RGen Solutions

OPENSHIFT ENTERPRISE DEPLOYEMNT DOC.

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RGen Solutions

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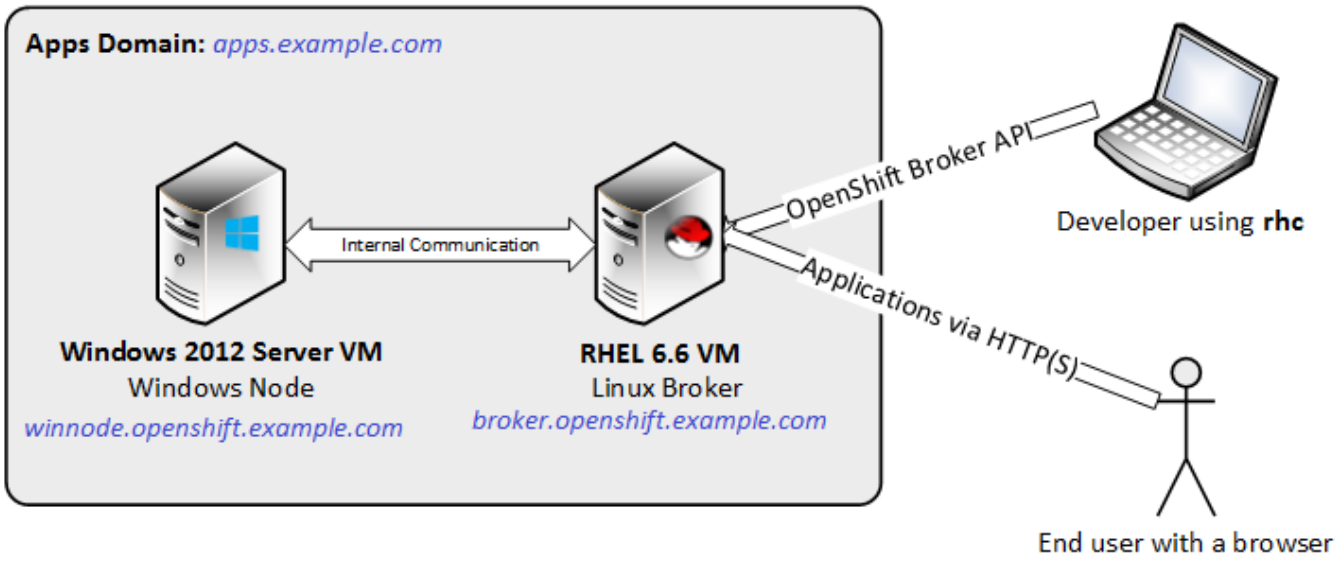
Table of Contents

DOCUMENT SUMMARY

This document provides instructions on how to deploy an OpenShift Enterprise environment using an OpenShift Enterprise installation.

The document also provides information about OpenShift Topology, System requirements, Windows and Linux Prerequisites & deployment steps, Steps to import .NET cartridges, creating Windows Applications and testing it.

1. OPENSHIFT CLOUD TOPOLOGY



2. SYSTEM REQUIRMENTS

2.1 Linux Broker System Requirement

Hardware

OS:	RHEL6.6 – (for OpenShift Setup)
Hostname:	broker.openshift.example.com
RAM:	10GB
HDD:	150GB
IP:	192.168.1.136
Domain Name:	openshift.example.com

2.2 Windows System Requirement

Hardware

OS:	Windows Server 2012 Datacenter
Hostname:	winnode
RAM	10GB
HDD	150GB
IP:	192.168.1.131
DNS suffix:	openshift.example.com
Software Installed:	SQL Server 2008R2 & 2012, IIS Services and VS2013

2.3 DNS Configurations

- **example.com**
  - **apps.example.com** - Used for OpenShift applications
  - **openshift.example.com** - Used for OpenShift Hosts
  - **broker.openshift.example.com** - The host name of our Droplet

3. PREREQUISUTE AND DEPLOYMENT

3.1 Linux Broker Prerequisite

Supported Operating System

OpenShift Origin is supported on; 64-bit versions of Red Hat Enterprise Linux (RHEL) 6.4 or higher, and CentOS 6.4 or higher.
It is not supported on Fedora, RHEL 7.x, or CentOS 7.x. A minimal installation of RHEL / CentOS is recommended to avoid package incompatibilities with OpenShift. This deployment have used RHEL 6.6 x64 image on a 10 GB Droplet.

