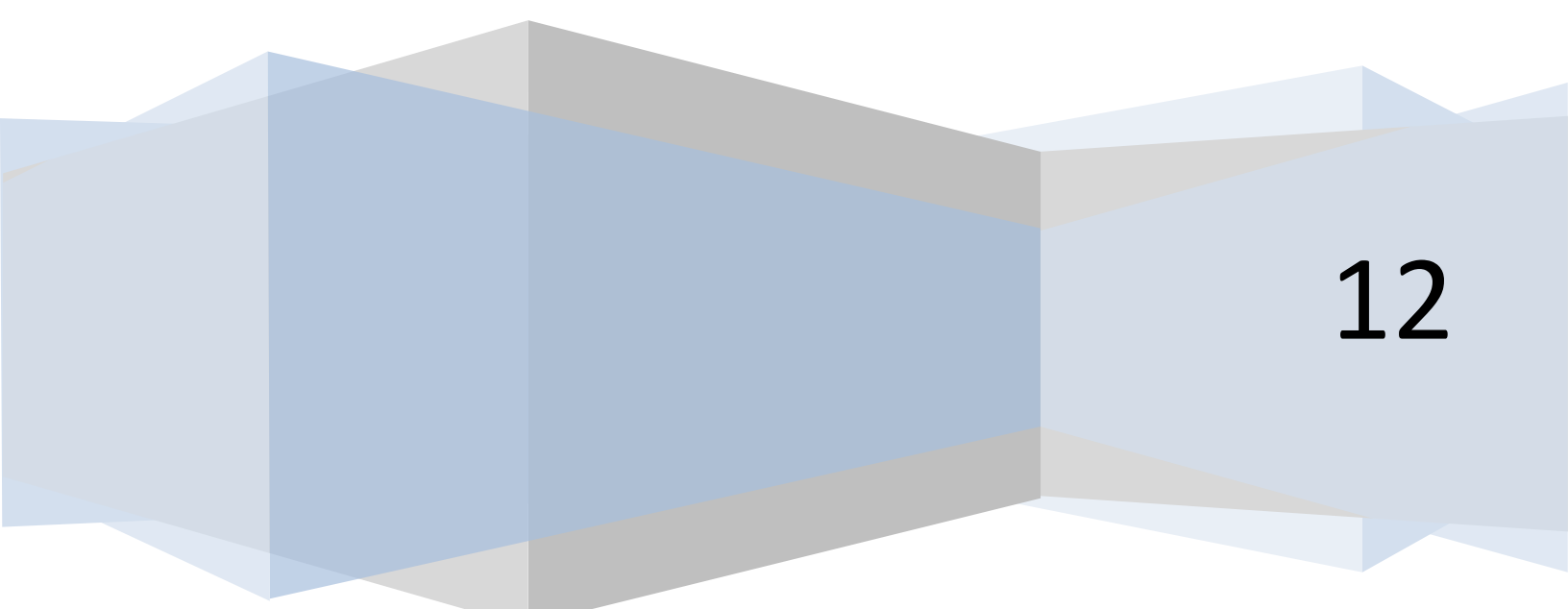


SAP Netweaver 7.3 on Amazon Cloud

RedHat 6 Install

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12

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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.

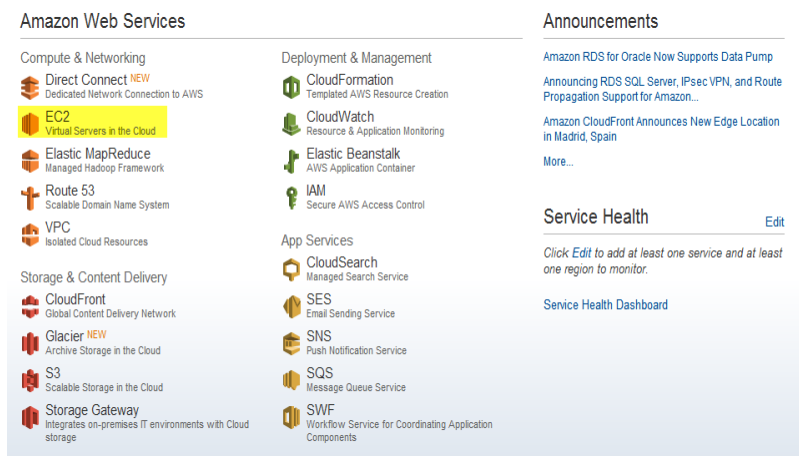


Figure 1 - Creating an EC2 Instance

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.

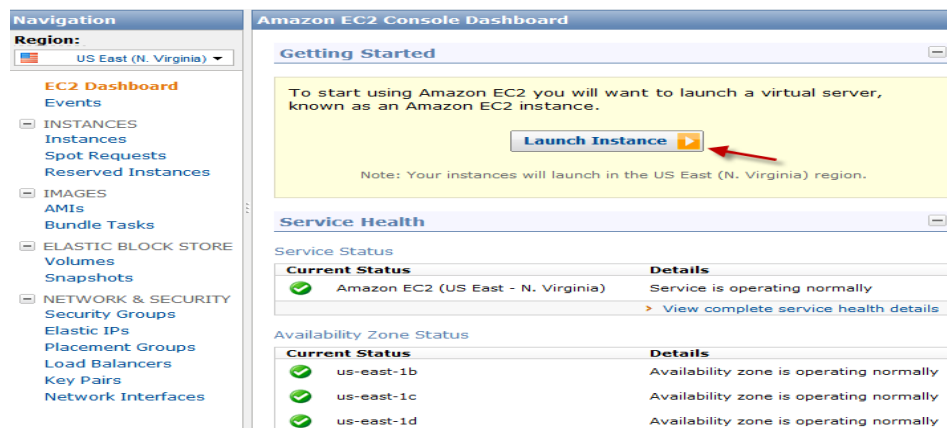


Figure 2 - Launch an EC2 Instance

EC2 Instance Wizard

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

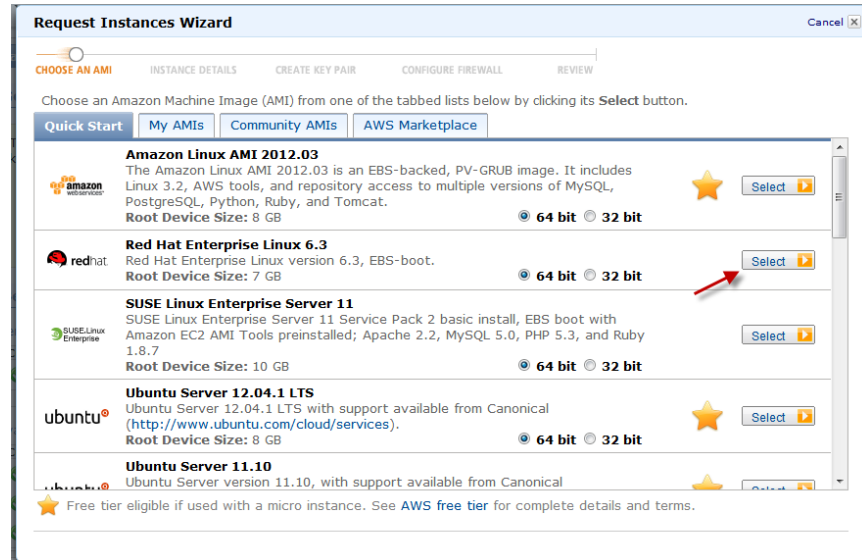


Figure 3 - EC2 Instance Wizard

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.

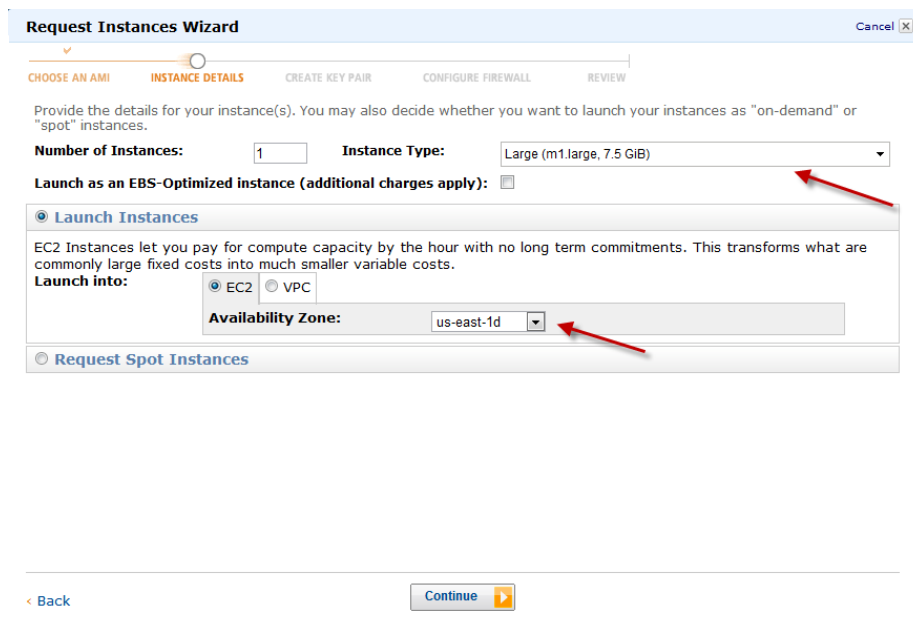


Figure 4 - Instance Details

- 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.

