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# GHub Arbor OpenShift Reference

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This document endeavors to describe OpenShift and supporting system components from a point of view structured in accord with the Software & Systems Process Engineering Meta-Model Specification (SPEM) version 2.0 [ SPEM ]. The following table summarizes the SPEM *model elements* described of this document, listing each of those *elements*' reference name, SPEM class type, and formal and informal <sup>1</sup> associations to other *elements* within the SPEM *model* effectively described of this document.

**Table 1. Overview — Client Installation**

Element	SPEM Sterotype	Associations	
		Assoc. Type	Element
rhc	Tool Definition	Managed Work Product	OpenShift Account
		Installation Task	Install OpenShift Online Client Tools
OpenShift Account	Work Product Definition	Managed By	rhc
Install OpenShift Online Client Tools	Task Definition	Step	Sign up for OpenShift Account
		Step	Install Ruby and RubyGems
		Step	Install Git
		Step	Install rhc Ruby Gem
		Step	rhc setup
		Installs Tool	rhc
Install Ruby and RubyGems	Task Definition	Step In Task Definition	Install OpenShift Online Client Tools
Install Git	Task Definition	Step In Task Definition	Install OpenShift Online Client Tools

[SPEM] *Software & Systems Process Engineering Meta-Model Specification* . Object Management Group. April 2008.

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<sup>1</sup>namely, "See also", such as could be formally represented in extension of the SPEM model, using an ownedParameter property onto each respective model element making reference to another model element by way of the "See also" relation.

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## Name

**rhc** — Command line interface for OpenShift Online Client Tools

### Tool Definition

<m:attribute></m:attribute>

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## Name

OpenShift Account — User Account on OpenShift Server  
**Work Product Definition**

## Summary

There are a number of approaches available from OpenShift, for signing up for an OpenShift account:

- [OpenShift Online](#), for individual accounts on the OpenShift *cloud*
- [OpenShift Enterprise PaaS](#), for Red Hat professional support in integration of OpenShift with existing IT enterprise systems.[ BWIRE2013 ]
- [OpenShift Origin](#), for private hosting of the OpenShift platform

## Works Referenced

[BWIRE2013] [Red Hat Advances OpenShift Enterprise with New Release](#) . Business Wire. accessed 8 October, 2013.

[OSFAQ] [OpenShift: Frequently Asked Questions](#) . Red Hat, Inc.. accessed 8 October, 2013.

[OS] [OpenShift](#) . Red Hat, Inc.. accessed 8 October, 2013.

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## Name

Install OpenShift Online Client Tools — Tools Installation and Configuration  
**Task Definition**

## Summary

## Steps

- Sign up for an OpenShift Account
- Install Ruby and RubyGems
- Install Git
- install rhc Ruby Gem
- **rhc setup**

## Procedure

### Example 1. Installing rhc Ruby Gem, With Initial Setup

```
gem install rhc &&  
rhc setup
```

## Results: Initial rhc setup on OpenShift Online

- SSH Key Pair (Optional) `$HOME/.ssh/id_rsa` (private key) and `$HOME/.ssh/id_rsa.pub` (public key), with public key optionally uploaded to OpenShift server via SSH (*cf.* **rhc sshkey**)
- Application Namespace (optional, but required for creating an OpenShift application) (*cf.* **rhc create-domain**) (must be unique across all OpenShift users) (will be part of each application's domain name under OpenShift)

## Works Referenced

[IORCT] *Installing OpenShift RHC Client Tools* . Red Hat, Inc.. accessed 8 October, 2013.

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## Name

Install Ruby and RubyGems — Program Tools Installation  
**Task Definition**

## Summary

The exact installation process for Ruby naturally will vary by host machine platform

Once Ruby is installed, it may be recommended to use a package management system unique to Ruby, such as [RVM](#) or [rbenv](#).

## Installing Ruby on Linux Platforms

The process for installing Ruby on the Linux platform will depend on the nature of the Linux *distribution* in use on the *host machine*. Typically, a Linux *distribution* will feature an integrated *package manager*, and a *graphical user interface* for accessing that *package manager*, whether via a *command line terminal* or alternately, a graphical *desktop* interface.