Various methods you can use for deploying OpenShift Enterprise includes:

- The **oo-install** installation utility, it interactively gathers information about a deployment before automating the installation of an OpenShift Enterprise host. This method is intended for trials of simple deployments.
- The installation scripts, available as either a kickstart or bash script, include configurable parameters that help automate the installation of an OpenShift Enterprise host. This method allows for increased customization of the installation process for use in production deployments.
- The sample deployment steps detailed later in this deployment guide describe the various actions of the installation scripts. This method allows for a manual installation of an OpenShift Enterprise host.
- In this deployment, we have used **oo-install** utility.

Install Linux 6.6 OS and Register the Subscription by command

```
Subscription-manager register --username <username> --password <password> --auto-attach
```

Redhat Subscription
Access.redhat.com
User: xxxxxxxxxxxxxxxx
Pwd: ********

RedHat Subscription Requirements:

OpenShift Enterprise requires several packages that are not available in the standard Red Hat Enterprise Linuxchannels. A broker host requires a subscription for the appropriate OpenShift Enterprise channels to receive these extra packages.

Channel Name	Purpose	Required	Provided By
Red Hat OpenShift Enterprise 2.2 Infrastructure.	Base channel for OpenShift Enterprise 2.2 broker hosts.	Yes.	"OpenShift Enterprise Broker Infrastructure" subscription.
Red Hat OpenShift Enterprise 2.2 Client Tools.	Provides access to the OpenShift Enterprise 2.2 client tools.	Not required for broker functionality, but required during installation for testing and troubleshooting purposes.	"OpenShift Enterprise Broker Infrastructure" subscription.
Red Hat Software Collections 1.	Provides access to the latest version of programming languages, database servers, and related packages.	Yes.	"OpenShift Enterprise Broker Infrastructure" subscription.

You can verify the repository packages by **$ yum repolist** command.

Please Note:

Before attempting to run the installation utility, ensure you already have ruby-1.8.7 or later, curl, tar, and gzip installed on your system. If required, the installation utility offers suggestions to install RPM packages of utilities that are missing.

3.1.1 Linux Broker Deployment

Run the Installation Utility

1. Download and unpack the installation utility:

```
$ curl -o oo-install-ose.tgz https://install.openshift.com/portable/oo-install-ose.tgz

$ tar -zxf oo-install-ose.tgz
```

2. Execute the installation utility to interactively configure one or more hosts:

```
$ ./oo-install-ose -s rhsm -u user@company.com
```

3. Follow the instructions provided below to deploy OpenShift Enterprise.

OpenShift Enterprises uses an interactive installation process. There are quite a few questions to answer, so pay attention! The questions are shown below, with the user input in red.

```
Checking for necessary tools...
...looks good.
Using bundled assets.
Extracting oo-install to temporary directory...
Starting oo-install...
OpenShift Installer (OpenShift Enterprise 2.2 - Build 20141119-2104)
------------------------------------------------------------------------

Welcome to OpenShift.

This installer will guide you through a basic system deployment, based
on one of the scenarios below.

Select from the following installation scenarios.
You can also type '?' for Help or 'q' to Quit:
1. Install OpenShift Enterprise
2. Add a Node to OpenShift Enterprise
Type a selection and press <return>: 1
```

I. DNS — install a new DNS Server

```
------------------------------------------------------------------------
DNS Configuration
------------------------------------------------------------------------
First off, we will configure some DNS information for this system.
Do you want me to install a new DNS server for OpenShift-hosted applications, or do you want this system to use an existi
ng DNS server? (Answer 'yes' to have me install a DNS server.) (y/n/q/?) y
```

For this tutorial we want to deploy a new DNS server, so enter **y** and press **Enter**.

II. DNS — Application Domain

```
All of your hosted applications will have a DNS name of the form:
<app_name>-<owner_namespace>.<all_applications_domain>

What domain name should be used for all the hosted apps in your OpenShift system? |example.com| apps.example.com
```

Enter the domain you would like to use for your hosted applications, which in this example is **apps.example.com**, and press **Enter**.

III. DNS — OpenShift Hosts Domain

```
Do you want to register DNS entries for your OpenShift hosts with the same OpenShift DNS service that will be managing
DNS records for the hosted applications? (y/n/q) y

What domain do you want to use for the OpenShift hosts? openshift.example.com
```

Enter the domain you would like to use for your OpenShift Hosts, which in this example is openshift.example.com, and press **Enter**.

IV. DNS — FQDN of the Name Server

```
Hostname (the FQDN that other OpenShift hosts will use to connect to the host that you are describing): broker.open
shift.example.com
```

Since we are hosting the DNS on the same Droplet, we will use this machine's Fully Qualified Domain Name. Enter your host's FQDN, which in this example is broker.openshift.example.com, and press **Enter**.

