SAP Netweaver 7.3 on Amazon Cloud

RedHat 6 Install

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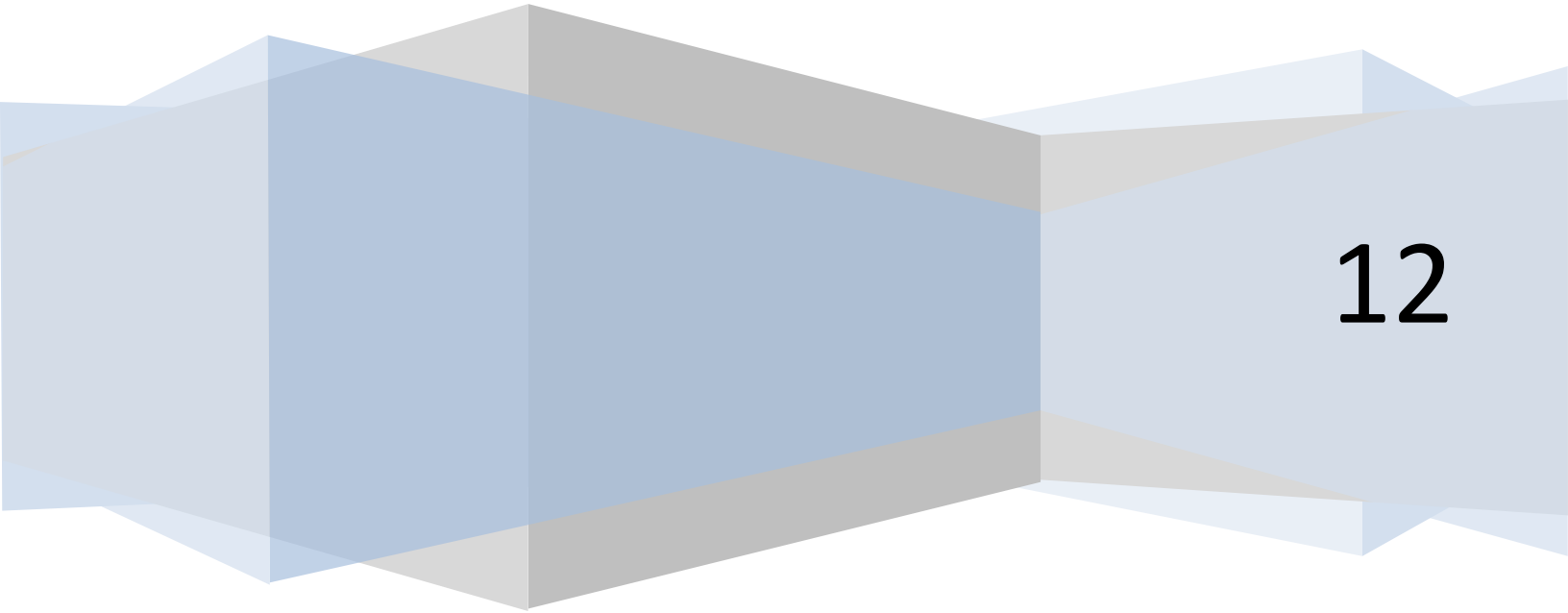

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Amazon EC2 Setup

To setup an EC2 instance, you need to first create an account on http://aws.amazon.com. Once you have created an account and logged in, please follow these steps in setting up an EC2 Server.

RedHat EC2 Instance

AWS Dashboard

In your dashboard, there will be an EC2 Hyperlink. Select that to go into the EC2 dashboard to launch/edit instances.

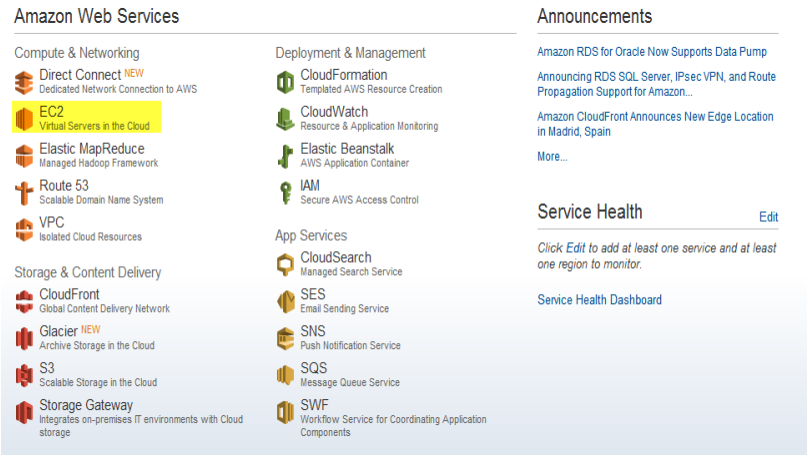


Figure 1 - Creating an EC2 Instance

Launch an EC2 Instance

- Once you are in the EC2 Console Dashboard, click on the Launch Instance. This will allow you to create a cloud based server on AWS.

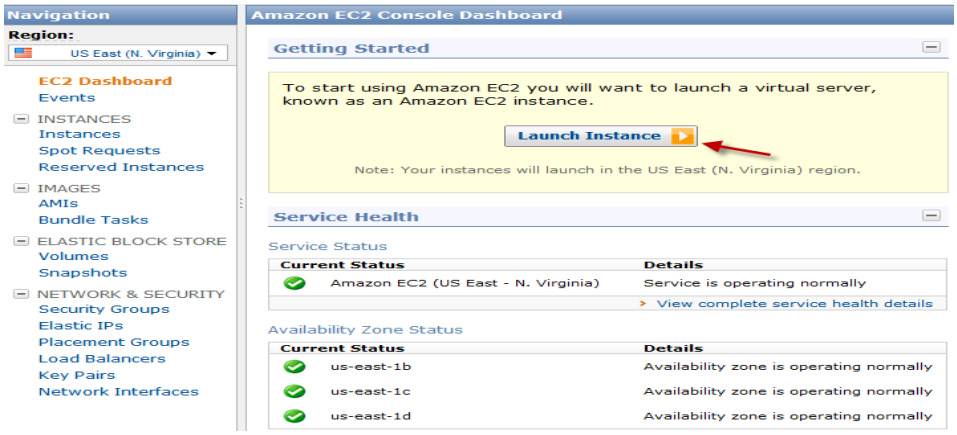


Figure 2 - Launch an EC2 Instance

EC2 Instance Wizard

- On the instance wizard, select the RH 6.3 Server 64 Bit.

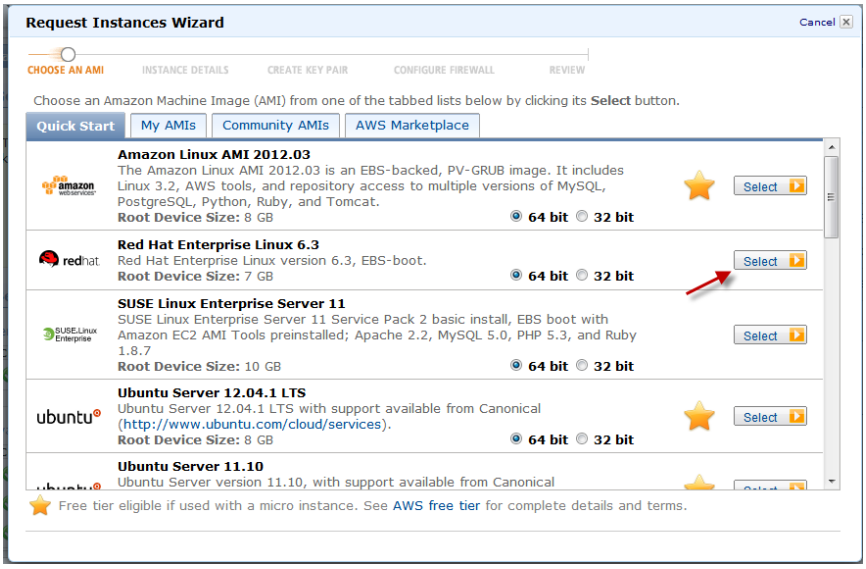


Figure 3 - EC2 Instance Wizard

EC2 Instance Details

- When selecting the Instance Type, its best to pick the Large type as that will provide ample resources for the installation.
- Note: when picking the availability zones, pick the one that is closest to you and make sure you keep the same zones across other instances and volumes. In particular volumes as you won't be able to mount volumes from one zone to another zone.

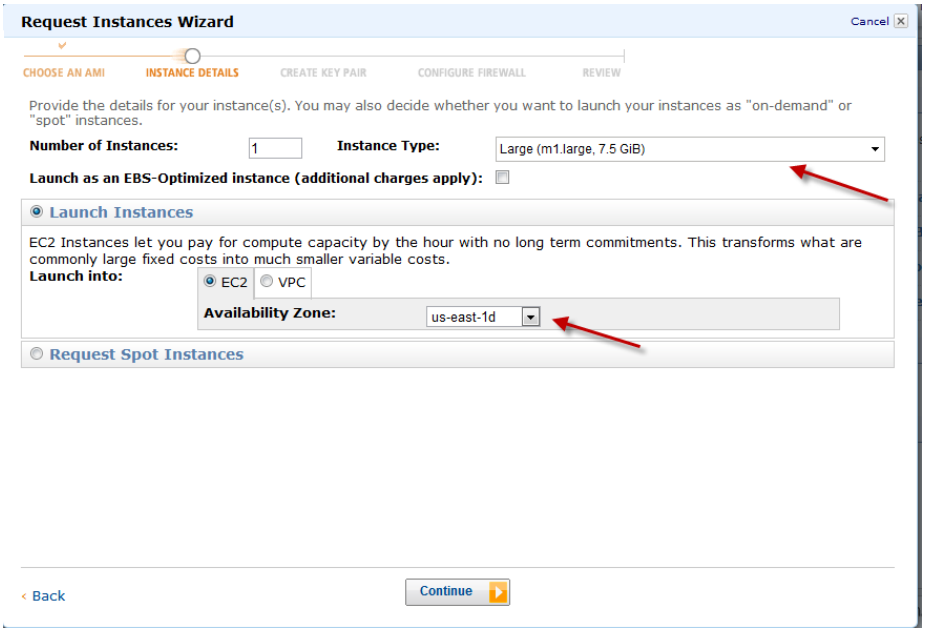


Figure 4 - Instance Details

- In the next portion of the Instance Details, adjust some of the advanced features if you so wish. However for the average user, these fields do not need to be adjusted.

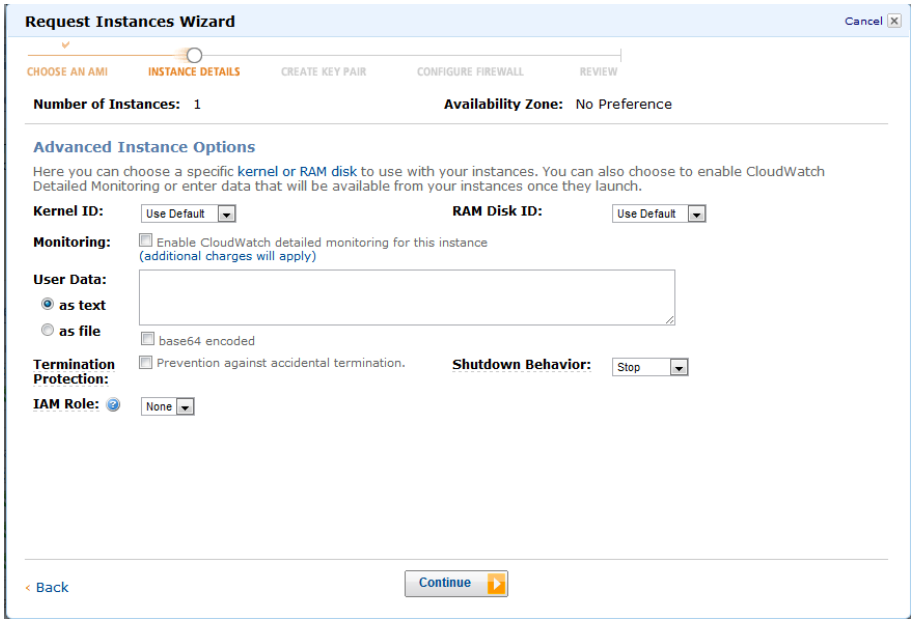


Figure 5 - Instance Details (Cont'd)

- The third screen of the Instance Details details with the storage configuration. You can edit these to add more EBS. However, we'll be discussing how to do that later in this document.

