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| Installation of Redhat linux for Oracle |

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| Contents |

[Revision historie 2](#_Toc286669940)

[1. Introduction and pre-conditions 4](#_Toc286669941)

[1.1 Typography 4](#_Toc286669942)

[1.2 Skills 5](#_Toc286669943)

[2. Prerequisites 5](#_Toc286669944)

[3. Installation 5](#_Toc286669945)

[3.1 Basic install options 5](#_Toc286669946)

[3.2 Customization 5](#_Toc286669947)

[3.3 Installed add-on’s 5](#_Toc286669948)

[4. Network setup 5](#_Toc286669949)

[4.1 Single NIC setup 5](#_Toc286669950)

[4.2 NIC bounding 6](#_Toc286669951)

[5. Post configuration 7](#_Toc286669952)

[5.1 Add users 7](#_Toc286669953)

[5.2 Configure NTP 7](#_Toc286669954)

[5.3 Configure DNS 7](#_Toc286669955)

[5.4 Configure updates / RHEL proxy 7](#_Toc286669956)

[5.5 Update OS to the latest 7](#_Toc286669957)

[5.6 Configure SUDO 7](#_Toc286669958)

[5.7 Configure IPTABLES 7](#_Toc286669959)

[5.8 Configure SSH 7](#_Toc286669960)

[5.9 Multipath setup 8](#_Toc286669961)

[6. Customize for Oracle 11.2 8](#_Toc286669962)

[6.1 Oracle Tech note 468051.1 / kernel parameters 8](#_Toc286669963)

[6.2 Add packages 8](#_Toc286669964)

[6.3 System parameters for Oracle RAC 9](#_Toc286669965)

# Introduction and pre-conditions

## Typography

In a number of places in this document there are highlighted sections. There are three different forms of these marked with a unique colour. They are used as follows:

Light grey: Marks commands issued on OS command line

Olive green: Marks commands issued in SQLPlus

Light yellow: Marks text in a file

Turquoise background indicates something to be entered, brackets for keystrokes like [ENTER]

Green background indicates something to be marked or clicked on.

Example for showing version of perl, logged onto Linux

[user@server ~]$ perl –v  
  
This is perl, v5.8.8 built for x86\_64-linux-thread-multi  
  
Copyright 1987-2006, Larry Wall  
  
Perl may be copied only under the terms of either the Artistic License or the GNU General Public License, which may be found in the Perl 5 source kit.  
  
Complete documentation for Perl, including FAQ lists, should be found on this system using "man perl" or "perldoc perl". If you have access to the Internet, point your browser at http://www.perl.org/, the Perl Home Page.  
  
[user@server ~]$

Guidance to click on something goes under the Graphic, as shown example:

[](http://www.google.dk/imgres?imgurl=http://www.webreference.com/dhtml/column22/exMsgBox.gif&imgrefurl=http://sho3a3elamal.com/msgbox-yes-no&page=3&usg=__Qd6DZTUPeDiLMuIlMuyTRS9KypA=&h=119&w=171&sz=3&hl=da&start=207&zoom=1&tbnid=sWbLhsC2kgMpVM:&tbnh=95&tbnw=136&ei=l3VmTYDpM4KcOujesdAL&prev=/images?q=yes+no+prompt&hl=da&biw=1420&bih=700&tbs=isch:1&itbs=1&iact=rc&dur=1094&oei=SHVmTYjpBM_oOfCA-Y0L&page=8&ndsp=32&ved=1t:429,r:4,s:207&tx=88&ty=50)

Click OK to continue.

## Skills

This guide is intended for technical personnel with administration skills on Linux.

# Prerequisites

Access to the console of the machine, which RedHat linux needs to be installed on. Furthermore the latest install image from Redhat.

# Installation

This will describe a basis installation of RHEL 5.6. It will be in a overview form, as some knowledge about RHEL will be expected.

## Basic install options

This will list the options which have been chosen through the installation of Redhat.