V. DNS — SSH Host Name

```
Hostname / IP address for SSH access to broker.openshift.example.com

from the host where you are running oo-install. You can say 'localhost' if you are running oo-install from the system that y
ou are describing: |broker.openshift.example.com| localhost

Using current user (root) for local installation.
```

This is the hostname used to perform the installation of OpenShift. Since we are installing to the same Droplet running the installer, we can use localhost. Enter **localhost**, and press **Enter**.

VI. DNS — IP Address Configuration

If you have private networking enabled, you will need to use the WAN interface/IP Address for any host you wish to assign the Node Role. Since we are only installing to a single host in this tutorial, make sure you use eth0 as your interface for this host. In a large setup with multiple Brokers and DBServers, you would use the private networking interface for those hosts only. Attempting to use the private interface on a Node will cause an IP address error during deployment.

```
Detected IP address 192.168.1.136 at interface eth0 for this host.

Do you want Nodes to use this IP information to reach this host? (y/n/q/?) y

Normally, the BIND DNS server that is installed on this host will be reachable from other OpenShift components using the
host's configured IP address (192.168.1.136).

If that will work in your deployment, press <enter> to accept the default value. Otherwise, provide an alternate IP addre
ss that will enable other OpenShift components to reach the BIND DNS service on this host: |192.168.1.136| 192.168.1.1
36

That's all of the DNS information that we need right now. Next, we need to gather information about the hosts in your Op
enShift deployment.
```

For the purposes of this tutorial we will use the default settings, as shown in the image above.

VII. Broker Configuration

```
---------------------------------------------------------------------
Broker Configuration
---------------------------------------------------------------------
Do you already have a running Broker? (y/n/q) n
Okay. I'm going to need you to tell me about the host where you want to install the Broker.
Do you want to assign the Broker role to broker.openshift.example.com? (y/n/q/?) y
Okay. Adding the Broker role to broker.openshift.example.com.
That's everything we need to know right now for this Broker.
Do you want to configure an additional Broker? (y/n/q) n
Moving on to the next role.
```

The installer will now ask us to set up a Broker. In this example we do not have any Brokers yet, so we will install the role on broker.openshift.example.com.

VIII. Node Configuration

```
---------------------------------------------------------------------
Node Configuration
---------------------------------------------------------------------
Do you already have a running Node? (y/n/q) n
Okay. I'm going to need you to tell me about the host where you want to install the Node.
Do you want to assign the Node role to broker.openshift.example.com? (y/n/q/?) n
```

IX. Username and Password Configuration

```
Do you want to manually specify usernames and passwords for the various supporting service accounts? Answer 'N' to h
ave the values generated for you (y/n/q) n
```

If you would like to manually configure the usernames and passwords used for your deployment, you can do that here. In our example we decided to have them automatically generated for us. Enter **n**, and press **Enter**.

NOTE: Later on, Please set the mcollective password to ***marionette*** as it will require to communicate with windows mcollective services.

Pay attention to the output. You will need the values in the "Account Settings" table later in the tutorial, specifically the OpenShift Console User and the OpenShift Console Password.

```
Account Settings

+--------------------------+-----------------------+
```

| OpenShift Console User | demo |

| OpenShift Console Password | S94XXXXXXXXXXXXXXXH8w |

...

X. Finish Deployment

```
Host Information
+--------------------------------+-------------+
| Hostname                       | Roles       |
+--------------------------------+-------------+
| broker.cloud.rgenopenshift.net | Broker      |
|                                | NameServer  |
```

Choose an action:

1. Change the deployment configuration

2. View the full host configuration details

3. Proceed with deployment

Type a selection and press <return>: **3**

When you are satisfied with the configuration, enter **3**, and press **Enter**.

XI. Repository Subscriptions

Do you want to make any changes to the subscription info in the configuration file? (y/n/q/?) **y**
What type of subscription should be used? (none, yum, rhsm, rhn)
|rhsm| **rhsm**
Red Hat Login username? (Use '-' to leave unset) | "your subscription user name" |
Red Hat Account password? (Use '-' to leave unset) **********
Type password again to verify: (Use '-' to leave unset) **********
Pool ID(s) to subscribe? (Use '-' to leave unset) |-| "your subscription pool id which have the openshift 2.2 ent subscription"

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```
Here is the subscription configuration that the installer will use for
this deployment.
+-------------+-----------------------------------+
| Setting     | Value                             |
+-------------+-----------------------------------+
| type        | rhsm                              |
| rh_username | [redacted]                        |
| rh_password | ******                            |
| sm_reg_pool | [redacted]                        |
+-------------+-----------------------------------+

