

# Bull

## Linux – Open Source Solutions Installation Guide



**Bull**



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Software

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This guide explains the specific installation defined for the Bull Linux Open Source Software tool kits. For information about the Linux system standard installation, please refer to the Red Hat 7.3 Installation Guide.

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## 1 Prerequisites

The installation of these bundles requires an Express5800 server powered on and connected to the with, at least:

- 1 floppy drive,
- 1 CD-ROM drive,
- 1 hard disk with at least 9GB storage capacity.

## 2 Installation

Software MIs (i.e. Product References) needed:

1. For Linux system, according to the target language:
  - EXSHxx-xxBB : Red Hat Professional 7.3 English release
  - or
  - EXSHxx-xxFF : Red Hat Professional 7.3 French release
2. For dedicated server pre-setting:
  - EXSH020-30S2 : **Web Infrastructure** Open Source Software Tool kit
  - or
  - EXSH021-30S2 : **Workgroup** Open Source Software Tool kit
  - or
  - EXSH029-30S2 : **Cluster Administration** Open Source Software Tool kit
  - or
  - EXSH028-30S2: **HA Storage** Open Source Tool kit

These MIs provide both English and French languages.

The installation process is started from the Red Hat 7.3 CD-ROMs.

Insert the CD-ROM 1 on 3 in the drive:

CD 1 Red Hat 7.3 - Operating System

Boot the system from this CD-ROM (check in the bootlist of the BIOS that the first media search for boot is the CD-ROM).

When prompted 'Boot:'

- 1) **Insert the appropriate floppy** in the drive.
- 2) Enter the command:  
**linux ks=floppy**

The install process, managed from the floppy, starts. The process is automated by providing default parameters:

- Language en
- keyboard en
- mouse generic ps/2
- video board ATI Mach64 3D RAGE II
- timezone Europe/Paris
- bootloader use lilo default disk partitionning:
  - partition / type ext3 size 4096
  - partition /var type ext3 size 2048\*
  - partition /home type ext3 size 512
  - partition swap size 2048

\*Please note: for the needs of 'Cluster Administration' tool-kit, the size of ext3 partition is extended to 6144.

Then the process requests the 2<sup>nd</sup> CD-ROM on 3:

→ insert CD 2 (Operating system) and validate.

Then, depending on installation, the process may request the 3rd CD-ROM on 3.

→ in this case, insert CD 3 (Operating system) and validate.

At the end of the system install, the user is requested to remove the floppy and to type Enter.

→ the CD-ROM is ejected and the system is rebooted from the disk.

While rebooting, a message requests the user to insert the CD-ROM Bull Linux Solution:

→ 'Please mount the Bull Linux Solution CD and hit a key'

A waiting message is displayed:

→ 'Wait for the CD'

The install process then performs the install operations specific to the selected MI.

When completed a message is displayed:

**Installation is completed**

see log file under /root for the following messages:

The new kernel for Linux Virtual Server has been installed  
but it's necessary to reboot your system to take it into account

Now you have to

- modify your root password (actually it's root)
- execute: service webmin start  
and modify the root password for webmin access (actually it's root)
- configure your network
- execute: service httpd start
- see configuration of: <depends on the MI>

In a few seconds your CD will be ejected

To continue hit a key

The installation of the system is completed.

You can now connect to the system using:

Login: root  
Password: root

## 3 Additional operations to complete the products installation

### 3.1 Operations common to the MIs (Cluster Administration , Workgroup , Web Infrastructure, HA Storage)

Check the errors in the log file under the /root directory.

#### 3.1.1 WEBMIN: additional modules

It is necessary to install Webmin as a complementary module.

Execute the operations requested by the message displayed at the end of the install process:

Open a new window and enter the following commands:

```
#service webmin start (#: unix prompt)
    network configuration (you may configure the network now, or later via webmin, when Netscape is started).
# service httpd start
# netscape &
```

-----

Connect to the Web administrative tool using URL: **https://localhost:10000**

Accept the certificates (next.....finish) username root, passwd root.

To install the webmin additional modules:

- ➔ select **webmin administration screen**
- ➔ then, **webmin configuration**
- ➔ then, **webmin modules**

Then, use the form 'Install module ..... from local file':

Select successively each wbm module present in the directory: /root/wbm/

Install each module by clicking on Install Modules From File.

For instance, depending on your release, you can find and install:

```
/root/wbm/ldap-users-xxxxx.wbm
    lvs.wbm
    mrtgxxxx.wbm
    openldapxxx.wbm
    vncxxx.wbm
```

Proceed the **same way** to **install the patches provided with your current release of webmin** product.  
The patches (if existing) are available under the directory **/root/wbm/**.

Check the file **/root/wbm/patch**, to get more information on installed patches.

Please note: every time, you modify webmin, it is useful to restart it, using:

```
service webmin start / restart / stop / status
service httpd start / restart / stop / status
```

### **3.1.2 NETWORK: configuration**

Configure your network , if you don't have already configured it:

Select the 'Networking' folder, then

**'network configuration'**

then each proposed module:

network interface, routing & gateways, DNS client, Host Addresses

To validate the network configuration, execute the command:

```
# service network restart
```

### **3.1.3 NAGIOS: System management functions**

This installation is optional, but available with every tool kit.

Nagios is a software that enable you to monitor hosts and services on the network. It has the ability to warn the administrator when a problem arises and when it gets resolved.

If you decide to put it in place, in a first step you have to define:

- the Linux Red Hat 7.3 server on which nagios will be installed, and that will be used to monitor hosts and services.  
For efficiency, we will call this server, the nagios server, later on.
- the other servers on the network that you want to manage with Nagios.

Then, you must:

- install and configure Nagios on the Nagios server,
- install and configure NRPE on the other servers. In this document, we explain how to install and configure NRPE on Linux Red Hat 7.3 servers.

