Step-by-Step guide to setup an IBM WebSphere Portal and IBM Web Content Manager V8.5 Cluster From Zero to Hero (Part 2.)

Summary

Abstract

This guide want to explain how install, configure, and building an IBM WebSphere Portal v8.5 cluster using:

IBM WebSphere Application Server
Red Hat Enterprise Linux 6.0 update 3
DB2 10.5
Active Directory 2012 R2 mixed mode
IBM HTTP Server 8.0

Windows/Unix Differences

This guide was written using Linux as the base operating system, however the steps/concepts listed in this guide are independent of operating system.

The only significant difference is that for Windows, you must use the batch file commands instead of the UNIX shell commands listed in this guide.

For example:

UNIX: ./startServer.sh WebSphere_Portal
Windows: startServer.bat WebSphere_Portal

Or

UNIX: ./ConfigEngine.sh cluster-node-config-cluster-setup
Windows: ConfigEngine.bat cluster-node-config-cluster-setup

Hostnames Used in this Guide

To avoid confusion with my own hostnames, I've replaced each instance of the hostnames of my servers with a sample value that corresponds to the server it belongs to so that it may be easier to understand which server I'm referring to in my examples.
I use the following values:

Primary Node :	first.ondemand.com
Secondary Node:	second.ondemand.com
DMGR:	dmgr.ondemand.com
Database Server:	dbstore.ondemand.com
LDAP Server:	ldap.ondemand.com
IBM HTTP Server:	portal.ondemand.com

Cluster Concepts

Server - A Java Virtual Machine (JVM) that manages user applications (such as WebSphere Portal and Web Content Management).

Node - A logical grouping of one or more application servers. A node does not necessarily mean a single physical server.

Cell - A logical grouping of one more nodes.

Cluster - A logical grouping of one or more servers across one or more nodes. The servers are managed together and participate in workload management. Servers in a cluster share resources, such as applications. Multiple clusters can exist in a single cell, but a single cluster cannot exist across multiple cells.

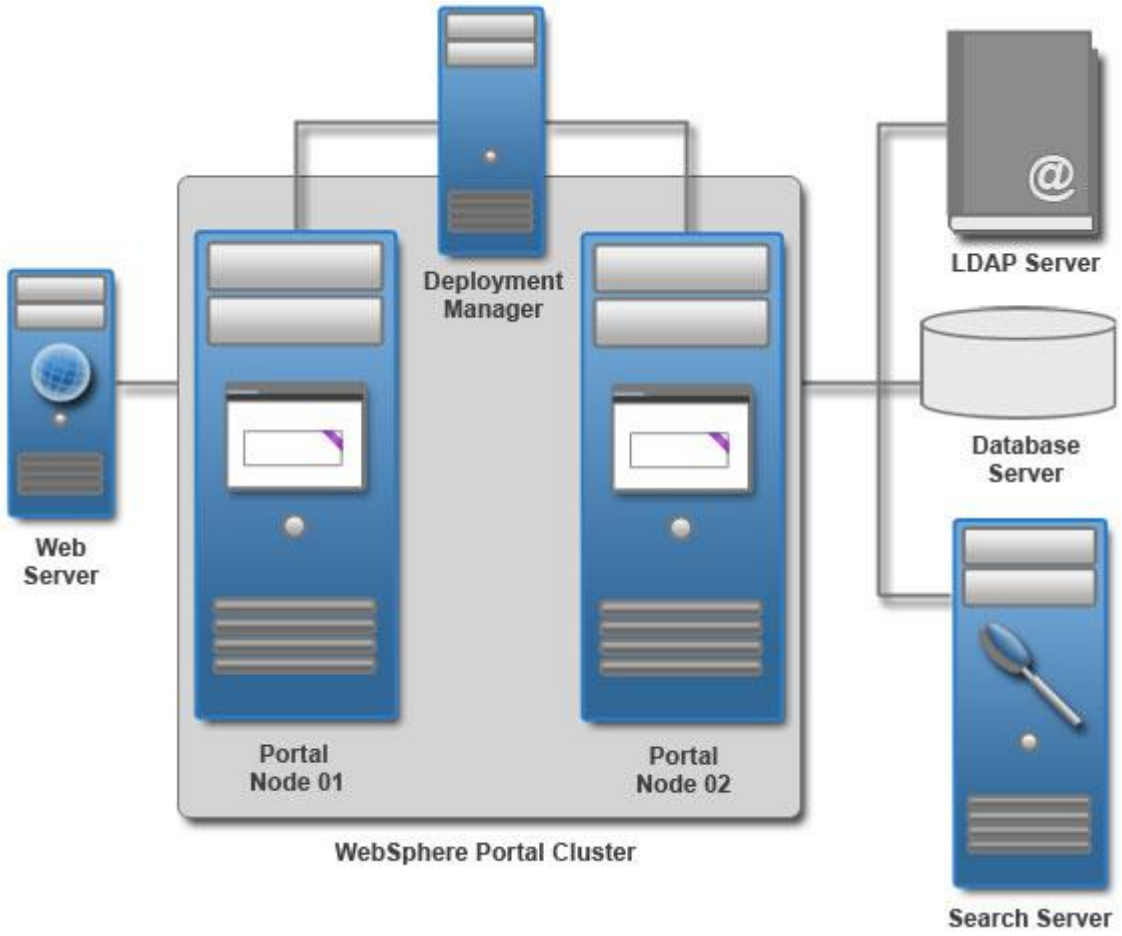


Figure 1 – WebSphere Portal cluster with two nodes, each with three cluster members.

Main Guide

Prepare Secondary Node

Pre check

Verify have more then 5GB on temporary directory /tmp

Open terminal and verify if your system is reachable using fully qualified hostname

[root@serv01 /]# ping first.ondemand.com

In the same terminal, execute

[root@serv01 /]# ping localhost

To verify the "localhost" network settings are configured properly on your machine.

Linux/UNIX environments only.
If in your environment do not use IPV6 verify that is disable in each machine.

In the same terminal, execute

[root@serv01 /]# cat /etc/sysconfig/network

And verify if your NETWORKING_IPV6 is set to "no"

Ensure have sufficient file open limit, is set to 10240 or higher.

ulimit -n 10240

Web Content Manager only: Complete the following steps to remove any file size limits: Use the ulimit -f command to set the maximum size of files that can be created.

Following library is needed during installation process, if you do not configure X environment verify you can use export display to use each wizard, in this guide I use this method to execute installation.

gtk2-2.18.9-6.el6.x86_64.rpm
glib2-2.22.5-6.el6.x86_64.rpm
libXtst-1.0.99.2-3.el6.x86_64.rpm
compat-libstdc++-33-3.2.3-69.el6.x86_64.rpm
openmotif22-2.2.3-19.el6.x86_64.rpm
pam-1.1.1-10.el6.x86_64.rpm
libXp-1.0.0-15.1.el6.x86_64.rpm
libXmu-1.0.5-1.el6.x86_64.rpm
kernel-headers-2.6.18-238.19.1.el5.x86_64.rpm
compat-glibc-headers-2.3.4-2.26.x86_64.rpm
compat-glibc-2.3.4-2.26.x86_64.rpm
libgtk-x11-2.0.so.0
libgtk-x11-2.0.so.0

libcanberra-gtk-module.so
glibc-2.12-1.47.el6.i686.rpm
compat-libstdc++-33-3.2.3-69.el6.x86_64.rpm
compat-libstdc++-33-3.2.3-69.el6.i686.rpm
yum search -1.0.0-15.1.el6.i686.rpm
libXp-1.0.0-15.1.el6.x86_64.rpm
openmotif-2.3.3-4.el6.i686.rpm
xterm
xkeyboard-config
tigervnc-server-1.0.90-0.17.20110314svn4359.el6.x86_64.rpm
xorg-x11-twm-1.0.3-5.1.el6.x86_64.rpm
xorg-x11-font*

Create Additional Cluster Node

Connect to secondary server and

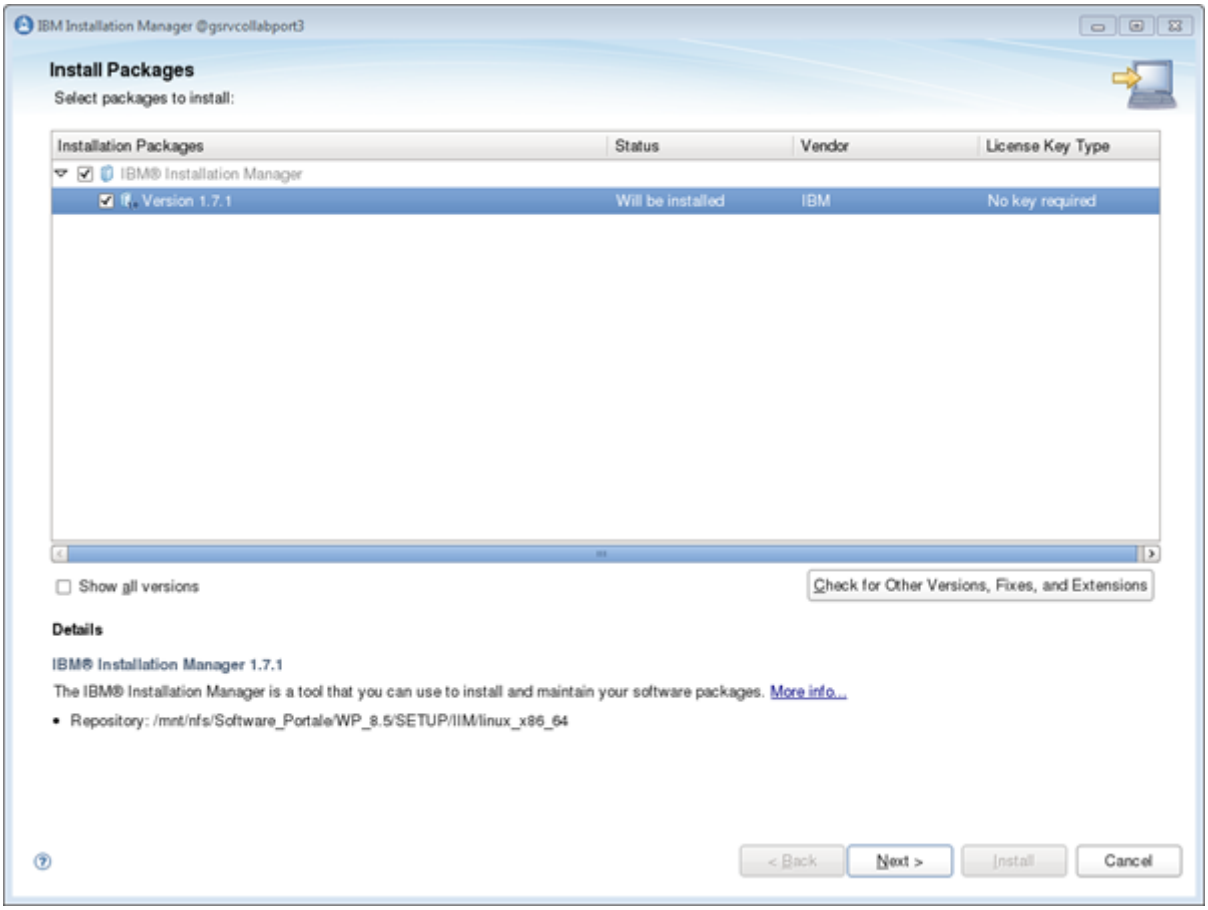
Install IBM Installation manager:

From shared disc where you have already expand all packages needed to execute installation, move where you have expand WSP_Server_8.5_Setup.zip and find following path

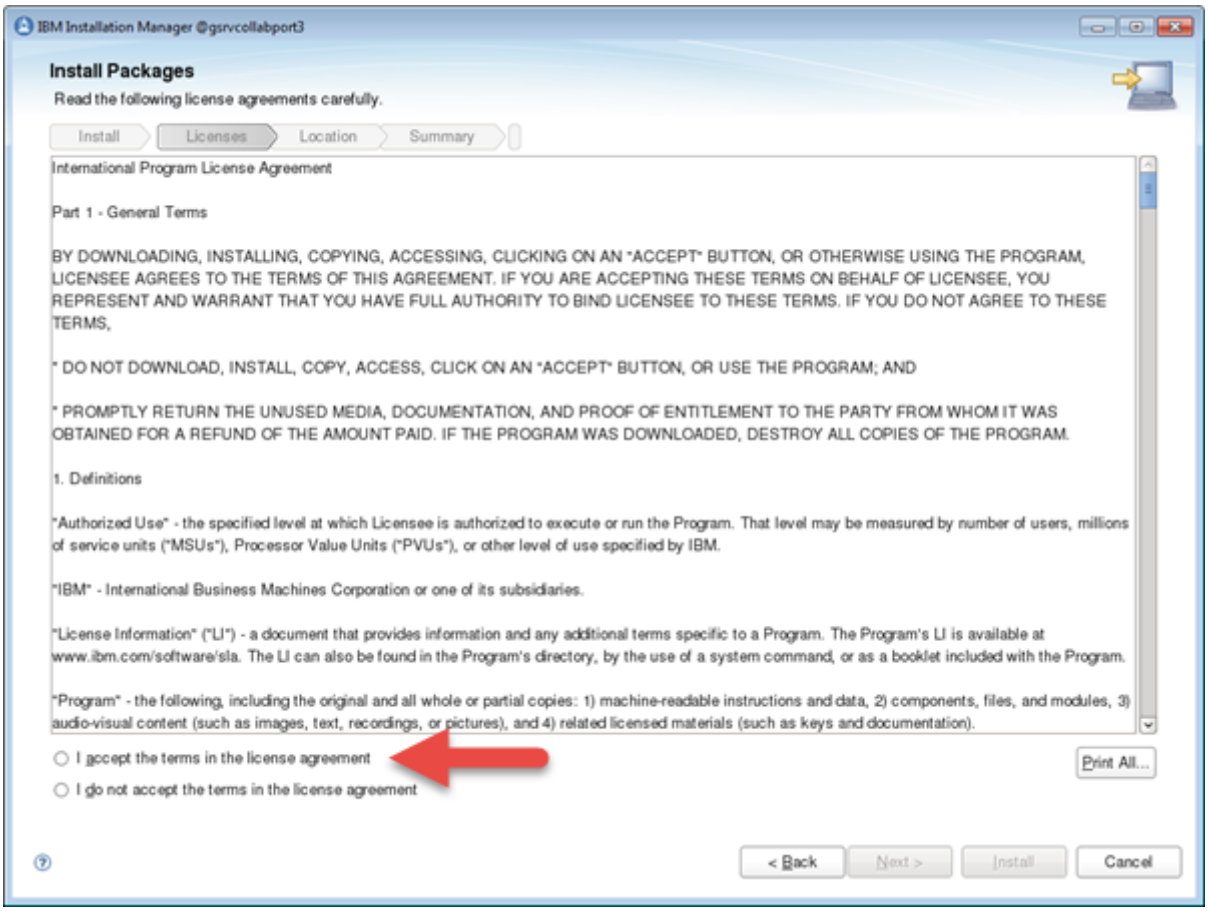
<expandHome>/SETUP/IIM/Linnux_x86_64

and run ./install

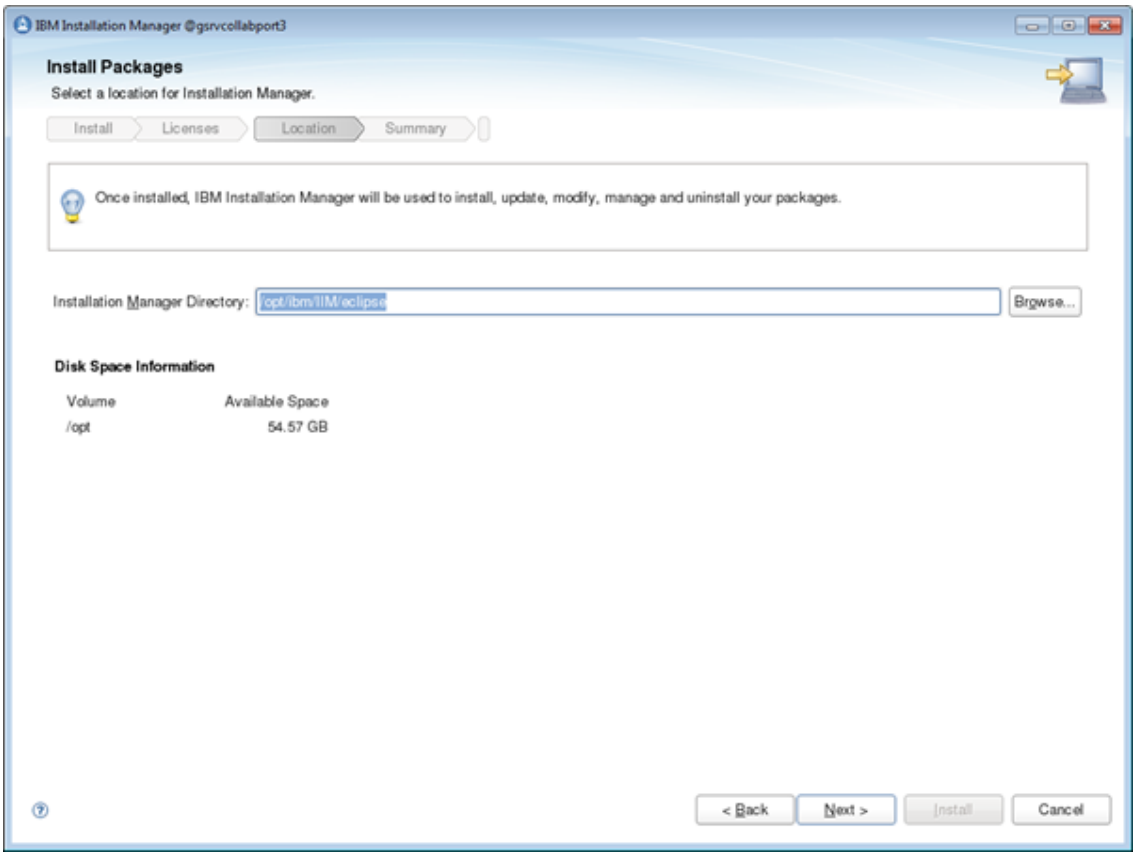
following screen appear to you:



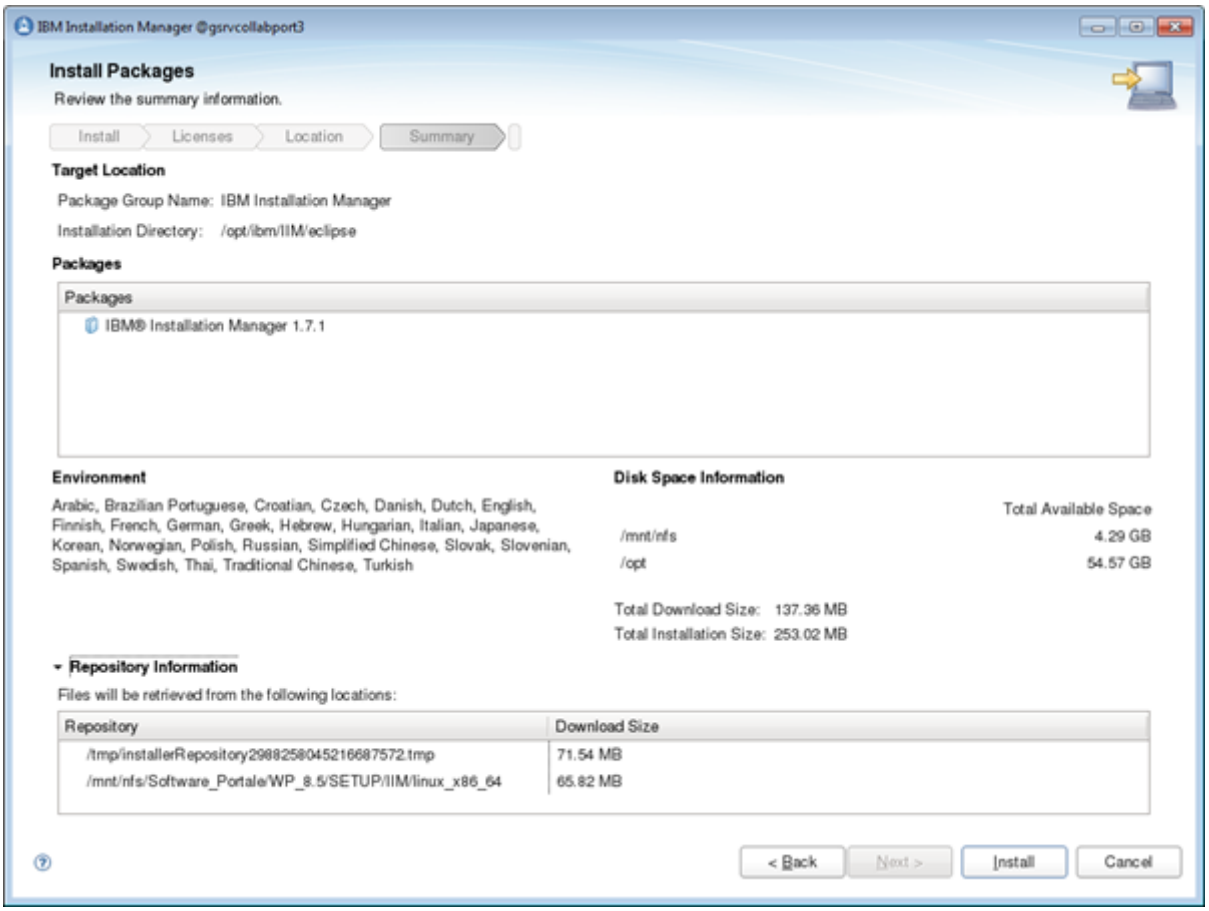
Click next.



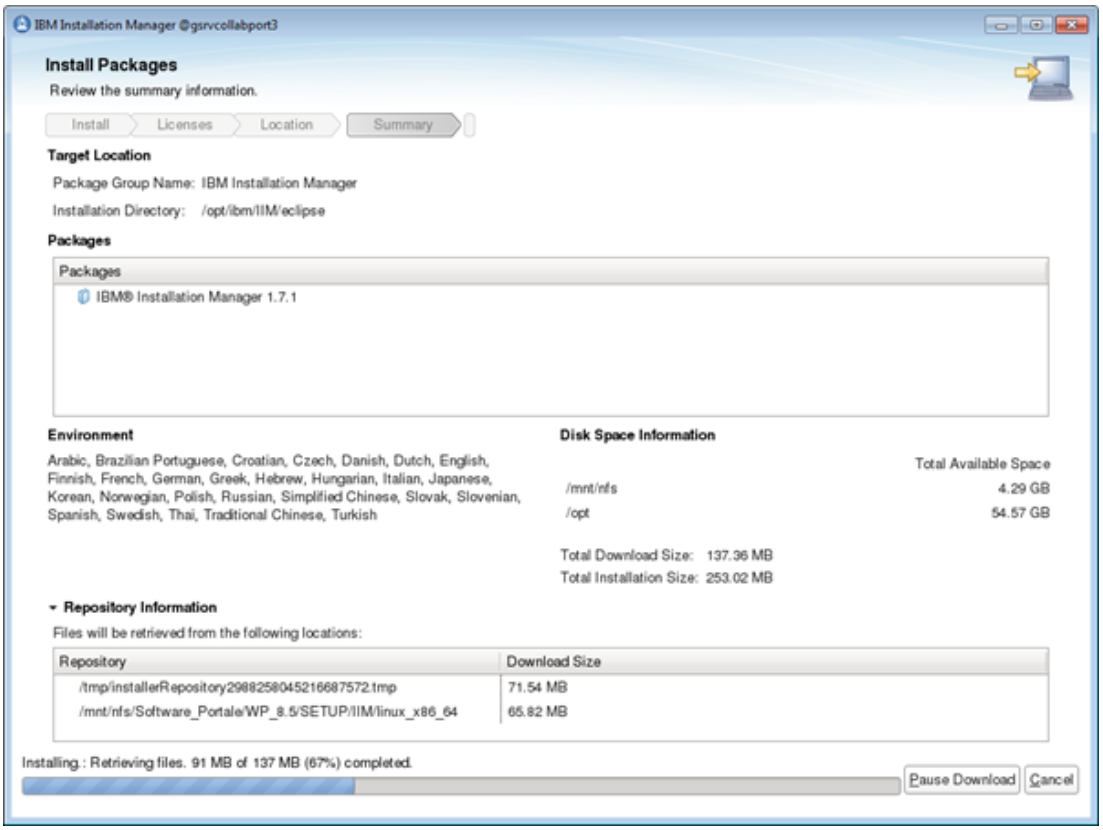
Accept license and click next



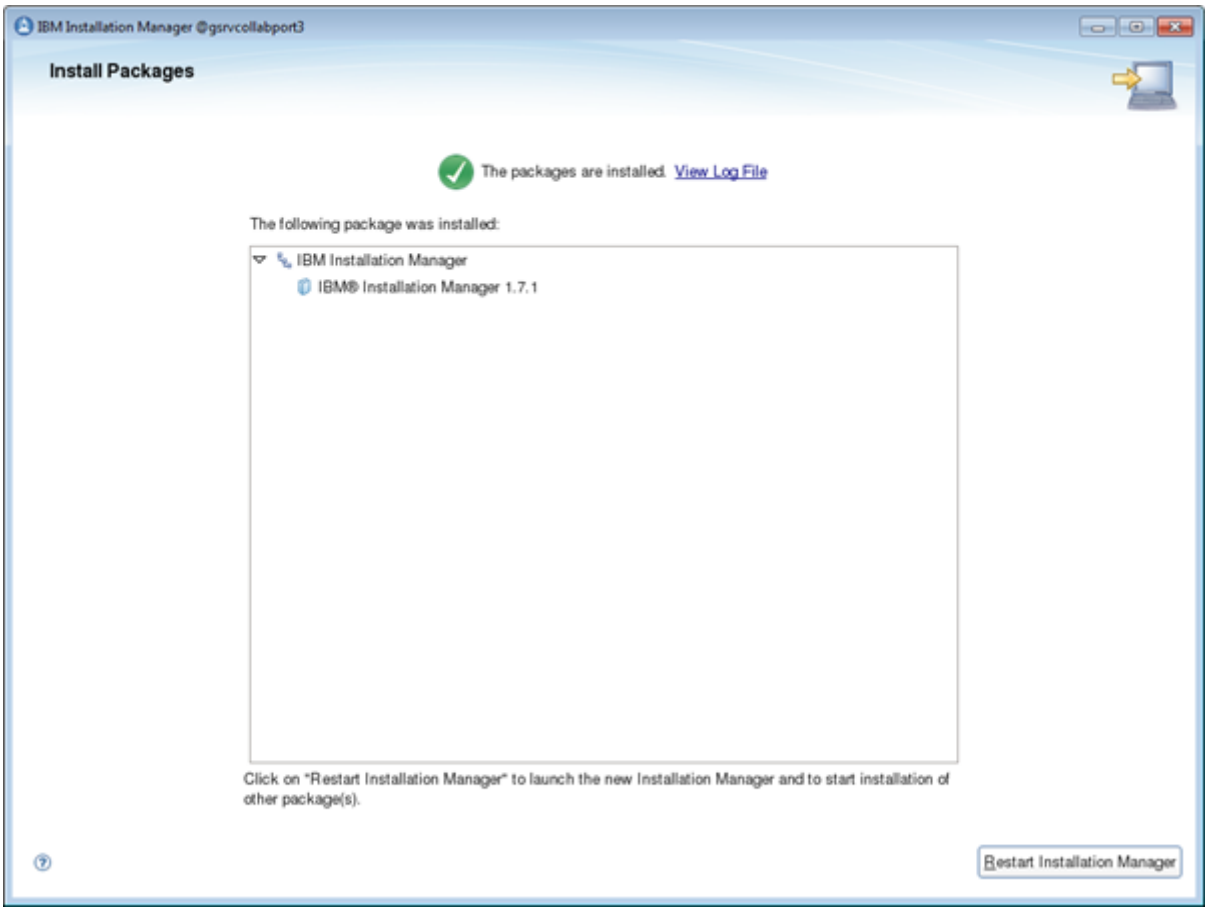
Choose installation path, in my case /opt/ibm/IIM/eclipse, and next



If all summarize information is ok, click install



Waiting to install

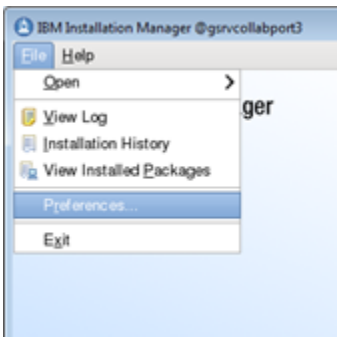


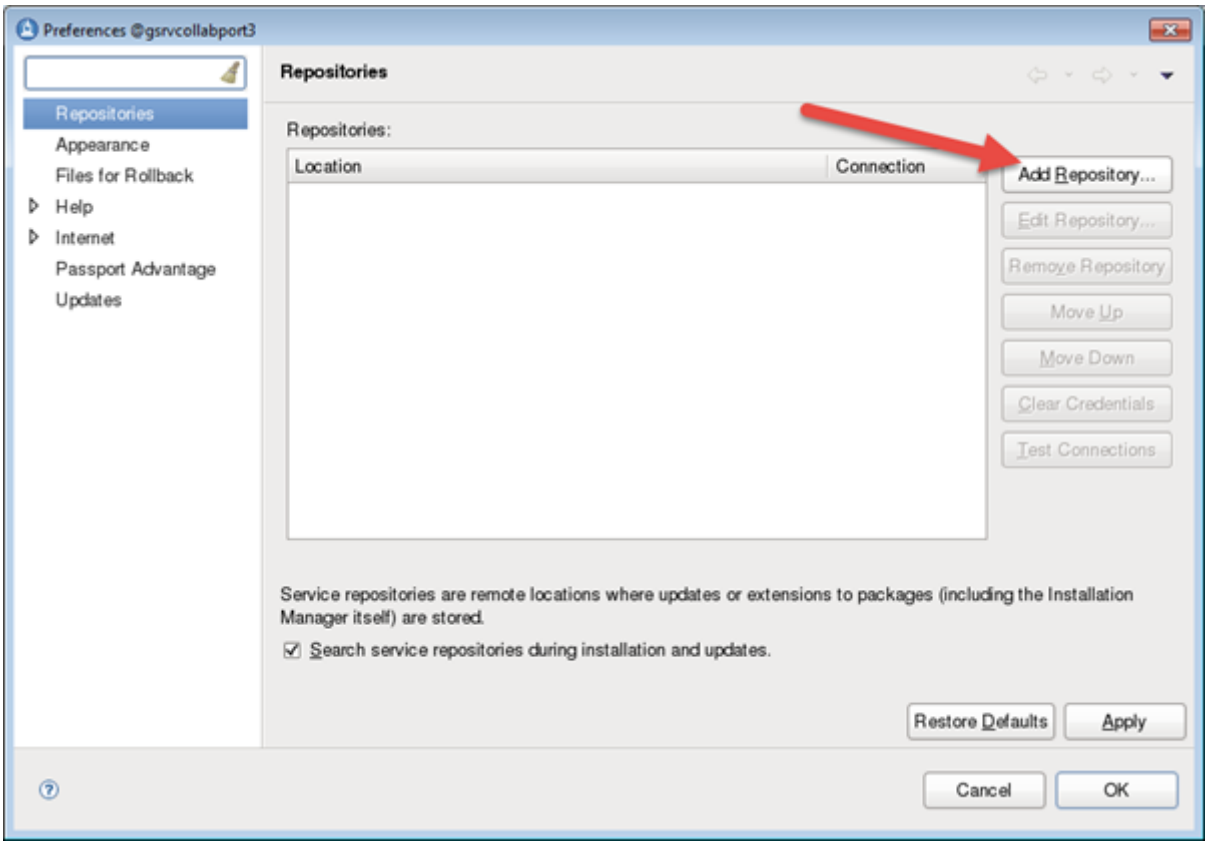
If Success you can click Restart Installation Manager, otherwise correct error and re-try.

Install WebSphere Portal

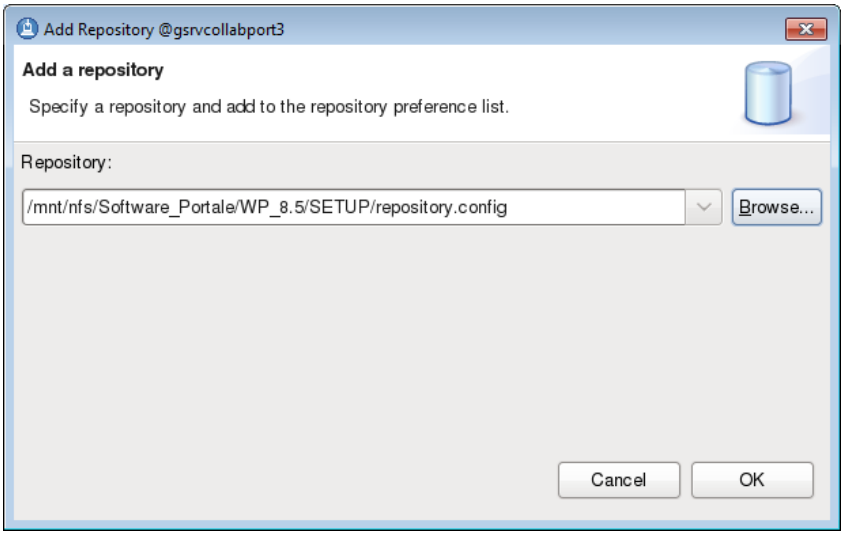
Now you are ready to install Digital Experience Software (WebSphere Portal)

