Rexx

The Universal Language

By Howard Fosdick

EVERYONE WHO WORKS WITH MAINFRAMES KNOWS ABOUT REXX. IT'S THE command or "scripting" language that's been shipped with all mainframes for years. It's versatile, flexible, and powerful. Somehow it still manages to be very easy to learn and use.

In recent years, Rexx has spread its wings. It now runs as an open source language on virtually every platform and operating system. Moreover, it comes in object-oriented and Java-compatible forms. This article gives you a quick tour of modern Rexx. We'll summarize the different versions of Rexx. We'll describe the many free Rexx interpreters and tools that are available, and tell you where you can download them.

Before we proceed, you might ask: why should I care? The answer comes down to two key benefits:

- Transferability of skills
- Transportability of code

If you know Rexx, you know a universal programming language. Since it runs everywhere, this makes your Rexx skills transferable to other platforms. For example, you work on the mainframe but use a PC. Rexx gives you a way to program both without having to learn a new programming language. You can even program your handheld with Rexx. And those new Linux blade servers the manager wants to bring in? Administer them with Rexx scripts and you won't have to spend your weekends learning bash or Perl. A language that runs everywhere gives you skills that apply everywhere.

This same principle applies to your code. A standard Rexx script runs anywhere, from handhelds to laptops to desktops to servers to mainframes. Portable code gives you a choice of platforms and reduces costs. Rexx has evolved into a "universal programming language."

As figure 1 shows, Rexx comes in three flavors: "classic," procedural Rexx; object-oriented Rexx; and, Java-compatible Rexx. Let's discuss them.

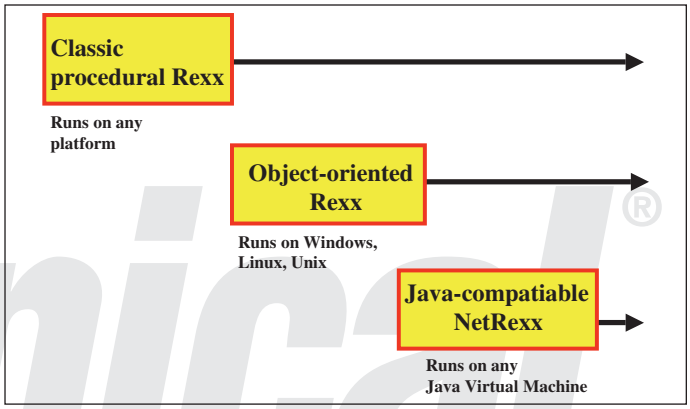

Figure 1: Three Rexx Flavors

CLASSIC REXX

Classic Rexx was defined back in the 1980s. This procedural language ships bundled with all IBM mainframe operating systems, i5/OS,

Interpreter	Platforms	Quick Profile
Regina	All major operating systems	The most popular free procedural Rexx. Its large user community means good support and it interfaces to most free tools and interfaces. Comes with many extra built-in functions and excellent, professional documentation. Download from: **http://regina-rexx.sourceforge.net/**
Rexx/imc	Linux, Unix, BSD	Unix, Linux, and BSD -oriented with nice extensions for Unix programmers in these environments. A rock-solid interpreter with a proven track record for long-term support. Includes a free Rexx tutorial. Download from: **http://users.comlab.ox.ac.uk/ian.collier/Rexx/rexximc.html**
BRexx	Linux, Unix, Windows CE, Mac OS, 16- and 32- bit DOS, others.	Extremely fast and light, runs on many platforms including resource-limited systems like Windows CE, embedded Linuxes, DOS. Many extra functions and interfaces. Long-term track record of support. **Download from: http://bnv.home.cern.ch/bnv/**
Reginald	Windows	Customizes and extends Rexx for Windows programmers. Includes many Windows tools such as a GUI, speech, MIDI, and media functions, etc. Provides a standard language alternative to proprietary tools like VBScript. Nicely documented with examples and easy to use. **Download from: www.borg.com/~jglatt/rexx/rexxuser.htm**
r4	Windows	Rexx extended for Windows with many tools for developers including a GUI forms tool, color text file viewer and editor, over 135 windows command tools, visual accessories, XML to HTML auto-converter, GUI widgets, and others. Excellent tutorials and example scripts. Download from: **www.kilowattsoftware.com/**
Rexx for Palm OS	Palm OS	Glues Palm OS applications and databases together in scripts that run without leaving the current application. Scripts can access all Palm data and resources, including TCP/IP, Infrared, USB and serial communications, console, clipboard, etc. Runs natively. Good example scripts with easy-to-follow tutorials. Download from: **www.jaxo.com/rexx/**