### **Installation of Nagios, Nagat, plug-ins and NRPE:**

The following Nagios, Nagat, plug-ins and NRPE are downloaded during the post-installation process of the tool kit installation:

- nagios-1.0b6
- nagiosplug-1-3
- nagat-1\_0a2
- nrpe-1\_5.

They are also pre-installed during this step.

During this process, the user 'nagios' is created.

**Nagat**, management interface, which **allows you to configure Nagios**, is already available. To launch it on your browser, enter the following url:

**`http://server_name/nagat/`**

**The Web interface of Nagios** (CGI scripts) is also available. To access it, Nagios must be activated, then, on your browser, enter the following url:

**`http://server_name/nagios/`**

This interface allows you:

- to view the status of the servers and services managed with Nagios,
- to have access to Nagios documentation.

Please note: if you have installed Nagios with Bull toolkits, you may activate Nagios directly after installation (fictitious servers are displayed, before you design your own configuration).

It remains to make the installation effective and to configure appropriate files according to your infrastructure:

- Nagios and check\_nrpe on the Nagios server,
- nrpe on every server, you want to supervise.

### **Configure Nagios on the Nagios server**

Nagios uses 10 configuration files (.cfg).

All these files are located in **`/usr/local/nagios/etc`**.

For each one, examples are provided with Nagios software.

We suggest you to study these examples to create your own configuration adapted to your infrastructure, according to:

- hosts,
- groups of hosts,
- services and commands you need.

So, you must at least configure data in the files:

- hosts.cfg
- hostgroups.cfg
- services.cfg
- checkcommands.cfg.

It may also be useful to configure the following files:

- contacts.cfg
- contactgroups.cfg

Please note: you may supervise a distant server with ping command, without installing nrpe on this host.

To test the consistency and completeness of your configuration, run the following command:

**`# /root/nagios/nagios-1_0b6/base/nagios/ -v /usr/local/nagios/etc/nagios.cfg`**

## **Install and Configure NRPE and check\_nrpe**

Pre-requisite: nagios must be installed.

### Operations to process on distant hosts (servers) to manage:

1. Install the nrpe files, if necessary, on each distant host to manage:
  - verify if following directories exist:  
/usr/local/nagios/etc  
/usr/local/nagios/libexec
  - create them if they do not exist, and copy in these directories all files that are in the same directories on the nagios host.

Please note: during this operation, you must copy one **nrpe.cfg** file and one **nrpe** file among others.

- Then, copy **/etc/xinetd.d/nrpe** file from the nagios server on the distant host, at the same place.
- Create the user 'nagios' on the distant host:  
**# adduser nagios**

2. Edit **/etc/services** file
  - remove the comment character (#) of the line:  
nrpe 5666/tcp #NRPE  
to validate this line;
  - if this line does not exist, create it.

3. Edit **/etc/xinetd.d/nrpe**  
remove all the the comment characters (#) defined between lines:  
service nrpe  
and '}' (these lines included).

Please note: with these two last actions, you have defined the nrpe daemon.

4. Validate nrpe daemon  
Execute the following command:  
**# etc/rc.d/init.d/xinetd.d restart**
5. Edit **/usr/local/nagios/etc/nrpe.cfg**  
Verify that several commands are defined, like **check-host** and **check\_users**.

The operations on distant hosts are now finished.

It is necessary to complete them with operations on the nagios server.

### Operations to process on the Nagios server:

6. Edit **/usr/local/nagios/etc/services.cfg**
  - find the service's example with c-nrpe-dist1,
  - validate this service (remove the # character), and substitute the remote server name,
  - or create another service, following the same design.
7. Edit **/usr/local/nagios/etc/checkcommands.cfg**
  - find the command's example with check\_nrpe
  - validate this command (remove the # character),
  - or create another one, following the same design.

Please note: these examples call for check-host command, as defined in nrpe.cfg on the distant hosts.

## **Execute, stop Nagios, Nagat, and NRPE**

1. Please remind to execute httpd and Netscape on your nagios server:
  - **# service httpd start / restart / .....**
  - **# netscape&**
2. Execute / stop nagios  
**# etc/rc.d/init.d/nagios start / restart / reload / status / stop**

3. Web interface for Nagios configuration (nagat)  
**http://server\_name/nagat/**
4. Nagios Web interface for **documentation** and **status** of servers and services  
**http://server\_name/nagios/**

To view status, select 'status map', 'service detail'; ....

Please note: Nagios must be activated, if you want to access to this interface.

5. Execution of nrpe (on distant hosts):
  - automatic (because done by daemon), if you have configured nrpe as described above, and restarted the xinetd.d daemon :  
**# /etc/rc.d/init.d restart.**

## **MRTG-RDDTOOL**

This installation is optional.

Select folder 'System', then: 'historic system statics'.

When the error message « The /usr/local /rddtool command is not installed on your system. May be the module configuration is incorrect » is displayed, click on 'module configuration'.  
Replace *Full path: /usr/local/rddtool* with */usr/local/rddtool-1.0.33/bin/rddtool*.

Click on 'save' button

The 'Webmin Syststats' window is opened.

To start Webmin Syststats jobs, it is mandatory to click on 'Start Sysstats' button.

## **VNC**

This installation is optional.

Start the **vncserver** script. It asks for a password; this password is used for authentication and will be required by the viewer to connect to the server.

vncserver returns the ident of the X session to be used to connect to the server:

```
New 'X' desktop is 'nom_machine:i'
```

Then, update the /home\_directory/.vnc/xstartup file:

replace 'twm &' by 'startkde &'

To connect to the Xvnc server from the administrative server, use the command:

**vncviewer -shared machine\_name:i**

The '-shared' option indicates that it is possible to connect simultaneously several clients on the same server. If not doing that, the last client to connect to the server kills all the previously established connections.  
'i' indicates the display number returned by the vncserver script.

