

Open Object Rexx™

Release Notes

Version 4.1.0

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November 25, 2010

1. About The 4.1.0 Release

Open Object Rexx Version 4.1.0 is based on the previous version of ooRexx™ (4.0.1). Version 4.1.0 has both enhancements and bug fixes.

IMPORTANT: If you have a version of IBM Object Rexx™ installed on your system, you must remove it before starting with the installation of this package. The two packages, Object Rexx and ooRexx can not be installed side-by-side.

Note that a *true upgrade* type installation is not supported on any platform. If a previous version of ooRexx is installed, it must be completely uninstalled prior to installing 4.1.0. Failure to completely uninstall the previous version will produce unpredictable results. However, on Windows, a pseudo [update](#) type of install is provided with ooRexx 4.1.0 and later.

On a Unix-like system use the appropriate package manager to uninstall the previous version. For instance, on Linux with a rpm install, you could use the command:

```
rpm -iv ooRexx
```

to uninstall ooRexx. On a Debian-based system you should use the `-P` option of `dpkg` to uninstall ooRexx:

```
dpkg -P ooRexx
```

On Windows, when the installation program is started, the installer will recognize that a previous version is installed. It will then present an option to uninstall the previous version before proceeding with the 4.1.0 install. Alternatively, you can completely uninstall the previous version prior to starting the 4.1.0 installation.

1.1. New in this Release

This section lists the new features and enhancements introduced since Open Object Rexx 4.0.1.

You should refer to the CHANGES document accompanying the release for a complete list of the changes and bug fixes. In addition, there is a ReleaseNotes document that contains essentially the same information as this section, but in a text format. These documents are accessible from the *Notes* icon on the SourceForge download page for each ooRexx release. They are also included in the source code for ooRexx when SourceForge is not used.

1.1.1. All Platforms

The enhancements listed here are platform-independent and available on all supported platforms.

1.1.1.1. Builtin Classes

Enhancements to the built in classes have been made.

File Class

A new class, the File class has been added to the built in classes. It has the following methods:

- **Class methods:**

- isCaseSensitive
- listRoots
- pathSeparator
- separator

- **Instance methods:**

- absoluteFile
- absolutePath
- canRead
- canWrite
- compareTo
- delete
- exists
- hashCode
- init
- isCaseSensitive
- isDirectory
- isFile
- isHidden
- lastModified
- lastModified=
- length
- list
- listFiles
- makeDir
- makeDirs
- name

- parent
- parentFile
- path
- pathSeparator
- qualifiedPath
- renameTo
- separator
- setReadOnly
- string

New methods in DateTime

A new method, `toLocalTime()` has been added to the `DateTime` class.

1.1.1.2. Subcommand environment

A new subcommand environment, `Host Emulator (hostemu)`, has been added. This environment partially emulates a TSO/CMS environment.

1.1.1.3. Extension classes

The following classes have been added to the distribution. These are extension classes, not built in classes. A `requires` statement is needed to use them.

- `csvstream.cls`
- `mime.cls`
- `smtp.cls`
- `streamsocket.cls`

1.1.1.4. Documentation

Two new documentation books, *Open Object Rexx, Rexx Extensions Library Reference* and *Open Object Rexx, Unix Extensions Reference* have been added. These references are available in both PDF and HTML format, the same as other ooRexx documentation.

Both references are intended to document extensions to ooRexx, where the documentation is not big enough to warrant an individual book. The *Rexx Extensions* reference is for extensions available on all platforms, such as the `Host Emulator` or the `CVS Stream` class. The *Unix Extensions* reference is for extensions specific to Unix platforms. The new `rxunixsys` extension library is documented here.

1.1.2. Unix Platform

The Unix specific enhancements consist of a major new extension library.

1.1.2.1. rxunixsys

rxunixsys is a new extension of external functions specific to unix-like operating systems. To use these functions add a `requires` directive to your program.

```
::requires 'rxunixsys' LIBRARY
```

These functions are included in the library:

- SysAccess
- SysChmod
- SysChown
- SysChroot
- SysCrypt
- SysEuidaccess
- SysGetdirlist
- SysGetegid
- SysGeterrno
- SysGeterrnomsg
- SysGeteuid
- SysGetgid
- SysGetgrgid
- SysGetgrnam
- SysGethostname
- SysGetpgrp
- SysGetpid
- SysGetppid
- SysGetpwnam
- SysGetpwuid
- SysGetservbyname
- SysGetservbyport
- SysGetsid
- SysGetsizeofptr
- SysGettid

- SysGettzname1
- SysGettzname2
- SysGetuid
- SysGetxattr
- SysLchown
- SysLink
- SysListxattr
- SysMkdir
- SysRemovexattr
- SysRmdir
- SysSetegid
- SysSeteuid
- SysSetgid
- SysSetpgid
- SysSetpgrp
- SysSetsid
- SysSetuid
- SysSetxattr
- SysSignal
- SysStat
- SysSymlink
- SysUmask
- SysUname
- SysWordexp

1.1.3. Windows Platform

A few Windows specific enhancements have been made, mostly to the installation program.

