

Use cases and best practices for HP StorageWorks P2000 G3 MSA FC/iSCSI Combo Controller

Technical white paper

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About this document

This whitepaper introduces features and specifications of the HP StorageWorks P2000 G3 MSA FC/iSCSI Combo Controller. A series of use cases present best practices in setting up and using the HP P2000 Combo Controller.

Intended audience

This paper is intended for entry-level and mid-range HP StorageWorks MSA P2000fc G3 administrators and requires previous SAN knowledge.

About the HP P2000 Combo Controller

The HP P2000 Combo Controller is an affordable and flexible solution for small, medium, and enterprise-level IT departments. With both 8 Gb Fibre Channel (FC) and 1GbE iSCSI ports, the HP P2000 G3 is cost effective and ideally positions your department for future growth and expansion.

The two 8 Gb Fibre Channel ports enable high speed access to data. The two 1 GbE iSCSI ports allow smaller departments with tight budgetary restrictions to enjoy shared storage benefits without purchasing their own array, and eliminating the cost of implementing an FC infrastructure.

It is also an ideal solution for large companies with multiple smaller departments and/or remote locations, and smaller companies whose storage needs demand shared resources.

The dual-protocol *combo* capability allows you high speed data access through the 8 Gb FC ports, while designating the two 1 GbE iSCSI ports for Remote Snap.

Note:

You can use FC for Remote Snap and host I/O simultaneously. While the system does not prevent using iSCSI for Remote Snap and host I/O simultaneously, it is not recommended

Features

The HP P2000 Combo Controller offers the following features:

- Increased support to seven P2000 LFF disk enclosures (96 LFF drives)
- Increased support to five D2700 SFF disk enclosures (149 SFF drives)
- Two new 8 Gb controllers with 2 GB cache memory each:
 - Standard model with two 8 Gb FC host ports each
 - Combo model with two 8 Gb FC host ports and two 1 GbE iSCSI ports each
- 6 Gb SAS back end and HDD support
- The array supports 512 volumes

Note:

A snapshot is a special or specific type of volume. Snap pools are another volume type

- 512 Max LUN support
- Higher performance with upgraded processing power
- 64 Snapshots and volume copy capability come standard on G3 models
- Optional controller-based replication (Remote Snap)
- Increased I/O performance
- Improved System Management Utility (SMU) user interface
- Full support for G1/G2 to G3 upgrade, including cross-protocol upgrades

Benefits

8 Gb Fibre Channel

- Suitable for larger or mid-size departments
- Capable of meeting heavy traffic demands
- Provides higher performance

1 GbE iSCSI

- Remote Snap
- Suitable for smaller departments
- Allow access from outside the FC SAN.

Supported operating systems

The HP P2000 Combo Controller supports a variety of operating systems. For complete details, go to HP's *Single Point of Connectivity Knowledge* (SPOCK) website at the following URL:

<http://spock.corp.hp.com/index.aspx>

Note:

Some operating system (OS) restrictions apply.

Specifications

Number of Drives	149 SFF drives or 96 LFF drives maximum including expansion
Drive Type	<p>P2000 300 GB 6G 15K LFF DP ENT SAS</p> <p>P2000 450 GB 6G 15K LFF DP ENT SAS</p> <p>P2000 600 GB 6G 15K LFF DP ENT SAS</p> <p>P2000 1 TB 6G 7.2k LFF DP MDL SAS</p> <p>P2000 2 TB 6G 7.2k LFF DP MDL SAS</p> <p>MSA2 1 TB 7.2k LFF SATA</p> <p>P2000 2 TB 3G 7.2K LFF MDL SATA</p> <p>72 GB 6G 15K SFF DP SAS</p> <p>146 GB 6G 10K SFF DP SAS</p> <p>300 GB 6G 10K SFF DP SAS</p> <p>146 GB 6G 15K SFF DP SAS</p> <p>500 GB 6G 7.2K SFF DP MDL SAS</p> <p>LFF or SFF supported, depending on model</p>
Capacity	192 TB Maximum including expansion, depending on model
Storage Expansion Options	P2000 3.5-inch disk enclosure or D2700 2.5-inch disk enclosure
Host Interface	<p>8 Gb Fibre Channel (2) Ports per controller or</p> <p>8 Gb Fibre Channel (2) Ports per controller and</p> <p>1 GbE iSCSI (2) Ports per controller</p> <p>Supported, depending on model</p>
Storage Controller	<p>(2) P2000 G3 Fibre Channel MSA Controller</p> <p>(2) P2000 G3 Fibre Channel/iSCSI Combo MSA Controller</p> <p>Maximum supported, depending on model. Unable to mix controllers within the array.</p>
SAN Backup Support	Yes
OV Storage Mirroring Support	Yes
Systems Insight Manager Support	Yes