If the interface is exported from a Windows system, 'i' is generally equal to 0. If the interface is exported from a Unix system, 'i' is generally equal to 1 (the display number 0 is taken by the local X server).

Then vncviewer asks for the password associated with the server; the desktop screen exported by the server is displayed on the client screen.

With a Windows system, the vnc server exports the desktop. With a Linux system, the vnc server behaves like any other X server where any X11 compatible application can be run.

## 3.2 Operations relative to the Cluster Administration MI

### 3.2.1 Nagios

It is highly recommended to use the 'Cluster Administration' server to install the 'Nagios server'. Its installation and configuration are described in the previous chapter, in "3.1.3 NAGIOS: System management functions".

### 3.2.2 MRTG-RDDTOOL

It is highly recommended to use the 'Cluster Administration' server to install 'MRTG-RDDTOOL server' on it. Its installation and configuration are described in the previous chapter, in "MRTG-RDDTOOL", above.

### 3.2.3 VNC

It is highly recommended to use the 'Cluster Administration' server to install the 'VNC server' on it. Its installation and configuration are described in the previous chapter, in "VNC", above.

### 3.2.4 SYSTEM INSTALLER SUITE (SIS)

'System Installer Suite' makes it easy to propagate software distribution, content or data distribution changes, operating system update, and software update, though your network of Linux machines.

'System Installer Suite' is used to ensure safe production deployments. By saving your current production image before updating to your new production image. You have a highly reliable contingency mechanism. If the new production environment is found to be flawed, simply roll-back to the last production image .

When the valid image is saved , it can be propagated on all cluster nodes through the network.

#### **Configuration and initialization after Installation**

Being connected as **root**:

System Installer Suite installation is effective through 2 main steps:

- 1) Prepare the Image Server
- 2) Prepare the Golden Client

#### **Prepare the Image Server:**

WARNING: If you do not have already configured your network, you must do it using Webmin:

Select folder 'hardware', then

**'network configuration'**

then each proposed module:

network interface, routing & gateways, Host Addresses

To validate your network configuration, please execute:

```
# service network restart
```

Network is now configured:

To start services needed by Image server and to complete the installation please execute the command:

```
#sh /root/systeminstaller/prepare-env.sh
```

The **dhcpd** server configuration file, **/etc/dhcpd.conf**, is pre-initialized with parameters that must be changed to take into account the new network. Edit the file **/etc/dhcpd.conf** and replace values 172.16.110.XX by the new network values.

By default a machine range from 172.16.110.80 to 172.16.110.90 has been defined for client boot request. This value can be increased as needed (for example 172.16.110.1 to 172.16.110.100).

### **/etc/dhcpd.conf**

```
# make network booting the SystemImager autoinstallclient possible
allow booting;
allow bootp;

# set lease time to 3 days
default-lease-time 259200;
max-lease-time 259200;

# what to get to boot the autoinstallclient
filename "/pxelinux.bin";
option dhcp-class-identifier "PXEClient";
option vendor-encapsulated-options 09:0f:80:00:0c:4e:65:74:77:6f:72:6b:20:62:6f:
6f:74:0a:07:00:50:72:6f:6d:70:74:06:01:02:08:03:80:00:00:47:04:80:00:00:00:ff;

subnet 172.16.110.0 netmask 255.255.255.0 {
    range 172.16.110.80 172.16.110.90;
    option domain-name "frec.bull.fr";
    option routers 172.16.110.250;
    # option-100 specifies the IP address of your SystemImager image server
    option option-100 "172.16.110.84";
    # option-208 specifies the URL address of your ssh download
    # option option-208 "";
}
```

When the dhcpd.conf file has been modified, restart hcpd service:

**# service dhcpd start**

### **Prepare a Golden Client:**

This installation is optional, but available with tools kit as 'Mail Server', 'Web server without cluster of servers', 'Web server with cluster of servers'.

In this case 'Mail Server', 'Web server without cluster of servers', 'Web server with cluster of servers' become clients of Image server machine.

WARNING: If you do not have already configured your network, you must do it using Webmin:

Select folder 'hardware', then

**'network configuration'**

then each proposed module:

network interface, routing & gateways, Host Addresses

To validate your network configuration, please execute:

**# service network restart**

The network is now configured:

According to the **dhcpd.conf** file on the Image server, add the range of machines to your **/etc/hosts** file.

A base host name has to be chosen (for example **merced**) with a domain name (for example **frec.bull.fr**)

As result a serie of hosts is added to the **/etc/hosts** file, as in this example:

### **#vi /etc/hosts**

```
172.16.110.80   merced80.frec.bull.fr  merced80
172.16.110.81   merced81.frec.bull.fr  merced81
172.16.110.82   merced82.frec.bull.fr  merced82
172.16.110.83   merced83.frec.bull.fr  merced83
172.16.110.84   merced84.frec.bull.fr  merced84
172.16.110.85   merced85.frec.bull.fr  merced85
172.16.110.86   merced86.frec.bull.fr  merced86
172.16.110.87   merced87.frec.bull.fr  merced87
172.16.110.88   merced88.frec.bull.fr  merced88
172.16.110.89   merced89.frec.bull.fr  merced89
172.16.110.90   merced90.frec.bull.fr  merced90
```

Now you have to complete the client preparation using the **/usr/local/sbin/prepareclient** script.

Just answer "y" to the question "*Prepare client for SystemImager? (y/[n])*"

### # /usr/local/sbin/prepareclient

Welcome to the SystemImager prepareclient command. This command may modify the following files to prepare your client for having it's image retrieved by the imageserver. It will also create the /etc/systemimager directory and fill it with information about your golden client, such as the disk partitioning scheme(s).

```
/etc/services      -- add rsync line if necessary
/etc/inetd.conf    -- comment out rsync line if necessary
                   (rsync will run as a daemon until shutdown)
/tmp/rsyncd.conf   -- create a temporary rsyncd.conf file with a
                   [root] entry in it.
```

All modified files will be backed up with the .beforesystemimager extension.

