144 = _____

CA Spool Event List:
 Number of spool volumes * 4 + 60

Pre-defined CA Spool Processor Control Blocks

Checkpoint Processor = _____ 288 _
 Command Processor = _____ 528 _
 Cross-Memory Request Processor:
 (XEQBUFS * (BUFSIZE + 24)) + 352 = _____

Purge Processor: = _____ 336 _
 (BUFSIZE * 2) + 256 = _____

File-transfer Interface Processor:
 BUFSIZE + 264 = _____

Network-management Processor:
 (Only allocated if one or more network nodes have been defined)

Printer-node Processors
 (Number of printer nodes defined * (216 + 1072)) + (Number of printer nodes active * SNABSIZE) + Number of printer nodes active * (BUFSIZE + 120) = _____

Display-node Processors
 Number of display nodes defined * (216 + 224) + (Number of display nodes active * SNABSIZE) = _____

Network-group Control Blocks:

Highest network group number (from GROUP keyword on NODE definitions) specified 15* 32 = _____

Internal Trace Table:

Number of trace entries specified (if any) * 16 = _____

The CA Spool control blocks are allocated above the 16 MB boundary.

CSA Storage Estimates

The following categories define the storage needed in the Common Storage Area (CSA) subpool 241 below the 16 MB limit:

- 1. Subsystem Communication Table (SSCT) = _____ 36_
- 2. Subsystem Vector Table (SSVT) = _____ 636_
- TOTAL COMMON STORAGE = _____ 672_

The following categories define the storage needed in the Extended Common Storage Area (ECSA) subpool 241 above the 16 MB limit:

- 1. Cross-Memory Command Buffers:
NUMCMBS * 152 = _____
- 2. Address-space Vector Table (ASVT):
Maximum Number of Concurrent Address Spaces * 4 + 12 = _____
(Maximum Number of Address Spaces is defined in member IEASYS00 of SYS1.PARMLIB keyword MAXUSER)
- 3. Communication-interface Blocks (CIB):
Number of communication channels defined * 208 = _____
- TOTAL COMMON STORAGE = _____

Appendix B: SMF Records

This appendix describes the CA Spool generated SMF-formatted records. CA Spool reports all major events in the system using SMF records. You have to specify SMF=YES in the parameter data set to report the events.

Fields marked as reserved are used either by CA Spool or by SMF, and are not available for user modifications. CA Spool uses only one record type (specified by the SMFTYPE parameter).

To separate the various SMF records, CA Spool operates with record subtypes, which ranges from 0 to 255.

All the CA Spool SMF records are mapped by the \$IQSMFB macro, which is located in the CA Spool source library. The macro has no operands. If the \$IQSMFB macro is used to map the record fields, use SMFFLAG (without RDW) or SMFRDW (with RDW) in the USING statement.

This section contains the following topics:

- [Standard SMF Record Header](#) (see page 453)
- [Record Subtype 0 \(00\)—Start](#) (see page 455)
- [Record Subtype 1 \(01\)—Termination](#) (see page 455)
- [Record Subtype 2 \(02\)—SMF Data Lost](#) (see page 456)
- [Record Subtype 3 \(03\)—VTAM-session Start](#) (see page 456)
- [Record Subtype 4 \(04\)—VTAM-Session End](#) (see page 457)
- [Record Subtype 5 \(05\)—File Open](#) (see page 457)
- [Record Subtype 6 \(06\)—File Close](#) (see page 458)
- [Record Subtype 7 \(07\)—File Purge](#) (see page 459)
- [Record Subtype 8 \(08\)—File Route](#) (see page 459)
- [Record Subtype 9 \(09\)—File Transfer](#) (see page 461)
- [Record Subtype 10 \(0A\)—File Reset](#) (see page 461)
- [Record Subtype 11 \(0B\)—Print End](#) (see page 463)
- [Record Subtype 12 \(0C\) - File Transformation](#) (see page 464)

Standard SMF Record Header

Each record created by CA Spool and passed to SMF contains the standard SMF record header, plus one field containing the subtype, and one field containing the subsystem identifier of the CA Spool system, which created the record.