Request Instances Wizard [Cancel X]

CHOOSE AN AMI | **INSTANCE DETAILS** | CREATE KEY PAIR | CONFIGURE FIREWALL | REVIEW

Number of Instances: 1 **Availability Zone:** No Preference

Advanced Instance Options

Here you can choose a specific [kernel](#) or [RAM disk](#) to use with your instances. You can also choose to enable CloudWatch Detailed Monitoring or enter data that will be available from your instances once they launch.

Kernel ID: Use Default **RAM Disk ID:** Use Default

Monitoring: ☐ Enable CloudWatch detailed monitoring for this instance (additional charges will apply)

User Data:
☒ as text ☐ as file
☐ base64 encoded

Termination Protection: ☐ Prevention against accidental termination.

Shutdown Behavior: Stop

IAM Role: None

< Back Continue >

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.

Request Instances Wizard [Cancel X]

CHOOSE AN AMI | **INSTANCE DETAILS** | CREATE KEY PAIR | CONFIGURE FIREWALL | REVIEW

Number of Instances: 1 **Availability Zone:** No Preference

Storage Device Configuration

Your instance will be launched with the following storage device settings. Edit these settings to add EBS volumes, instance store volumes, or edit the settings of the root volume.

Type	Device	Snapshot ID	Size	Volume Type	IOPS	Delete on Termination
Root	/dev/sda1	snap-6eaab211	7GiB	standard		true

Edit

< Back Continue >

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.

Request Instances Wizard Cancel

CHOOSE AN AMI **INSTANCE DETAILS** CREATE KEY PAIR CONFIGURE FIREWALL REVIEW

Add tags to your instance to simplify the administration of your EC2 infrastructure. A form of metadata, tags consist of a case-sensitive key/value pair, are stored in the cloud and are private to your account. You can create user-friendly names that help you organize, search, and browse your resources. For example, you could define a tag with key = Name and value = Webserver. You can add up to 10 unique keys to each instance along with an optional value for each key. For more information, go to [Using Tags](#) in the *EC2 User Guide*.

Key (127 characters maximum)	Value (255 characters maximum)	Remove
Name		✖
Software	SAP730	✖
		✖

[Add another Tag.](#) (Maximum of 10)

< Back Continue >

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.

Request Instances Wizard Cancel

CHOOSE AN AMI INSTANCE DETAILS **CREATE KEY PAIR** CONFIGURE FIREWALL REVIEW

Public/private key pairs allow you to securely connect to your instance after it launches. To create a key pair, enter a name and click **Create & Download your Key Pair**. You will then be prompted to save the private key to your computer. Note, you only need to generate a key pair once - not each time you want to deploy an Amazon EC2 instance.

☒ **Choose from your existing Key Pairs**

Your existing Key Pairs*: tkuben

☐ Create a new Key Pair

☐ Proceed without a Key Pair

< Back Continue >

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.

The screenshot shows the 'Request Instances Wizard' at the 'CONFIGURE FIREWALL' step. The wizard has five steps: CHOOSE AN AMI, INSTANCE DETAILS, CREATE KEY PAIR, CONFIGURE FIREWALL (current), and REVIEW. A progress bar indicates the current step. Below the progress bar, there is a text box explaining that security groups determine whether a network port is open or blocked. Below this, there are two radio buttons: 'Choose one or more of your existing Security Groups' (selected) and 'Create a new Security Group'. Under the selected option, a list box shows two security groups: 'sg-14493a7c - default' and 'sg-fc4d3e94 - tkuben'. Below the list box, it says '(Selected groups: sg-fc4d3e94)'. At the bottom, there are 'Back' and 'Continue' buttons.

EC2 Summary

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

The screenshot shows the 'Request Instances Wizard' at the 'REVIEW' step. The wizard has five steps: CHOOSE AN AMI, INSTANCE DETAILS, CREATE KEY PAIR, CONFIGURE FIREWALL, and REVIEW (current). A progress bar indicates the current step. Below the progress bar, there is a summary of the instance configuration. The summary includes: AMI: Red Hat AMI ID ami-cc5af9a5 (x86_64), Name: Red Hat Enterprise Linux 6.3, Description: Red Hat Enterprise Linux version 6.3, EBS-boot. Below this, there are sections for 'Number of Instances: 1', 'Availability Zone: us-east-1d', 'Instance Type: Large (m1.large)', 'Instance Class: On Demand', 'EBS-Optimized: No', 'Monitoring: Disabled', 'Termination Protection: Disabled', 'Tenancy: Default', 'Kernel ID: Use Default', 'Shutdown Behavior: Stop', 'RAM Disk ID: Use Default', 'Network Interfaces: Secondary IP Addresses: User Data: IAM Role:'. Below these sections, there are links to 'Edit Instance Details', 'Edit Advanced Details', 'Edit Key Pair', and 'Edit Firewall'. At the bottom, there are 'Back' and 'Launch' buttons.

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.

Name	Instance	AMI ID	Root Device	Type	State	Status Checks	Alarm Status	Monitoring	Security Groups
empty	i-5acae20	ami-cc5af9a5	ebs	m1.large	stopped	2/2 checks passed	none	basic	tkuben
empty	i-08d5e472	ami-71b50018	ebs	m1.large	running	2/2 checks passed	none	basic	tkuben
empty	i-de5f67a4	ami-cc5af9a5	ebs	m1.large	running	2/2 checks passed	none	basic	tkuben
SAP730	i-095ab474	ami-cc5af9a5	ebs	m1.large	running	2/2 checks passed	none	basic	tkuben

No EC2 Instances selected.

Select an instance above

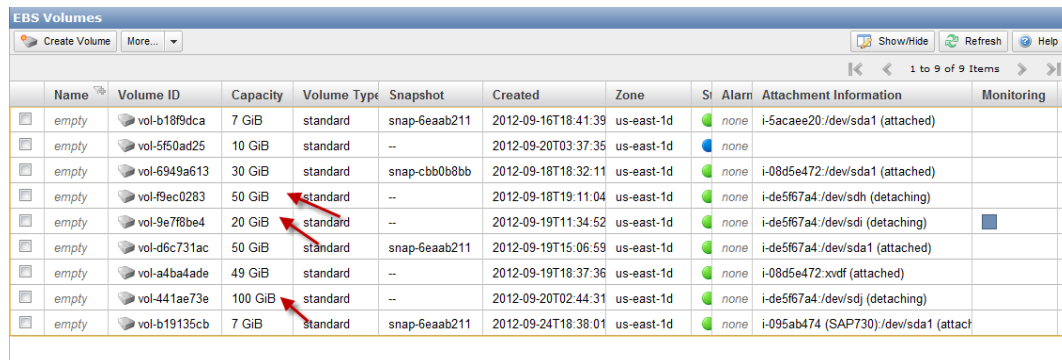
Figure 10 - My Instances

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 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.



Name	Volume ID	Capacity	Volume Type	Snapshot	Created	Zone	SI	Alarm	Attachment Information	Monitoring
empty	vol-b18f9dca	7 GiB	standard	snap-6eaab211	2012-09-16T18:41:39	us-east-1d		none	i-5acae20:/dev/sda1 (attached)	
empty	vol-5f50ad25	10 GiB	standard	--	2012-09-20T03:37:35	us-east-1d		none		
empty	vol-6949a613	30 GiB	standard	snap-cbb0b8bb	2012-09-18T18:32:11	us-east-1d		none	i-08d5e472:/dev/sda1 (attached)	
empty	vol-f9ec0283	50 GiB	standard	--	2012-09-18T19:11:04	us-east-1d		none	i-de5f67a4:/dev/sdh (detaching)	
empty	vol-9e7f8be4	20 GiB	standard	--	2012-09-19T11:34:52	us-east-1d		none	i-de5f67a4:/dev/sdi (detaching)	
empty	vol-d6c731ac	50 GiB	standard	snap-6eaab211	2012-09-19T15:06:59	us-east-1d		none	i-de5f67a4:/dev/sda1 (attached)	
empty	vol-a4ba4ade	49 GiB	standard	--	2012-09-19T18:37:36	us-east-1d		none	i-08d5e472:xvdf (attached)	
empty	vol-441ae73e	100 GiB	standard	--	2012-09-20T02:44:31	us-east-1d		none	i-de5f67a4:/dev/sdj (detaching)	
empty	vol-b19135cb	7 GiB	standard	snap-6eaab211	2012-09-24T18:38:01	us-east-1d		none	i-095ab474 (SAP730)/dev/sda1 (attach	

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.

