ooRexx Documentation 5.0.0

Open Object Rexx

ooRexx Build Machine

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Preface

This book describes the Open Object Rexx release build machine environment.

This book is intended to document the release and build environment for ooRexx. It is a complete description of the build machine environment as well as a user guide to building ooRexx releases using the build machine.

1. Document Conventions

This manual uses several conventions to highlight certain words and phrases and draw attention to specific pieces of information.

1.1. Typographic Conventions

Typographic conventions are used to call attention to specific words and phrases. These conventions, and the circumstances they apply to, are as follows.

`Mono-spaced Bold` is used to highlight literal strings, class names, or inline code examples. For example:

> The **`Class`** class comparison methods return **`.true`** or **`.false`**, the result of performing the comparison operation.

> This method is exactly equivalent to **`subWord(`**_n_**`, 1)`**.

`Mono-spaced Normal` denotes method names or source code in program listings set off as separate examples.

> This method has no effect on the action of any `hasEntry`, `hasIndex`, `items`, `remove`, or `supplier` message sent to the collection.

```
-- reverse an array
a = .Array~of("one", "two", "three", "four", "five")

-- five, four, three, two, one
aReverse = .CircularQueue~new(a~size)~appendAll(a)~makeArray("lifo")
```

Proportional Italic is used for method and function variables and arguments.

> A supplier loop specifies one or two control variables, _index_, and _item_, which receive a different value on each repetition of the loop.

> Returns a string of length _length_ with _string_ centered in it and with _pad_ characters added as necessary to make up length.

1.2. Notes and Warnings

Finally, we use three visual styles to draw attention to information that might otherwise be overlooked.

> **Note**
>
> Notes are tips, shortcuts or alternative approaches to the task at hand. Ignoring a note should have no negative consequences, but you might miss out on a trick that makes your life easier.

> **Important**
>
> Important boxes detail things that are easily missed, like mandatory initialization. Ignoring a box labeled 'Important' will not cause data loss but may cause irritation and frustration.

> **Warning**
>
> Warnings should not be ignored. Ignoring warnings will most likely cause data loss.

2. Getting Help and Submitting Feedback

The Open Object Rexx Project has a number of methods to obtain help and submit feedback for ooRexx and the extension packages that are part of ooRexx. These methods, in no particular order of preference, are listed below.

2.1. The Open Object Rexx SourceForge Site

The *Open Object Rexx Project*[1] utilizes *SourceForge*[2] to house the *ooRexx Project*[3] source repositories, mailing lists and other project features. Over time it has become apparent that the Developer and User mailing lists are better tools for carrying on discussions concerning ooRexx and that the Forums provided by SourceForge are cumbersome to use. The ooRexx user is most likely to get timely replies from one of the mailing lists.

Here is a list of some of the most useful facilities provided by SourceForge.

The Developer Mailing List
> You can subscribe to the oorexx-devel mailing list at *ooRexx Mailing List Subscriptions*[4] 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*[5] page. This list is for discussing using ooRexx. It also supports a historical archive of past messages.

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[1] http://www.oorexx.org/
[2] http://sourceforge.net/
[3] http://sourceforge.net/projects/oorexx
[4] http://sourceforge.net/mail/?group_id=119701
[5] http://sourceforge.net/mail/?group_id=119701

The Announcements Mailing List

You can subscribe to the oorexx-announce mailing list at *ooRexx Mailing List Subscriptions*[6] 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*[7] 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*[8] 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.

Documentation Feedback

You can submit feedback for, or report errors in, the documentation at *ooRexx Documentation Report*[9] page. Please try to provide as much information in a documentation report as possible. In addition to listing the document and section the report concerns, direct quotes of the text will help the developers locate the text in the source code for the document. (Section numbers are generated when the document is produced and are not available in the source code itself.) Suggestions as to how to reword or fix the existing text should also be included.

Request For Enhancement

You can suggest ooRexx features at the *ooRexx Feature Requests*[10] page.