* Language English (English)
* Keyboard Danish
* No installation number
* Disk configuration
  + - boot 100 mb
    - LVM volgroup00
      * / 20 GB
      * /var 5 GB
      * /tmp 4 GB
      * /opt 5 GB
* GRUB Boot loader
* Danish Time ZONE with UTC
* Choose “Software development” and Customize now
  + Customize
    - Remove Games and entertainment
    - Development libraries
      * Add libstdc++
    - Servers
      * Add Server configuration tools
    - Base System
      * Remove Dialup Networking support
      * Add system tools
    - Languages
      * Add danish

## Customization

The following customizations has been done on the system after the initial install

* SE linux disabled
* Kdump enabled
* Enabled NTP

## Installed add-on’s

The following packages have been added or should be added to the system

* Install Vmware-tools if a vmware box
* Install HP support pack or other vendor specific tools if needed.

# Network setup

We will try to describe how to setup the network. It will be individual for each installation, for which options they will need.

## Single NIC setup

* edit /etc/sysconfig/network-scripts/ifcfg\*

DEVICE=eth0

ONBOOT=yes

USERCTL=no

BOOTPROTO=none

NETMASK=255.255.255.0

IPADDR=10.6.201.xxx

GATEWAY=10.6.201.1

TYPE=Ethernet

IPV6INIT=no

* Restart network services on the machine

## NIC bounding

bond0: bonds e.g. eth1 and eth2 as public network interface

bond1: bonds e.g. eth3 and eth4 as RAC database interconnect

**bond0 configuration**

# cat >> /etc/modprobe.conf

alias bond0 bonding

#vi /etc/sysconfig/network-scripts/ifcfg-bond0

DEVICE=bond0

BONDING\_OPTS="mode=1 miimon=500"

BOOTPROTO=none

ONBOOT=yes

IPADDR=10.6.202.xx

NETWORK=10.6.202.0

NETMASK=255.255.255.0

GATEWAY=10.6.202.1

USERCTL=no

Edit config for eht1 and eth2:

/etc/sysconfig/network-scripts/ifcfg-eth1

/etc/sysconfig/network-scripts/ifcfg-eth2

Remove (or comment) entries for: IPADDR, NETMASK and GATEWAY.

Add:

MASTER=bond0

SLAVE=yes

**bond1 configuration**

# cat >> /etc/modprobe.conf

alias bond1 bonding

# vi /etc/sysconfig/network-scripts/ifcfg-bond1

DEVICE=bond1

BONDING\_OPTS="mode=1 miimon=500"

BOOTPROTO=none

ONBOOT=yes

IPADDR=10.6.203.xx

NETWORK=10.6.202.0

NETMASK=255.255.255.0

GATEWAY=10.6.202.1

USERCTL=no

Edit config for eht3 and eth4:

/etc/sysconfig/network-scripts/ifcfg-eth3

/etc/sysconfig/network-scripts/ifcfg-eth4

Remove (or comment) entries for: IPADDR, NETMASK and GATEWAY.

Add:

MASTER=bond1

SLAVE=yes

Reboot now to activate bonding.

# Post configuration

This section will describe the most common post configuration for Redhat linux installation. Again it is individual for each setup

## Add users

Add users according to the company strategy.

## Configure NTP

On Vmware platform remember to add the following to the grub.conf

divider=10 clocksource=acpi\_pm

eg: kernel /boot/vmlinuz-2.6.18-128.4.1.el5PAE ro root=LABEL=/ rhgb quiet divider=10 clocksource=acpi\_pm

## **Configure DNS**

Edit /etc/resolv.conf to match your setup

## **Configure updates / RHEL proxy**

Some uses proxy servers, satellite etc. configure this to match your installation

## **Update OS to the latest**

run the command as root

#yum update

## **Configure SUDO**

As root run the command

#visudo

Search for “wheel” in the file and uncomment the first line. This will enable users in the group “wheel” to run commands as root. More option can be done, e.g. speciel setup for DBA users.