Figure 2: Free Classic Rexx Interpreters

OS/400, OS/2, PC-DOS, and Amiga OS and other systems.

Classic Rexx gained its ANSI standard in 1996. Since then, two major trends have hit the software world: *open source software* and *free scripting languages*. These two trends converge in Rexx and this has led to a proliferation of Rexx interpreters across many platforms.

Today free Rexx is available for any mainstream operating system, including all versions of Windows, Linux, and Unix, and even most "second-tier" operating systems, including the Mac OS, Palm OS, Windows CE, BSD, Symbian/EPOC, VAX/VMS, DOS, OS/2, Amiga OS, i5/OS, OS/400, and many others.

You can download and install free Rexx for any of these operating systems in a jiffy. Figure 2 tells you where to get the interpreters. For most operating systems, you have a choice of more than one free Rexx interpreter. Figure 2 briefly profiles each interpreter, but you'll want to download the ones available for your platform (all are free) and evaluate them yourself.

Rexx also offers hundreds of free tools. These support graphical user interfaces, database access, web programming, controlling web servers, text processing, XML, communications, and almost any other programming function. The tools typically come in the form of "function libraries," so after issuing a command to access them, your Rexx program uses them just like the built-in functions that come with the language. This easy extensibility makes Rexx ideal as a "glue" language. You can use it for quick programming with many interfaces. Figures 2 and 3 list sites where you can download free Rexx tools.

Interpreter	Platforms	Quick Profile
Open Object Rexx	Windows, Linux, Unix	Fully object-oriented superset of classic Rexx. Developed by IBM, it became open source in early 2005. Now enhanced and maintained by the Rexx Language Association. The most widely-used object-oriented Rexx interpreter. Runs on Windows, Linuxes, and Unixes. Download from: **www.oorexx.org/**
roo!	Windows	Fully object-oriented superset of classic Rexx. From the same company as the standard r4 Rexx interpreter, it comes with the same extensive set of Windows tools. Includes quick, easy tutorials that nicely bridge the gap between standard and object-oriented Rexx programming. Download from: **www.kilowattsoftware.com/**
NetRexx	Any JVM	A Rexx-like language that integrates with the Java environment. NetRexx uses Java classes and can be used to develop classes, applications, applets, servlets, and beans. Download from: **www-306.ibm.com/software/awdtools/netrexx/library.html**

Figure 3: Free Object-oriented and Java-compatible Rexx Interpreters

Interpreter	Platforms	Quick Profile
Open Object Rexx	Windows, Linux, Unix	Fully object-oriented superset of classic Rexx. Developed by IBM, it became open source in early 2005. Now enhanced and maintained by the Rexx Language Association. The most widely-used object-oriented Rexx interpreter. Runs on Windows, Linuxes, and Unixes. Download from: **www.oorexx.org/**
roo!	Windows	Fully object-oriented superset of classic Rexx. From the same company as the standard r4 Rexx interpreter, it comes with the same extensive set of Windows tools. Includes quick, easy tutorials that nicely bridge the gap between standard and object-oriented Rexx programming. Download from: **www.kilowattsoftware.com/**
NetRexx	Any JVM	A Rexx-like language that integrates with the Java environment. NetRexx uses Java classes and can be used to develop classes, applications, applets, servlets, and beans. Download from: **www-306.ibm.com/software/awdtools/netrexx/library.html**

Figure 4: To Get Further Information

OBJECT-ORIENTED REXX

Rexx joined the object-oriented revolution with the advent of IBM's Object Rexx interpreter a decade ago. IBM has since open-sourced this interpreter and turned over its enhancement and maintenance to the Rexx Language Association. Renamed "Open Object Rexx," or "ooRexx" for short, this product is a true super-set of classic Rexx. Any standard procedural Rexx program will run, without change, under Open Object Rexx.

ooRexx adds all the features of object-oriented programming to Rexx. These include single and multiple inheritance, classes and methods, data encapsulation, polymorphism, operator overloading, and a large class library. ooRexx runs under Windows, Linux, and Unix.