### Debian: Packages for Ruby Platform Component Installation

A *virtual package* named `ruby-interpreter` is available on Debian Linux. The `ruby-interpreter` *virtual package* is *provided* by any version-named package in the *package repository* providing a Ruby *interpreter*. Alternately, a *virtual package* is available, named `ruby-full`, such that effectively depends on a broader set of packages for the Ruby platform.

Additionally, the `rubygems` package should be installed — optionally along with `rubygems-doc` — as to be able to install the `rhc` gem for Ruby, via the **gem** command. Note, however, that the `rubygems` package may depend on a specific version of Ruby, such that may be older than the most recently released version. There is also the `ruby-switch` package, for developing on multiple versions of the Ruby interpreter.

Lastly, the package, *rubygems-integration* would be recommended, as in order to ensure that Debian packaged Ruby components, when installed, will be visible to RubyGems.

### Example 2. Installation of Ruby Gems, Documentation, and Supporting Packages, on Debian Linux

```
sudo aptitude install rubygems rubygems-doc \  
  rubygems-integration ruby-switch
```

## Installing Ruby on Apple OS X Platforms

If Ruby is not available on the Apple OS X *machine*, it may be installed via [Xcode](#).

## Installing Ruby on Microsoft Windows Platforms

Refer to [RubyInstaller](#) for Windows[DLRuby]. (Note that RubyGems is distributed within RubyInstaller[ARI])

## Works Referenced

[DLRuby] [Download Ruby](#) . [Ruby Community](#) . accessed 8 October, 2013.

[ARI] [About RubyInstaller](#) . RubyInstaller Contributors. accessed 8 October, 2013.

[CTIG] *[Client Tools Installation Guide](#)* . [Red Hat Customer Portal](#) . accessed 8 October, 2013.

[IORCT] *[Installing OpenShift RHC Client Tools](#)* . Red Hat, Inc.. accessed 8 October, 2013.

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## Name

Install Git — SCCM Tool Installation  
**Task Definition**

## Summary

### Installing Git on Linux Platforms

#### On Debian

##### **Example 3. Installation of Git on Debian Linux**

```
aptitude install git
```

### Installing Git on Apple OS X Platforms

*cf.* [Git for Apple OS X](#)

### Installing Git on Microsoft Windows Platforms

*cf.* [TortoiseGit](#)

## Works Referenced

[IORCT] [Installing OpenShift RHC Client Tools](#) . Red Hat, Inc.. accessed 8 October, 2013.

[GITDOCS] [Git Documentation](#) . Software Freedom Conservancy. accessed 9 October, 2013.

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## Name

OpenShift Origin VirtualBox® Virtual Machine Image — VirtualBox® Virtual Machine Image providing OpenShift Origin Host Services

**Work Product Definition**

## Summary

## Availability

OpenShift Origin provides an *archive* containing a number of files suitable for creation of OpenShift Origin *virtual machine* instances. The *archive* may be downloaded from a local OpenShift Origin *mirror* site [OSM] [OSSRV] or [directly from mirrors.openshift.com](https://mirror.openshift.com/pub/origin-server/release/2/images/openshift-origin)

Using **wget**<sup>1</sup>

### Example 4. Downloading OpenShift Origin Image Via wget

```
wget --continue --progress=dot \
  https://mirror.openshift.com/pub/origin-server/release/2/images/openshift-origin
```

### OpenShift Origin Image Archive Contents

file	format	references
openshift-origin.vmdk	Virtual Machine Disk File	VBOXST, VMF
openshift-origin.vmx	VMware Configuration File	VMF
openshift-origin.ovf	Open Virtualization Format	WPOVF, VMF
openshift-origin.tdl	Template Definition Language	VBTDL, VMF

This manual will focus primarily on the VMDK file provided in the *archive*. The VMDK file can be loaded as a *disk image* in a VirtualBox® *virtual machine* <sup>2</sup>

## Required Tools

- VirtualBox® Virtual Machine Host

## Works Referenced

[OSODG] *OpenShift Origin Virtual Machine Deployment Guide*. Red Hat, Inc.. accessed 10 October, 2013.

[VBOXNET] *Chapter 6. Virtual networking*. *Oracle VM VirtualBox® User Manual*. 2013. Oracle Corporation.

[VBOXST] *Chapter 5. Virtual Storage*. *Oracle VM VirtualBox® User Manual*. 2013. Oracle Corporation.

[VMPROV] *Provisioning Virtual Machines*. VMware, Inc.. accessed 10 October, 2013.