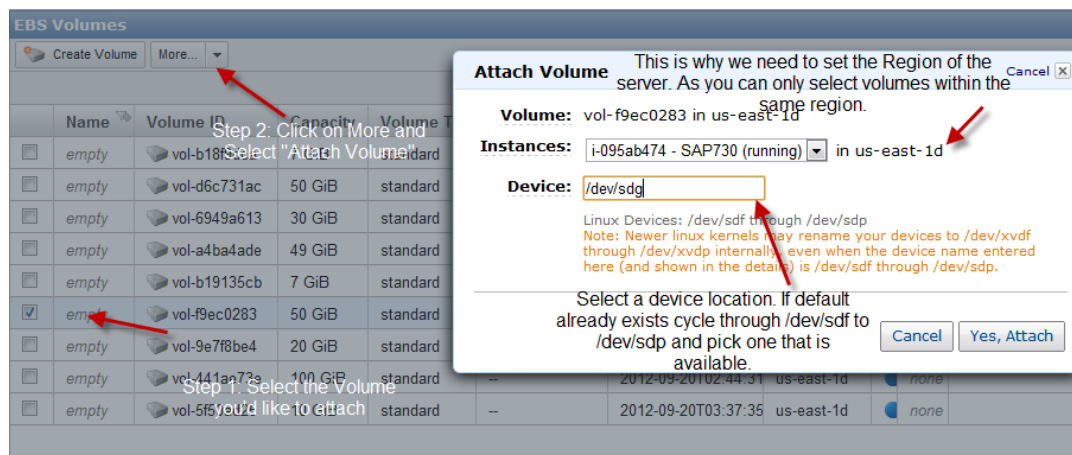


Figure 12 - Attaching a Volume

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...
1:epel-release
[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
/dev/xvdm          1         6527     52426752    7  HPFS/NTFS

Disk /dev/xvdm: 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/xvdm          1         6527     52426752    7  HPFS/NTFS
[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/xvda1    /tmp     ext3      defaults 0 0
/dev/xvda2    /usr/sap ext3      defaults 0 0
/dev/xvda3    /sapmnt ext3      defaults 0 0
/dev/xvda1    /oracle ext3      defaults 0 0
/dev/xvda1    /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/xvda1      5.7G  1.8G  3.9G  32% /
none            3.7G   0    3.7G   0% /dev/shm
/dev/xvda1       20G  173M   19G   1% /tmp
/dev/xvda2       60G  180M   56G   1% /usr/sap
/dev/xvda3       20G  173M   19G   1% /sapmnt
/dev/xvda1       20G  173M   19G   1% /oracle
/dev/xvda1       50G  28G   23G  56% /sap
[root@ip-10-194-11-208 ~]#
```

Figure 17 - Modify and mount /etc/fstab

/etc/fstab:

```
/dev/xvda1 /sap ntfs defaults 0 0
/dev/xvda1 /oracle ext3 defaults 0 0
/dev/xvda2 /usr/sap ext3 defaults 0 0
/dev/xvda3 /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.
```

```

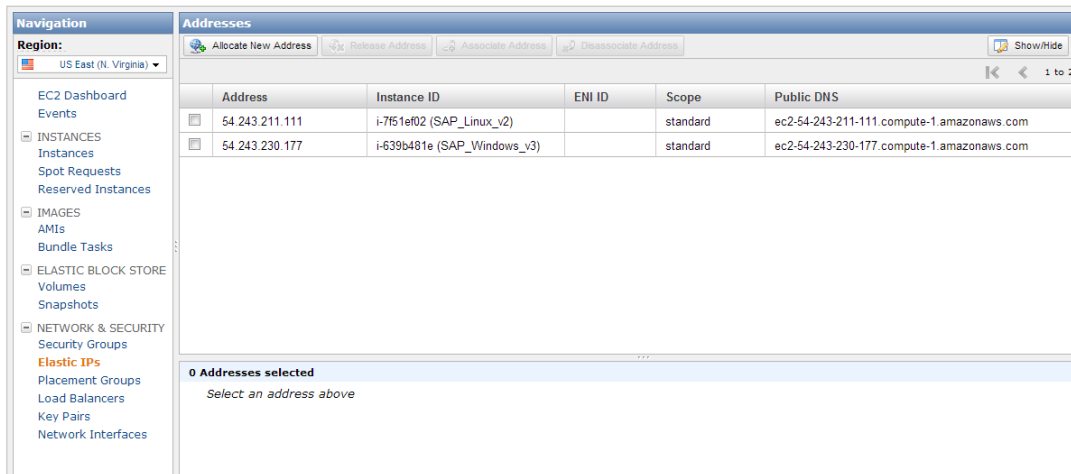
Setting up swapspace version 1, size = 16777212 KiB
no label, UUID=4d802f71-1921-4e5a-ae21-ffb6ae488eb6
[root@saplinux ~]# chown root:root !$
chown root:root /sapmnt/swapfile
[root@saplinux ~]# swapon !$
swapon //sapmnt/swapfile
[root@saplinux ~]#

```

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.



Address	Instance ID	ENI ID	Scope	Public DNS
54.243.211.111	i-7f51ef02 (SAP_Linux_v2)		standard	ec2-54-243-211-111.compute-1.amazonaws.com
54.243.230.177	i-639b481e (SAP_Windows_v3)		standard	ec2-54-243-230-177.compute-1.amazonaws.com

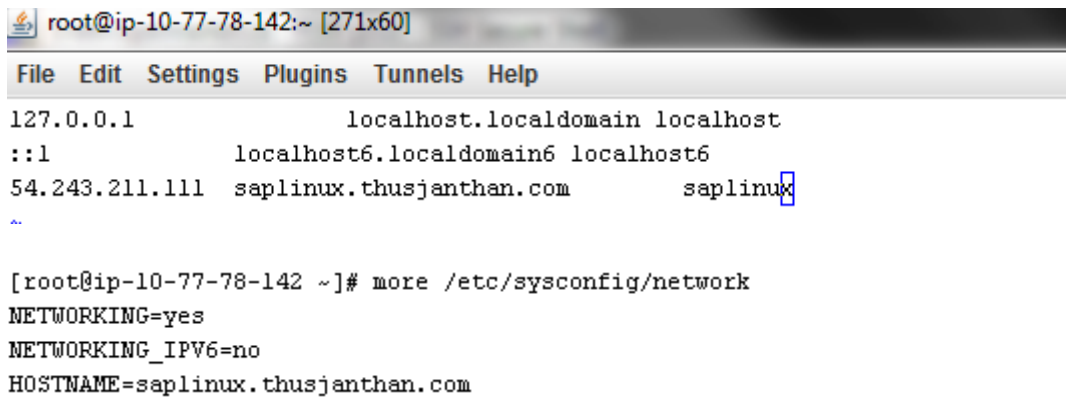
Figure 18 - Elastic IP

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:

A screenshot of a terminal window with a title bar showing 'root@ip-10-77-78-142:~ [271x60]'. The terminal has a menu bar with 'File', 'Edit', 'Settings', 'Plugins', 'Tunnels', and 'Help'. The content shows the output of the 'cat /etc/hosts' command, displaying three entries: '127.0.0.1 localhost.localdomain localhost', '::1 localhost6.localdomain6 localhost6', and '54.243.211.111 saplinux.thusjanthan.com saplinux'. Below this, the output of 'more /etc/sysconfig/network' is shown, with 'NETWORKING=yes', 'NETWORKING_IPV6=no', and 'HOSTNAME=saplinux.thusjanthan.com'.