The format of the CA Spool SMF record header is:

Offset	Name	Length	Format	Source	Description
0 0	SMFFLAG	1	Binary		System indicator Bit meaning (if set): 0-5 reserved 6 VS2 7 VS1
1 1	SMFRTYPE	1	Binary	ESF	OS Record type
2 2	SMFTIME	4	Binary		Time, in hundredths of a second, when record was moved to the SMF buffer.
6 6	SMFDATE	4	Packed		Date record was moved to the SMF buffer, in the form 0CYDDDF where F is the sign.
10 A	SMFSYSID	4	EBCDIC		System identification (taken from system SID parameter or ESF SID parameter).
14 E	SMFSTYPE	1	Binary	Internal	Record subtype.
15 F	SMFSUBID	4	Mixed	\$\$\$NAM	ESF subsystem identification.
19 13	SMFSYSID	4	EBCDIC	SID PARM	SID from parameters or SMF.
23 17		3			Reserved.

If SMF=SUBTYPE is specified, then the format of the CA Spool SMF record header is:

Offset	Name	Length	Format	Source	Description
0 0	SMFFLAG	1	Binary		System indicator Bit meaning (if set): 0-5 reserved 6 VS2 7 VS1
1 1	SMFRTYPE	1	Binary	ESF	OS Record type
2 2	SMFTIME	4	Binary		Time, in hundredths of a second, when record was moved to the SMF buffer.
6 6	SMFDATE	4	Packed		Date record was moved to the SMF buffer, in the form 00YDDDF where F is the sign.

10	A	SMFSYSID	4	EBCDIC		System identification (taken from system SID parameter or ESF SID parameter).
14	E	SMFXSSI	4	Mixed	\$SSNAM	ESF subsystem identification.
18	12	SMFXSTY	2	Mixed	Internal	Record subtype.
20	14	SMFXSSID	4	EBCDIC	SID PARM	SID from parameters or SMF.
24	18		2			Reserved.

Note: When using the SMF records, remember to add four bytes to the offset listed in the record to account for the RDW.

Record Subtype 0 (00)—Start

Record subtype 0 is written by ESFNUC when the CA Spool system is started. It includes the CA Spool initialization options in effect. Its length is 27 bytes.

The format of a subtype 00 field is:

Offset	Name	Length	Format	Source	Description	
26	1A	SMFT00OP	1	Binary	\$OPTIONS	Initialization options Bit meaning (if set): 0 COLD started 1 FORMAT started 2 LIST requested 3 LOG requested 4 BUILDQ requested 5-7 Reserved

Record Subtype 1 (01)—Termination

Record subtype 1 is written by ESFNUC when the CA Spool system is terminated. It includes the TCB and SRB time used. Its length is 44 bytes.

The format of subtype 01 fields is:

Offset	Name	Length	Format	Source	Description
26	1A		2		Reserved

Offset	Name	Length	Format	Source	Description
28	1C	SMFT01CT	8	Binary	TCB time used
36	24	SMFT01ST	8	Binary	SRB time used

Record Subtype 2 (02)—SMF Data Lost

Record subtype 2 is the first record passed to SMF when an SMF data set becomes available after a period when no data sets were available. It is written by ESFSMF and its length is 36 bytes.

This record contains a count of the SMF records that were not written, and the start and end times of the period during which no records were written. (The end time is the time recorded in offset 2.)

The format of subtype 02 fields is:

Offset	Name	Length	Format	Source	Description	
26	1A	SMFT02CT	2	Binary	SUSPRCNT	Number of SMF records lost
28	1C	SMFT02ST	4	Binary		Start time, in hundredths of a second, of period during which no SMF data sets were available for recording
32	20	SMFT02SD	4	Packed		Start data of period during which no SMF data sets were available for recording, in the form OCYYDDD where F is the sign

Record Subtype 3 (03)—VTAM-session Start

Record subtype 3 is written by ESFNETM when a network session is started. It includes the node name and the group number of the terminal logged on. Its length is 40 bytes.

The format of subtype 03 fields is:

Offset	Name	Length	Format	Source	Description	
26	1A	SMFT03NM	8	EBCDIC	DCENNAME	Node name of terminal logged on
34	22		2			Reserved

Offset	Name	Length	Format	Source	Description
36 24	SMFT03GN	4	Binary	DCENGNM	Network group number

Record Subtype 4 (04)—VTAM-Session End

Record subtype 4 is written by ESFNETM when a network session is ended. It includes the node name and the group number of the terminal logged off. Its length is 40 bytes.

The format of subtype 04 fields is:

Offset	Name	Length	Format	Source	Description
26 1A	SMFT04NM	8	EBCDIC	DCENNAME	Node name of terminal logged off
34 22		2			Reserved
36 24	SMFT04GN	4	Binary	DCENGNM	Network group number

Record Subtype 5 (05)—File Open

Record subtype 5 is written by ESFXEQ when a CA Spool file is opened. This record contains all information concerning the file being opened.