1.1.3.1. Installation Program

The Windows installer has been rewritten to address some annoyances.

1.1.3.1.1. Major Changes

1. There is a new 'type' of install ('upgrade'). The upgrade installation is only active if there is a previous version of ooRexx installed.

An upgrade removes only the files from the previous version and installs the files for the current version. It does not change any of the existing registry or environment settings. They stay exactly the same.

Since the uninstaller is written at the time of installation, the upgrade install is only available if the version of the uninstaller is 4.1.0 or later. What this means in practice is, the first time you install a 4.1.0 ooRexx, the upgrade install will not be available because the previous installation wrote an uninstaller that does not understand the upgrade type.

When you do an upgrade install you can not change any of the settings from the previous install. I.e., if you installed in C:\MyCrummyDirectory\ooRexx then the upgrade also installs in that directory. If you installed rxapi as a service in the previous install, then it remains installed as a service. Etc., etc..

2. The installation lets associate file extensions with the ooRexx executables. Default values are :

Table 1. Default file associations

Executable	Extension	ftype (File type)
rex.exe	.rex	RexScript
rexhide.exe	.rexg	RexHide
rexspaws.exe	.rexp	RexPaws

3. A 'Send To' item can be defined for rex.exe, rexhide.exe and rexspaws.exe.
4. An editor for the Edit context menu item can be defined (the same editor is used for all ooRexx file types.)

1.1.3.1.2. Minor Changes

1. Rather than put up a message box about stopping rxapi, a page is displayed. That way there is more room to explain why rxapi needs to be stopped. If the user elects to not stop rxapi, the installer quits.
2. The message box popup with the question about uninstalling the previous version is turned into a page. This makes it easier to insist that the user uninstall the previous version and explain that if she chooses not to uninstall the previous version it is likely to cause problems and that we won't support that. It is made more difficult for the user to not uninstall a previous version, there is a second check box that has to be manually checked.
3. During the uninstall, the user is given the option of uninstalling by simply deleting the installation directory or only deleting the files placed there by the installer using the log file. Using the log file is the default. Uninstalling by deleting the whole installation directory is generally faster than using the install log.
4. The installation user interface is meant to be more modern, meant to explain better to some one new to the install of ooRexx on Windows what they should do and why, and meant to allow some one used to installing a quicker uninstall / install cycle.

1.1.3.2. ooDialog

New method. The `setIcon()` method has been added to the `Image` class.

New sample The `samples\oodialog\examples\columnclicklistview.rex` example program has been added.

2. Windows Requirements, Installation and Configuration

2.1. Hardware Requirements

In reality, there are no special hardware requirements for ooRexx on Windows. Any system capable of running Windows 2000 is sufficient to install ooRexx.

- Approximately 38 MB free disk space is needed for a complete installation.
- 8 MB free disk space for the core interpreter.
- 22 MB free disk space for online documentation.
- 7 MB free disk space for all samples.
- 1 MB free disk space for the API headers and libraries.
- IBM-compatible, Pentium or AMD processor, or higher. Both 32-bit and 64-bit processors are supported.

2.2. Software Requirements

- Windows 2000
- Windows Server 2003
- Windows XP
- Windows Vista
- Windows Server 2008
- Windows 7

ooRexx version 4.1.0 is not supported on Windows prior to Windows 2000. There is no known reason why this version of ooRexx will not work on Windows NT(R) 4.0, but it has not been tested. Likewise, ooRexx may work on Windows 98 or Windows Me, but it has not been tested and there is no support for it.

2.3. Installation and Configuration Information

2.3.1. Pre-installation Notes

Open Object Rexx cannot coexist with IBM Object REXX, or other versions of ooRexx. If IBM Object REXX is installed on the system you must first uninstall it.

If a previous version of ooRexx is installed, it *must* be uninstalled. If two different versions of ooRexx are installed on the same system, the results are not predictable and the interpreter will *not* work correctly.

However, beginning with ooRexx 4.1.0, a type of [update](#) install is supported. Technically, this is not a true update install because: rxapi must be stopped, all files from the previous installation are deleted. This type of install will preserve the current ooRexx registry settings, path entry, etc.

A previous version of ooRexx can be [uninstalled](#) before starting the new installation. However, the uninstall does not have to be done as a separate step. When the installation program is started it will detect a previous version of ooRexx and offer to uninstall it at that time. Note that an *update* type of install can **not** be done if the previous version of ooRexx has been uninstalled in a separate step. The update install must be initiated through the installation program and is not available if there is no previous version of ooRexx installed.

rxapi is an important part of ooRexx that runs as a daemon process. The installation program offers the option of installing rxapi as a Windows Service. Unless you are a knowledgeable user, with a good reason not to, you should elect to install rxapi as a Windows Service.

ooRexx should be installed by a user with administrator rights. On Vista and later this is a requirement. It is also a requirement in order to install rxapi as a service. In addition, there are installations steps that are done to better integrate ooRexx into the operating system. Some of these steps can only be performed with administrator rights.