[WPOVF] *Open Virtualiation Format*. Wikipedia. accessed 10 October, 2013.

[VBTDL] *Creating a VirtualBox image from an appliance (TDL) file*. Denis Arnaud. accessed 10 October, 2013.

[VMF] *What Files make Up a Virtual Machine?*. VMware, Inc.. accessed 10 October, 2013.

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<sup>1</sup>Some versions of **wget** may present an error when provided with an `https` URL[D707555]. In those instances, it may be advisable to use a *desktop download manager*, such as **kget**

<sup>2</sup>Alternately, OpenShift provides instructions for installing OpenShift Origin within a QEMU emulator environment. [OSODG]



[OSM] *Become an OpenShift Mirror*. Red Hat, Inc.. accessed 10 October, 2013.

[OSSRV] *openshift/origin-server (github)*. OpenShift Origin. . accessed 10 October, 2013.

[D707555] *wget: https fails with GnuTLS*. Debian Bug report logs. accessed 10 October, 2013.

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## Name

VirtualBox® Virtual Machine Host — Host Service for VirtualBox® Virtual Machine Images  
**Work Product Definition**

## Summary

### Overview

VirtualBox® provides a framework for operating system *virtualization*, within Linux, Apple OS X, solaris, and Microsoft Windows *host operating system* architectures.

A VirtualBox® *host service* provides a VirtualBox® *virtual image* manager for any zero or more VirtualBox® *guest* system images. The VirtualBox® *virtual image* manager provides features for sharing a *host* platform's filesystem, memory, video, audio, and network resources with a *guest virtual machine* system.

### Availability

For *operating systems* with an available *package manager*, VirtualBox® may be available from a remote *package repository* for the *operating system*. Alternately, VirtualBox® installers are available at [www.virtualbox.org](http://www.virtualbox.org)<sup>1</sup>

## Installation Procedures

### Installing VirtualBox® on Linux Hosts

#### Installing VirtualBox® on Debian Linux Hosts

Package	Usage
virtualbox	System and service components for VirtualBox® host-tier machines
virtualbox-qt	Host-tier graphical user interface (GUI) for VirtualBox®
virtualbox-guest-additions-iso	Host-tier CD image for VirtualBox® guest additions
virtualbox-dkms	DKMS-enabled source code for VirtualBox® host-tier extensions
virtualbox-source	alternative to virtualbox-dkms, without DKMS integration

The virtualbox-guest *packages* will not be installed on the VirtualBox® *host machine*.<sup>2</sup>

#### Example 5. Installing VirtualBox® Host Packages on Debian Linux

```
sudo aptitude install virtualbox virtualbox-qt \  
virtualbox-guest-additions-iso \  
virtualbox-dkms virtualbox-source
```

The *kernel module source code* provided by the virtualbox-dkms *package* will be compiled by the DKMS *subsystem*, when the *package* is installed.

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<sup>1</sup> cf. [Downloads](#) — Oracle VM VirtualBox