Do you want to go back and modify your subscription info settings in
the configuration file? (y/n/q/?) n
```

Do you want to set any temporary subscription settings for this installation only? (y/n/q/?) **n**

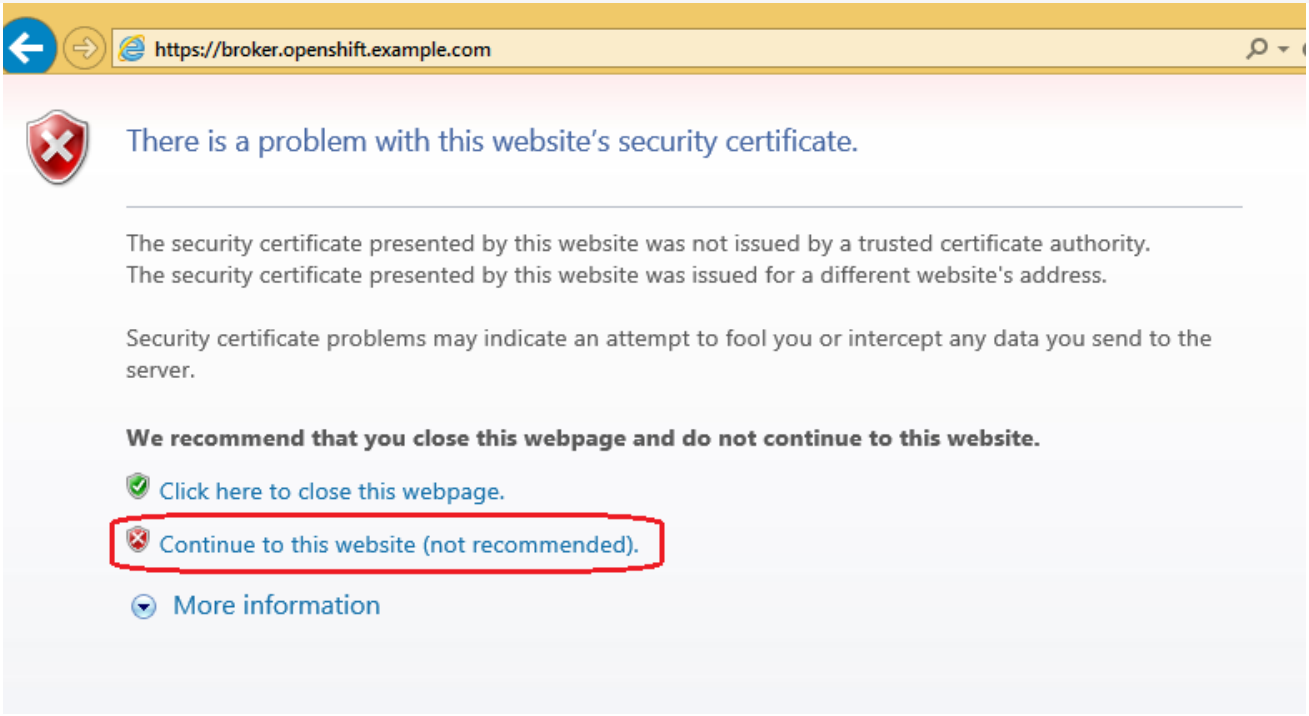
NOTE: Red text in the output is used to highlight errors and warnings.

The installer will now perform the rest of the deployment. You may see some warnings during this process. These are normal and will not affect the deployment. **This process can take upwards of an hour to complete.**

XII. Test Your OpenShift Deployment

Your OpenShift installation is now completed. You can test your OpenShift Deployment by visiting the following url in a web browser.

https://192.168.1.136/ or https://broker.openshift.example.com



OpenShift will be using a self-signed certificate, so you will have to click on Continue to this website.

If you didn't note the credentials before, scroll back up to the "Account Settings" output section, and use the OpenShift Console User and OpenShift Console Password to log in. Here, we have used demo user and demo@123 password.