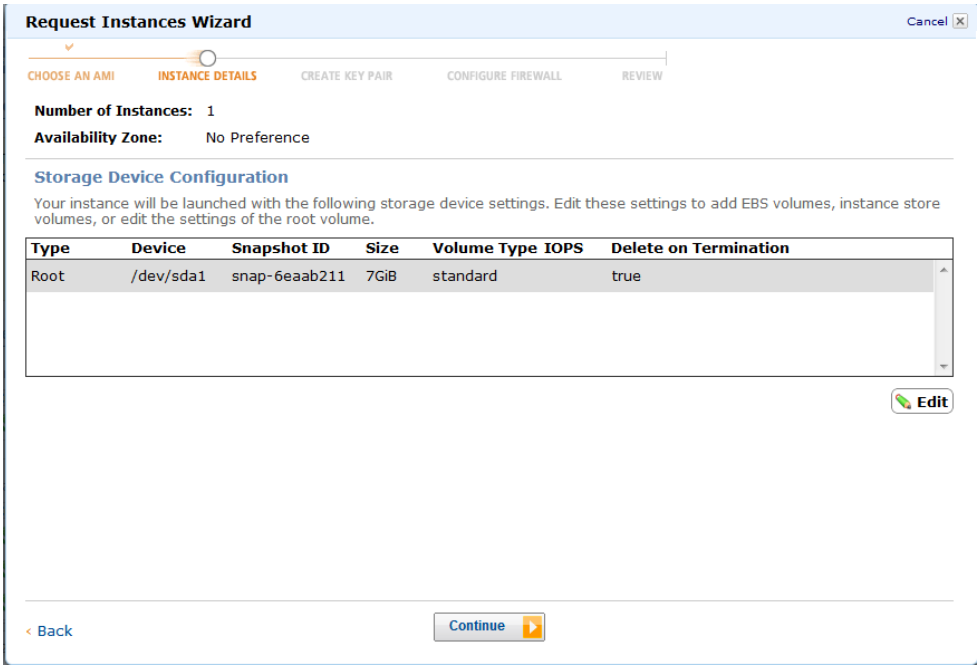


Figure 6 - Instance Details (Storage)

- You can Tag your EC2 instances so that you can identify that easily down the road. This is optional only if you have many EC2 systems in your dashboard.

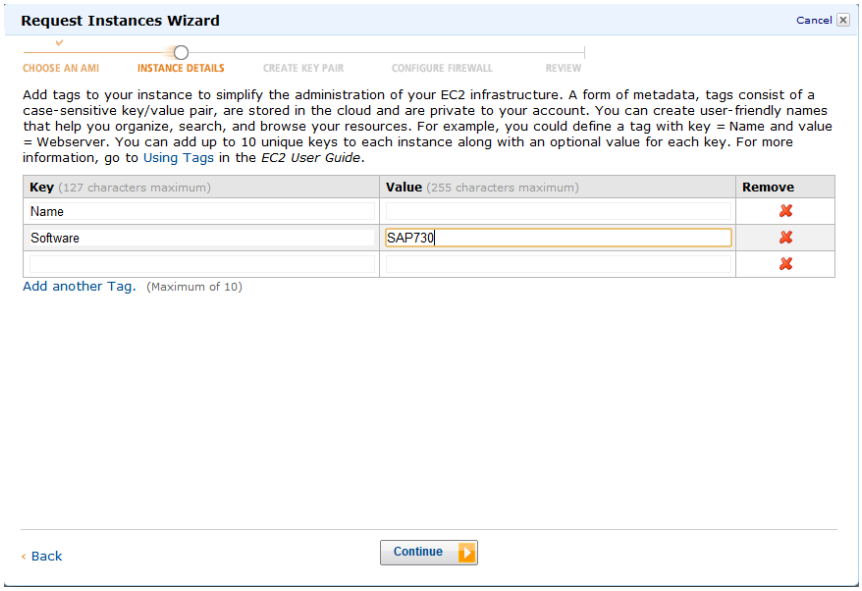


Figure 7 - Instance Details (Tagging)

Create Key Pair

- To login to a *nix system, you need to create a keypair and use the keypair in your ssh commands. Here I have already created a key pair. Creating a key pair is as simple as clicking on the radio box and hitting next. You'll be prompted to download a .pem file which you should keep in a secure location. You can then use this to ssh –i pem_file to the machine or use the software AWS provides to login to the machine using the pem file.

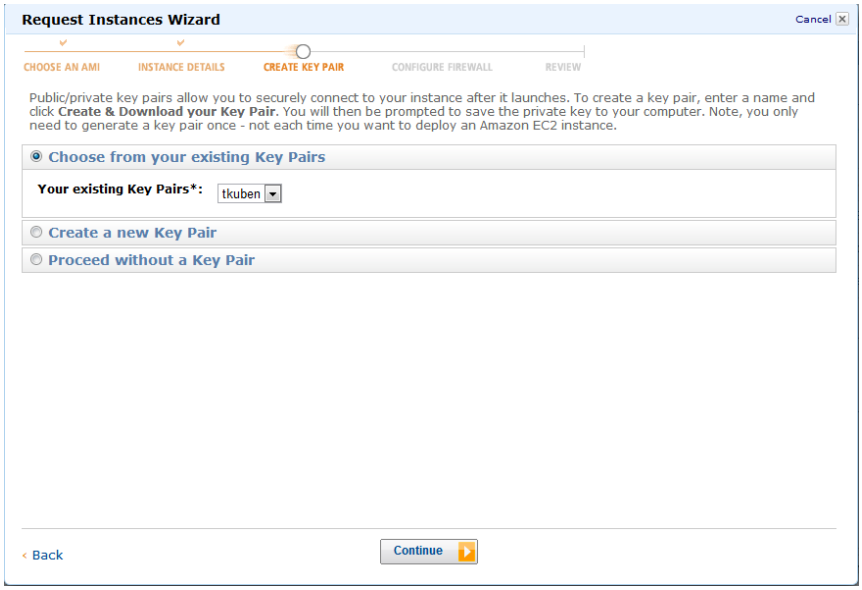
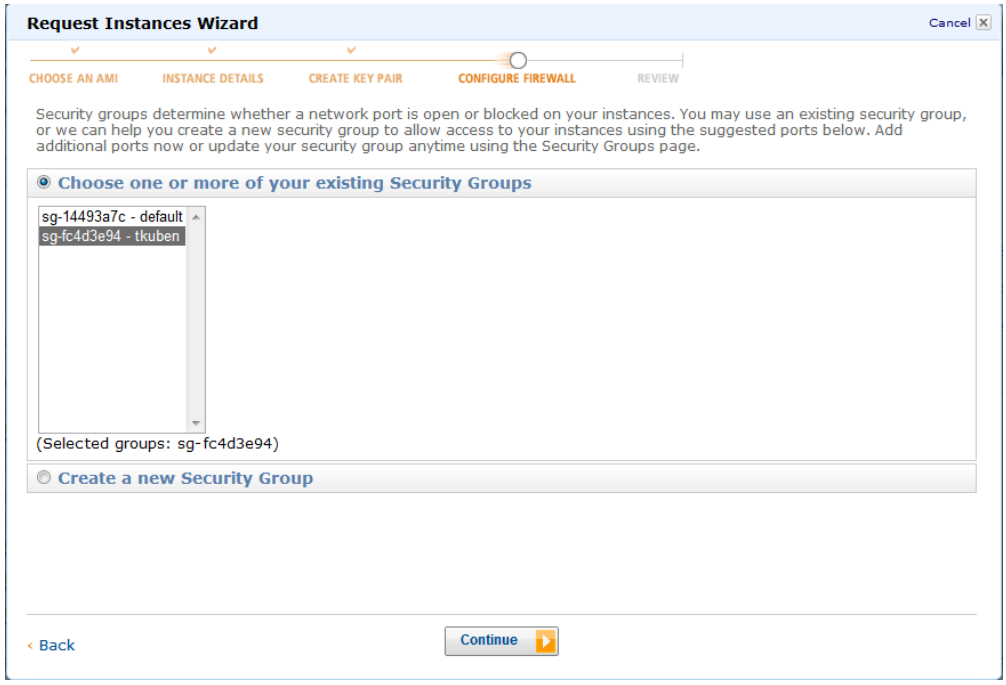


Figure 8 - Key Pair

Configuring the firewall

- This is very important. For testing purposes you can create a new Security Group and allow all TCP, UDP and ICMP to come inbound. However, you should also create a stricter group to allow only those ports that SAP and Oracle requires such as the 32**, 36**, 1521 and etc. I have already created a security group called tkuben which essentially is fully open to prevent any firewall issues during the install.



EC2 Summary

- All Done! Now just review your EC2 summary and make sure all is fine and hit Launch.

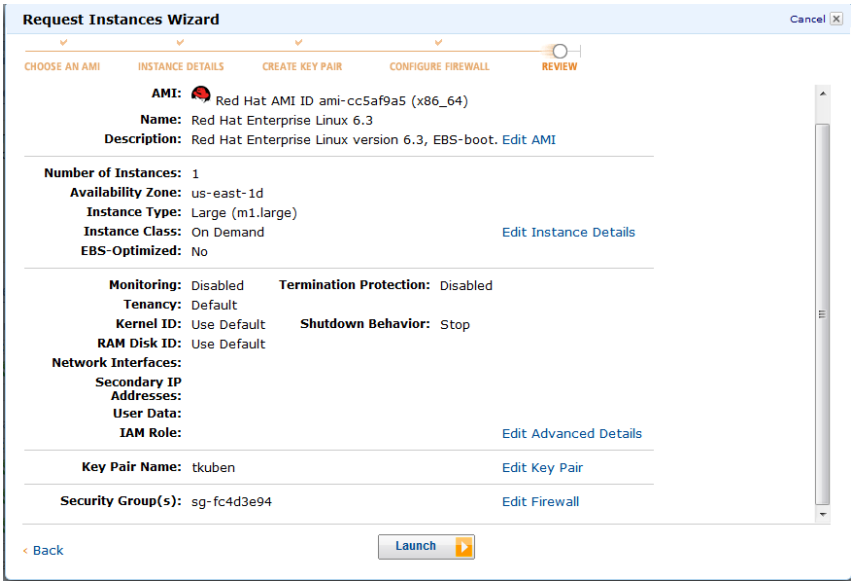


Figure 9 - Review EC2

AWS EC2 Dashboard

My Instances

- This interface shows you all the EC2 instances you currently have. As you can see I have 4 instances. The notable instances are the ones with the arrows. You'll need to create another windows based instance. There are two reasons you'll need the windows box.
    1. Since Redhat is a console based system, you'll need to run the sapinst in non GUI mode and connect the sapgui from your windows box to the linux box to continue with the installation.
    2. You can sit there downloading your SAP media on your local and uploading it to the server slowly! OR, you can create an EBS Volume with the SAP media, attach it to your windows box, install the SAP download manager and download all the media to the attached volume. Once you have the media on the drive, de-attach it from the windows box and attach it to your linux box and away you go. Please note, you'll also need to download the Windows version of the media as well. You will need this to do the GUI install from the windows box to the linux box.

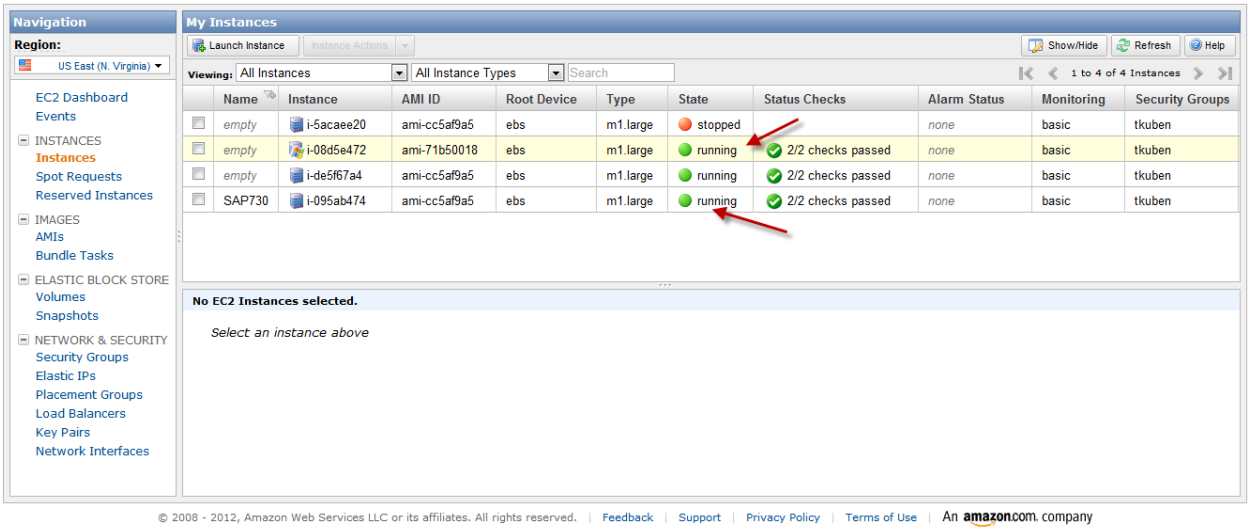


Figure 10 - My Instances

AWS Volume Management

Volumes

- Volumes are essentially blocks of disks that you can take online/offline between any instances. So as you can see, this can be quite useful when you want to share media between multiple machines. Its best to create a volume to contain all your Media files. Based on Figure 11, we have used the 50 GB volume as a a Media Drive. We had already mounted this to a windows instance and downloaded the SAP Linux Media to it. The 20 GB, we are using as a /tmp location

to boost the /tmp dir. The 100 GB drive, we'll use to split it 60/40 for SAP instance/Oracle Instance respectively.