The format of subtype 05 fields is:

Offset	Name	Length	Format	Source	Description
26 1A	SMFT05FL	1	Binary	XMRBOFLG	Open type flag Bit meaning (if set): 0—Open input /output if off 1—Open modify /initial if off 2—Open backward /forward if off (input only) 3—7 Reserved
27 1B		1			Reserved
28 1C	SMFT05SQ	4	Binary	FQESEQNO	File sequence number
32 20	SMFT05OW	8	EBCDIC	FQEOWNNM	Filename
40 28	SMFT05DS	8	EBCDIC	FQEDSTNM	File destination name
48 30	SMFT05CL	1	EBCDIC	FQECLASS	File output class

Offset	Name	Length	Format	Source	Description	
49	31	SMFT05FR	4	EBCDIC	FQEFORMS	Form number
53	35	SMFT05FC	4	EBCDIC	FQEFCB	FCB name
57	39	SMFT05US	8	EBCDIC	FQEUSRID	Userid
65	41	SMFT05AC	8	EBCDIC	FQEACTNO	Account number
73	49		3			Reserved
76	4C	SMFT05LC	4	Binary	FQELNCNT	Number of lines in file (input only)
80	50	SMFT05CP	1	Binary	FQECOPYS	Number of copies
81	51	SMFT05PR	1	Binary	FQEPRIO	File priority
82	52	SMFT05CU	8	EBCDIC	XMRBUSID	Caller's Userid
90	5A	SMFT05F8	8	EBCDIC	FQEFORM8	8 character form number
98	62	SMFT05PL	2	Binary	\$PGMNLN	Programmer's name length
100	64	SMFT05PN	0-255	- any -	FQEPGMNM	Programmer's name

Record Subtype 6 (06)—File Close

Record subtype 6 is written by ESFXEQ when a CA Spool file is closed. This record contains information concerning the file being closed. The record length is 66 bytes.

The format of subtype 06 fields is:

Offset	Name	Length	Format	Source	Description	
26	1A	SMFT06FL	1	Binary	XMRBCFLG	Close type flag Bit meaning (if set): 0 Close temporarily /permanently if off 1 Opened for input /output if off 2-7 Reserved
27	1B		1			Reserved
28	1C	SMFT06SQ	4	Binary	FQESEQNO	File sequence number
32	20	SMFT06OW	8	EBCDIC	FQEOWNNM	Filename
40	28	SMFT06DS	8	EBCDIC	FQEDSTNM	File destination name
48	30	SMFT06LC	4	Binary	FQELNCNT	Number of lines in file

Offset	Name	Length	Format	Source	Description
52 34	SMFT06CP	1	Binary	FQECOPYS	Number of copies
53 35	SMFT06PR	1	Binary	FQEPRIO	File priority
54 36		2			Reserved
56 38	SMFT06PC	4	Binary	FQEPGCNT	Number of pages in file
60 3C		2			Reserved

Record Subtype 7 (07)—File Purge

Record subtype 7 is written by ESFPURG when a CA Spool file has been purged. This record contains information concerning the purged file. The record length is 56 bytes.

The format of subtype 07 fields is:

Offset	Name	Length	Format	Source	Description
26 1A	SMFT07FL	1	Binary	ESF	Purge Control flag Bit meaning (if set): 0 File purged on cross memory request /file purged by purge processor if off
27 1B		1			Reserved
28 1C	SMFT07SQ	4	Binary	FQESEQNO	File sequence number
32 20	SMFT07OW	8	EBCDIC	FQEOWNNM	Filename
40 28	SMFT07DS	8	EBCDIC	FQEDSTNM	File destination name
48 30	SMFT07OP	8	EBCDIC		Requestor's userid
56 38		8			Reserved

Record Subtype 8 (08)—File Route

Record subtype 8 is written by ESFCOMM or ESFXEQ when a CA Spool file is routed or re-queued. It includes old and new file information.

Its length is 78 bytes.