See "prepareclient -help" for command line options.

```
Prepare client for SystemImager? (y/[n]): Y
Ok. Preparing client for SystemImager...
```

```
Creating /tmp/rsyncd.conf ...
Starting or re-starting rsync as a daemon....done!
```

This client is ready to have it's image retrieved.  
You must now run the "getimage" command on the imageserver.

## 3.3 Operations relative to the Workgroup MI

### 3.3.1 Mail Server

#### SendMail / POP – IMAP

The Mail Transport Agent **Sendmail** is pre-configured to run as a standalone local mail agent on the newly installed system.

To make it available to every local user, being **root**:

- start a **Netscape** browser,
- connect to the Web administration tool **Webmin**,
  - Folder Serveur* choose *Sendmail Configuration*,
  - Item *Sendmail Options* set the *IP address* of the machine for the MTA server
  - Item *Local Domains* add the machine to the list using the dot format  
<hostname>.<domain>
  - Click on *Save* button
- thru **Webmin** → *Stop Sendmail* then *Start Sendmail* to make **Sendmail** aware of the new configuration

No special configuration is needed for the **POP – IMAP** servers.

- Restart the **xinetd** service to make the **POP** and **IMAP** servers start:  
**service xinetd restart**

Now **Sendmail** is ready to manage mails but only for local users. It is strongly advised to use the **Webmin** tool for a full configuration. For information on the /etc/sendmail.cf file, see the file **groupware/README\_mail** on the CD-ROM *Bull Linux Solutions*.

Do not forget to restart **Sendmail** once the configuration is completed.

#### OpenLDAP

The directory server **OpenLDAP** is pre-installed. It needs a complex configuration which is not the matter of this document. The goal of the following is only to verify the correct install of the product using a small sample. It is advised to see the file /etc/openldap/README for more detailed information.

The **slapd** server configuration file, /etc/openldap.slapped.conf, is pre-initialized with parameters to create a mini-database for the directory. This database is located in the /var/lib/ldap directory.

Being connected as **root**:

- start the **slapd** server:  
**service ldap start**
- initialize the directory database:  
**ldapadd -v -x -w secret -D "cn=Manager,o=frec.bull.fr,c=FR" </etc/openldap/bases/bull.ldif**  
**ldapadd -v -x -w secret -D "cn=Manager,o=frec.bull.fr,c=FR" </etc/openldap/bases/Dupont.ldif**

Use **slapcat** pour lister le contenu de la base de données.

### **Test of the installation using a Netscape browser**

\*\* Test of the mail server:

- using the **Webmin** tool, create a user and its passwd,
- connect to the system using this new user ident,
- start a **Netscape** browser,
- edit the Netscape *Preferences*,
  - *Folder Mail & Newsgroups*,
  - Email Address* set <user>@<hostname>.<domain>
  - Incoming Mail Servers* set <hostname> and <user>
  - Save
  - Outgoing Mail Server* <hostname> and <user>
  - Save
- save *Preferences*,
- click on the mailer icon at the bottom of the **Netscape** navigator,
- make the user send a mail to himself and check it is correctly transmitted.

\*\*Test of the directory server:

- start a **Netscape** browser,
- ask the netscape **Communicator** to start the **Address Book Manager**,
- create a new Directory,
  - Description* set "OpenLDAP test directory"
  - LDAP Server* set <hostname>
  - Search Root* set "o=frec.bull.fr,c=FR"
  - Save
- in the **Address Book Manager** window select the directory " *OpenLDAP test directory*"  
In the field *Show names containing* enter *Dupont* then hit key *TAB*
- the directory must answer with *Jean Dupont*

### **Mail Serveur 'Golden Client'**

This installation is optional, Mail Server become in this case Mail Server 'Golden Client'.  
See "Prepare a Golden Client:" in "3.2.4 SYSTEM INSTALLER SUITE (SIS)". for this installation.

### **3.3.2 GroupWare Server**

#### **NFS**

Being connected as **root**, start the NFS service:

**service nfs start**

To export a local file system:

- start a **Netscape** browser,
- connect to the **Webmin** administration tool,
  - Folder System* choose *NFS exports*,
  - Add a new export* and fill the form
  - Click on *Create*
- click on *Apply changes* to make the new configuration available.

To locally mount a remotely exported filesystem:

- start a **Netscape** browser,
- connect to the **Webmin** administrative tool,
  - Folder System* choose *Disk and network filesystems*
  - Add mount type* *Linux Native Filesystem*
  - Click on *Create*

### **Samba**

The **Samba** suite is reachable as the **smb** service, which configuration file is */etc/samba/smb.conf*. To easily configure and start this service, it is strongly advised to use its Web administration tool **SWAT**.

**SWAT** is a daemon process managed by the **xinetd** service and it is registered in the */etc/services* file:

- restart the **xinetd** service to start the **swat** server

#### **service xinetd restart**

\*\* To connect to the **SWAT** tool and initialize the **smb** service:

- start a **Netscape** browser,
- connect to the **Webmin** administration tool,
  - Folder Server* choose *Samba Windows File Sharing, SWAT*
- in the **SWAT** tool,
  - Folder Globals*
    - Initialize the Windows network access parameters, especially *workgroup* and *netbios name*
    - Click on *commit changes* to validate
  - Folder Status*
    - Click on *start smbd*
    - Click on *start nmbd*
- disconnect from **SWAT** by clicking on the link *Déconnexion de SWAT* (at bottom on the right)

\*\* To export a local filesystem:

- connect to the **SWAT** tool,
  - Folder Shares*
    - Enter a share name and click on *create share*
    - Fill the form
    - Click on *commit changes* to validate
  - Folder Status*
    - Click on *stop smbd* then *start smbd*
    - Click on *stop nmbd* then *start nmbd*
- disconnect from **SWAT** by clicking on the link *SWAT déconnexion* (at bottom on the right)

\*\* To locally mount a remotely exported filesystem:

- start a **Netscape** browser,
- connect to the **Webmin** administration tool,
  - Folder System* choose *Disk and network filesystems*
  - Add mount type* *Windows Networking Filesystem*
  - Click on *Create*

For information about the **Samba** suite configuration and use, see the **groupware/README\_samba** file on the *Bull Linux Solutions* CD-ROM.