```
Account Settings
+---------------------------+-----------------------+
| OpenShift Console User    | demo                  |
| OpenShift Console Password| demo@123              |
| MCollective User          | mcollective           |
```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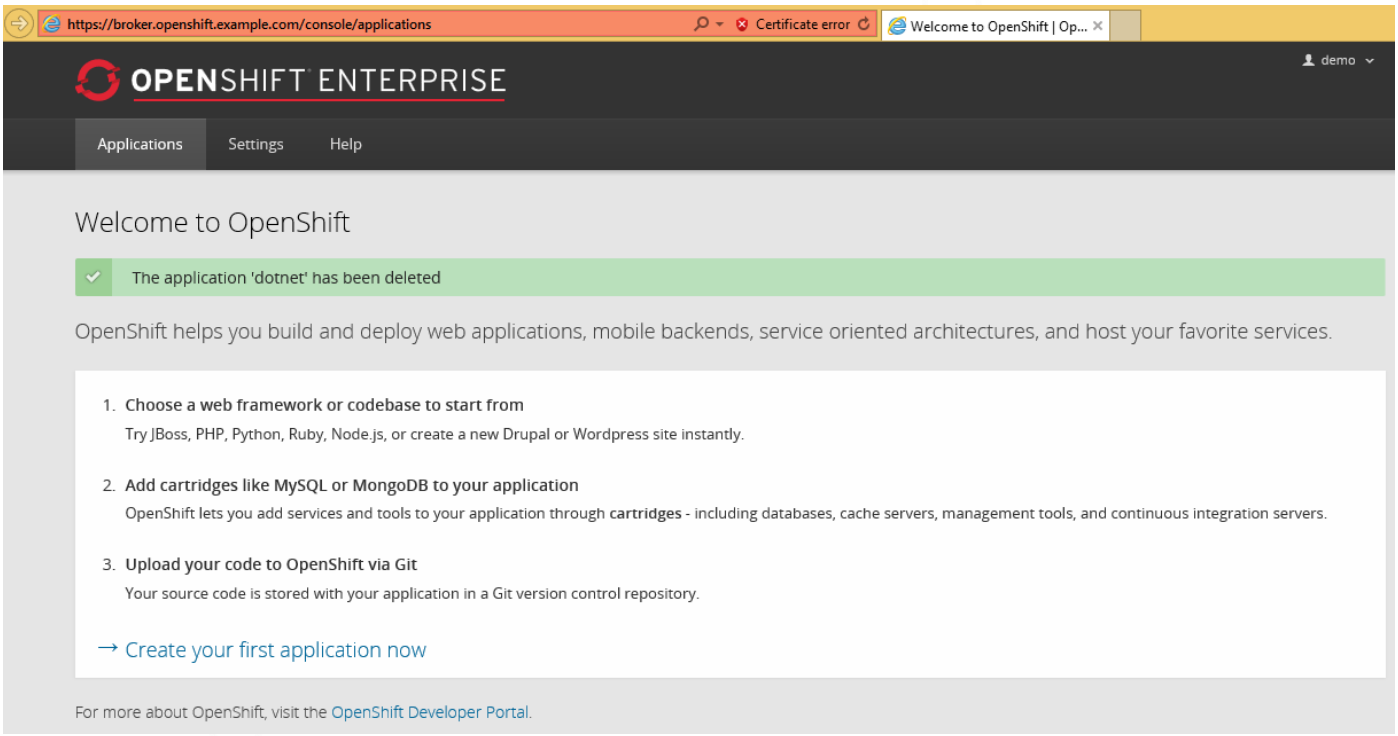
MCollective Password	marionette
MongoDB Admin User	admin
MongoDB Admin Password	RRgY8vJ*********
MongoDB Broker User	openshift
MongoDB Broker Password	28pO0rU8*******

Please Note:

We have changed the mcollective password from Linux broker, while installation to communicate with windows node. As the windows node script using the default password i.e. "marionette"



Now your Linux broker is deployed successfully, you can use the below commands to test the Linux broker configurations:

oo-accept-node –v

oo-accept-broker –v

oo-diagnostics –v

We now need to set the available platforms – tell the broker that we are going to have a Windows node. To do this, edit **/etc/openshift/broker.conf** and add the following line:

```
NODE_PLATFORMS="windows,linux"
```

To finish the installation reboot the VM.
For deployment validation you should run:

```
oo-diagnostics –v
```

3.2 Windows Node Prerequisite

Please Note:
All the tasks and operations needs to be performed using an administrator account/user.

Supported Windows OS versions;

- Window Server 2012
- Window Server 2012 R2

Feature to active in Window Server

- NET-Framework-Features
- NET-Framework-Core
- NET-Framework-45-Features
- NET-Framework-45-Core
- NET-Framework-45-ASPNET
- NET-WCF-Services45
- NET-WCF-TCP-PortSharing45

✓ Also, please install Visual C++ Redistributable Packages for Visual Studio 2013. You can install by clicking this link http://www.microsoft.com/en-us/download/details.aspx?id=40784 . Make sure the download version should be 'vcredist_x64.exe'.

✓ Please install build tools for Visual Studio 2012 and 2013.

Important:
Please note that the 2008 version of the installer first sets up the 'real' installer in **C:\VS 2008 Shell Redist\Isolated Mode**. You will have to run the **vs_shell_isolated.enu** package from there to complete the installation.

- ✓ Please make sure to keep the filenames of the installers intact (use separate folders when downloading the packages); the installers are sensitive to their filenames being changed. You can find them at the following locations:
  - Microsoft Visual Studio 2013 Shell (Isolated)
  - Microsoft Visual Studio 2012 Shell (Isolated)
  - Microsoft Visual Studio 2010 Shell (Isolated) - ENU
  - Microsoft Visual Studio Shell 2008 - ENU

- ✓ Please install Microsoft Agents for Visual Studio 2013. This is not mandatory. It is needed if you want to run mstest during a jenkins build. Make sure to add the directory containing mstest.exe (C:\Program Files (x86)\Microsoft Visual Studio 12.0\Common7\IDE) to PATH environment variable.

- ✓ Please download and then install Java JRE 7 x64 from the below link: http://www.oracle.com/technetwork/java/javase/downloads/jre7-downloads-1880261.html

Please install Internet Information Services (IIS). Add the Web Server role to Windows, with the following features enabled:

Web-Server	Web-WebServer	Web-Common-Http	Web-Default-Doc
Web-Dir-Browsing	Web-Http-Errors	Web-Static-Content	Web-Http-Redirect
Web-DAV-Publishing	Web-Health	Web-Custom-Logging	Web-Http-Logging
Web-Log-Libraries	Web-ODBC-Logging	Web-Request-Monitor	Web-Http-Tracing
Web-Performance	Web-Security	Web-Dyn-Compression	Web-IP-Security
Web-Filtering	Web-Basic-Auth	Web-Stat-Compression	Web-CertProvider
Web-Client-Auth	Web-Digest-Auth	Web-Cert-Auth	Web-Url-Auth
Web-Windows-Auth	Web-App-Dev	Web-Net-Ext	Web-Net-Ext45
Web-AppInit	Web-Asp-Net	Web-Asp-Net45	Web-CGI
Web-ISAPI-Ext	Web-ISAPI-Filter	Web-Includes	Web-WebSockets
Web-Mgmt-Tools	Web-Scripting-Tools	Web-Mgmt-Service	Web-WHC

Use the below script from Windows PowerShell to install the above IIS features:

```
Add-WindowsFeature Web-Server, Web-WebServer, Web-Common-Http, Web-Default-Doc, Web-Dir-Browsing, Web-Http-Errors, Web-Static-Content, Web-Http-Redirect, Web-DAV-Publishing, Web-Health, Web-Http-Logging, Web-Custom-Logging, Web-Log-Libraries, Web-ODBC-Logging, Web-Request-Monitor, Web-Http-Tracing, Web-Performance, Web-Stat-Compression, Web-Dyn-Compression, Web-Security, Web-Filtering, Web-Basic-Auth, Web-CertProvider, Web-Client-Auth, Web-Digest-Auth, Web-Cert-Auth, Web-IP-Security, Web-Url-Auth, Web-Windows-Auth, Web-App-Dev, Web-Net-Ext, Web-Net-Ext45, Web-AppInit, Web-Asp-Net, Web-Asp-Net45, Web-CGI, Web-ISAPI-Ext, Web-ISAPI-Filter, Web-Includes, Web-WebSockets, Web-Mgmt-Tools, Web-Scripting-Tools, Web-Mgmt-Service, Web-WHC
```