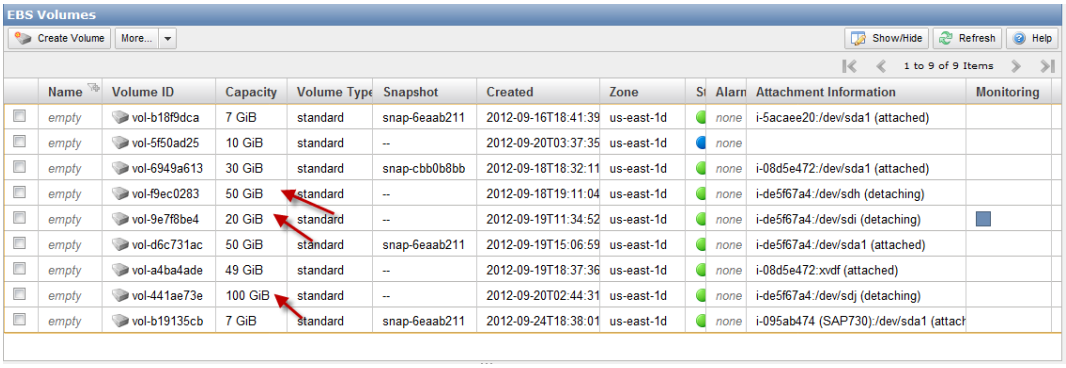


Figure 11 - Volumes

Attaching a Volume

- The following figure shows how to attach a particular volume to an instance. Note: that this is where setting the same Zone is mandatory. You cannot allocate a volume to instance that is in a different zone. Also, you might need to adjust the Device from /dev/sdg to another device if the one defaulted to is already in use. Once attached, it will take a few seconds to actually attach to the machine.

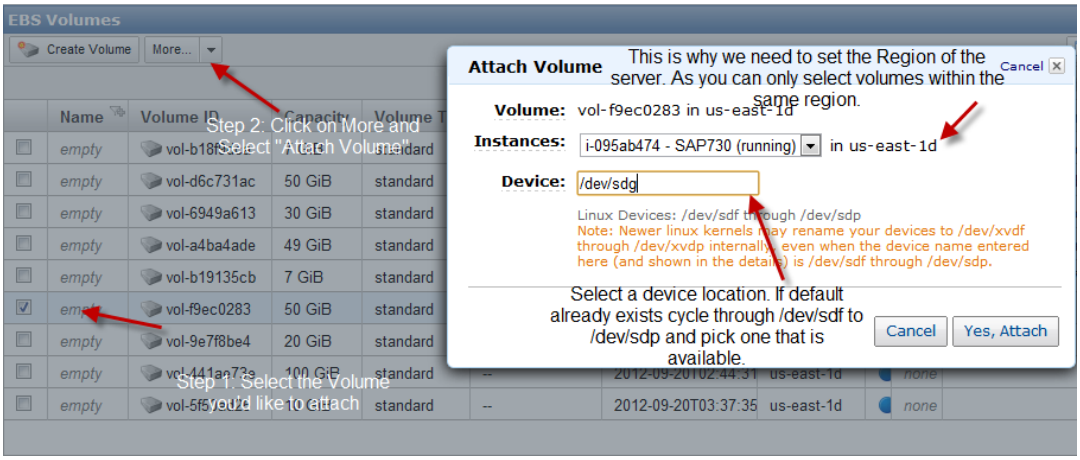


Figure 12 - Attaching a Volume

NTFS Volumes on Linux

- By Default, the RedHat instance will not allow you to mount an NTFS partition let alone edit files within it. Thus, you'll need to install the ntfs-3g package to allow to mount the device. Figure 13 shows how to add the repo and use yum to install the ntfs-3g package on your RedHat instance. In short, you'll need to run:

  rpm -Uvh http://dl.fedoraproject.org/pub/epel/6/x86_64/epel-release-6-7.noarch.rpm
  yum install dkms ntfs-3g

```
[root@ip-10-194-11-208 ~]# rpm -Uvh http://dl.fedoraproject.org/pub/epel/6/x86_64/epel-release-6-7.noarch.rpm
Retrieving http://dl.fedoraproject.org/pub/epel/6/x86_64/epel-release-6-7.noarch.rpm
warning: /var/tmp/rpm-tmp.CYy5tB: Header V3 RSA/SHA256 Signature, key ID 0608b895: NOKEY
Preparing...                ########################################### [100%]
   1:epel-release           ########################################### [100%]
[root@ip-10-194-11-208 ~]#
[root@ip-10-194-11-208 ~]# yum install dkms ntfs-3g
```

Figure 13 - Install the NTFS package

Mount Appropriate Directories

- Next we'll setup the appropriate directories and mount the drives. First lets create the those directories:
  mkdir /sap /usr/sap /sapmnt /oracle
- Then we'll run fdisk –l to discover all the devices that we have mounted. Based on that we'll partition the appropriate devices. Here we have chose to partition the 100 GB drive into 20 GB, 20 GB and 50 GB for /sapmnt, /oracle and /usr/sap respectively.
- We will then write those changes, make them into ext3, add the appropriate lines to the fstab and mount all drives. Please see Figure 14 – Figure 18 for the actual calls.

```
[root@ip-10-194-11-208 ~]# mkdir /sap/ /usr/sap/ /sapmnt/ /oracle/
[root@ip-10-194-11-208 ~]# fdisk -l

Disk /dev/xvdel: 7516 MB, 7516192768 bytes
255 heads, 63 sectors/track, 913 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x00000000


Disk /dev/xvdj: 450.9 GB, 450934865920 bytes
255 heads, 63 sectors/track, 54823 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x00000000


Disk /dev/xvdk: 450.9 GB, 450934865920 bytes
255 heads, 63 sectors/track, 54823 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x00000000


Disk /dev/xvdl: 53.7 GB, 53687091200 bytes
255 heads, 63 sectors/track, 6527 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0xae4973aa

   Device Boot      Start         End      Blocks   Id  System
/dev/xvdl1               1        6527    52426752    7  HPFS/NTFS

Disk /dev/xvdm: 21.5 GB, 21474836480 bytes
255 heads, 63 sectors/track, 2610 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0xef2529df

   Device Boot      Start         End      Blocks   Id  System

Disk /dev/xvdn: 107.4 GB, 107374182400 bytes
255 heads, 63 sectors/track, 13054 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x3ec58f8b

   Device Boot      Start         End      Blocks   Id  System
[root@ip-10-194-11-208 ~]#
```

Figure 14 - Making the directories

```
[root@ip-10-194-11-208 ~]# fdisk /dev/xvdn

WARNING: DOS-compatible mode is deprecated. It's strongly recommended to
         switch off the mode (command 'c') and change display units to
         sectors (command 'u').

Command (m for help): n
Command action
   e   extended
   p   primary partition (1-4)
p
Partition number (1-4): 1
First cylinder (1-13054, default 1):
Using default value 1
Last cylinder, +cylinders or +size{K,M,G} (1-13054, default 13054): +20G

Command (m for help): n
Command action
   e   extended
   p   primary partition (1-4)
2
Invalid partition number for type `2'
Command action
   e   extended
   p   primary partition (1-4)
p
Partition number (1-4): 2
First cylinder (2613-13054, default 2613): +40G
Last cylinder, +cylinders or +size{K,M,G} (5222-13054, default 13054):
Using default value 13054

Command (m for help): n
Command action
   e   extended
   p   primary partition (1-4)
p
Partition number (1-4): 3
First cylinder (2613-13054, default 2613):
Using default value 2613
Last cylinder, +cylinders or +size{K,M,G} (2613-5221, default 5221):
Using default value 5221

Command (m for help): w
The partition table has been altered!

Calling ioctl() to re-read partition table.
Syncing disks.
```

Figure 15 - Fdisk Utility to create partitions

```
[root@ip-10-194-11-208 ~]# fdisk -l /dev/xvdn

Disk /dev/xvdn: 107.4 GB, 107374182400 bytes
255 heads, 63 sectors/track, 13054 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x3ec58f8b

    Device Boot      Start         End      Blocks   Id  System
/dev/xvdn1               1        2612    20980858+  83  Linux
/dev/xvdn2            5222       13054    62918572+  83  Linux
/dev/xvdn3            2613        5221    20956792+  83  Linux

Partition table entries are not in disk order
[root@ip-10-194-11-208 ~]# mkfs.ext3 /dev/xvdn1
mke2fs 1.41.12 (17-May-2010)
Filesystem label=
OS type: Linux
Block size=4096 (log=2)
Fragment size=4096 (log=2)
Stride=0 blocks, Stripe width=0 blocks
1313760 inodes, 5245214 blocks
262260 blocks (5.00%) reserved for the super user
First data block=0
Maximum filesystem blocks=4294967296
161 block groups
32768 blocks per group, 32768 fragments per group
8160 inodes per group
Superblock backups stored on blocks:
        32768, 98304, 163840, 229376, 294912, 819200, 884736, 1605632, 2654208,
        4096000

Writing inode tables: done
Creating journal (32768 blocks): done
Writing superblocks and filesystem accounting information: done

This filesystem will be automatically checked every 23 mounts or
180 days, whichever comes first.  Use tune2fs -c or -i to override.
```

Figure 16 - Making the partitions to ext3

```
[root@ip-10-194-11-208 ~]# more /etc/fstab
LABEL=_/    /           ext4    defaults         1 1
/dev/xvdb   /mnt        ext3    defaults,context=system_u:object_r:usr_t:s0   0 0
none        /proc       proc    defaults         0 0
none        /sys        sysfs   defaults         0 0
none        /dev/pts    devpts  gid=5,mode=620   0 0
none        /dev/shm    tmpfs   defaults         0 0
/dev/xvdn1 /tmp ext3 defaults 0 0
/dev/xvdn2 /usr/sap ext3 defaults 0 0
/dev/xvdn3 /sapmnt ext3 defaults 0 0
/dev/xvdm1 /oracle ext3 defaults 0 0
/dev/xvdl1 /sap ntfs defaults 0 0
[root@ip-10-194-11-208 ~]# mount -a
mount: special device /dev/xvdb does not exist
[root@ip-10-194-11-208 ~]# df -h
Filesystem            Size  Used Avail Use% Mounted on
/dev/xvde1            5.7G  1.8G  3.9G  32% /
none                  3.7G     0  3.7G   0% /dev/shm
/dev/xvdn1             20G  173M   19G   1% /tmp
/dev/xvdn2             60G  180M   56G   1% /usr/sap
/dev/xvdn3             20G  173M   19G   1% /sapmnt
/dev/xvdm1             20G  173M   19G   1% /oracle
/dev/xvdl1             50G   28G   23G  56% /sap
[root@ip-10-194-11-208 ~]#
```

Figure 17 - Modify and mount /etc/fstab

/etc/fstab:

/dev/xvdm1 /sap ntfs defaults 0 0
/dev/xvdl1 /oracle ext3 defaults 0 0
/dev/xvdl2 /usr/sap ext3 defaults 0 0
/dev/xvdl3 /sapmnt ext3 defaults 0 0

SwapFile

- We are going to create a 16 GB swap file. While writing this, I had increased the size of the /sapmnt to 50 GB and we created a swap file within there. To create a swapfile, follow these commands:

```
[root@saplinux ~]# dd if=/dev/zero of=/sapmnt/swapfile bs=1024 count=16777216
16777216+0 records in
16777216+0 records out
17179869184 bytes (17 GB) copied, 418.528 s, 41.0 MB/s
[root@saplinux ~]#
[root@saplinux ~]# mkswap /sapmnt/
lost+found/ swapfile
[root@saplinux ~]# mkswap /sapmnt/swapfile
mkswap: /sapmnt/swapfile: warning: don't erase bootbits sectors
        on whole disk. Use -f to force.
```

```
Setting up swapspace version 1, size = 16777212 KiB
no label, UUID=4d802f71-1921-4e5a-ae21-ffb6ae488eb6
[root@saplinux ~]# chown root:root !$
chown root:root /sapmnt/swapfile
[root@saplinux ~]# swapon /!$
swapon //sapmnt/swapfile
[root@saplinux ~]#
```

AWS Network Setup

Elastic IP

- For this install, we have created an elastic IP, which is a static public IP that we can use to access the server. One additional step we had done here is to create a Anchor DNS entry for our IP to point to saplinux.thusjanthan.com.