It is important that if ooRexx is installed by a user with administrator rights, that ooRexx is uninstalled by a user with administrator rights. Otherwise, the installation steps described above, including removal of rxapi as a service, will not be undone when ooRexx is uninstalled.

Note: On Vista and later when a user starts the installation program, the user is prompted for an administrator password to continue. It is not necessary to actually be logged in as administrator when the installation is started.

ooRexx is compiled both as 32-bit application and as a native 64-bit application. The native 64-bit application can not be installed on a 32-bit version of Windows. Either the 32-bit or the 64-bit ooRexx can be installed on a 64-bit version of Windows. However, to take full advantage of both the operating system and ooRexx, the user should install the 64-bit version of ooRexx on a 64-bit version of Windows. The installation programs for the two types of ooRexx are clearly labeled: ooRexx-4.1.0.i586.exe and ooRexx-4.1.0.x86_64.exe.

2.3.2. Running the Installation Program on Windows

Before starting the installation, review the [pre-installation](#) notes if you have not already done so.

The ooRexx installation program is a typical Windows installation program. Download the appropriate installation program, 32-bit or 64-bit. From Windows Explorer double-click the installation package: ooRexx-4.1.0.i586.exe or ooRexx-4.1.0.x86_64.exe. Follow the prompts in the installation dialog. Naturally, the program can also be run from a console window by typing the executable name at the command prompt.

A running rxapi process. If a previous version of ooRexx is installed and the rxapi daemon process is running, the user will be prompted to halt the process. The process *must* be halted to properly install the new version. If necessary, (because a Rexx program is running in the background and you are worried about possible data loss,) cancel the installation and take the appropriate steps to halt the process cleanly. Because it is known that running the installation without stopping rxapi will cause problems, the installer will not execute if rxapi is not stopped.

Update install. Beginning in ooRexx 4.1.0, an *update* type of install is available. This type of install preserves the current ooRexx options that are used to integrate ooRexx into the operating system. It is important to realize that the uninstall program is written at the time of installation. Therefore, if the installed ooRexx is a version prior to 4.1.0, the upgrade type of install is not available. However, once a 4.1.0, or later, version of ooRexx is installed, the upgrade type of install is then available going forward.

The upgrade type of install is dependent on a version of ooRexx being currently installed. If the current version of ooRexx is uninstalled as a separate step, the upgrade install will no longer be available. The upgrade install must be initiated from within the install program. After the first introductory pages of the installation dialog, a page with the option to uninstall the previous version of ooRexx will appear. Select to uninstall the previous version. The upgrade option is presented on the next page.

When the upgrade install is used, the ooRexx options currently in effect can not be changed. When the upgrade option is selected, a second option to do a *quick* upgrade is presented. During a regular upgrade installation, the dialog pages for the installation options are displayed, but the dialog controls are disabled. This way the options in effect can be reviewed, but not changed. During a quick upgrade, these pages are not displayed at all.

Installation options. The installation program can, and normally does, add a number of items that better integrate ooRexx into the operating system. In ooRexx 4.1.0 and later versions of ooRexx, the user is given more flexibility and choice in how, or if, these items are done. The options are presented during installation using several pages in the dialog. In general the options require that the installation is performed using administrative privileges. The option pages and some general recommendations follow:

1. **Uninstall previous version.** This page only appears if a previously installed version of ooRexx is detected. Select to uninstall the previous version.
2. **Perform an upgrade install.** The page only appears if the upgrade install is available. Selection depends upon the user preference. If selected, the option to do a quick upgrade is also presented.
3. **Components to install.** Select which components to install. Since the individual components use up little disk space all the components are normally installed.
4. **Installation directory.** ooRexx can be installed wherever the user chooses. This is a matter of personal preference.
5. **Install rxapi as a Windows Service.** It is highly recommended that rxapi be installed as a service.
6. **Create file associations.** Individual file associations can be created for each of the executables: rexx, rexxhide, and rexxpaws. When selected, pages are presented to customize the file associations.

If not selected, no file associations will be created. Normally on Windows a file association is created for rexx and it is recommended that creating file associations be selected.

7. **Install rxapi as a Windows Service.** It is highly recommended that rxapi be installed as a service.
8. **Create file associations.** Individual file associations can be created for each of the executables: rexx, rexxhide, and rexxpaws. When selected, pages are presented to customize the file associations. If not selected, no file associations will be created. Normally on Windows a file association is created for rexx and it is recommended that creating file associations be selected.
9. **Create send to items.** Send to items allow the user to right click on a Rexx program file in Windows explorer and *send* it to one of the Rexx executables. The Rexx executable then runs the program. Some users may prefer send to items over than file associations. Both send to items and file associations can be created, it is not an either or choice.
10. **Create rexx.exe file association.** This page only appears when the user has selected to create file associations. This page also allows the user to pick an editor to associate with the file types selected for file associations. The same editor is used for all of the Rexx file associations.