```
Add-WindowsFeature NET-Framework-Features,NET-Framework-Core
```

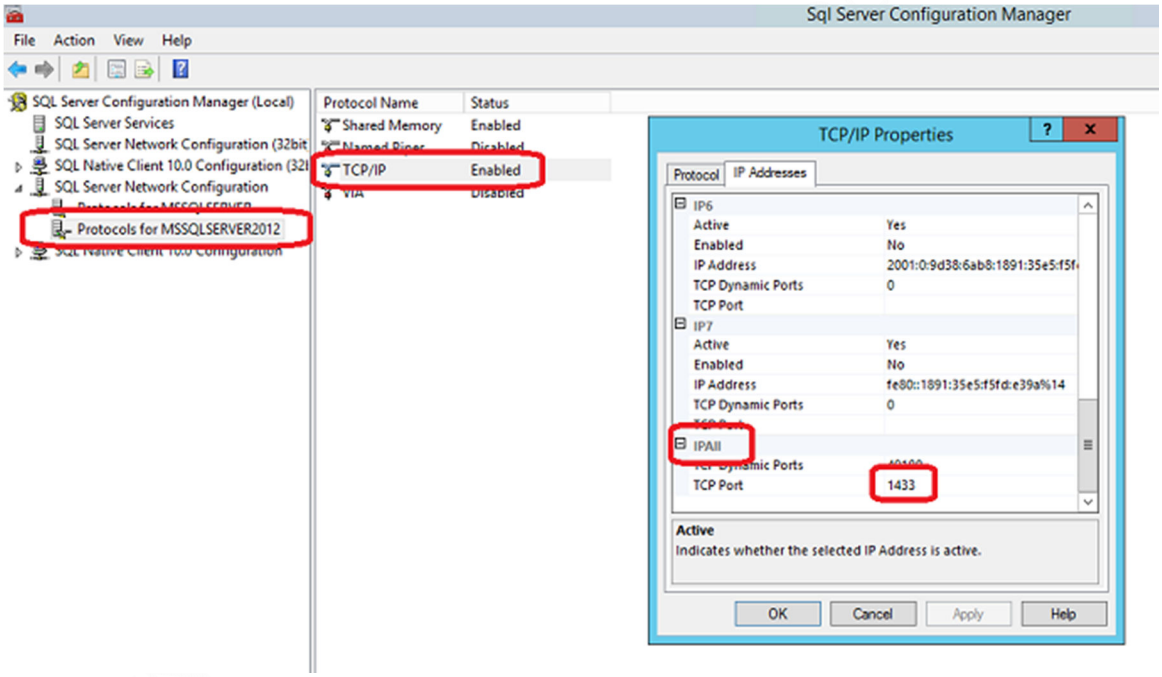
- ✓ Please install SQL Server 2008 R2 with default instance (Only Database Engine) and with mixed authentication. After successfully installation of SQL Server, please stop SQL Server (**MSSQLSERVER**) Windows Service, then disable it. (The Window node installation script will check to see if this was setup correctly)

- ✓ Please install SQL Server 2012 with a simple named instance MSSQLSERVER2012 (Only database). After successfully installation of SQL Server, please stop SQL Server (**MSSQLSERVER2012**) Windows Service, then disable it. (The Window node installation script will check to see if this was setup correctly). Make sure you set it up with mixed authentication.

  - ➢ Enable TCP/IP SQL Server 2012 Protocol to listen to All IPs

Important:

Make sure that the TCP/IP protocol is enabled for SQL Server 2012 and that the port 1433 is set to for "IPAll" in the SQL Server Configuration Manager.



Important:

Make sure the time of the VM is synced.
Before proceeding with the Windows installation, you have to make sure your hosts resolve OK

3.2.1 Windows Node Deployment

I. SETTING UP DNS

Please do the following entry in your **Linux Broker** Server in **/etc/hosts** file
192.168.1.131 winnode.openshift.example.com

Please do the following entry in your **Windows** system **c:\windows\system32\drivers\etc\hosts**
192.168.1.136 broker.openshift.example.com

II. Register DNS on Linux Broker for Windows Node

On the **Linux Broker VM**, use the following command to register the windows node on the local DNS server:

For example:
oo-register-dns --with-node-hostname <the hostname of the windows node (not fqdn, e.g. winnode1)> \
--with-node-ip <the public ip of the node> --domain <domain of the cloud, e.g. mycloud.com> \
--dns-server <the hostname of the broker (e.g. broker.rgenopenshift.com)>

Command:
*oo-register-dns --with-node-hostname winnode *
*--with-node-ip 192.168.1.131 --domain openshift.example.com *
--dns-server broker.openshift.example.com

Setup a conditional forwarder for your cloud's domain in your organization's DNS server. The Windows Node will have to use your organization's DNS server. To make sure everything is in order, see if these return the proper response:

- On Windows, nslookup broker.openshift.example.com
- On Linux, nslookup windows.openshift.example.com

III. Install on the Node

First you have to disable the PowerShell execution policy: Set Execution Policy Unrestricted

Now download the Winnode installer from the here.

Run the installer

- Disable PowerShell execution policy: Set-ExecutionPolicy Unrestricted
- Run the installer
- It will unpack the build in a temporary folder and drop you in PowerShell and from there you can run the installation script.

Form here you have to run the installer script by passing the minimal parameters, please see the example below:
.\install.ps1 -mcollectivePskPlugin asimplething -publicHostname winnode.openshift.example.com -brokerHost broker.openshift.example.com -cloudDomain openshift.example.com

(For an OpenShift Enterprise installation, you have to specify an mcollective psk plugin (asimplething), so provide that as a parameter: ./install.ps1 -mcollectivePskPlugin asimplething)

The installer script supports specifying an HTTP proxy, to be used when downloading software (Ruby, MCollective and Cygwin). Only http proxies without authentication can be used.

Important:
Before starting installation of this script, please ensure that all the prerequisites are present and properly installed. This script installs all the components of OpenShift Window Node.

Please install the node by passing the minimum information required.

.\install.ps1 -publicHostname winnode-001.mycloud.com -brokerHost broker.mycloud.com -cloudDomain mycloud.com

Please install the node by also passing the public IP address of the machine.

.\install.ps1 -publicHostname winnode-001.mycloud.com -brokerHost broker.mycloud.com -cloudDomain mycloud.com -publicIP 10.2.0.104

Please install the node for an OpenShift Enterprise deployment, passing a non-default mcollectivePskPlugin.

.\install.ps1 -mcollectivePskPlugin asimplething

Please install the node for an OpenShift Enterprise deployment, passing a non-default mcollectivePskPlugin and the minimum information required.

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```
.\install.ps1 -mcollectivePskPlugin asimplething -publicHostname winnode-001.mycloud.com -brokerHost broker.mycloud.com -cloudDomain mycloud.com
```