Supported Operating Systems	<p>Microsoft® Windows® Server 2008 IA32, x64, IA64(Standard, Enterprise, Datacenter)</p> <p>Microsoft Windows 2003 R2</p> <p>Microsoft Windows 2003 X64, IA64</p> <p>Red Hat® Linux (32/64)</p> <p>SUSE® Linux (32/64)</p> <p>HP-UX</p> <p>VMware 3.5, 4.0</p> <p>Citrix Xen</p> <p>Combo Controller iSCSI ports support Windows, VMware, Red Hat Linux and SuSE Linux</p>
Clustering Support	<p>Yes</p> <p>Windows, Linux, HP-UX</p>
Form Factor	<p>2U</p>

Use cases

This section of the paper discusses the following use cases demonstrating the capability of the Combo Controller to operate in both Fibre Channel (FC) and iSCSI mode. See the [Remote Snap whitepaper](#) for more details.

For all use cases that provide backup and disaster recovery capabilities, use Remote Snap to replicate data from one array to the other. The steps to achieve this generally are:

1. Install the Remote Snap license. Either use a permanent license that you have bought, or the temporary license available on the array's Storage Management Utility (SMU) web-based interface.
2. Provision storage. Create vdisks, volumes, and snap-pools on both systems.
3. Set up the relationship between the systems. Add each system to the other system's list of remote systems.
4. Create the replication set, specifying the source, or external-view volume, the destination volume or vdisk, and the protocol (FC or iSCSI) used for replication.
5. In case of disaster, you can switch applications over to the backup array.

You may want to convert the volumes of the backup array to external-view volumes until the primary array is back online. Once the primary array is back online, replicate the changes made while it was down back to it, and then make its volumes the external-view volumes.

Single office with remote site for backup and disaster recovery using iSCSI to replicate data

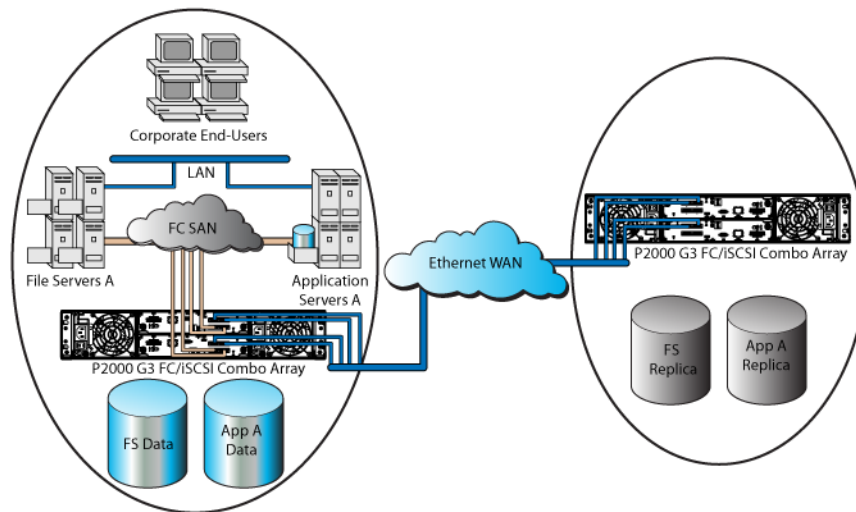


Figure 1: Single office with remote site for backup and disaster recovery (iSCSI)

This use case illustrates the Combo Controller's ability to serve data via the FC protocol, and provide for an offsite backup and disaster recovery via the iSCSI protocol, using an existing WAN.