In installation manager menu select File / Preferences…

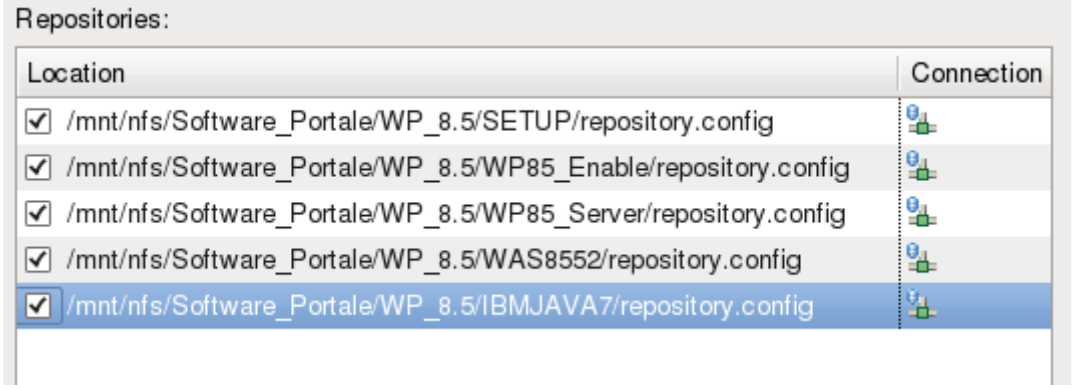


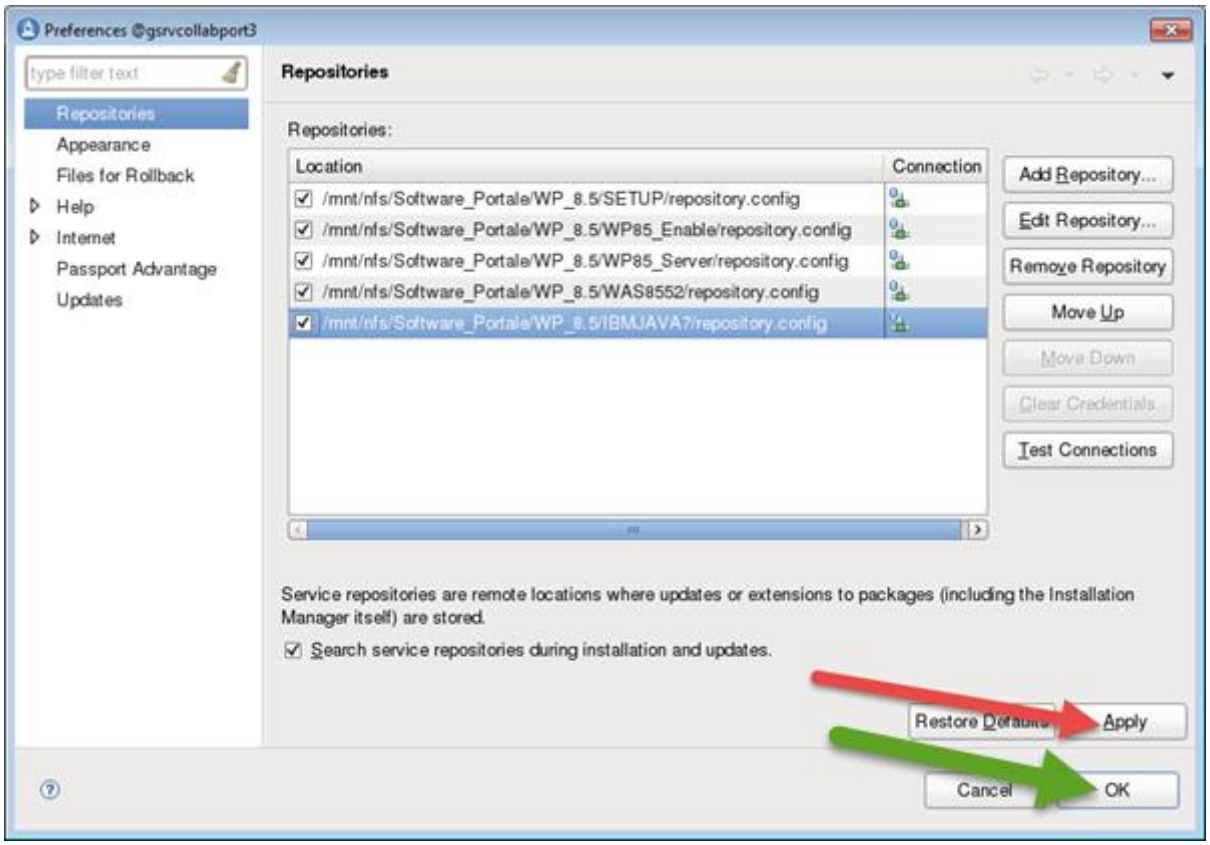


Add repository used during installation

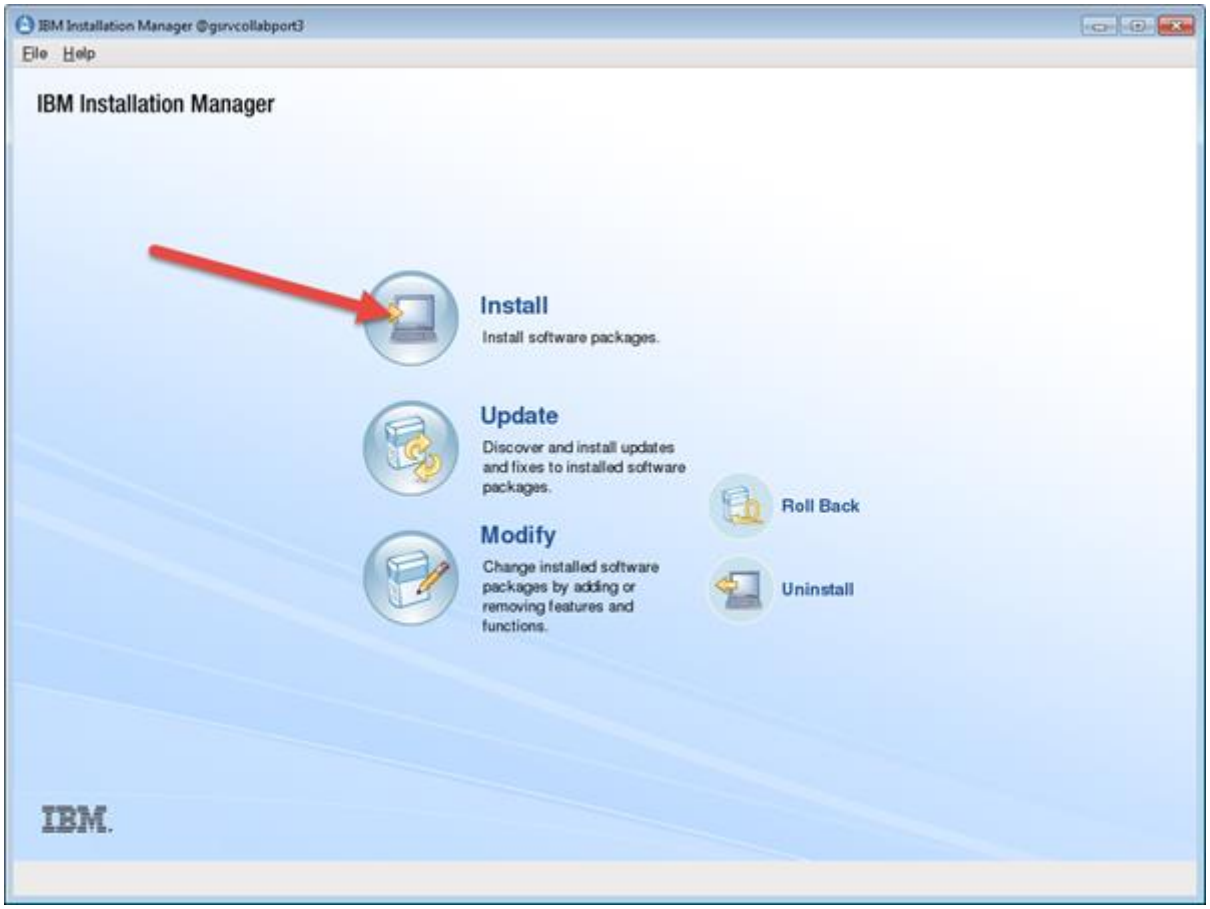


You must choose following repository

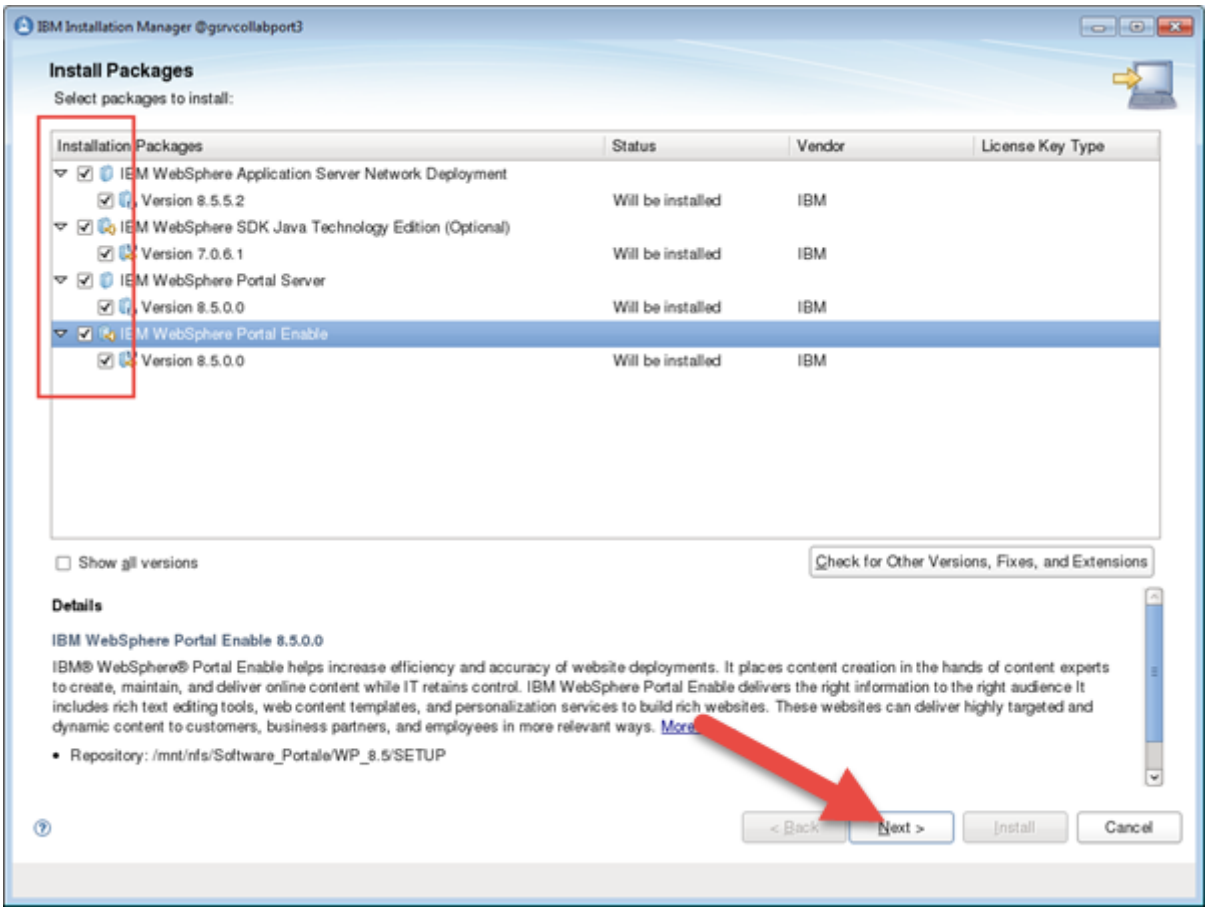




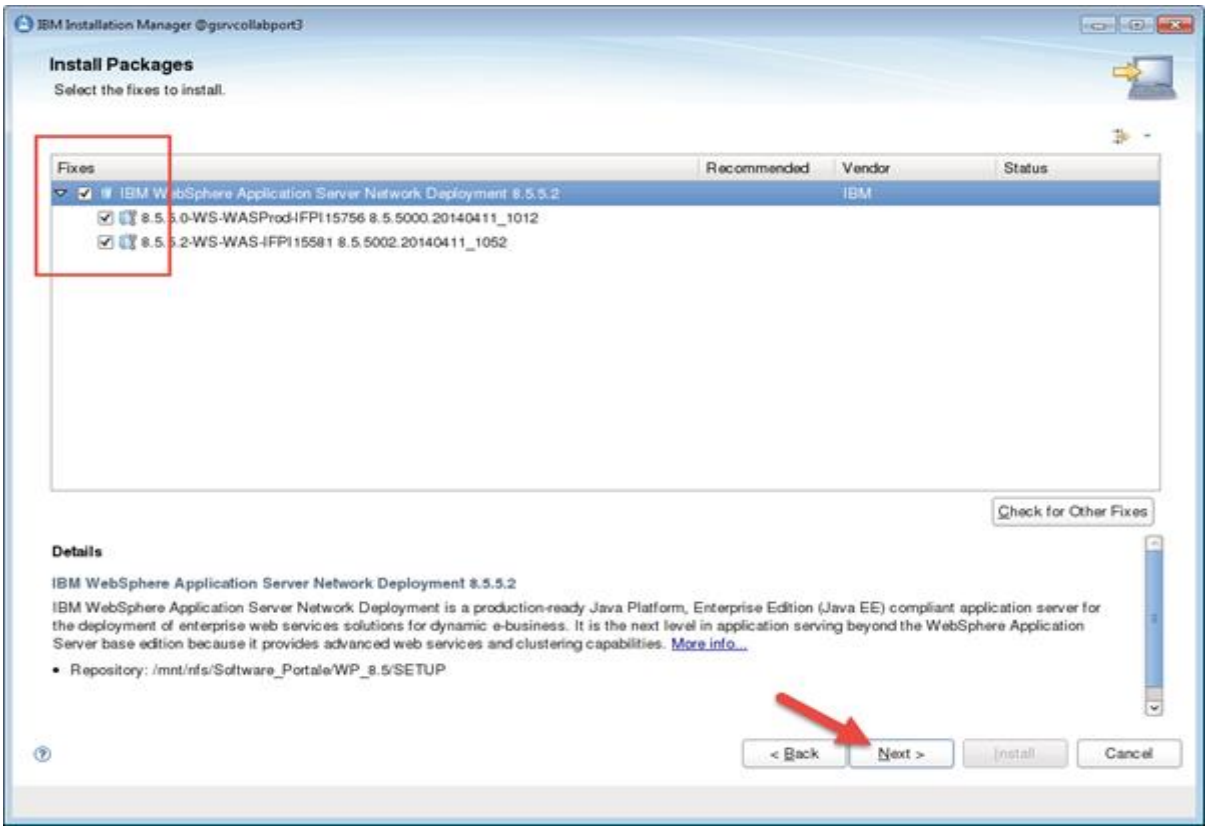
Click Apply and OK



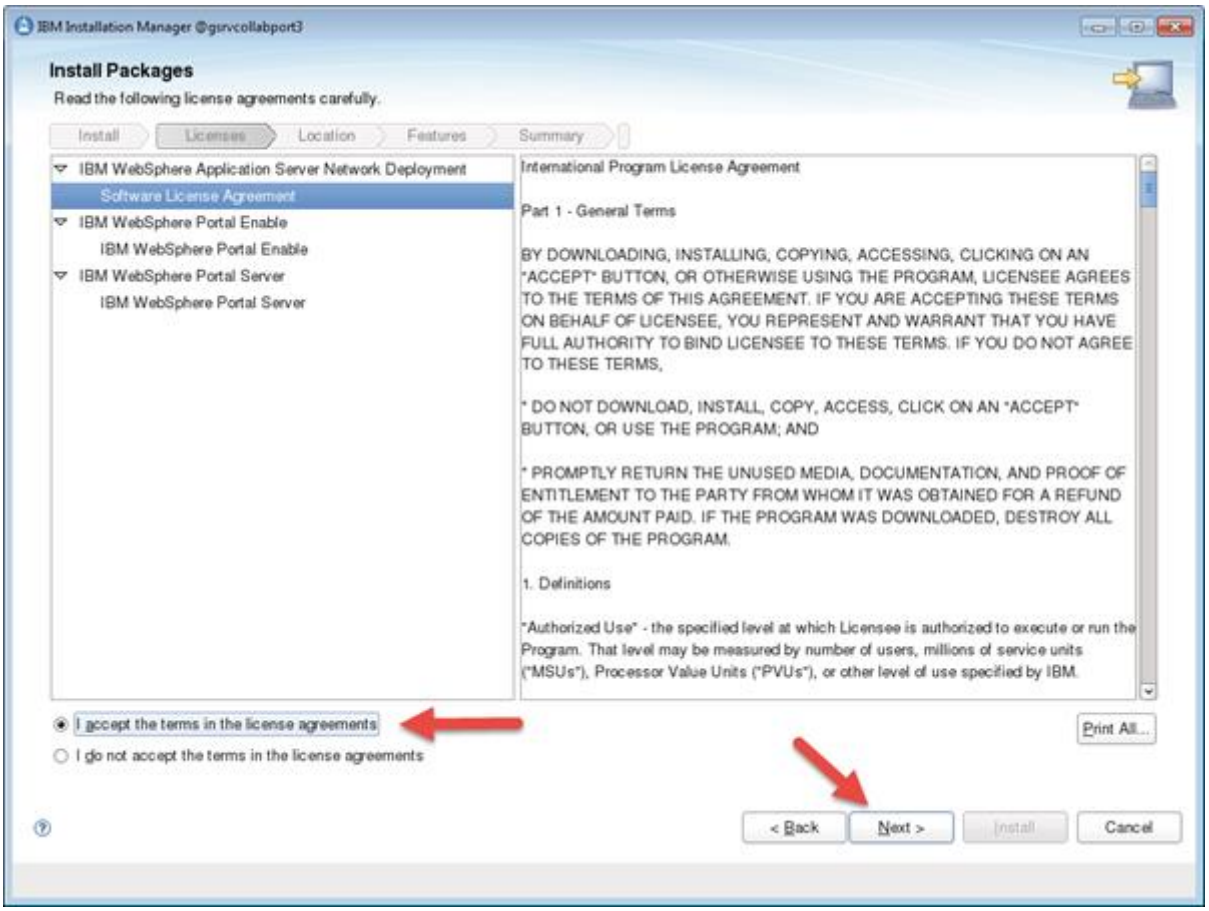
Now click Install



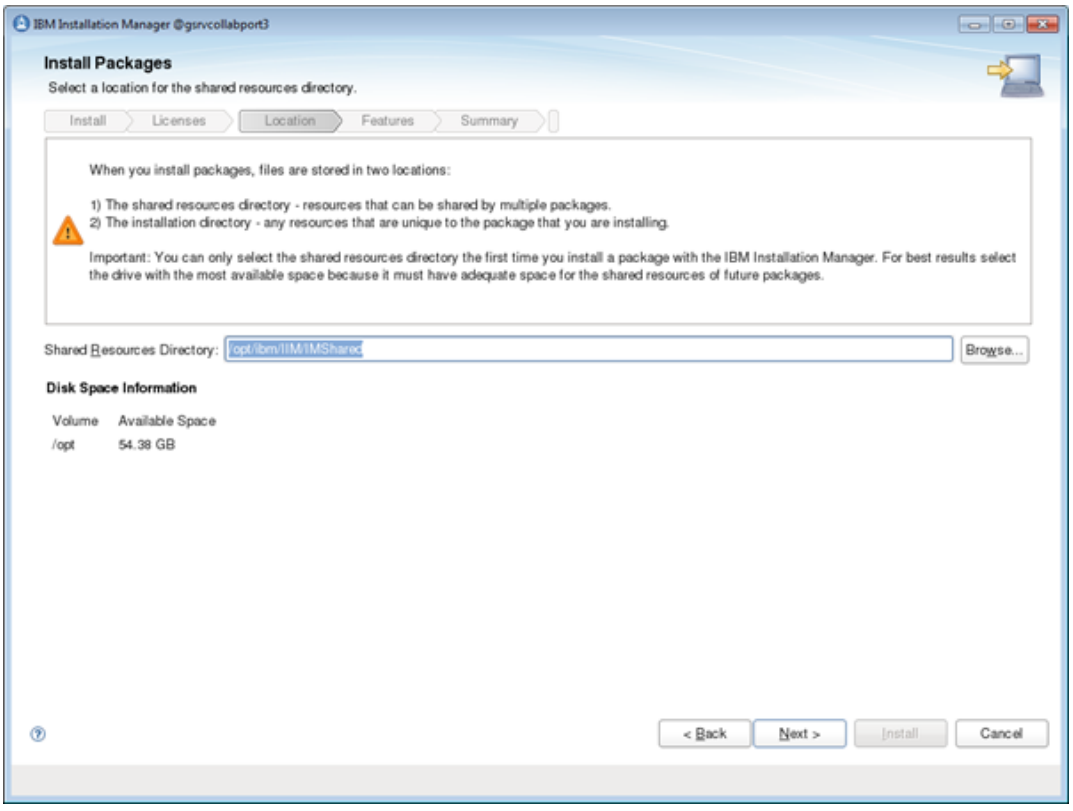
Select all Packages and Next



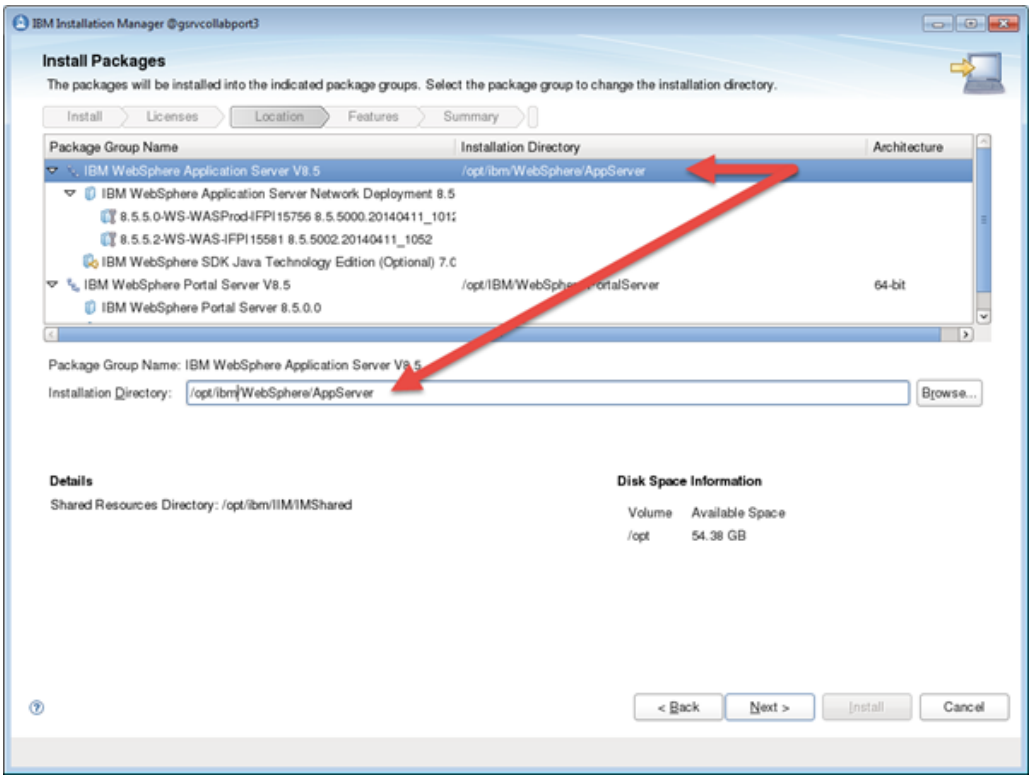
Select all Packages and Next