Patch Reports

If you create an enhancement patch for ooRexx please post the patch using the *ooRexx Patch Report*[11] 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 fix patches here, instead you should open a bug report and attach the patch to it.

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*[12] page. There are currently three forums available: Help, Developers and Open Discussion. In addition, you can monitor the forums via email.

2.2. The Rexx Language Association Mailing List

The *Rexx Language Association*[13] 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*[14] or the *RexxLA Membership Application*[15] page.

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[6] http://sourceforge.net/mail/?group_id=119701
[7] http://sourceforge.net/mail/?group_id=119701
[8] http://sourceforge.net/tracker/?group_id=119701&atid=684730
[9] http://sourceforge.net/tracker/?group_id=119701&atid=1001880
[10] http://sourceforge.net/tracker/?group_id=119701&atid=684733
[11] http://sourceforge.net/tracker/?group_id=119701&atid=684732
[12] http://sourceforge.net/forum/?group_id=119701
[13] http://www.rexxla.org/
[14] http://rexxla.org/
[15] http://www.rexxla.org/rexxla/join.html

2.3. comp.lang.rexx Newsgroup

The *comp.lang.rexx*[16] 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.

3. Related Information

See also: *Open Object Rexx: Reference*

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[16] http://groups.google.com/group/comp.lang.rexx/topics?hl=en

WORK IN PROGRESS FAR FROM READY

Release Build Environment Description

2.1. Requirements

In early 2007 the Rexx Language Association and the Open Object Rexx Development Team determined that it was time to provide a build environment for the Open Object Rexx (ooRexx) application. An environment was needed that met the following requirements:

- Provide Internet access so that anyone could obtain an up-to-date build release of ooRexx.

- Provide a variety of software build environments for multiple operating systems.

- Provide an automated solution for each supported build environment so that a minimum of human interaction is needed to perform a build of ooRexx.

- Make all builds available to the Internet. Only keep 30 days of builds available.

- Support the Subversion (SVN) source repositories.

2.2. Solution

From these requirements a plan was established to implement them. Several decisions were made early on that influenced the final design.

- Rather than purchasing individual servers for each operating system to be supported it was determined that a better solution would be to purchase one large server and use the Linux kernel Virtual Machine (KVM) environment to provide support for multiple operating systems.

- Since the ooRexx Project is an open source project it was determined anyone should be able to get access to a build.

- It was determined that we should use Fedora Linux to host the KVM environment. This would ease security concerns and provide the easiest setup.

2.3. Update 2018-2022

After having been hosted in a cloud solution for some time, with some performance problems, it was decided to try to migrate Jenkins to a system more in line with the solution initially drawn up. It was agreed that the Requirements were essentially the same as before.

2.4. New Solution

- It was determined that rather than running all the software on one single powerfull (and expensive) server, a better solution would be to use one server as a controller, running the Jenkins webserver, and to connect to distributed agents provided by volounteers. This is also the recommended setup for Jenkins, since running agent tasks on the controller is deprecated for safety reasons. This also requires only a moderatly powerful server and the build system is easily scalable. Initially one server and three agents were donated to the project (Windows, macOS and Raspberry Linux agents) and further remote agents were contributed.

- During 2021 and 2022 it was once again experimented with virtualisation, this time using Virtualbox running on a machine separated from the Jenkins controller.

- The server used as Controller was set up using Ubuntu, whereas the machine hosting Virtualbox was a macOS machine. Since macOS can only be installed in a VM running on true Apple

hardware, this provided the additional advantage that all kinds of platforms could be set up in virtual machines (Windows, macOS, Linux, Unix)

Build Machine (Controller) Functional Description

The following is the server hardware configuration to support the ooRexx build environment:

Dell T20 server
Quad Core Intel® Xeon® 3.2 GHz CPU
12GiB DDR3
System disk: Crucial BX500 240 GB 3D NAND SATA 2,5-Zoll SSD
Data disk: 1 TB TOSHIBA DT01ACA100 (MS2OA7S0)
Backup disk: WDC Western Digital WD5000AAVS-00ZTB0 (01.01B01)
CDROM/DVD R/W

The following operating system and ooRexx is currently installed on the Controller (2022-07-01):

• Ubuntu 20.04 LTS

• ooRexx version 5.0.0

3.1. Build Host User Accounts

After Ubuntu was installed on the Controller one user account was established to own everything concerning the build process and administration of the server. The account name was *jenkins*. This account is very important because it will own the shared files for the guest operating systems.