### **Setting up PHPGroupWare**

The Workgroup framework **PHPGroupWare** is pre-installed with all the necessary requisites. It is a powerful tool with many development and configuration capabilities which are not described there. The goal is only to verify the product installation by running its sample application.

For information about the installation and configuration see the **groupware/README\_PHPGW** on the *Bull Linux Solutions* CD-ROM.

The sample application records its information into a **MySQL** database.

To create the **MySQL** database:

- start a **Netscape** browser,
- connect to the **Webmin** administration tool,
  - Folder Servers* choose *MySQL Database Server*,
  - Click on *Start MySQL Server* to start the database server daemon which is necessary to initialize the **PHPGroupWare** database
  - The **MySQL** administration screen is displayed
- click on the link *create a new database*,
  - Database name* set *phpgroupware*
  - Click on *create*
  - A new icon underlined by *phpgroupware* is displayed
- click on the link *database phpgroupware* to access to its specific administration screen,
  - Click on *execute SQL*
  - In the input field displayed enter  
*grant all on phpgroupware.\* to phpgw@host-name identified by "phpgw"*
  - Click on *execute*
  - The command must display no error: diagnostic *No Data Returned*
- click on the link *return to database list*
- *item User permissions*
  - The user *phpgw* has been created with an encrypted password *phpgw*
  - Add all the rights to this user: phpgw.*

\*\* To configure **PHPGroupWare**:

*\*Create the header file:*

- start a **Netscape** browser,
- verify that the **httpd** service is running
- connect to the URL *http://<host-name>/phpgroupware/setup/*,
- fill the form, especially the database access parameters and the various administrative passwords,
  - remember: already created user is *phpgw*, with *phpgw* as password
- click on *write config*,
  - created .inc.ph* must be displayed
  - click on *continue*

A double login window is displayed, which allows access to header file update or to **PHPGroupWare** configuration.

*\*Configure the PHPGroupWare application:*

- choose the box *setup/config Admin login*,
  - Enter the configuration password access defined in the header file
  - Click on *login*

The configuration screen is displayed

- to fill the database click on *install*
  - The result screen must not display any error.
- click on *re-verify my installation* to validate,
  - The tables are created into the database.
  - Please note: understand 'if insanity' instead of 'insanity'
- click on *Edit current configuration* and fill the form with the data relative to the system configuration,
- click on the link *Click Here* to create the **PHPGroupWare** administrator account and the demo user accounts,
- click on the link 'manage applications' to choose and install the applications you want to use.
  - Ex: calendar, projects,...
  - Please note: some applications are logically unreachable. If you do want to use them, you have to perform specific additional installations.

- click on the link [Logout](#) to disconnect from the administration tool.

The demonstration application can then be accessed using the URL [http:// <host-name>/phpgroupware](http://<host-name>/phpgroupware). The welcome screen must be displayed.

### 3.4 Operations relative to the Web Infrastructure MI

#### 3.4.1 Web server without cluster of servers

At the time of installation, you must have chosen the floppy disk: **Web Infrastructure**.

Now, you can install a Web server, with a proxy cache, or DNS or Firewall without using cluster of servers.

To configure proxy DNS:

- start a **Netscape** browser,
- connect to the **Webmin** administration tool
- choose folder 'Servers'
- select 'Squid Proxy Server' to configure your proxy cache
- or 'BIND DNS Server' to configure Bind & DNS

FIREWALL initialization:

- start a **Netscape** browser,
- connect to the **Webmin** administration tool
- choose folder 'Networking'
- select 'firewall' module
  - please note: this firewall is based on Netfilter/iptables.
- When selecting this module, you get a form allowing you to see and to define the characteristics of your firewall:
  - Packets filtering: chains, firewall rules definition, creation of new chains
  - Network Adress Translation: NAT
  - Packet alteration: Mangle.

When you have finished to define your firewall:

- apply the configuration (click on button).

Then, ask for boot activation (click on button). If not, rules and other information you have defined will be inactive at next reboot.

You can check that your rules are operational, with the Linux command:

**iptables -L**

-----

Bastille activation:

Bastille has been installed at the time of post-installation phase.

To activate Bastille, you only need to enter the following command:

InteractiveBastille

You must see the graphic interface of Bastille.

Bastille Linux is a tool, that allows you to harden Linux systems. It asks the user a number of questions, which it uses to provide the most comprehensive security, without removing needed functionality. Bastille has been thought to be accessible to every class of user from the newbie to experienced admin. Bastille educates users, by giving explanation and asking questions at every step.

### **Web server without cluster of servers 'Golden Client'**

This installation is optional, Web server without cluster of servers\_become in this case **Web server without cluster of servers 'Golden Client'**.

See "Prepare a Golden Client:" in "3.2.4 SYSTEM INSTALLER SUITE (SIS)". for this installation.

#### **3.4.2 Web server with cluster of servers**

For this installation you have to use the 2 floppies:

- **Web Infrastructure** to install proxy machine or DNS or firewall or director machine
- **Cluster Web server** to install the real server

A Linux Virtual Server (LVS) is a cluster of servers which appears to be one server to an outside client. This apparent single server is called here a "virtual server".