Single office with local site disaster recovery and backup using iSCSI

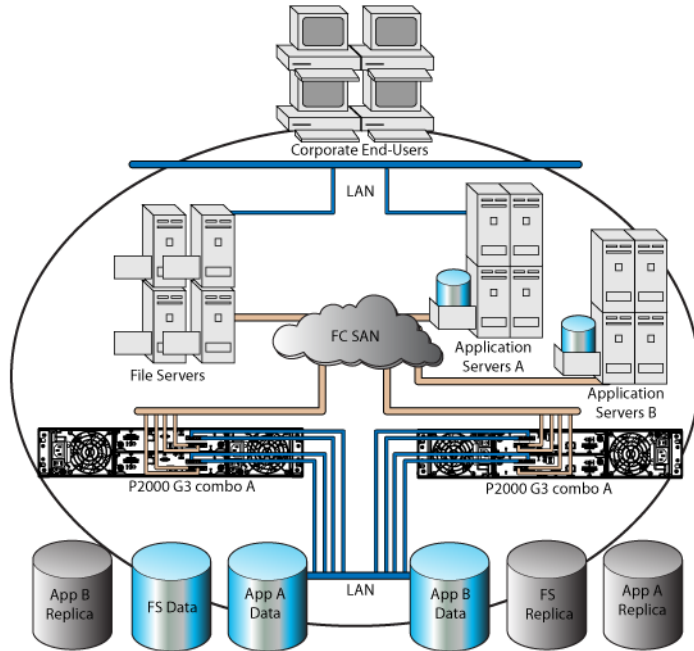


Figure 2: Single office with local site disaster recovery and backup using iSCSI

This use case is similar to the one above, but exists on one site, rather than using a remote site, and uses your LAN, rather than a WAN, for replication using Remote Snap.

Single office with local site disaster recovery and backup using FC

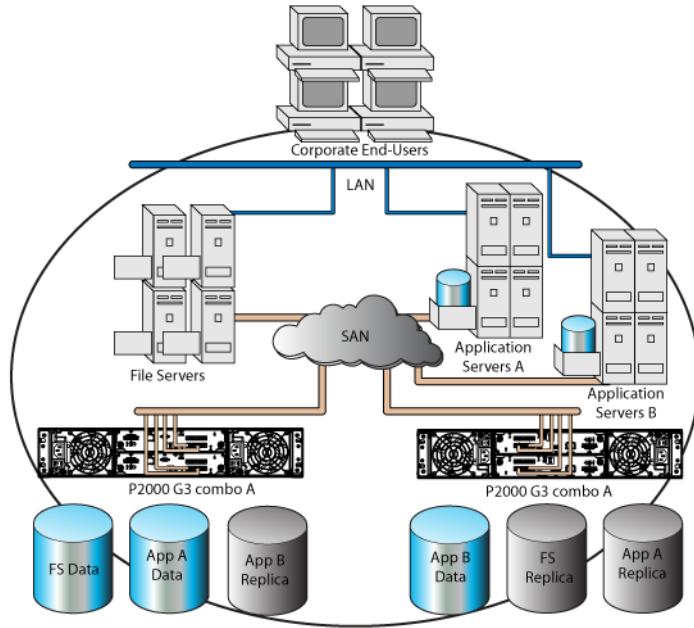


Figure 3: Single office with local site disaster recovery and backup using FC

This use case is similar to the previous one, but uses FC for replication.

Two branch offices with disaster recovery and backup

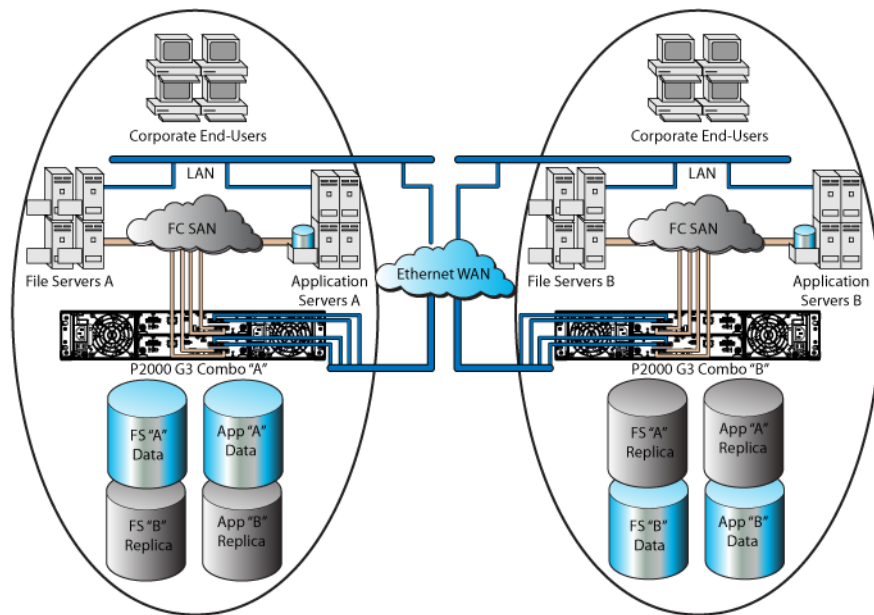


Figure 4: Two branch offices with disaster recovery and backup

This use case is similar to the first one, but illustrates that the Combo Controller can be used in an *active-active* role, with each system both serving data and acting as backup to the other.