The format of subtype 08 fields is:

Offset	Name	Length	Format	Source	Description	
26	1A	SMFT08FL	1	Binary	ESF	Flag byte Bit meaning (if set): 0 Routed by cross memory request handler (ESFXEQ) 1—routed by system operator 2—routed by network user 3—routed by communication user 4—file requeued; not routed 5-7— Reserved
27	1B	SMFT08RF	1	Binary	ESF	Routing flag byte Bit meaning (if set): 0—Filename changed 1—File destination name changed 2—File output class changed (ESFXEQ only) 3—End of file indicator removed (ESFXEQ only) 4—Programmer's name changed 5-7—Reserved
28	1C	SMFT08SQ	4	Binary	FQEQNO	File sequence number
32	20	SMFT08OO	EBCDIC	8	ESF	Old filename
40	28	SMFT08OD	8	EBCDIC	ESF	Old file destination name
48	30	SMFT08OC	1	EBCDIC	ESF	Old file output class (ESFXEQ only)
49	31	SMFT08NO	8	EBCDIC	ESF	New file destination name
57	39	SMFT08ND	8	EBCDIC	ESF	New file destination name
65	41	SMFT08NC	1	EBCDIC	ESF	New file output class (ESFXEQ only)
66	42	SMFT08OP	8	EBCDIC		Requestor's userid
74	4A		12			Reserved

Record Subtype 9 (09)—File Transfer

Record subtype 9 is written by ESFXFER when a CA Spool file has been transferred to the primary JES system.

The format of subtype 09 fields is:

Offset	Name	Length	Format	Source	Description
26	1A	2			Reserved
28	1C SMFT09SQ	4	Binary	FQESEQNO	File sequence number
32	20 SMFT09OW	8	EBCDIC	FQEOWNNM	Filename
40	28 SMFT09DS	8	EBCDIC	FQEDSTNM	Destination name
48	30 SMFT09CL	1	EBCDIC	FQECLASS	Output class
49	31 SMFT09FR	4	EBCDIC	FQEFORMS	Form number
53	35 SMFT09FC	4	EBCDIC	FQEFCB	FCB name
57	39 SMFT09US	8	EBCDIC	FQEUSRID	Userid
65	41 SMFT09AC	8	EBCDIC	FQEACTNO	Account number
73	49	3			Reserved
76	4C SMFT09LC	4	Binary	FQELNCNT	Line count
80	50 SMFT09CP	1	Binary	FQECOPYS	Number of copies
81	51 SMFT09PR	1	Binary	FQEPRIO	File priority
82	52 SMFT09F8	8	EBCDIC	FQEFORM8	8 character form number
90	5A	8			Reserved
98	62 SMFT09PL	2	Binary	\$PGMNLEN	Programmer's name length
100	64 SMFT09PN	0-255	Any	FQEPGMNM	Programmer's name

Record Subtype 10 (0A)—File Reset

Record subtype 10 is written by ESFCOMM when the output class, output priority, or affinity of a file is changed. Its length is 94 bytes.

The format of subtype 0A fields is:

Offset	Name	Length	Format	Source	Description	
26	1A	SMFT0AFL	1	Binary	ESF	Flag byte Bit meaning (if set): 0—Output class changed 1—Output priority changed 2—Affinity changed 3—FCB name changed 4—Forms number changed 5—Copy count changed 6—Partial print changed 7—Retain time changed
27	1B		1			Reserved
28	1C	SMFT0ASQ	4	Binary	FQEQNO	File sequence number
32	20	SMFT0AOW	8	EBCDIC	FQEQNNM	Filename
40	28	SMFT0ADS	8	EBCDIC	FQEDSTNM	Destination name
48	30	SMFT0AOQ	1	EBCDIC	FQECLASS	Old output class
49	31	SMFT0AOP	1	EBCDIC	FQEPRIO	Old output priority
50	32	SMFT0ANQ	1	EBCDIC	FQECLASS	New output priority
51	33	SMFT0ANP	1	Binary	FQEPRIO	New output priority
52	34	SMFT0AOA	1	Binary	FQEAF	Old affinity mask
53	35	SMFT0ANA	1	Binary	FQEAF	New affinity mask
54	36	SMFT0AOC	4	EBCDIC	FQFCB	Old FCB Name
58	3A	SMFT0ANC	4	EBCDIC	FQFCB	New FCB Name
62	34	SMFT0AOF	4	EBCDIC	FQFORMS	Old forms number
66	42	SMFT0ANF	4	EBCDIC	FQFORMS	New forms number
70	46	SMFT0AON	1	Binary	FQECOPYS	Old copy count
71	47	SMFT0ANN	1	Binary	FQECOPYS	New copy count
72	48	SMFT0AOG	2	Binary	FQEPSPNO	Old starting page
74	4A	SMFT0ANG	2	Binary	FQEPSPNO	New starting page
76	4C	SMFT0AO#	1	Binary	FQEPSPG#	Old page count
77	4D	SMFT0AN#	1	Binary	FQEPSPG#	New page count