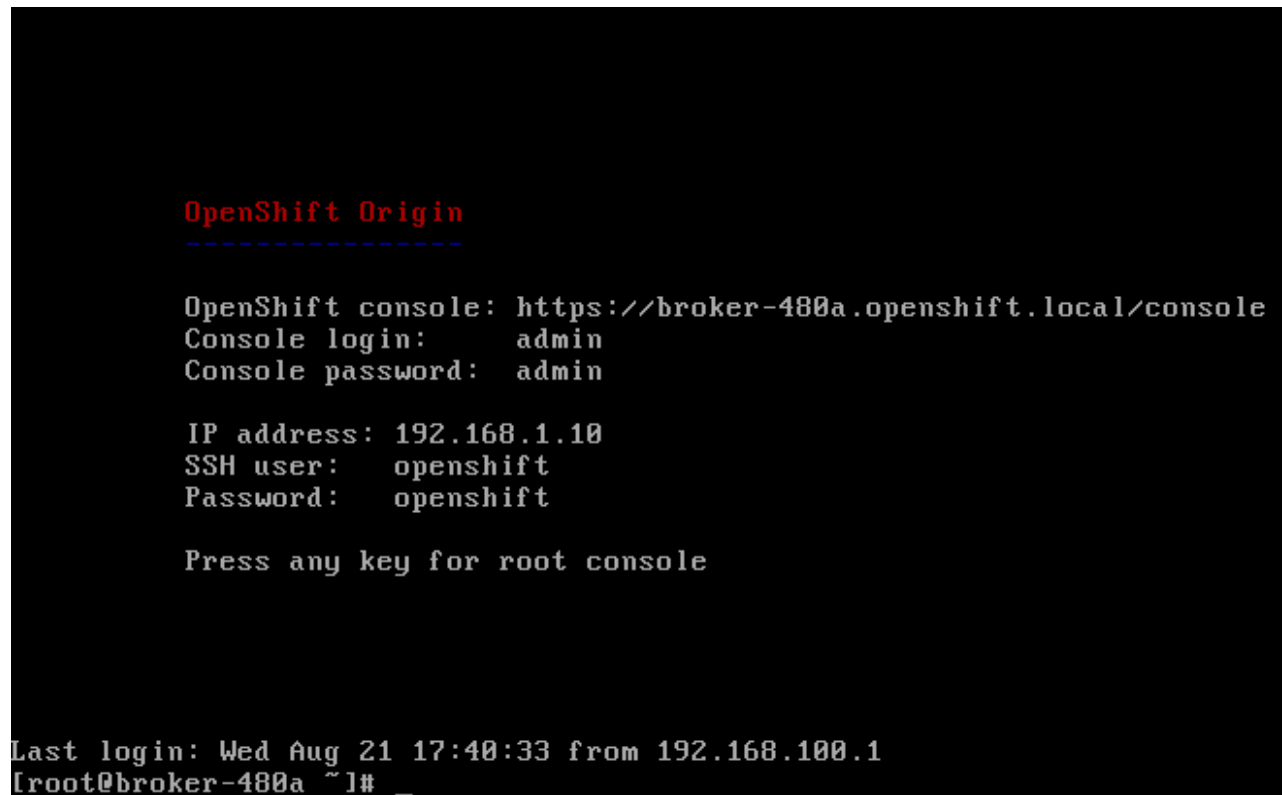
<sup>2</sup> Those *guest packages* may be installed within the *guest virtual machine*, if the *guest virtual machine* is running Debian Linux. Alternately, the *user* may be advised to consult the documentation specific to the *operating system distribution* used within the *guest virtual machine*

OpenShift provides an illustrated walk-through of the process for creating an appropriate VirtualBox® *guest* configuration and selecting the OpenShift Origin VMDK *disk image* for the guest's primary filesystem. A similar process can be accomplished via the command line.

### Example 6. Minimal Command-Line Configuration of VirtualBox® Guest for OpenShift Origin

```
VBoxManage createvm --name "OSOrigin" --ostype Fedora_64 --register
VBoxManage modifyvm OSOrigin --memory 2048 \
  --nic1 bridged --bridgeadapter1 eth0
VBoxManage storagectl OSOrigin --add ide --name IDE1 --bootable on
VBoxManage storageattach OSOrigin --storagectl IDE1 --device 0 --port 0 \
  --type hdd --medium path/to/openshift-origin.vmdk
```

Once the VirtualBox® *guest* is configured, it can be started via the visual VirtualBox® manager, or alternatively via the shell, using **vboxheadless**



```
OpenShift Origin
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OpenShift console: https://broker-480a.openshift.local/console
Console login:      admin
Console password:   admin

IP address: 192.168.1.10
SSH user:    openshift
Password:    openshift

Press any key for root console

Last login: Wed Aug 21 17:40:33 from 192.168.100.1
[root@broker-480a ~]# _
```

VirtualBox® command line interface

## Further Information

For documentation about how to configure the *host machine* and the VirtualBox® *resource manager* for sharing the following types of *resource* between a VirtualBox® *host machine* and a VirtualBox® *guest virtual image*, refer to ???

- Networking Services
- Filesystem Resources
- Input Devices

USB Devices  
Video Services  
Audio Services

## Works Referenced

[OSODG] *OpenShift Origin Virtual Machine Deployment Guide* . Red Hat, Inc.. accessed 10 October, 2013.

[VBOXINST] *Chapter 2. Installation Details. Oracle VM VirtualBox® User Manual*. 2013. Oracle Corporation.

[DKMSDEB] *Building Debian kernel modules with DKMS*. Debian wiki. accessed 10 October, 2013.