Once the script gets completed you will the success message.

Now run the oo-accept-node –v command to check if there are any errors for windows node. Also check the following directories for cartridges availability:

c:/openshift/cartridges

c:/openshift/.cartridge_repository

4. IMPORTING .NET CARTRIDGES

4.1 Restarting services on the broker and importing cartridges

After finishing the installation on Windows, clear the cache on the Linux machine using the following commands: #oo-admin-broker-cache --console –c

Important:
Run the following commands to import cartridges. ** It will cleanup all currently configured cartridges and import them all again**

```
for i in `oo-admin-ctl-cartridge -c list | awk '{print $2}'`;do echo "$i";done | oo-admin-ctl-cartridge -c deactivate
oo-admin-ctl-cartridge -c clean
oo-admin-broker-cache --clear
oo-admin-ctl-cartridge -c import-node --activate --force
```

You will see the DotNet cartridge added successfully to your broker:

```
dotnet-4.5       web       DotNet 4.5              2014/12/12 14:49:56 UTC
mssql-2008       service   MS SQL Server 2008      2014/12/12 14:49:56 UTC
mssql-2012       service   MS SQL Server 2012      2014/12/12 14:49:56 UTC
```

5. CREATING DISTRICTS

Important:
Districts should be created before creating any gears are made on your OpenShift cloud.
As long as a node has a gear, it cannot be added to a district. Do not add Windows and Linux nodes to the same district.

- Create a District for windows node from the following command:
  oo-admin-ctl-district -c create -n <NameOfYourDistrict> –o windows
- Now add a node to your district
  oo-admin-ctl-district -c add-node -n <NameOfYourDistrict> -i <HostnameOfYourNode>
- To make sure everything is in order check your configuration
  oo-admin-ctl-district

  This will display all the district information.

To test the windows node availability, run the below command:

oo-mco ping

6. CREATING WINDOWS APPLICATION

From a client machine, use rhc to connect to your OpenShift cloud.

Click here to download rhc command line tool to your system.

Before creating your app, add the app's hostname to your local hosts file, pointing to the Linux machine, so the git client and your browser know how to resolve that hostname.

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All OpenShift applications that contain a Windows cartridge must be configured as scalable. When you use rhc to create a Windows application, make sure to specify the -s flag.
Example:

```
rhc create-app myapp dotnet -s
```

Add a MS SQL Server 2008 cartridge

```
rhc add-cartridge mssql-2012 -a myapp
```

You have successfully created your app using windows DotNet cartridges.

7. TESTS

7.1 Checklist to verify deployment on Windows Node

Below are the line-items that you can manually verify to test the deployment.

- ✓ Verify that the core Openshift.Net service exists, started and running at the time of startup.
- ✓ Verify that the scheduled tasks required for Openshift.Net functionality exist,
- ✓ Verify that Broker, hostname and winnode resolved
- ✓ Verify TCP connection with ActiveMQ Service
- ✓ Check that both MS SQL Server 2008 and MS SQL Server 2012 are installed, their services are stopped and the startup mode is set to be disabled
- ✓ Check that the firewall is enabled, that the SSHD port is opened and that all the existing prisons have a corresponding rule.
- ✓ Check the prison users exist as local user account.
- ✓ Check that local user accounts with the prison prefix have corresponding prison entries.
- ✓ Check that the users found in cygwin/etc/passwd exist on the llocal system and also in the prison db