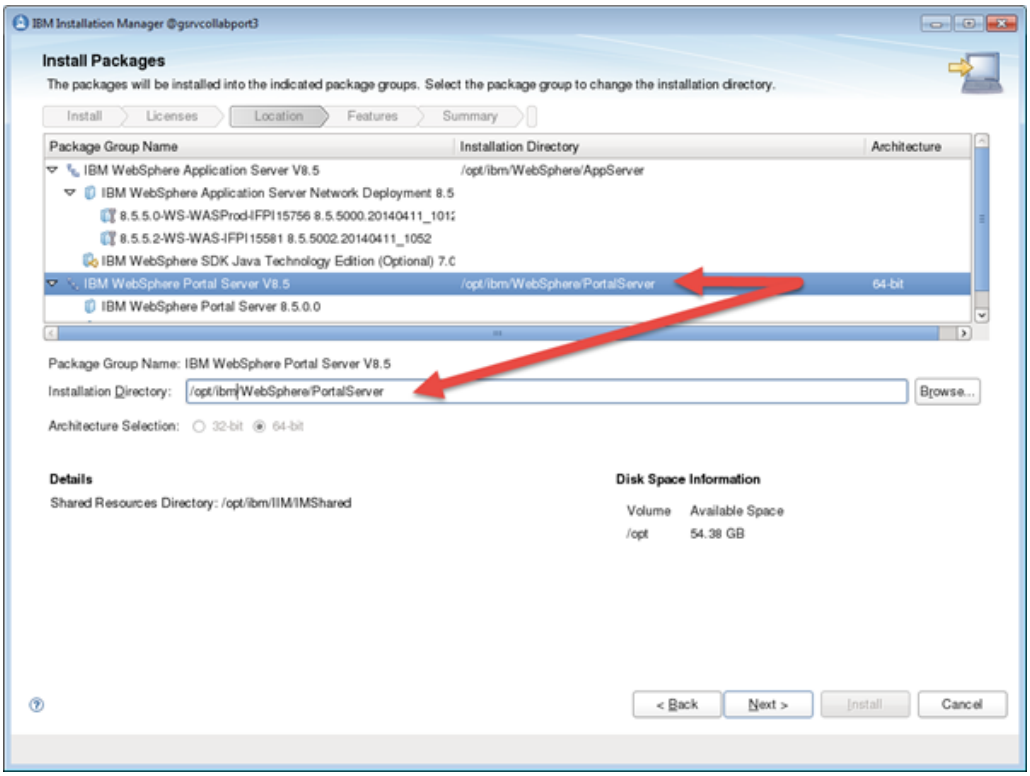
Accept license and Next



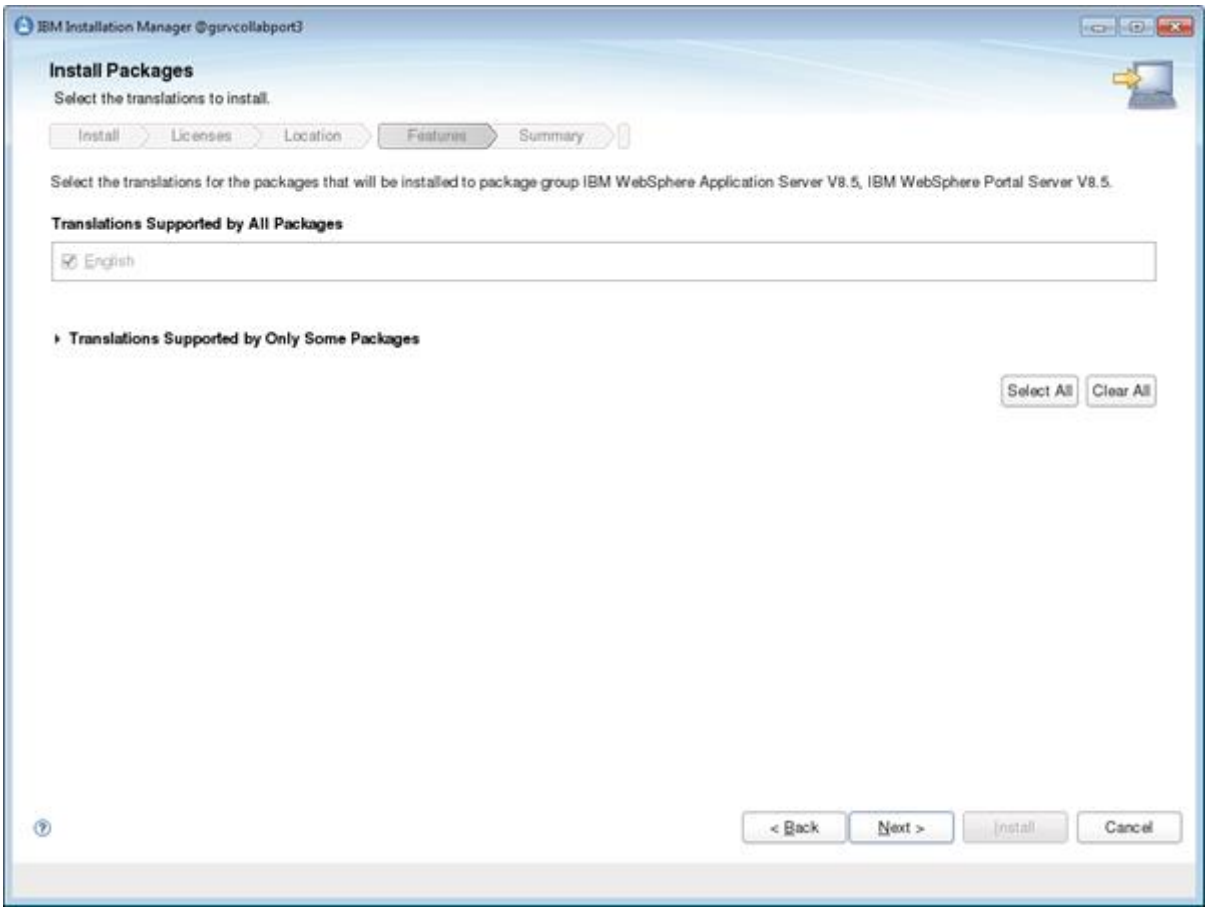
Choose your IMShared directory, in my case /opt/ibm/IIM/IMShared and Next



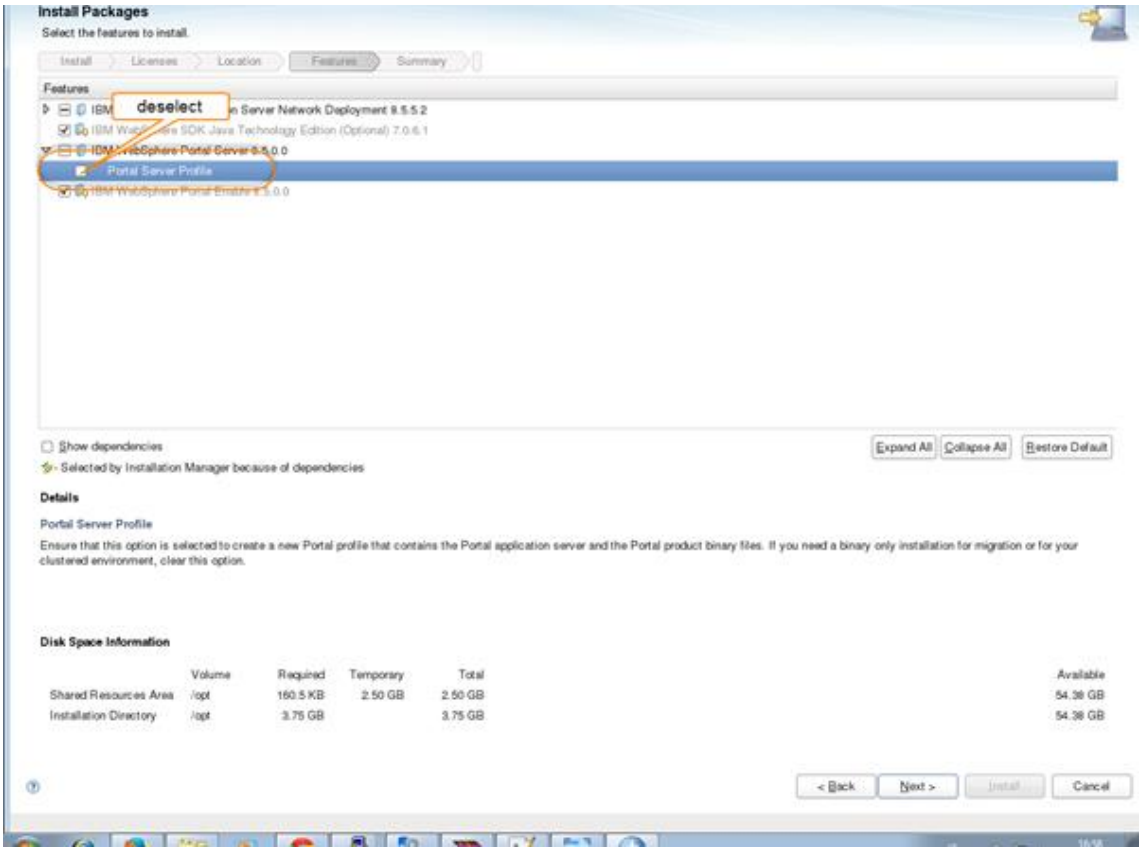
Choose your WebSphere Application Server install path, in my case /opt/ibm/WebSphere/AppServer



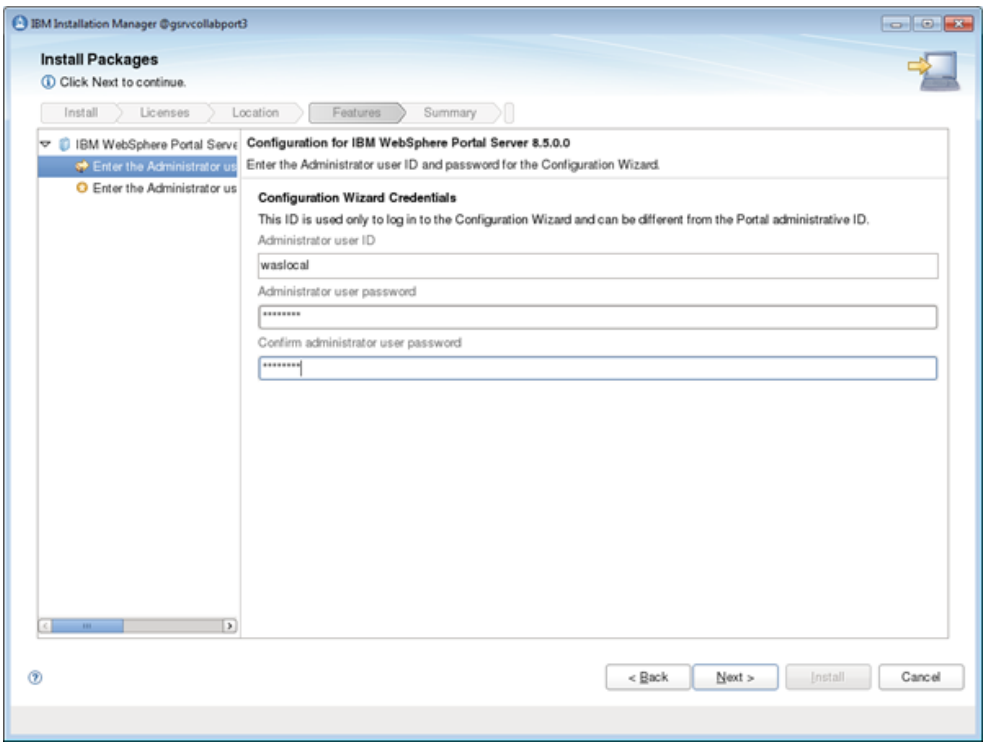
Choose your WebSphere Portal Server install path, in my case /opt/ibm/WebSphere/PortalServer and Next



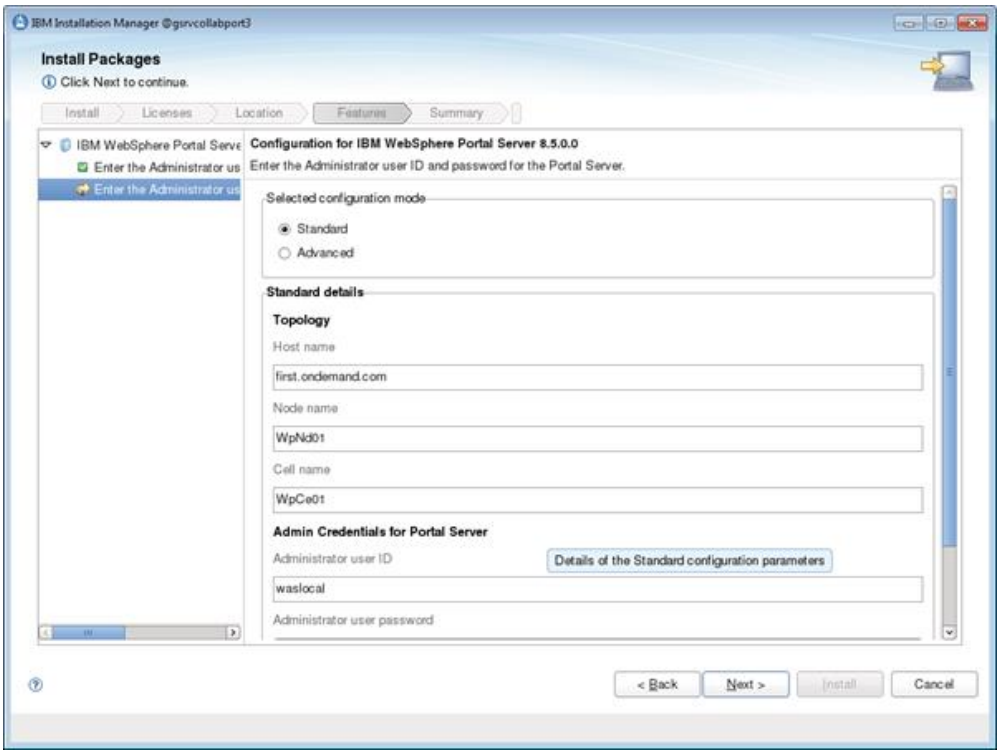
If needed choose your language, otherwise Next