Single office with target model using FC and iSCSI ports

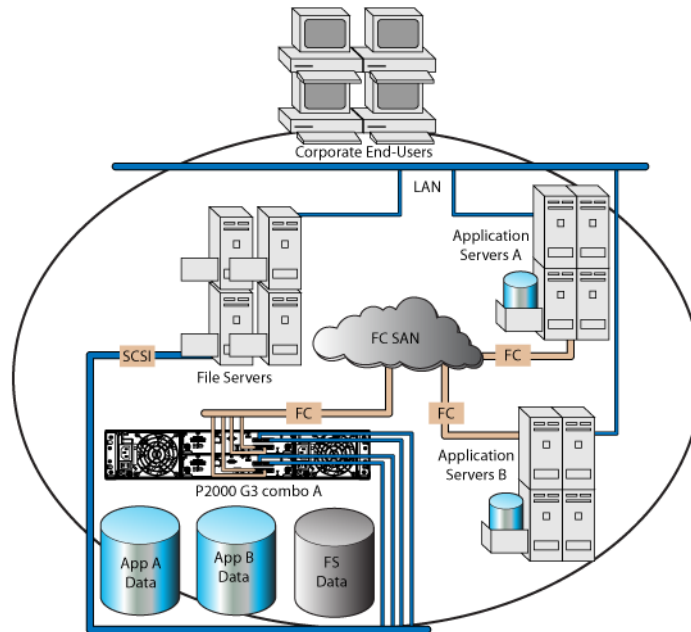


Figure 5: Single office with target model using FC and iSCSI ports

This use case does not use Remote Snap to replicate data to a backup array, but does show the flexibility of the Combo Controller to serve data through both the FC protocol for existing SAN servers, and through the iSCSI protocol for those clients and servers that are not currently part of the FC SAN.

Note:

Accessing a volume both through iSCSI and FC is not supported.

Best practices

Using iSCSI and FC at same time

- It is not supported for a volume to be mapped via iSCSI and FC at the same time. However the interface does not prevent this configuration.
- Use a dedicated LAN for iSCSI traffic. Limit the traffic on the LAN to iSCSI only. However, for the purposes of replication over a WAN, you'll probably need to share the link with other applications and purposes.
- Connect the FC and iSCSI ports to a switch – direct connect is not supported for replications, anyway, and connecting to a switch provides more flexibility in your SAN.
- Connect the two ports of the same type on a controller to different switches. For example A1 and B1 connect to one switch, and A2 and B2 to another. That way, you're protected against switch failure as well as controller failure.
- Plug in both the controllers the system and run it in dual controller mode. Remote Snap is not supported on single controller arrays.

- Configure all four iSCSI ports with valid IP address and make sure they are connected to the Ethernet switch.
- Make sure all four FC ports are connected to the FC switch.
- Make sure that both controllers have the same firmware version.
- Make sure that both local and remote systems are up with same firmware version.
- You can use the FC port for Remote Snap and host I/O at the same time.
- You can use FC and iSCSI ports for running I/O (to different LUNs) at the same time.

Using with Remote Snap

- When replicating, put both the volume and snap-pool on the same vdisk, but try to keep any other volumes off that vdisk. That way, you can detach the volume while disturbing the least number of volumes and other components in the array.
- All replications with which an array is involved must employ one protocol. This means that all replications must either be iSCSI or FC. You cannot have some replications using iSCSI and some using FC. Mixed protocol replications are not supported, but the user interface does not prevent you from configuring it that way.
- If you intend to use Remote Snap, add each array to the other as a Remote System. This is required if using the Storage Management Utility (SMU) to configure replication sets, and is also helpful if using the Command Line Interface (CLI) to configure replication sets.
- You must install the Remote Snap license on both the local and remote system

For more information

For more information, go to:

<http://www.hp.com/go/p2000>

For a list of QuickSpecs, go to:

http://h18000.www1.hp.com/products/quickspecs/13551_div/13551_div.html

For all P2000 related manuals and user guides, go to:

<http://h20000.www2.hp.com/bizsupport/TechSupport/DocumentIndex.jsp?contentType=SupportManual&lang=en&cc=us&docIndexId=64179&taskId=101&prodTypeId=12169&prodSeriesId=4118559>

For the HP StorageWorks P2000 G3 MSA System FC/iSCSI User Guide, go to:

<http://bizsupport2.austin.hp.com/bc/docs/support/SupportManual/c02006876/c02006876.pdf>

For the HP StorageWorks P2000 Array System Remote Snap Software Technical white paper, go to:

<http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA1-0977ENW.pdf>

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