## **Configure IPTABLES**

As default only SSH is open in IPTABLES, so you need to configure the firewall as needed for monitoring, apps etc.

## **Configure SSH**

Edit /etc/ssh/sshd\_config

Change this line

#PermitRootLogin yes to

PermitRootLogin no

Change the line

#Banner /some/place to

Banner /etc/banner

Add the file /etc/banner with the following text. Replace XXXXXXX with company name

WARNING: The systems of XXXXXXX are for the use of authorized users

and approved functions only.

Unauthorized attempts to defeat or circumvent security features, to use the system for

other than intended purposes, to deny service to authorized users, to access, obtain, alter,

damage, or destroy information, or otherwise to interfere with the system or its operation

is prohibited and are subject to having all of their activities on this system monitored and

recorded by system personnel. In the course of monitoring individuals improperly using

this system, or in the course of system maintenance, the activities of authorized users

may also be monitored.

Anyone using this system expressly consents to such monitoring and is advised that if such

monitoring reveals possible evidence of criminal activity, system personnel may provide

the evidence of such monitoring to law enforcement officials and may result in criminal

or civil prosecution.

## **Multipath setup**

edit /etc/multipath.conf (at least comment out the default blacklist)

#blacklist {

# devnode "\*"

#}

# modprobe dm-multipath

# service multipathd start

# multipath -ll

# chkconfig multipathd on

# Customize for Oracle 11.2

This will describe the things which have been done, to get Oracle to run

## Oracle Tech note 468051.1 / kernel parameters

* 1. Change the value of the following kernel parameters by including the following line in /etc/sysctl.conf. This again could individual for each setup, and for what purpose Oracle should be used. This is the minimum setup.
* kernel.shmmax = 536870912
* kernel.sem = 250 32000 100 128
* fs.file-max = 6815744
* net.ipv4.ip\_local\_port\_range = 9000 65500
* net.core.rmem\_default = 262144
* net.core.rmem\_max = 4194304
* net.core.wmem\_default = 262144
* net.core.wmem\_max = 1048576
  1. Activate the new SHMMAX setting by running the command

# /sbin/sysctl –p

* 1. Minimum openfile limit should be changed
     1. To check

#/usr/sbin/lsof | wc -l

* + 1. To change
       1. Edit the file /etc/security/limits.conf
          - \* soft nofile 2048 to 4096
          - \* hard nofile 2048 to 65536

## Add packages

The following packages needs to be added to the system

* libaio-devel.i386
* libaio-devel.x86\_64
* openmotif22.x86\_64
* openmotif.x86\_64
* libXp
* install unixODBC.i386
* unixODBC.x86\_64
* unixODBC-devel.i386
* unixODBC-devel.x86\_64
* sysstat.x86\_64

## System parameters for Oracle RAC

1. # vi /etc/sysctl.conf

* kernel.shmmni = 4096
* kernel.sem = 250 32000 100 128
* fs.file-max = 788410
* net.ipv4.ip\_local\_port\_range = 1024 65000
* net.core.rmem\_default=4194304
* net.core.wmem\_default=262144
* net.core.rmem\_max=4194304
* net.core.wmem\_max=262144

1. # vi /etc/security/limits.conf

* oracle soft nproc 2047
* oracle hard nproc 16384
* oracle soft nofile 1024
* oracle hard nofile 65536

1. # vi /etc/pam.d/login
   * 1. session required /lib/security/pam\_limits.so

## Create filesystems

The file system for Oracle DB needs to be created

The size and names will vary depending on system and size. But as a default rule, then we will make 2 Volume groups and 5 mount points to the DB. This is done to secure data redundancy, so if VG gets corrupted, then we can still recover redo files.