Verify that “Portal Server Profile” will be deselected, and Next



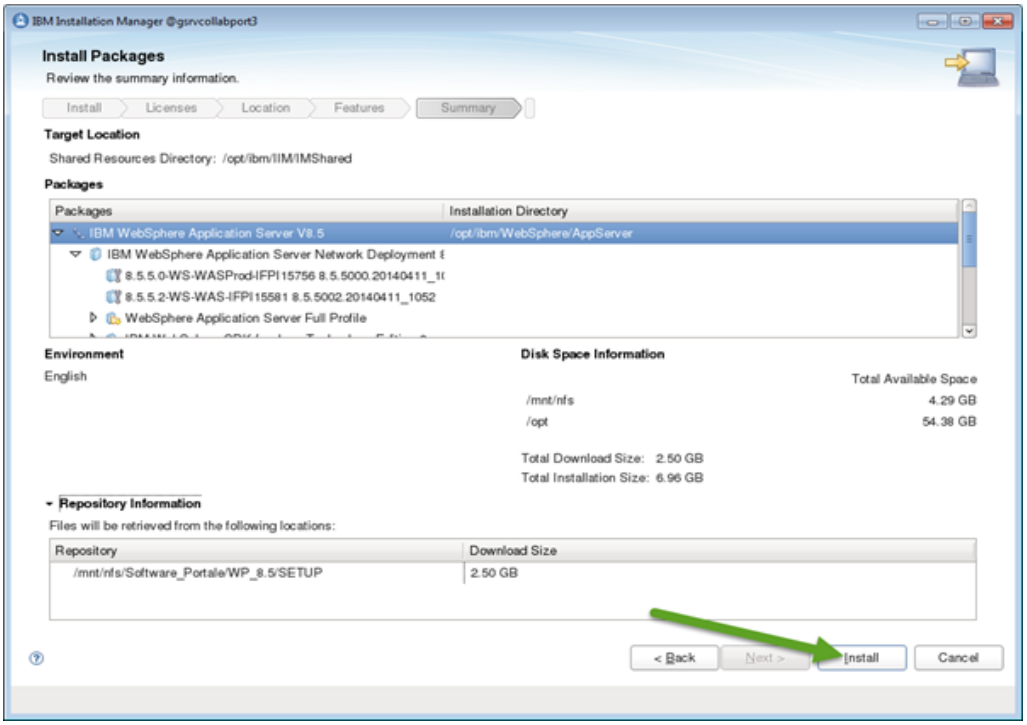
Choose your WebSphere Administrator credential, this credential will be stored in Internal Repository and MUST be unique when you add your LDAP configuration, in my case I use waslocal / passw0rd



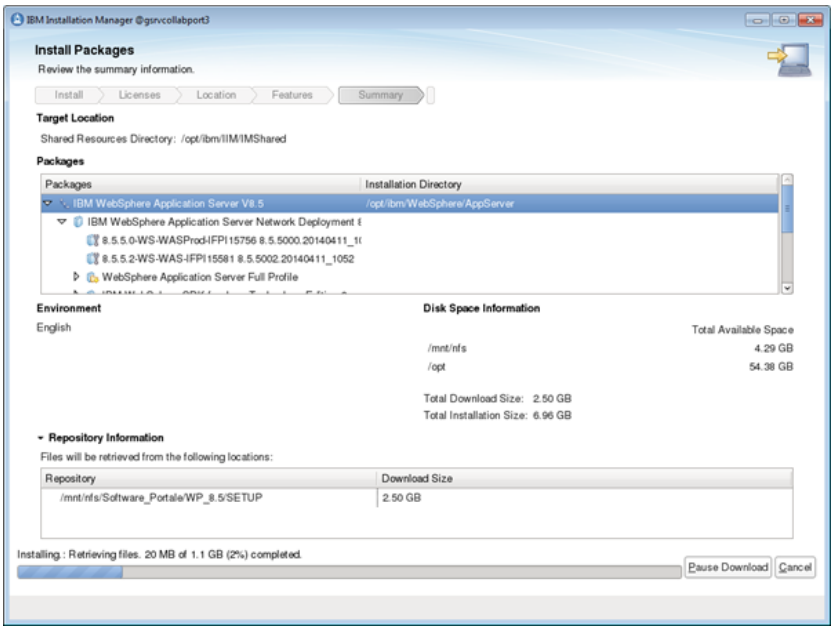
Set Hostname, this name will be solved during your digit. Set Node name and Cell Name,
In my case I choose as Node name : WpNd02 and for Cell name: WpCe02, this cell name will be updated when node will be federated to DMGR.

Choose your WebSphere Portal Administrator credential, this credential will be stored in Internal Repository and MUST be unique when you add your LDAP configuration, to simplify your work I can suggestion to use same user you choose as WebSphere Administartor,
in my case I use
Waslocal / passw0rd

Optional: If you select the Advanced Configuration radio button at the top of this screen (not shown), you can also set the Context Root, Default Home, Personalized Home, starting Port range, Profile Name, and Profile Path. For this guide, these were all left as the defaults but you are welcome to configure these as you see fit.

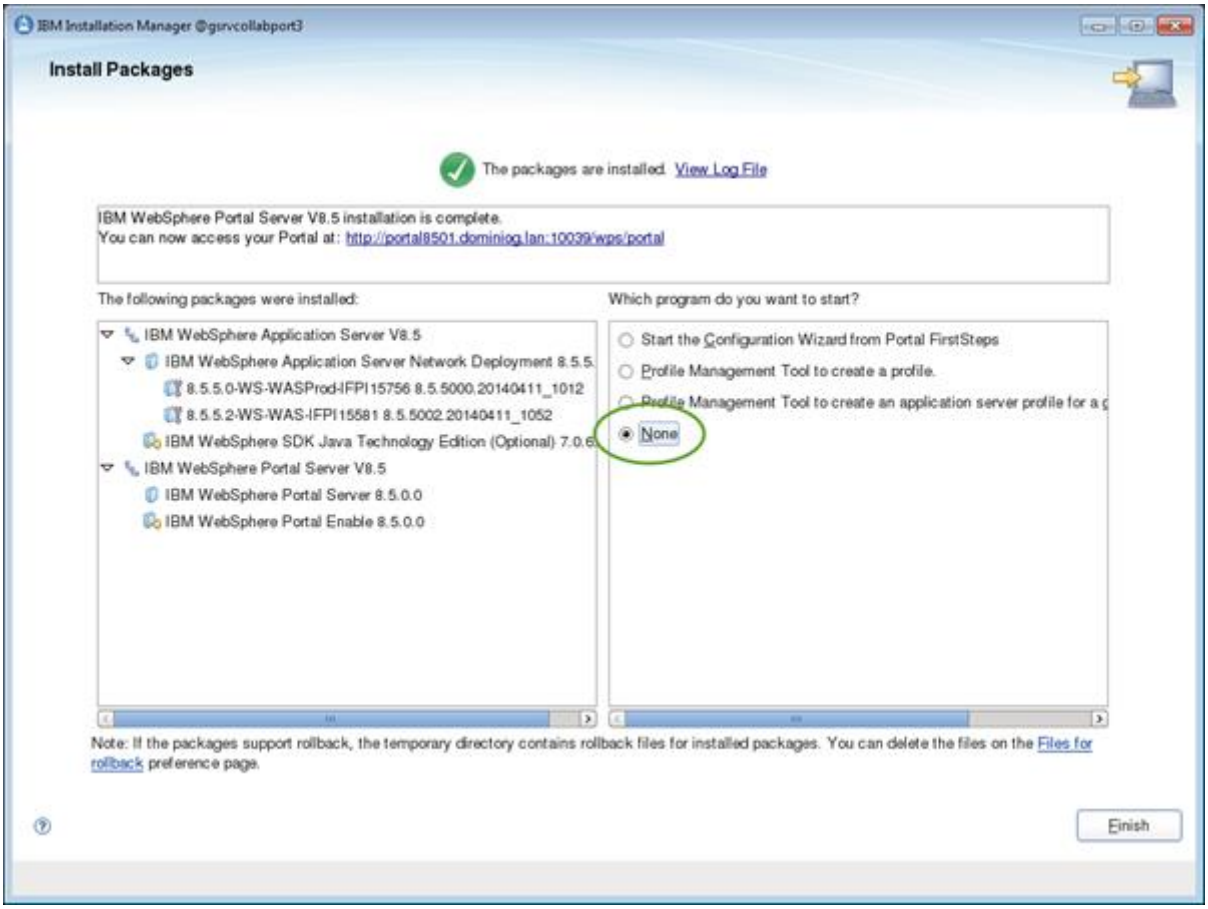


If all summarize data is OK, you can click Install



And wait to complete

if all activities are successful you will get the following screen, it will take enough time, if you see the bar stops do not worry to be patient.



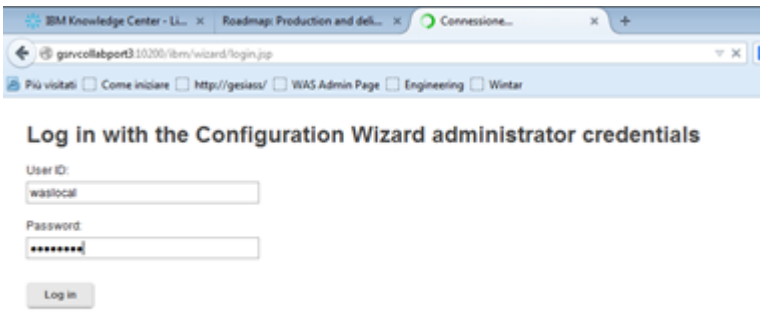
Now choose “None”, and Finish

Federated Additional Cluster Member

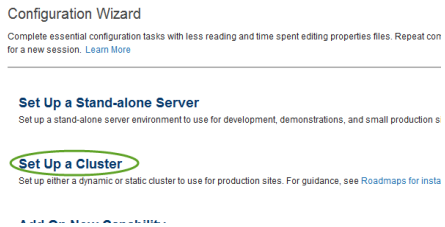
Now we must federate new node in our cell.

Use the Configuration Wizard to generate script to define additional cluster node.

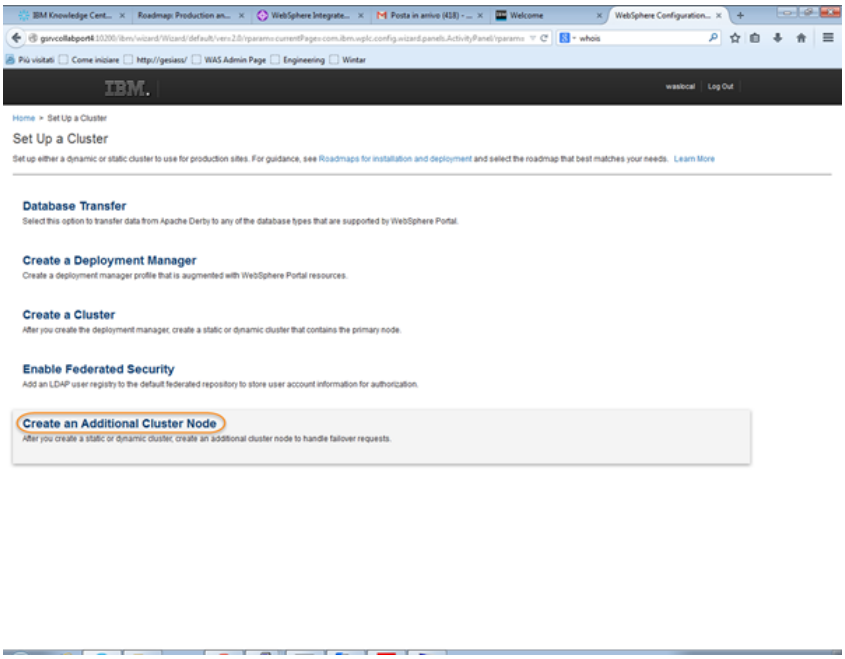
Connect to http://localhost:10200/ibm/wizard , start it if stopped.



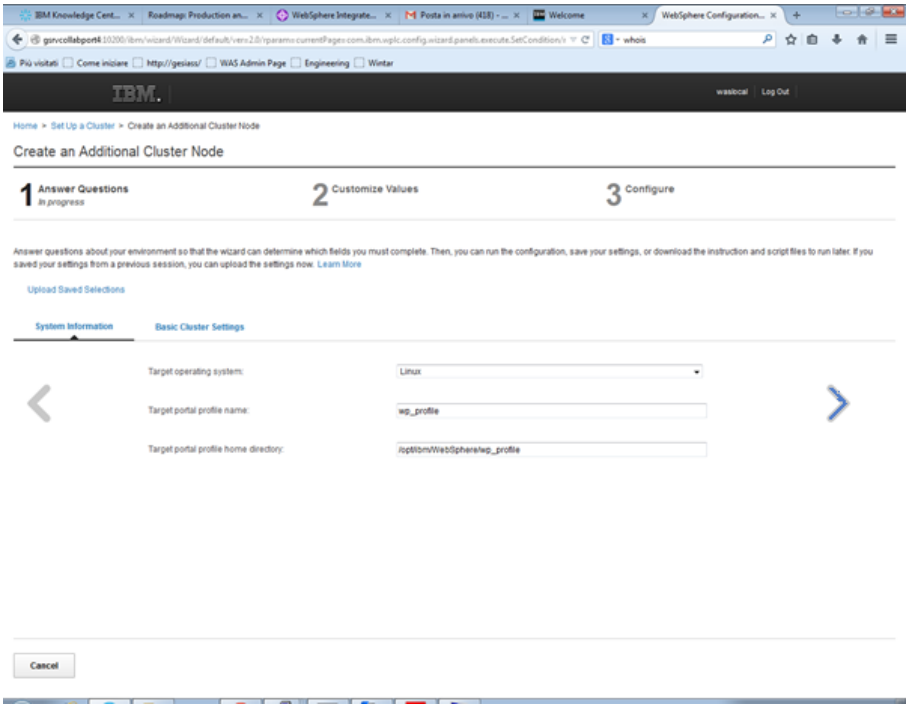
Authenticate using waslocal



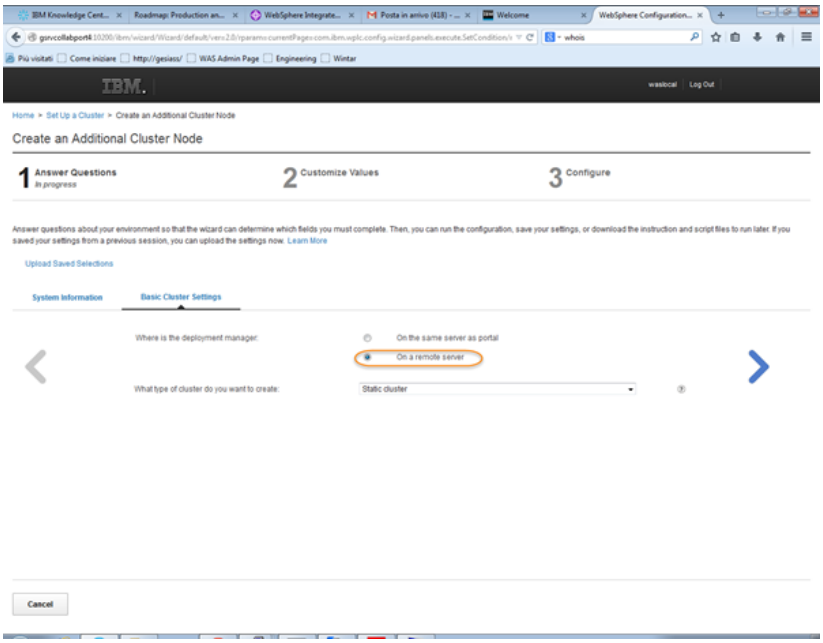
Choose Set Up a cluster



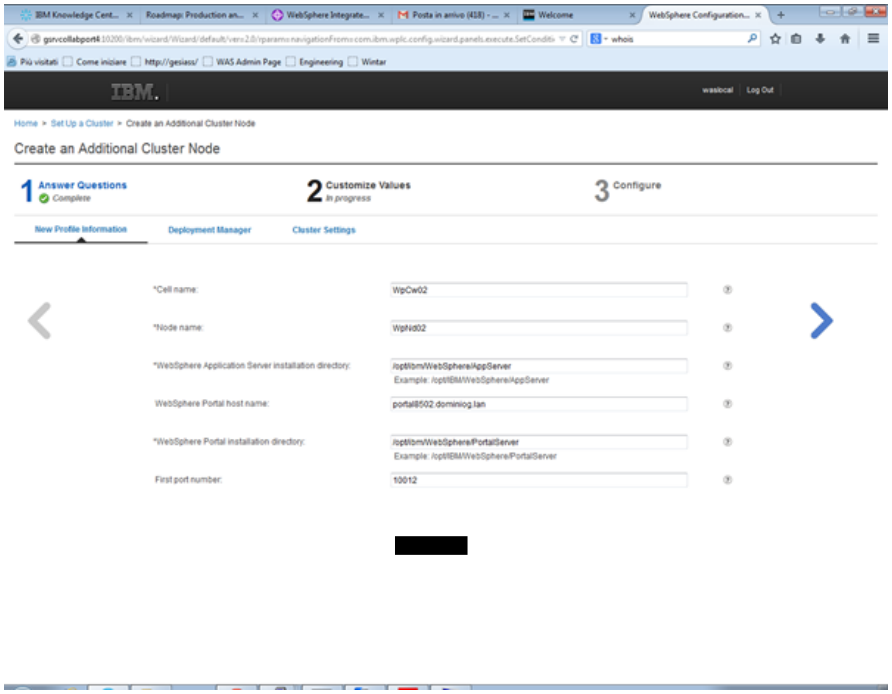
and choose “Create an Additional Cluster Node”



Select default for your script environment and next (right blue arrow)