The individual servers (real servers) are under the control of a server called director (or load balancer). This director manages load balancing on several real servers using different algorithms (it is a router with modified routing rules), according to the availability of each real server (connection failed, crash). Moreover, this director is connected to another director which plays a backup role in case of non availability of the first one. All these servers need a Linux kernel patched to include the ipvs code.

To use LVS, it's necessary to define:

- the virtual address (VIP)
- the director server (DIP), on which a **Web Infrastructure** is to be installed
- the director server backup (DIPB), on which a **Web Infrastructure** is to be installed
- the real servers (RIP), on which a **Cluster Web Server** is to be installed.

On each server, it is necessary:

- to load the Linux kernel whose default kernel is modified in the boot loader configuration file:  
/etc/lilo.conf (don't forget to execute **lilo** after modification)  
or /boot/grub/grub.conf
- and to reboot the system.

On the real servers, configure the VIP on a loopback interface and check that the chosen services work fine (httpd, telnet...).

On the directors, configure the LVS services (Virtual Service, Real Servers Monitoring Service, Link between director and its backup Service).

### **Web server with cluster of servers 'Golden Client'**

This installation is optional, Web server with cluster of servers\_become in this case **Web server with cluster of servers 'Golden Client'**.

See "Prepare a Golden Client:" in "3.2.4 SYSTEM INSTALLER SUITE (SIS)". for this installation.

## **3.5 Operations relative to HA Storage MI**

HA Storage installation is effective through 2 main steps:

- 1) DAS Installation and initialization
- 2) Cluster creation for Kimberlite: DAS management and HA fonctions.

### **3.5.1 DAS 5300 Installation and fibre adapter.**

The installation of the Emulex driver for the fibre adapter LP8000 is automatically realized when we do the installation of the EXSH028-3000 module.

The Naviagent software installation for the DAS5300 is realized from the CD-ROM delivered by EMC Clariion.

#### **Driver Emulex installation**

The driver of the Emulex fibre adapter was installed at the time of post-installation (see **installBullkimberlite\_en** file on floppy, for more information).

It is installed as a module loaded by the kernel **lpfcdd**.

This installation install the following files:

```
/usr/lib/libHBAAPI.so
/usr/lib/libemulexhbaapi.so
/usr/sbin/lpfc
/usr/sbin/lpfc/dfc
/usr/sbin/lpfc/lputil
/usr/src/linux/drivers/scsi/lpfc
/usr/src/linux/drivers/scsi/lpfc/Makefile
/usr/src/linux/drivers/scsi/lpfc/Makefile.kernel
/usr/src/linux/drivers/scsi/lpfc/Makefile.module
/usr/src/linux/drivers/scsi/lpfc/README
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/usr/src/linux/drivers/scsi/lpfc/lpfc.conf.c
/usr/src/linux/drivers/scsi/lpfc/lpfc.conf.defs
/usr/src/linux/drivers/scsi/lpfc/lpfcdriver
/usr/src/linux/drivers/scsi/lpfc/lputil
```

During the post-installation phase, **the driver is also configured and compiled**: exchange speed and working mode are defined.

Normally, it is not necessary to modify the driver configuration.

In the directory **/etc/rc.d/init.d** the **emulexdrv** script allows to install or uninstall the emulex **lpfcdd** driver module with the commands **/etc/rc.d/init.d/emulexdrv start, stop, status** or **restart**.

A link exists at the execution level 5 (init 5).

### **Installation and Naviagent configuration**

Mount the CD-ROM including the Software Naviagent for Linux:

```
mount /mnt/cdrom
```

```
cd /mnt/cdrom
```

```
rpm -ivh naviagent-6_1_0_10_6-1_i386.rpm
```

The following files are installed:

```
/etc/Navisphere
/etc/Navisphere/Navimon.cfg
/etc/Navisphere/agent.config
/etc/rc.d/init.d/naviagent
/opt/Navisphere
/opt/Navisphere/bin
/opt/Navisphere/bin/naviagent
/opt/Navisphere/bin/navicli
```

### **Initial Configuration**

For the first use, if the DAS 5300 has no configured LUN, you need to use the serial interface of the DAS. For the definition of the LUNs, RAIDS and others technically term of the DAS 5300 see the documentation provided with the DAS.

The navicli documentation is necessary; you can find it on the CD-ROM provided by EMC.

Configuration of the file **/etc/Navisphere/agent.config**:

In this file, before the line:

```
device auto auto
```

add the following line:

```
ttydevice ttyS0 ttyS0 "tty"
```

Add the name and the address of the authoritative user to configure the DAS:

```
user root@machine_name # only on this machine
```

Set the speed to 19200 bauds:

```
baud 19200
```

Start naviagent with the command:

```
/etc/rc.d/init.d/naviagent start (or restart).
```

Run the command **/opt/Navisphere/bin/navicli getagent** to obtain the name of the agent known by navicli:

```
# navicli getagent
```

```
Agent Rev:      6.1.0 (10.0)
Name:           ttyS0
Desc:           "tty"
Node:           ttyS0
Signature:      2990815279
Peer Signature: 391094097
Revision:       5.24.05
SCSI Id:        0
Model:          5200
Model Type:     Deskside
Prom Rev:       2.09.00
SP Memory:      64
Serial No:      m10005000005
SP Identifier:  A
Cabinet:       DAE/SP
```

The agent name is given by the Node line, (ttyS0 in the example).