The user can specify both the file extension and the file type name for the association. Normally a file association for rexx.exe is created using an extension of .rex and a file type name of RexxScript. It is suggested that the user stick with this.
11. **Create rexxhide.exe and rexxpaws file association.** This page only appears when the user has selected to create file associations. The user can specify both the file extension and the file type name for the either association. These options have not been available in the past, so there is no real convention here. The text on the page offers some suggested extensions and file type names. They should be treated as suggestions only.

Unattended installation. The Windows installation program can be run from the command line with no user input. This is done by using the /S option. Note that in this mode default values are used for all options other than the installation directory. In addition, the *upgrade* installation is not currently integrated into a silent install and is therefore unavailable.

This mode can be used to script automatic installs or multiple installs on different machines. From a script, or from the command line, enter the installation program name followed by the /S parameter, and the /D parameter if the default installation directory should be changed:

/S : Silent mode

This will install ooRexx without any user intervention using default values for all options.

/D : Default directory

The default installation directory, (C:\Program Files\ooRexx), can be changed using this switch.

This must be the last parameter used in the command line and must not contain any quotes, even if the path contains spaces. For example:

```
ooRexx-4.1.0.x86_64.exe /S /D=C:\Program Files\Interpreters\ooRexx
```

2.3.3. Windows Uninstallation Information

From the Control Panel select “Add Remove Programs”, then select “Open Object Rexx for Windows” and select “Remove”.

Alternatively, the ooRexx installation places a menu item in the program folder that can be used to uninstall. Select “Start->All Programs->Open Object Rexx->Uninstall ooRexx”. This is functionally equivalent to using “Add Remove Programs”.

2.4. Running Open Object Rexx as a Child Process of a Service on Windows

`rxapi` in its role as the memory manager for ooRexx can share out some resources among all the ooRexx processes to enable global functions, system exits, subcommand handlers, and global queues. If you start ooRexx from a service, two or more processes might run under different user accounts. Therefore it is required that the memory manager is not protected and can be accessed by every user. This means that ooRexx global data is system global and unsecured.

Note that starting ooRexx from a service is different than installing `rxapi` as a service.

If you want ooRexx to be started from a service, ooRexx must be installed as a common program or you must modify the system path manually to include the directory where ooRexx has been installed.

If you are writing a service that calls `RexxStart()`, ensure that the `SERVICE_INTERACTIVE_PROCESS` flag is set for your service. To prevent access violations, use a NULL security descriptor and assign it to your service process.

2.5. Open Object Rexx and Other Rexx Interpreters

If you have other Rexx interpreters installed, you may have to set the PATH manually because ooRexx and the other Rexx interpreters may both use the name “`rex`” for invoking the interpreter. Interpreter error messages that begin with “`Rexx:` ” indicate that another Rexx interpreter was called instead of ooRexx. You can verify which Rexx interpreter is running either by the form of the error messages, by running `rextry.r` and executing `SAY VERSION`, or by invoking `rex /V`, which then should display information about the Rexx interpreter that is invoked. If no information is displayed, it is not ooRexx. If you don’t want the other Rexx interpreter to be invoked, you should remove it from the PATH, delete it, or rename `rex.exe` in the installation directory to `orx.exe` and use `orx` to invoke the interpreter.

2.6. Exploring Open Object Rexx

Once you have installed the ooRexx files you can run Rexx scripts by issuing the command `rex` followed by the name of your Rexx script at the command prompt. In addition, if you installed ooRexx as recommended, a file type has been associated with the `.rex` extension which allows you to just type the name of your script, without the extension, to run it. For example, if your program was named `addressBook.r`, the file association will allow you to execute the program as follows:

```
C:\work.ooRexx>addressBook
```

An execution of the program might look like this:

```
C:\work.ooRexx>addressBook
```

```
ooRexx Address Lookup, version 1.1.0
  Look up address for: gatch
```

```
Tom Gatch
3245 Westfield Dr
Mission Bay CA 92110
```

```
  Look up another address? [y/n] n
```

```
C:\work.ooRexx>
```

To interactively try Object Rexx statements, enter `rexx rexxtry.rex` on the command line. Enter `exit` to end the program.