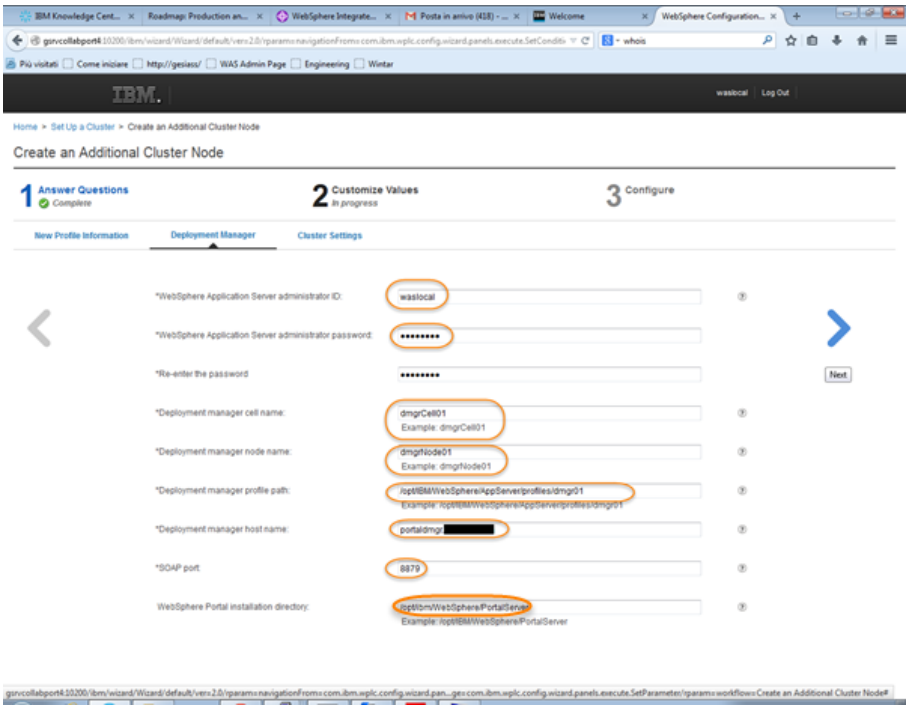


In our case choose “On Remote Server” and next



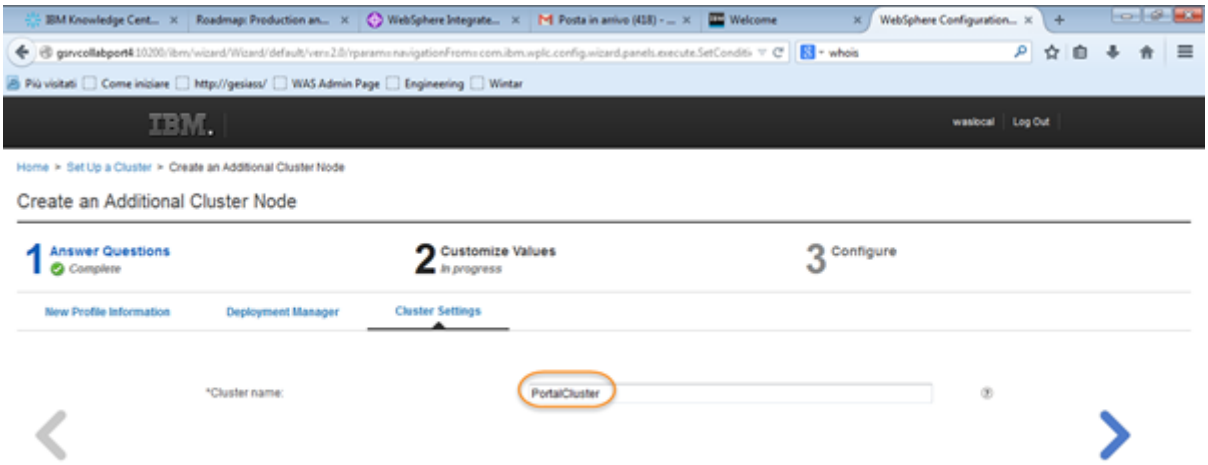
Specify parameter, in my case
CellName: WpCe02
NodeName: WpNd02
WasHome: /opt/ibm/WebSphere/AppServer
PortalHost: portal8502.xxxxxxxxxxxxx
WpsHome: /opt/ibm/WebSphere/PortalServer

and Next

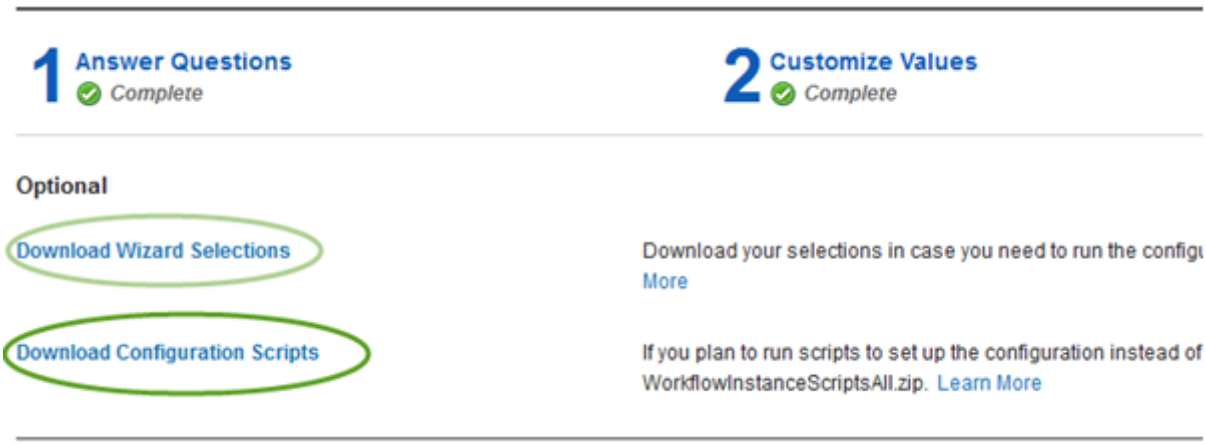


Specify parameter, in my case
Was Admin: wpsadmin (DMGR Administrator)
Was Password: xxxxxxxxx (DMGR Administrator)
CellName: dmgrCe01
NodeName: dmgrNd01
DmgrProfileHome: /opt/ibm/WebSphere/AppServer/profiles/Dmgr01
DmgrHost: portaldmgr.xxxxxxxxxxxxx
SOAP port: 8879
WpsHome: /opt/ibm/WebSphere/PortalServer

and Next



Choose your ClusterName, in my case “PortalCluster” and Next



Choose Download Configuration Scripts

Copy WorckflowInstanceScriptAll.zip into Portal Server and expand it in temporary directory
In my case I expand it in /opt/ibm/script/addnode

In my case I must following a different path to complete configuration, and use only first script generated, because in real configuration I have different credential between Deploy Manager and new node.

Good, now we must prepare new node to federation activities.

Install profile templates.

Create a directory to store templates.

1. Copy the `/opt/ibm/WebSphere/PortalServer /profileTemplates.zip` from the `/opt/ibm/WebSphere/PortalServer/profileTemplates` directory on the primary node to the same location on the additional cluster node. These instructions assume that the primary and secondary nodes are on the same operating system.

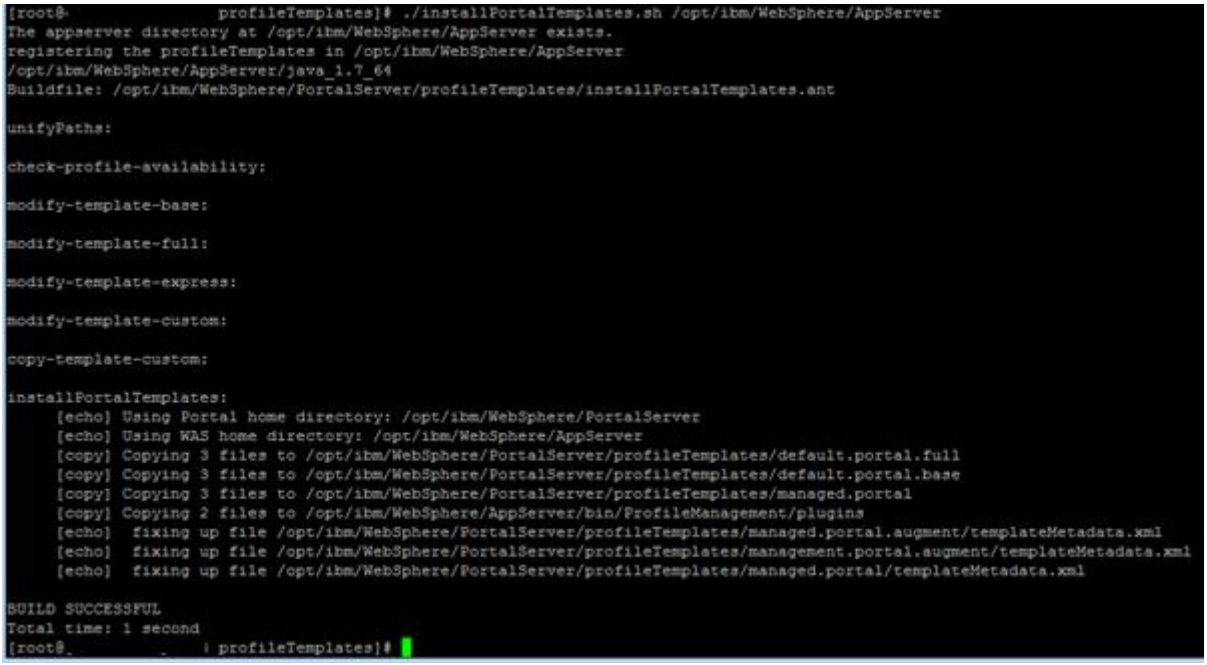
```
[root@gsrvcollabport4 profileTemplates]# scp _          _    }:/opt/ibm/WebSphere/PortalServer/profileTemplates/profileTemplates.zip ./

The authenticity of host '_____)' can't be established.
RSA key fingerprint is 3c:f2:c9:8e:01:11:c5:14:0c:e2:0c:61:06:08:b3:fb.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added 'gsrvcollabport3' (RSA) to the list of known hosts.
root@(          )'s password:
profileTemplates.zip                                                    100%  459MB  19.1MB/s   00:24
[root@      ' '    $ profileTemplates]# ll
total 470204
-rw-r--r-- 1 root root 481487351 Jul 14 13:59 profileTemplates.zip
[root@          $ profileTemplates]# unzip profileTemplates.zip
```

2. Extract the `profileTemplates.zip` file in the same location. If any of the templates exist in your `profileTemplates` directory, overwrite them.

```
[root@(              profileTemplates]# ll
total 470248
drwxr-xr-x 8 root root      4096 Jun  9 10:48 default.portal
drwxr-xr-x 8 root root      4096 Jun  9 10:48 default.portal.augment
-rwxr-xr-x 1 root root     10409 Jun  9 10:48 installPortalTemplates.ant
-rwxr-xr-x 1 root root      1921 Jun  9 10:48 installPortalTemplates.bat
-rwxr-xr-x 1 root root      4834 Jun  9 10:48 installPortalTemplates.sh
drwxr-xr-x 6 root root      4096 Jun  9 10:48 managed.portal
drwxr-xr-x 6 root root      4096 Jun  9 10:48 managed.portal.augment
drwxr-xr-x 5 root root      4096 Jun  9 10:48 management.portal.augment
-rw-r--r-- 1 root root 481487351 Jul 14 13:59 profileTemplates.zip
[root@(              profileTemplates]#
```

3. Run the `installPortalTemplates` script from the newly created `profileTemplates` directory to install the copied profile template. This script updates and registers the profile templates with the Profile Management Tool if it exists on your server.

```
installPortalTemplates.sh /opt/ibm/WebSphere/AppServer
```



PreSet the database drivers on the additional node.

You must copy the drivers to the same directory path on the additional node. To find the location of your database driver JAR files, see the examples for *your_database*.DbLibrary property in the `wkplc_dbtype.properties` file at:

```
${WasUserHome}/ConfigEngine/properties/wkplc_dbtype.properties
```

You must copy the drivers to the same directory path on the additional node. To find the location of your database driver JAR files, see the examples for *your_database*.DbLibrary property in the `wkplc_dbtype.properties` file at:

```
${WasUserHome}/ConfigEngine/properties/wkplc_dbtype.properties
```

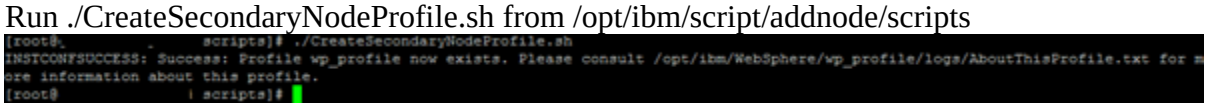
In our, case *"/opt/ibm/jdbc*"

Verify Time Set

For the deployment manager and each portal node to be in the cluster, verify that the system clocks are within 5 minutes of each other, or the addNode command fails.

Create Secondary Profile

If all ready, you can run first script to create secondary portal profile.
Run ./CreateSecondaryNodeProfile.sh from /opt/ibm/script/addnode/scripts



This task will be silent for some minutes, at the end write if success or not, you must wait until it finish.

Now we must continue manually, suing following command.

Federated Secondary Node

Now we proceed to federate new node into our cell, to doing you must run following command

```
./addNode.sh dmgr_hostname dmgr_port
        -username was_admin_user
        -password was_admin_password
```

The variables are defined as:

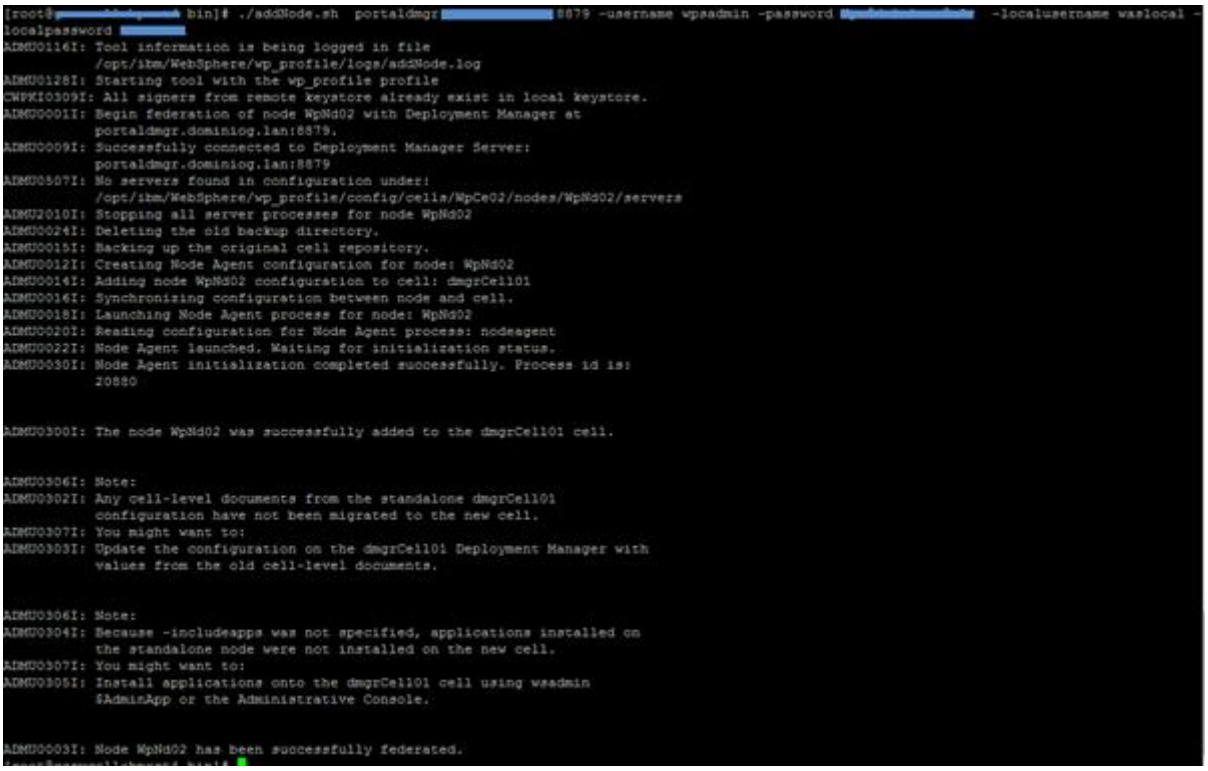
- *dmgr_hostname* is the TCP/IP host name of the Deployment Manager server
- *dmgr_port* is the SOAP port number of the Deployment Manager server
- *was_admin_user* and *was_admin_password* are the user ID and password for the Deployment Manager administrator

If the WebSphere Application Server administrator user ID and password are different from the Deployment Manager values, add the following parameters to the addNode task:

- `-localusername` *local_was_admin_user*
- `-localpassword` *local_was_admin_password*

In our case:

./addNode.sh portaldmgr.xxxxxxxx 8879 –username xxxxxx –password xxxxxx –localusername waslocal –localpassword xxxxxxxx



Warning: If the addNode task fails for any reason, you must complete the following steps before you rerun the task:

a. Remove the node if the `AddNode` task succeeded in creating the node.
b. If the items exist, log on to the deployment manager and complete the following steps:
    i. Remove the WebSphere_Portal server definition.
    ii. Remove the WebSphere Portal JDBC Provider.

AddSecondaryNode

This step create a secondary JVM and add it to your cluster, and synchronize all configuration from DMGR.

Before execute, you must ensure that the following parameters are set correctly in the `wkplc.properties` file:

Note: You can add these parameters (particularly passwords) directly to any task. However, you might want to temporarily add them to the properties file. You can then remove them when you are finished to keep your environment secure.

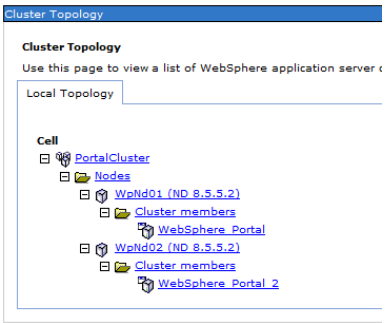
a. Set WasSoapPort to the port used to connect remotely to the deployment manager.
b. Set WasRemoteHostName to the full host name of the server that is used to remotely connect to the deployment manager.
c. Change ServerName to WebSphere_Portal_2
d. Verify that WasUserid is set to your Deployment Manager administrator user ID.
e. Verify that WasPassword is set to your Deployment Manager administrator password.
f. Verify that PortalAdminPwd is set to your WebSphere Portal administrator password.
g. Verify that ClusterName is set, with the same value you have in PrimaryNode
h. Verify that PrimaryNode is set to `false`.