The fact that object-oriented Rexx is a super-set of classic Rexx means that if you know classic Rexx, you can immediately move into the object-oriented world.

A company named Kilowatt Software offers an alternative object-oriented free Rexx. Called roo!, this interpreter is also a true super-set of standard, classic Rexx. It offers the same features as Open Object Rexx, but is based on an entirely different class library and uses different syntax for object-oriented features. Those interested in object Rexx will want to check out both ooRexx and roo! to see which product best meets their needs. Figure 3 lists where to download the free object-oriented Rexx interpreters.

The fact that object-oriented Rexx is a super-set of classic Rexx means that if you know classic Rexx, you can immediately move into the object-oriented world. Use the object-oriented Rexx interpreters and program procedurally. Then add in object-oriented features as you learn them. Over time, at whatever pace suits you, you can leverage Rexx to transition to fully object-oriented programming. This is an ideal way for mainframe scripters to grow into object-oriented programming.

JAVA-COMPATIBLE REXX

As Java programming spread in the late 1990s, the inventor of Rexx, Michael Cowlishaw, saw another opportunity. Java brought key benefits to programmers, through its virtual machine technology and other

advances. But Java inherited a somewhat difficult C-like syntax. Could there be a better way?

The result was NetRexx, a variant of Rexx that brings Rexx's traditional ease of use to the Java environment. NetRexx reduces the number of lexical tokens versus Java source for a typical class by about 35% and it requires 20% fewer keystrokes. Yet, NetRexx uses all Java's classes, and can itself be used to create classes used by Java programs. You can create applications, applets, servlets, and beans in NetRexx. You can even use NetRexx to generate fully-commented Java code. NetRexx completely integrates into Java development.

NetRexx differs from all other Rexx interpreters in that it does not meet the ANSI 1996 Rexx standard. Unlike object-oriented Rexx, NetRexx is not an upwardly-compatible super-set of standard Rexx. NetRexx is best called a "Rexx-like" language. Those who know Rexx can switch to NetRexx quickly; like Rexx, NetRexx is easy to learn. Programs can be converted from classic Rexx to NetRexx by running an automatic "Rexx to NetRexx" conversion tool. Figure 3 lists the download site for free NetRexx.

GOING FORWARD

Since its definition twenty-five years ago, Rexx has grown and diversified. From its beginnings as one of the first scripting languages, Rexx has evolved into object-oriented and Java-compatible forms. These augment the original procedural language; they do not supplant it.

From its beginnings as one of the first scripting languages, Rexx has evolved into object-oriented and Java-compatible forms.

Today there are six free classic Rexx interpreters that run on nearly any platform and operating system. There are two free object-oriented Rexx interpreters and the Java-oriented NetRexx. Rexx is popular worldwide. Web forums discuss Rexx in many spoken languages including English, French, German, Russian, Japanese, and Turkish.

Figures 2 and 3 briefly profile the free Rexx interpreters and where you can download them. Since the interpreters are free, we urge you to download a couple for your platform and see which you prefer. Each has its strengths.

Figure 4 gives you pointers to further information. These include user groups, books, online forums, tutorials, and other resources. Like the Rexx interpreters and tools, these resources are either free or very inexpensive.

The open source revolution offers great value to IT organizations and computer professionals. It's led to the revival of one of the first and most powerful scripting languages. We hope you'll look into how you can leverage free Rexx.

NaSPA member Howard Fosdick authored the Rexx Programmer's Reference, a book that starts with an easy tutorial and then covers everything you'll want to know about Rexx, available at www.amazon.com/rexx.