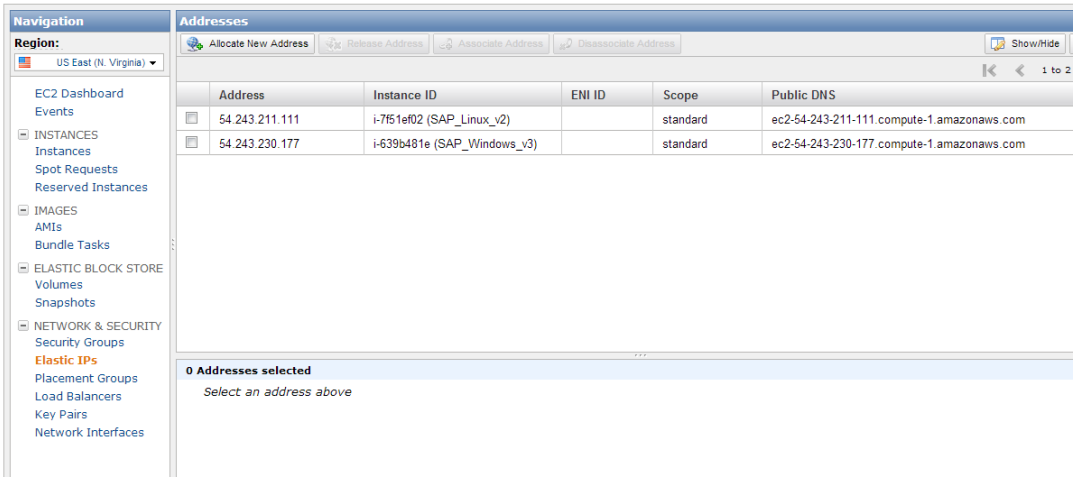


Figure 18 - Elastic IP

AWS Tools

- AWS provides a command line interface to updating its services. There are two documents that you'll need to follow to set the elastic IP permanently on your machine.
    1. http://www.idevelopment.info/data/AWS/AWS_Tips/AWS_Management/AWS_8.shtml - used to install the AWS Tools
    2. http://www.idevelopment.info/data/AWS/AWS_Tips/AWS_Management/AWS_14.shtml - used to set the static ip and dns for the linux machine.

Setup Hostname

- With the setup above you'll probably not need to do this but you'll still want to set your hosts file. Set the /etc/hosts file and /etc/sysconfig/network files accordingly:

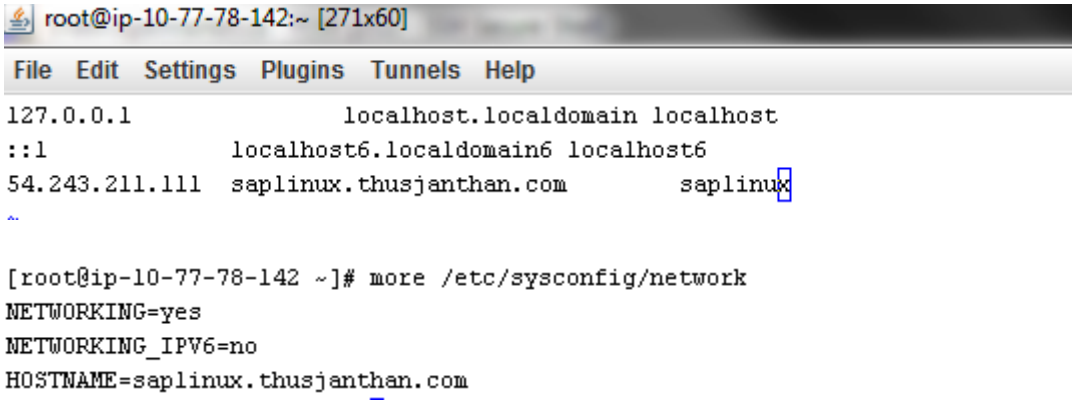


Figure 19 - Hostname changes

Firewall

- Make sure that the security group on AWS has all ports open for the time being and also disable the iptables firewall on linux by running: chkconfig iptables off; /etc/init.d/iptables stop

Installation

Oracle Install

User/Group Accounts

groupadd -g 1001 oinstall ## software inventory
groupadd -g 1002 dba ## database
groupadd -g 1003 oper ## database
groupadd -g 1004 asmadmin ## ASM, if needed
groupadd -g 1005 asmdba ## ASM, if needed
groupadd -g 1006 asmoper ## ASM, if needed
useradd -u 1002 -g dba -G dba,oper,asmadmin,asmdba,asmoper orabwd

Environment Variables

Vi /etc/bashrc

export DB_SID=BWD
export ORACLE_HOSTNAME=saplinux
export ORACLE_UNQNAME=DB11G
export ORACLE_BASE=/oracle
export ORACLE_HOME=$ORACLE_BASE/BWD/11203
export ORACLE_SID=BWD
export ORACLE_STAGE=/home/orabwd/database

export PATH=/usr/sbin:$PATH;
export PATH=$ORACLE_HOME/bin:$PATH

export LD_LIBRARY_PATH=$ORACLE_HOME/lib:/lib:/usr/lib
export CLASSPATH=$ORACLE_HOME/jlib:$ORACLE_HOME/rdbms/jlib

Folder Permissions

mkdir /oracle/BWD
chown -R orabwd:dba /oracle/BWD
chmod -R 777 /oracle/BWD
cp –Rp /sap/Downloads/oracle_server_51042939/database /home/orabwd/database
chown -R orabwd:dba /home/orabwd/database/

Installer

- To install you'll need to login as a normal user. We've created ora<sid> (orabwd) in our case.
    1. su – orabwd
    2. cd /home/orabwd/database/SAP
    3. Run prerequisite checker: ./RUNINSTALLER_CHECK
    4. Run installer in silent mode: ./RUNINSTALLER –silent
- This will install the Oracle database for you.

SAP Netweaver Install

- We are finally at the actual installation of SAP 7.3 Netweaver. You'll need to load up the windows instance for this. Since this is a server, you'll need to do a remote install. On the linux server run the following command as 'root'

/sap/Downloads/51042312/DATA_UNITS/NW730_IM_LINUX_X86_64_ORA /sapinst
SAPINST_START_GUI=false

Once you have run this, you'll notice this line:

guiengine: No GUI server connected; waiting for a connection on host saplinux.thusjanthan.com, port 21200 to continue with the installation
Which basically indicates that you are now ready to connect the SAP QUI to point to the server.

Windows Remote Install

Connect to the remote Server

- Once the server is awaiting for a client to connect, we'll load up the sapinstgui from our windows EC2 instance. In Figure 20, we had added saplinux and its IP to c:/Windows/System32/drivers/etc/hosts. Thus, it is able to find the saplinux server and connect

to the service that is awaiting the connect. Accept the Authentication. Figure 21, shows the authentication screen which is looking for the root login of the linux server.

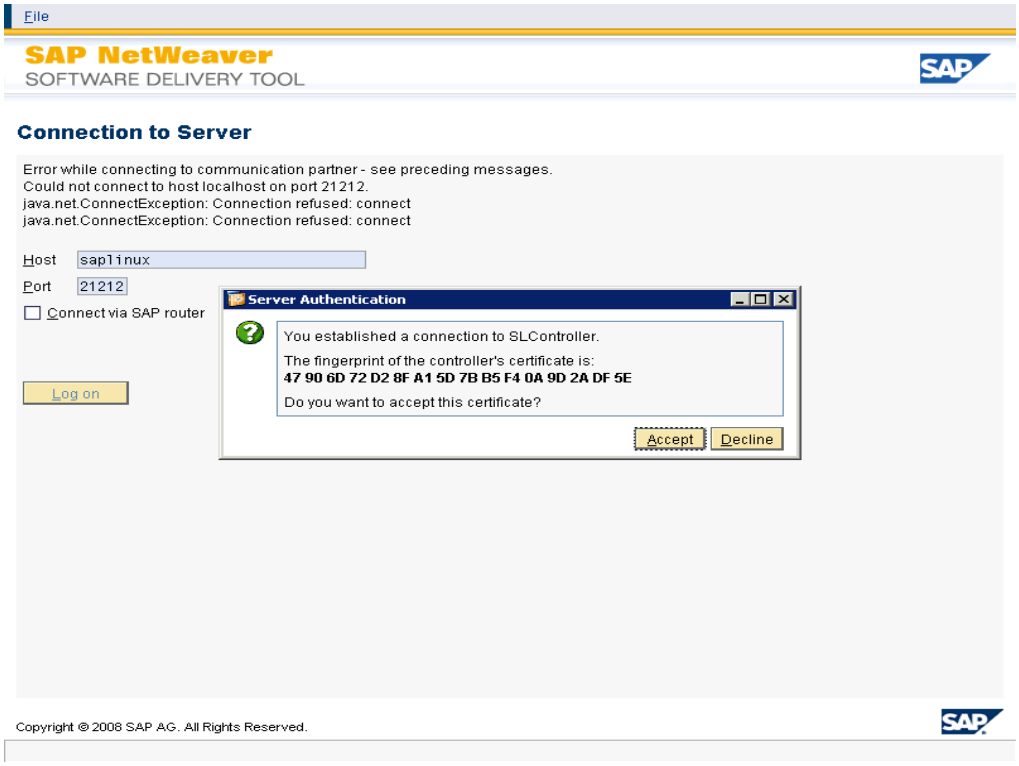


Figure 20 - Connect to Remote Server

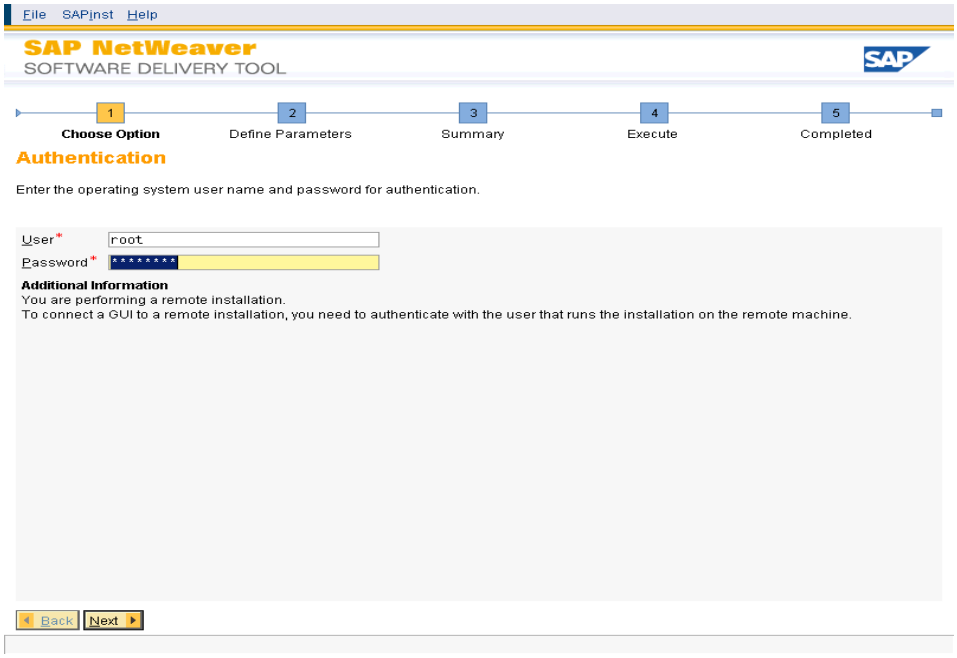


Figure 21 - Authentication of the Linux Server

Package Selection

- In this screen, we are going to pick which SAP product we are going to install. For our setup, we are going to install the Standard System