Now you can run last step:

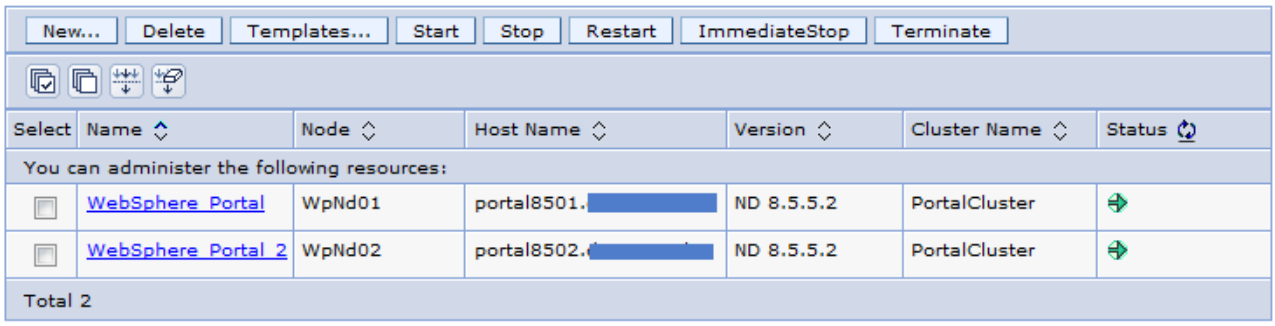
./ConfigEngine.sh cluster-node-config-cluster-setup

If you check in your ICS you find following configuration:

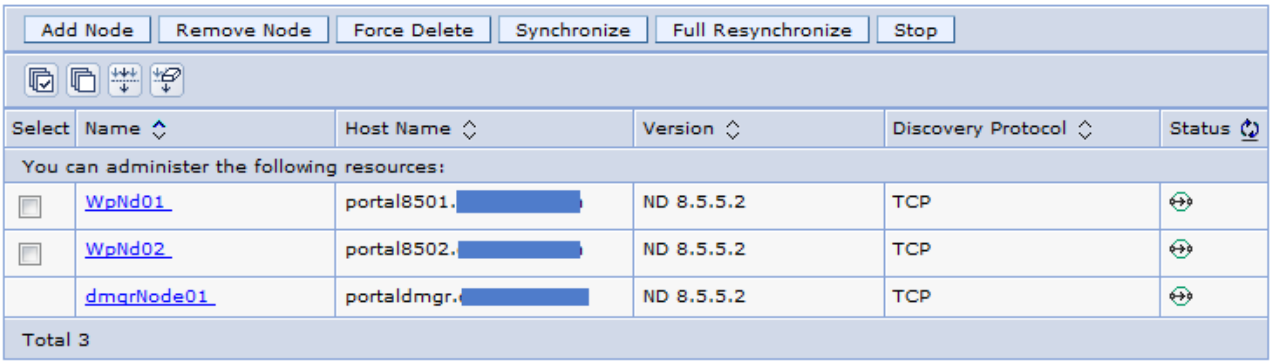
Cluster Topology



Server



Nodes



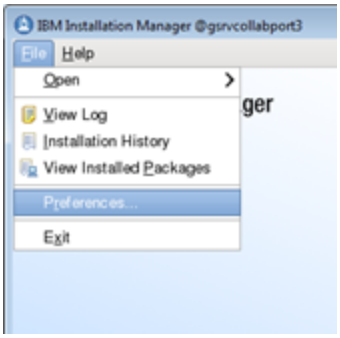
Configuring the web server

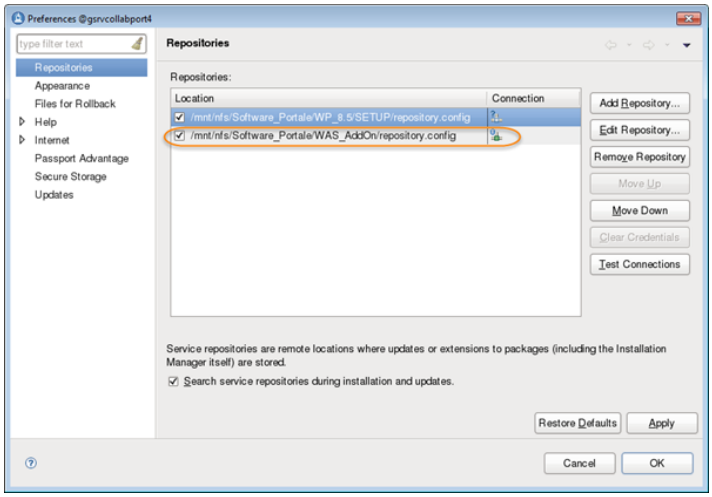
To enable communication between the web server and WebSphere Application Server, a web server plug-in is required. The web server plug-in determines whether a request is handled by the web server or by the application server. The plug-in can be installed into a web server that is located either on the same server as WebSphere Application Server or on a separate server. The web server plug-in uses an XML configuration file (plugin-cfg.xml) that contains settings that describe how to handle and pass on requests to the WebSphere Application Server made accessible through the plug-in.

Install IBM HTTP Server

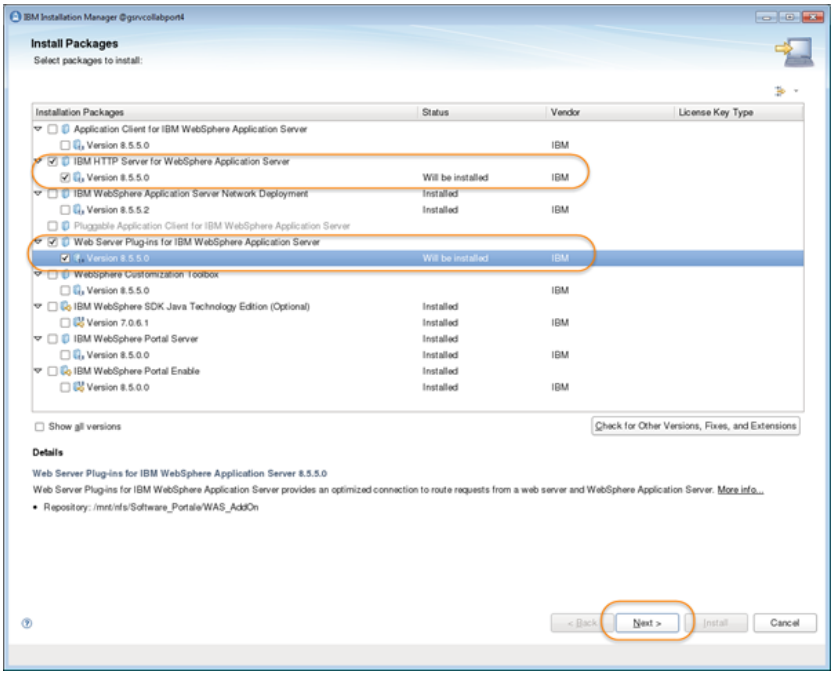
To install IBM Http Server, you can apply next step:

Open IBM Installation Manager and add new repository:



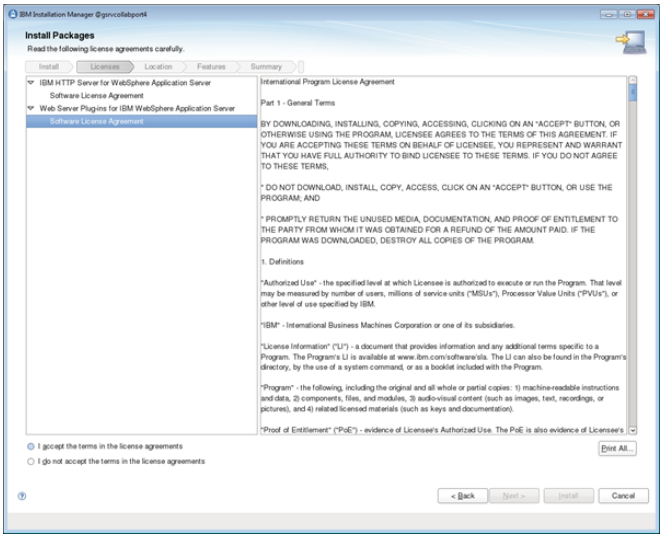


Apply, Ok, Install

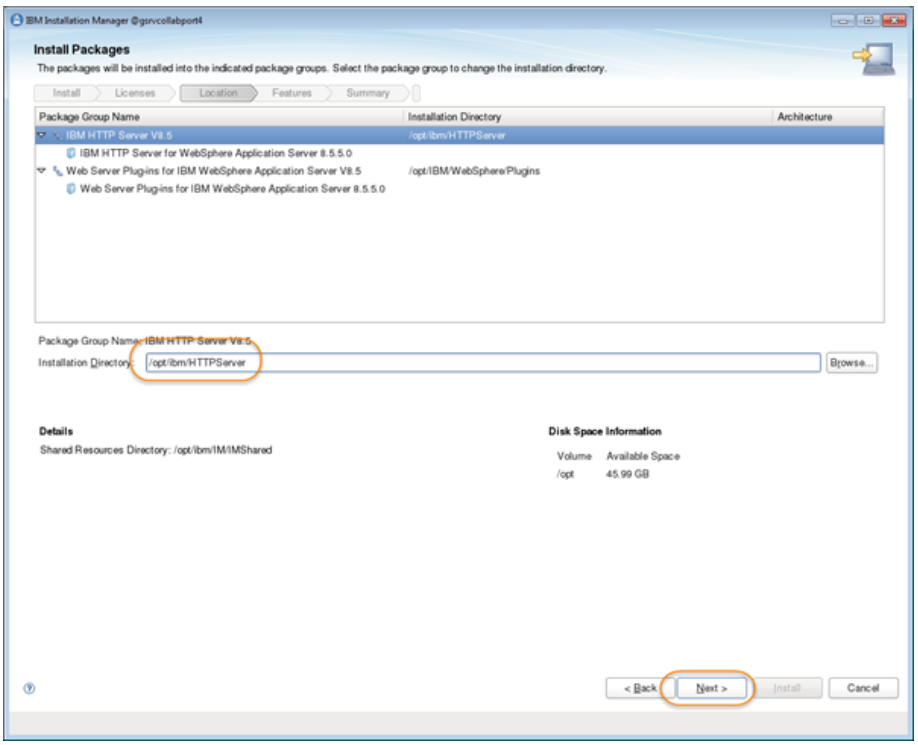


Select appropriate product,

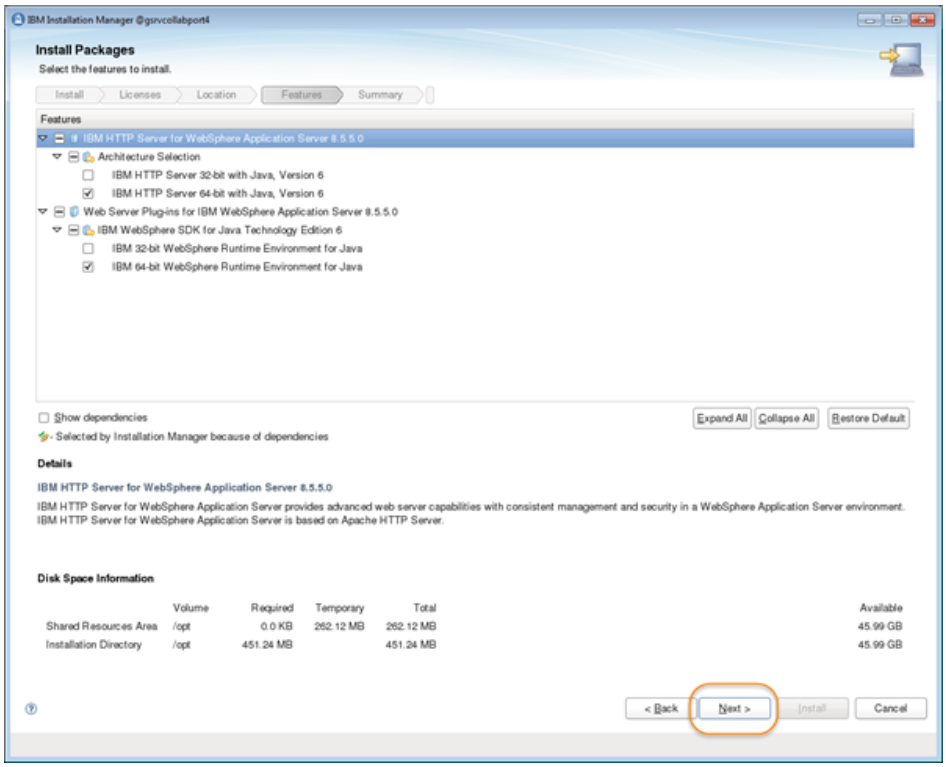
IBM HTTP Server for IBM WebSphere Application Server
Web Server Plug-in for IBM WebSphere Application Server
And next



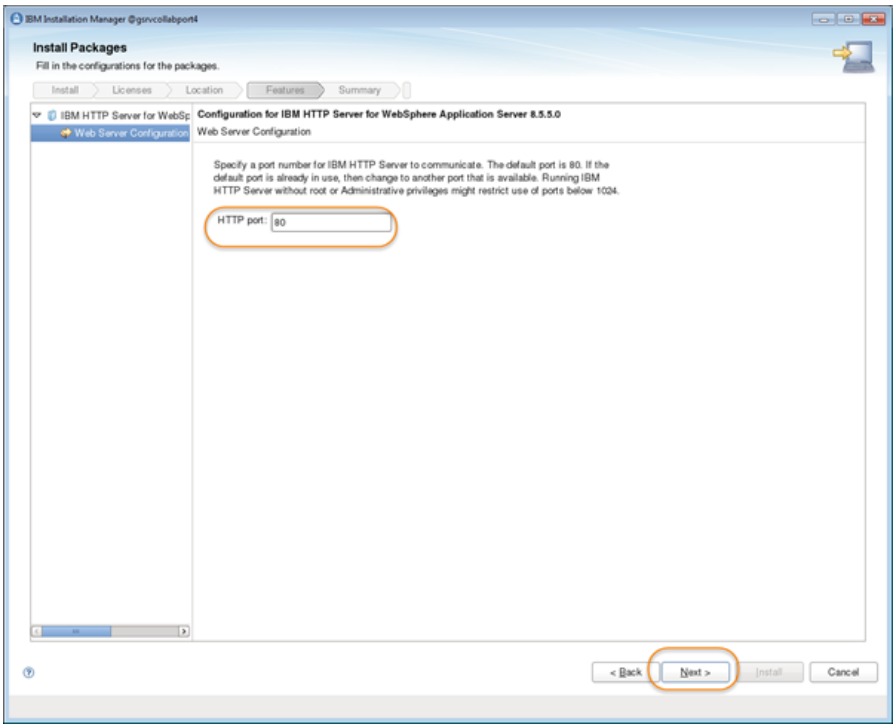
Accept License and next



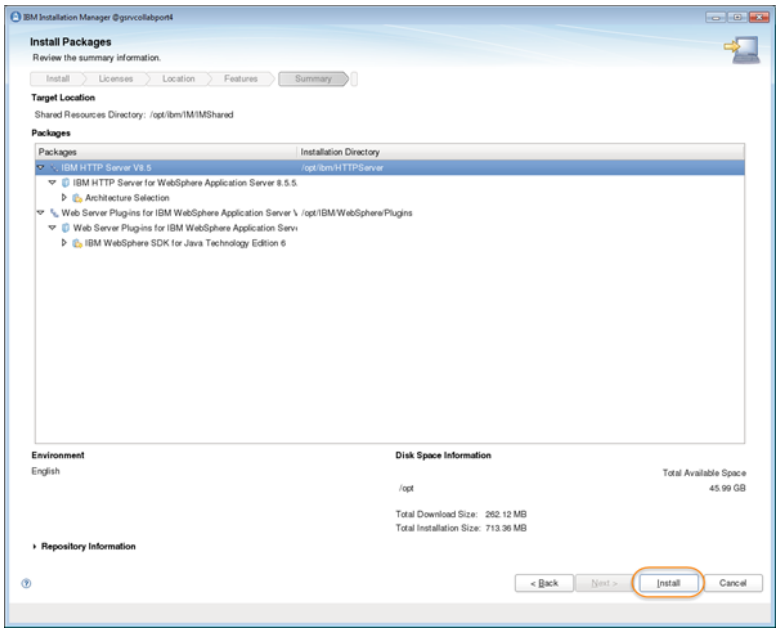
Select installation path,
For HTTP Server use “/opt/ibm/HTTPServer”,
For Plug-in use “/opt/ibm/Plugins”
and Next



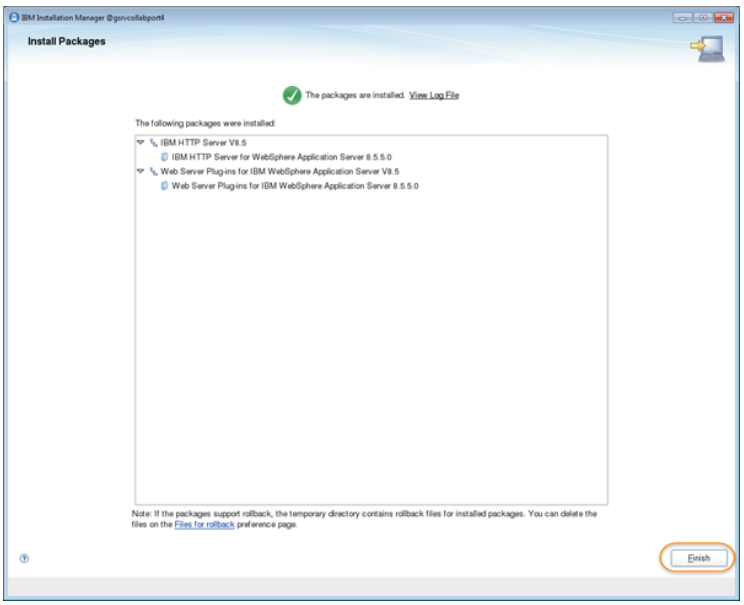
If summarize is ok, Next



Choose your standard port for http protocol, standard is 80, and next



Install, and wait until finish.



Finish and exit

Configure Virtual-Host

Now configure your virtual server and propagate plugin.

Create in your installation path, definition for your Virtual Host, and include it in httpd.conf configuration file.