A *jenkins* account is used on all physical machines, whereas a *osboxes* account is used on all virtual machines. More about this later.

3.2. Disk Layout

CONTINUE HERE After considering a number of different partitioning schemes for the build server it was determined that the best alternative would be to keep the partitioning scheme as simple as possible and still provide for upgrades to the host system. The following scheme was applied to the server disk.

• 100MB partition for /boot

• 50GB partition for / root partition

• 100GB partition for /home partition

• 1000GB partition for /pub partition

• 500GB partition for /virt partition

• 16GB swap partition

3.3. Operating System Installation

The following are the step-by-step instructions used for setting up the build machine environment. This does not include instructions on setting up VMware guest operating systems. Those instructions are described in the sections describing each individual guest OS.

Hopefully you have installed the Fedora Linux distribution before so an extended step-by-step guide will not be needed. Only the essential steps are described below as well as the configuration steps for managing the server.

1. Start the Fedora installation.

2. Partition the hard drive per the description above.

3. SELinux was disabled for our installation as that level of security was not deemed necessary.

4. The firewall was enabled for our installation because the server is directly available on the Internet.

5. Make sure that you install Apache, all the development tools, CVS, Subversion, Samba (used by the Windows guest OSs), xinetd, and any other required tools.

6. After the reboot, create the *buildorx* user account.

7. On the initial login let the software updates be applied to the system when prompted by the system.

> **Note**
>
> This will probably load a new Linux kernel onto the system.

8. Naturally we will install a copy of Open Object Rexx. It will be used as our primary scripting engine. The latest version at the time of this publication was 4.1.

9. Samba is used to store shared files used by the WMware Windows guest operating systems. To set it up first edit the `/etc/samba/smb.conf` and make the following changes.

```
# Use whatever workgroup works for you but remember that all the guest
# Windows OSs must use the same value.
   workgroup = OOREXX

# This should cover any virtual network defined by VMware
# It will also restrict the shares to the vitual network
   interfaces = vmnet*

# Create the public share with exclusive access given to the buildox account
[public]
   comment = Shared public stuff
   path = /pub
   public = yes
   writable = yes
   printable = no
   write list = @users
   force group = @users
   create mask = 0664
   directory mask = 0775
```

Next we need to create the SMB user account that will be used by the guest Windows OS clients.

```
# smbpasswd -a buildorx
```

Now start the Samba server and make it auto start at boot.

```
# service smb start
# chkconfig --level 5 smb on
```

10. Next we need to generate the SSH public/private keys for the server.

```
# ssh-keygen
```

Be sure to just hit return for the passphrase prompt (we do NOT want a passphrase). Otherwise we cannot get true automation from our scripts.

Kernel Virtual Machine Setup Guide

4.1. KVM Installation

KVM should be installed as an option during the installation of Fedora. If you forgot then you can add it later via the Add/Remove Software Administrative option.

4.2. KVM Setup

There are only a few options to be concerned about in this area. The most interestting is the ability to specify a different logical volumn in which to place the guest OS images. It is usually a good idea not to use the default area as space in this area is usually limited. We chose to create a special partition (logical volumn) to hold all of our guest OS image files so we could better control the available space.

KVM Guest Operating Systems

5.1. Windows XP Professional w/SP2

The following are the virtual machine configuration settings for Windows XP Professional.