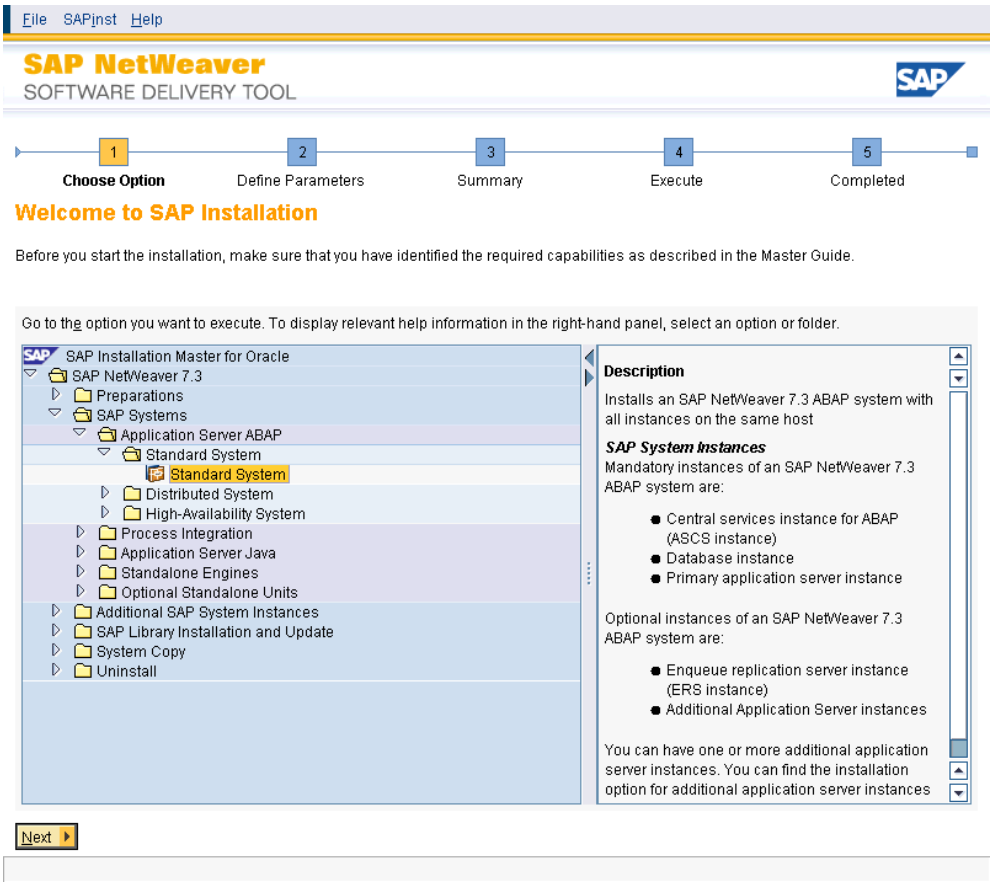


Figure 22 - Package Selection

Parameter Setting

- The parameter mode we wish to install using. Typical option will select many of the default settings. Whereas the custom mode allows you to configure many aspects of the installation ranging from ports, domain, drives and etc. For our install, we have chosen custom to show all the screens that are available to the end user.

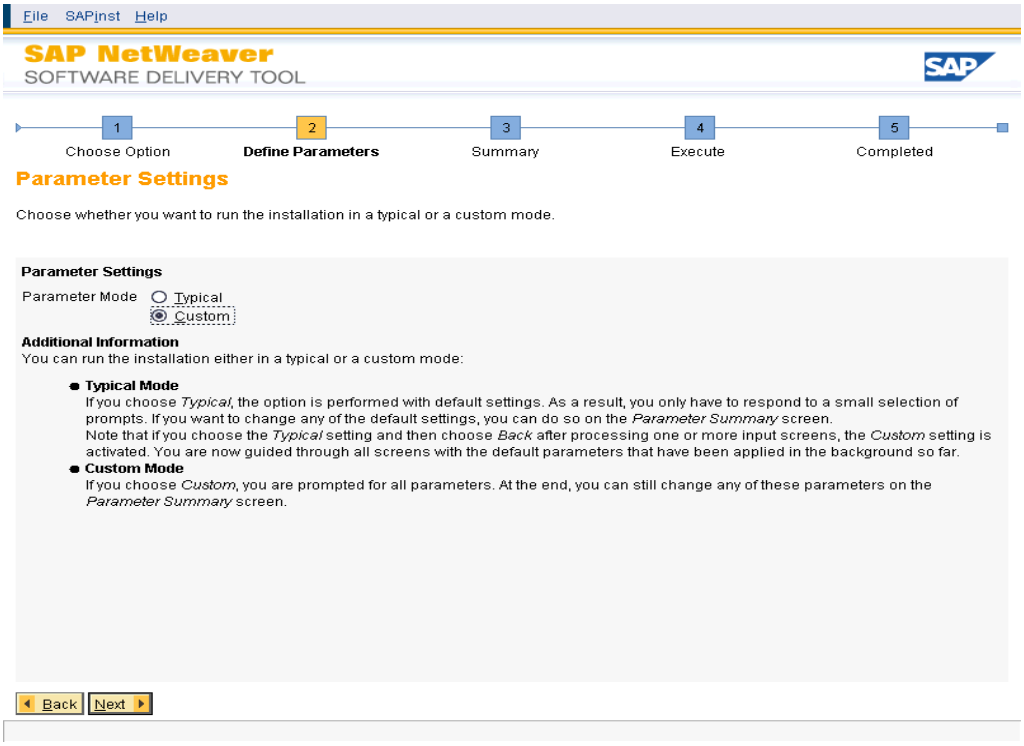


Figure 23 - Parameter Setting

SAP System Parameter

- Here you'll set the SID of the SAP install. The SID is exactly three uppercase alphanumeric unique character set. The following reserved sets that should not be used:
- ADD ADM ALL AMD AND ANY ARE ASC AUX AVG BIT CDC COM CON DBA END EPS FOR GET GID IBM INT KEY LOG LPT MAP MAX MIN MON NIX NOT NUL OFF OLD OMS OUT PAD PRN RAW REF ROW SAP SET SGA SHG SID SQL SUM SYS TMP TOP UID USE USR VAR

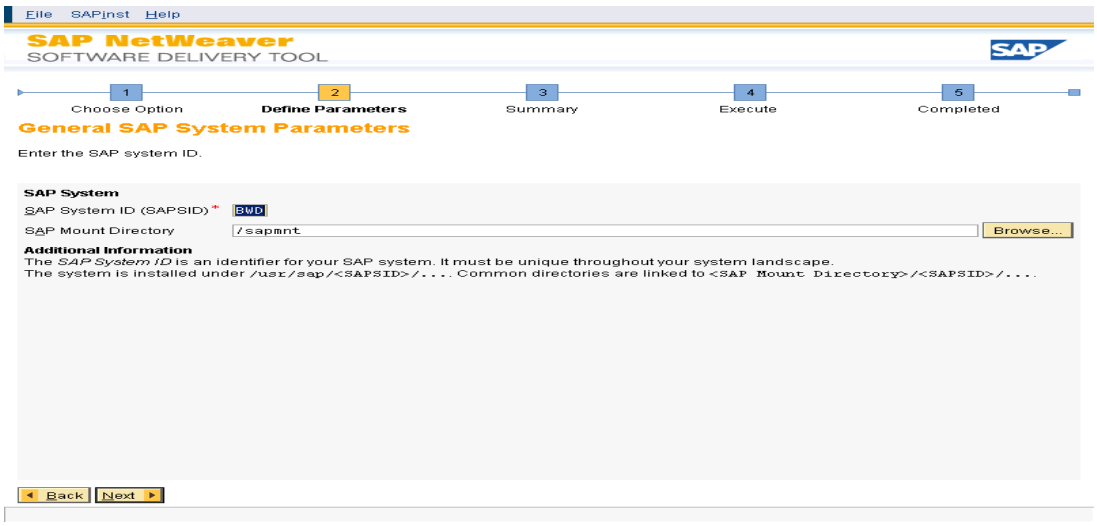


Figure 24 - SAP System parameter

DNS Domain Name

- The DNS allows you to access the machine anywhere within the network. In our case, we have created an Anchor record at thusjanthan.com domain for saplinux. Thus, we can set that as the FQDN to be able to access the service via FQDN on the internet.

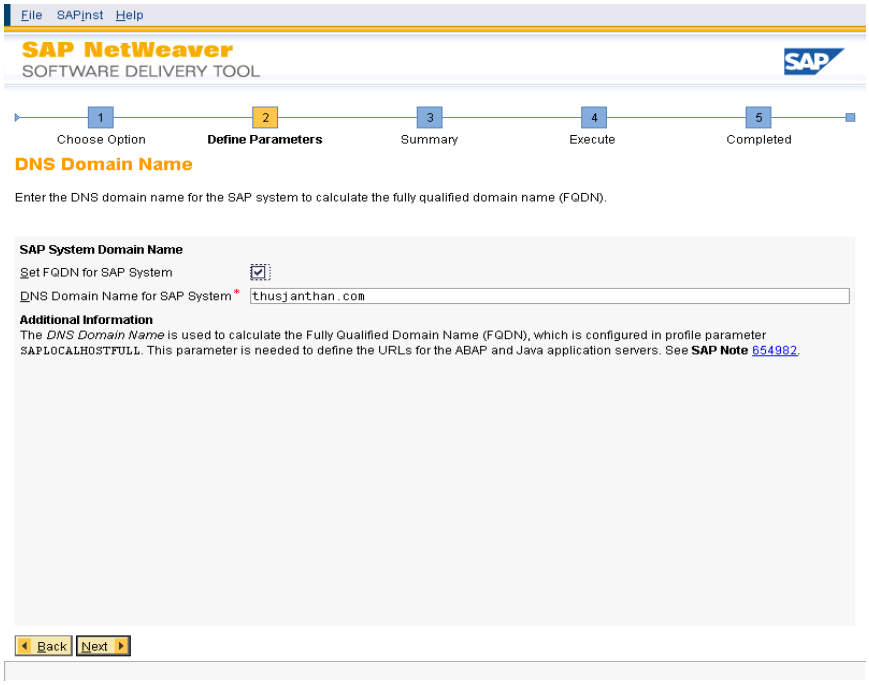


Figure 25 - Domain name Setting

Master Password

- This screen you will select the master password which is used throughout the installation. Keep this password safe as this will be the default password for many of the SAP services.

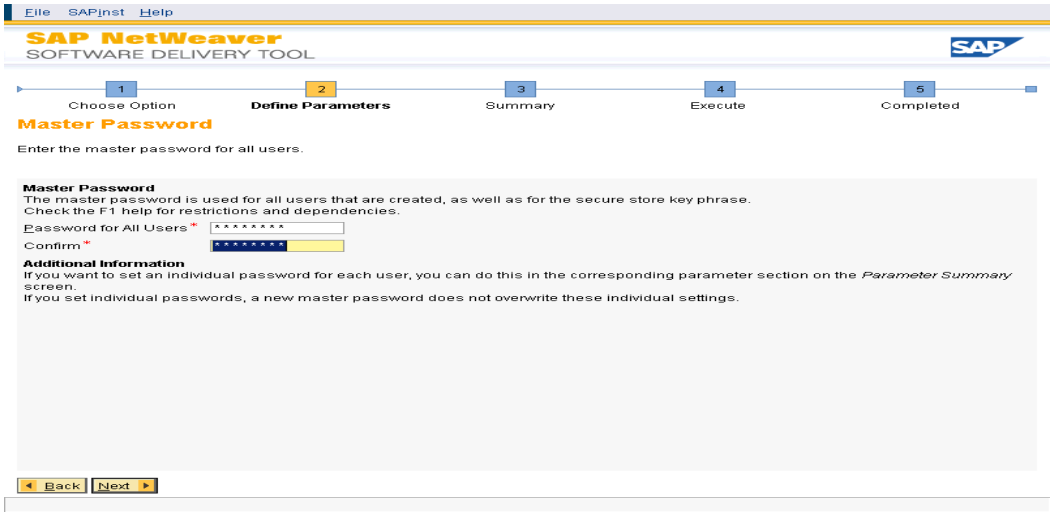
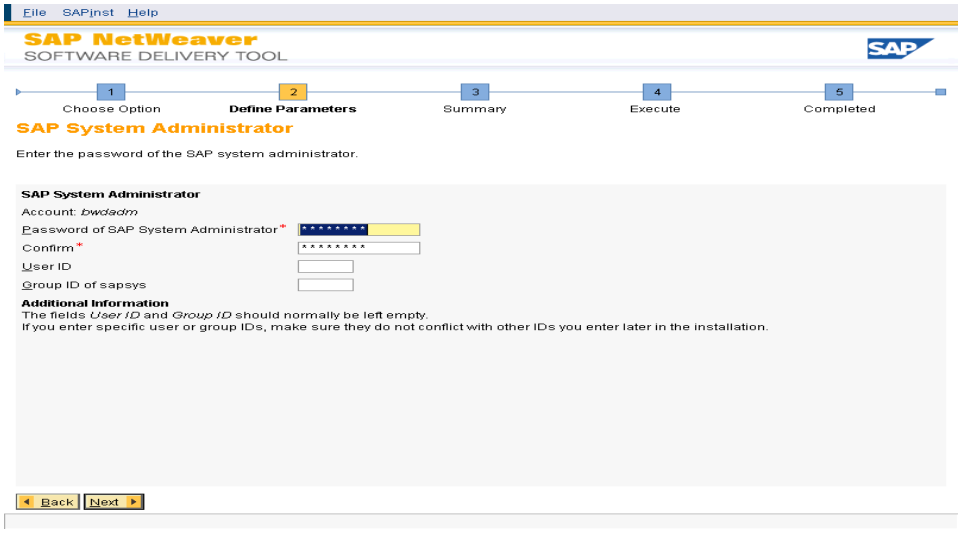


Figure 26 - Master password selection

SAP System Administrator Password

- <sid>adm password section. Again, this has taken the master password from Figure 26.