In our case:

I create a specific directory:

<httpHome>/conf/vh , where I put my virtual host configuration file

<httpHome>/logs/www/<VhName>, where I put my log
<httpHome>/www/<VhName>, where I put static page/image and so on

Create file called portal.conf with my specification, inside <httpHome>/conf/vh, like this:

```
<VirtualHost *:80>
    ServerAdmin webmaster@net2action.com
    DocumentRoot www/portal
    ServerName portal.ondemand.com
    ErrorLog  logs/www/portal/error.log
    CustomLog logs/www/portal/access.log common

    #---------------------------------------
    # managing hidden redirection of /
    #---------------------------------------
    RewriteEngine On
    RewriteLog logs/www/portal/rewrite.log
    RewriteLogLevel 0
    RewriteCond %{HTTP_HOST} ^portal.ondemand.com
    RewriteCond %{REQUEST_URI} ^(/)?$
    RewriteRule ^(/)?$ https://%{SERVER_NAME}/$1 [R=301,L]
    #---------------------------------------

</VirtualHost>

<VirtualHost *:443>
    ServerAdmin webmaster@net2action.com
    DocumentRoot www/portal
    ServerName portal.ondemand.com
    ErrorLog  logs/www/portal/error.log
    CustomLog logs/www/portal/access.log common
    SSLEnable
    #---------------------------------------
    # managing hidden redirection of /
    #---------------------------------------
    RewriteEngine On
    RewriteLog logs/www/portal/rewrite.log
    RewriteLogLevel 0
    RewriteCond %{HTTP_HOST} ^portal.ondemand.com
    RewriteCond %{REQUEST_URI} ^(/)?$
    RewriteRule ^(/)?$ /wps/portal/ [R=301,PT,NC]
    #---------------------------------------
</VirtualHost>
SSLDisable
```

If you do not use SSL can omit second definition

Modify you httpd.conf file including following row:

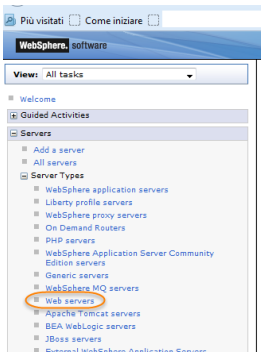
```
NameVirtualHost *:80
AllowEncodedSlashes On
include conf/vh
LoadModule proxy_module modules/mod_proxy.so
LoadModule proxy_connect_module modules/mod_proxy_connect.so
LoadModule proxy_ftp_module modules/mod_proxy_ftp.so
LoadModule proxy_http_module modules/mod_proxy_http.so
```

```
LoadModule rewrite_module modules/mod_rewrite.so

LoadModule was_ap22_module /opt/ibm/Plugins/bin/64bits/mod_was_ap22_http.so
WebSpherePluginConfig  /opt/ibm/Plugins/config/WebServer1/plugin-online-cfg.xml

#
# -----------------------------------------------------------
```

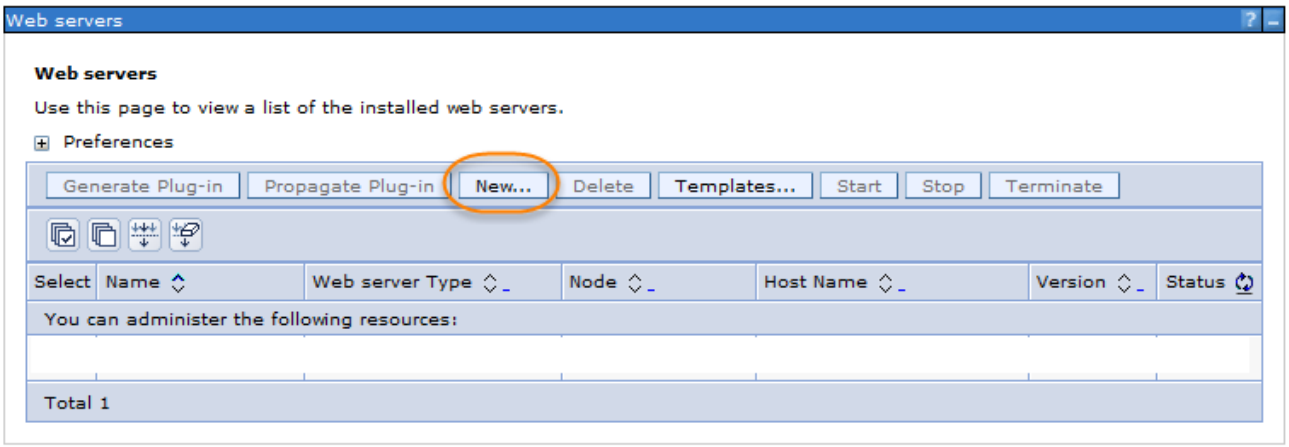
Note: I use `plugin-online-cfg.xml` to protect accidentally propagation of Plugin.

Define WebServer into WebSphere ICS

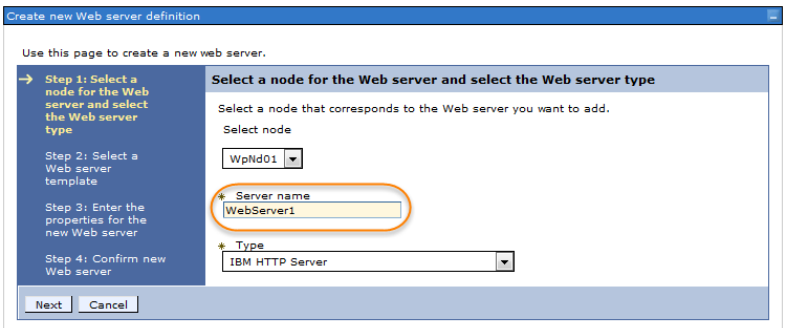
Open dmgr console and create WebServer definition:



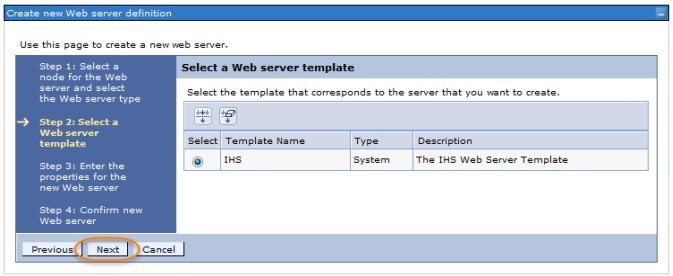
Select Servers, Server Type, Web server



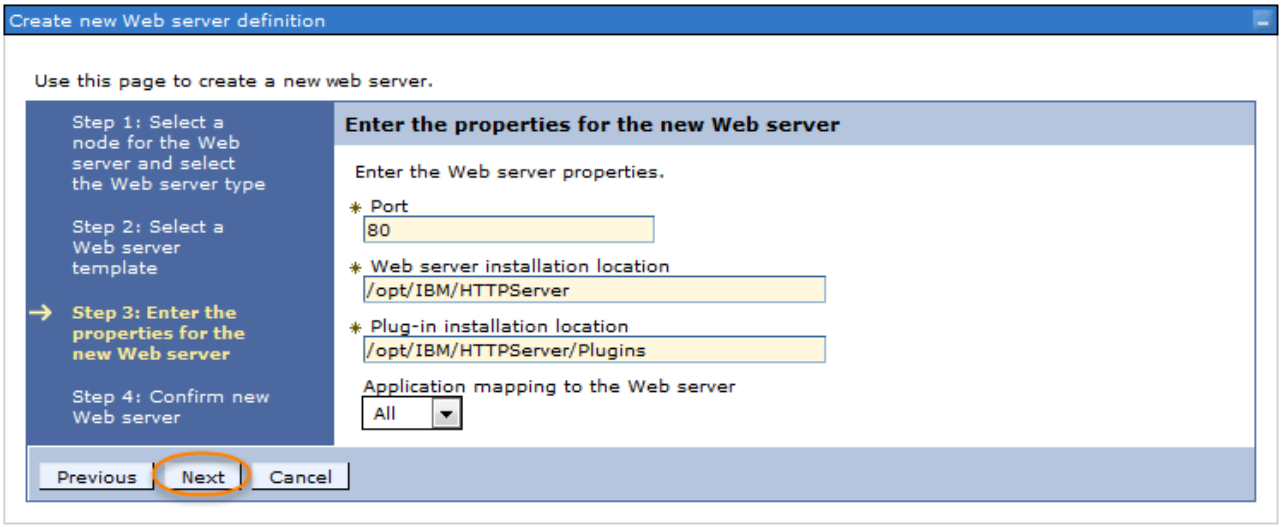
and New



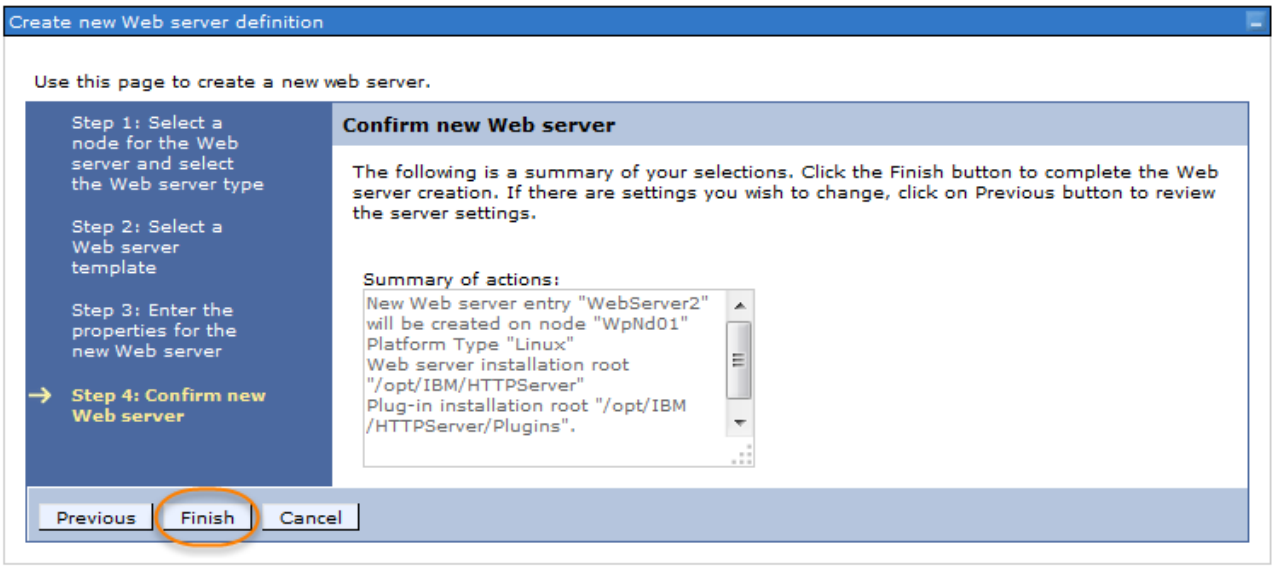
Specify ServerName, in pur case WebServer1, this is same name used to create configuration directory.



Next

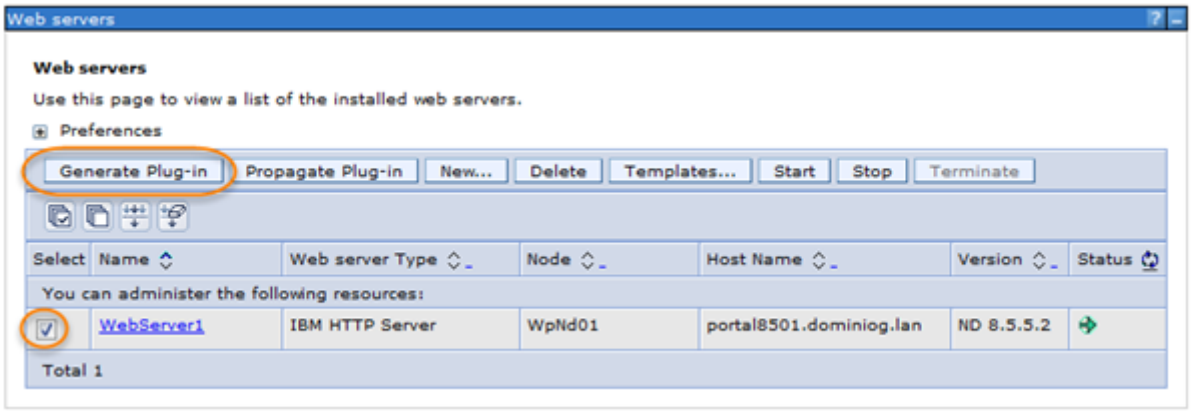


Next

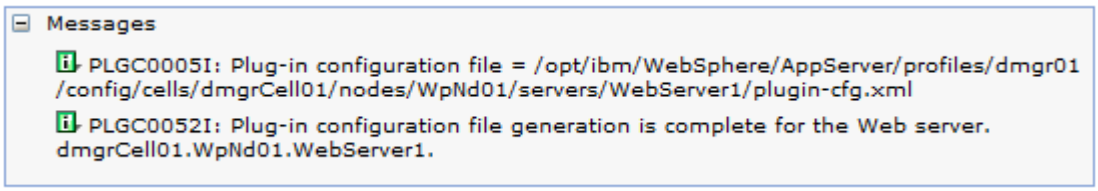


Finish

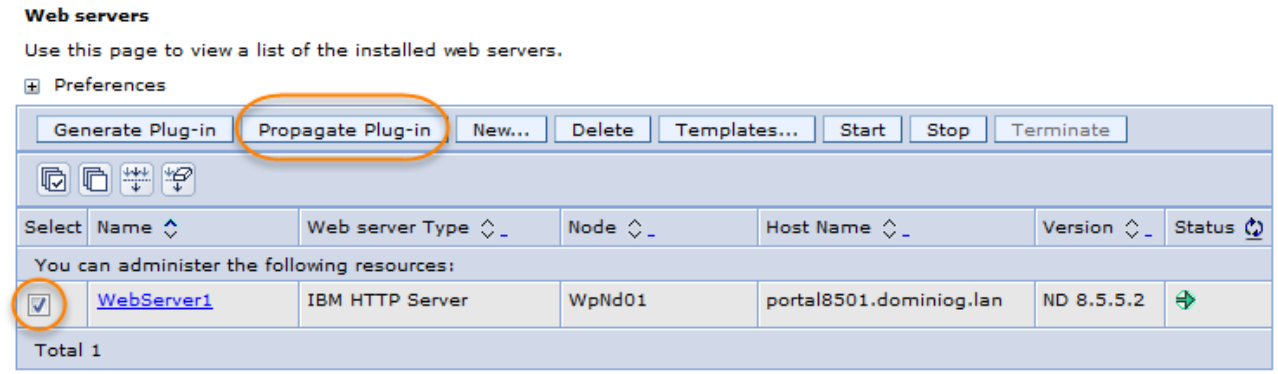
Now you can generate and propagate your plugin-cfg file



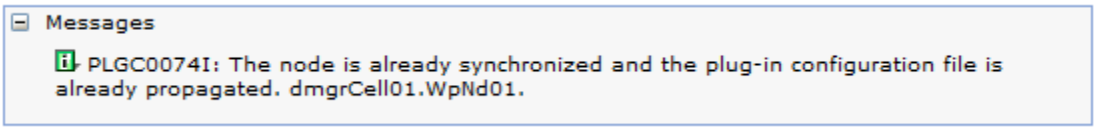
Select WebServer and Generate Plugin, if ok you receive next message



Now select Web Server and click Propagate Plug-in



If ok,



Verify configuration using following command:

<httpHome>/bin/apachectl –S

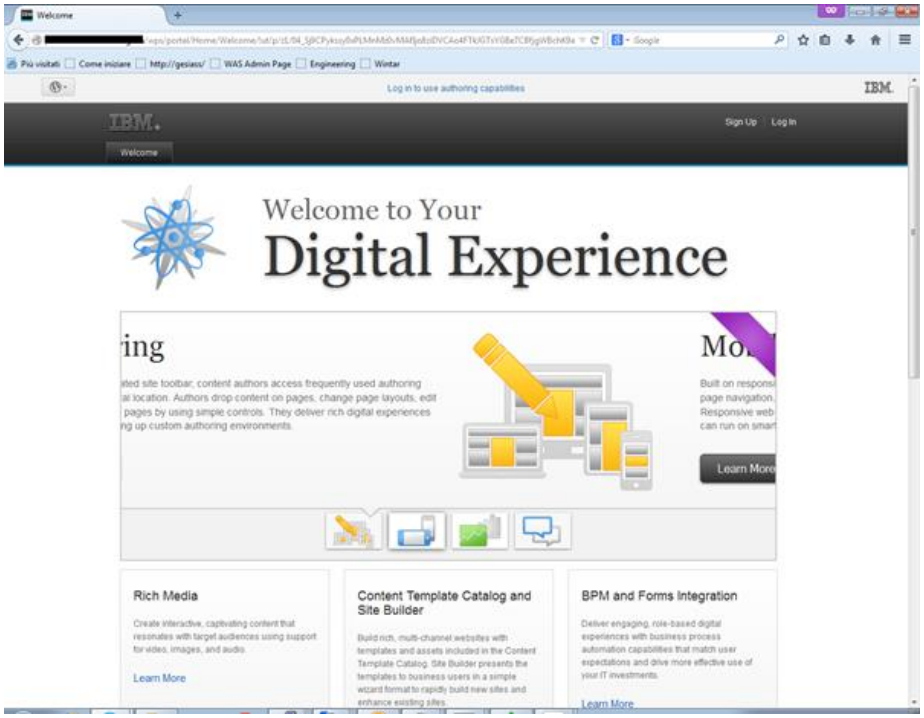
```
VirtualHost configuration:
[redacted]:1080      is a NameVirtualHost
        default server portal[redacted] (/opt/ibm/HTTPServer/conf/vh/portal.conf:1)
        port 1080 namevhost portal[redacted] (/opt/ibm/HTTPServer/conf/vh/portal.conf:1)
        port 1080 namevhost portal[redacted] (/opt/ibm/HTTPServer/conf/vh/portal.conf:21)
        port 1080 namevhost portal.[redacted] (/opt/ibm/HTTPServer/conf/vh/portal.conf:41)
        port 1080 namevhost portala[redacted] (/opt/ibm/HTTPServer/conf/vh/portal.conf:61)
Syntax OK
```

If OK, you can restart your HTTP Server,

<httpHome>/bin/apachectl –k graceful

And now you can use your portal:

http://portal.ondemand.com



Next step to complete our configuration is, configure Remote Search service, will be describe in next article

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