Create a LUN 0 for example with the first 2 disks of DAS with the command:

```
# navicli -d ttyS0 bind r1 00 0_0 0_1
```

Verify, at the end of the previous command, the LUN creation with the command:

```
#navicli -d ttyS0 getlun
```

The result begins as follows:

```
LOGICAL UNIT NUMBER 0
Prefetch size (blocks) =          0
Prefetch multiplier =             4
Segment size (blocks) =           0
Segment multiplier =              4
Maximum prefetch (blocks) =       512
Prefetch Disable Size (blocks) =  129
Prefetch idle count =            40
```

Type the following command to run the new configuration:

```
/etc/rc.d/init.d/emulexdrv restart
```

Verify that the new configuration is okay under the scsi drivers with the command:

```
cat /proc/scsi/scsi
```

```
the previous command lists the LUN 0 under the format:
Host: scsi2 Channel: 00 Id: 00 Lun: 00
  Vendor: DGC      Model:                Rev: 0524
  Type:   Direct-Access                    ANSI SCSI revision: 04
```

Continue as for a DAS with a LUN 0 already configured.

### **Configuration for a DAS with LUN 0 configured**

Modify the configuration file **/etc/Navisphere/agent.config** and comment the line:

```
#ttydevice ttyS0 ttyS0 "tty"
```

### Run again naviagent:

```
/etc/rc.d/init.d/naviagent restart
```

### Look for the agent name with the command:

```
/opt/Navisphere/bin/navicli getagent
```

### The result is similar to the following:

```
Agent Rev:      6.1.0 (10.0)
Name:          sg3
Desc:         sg3
Node:         A-m10005000005
Physical Node: sg3
Signature:    2990815279
Peer Signature: 391094097
Revision:     5.24.05
SCSI Id:      0
Model:        5200
Model Type:   Deskside
Prom Rev:     2.09.00
SP Memory:    64
Serial No:    m10005000005
SP Identifier: A
Cabinet:     DAE/SP
```

### The navicli commands are as follows:

```
/opt/Navisphere/bin/navicli -d sg3 commande parameters_of_the_command
```

You can now configure the DAS as you want (it is possible to delete the LUN 0 previously created but you must not stop naviagent, nor the **lpfcdd** driver).

The following line is an example that shows how to configure a DAS5300 including 10 disks of 9GB, with 3 LUNs in RAID1, 1 LUN in RAID5 and a disk in « hot Spare ». See the Command Line Interface EMC Navisphere documentation.

### Creation of the « raid group » 1, 2 and 3:

```
# navicli -d sg3 createrg 1 0_2 0_3 -rm yes -pri high
# navicli -d sg3 createrg 2 0_4 0_5 -rm yes -pri high
# navicli -d sg3 createrg 3 0_6 0_7 0_8 -rm yes -pri high
```

### Creation of LUNS 1, 2 and 3 on the raids groups previously created:

```
# navicli -d sg3 bind r1 1 -rg 1
# navicli -d sg3 bind r1 2 -rg 2
# navicli -d sg3 bind r5 3 -rg 3
```

### Creation of the hot spare:

```
# navicli -d sg3 bind hs 4 0_9
```

### Verify with the command to list the LUNs created:

```
#navicli -d sg3 getlun
```

### To get the new LUNs stop and restart the driver and naviagent:

```
/etc/rc.d/init.d/emulexdrv restart
/etc/rc.d/init.d/naviagent start
```

### Verify that the new disks are seen by the scsi driver:

```
cat /proc/scsi/scsi:
Host: scsi2 Channel: 00 Id: 00 Lun: 00
  Vendor: DGC      Model: RAID 1          Rev: 0524
  Type:   Direct-Access                    ANSI SCSI revision: 04
Host: scsi2 Channel: 00 Id: 00 Lun: 01
  Vendor: DGC      Model: RAID 1          Rev: 0524
  Type:   Direct-Access                    ANSI SCSI revision: 04
Host: scsi2 Channel: 00 Id: 00 Lun: 02
  Vendor: DGC      Model: RAID 1          Rev: 0524
  Type:   Direct-Access                    ANSI SCSI revision: 04
Host: scsi2 Channel: 00 Id: 00 Lun: 03
  Vendor: DGC      Model: RAID 5          Rev: 0524
  Type:   Direct-Access                    ANSI SCSI revision: 04
```

List the created disks with the command:

```
fdisk -l
```

The created disks are seen under the name « sdc » and following:

```
Disk /dev/sda: 255 heads, 63 sectors, 2213 cylinders
Units = cylinders sur 16065 * 512 bytes
```

Device	Boot	Start	End	Blocks	Id	System
/dev/sda1	*	1	522	4192933+	83	Linux
/dev/sda2		523	587	522112+	83	Linux
/dev/sda3		588	2213	13060845	83	Linux

```
Disk /dev/sdb: 255 heads, 63 sectors, 2213 cylinders
Units = cylinders sur 16065 * 512 bytes
```

Device	Boot	Start	End	Blocks	Id	System
/dev/sdb1	*	1	261	2096451	82	Linux swap
/dev/sdb2		262	522	2096482+	83	Linux

```
Disk /dev/sdc: 255 heads, 63 sectors, 1063 cylinders
Units = cylinders sur 16065 * 512 bytes
```

The disk /dev/sdc doesn't contain a valid partition table.

```
Disk /dev/sdd: 255 heads, 63 secteurs, 1063 cylindres
Units = cylinders sur 16065 * 512 bytes
```

The disk /dev/sdd doesn't contain a valid partition table.

```
Disk /dev/sde: 255 heads, 63 sectors, 1063 cylinders
Units = cylinders sur 16065 * 512 bytes
```

The disk /dev/sde doesn't contain a valid partition table.

```
Disk /dev/sdf: 255 heads, 63 sectors, 2126 cylinders
Units = cylinders sur 16065 * 512 bytes
```

The disk /dev/sdf doesn't contain a valid partition table.

Create the partitions on these disks as you need with **fdisk**, and the possible files systems with **mkfs**.