Offset	Name	Length	Format	Source	Description
78	4E SMFT0AOR	2	Binary	FQERETAN	Old retain hours
80	50 SMFT0ANR	2	Binary	FQERETAN	New retain hours
82	52 SMFT0AOE	8	EBCDIC		Requestor's userid
90	5A SMFT0AF8	8	EBCDIC	FQEFORM8	8 character form number
98	62	4			Reserved

Record Subtype 11 (OB)—Print End

Record subtype 11 is written by ESPRT when the printing of a file has been completed.

The format of subtype OB fields is:

Offset	Name	Length	Format	Source	Description
26	1A	2			Reserved
28	1C SMFT0BSQ	4	Binary	FQESEQNO	File sequence number
32	20 SMFT0BOW	8	EBCDIC	FQEOWNNM	Filename
40	28 SMFT0BPG	4	Binary	DCENPGCT	Number of pages printed
44	2C SMFT0BOD	8	EBCDIC	DCENNAME	Output device node name
52	34 SMFT0OBGN	4	EBCDIC	DCENGNM	Output device's network group number
56	38 SMFT0BCL	1	EBCDIC	FQECLASS	Output class
57	39 SMFT0BFO	4	EBCDIC	FQEFORMS	Form number
61	3D SMFT0BFC	4	EBCDIC	FQEFCB	FCB name
65	41	3			Reserved
68	44 SMFT0BLC	4	Binary	FQELNCNT	Number of lines in file
72	48 SMFT0BLP	4	Binary	DCENLNCT	Number of lines printed
76	4C SMFT0BDS	8	EBCDIC	FQEDSTNM	File destination name
84	54 SMFT0BCP	2	Binary	FQECOPYS	Number of copies
86	56 SMFT0BUS	8	EBCDIC	FQEUSRID	Userid
94	5E SMFT0BAC	10	ENCDIC	FQEACTNO	Account number
104	68 SMFT0BST	4	Binary		Time in hundredths of a second when print was started

Offset	Name	Length	Format	Source	Description
108 6C	SMFT0BSD	4	Packed		Date when print was started The format is 0CYDDDF, where F is the sign.
112 70	SMFT0BF8	8	EBCDIC	FQFORM8	8 character form number
120 78		8			Reserved
128 80	SMFT0BPL	2	Binary	\$PGNMLEN	Programmer's name length
130 82	SMFT0BPN	Any	EBCDIC	FQEPGMNM	Programmer's name length

Record Subtype 12 (0C) - File Transformation

Change the format of subtype 0C fields so the new format looks as follows:

Offset	Name	Length	Format	Source	Description
26 1A		2			Reserved
28 1C	SMFT0CSQ	4	Binary	FSXEISEQ	File sequence number
32 20	SMFT0COW	8	EBCDIC	FSXEIFNM	Filename
40 28	SMFT0CDS	8	EBCDIC	FSXEIDST	Destination name
48 30	SMFT0CCL	1	EBCDIC	@OPENCLS	Output class
49 31	SMFT0CFR	8	EBCDIC	@OPGFORM	8 character Form number
57 39	SMFT0CFC	4	EBCDIC	@OPENFCB	FCB name
61 3D	SMFT0CUS	8	EBCDIC	FSXEIUID	User id
69 45	SMFT0CAC	10	EBCDIC	@OPENACT	Account number
79 4F		3	EBCDIC		Reserved
82 52	SMFT0CTR	10	EBCDIC	FSXETRFO	TRANSFRM= parameter options
92 5C	SMFT0CRC	4	Binary	FSXEICNT	Input Record Count
96 60	SMFT0CPC	4	Binary	In_PageCount	Input Page Count
100 64	SMFT0COC	4	Binary	Out_PageCount	Output Page Count
104 68	SMFT0CTU	4	Binary	TIMEUSED	Transformation CPU time in 1/100 seconds
108 6C		8			Reserved
116 74	SMFT0CPL	2	Binary	@OPNPLNG	Programmer's name length

Offset	Name	Length	Format	Source	Description
118 76	SMFT0CPN	16	Any	@OPNPNAM	Programmer's name