To help you explore programming in Open Object Rexx, the following generic sample programs are provided:

```
ccreply.rex
```

```
    concurrent program using REPLY
```

```
complex.rex
```

```
    complex number class
```

```
drives.rex
```

```
    demonstrates the usage of Sys functions
```

```
factor.rex
```

```
    factorial program
```

```
greply.rex
```

```
    concurrent program using WAIT and NOWAIT
```

```
guess.rex
```

```
    a guessing game
```

```
ktguard.rex
```

```
    concurrent program using START and GUARD
```

```
makestring.rex
```

```
    demonstrated the usage of the makestring method
```

```
month.rex
```

```
    displays a calendar for the month of January
```

```
philfork.rex
```

```
    program that demonstrates Open Object Rexx concurrency
```

`pipe.rex`

a pipeline implementation

`properties.rex`

shows usage of the `.Properties` class and some `Sys` functions

`qdate.rex`

date query program

`qtime.rex`

time query program

`rexxcps.rex`

measures Rexx performance

`scclient.rex` `scserver.rex`

a client / server demonstration using the `.Socket` class from `socket.cls`

`semcls.rex`

semaphore class

`sfclient.rex` `sfserver.rex`

a client / server demonstration using the external `rxsock` library

`stack.rex`

program that uses a stack class

`usecomp.rex`

program that uses the complex number class (see note below)

`usepipe.rex`

program that uses the pipeline implementation (see note below)

Note: To run these programs, you must either add the `samples` directory to the `PATH` or execute them directly from the `samples` directory.

To help you explore using the Windows `WinSystem.cls`, the following sample programs are provided:

`deskicon.rex`

`AddDesktopIcon` method of the `WindowsProgramManager` class

`desktop.rex`

uses the `WindowsProgramManager` class

`displayAnyMenu.rex`

Displays the menu hierarchy for a window that the user picks. The example uses a mixture of `ooDialog` and `WinSystem`.

`displayWindowTree.rex`

Allows the user to pick an open top-level window and then displays the window hierarchy for that window. The program uses both `ooDialog` and `WinSystem` classes.

`eventlog.rex`

uses the `WindowsEventLog` class

`getTheWindow.rex`

This example shows how to find a window without using the exact window title.

`menuCalc.rec`

Uses the `MenuObject` class to display the menu hierarchy of the Windows Calculator application. The menu hierarchy for both the Calculator's standard view and its scientific view are printed to the console.

`menuNotepad.rex`

Uses the `MenuObject` class to displays the hierarchy of the Notepad menu.

`quickCalc.rex`

Demonstrates how to control an application programmatically using the `winsystem` classes. Does some simple calculations using the Windows Calculator application. This program is similar to `userwmgr.rex` but more simple to better show what is going on.

`quickShowAllMenus.rex`

Uses the `windowsSystem.frm` package to print out a menu outline of every open window that has a menu.

`registry.rex`

uses the `WindowsRegistry` class

`usewmgr.rex`

program that uses the `WindowsManager` class

`windowsSystem.frm`

A collection of public routines and classes to help work with the `winsystem.cls` package. This is an example of how to extract common function into a package, and then use the package to help in writing similar programs. A number of the sample programs that use `winsystem.cls` make use of this framework.

`writeWithNotepad.rex`

Uses classes in `winsystem.cls` to automate the Windows Notepad application. This is a subset of the `usewmgr.rex` program designed to be a little easier to understand.

The directory `samples\ole\` and its subdirectories contain a number of samples for the ooRexx OLE / ActiveX interface. The sample programs contain comments to help with learning to use the `OLEObject` class.

The `samples\oodialog` and its subdirectories contain a relatively large number of example programs that demonstrate the use of `OODialog`. A subset of these examples can be launched from the ooRexx Program folder in the Start Menu. “Start->All Programs->Open Object Rexx->ooRexx Samples->oodialog”

There are several examples provided to help with programming external function libraries using the ooRexx native API. These samples are located under the `samples\api` directory, along with two read me files:

- `sample\api\readme.txt`
- `sample\api\callrxnt`
- `sample\api\callrxwn`
- `sample\api\rexsexit`
- `sample\api\wpipe`
- `sample\api\wpipe\readme.txt`

Several of the API samples can be launched from the ooRexx Program folder in the Start Menu. “Start->All Programs->Open Object Rexx->ooRexx Samples->API”

3. Unix-Like (AIX, Linux, etc.,) Requirements, Installation and Configuration

3.1. Hardware Requirements

- 12 MB free disk space for the program (20 MB for AIX)
- 13.5 MB free disk space for online documentation
- IBM-compatible, Pentium or AMD processor, or higher, for an x86 32-bit or 64-bit platform.
- Any system capable of running AIX 5L 5.2/5.3 or AIX 6.1 for an AIX platform.
- Sparc processor for a SUN Solaris (Sparc) platform.

3.2. Software Requirements

- **Linux**
 - Linux ELF system (i386 or x86_64.) Linux kernel version 2.4.1 or higher, with support for System V IPC.
 - Linux PPC system. Linux kernel version 2.4.1 or higher, with support for System V IPC.
- **AIX**
 - AIX 5L 5.2 TL10 and up.
 - AIX 5L 5.3 TL7 and up.
 - AIX 6.1 TL1 and up.
- **Solaris**
 - Solaris V2.8 or higher.

3.3. Installation and Configuration Information

This new version of Open Object REXX cannot coexist with a previous installed version of Open Object REXX or IBM Object REXX on your system. If you have previously installed IBM Object REXX or Open Object REXX, you must first deinstall that program.

3.3.1. Installation/Removal of the RPM Package

Note: The installation of Open Object REXX requires that all steps be run with root authority.