- Typical device settings

- Guest operating system - Microsoft Windows XP Professional

- Name - Windows XP Professional

- Network configuration - Bridged networking

- Disk size - 10GiB, do not pre-allocate space, use the QCOW2 type

- Memory - 512MiB

The following are the settings used during the installation of Windows XP Professional.

- Format the disk using NTFS

- Computer name - ORXWINXP

- Workgroup - OOREXX

The following are the post installation steps and settings for Windows XP Professional.

- Create the buildorx account and make it an administrator

- Map drive letter (P:) to host PUBLIC share

- Install Putty and pscp

- Install Subversion

- Install Visual Studio .NET (Visual C++ 7.0)

- Update the system PATH to point to the Xerces shared location (P: drive)

- Update the system PATH to point to the Xalan shared location (P: drive)

5.2. Fedora 17

The following are the virtual machine configuration settings for Fedora.

- Typical device settings

- Guest operating system - Fedora

- Name - fedora17-i386

- Network configuration - Bridged networking

- Disk size - 10GB, do not pre-allocate space, use the QCOW2 type

- Memory - 512MiB

The following are the settings used during the installation of Fedora.

- Create a standard disk layout

- Install all the development and Publishing tools

- Disable the firewall

- Disable SELinux

- Create the buildorx account

The following are the post installation steps and settings for Fedora.

- Download and install the Fedora security updates.

- Next we need to generate the SSH public/private keys for the server.

```
# ssh-keygen
```

Be sure to just hit return for the passphrase prompt (we do NOT want a passphrase). Otherwise we cannot get true automation from our scripts.

Copy the host's public key into our authorized keys file.

```
# scp buildorx@build.oorexx.org:/home/buildorx/.ssh/id_rsa.pub .ssh/authorized_keys
```

Now copy our public key to the host.

```
# scp .ssh/id_rsa.pub buildorx@build.oorexx.org:/home/buildorx/xxx
```

Now on the host (NOT the KVM guest!) copy that key to the authorized keys file.

```
# cat xxx >> .ssh/authorized_keys
# rm xxx
```

5.3. Ubuntu 10.10

The following are the virtual machine configuration settings for Ubuntu.

- Typical device settings

- Guest operating system - Ubuntu

- Name - ubuntu1010-i386

- Version - Ubuntu 10.10

- Network configuration - Bridged networking

- Disk size - 10GiB, do not pre-allocate space, use the QCOW2 type

- Memory - 512MiB

The following are the settings used during the installation of Ubuntu.

- Create the buildorx account

- Create a standard disk layout

The following are the post installation steps and settings for Ubuntu 10.10.

- Download and install the Ubuntu security updates.

- Next we need to generate the SSH public/private keys for the server.

```
# ssh-keygen
```

Be sure to just hit return for the passphrase prompt (we do NOT want a passphrase). Otherwise we cannot get true automation from our scripts.

Copy the host's public key into our authorized keys file.

```
# scp buildorx@build.oorexx.org:/home/buildorx/.ssh/id_rsa.pub .ssh/authorized_keys
```

Now copy our public key to the host.

```
# scp .ssh/id_rsa.pub buildorx@build.oorexx.org:/home/buildorx/xxx
```

Now on the host (NOT the VMware guest!) copy that key to the authorized keys file.

```
# cat xxx >> .ssh/authorized_keys
# rm xxx
```

- Use apt-get to install some additional tools.

```
# sudo apt-get install g++ gcc subversion autoconf automake1.9 debhelper \
  fakeroot libtool sendmail mailutils bison
```

Build Machine Administration

No content yet.

Building ooRexx Releases Using the Build Machine

No content yet.

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The source code for this document is maintained in DocBook SGML/XML format.

The railroad diagrams were generated with the help of "Railroad Diagram Generator" located at *http:// bottlecaps.de/rr/ui*. Special thanks to Gunther Rademacher for creating and maintaining this tool.

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Appendix C. Revision History

Revision 0-0   Tue Aug 7 2012   David Ashley

Initial creation of book by publican

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