Oracle Database Parameter

Here you will select the SID of the oracle db. This can be the same as the SAP SID, but again should not be part of the list provided in the sid selection above. The host is the host that the listener will bind to.

Figure 27- Oracle DB parameters

Prerequisites Checker

- As per SAP, you should keep this file up to date. Always download the latest version of the prerequisite checker. This will check against system parameters such as SWAP size.

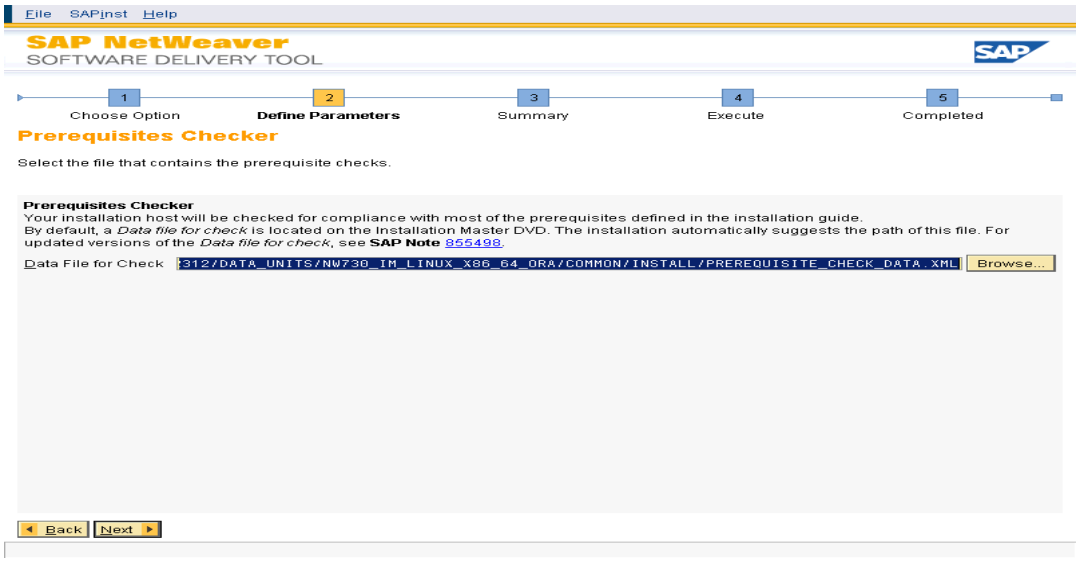
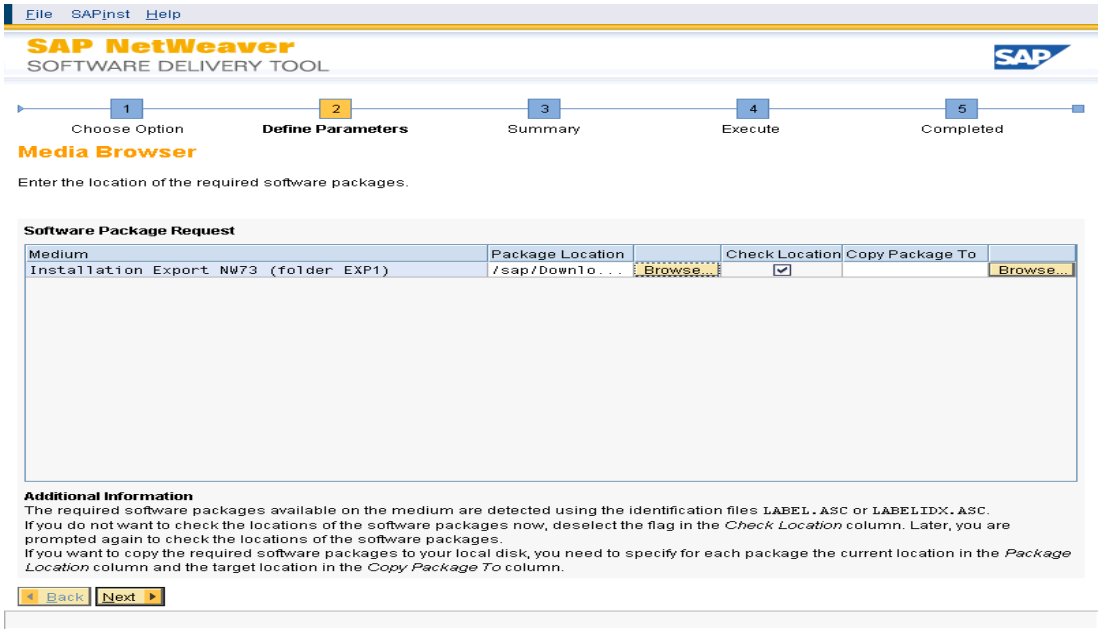


Figure 28 - Prerequisites checker

Media Browser

- The required software packages are detected using the LABEL.ASC. You will want to point to the NW73 file you downloaded and point to the EXP1 directory.



Oracle Database Schema

- Here you will set the instance RAM and select the Schema for the ABAP stack.

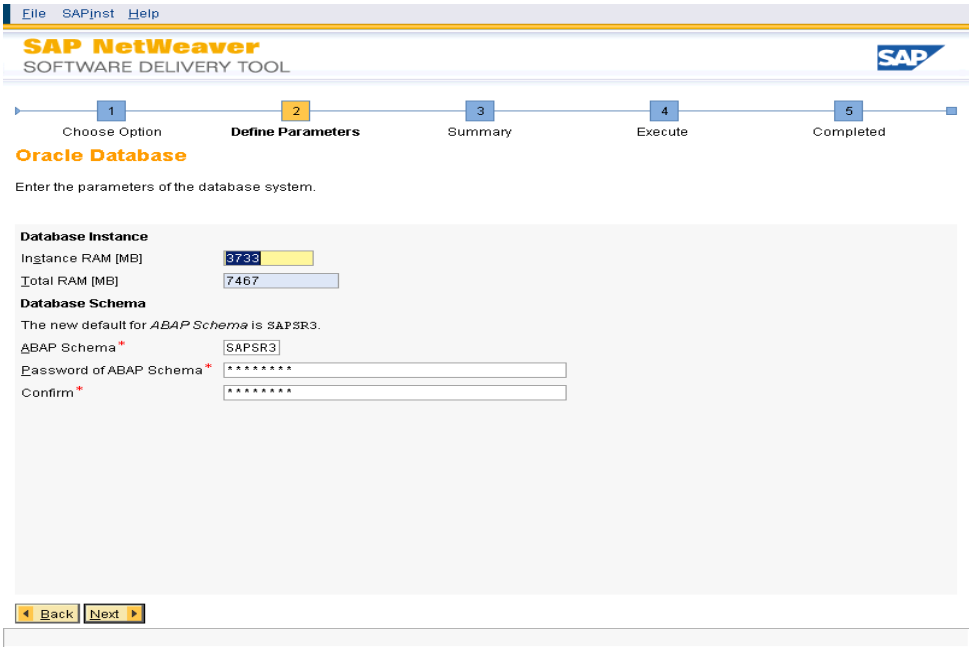


Figure 29 - Oracle DB Schema

Oracle Database Parameters

- Here you can set many of the parameters. Here you'll notice how we are using Oracle 11.2 with a 10.2 client on a 64 bit system.

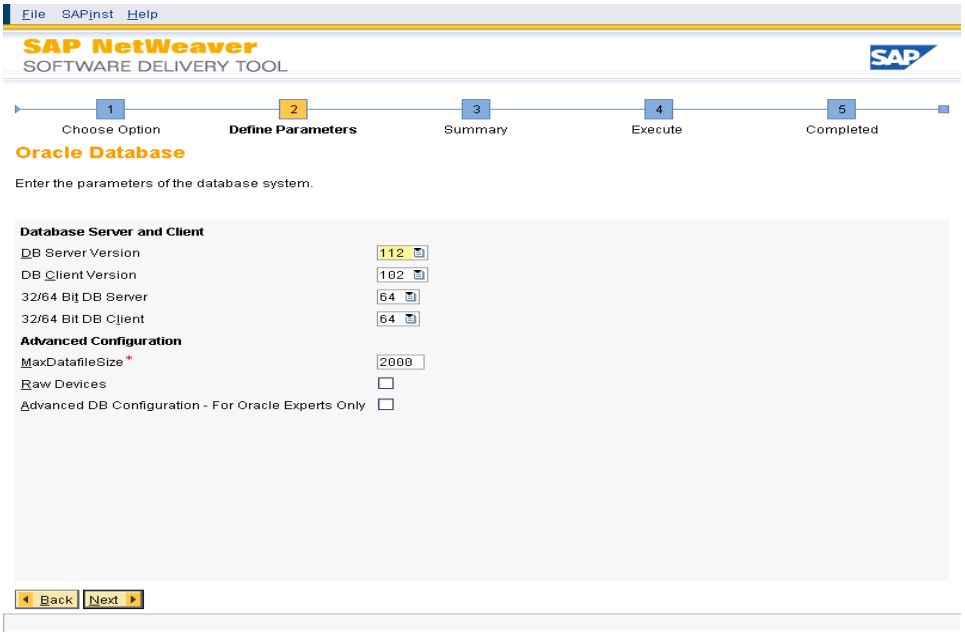


Figure 30 - Oracle Parameter Settings

Oracle Database Accounts

- Here you will set the passwords to some of the standard ‘sys’, ’system’ users of Oracle. By default it is the master password you set from the initial screen.

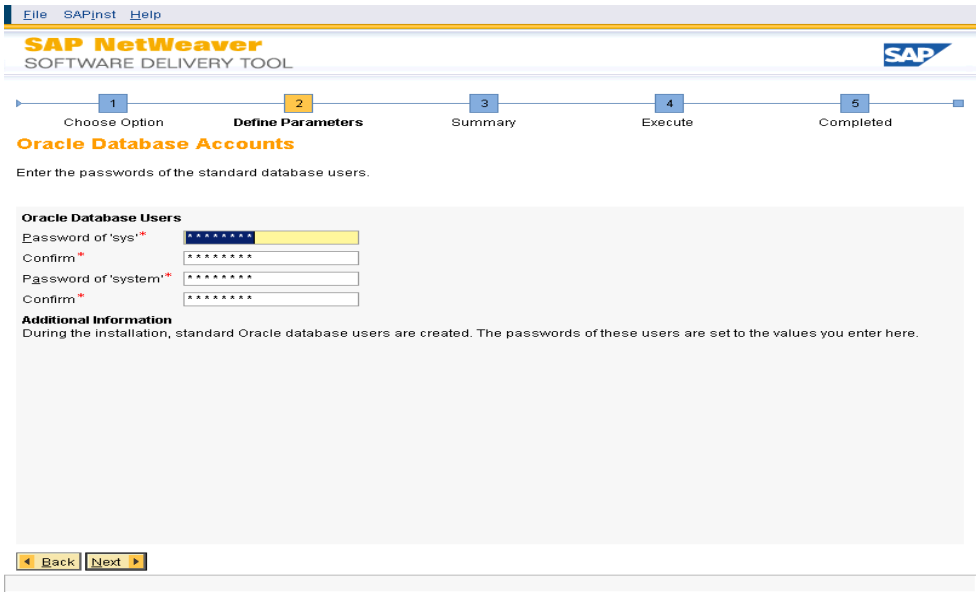


Figure 31 - Oracle Users

Oracle Listener

- This screen allows you to configure the Oracle Listener for the listener.ora and tnsnames.ora files. Unless you are Oracle savy, you should leave this screen as is.