```
root@ip-10-77-78-142:~ [271x60]
File Edit Settings Plugins Tunnels Help

127.0.0.1          localhost.localdomain localhost
::1               localhost6.localdomain6 localhost6
54.243.211.111    saplinux.thusjanthan.com      saplinux

[root@ip-10-77-78-142 ~]# more /etc/sysconfig/network
NETWORKING=yes
NETWORKING_IPV6=no
HOSTNAME=saplinux.thusjanthan.com
```

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 GUI 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.

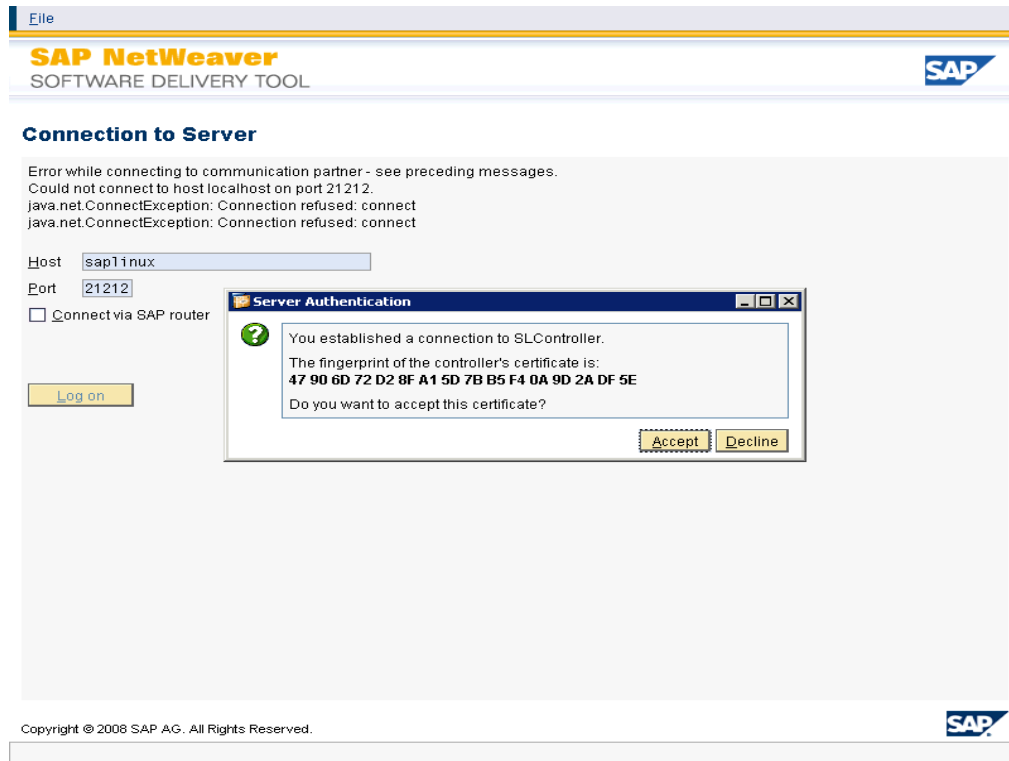


Figure 20 - Connect to Remote Server

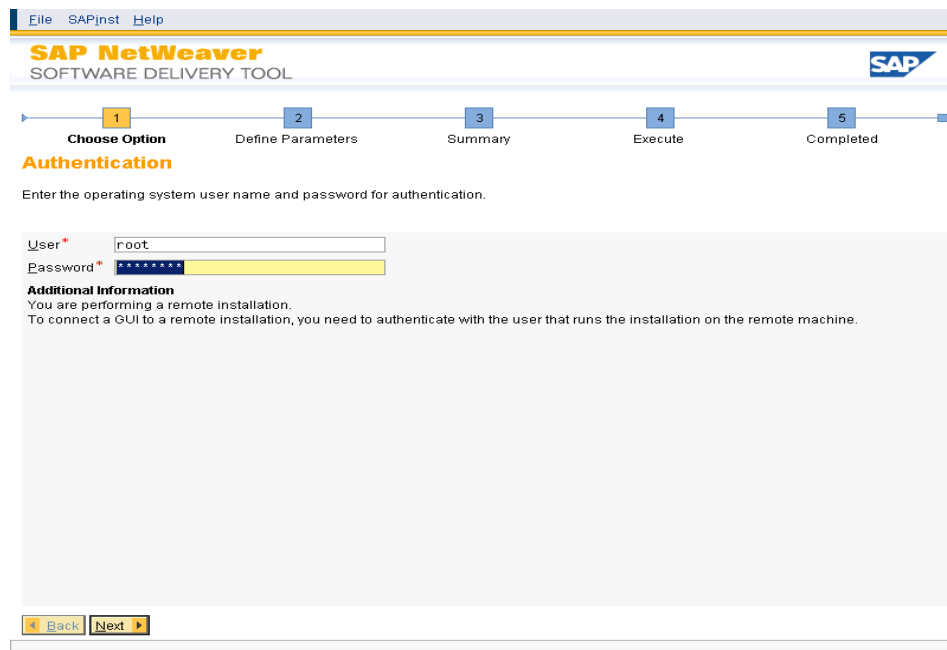


Figure 21 - Authentication of the Linux Server

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

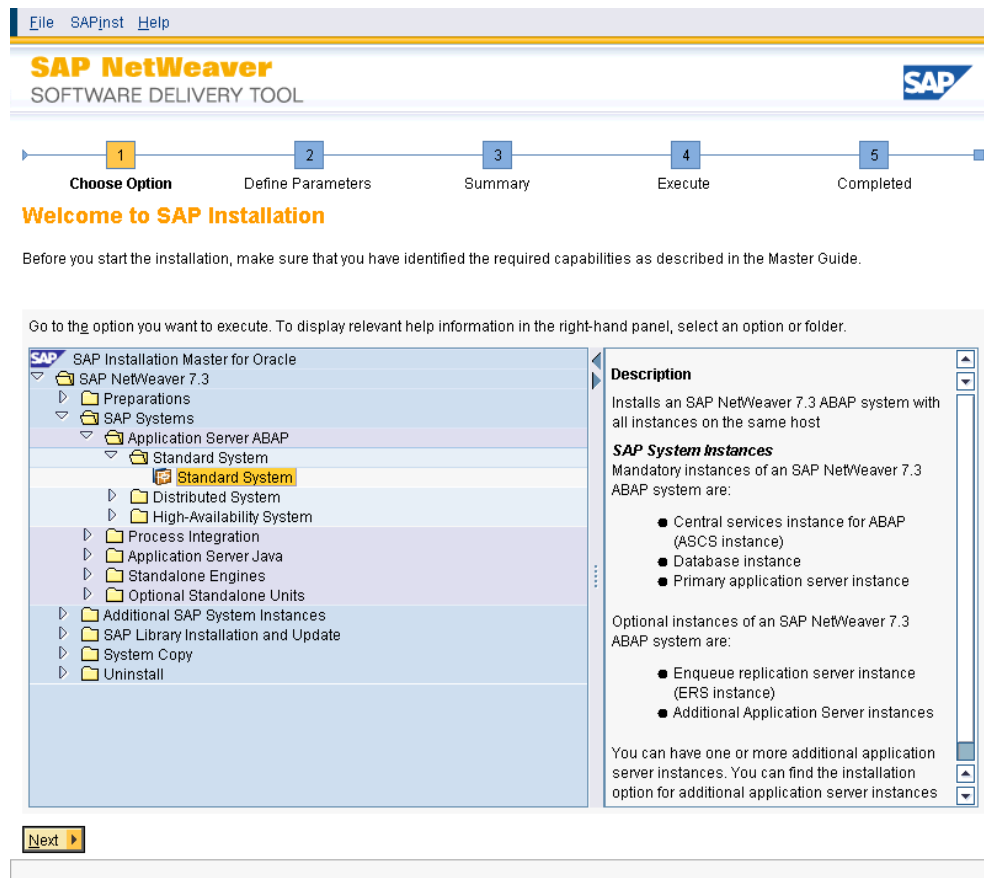


Figure 22 - Package Selection

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.

File SAPInst Help

SAP NetWeaver
SOFTWARE DELIVERY TOOL

1 Choose Option 2 Define Parameters 3 Summary 4 Execute 5 Completed

Parameter Settings

Choose whether you want to run the installation in a typical or a custom mode.

Parameter Settings

Parameter Mode ☐ Typical ☒ Custom

Additional Information
You can run the installation either in a typical or a custom mode:

- Typical Mode**
 If you choose *Typical*, the option is performed with default settings. As a result, you only have to respond to a small selection of prompts. If you want to change any of the default settings, you can do so on the *Parameter Summary* screen.
 Note that if you choose the *Typical* setting and then choose *Back* after processing one or more input screens, the *Custom* setting is activated. You are now guided through all screens with the default parameters that have been applied in the background so far.
- Custom Mode**
 If you choose *Custom*, you are prompted for all parameters. At the end, you can still change any of these parameters on the *Parameter Summary* screen.

◀ Back Next ▶

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

File SAPInst Help

SAP NetWeaver
SOFTWARE DELIVERY TOOL

1 Choose Option 2 Define Parameters 3 Summary 4 Execute 5 Completed

General SAP System Parameters

Enter the SAP system ID.

SAP System

SAP System ID (SAPSID) *

SAP Mount Directory

Additional Information
The *SAP System ID* is an identifier for your SAP system. It must be unique throughout your system landscape.
The system is installed under `/usr/sap/<SAPSID>/...` Common directories are linked to `<SAP Mount Directory>/<SAPSID>/...`

◀ Back Next ▶

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.

The screenshot shows the SAP NetWeaver Software Delivery Tool interface. At the top, there is a menu bar with 'File', 'SAPInst', and 'Help'. Below the menu bar, the title 'SAP NetWeaver SOFTWARE DELIVERY TOOL' is displayed. A progress bar at the top indicates five steps: 1. Choose Option, 2. Define Parameters (current step), 3. Summary, 4. Execute, and 5. Completed. The main content area is titled 'DNS Domain Name' and contains the following text: 'Enter the DNS domain name for the SAP system to calculate the fully qualified domain name (FQDN)'. Below this, there is a section titled 'SAP System Domain Name' with a checkbox 'Get FQDN for SAP System' which is checked. A text input field labeled 'DNS Domain Name for SAP System *' contains the value 'thusjanthan.com'. Below the input field, there is a section titled 'Additional Information' with the text: 'The DNS Domain Name is used to calculate the Fully Qualified Domain Name (FQDN), which is configured in profile parameter SAPLOCALHOSTFULL. This parameter is needed to define the URLs for the ABAP and Java application servers. See SAP Note 654982'. At the bottom of the screen, there are 'Back' and 'Next' buttons.

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.