**Volumegroup 1**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| VGname | LVname | Size | Mountpoint | Description |
| vgora01 | orasoft | 15G | /opt/oracle | Will contain the oracle software |
| vgora01 | oradata | 10G | /opt/oracle/data1 | Will contain the oracle data |
| vgora01 | oraredo1 | 1G | /opt/oracle/redo1 | First redo destination |

**Volumegroup 2**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| VGname | LVname | Size | Mountpoint | Description |
| vgora02 | orasoft | 1G | /opt/oracle/redo2 | Second redo destination |
| vgora02 | oraarch | 1G | /opt/oracle/archive | Archive data |

### Adding disk to Linux

Scan for the new disk

[root@UITANVVDBA02 ~]# echo "- - -" > /sys/class/scsi\_host/host0/scanl

Look for new device files in /dev. In this example we will use /dev/sdb for vgora01 and /dev/sdc for vgora02

### Doing the LVM stuff

Formatting the disks for LVM

[root@UITANVVDBA02 ~]# pvcreate /dev/sdb /dev/sdc

Creating the VG

[root@UITANVVDBA02 ~]# vgcreate vgora01 /dev/sdb

[root@UITANVVDBA02 ~]# vgcreate vgora02 /dev/sdc

Creating the LV’s

[root@UITANVVDBA02 ~]# lvcreate -A y -L 15G -n orasoft vgora01

[root@UITANVVDBA02 ~]# lvcreate -A y -L 10G -n oradata vgora01

[root@UITANVVDBA02 ~]# lvcreate -A y -L 1G -n oraredo1 vgora01

[root@UITANVVDBA02 ~]# lvcreate -A y -L 1G -n oraredo2 vgora02

[root@UITANVVDBA02 ~]# lvcreate -A y -L 1G -n oraarch vgora02

### Doing the filesystem things

Creating Filesystems

[root@UITANVVDBA02 ~]# mkfs -t ext3 /dev/vgora01/orasoft

[root@UITANVVDBA02 ~]# mkfs -t ext3 /dev/vgora01/oradata

[root@UITANVVDBA02 ~]# mkfs -t ext3 /dev/vgora01/oraredo1

[root@UITANVVDBA02 ~]# mkfs -t ext3 /dev/vgora02/oraredo2

[root@UITANVVDBA02 ~]# mkfs -t ext3 /dev/vgora02/oraarch

Creating mountpoint

[root@UITANVVDBA02 ~]# mkdir /u01/app/oracle

[root@UITANVVDBA02 ~]# mount /dev/vgora01/orasoft /u01/app/oracle

[root@UITANVVDBA02 ~]# mkdir /u01/app/oracle/oradata

[root@UITANVVDBA02 ~]# mkdir /u01/app/oracle/redo1

[root@UITANVVDBA02 ~]# mkdir /u01/app/oracle/redo2

[root@UITANVVDBA02 ~]# mkdir /u01/app/oracle/archive

[root@UITANVVDBA02 ~]# chown –R oracle:dba /u01/app/oracle

[root@UITANVVDBA02 ~]# chmod –R 775 /u01/app/oracle

[root@UITANVVDBA02 ~]# umount /u01/app/oracle

Changing the /etc/fstab, add the following lines to the file

/dev/vgora01/orasoft /u01/app/oracle ext3 defaults 1 2

/dev/vgora01/oradata /u01/app/oracle/oradata ext3 defaults 1 2

/dev/vgora01/oraredo1 /u01/app/oracle/redo1 ext3 defaults 1 2

/dev/vgora02/oraredo2 /u01/app/oracle/redo2 ext3 defaults 1 2

/dev/vgora02/oraarch /u01/app/oracle/archive ext3 defaults 1 2

And finally do the following to test that things are working

[root@UITANVVDBA02 ~]# chown –R oracle:dba /u01/app/oracle

[root@UITANVVDBA02 ~]# chmod –R 775 /u01/app/oracle

[root@UITANVVDBA02 ~]# mount -a

[root@UITANVVDBA02 ~]# df -m