To install the rpm package, use your rpm package manager. Refer to your package manager for further information. The package manager adds orexx to your local rpm-database. Select the appropriate package for your system. Although the 32-bit version of ooRexx can be installed on some 64-bit Linux distributions it is recommended that the 64-bit version of ooRexx be installed on all 64-bit Linux systems.

There may be several rpm packages available. Each package name will indicate the processor architecture (i386, x86_64, ppc, etc.,) it is intended for, and the Linux distribution it was built on. In general, the Linux distribution the package was compiled on does not make a difference. The ooRexx rpm will install on any Linux system that supports rpms. However, sometimes, because of the libraries present on a system, the ooRexx rpm will not install. For instance, the Fedora Core 10 rpm may not install on a SuSE 9.3 system. Because of this, when resources are available, the ooRexx project will make available rpm packages built for older Linux distributions.

To install with the command line rpm package manager, a typical command line might be:

```
rpm -i ooRexx-4.1.0-1.i386.fedora10.rpm
```


or

```
rpm -i ooRexx-4.1.0-1.x86_64.fedora10.rpm
```

Open Object Rexx is installed in the directory `/opt/ooRexx`. Links are created in `/usr/lib` and `/usr/bin` for the ooRexx shared libraries and executables respectively. Additional links are created in `/usr/include` for the native API header files.

Use the rpm package manager to remove ooRexx from the system. The command line rpm can also be used to remove the package from the system. The command to enter is:

```
rpm -e ooRexx
```

3.3.2. Installation/Removal of the DEB Package

Note: The installation of Open Object Rexx requires that all steps be run with root authority.

Debian based Linux distributions (Kubuntu, Ubuntu, etc.,) use the debian package manager. If you use one of the ... refer to the documentation for that tool. On the other hand, ooRexx installs easily from the command line. Use the following command to install a .deb package from the command line:

```
dpkg -i <packageFile>
```

For example:

```
tom@Loon:~/downloads$ dpkg -i ooRexx-4.1.0-1.i386.kubuntu810.deb
```

Open Object Rexx is installed in the directory `/opt/ooRexx`.

The command `dpkg --purge` is used to remove ooRexx from the system. For example:

```
tom@Loon:/$ dpkg --purged ooRexx
```

Or, use the same package manager you used to install to remove ooRexx from a debian based system.

3.3.3. Detailed Installation/Removal Information for AIX

Installation location

This build is installed in `/opt/ooRexx`.

The following links are created from `/opt/ooRexx/bin` to `/usr/bin`:

```
/usr/bin/rexx
/usr/bin/rexx.img
/usr/bin/rxftp.cls
/usr/bin/rxregexp.cls
```

```
/usr/bin/socket.cls  
/usr/bin/rxapi  
/usr/bin/ooorexx-config  
/usr/bin/rexxc  
/usr/bin/rxqueue  
/usr/bin/rxsubcom  
/usr/bin/rexximage
```

Required xIC.rte runtime level

xIC runtime 9.0.0.9 or higher

This runtime is contained in the April 2009 XL C/C++ Enterprise Edition V8.0 for AIX PTF.

IBM support ([http://www-](http://www-01.ibm.com/support/docview.wss?rs=2239&context=SSJT9L&dc=D400&uid=swg24022586&loc=en_US&cs=en&&lang=en)

[01.ibm.com/support/docview.wss?rs=2239&context=SSJT9L&dc=D400&uid=swg24022586&loc=en_US&cs=en&&lang=en](http://www-01.ibm.com/support/docview.wss?rs=2239&context=SSJT9L&dc=D400&uid=swg24022586&loc=en_US&cs=en&&lang=en))

xIC runtime 10.1 or higher

This runtime is contained in the January 2009 IBM C++ Runtime Environment Components

for AIX. *IBM support* ([http://www-](http://www-01.ibm.com/support/docview.wss&rs=2239&context=SSJT9L&dc=D400&uid=swg24022049&loc=en_US&cs=en&&lang=en)

[01.ibm.com/support/docview.wss&rs=2239&context=SSJT9L&dc=D400&uid=swg24022049&loc=en_US&cs=en&&lang=en](http://www-01.ibm.com/support/docview.wss&rs=2239&context=SSJT9L&dc=D400&uid=swg24022049&loc=en_US&cs=en&&lang=en))

Installed services

The ooRexx 4.1.0.0 LPP will install the `rxapi` daemon. This package integrates seamlessly into the AIX SRC (System Resource Controller). The daemon is started automatically after the installation. The daemon will be started upon system boot via an entry in `/etc/inittab`.

Comments

If you have any comments or questions please do not hesitate to ask. See the [Getting Help](#) sections for places to ask questions. The AIX maintainer can be reached by posting questions to [The Developer Mailing List](#).

To install the LPP package, use `smitty`.

```
smitty  
-> Software Installation and Maintenance  
-> Install and Update Software  
-> Install Software
```

To remove the LPP package, use `smitty`.

```
smitty  
-> Software Installation and Maintenance  
-> Software Maintenance and Utilities  
-> Remove Installed Software
```

3.3.4. Configuration

There is nothing to configure for a Unix/Linux installation.