The screenshot shows the SAP NetWeaver Software Delivery Tool interface. At the top, there is a menu bar with 'File', 'SAPInst', and 'Help'. Below the menu bar, the title 'SAP NetWeaver SOFTWARE DELIVERY TOOL' is displayed. A progress bar at the top indicates five steps: 1. Choose Option, 2. Define Parameters (current step), 3. Summary, 4. Execute, and 5. Completed. The main content area is titled 'Master Password' and contains the following text: 'Enter the master password for all users'. Below this, there is a section titled 'Master Password' with the text: 'The master password is used for all users that are created, as well as for the secure store key phrase. Check the FI help for restrictions and dependencies.' Below this, there are two password input fields: 'Password for All Users *' and 'Confirm *'. Both fields are masked with asterisks. Below the input fields, there is a section titled 'Additional Information' with the text: 'If you want to set an individual password for each user, you can do this in the corresponding parameter section on the Parameter Summary screen. If you set individual passwords, a new master password does not overwrite these individual settings.' At the bottom of the screen, there are 'Back' and 'Next' buttons.

Figure 26 - Master password selection

SAP System Administrator Password

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

The screenshot shows the 'SAP System Administrator' step in the SAP NetWeaver Software Delivery Tool. The progress bar at the top indicates the current step is 'Define Parameters' (2), with previous steps being 'Choose Option' (1), 'Summary' (3), 'Execute' (4), and 'Completed' (5). The main content area is titled 'SAP System Administrator' and contains the following fields:

- Account: *bwdadm*
- Password of SAP System Administrator*: [masked]
- Confirm*: [masked]
- User ID: [empty]
- Group ID of sapsys: [empty]

Below these fields is the 'Additional Information' section, which states: 'The fields *User ID* and *Group ID* should normally be left empty. If you enter specific user or group IDs, make sure they do not conflict with other IDs you enter later in the installation.'

At the bottom of the form are 'Back' and 'Next' navigation buttons.

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.

The screenshot shows the 'SAP System Database' step in the SAP NetWeaver Software Delivery Tool. The progress bar at the top indicates the current step is 'Define Parameters' (2), with previous steps being 'Choose Option' (1), 'Summary' (3), 'Execute' (4), and 'Completed' (5). The main content area is titled 'SAP System Database' and contains the following fields:

- Database ID (DBSID)*: *BWD*
- Database Host: *saplinux*

Below these fields is the 'Additional Information' section, which contains two bullet points:

- If you want to install your SAP system with a **new** database instance, enter the database ID (DBSID) for the database instance to be created.
- If you want to install your SAP system in an **existing** database instance, enter the DBSID of the existing database to which you want to add the SAP system.

At the bottom of the form are 'Back' and 'Next' navigation buttons.

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.

The screenshot shows the 'Prerequisites Checker' window of the SAP NetWeaver Software Delivery Tool. The window has a menu bar with 'File', 'SAPInst', and 'Help'. Below the menu bar is a progress bar with five steps: 1. Choose Option, 2. Define Parameters (highlighted), 3. Summary, 4. Execute, and 5. Completed. The main title is 'Prerequisites Checker' in orange. Below the title, it says 'Select the file that contains the prerequisite checks.' There is a section titled 'Prerequisites Checker' with a description: 'Your installation host will be checked for compliance with most of the prerequisites defined in the installation guide. By default, a Data file for check is located on the Installation Master DVD. The installation automatically suggests the path of this file. For updated versions of the Data file for check, see SAP Note 855498.' Below this, there is a text field for 'Data File for Check' containing the path 'F:\312\DATA_UNITS\NW730_LINUX_X86_64_ORA\COMMON\INSTALL\PREREQUISITE_CHECK_DATA.XML' and a 'Browse...' button. At the bottom, there are 'Back' and 'Next' buttons.

Figure 28 - Prerequisites checker

Media Browser

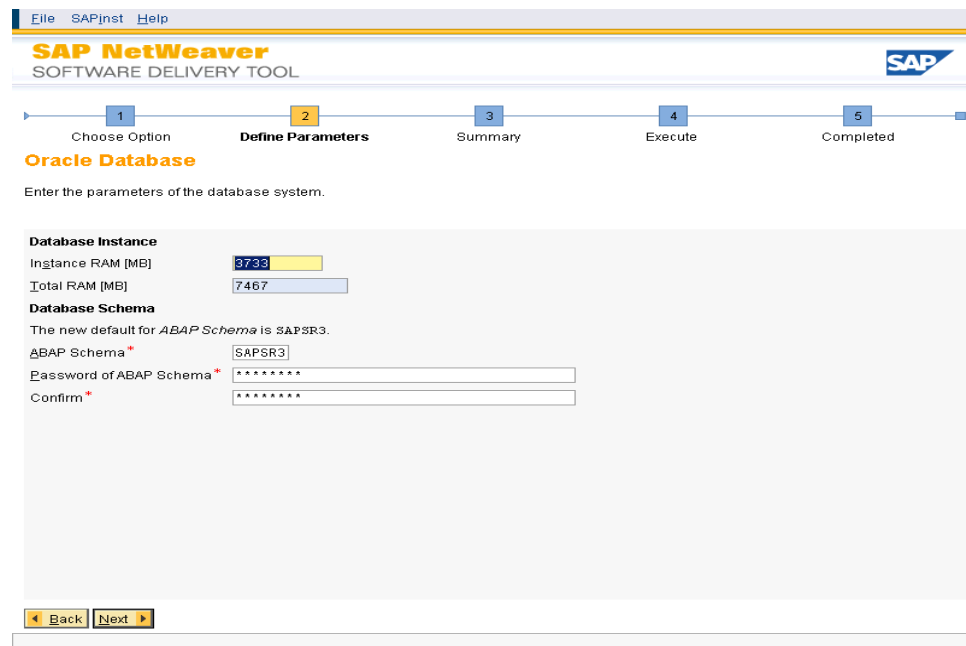
- The required software packages are detected using the LABEL.ASC. You will want to point to the NW73 file you downloaded and point to the EXP1 directory.