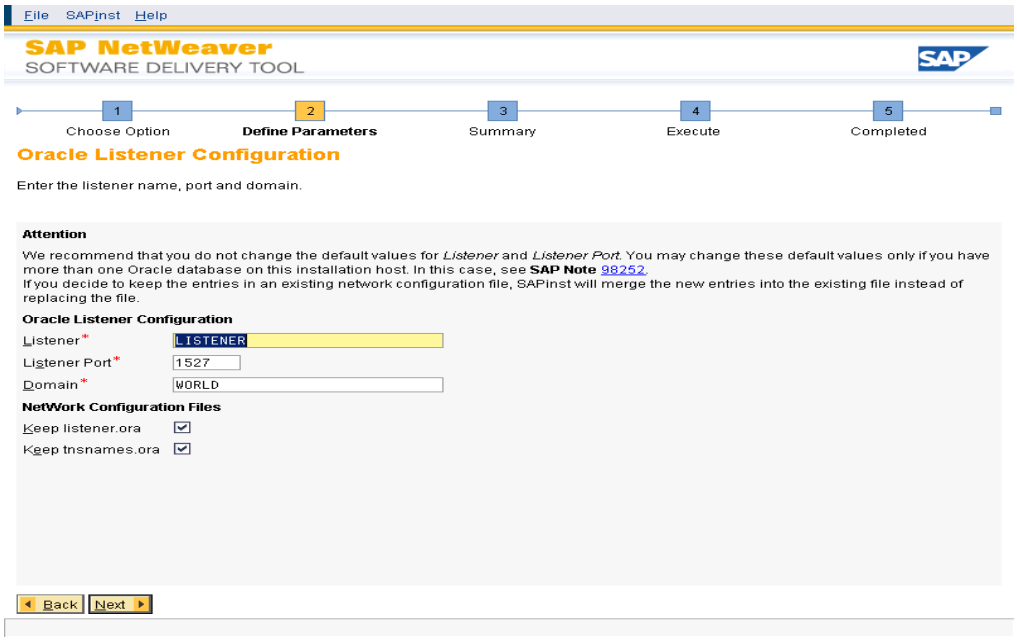


Figure 32 - Oracle Listener setup

Database Import Jobs

- This screen allows you to configure how many threads of the CPU to run simultaneously to import the data into the database. Typically this is 3 jobs. However, if your CPU can handle more then by all means set this higher as the install will go much faster. Too high, and you'll be getting warnings/errors.

Figure 33 - Parallel Jobs

Database Statistics

- Create statistics on the schema to provide caching and faster calls to the database server.

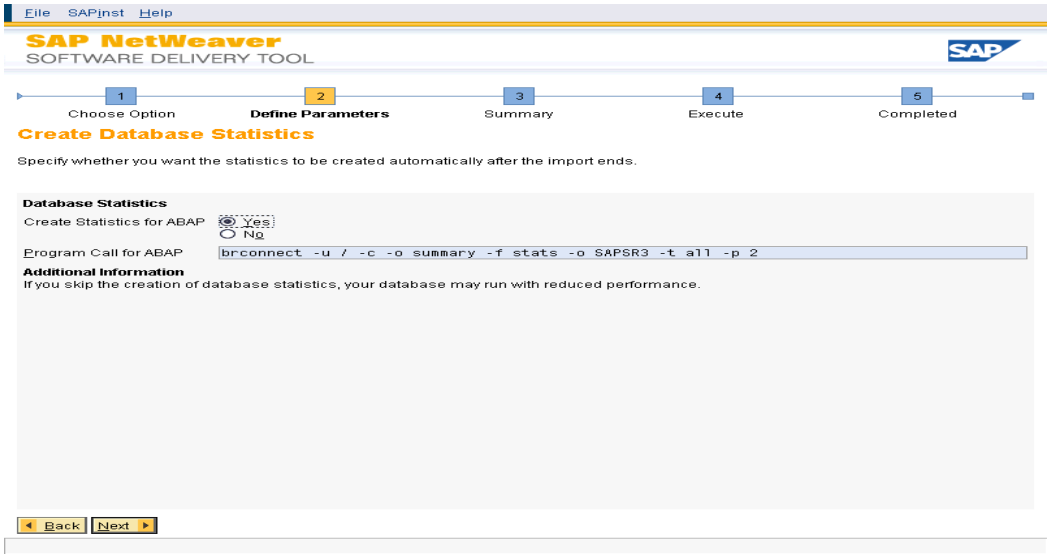


Figure 34 - Database Statistics

PAS & ABAP Instances

- Set the identifier number of the PAS and ABAP instances here. Remember the instances correlate with the port numbers. In our case, PAS will run on 3600 and ASCS will run on 3601.

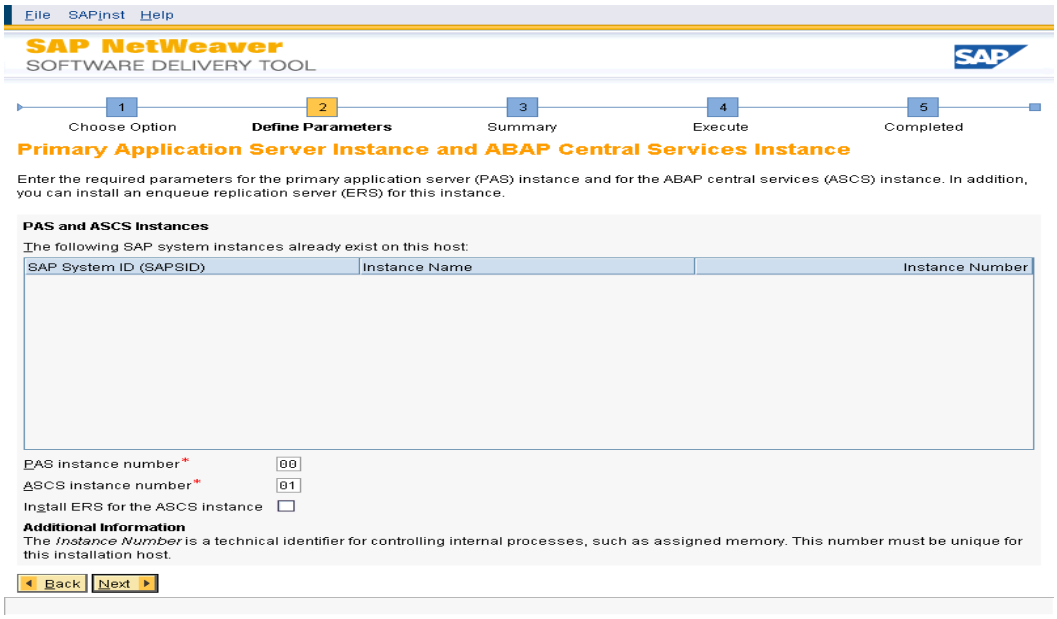


Figure 35 - PAS & ABAP Instances

ABAP message Server Ports

- Here you can configure the message server ports

Figure 36 - Message Server Ports

ICM Password

- Set the ICM password. An admin uses the webadm account to interface with the ICM and the web dispatcher.

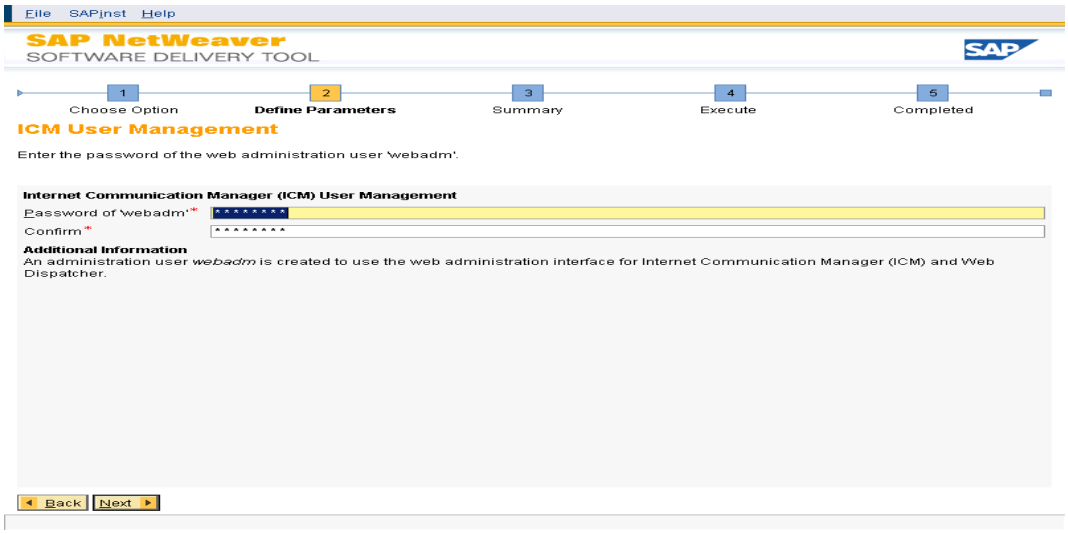


Figure 37 - ICM Password

Oracle Client

- Here you will provide the media for the Oracle client. Based on Figure 30, you've set the oracle client version to 10.2. Thus, we will need to provide the client files for the 10.2 version.

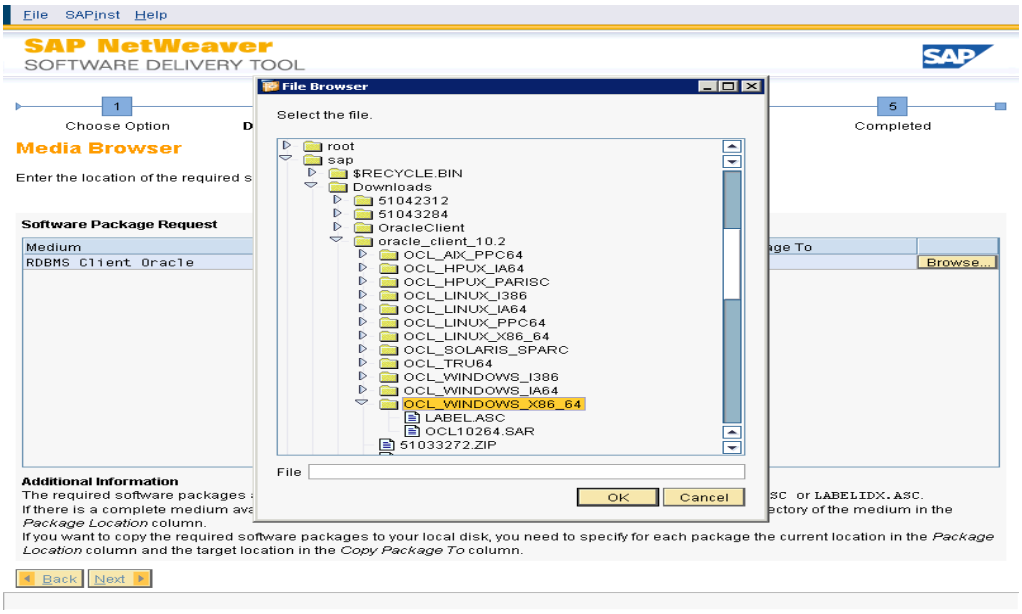


Figure 38 - Oracle Client 10.2

Unpack Archives

- Unpack the SAR archive files for the client and dba tools.

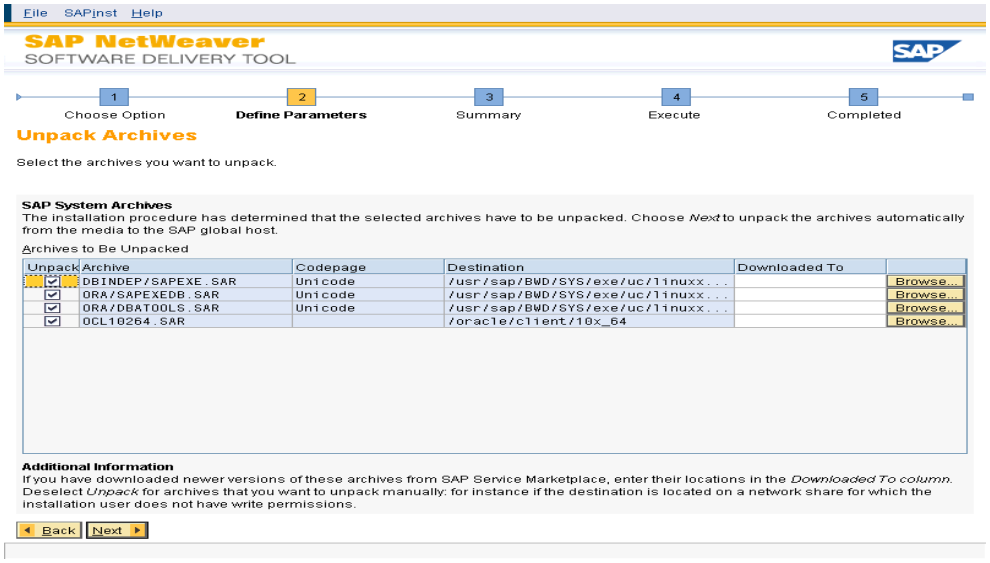


Figure 39 - Unpack SAR Files for DB

Diagnostics Agent

- A Diagnostics Agent is a standalone Java program that runs on each of the systems managed by SAP Solution Manager Diagnostics. It gathers information and reports to the SAP Solution Manager system. Provide a SID for that as well. Generally it is DAA.