3.3.5. Open Object Rexx and Other Rexx Interpreters

If you have other Rexx interpreters installed, you may have to set the PATH manually because Open Object Rexx and the other Rexx interpreters may both use the name "rexx" for invoking the interpreter. Interpreter error messages that begin with "Rexx: " indicate that another Rexx interpreter was called instead of Open Object Rexx. You can verify which Rexx interpreter is running either by the form of the error messages, by running `rexxtry` and executing `SAY VERSION`, or by invoking `rexx -v`, which then should display information about the Rexx interpreter that is invoked. If no information is displayed, it is not Open Object Rexx. If you don't want the other Rexx interpreter to be invoked, you should remove it from the PATH, delete it, or rename the `rexx` binary in the `/usr/bin` directory to `orx` and use `orx` to invoke the interpreter.

3.3.6. Exploring Open Object Rexx for Unix/Linux

Once you have installed the Open Object Rexx files you can run Rexx scripts by issuing the command `rexx` followed by the name of your script at the command prompt. To interactively try Rexx statements, from a command prompt type `rexx rexxtry`. Enter `exit` to end the program.

To help you explore programming in Open Object Rexx, the following sample programs are provided in the `/opt/ooRexx/share/ooRexx`:

`ccreply.rex`

concurrent program using `REPLY`

`complex.rex`

complex number class

`factor.rex`

factorial program

`greply.rex`

concurrent program using `WAIT` and `NOWAIT`

`guess.rex`

a guessing game

`ktguard.rex`

concurrent program using `START` and `GUARD`

`makestring.rex`

demonstrated the usage of the `makestring` method

`month.rex`

displays a calendar for the month of January

`pipe.rex`

a pipeline implementation

`properties.rex`

shows usage of the `.Properties` class and some `Sys` functions

`qdate.rex`

date query program

`qtime.rex`

time query program

`rexxcps.rex`

measures Rexx clauses per second

`rexxtry.rex`

interactively try out Rexx statements

`scclient.rex` `scserver.rex`

a client / server demonstration using the `.Socket` class from `socket.cls`

`semcls.rex`

implements a semaphore class on ooRexx

`sfclient.rex` `sfserver.rex`

a client / server demonstration using the external `rxsock` library

`stack.rex`

program that uses a stack class

`usecomp.rex`

program that uses the complex number class

`usepipe.rex`

program that uses the pipeline implementation

Note: To run these programs, you must either add the `/opt/ooRexx/share/ooRexx` directory to the `PATH` or execute them directly from the `/opt/ooRexx/share/ooRexx` directory.

3.4. The rxapi Daemon Process

Part of ooRexx is rxapi which is a daemon process that manages all data that can persist across interpreter invocations or is used for cross-process communications. The rxapi process manages the Rexx data queues, the macrospace, and all of the external function, subcommand handler and exit registrations.

In ooRexx 4.0.0 and later versions, the interpreter and rxapi communicate through a socket interface. In versions prior to 4.0.0, the communication was through shared memory.

Ideally, rxapi should run as a service. When you install ooRexx from a package on Linux, rxapi will be set up to run as a system service. When installing the Windows package, the default is to install rxapi as a Windows service. In this scenario, the operating system will start the rxapi daemon on boot up and shut the daemon down when the system is halted.

If rxapi is not installed as a service, the first time the interpreter executes, and needs the function provided by rxapi, the interpreter will start the daemon process. Once started, the rxapi process will continue to run until the system is halted.

There is little or no point in stopping the rxapi process once it is started. **Be aware** that if you do stop the rxapi process, all queues, all registered subcommand handlers, system exits, and external functions, and the macrospace, disappear.

When rxapi is installed as a service, it can be started and stopped by the user, if the user has the proper authority, in the same manner as other services. On Windows, the services manager can be used to start or stop rxapi. Or, from the command line, net stop or net start can also be used:

```
C:\work.ooRexx>net stop rxapi
The RXAPI service is stopping.
The RXAPI service was stopped successfully.
```

```
C:\work.ooRexx>net start rxapi

The RXAPI service was started successfully.
```

```
C:\work.ooRexx>
```

On Linux, the following can be used from the command line:

```
[root@Falcon work.ooRexx]# /etc/init.d/rxapid stop
Stopping rxapi: [ OK ]
[root@Falcon work.ooRexx]# /etc/init.d/rxapid start
Starting rxapi: [ OK ]
[root@Falcon work.ooRexx]#
```

It is likely that your installation of Linux also has a graphical means of starting or stopping services.