The screenshot shows the 'Media Browser' window of the SAP NetWeaver Software Delivery Tool. The window has a menu bar with 'File', 'SAPInst', and 'Help'. Below the menu bar is a progress bar with five steps: 1. Choose Option, 2. Define Parameters (highlighted), 3. Summary, 4. Execute, and 5. Completed. The main title is 'Media Browser' in orange. Below the title, it says 'Enter the location of the required software packages.' There is a section titled 'Software Package Request' with a table. The table has five columns: 'Medium', 'Package Location', 'Check Location', 'Copy Package To', and 'Copy Package To'. The first row shows 'Installation Export NW73 (folder EXP1)' in the 'Medium' column, '/sap/DownTo...' in the 'Package Location' column, a 'Browse...' button in the 'Check Location' column, a checked checkbox in the 'Copy Package To' column, and a 'Browse...' button in the 'Copy Package To' column. Below the table, there is a section titled 'Additional Information' with a description: 'The required software packages available on the medium are detected using the identification files LABEL.ASC or LABELIDX.ASC. If you do not want to check the locations of the software packages now, deselect the flag in the Check Location column. Later, you are prompted again to check the locations of the software packages. If you want to copy the required software packages to your local disk, you need to specify for each package the current location in the Package Location column and the target location in the Copy Package To column.' At the bottom, there are 'Back' and 'Next' buttons.

Medium	Package Location	Check Location	Copy Package To	Copy Package To
Installation Export NW73 (folder EXP1)	/sap/DownTo...	Browse...	<input checked="" type="checkbox"/>	Browse...

Oracle Database Schema

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



The screenshot shows the 'Oracle Database Schema' step in the SAP NetWeaver Software Delivery Tool. The progress bar at the top indicates five steps: 1. Choose Option, 2. Define Parameters (current), 3. Summary, 4. Execute, and 5. Completed. The main content area is titled 'Oracle Database' and contains the following fields:

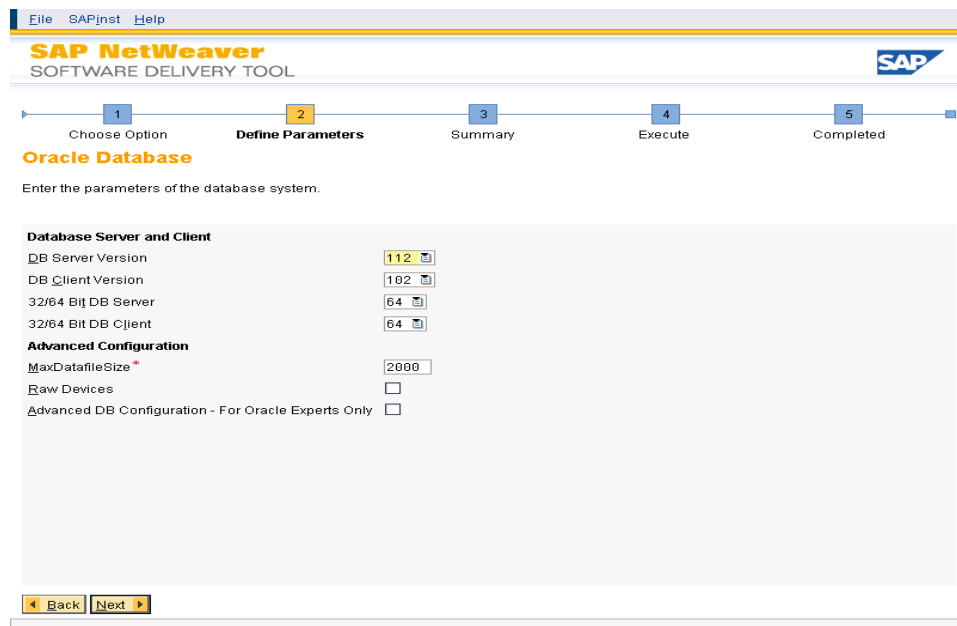
- Database Instance**
 - Instance RAM [MB]: 3733
 - Total RAM [MB]: 7467
- Database Schema**
 - The new default for ABAP Schema is SAPSR3.
 - ABAP Schema*: SAPSR3
 - Password of ABAP Schema*: [masked]
 - Confirm*: [masked]

At the bottom, there are 'Back' and 'Next' navigation buttons.

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.



The screenshot shows the 'Oracle Database Parameters' step in the SAP NetWeaver Software Delivery Tool. The progress bar at the top indicates five steps: 1. Choose Option, 2. Define Parameters (current), 3. Summary, 4. Execute, and 5. Completed. The main content area is titled 'Oracle Database' and contains the following fields:

- Database Server and Client**
 - DB Server Version: 112
 - DB Client Version: 102
 - 32/64 Bit DB Server: 64
 - 32/64 Bit DB Client: 64
- Advanced Configuration**
 - MaxDatafileSize*: 2000
 - Raw Devices: [unchecked]
 - Advanced DB Configuration - For Oracle Experts Only: [unchecked]

At the bottom, there are 'Back' and 'Next' navigation buttons.

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.

The screenshot shows the 'Oracle Database Accounts' screen in the SAP NetWeaver Software Delivery Tool. The progress bar at the top indicates the current step is 'Define Parameters' (step 2 of 5). The screen title is 'Oracle Database Accounts' and the instruction is 'Enter the passwords of the standard database users.' Below this, there are input fields for 'Password of 'sys'', 'Confirm', 'Password of 'system'', and 'Confirm'. The 'Additional Information' section states: 'During the installation, standard Oracle database users are created. The passwords of these users are set to the values you enter here.' At the bottom, there are 'Back' and 'Next' buttons.

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.

The screenshot shows the 'Oracle Listener Configuration' screen in the SAP NetWeaver Software Delivery Tool. The progress bar at the top indicates the current step is 'Define Parameters' (step 2 of 5). The screen title is 'Oracle Listener Configuration' and the instruction is 'Enter the listener name, port and domain.' Below this, there is an 'Attention' section with a warning about default values. The 'Oracle Listener Configuration' section has input fields for 'Listener' (default: LISTENER), 'Listener Port' (default: 1527), and 'Domain' (default: WORLD). The 'NetWork Configuration Files' section has checkboxes for 'Keep listener.ora' and 'Keep tnsnames.ora', both of which are checked. At the bottom, there are 'Back' and 'Next' buttons.