Figure 40 - DAA SID

DAA Password

- Defaults to the same as the master password.

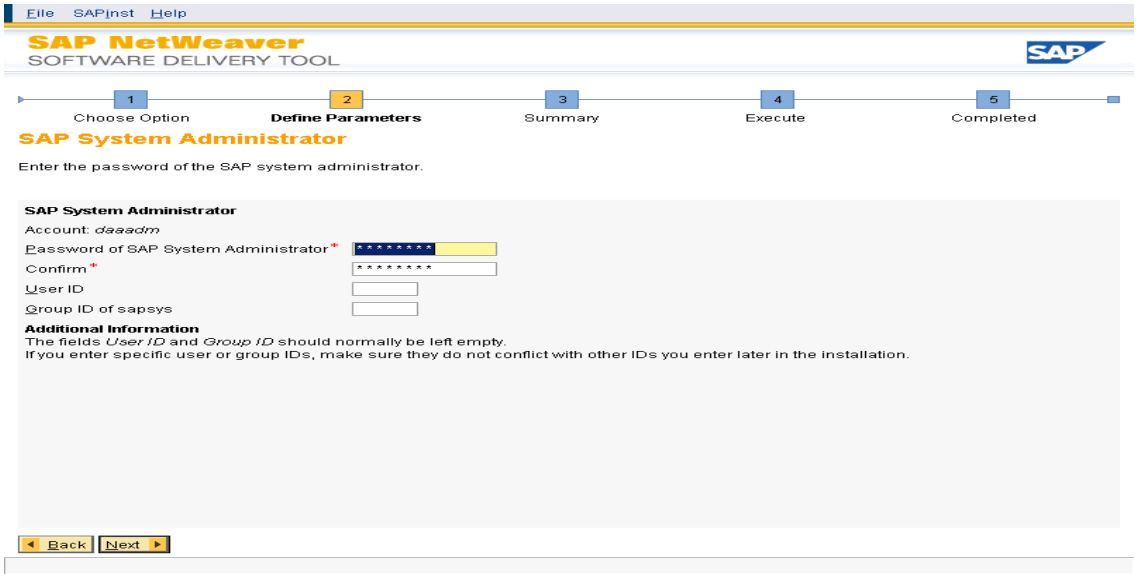


Figure 41 - DAA Password

DAA Instance

- By default it will choose the 97 instance as 00 and 01 are taken.

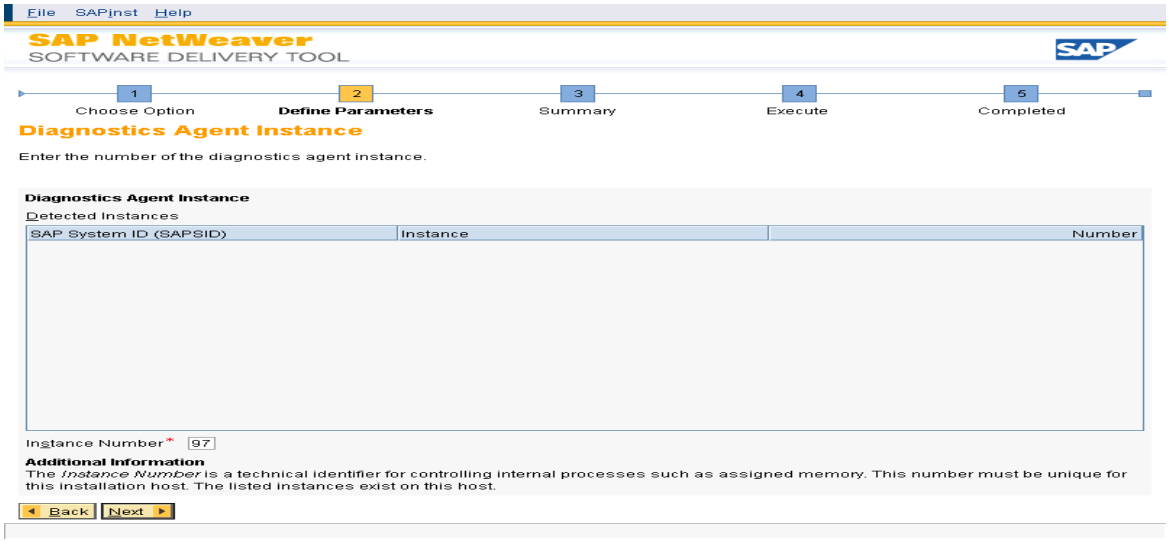


Figure 42 - DAA Instance

System Landscape Directory for Diagnostics

- Register the DAA to an existing SLD or not. We have chosen not to.

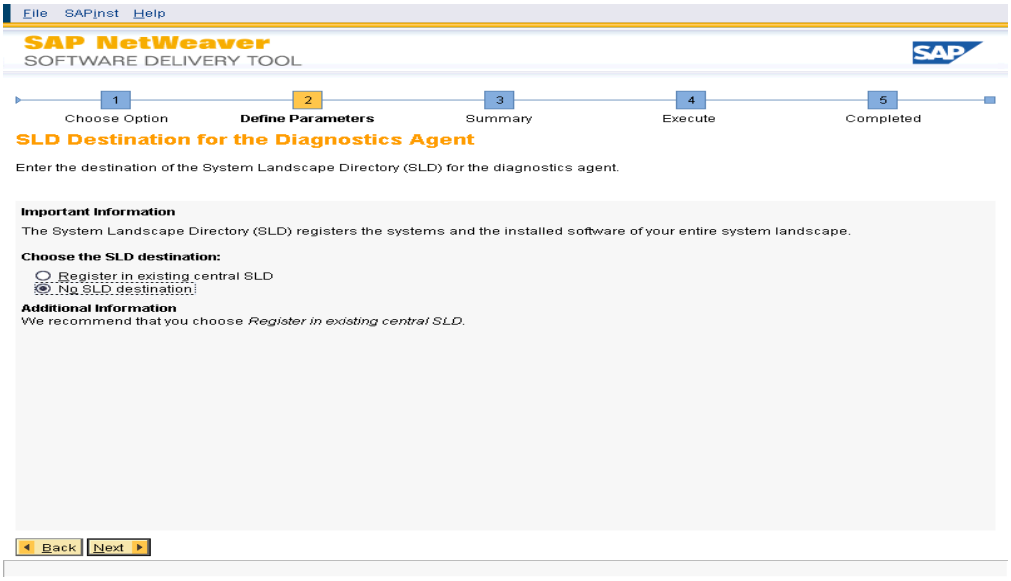


Figure 43 - SLD Register

Install Summary

- Here you can customize any of the parameter you have set above before giving the final go ahead to install.

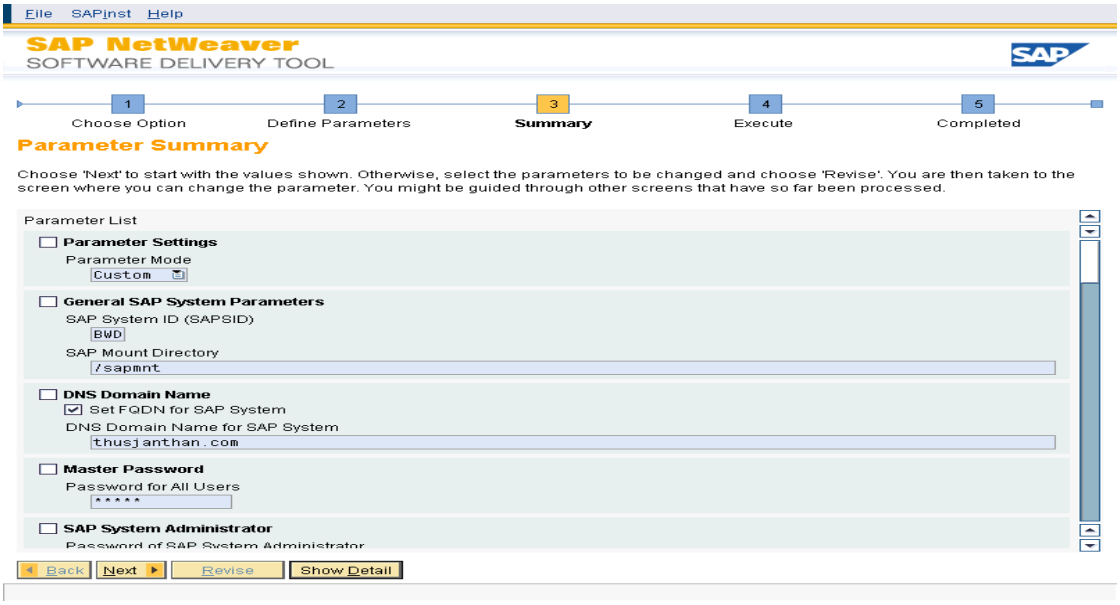


Figure 44 - Install Summary

Installation Screen

- This is what the installation screen will look like as it continues through each of the install procedures.

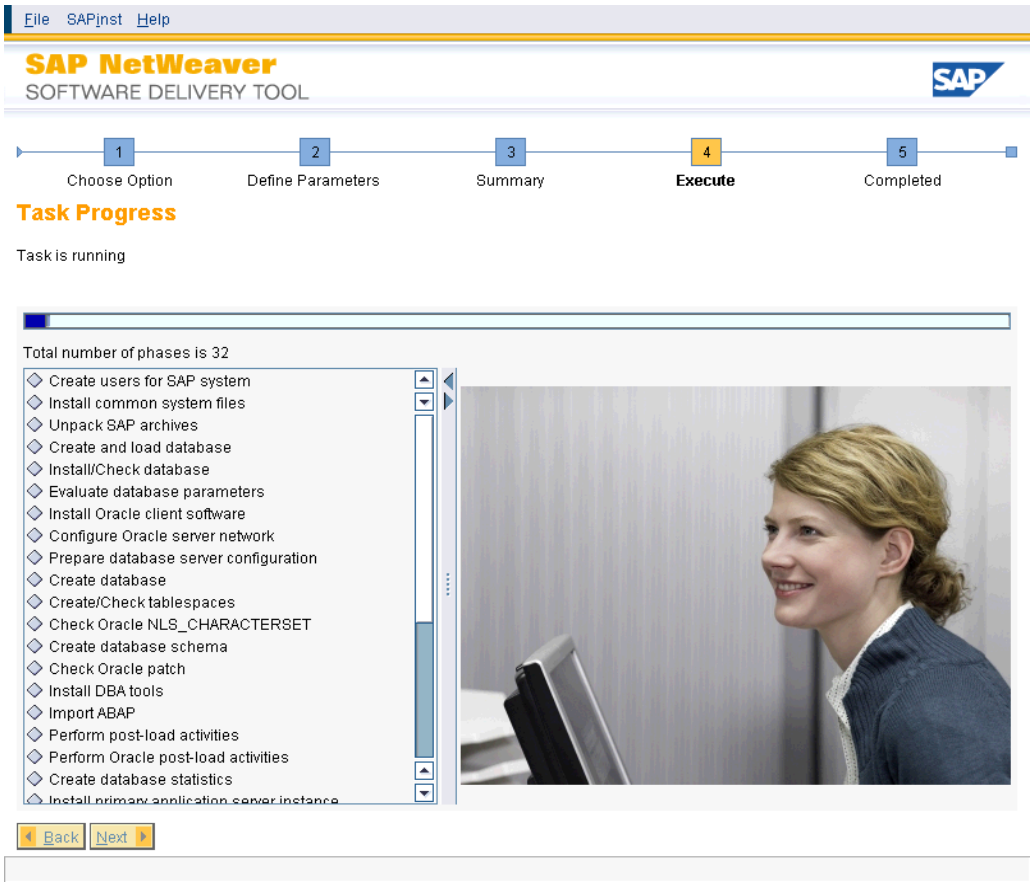


Figure 45 - Install Screen