### 3.5.2 Installation for the DAS Chaparral

#### Installation of the adapter

At the time of the system reboot, enter CTRL+A, then in the menus, choose to invalidate the bios of the adapter. Attention to not invalidate this bios on the interface SCSI that is embedded in the motherboard. The goal of this invalidation is to avoid booting from external disks such as the DAS Chaparral.

#### Installation and settings of the RS232 control line

To configure the RAIDS in the DAS Chaparral, you have to use an asynchronous line which controls the DAS with a terminal emulator, for example minicom.

Please use the following configuration:

Serial device	/dev/ttyS0
Bauds	1152090
Hardware flow control	No
Software flow control	yes

To configure the DAS Chaparral, please refer to the documentation provided with the subsystem, or on Internet site <http://www.chaparralnet.com/support.cfm?action=documentation> [https://www.xyratex.com/techsupport/user\\_site/softwaresearch\\_s.asp?master\\_cat=8](https://www.xyratex.com/techsupport/user_site/softwaresearch_s.asp?master_cat=8) and search for RR-0812-lvd User Guide/manual.

### **Recompiling the kernel**

In order to see all the logical units of the DAS Chaparral, you have to recompile the kernel with the answer "Y" for the parameter "*Probe all LUNs one each SCSI device*" in chapter "*SCSI support*", which results in the following parameter in the kernel configuration file:

```
CONFIG SCSI_MULTI_LUN="Y"
```

When recompiling the kernel, update the **/etc/lilo.conf** file and execute **/sbin/lilo** if you use lilo as linux loader, or **/boot/grub/menu.lst** if you use grub as linux loader.

### **3.5.3 Cluster creation for Kimberlite**

**Kimberlite** and **swig software** were loaded, compiled and installed at the time of post-installation (see **installBullkimberlite\_en** file on floppy, for more information).

Note: In the case of a new Linux system installation, please take care: you must switch off the DAS (unplug the cables between the servers and the DAS system).

If not, the existing linux partitions will be destroyed .

To create the cluster see the cluster.html documentation; you can find it in the kimberlite sources under the directory: */root/kimberlite/kimberlite-1.1.0.bull/doc/cluster.html*

#### Creation of raw devices:

Create 2 partitions of 20MB for example on the disk /dev/sdc:

```
/dev/sdc1      1          6      48163+  83  Linux
/dev/sdc2      7          12     48195   83  Linux
/dev/sdc3     13         1063   8442157+ 83  Linux
```

and create the raw devices on these partitions:

```
raw /dev/raw/raw1 /dev/sdc1
raw /dev/raw/raw2 /dev/sdc2
chmod a+r /dev/raw/raw1
chmod a+r /dev/raw/raw2
```

add these 4 previous lines in the **/etc/rc.d/init.d/rawio** file, and verify with the command:

```
raw -aq
```

```
/dev/raw/raw1: bound to major 8, minor 33
/dev/raw/raw2: bound to major 8, minor 34
```

Set the **/etc/hosts** file on the 2 nodes with the IP addresses, verify the configuration of the network with ping .

Create the cluster running the **/opt/cluster/bin/member\_config** utility (see the example in the cluster.html documentation).

Verify the access to the raw devices, running the following commands on the 2 nodes:

```
/opt/cluster/bin/diskutil -t
```

if successfull, run:

```
/opt/cluster/bin/diskutil -p
```

Modify the **/etc/syslog.conf** file as explained in the cluster.html documentation to log cluster events in the **/var/log/cluster** file.

Then restart syslog to apply the previous changes:

```
/etc/rc.d/init.d/syslog/restart
```

Start the cluster by invoking the cluster start command:

```
/etc/rc.d/init.d/cluster start
```

To obtain the cluster status run the command:

```
/etc/rc.d/init.d/clustat
```

To configure a service use the utility:

```
/etc/rc.d/init.d/cluadmin
```

This utility allows to set up and administer cluster services:

Configuring a service – Displaying a service configuration – Disabling a service – Enabling a Service –  
Modifying a service – Relocating a service – Deleting a service.

### **3.5.4 Restrictions in using Kimberlite with DAS Chaparral SR-1422**

During robustness tests some I/O errors were detected, which create unjustified roll over.

This problem happens during concurrent access to the “Quorum” partition, which is used by Kimberlite to manage the cluster. This partition is accessed in “Raw Device” mode, and this mode seems to be badly managed by the access methods driving the DAS Chaparral.

The error message is the following:

```
May 14 18:09:45 mizlinux3 kernel: SCSI disk error:  
host 1 channel 0 id 0 lun 1 return code = 8
```

No workaround exists at the moment, and the error occurs randomly.

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[\_\_]: **no revision number means latest revision** / pas de numéro de révision signifie révision la plus récente

NOM / NAME : \_\_\_\_\_ Date : \_\_\_\_\_

SOCIETE / COMPANY : \_\_\_\_\_

ADRESSE / ADDRESS : \_\_\_\_\_

PHONE / TELEPHONE : \_\_\_\_\_ FAX : \_\_\_\_\_

E-MAIL : \_\_\_\_\_

**For Bull Subsidiaries** / Pour les Filiales Bull :

Identification: \_\_\_\_\_

**For Bull Affiliated Customers** / Pour les Clients Affiliés Bull :

**Customer Code** / Code Client : \_\_\_\_\_

**For Bull Internal Customers** / Pour les Clients Internes Bull :

**Budgetary Section** / Section Budgétaire : \_\_\_\_\_

**For Others** / Pour les Autres :

**Please ask your Bull representative.** / Merci de demander à votre contact Bull.



**BULL CEDOC**  
**357 AVENUE PATTON**  
**B.P.20845**  
**49008 ANGERS CEDEX 01**  
**FRANCE**

ORDER REFERENCE  
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PLACE BAR CODE IN LOWER  
LEFT CORNER



Utiliser les marques de découpe pour obtenir les étiquettes.  
Use the cut marks to get the labels.



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