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.

File SAPInst Help

SAP NetWeaver
SOFTWARE DELIVERY TOOL

1 Choose Option 2 **Define Parameters** 3 Summary 4 Execute 5 Completed

SAP System Database Import

Enter the general load parameters.

Database Load

SAP Code Page * 4103

Number of Parallel Jobs * 3

Additional Information
We recommend that you configure only a maximum of 2-3 parallel R3load processes per CPU.

Back Next

Figure 33 - Parallel Jobs

Database Statistics

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

File SAPInst Help

SAP NetWeaver
SOFTWARE DELIVERY TOOL

1 Choose Option 2 **Define Parameters** 3 Summary 4 Execute 5 Completed

Create Database Statistics

Specify whether you want the statistics to be created automatically after the import ends.

Database Statistics

Create Statistics for ABAP ☒ Yes ☐ No

Program Call for ABAP brconnect -u / -c -o summary -f stats -o SAPSR3 -t all -p 2

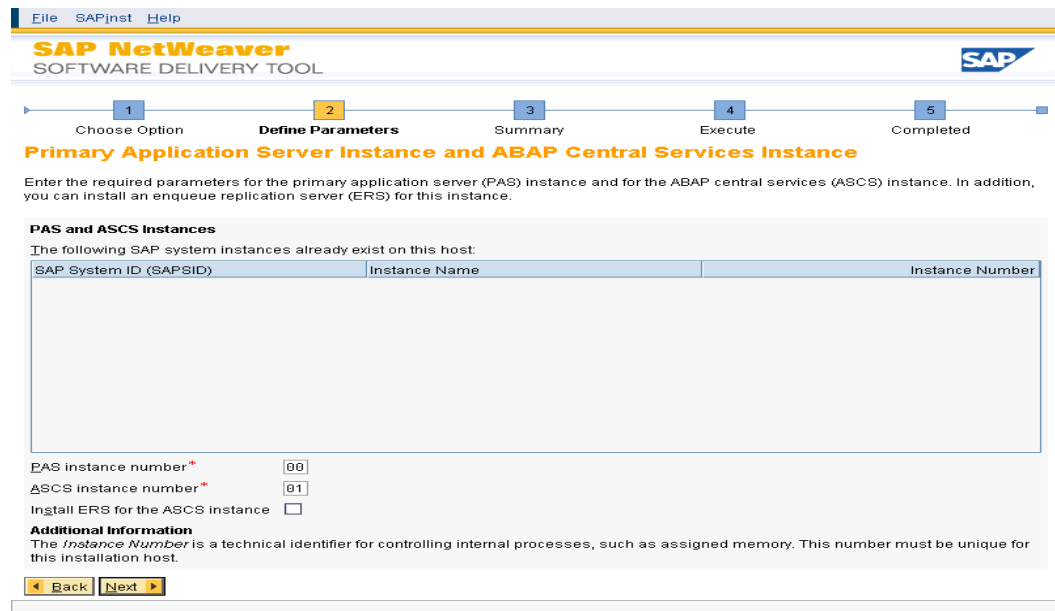
Additional Information
If you skip the creation of database statistics, your database may run with reduced performance.

Back Next

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.



The screenshot shows the 'SAP NetWeaver SOFTWARE DELIVERY TOOL' interface. At the top, there is a menu bar with 'File', 'SAPInst', and 'Help'. Below the menu bar is a progress bar with five steps: 1. Choose Option, 2. Define Parameters (highlighted), 3. Summary, 4. Execute, and 5. Completed. The main title is 'Primary Application Server Instance and ABAP Central Services Instance'. Below this, a text box says: 'Enter the required parameters for the primary application server (PAS) instance and for the ABAP central services (ASCS) instance. In addition, you can install an enqueue replication server (ERS) for this instance.'

PAS and ASCS Instances
The following SAP system instances already exist on this host:

SAP System ID (SAPSID)	Instance Name	Instance Number
------------------------	---------------	-----------------

PAS instance number*
ASCS instance number*
Install ERS for the ASCS instance ☐

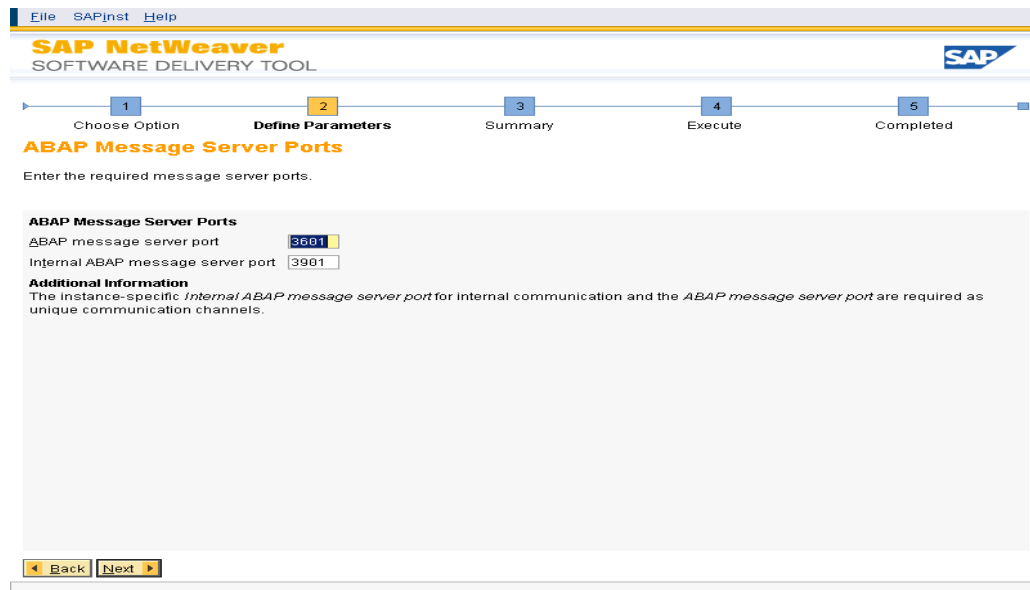
Additional Information
The *Instance Number* is a technical identifier for controlling internal processes, such as assigned memory. This number must be unique for this installation host.

Navigation buttons: < Back, Next >

Figure 35 - PAS & ABAP Instances

ABAP message Server Ports

- Here you can configure the message server ports



The screenshot shows the 'SAP NetWeaver SOFTWARE DELIVERY TOOL' interface. At the top, there is a menu bar with 'File', 'SAPInst', and 'Help'. Below the menu bar is a progress bar with five steps: 1. Choose Option, 2. Define Parameters, 3. Summary, 4. Execute (highlighted), and 5. Completed. The main title is 'ABAP Message Server Ports'. Below this, a text box says: 'Enter the required message server ports.'

ABAP Message Server Ports
ABAP message server port
Internal ABAP message server port

Additional Information
The instance-specific *Internal ABAP message server port* for internal communication and the *ABAP message server port* are required as unique communication channels.

Navigation buttons: < Back, Next >

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.

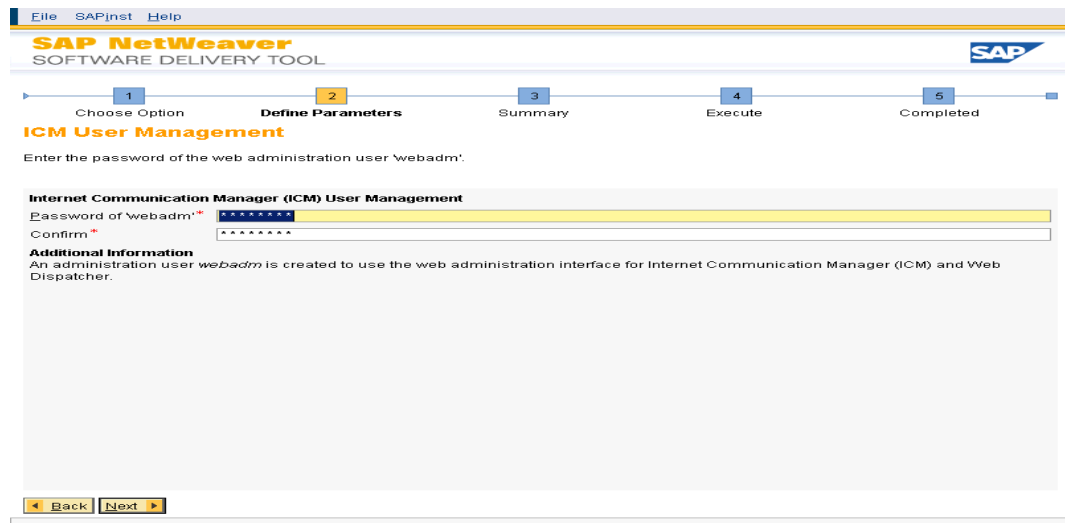


Figure 37 - ICM Password

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.

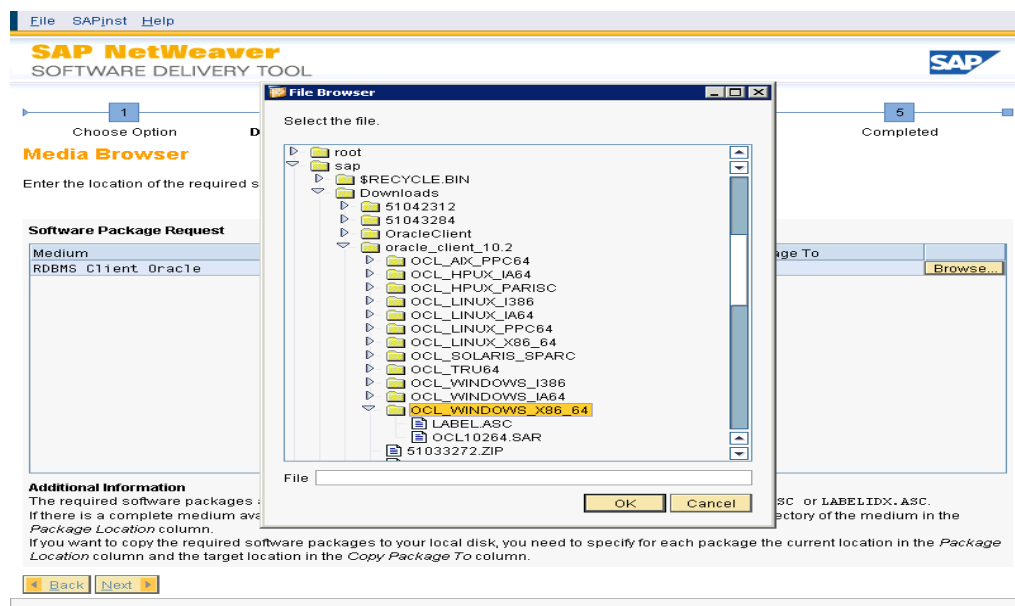


Figure 38 - Oracle Client 10.2

Unpack Archives

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

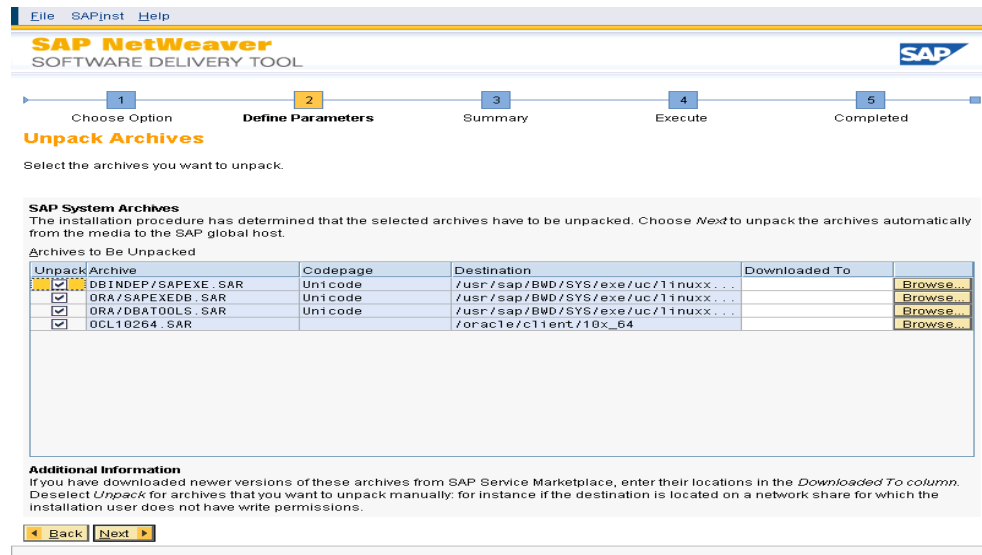


Figure 39 - Unpack SAR Files for DB

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.

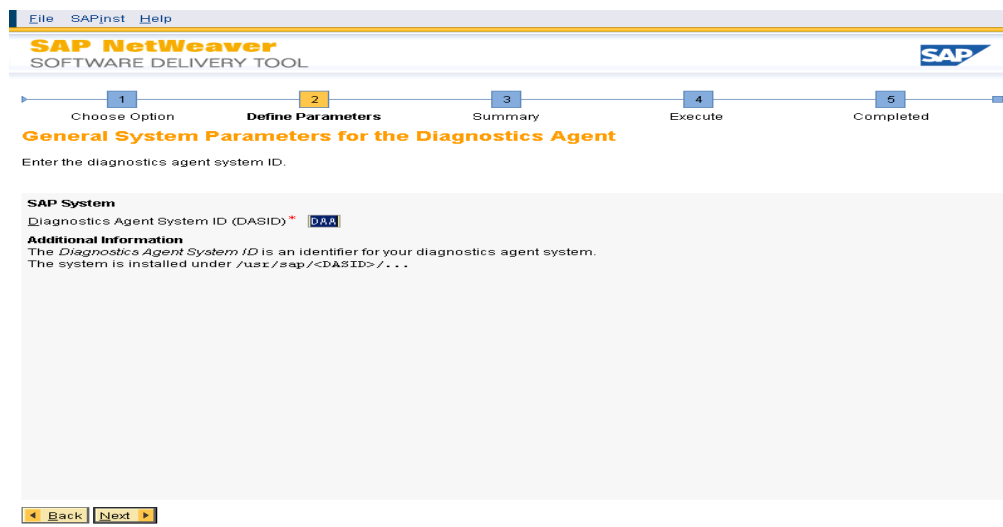


Figure 40 - DAA SID

DAA Password

- Defaults to the same as the master password.

The screenshot shows the 'SAP System Administrator' step in the SAP NetWeaver Software Delivery Tool. The progress bar at the top indicates the current step is 'Define Parameters' (2), with previous steps being 'Choose Option' (1), 'Summary' (3), 'Execute' (4), and 'Completed' (5). The main area contains the following fields and text:

SAP System Administrator
Account: *daaadm*
Password of SAP System Administrator *
Confirm *
User ID
Group ID of sapsys
Additional Information
The fields *User ID* and *Group ID* should normally be left empty.
If you enter specific user or group IDs, make sure they do not conflict with other IDs you enter later in the installation.

At the bottom, there are 'Back' and 'Next' buttons.

Figure 41 - DAA Password

DAA Instance

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

The screenshot shows the 'Diagnostics Agent Instance' step in the SAP NetWeaver Software Delivery Tool. The progress bar at the top indicates the current step is 'Define Parameters' (2), with previous steps being 'Choose Option' (1), 'Summary' (3), 'Execute' (4), and 'Completed' (5). The main area contains the following fields and text:

Diagnostics Agent Instance
Detected Instances

SAP System ID (SAPSID)	Instance	Number

Instance Number *
Additional Information
The *Instance Number* is a technical identifier for controlling internal processes such as assigned memory. This number must be unique for this installation host. The listed instances exist on this host.

At the bottom, there are 'Back' and 'Next' buttons.

Figure 42 - DAA Instance

System Landscape Directory for Diagnostics

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

The screenshot shows the SAP NetWeaver Software Delivery Tool interface. At the top, there is a menu bar with 'File', 'SAPInst', and 'Help'. Below the menu bar, the title 'SAP NetWeaver SOFTWARE DELIVERY TOOL' is displayed. A progress bar at the top indicates five steps: 1. Choose Option, 2. Define Parameters, 3. Summary, 4. Execute, and 5. Completed. The current step is 'Define Parameters', which is highlighted in orange. The main heading is 'SLD Destination for the Diagnostics Agent'. Below this, a text box says 'Enter the destination of the System Landscape Directory (SLD) for the diagnostics agent.' There is a section titled 'Important Information' which states: 'The System Landscape Directory (SLD) registers the systems and the installed software of your entire system landscape.' Below this, a section titled 'Choose the SLD destination:' contains two radio buttons: 'Register in existing central SLD' (which is selected) and 'No SLD destination'. An 'Additional Information' section follows, stating: 'We recommend that you choose Register in existing central SLD.' At the bottom, there are 'Back' and 'Next' buttons.

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.

The screenshot shows the SAP NetWeaver Software Delivery Tool interface. At the top, there is a menu bar with 'File', 'SAPInst', and 'Help'. Below the menu bar, the title 'SAP NetWeaver SOFTWARE DELIVERY TOOL' is displayed. A progress bar at the top indicates five steps: 1. Choose Option, 2. Define Parameters, 3. Summary, 4. Execute, and 5. Completed. The current step is 'Summary', which is highlighted in orange. The main heading is 'Parameter Summary'. Below this, a text box says: 'Choose "Next" to start with the values shown. Otherwise, select the parameters to be changed and choose "Revise". You are then taken to the screen where you can change the parameter. You might be guided through other screens that have so far been processed.' Below this, there is a 'Parameter List' section with several expandable/collapsible items: 'Parameter Settings' (expanded), 'General SAP System Parameters' (collapsed), 'DNS Domain Name' (collapsed), 'Master Password' (collapsed), and 'SAP System Administrator' (collapsed). The 'Parameter Settings' section shows 'Parameter Mode' set to 'Custom'. The 'General SAP System Parameters' section shows 'SAP System ID (SAPSID)' set to 'BWD' and 'SAP Mount Directory' set to '/sapmnt'. The 'DNS Domain Name' section shows 'Set FQDN for SAP System' checked and 'DNS Domain Name for SAP System' set to 'thusjathan.com'. The 'Master Password' section shows 'Password for All Users' with a masked input field. The 'SAP System Administrator' section shows 'Password of SAP System Administrator' with a masked input field. At the bottom, there are 'Back', 'Next', 'Revise', and 'Show Detail' buttons.

Figure 44 - Install Summary

Installation Screen

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

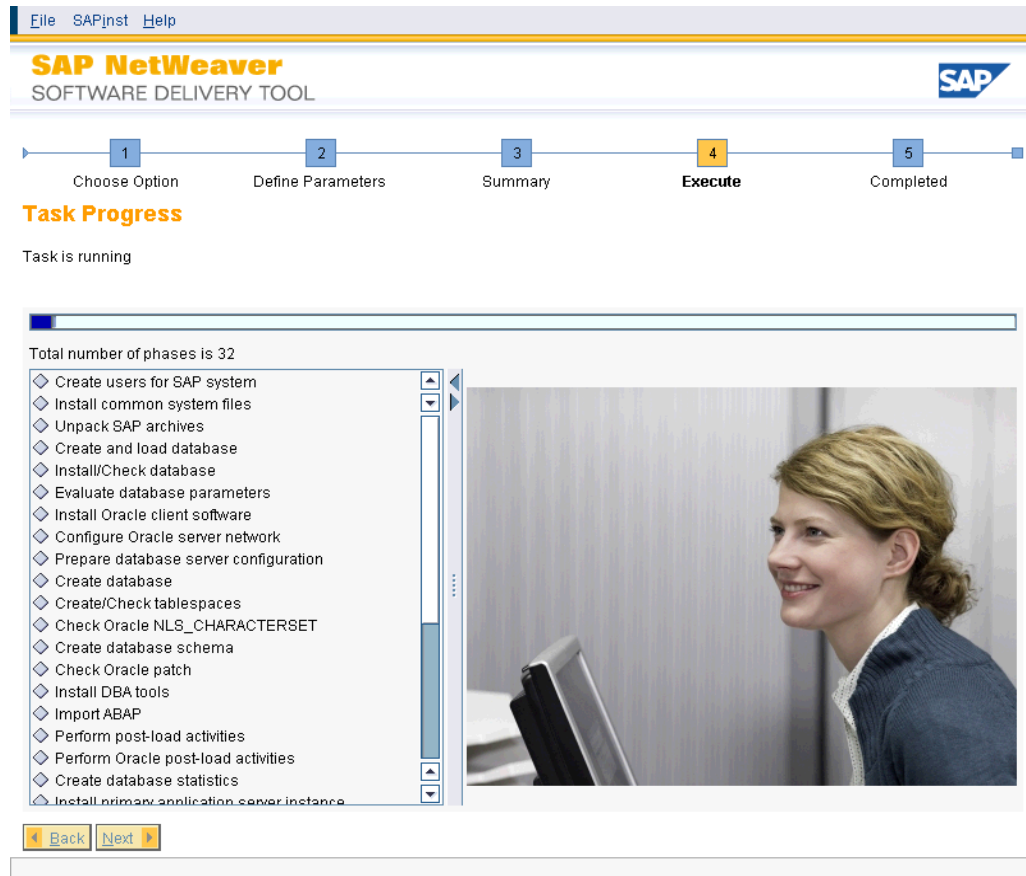


Figure 45 - Install Screen