On AIX, the following can be used from the command line:

```
[root@myhost]# stopsrc -s rxapi
0513-044 The rxapi Subsystem was requested to stop.
[root@myhost]# startsrc -s rxapi
0513-059 The rxapi Subsystem has been started. Subsystem PID is 1134614.
[root@myhost]# lssrc -s rxapi
```

Subsystem	Group	PID	Status
rxapi		1134614	active

[root@Falcon work.ooRexx]#

If rxapi is not installed as a service, it can be stopped by using an appropriate process killer for your platform. Typically the Task Manager on Windows and kill on a unix-like system.

3.5. Known Limitations, Problems and Workarounds

- The global directory .environment is process local, not global to the system.
- Under Unix/Linux only piped "|" input and redirected output(">") can be evaluated by Open Object Rexx. Redirected input("<") can not be evaluated.

3.6. Documentation

All documentation is contained in PDF files and zipped HTML package files and is available online at <http://www.ooRexx.org/docs.html>.

The following documents are available:

rexxref.pdf

This is the *Open Object Rexx: Reference*.

rexxpg.pdf

This is the *Open Object Rexx: Programming Guide*.

rexxextensions.pdf

This is the *Open Object Rexx: Rexx Extensions Library Reference*.

winextensions.pdf

This is the *Open Object Rexx: Windows Extensions Reference*.

unixextensions.pdf

This is the *Open Object Rexx: Unix Extensions Reference*.

oodialog.pdf

This is the *Open Object Rexx: Windows OODialog Reference*.

rxsock.pdf

This is the *Open Object Rexx: TCP/IP Socket Library Functions Reference*.

rxftp.pdf

This is the *Open Object Rexx: FTP Class Library Reference*.

rxmath.pdf

This is the *Open Object Rexx: Mathematical Functions Reference*.

readme.pdf

This document is in PDF and HTML format.

3.7. Getting Help

The Open Object Rexx Project has a number of methods to obtain help for ooRexx. These methods, in no particular order of preference, are listed below.

3.7.1. The Rexx Language Association Mailing List

The *Rexx Language Association* (<http://www.rexxla.org/>) maintains a mailing list for its members. This mailing list is only available to RexxLA members thus you will need to join RexxLA in order to get on the list. The dues for RexxLA membership are small and are charged on a yearly basis. For details on joining RexxLA please refer to the *RexxLA Home Page* (<http://rexxla.org/>) or the *RexxLA Membership Application* (<http://www.rexxla.org/rexxla/join.html>) page.

3.7.2. The Open Object Rexx SourceForge Site

The Open Object Rexx Project (<http://www.oorexx.org/>) utilizes *SourceForge* (<http://sourceforge.net/>) to house the *ooRexx Project* (<http://sourceforge.net/projects/oorexx>) source repositories, mailing lists and other project features. Here is a list of some of the most useful facilities.

The ooRexx Forums

The ooRexx project maintains a set of forums that anyone may contribute to or monitor. They are located on the *ooRexx Forums* (http://sourceforge.net/forum/?group_id=119701) page. There are currently three forums available: Help, Developers and Open Discussion. In addition, you can monitor the forums via email.

The Developer Mailing List

You can subscribe to the oorexx-devel mailing list at *ooRexx Mailing List Subscriptions* (http://sourceforge.net/mail/?group_id=119701) page. This list is for discussing ooRexx project development activities and future interpreter enhancements. It also supports a historical archive of past messages.

The Users Mailing List

You can subscribe to the oorexx-users mailing list at *ooRexx Mailing List Subscriptions* (http://sourceforge.net/mail/?group_id=119701) page. This list is for discussing using ooRexx. It also supports a historical archive of past messages.

The Announcements Mailing List

You can subscribe to the oorexx-announce mailing list at *ooRexx Mailing List Subscriptions* (http://sourceforge.net/mail/?group_id=119701) page. This list is only used to announce significant ooRexx project events.

The Bug Mailing List

You can subscribe to the oorexx-bugs mailing list at *ooRexx Mailing List Subscriptions* (http://sourceforge.net/mail/?group_id=119701) page. This list is only used for monitoring changes to the ooRexx bug tracking system.

Bug Reports

You can create a bug report at *ooRexx Bug Report* (http://sourceforge.net/tracker/?group_id=119701&atid=684730) page. Please try to provide as much information in the bug report as possible so that the developers can determine the problem as quickly as possible. Sample programs that can reproduce your problem will make it easier to debug reported problems.

Request For Enhancement

You can suggest ooRexx features at the *ooRexx Feature Requests* (http://sourceforge.net/tracker/?group_id=119701&atid=684733) page.

Patch Reports

If you create an enhancement patch for ooRexx please post the patch using the *ooRexx Patch Report* (http://sourceforge.net/tracker/?group_id=119701&atid=684732) page. Please provide as much information in the patch report as possible so that the developers can evaluate the enhancement as quickly as possible.

Please do not post bug patches here, instead you should open a bug report and attach the patch to it.

3.7.3. comp.lang.rexx Newsgroup

The comp.lang.rexx (news:comp.lang.rexx) newsgroup is a good place to obtain help from many individuals within the Rexx community. You can obtain help on Open Object Rexx or on any number of other Rexx interpreters and tools.

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