Bull System Manager

NOVASCALE & ESCALA

BSM 1.1 Server Add-ons

Installation and Administrator's Guide

REFERENCE
86 A2 59FA 01

NOVASCALE & ESCALA

BSM 1.1 Server Add-ons

Installation and Administrator's Guide

Software

July 2009

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

REFERENCE
86 A2 59FA 01

Printed in France

Trademarks and Acknowledgements

Table of Contents

List of Figures

List of Tables

Preface

Scope and Audience of this Manual

Bull System Manager Server Add-ons are Bull products, which provide extension to Bull System Manager for managing Bull platforms specific devices or tools. Administration environments can include different platforms from the NovaScale Universal or Intensive Series, Express 5800 Series, EvolutiveLine Blade Series or Escala servers

In order to monitor a specific item, Bull System Manager Server Add-ons configuration must be customized. This manual explains also how, as an Administrator you can perform configuration tasks for these Add-ons.

Note	Configuration tasks may only be performed by Administrators.

Using this Manual

For a conceptual approach to Bull System Manager Server Add-ons, read **Chapter 1**.

Chapter 2 describes how to install and configure Bull System Manager Server Add-ons.

Chapter 3 describes for each Server Add-on how to configure its elements on the Management server. It provides detailed information about all resource properties as well as concrete examples to help customization of the configuration (Modifying Service Parameters, …).
This chapter also contains reference information about categories and services of the monitoring server provided by these Bull System Manager Server Add-ons.

Appendix A contains reference information about the check Nagios commands used by Bull System Manager Server Add-ons monitoring services.

Related Information

- *Bull System Manager Installation Guide* (Ref. 86 A2 54FA).
- *Bull System Manager User's Guide* (Ref. 86 A2 55FA). The Bull System Manager GUI (Graphical User Interface) and the way to use are described in this guide.
- *Bull System Manager Administrator's Guide* (Ref. 86 A2 56FA).
- Restrictions and well-known problems are described in the associated *Release Notes* document (Ref. 86 A2 57FA).
- *Dynamic Domains for Applications User's Guide* (Ref. 86 A2 63ER).

Highlighting

The following highlighting conventions are used in this book:

Bold	Identifies commands, keywords, files, structures, directories and other items whose names are predefined by the system. Also identifies graphical objects such as buttons, labels and icons that the user selects.
Italics	Identifies chapters, sections, paragraphs and book names to which the reader must refer for details.
`Monospace`	Identifies examples of specific data values, examples of text similar to displayed messages from the system, or information you should actually type.

Note Important information.

Chapter 1. Bull System Manager Server Add-ons Concepts

1.1 Bull System Manager

1.1.1 Overview

Bull System Manager monitoring ensures the following tasks:

- Monitoring machines: Bull System Manager checks if these hosts are accessible, using the **ping** command from the System Manager. The machines to be monitored are either explicitly specified by the administrator or selected by a discovery mechanism.
- Monitoring specific elements of the hardware, operating system, services and Internet such as **Power Status**, **CPU load**, **memory usage**, **disk usage**, **number of users, processes** and **service execution**, **http** and **ftp services**.
  The administrator can define status thresholds (OK, WARNING, CRITICAL, UNKNOWN) for each monitoring element. When an anomaly occurs or when normal status is recovered, **alerts** (in a log file) and **notifications** (by e-mail, by Bull autocall and/or by SNMP trap) are generated.

Note Hardware and OS monitoring for Bull Intel-Based platforms are provided by the Bull System Manager Server package, not by the Add-ons packages.

Bull System Manager Server Add-ons extend the Bull System Manager monitoring with more specific links to third-party management tools for specific devices or/and specific system functionalities.

Note These Server Add-ons packages extend generally the management server independently of the platform or/and OS type (storage, network, virtualization, framework, ...).

Bull System Manager consists of three main components that can be deployed on Windows and Linux systems:

- Management Server and Server Add-ons
- Management Console
- Management Agent.

Note Management Agent component can also be installed ont AIX systems

Management Server and Server Add-ons

Provides the infrastructure and services in charge of collecting and operating management data. Management Server must be installed on the server dedicated to management.

Management Console

Provides third-party management tools for the end-user station running the Bull System Manager console WEB GUI.

Management Agent

Provides instrumentation and administration tools for monitored servers. Management Agent must be installed on each server to monitor.

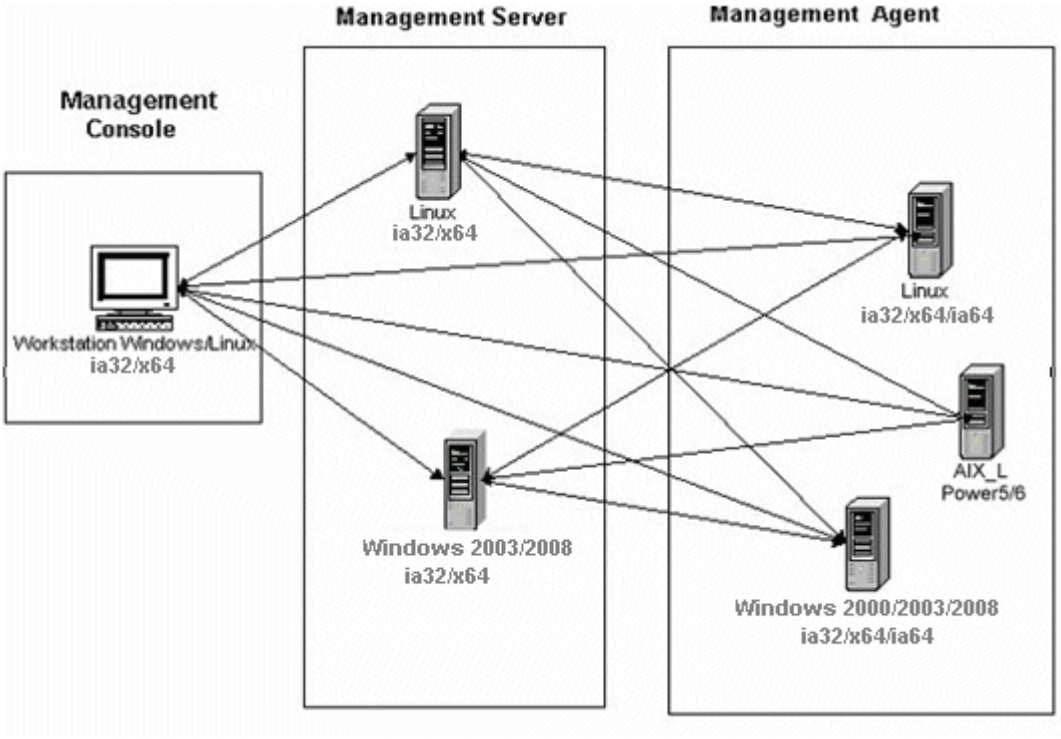


Figure 1-1. Bull System Manager Architecture

Note Bull System Manager for the different operating systems is distributed on the same CD-ROM.

1.1.2 Monitoring

A **Service** (or monitoring service) defines how specific host elements are monitored. A service can be defined for all hosts or for a list of hosts, depending on the OS (Windows, Linux, AIX or any) and/or on the model. Notification properties are defined for each service.

Services are organized into monitoring **categories**. For instance, the **SystemLoad** category includes the **CPU** and **Memory** services for a Windows host.

1.1.3 Event Reception

Bull System Manager can receive **SNMP traps** from any SNMP agent. SNMP traps enable an agent to notify the Bull System Manager Server of significant events via an unsolicited SNMP message. SNMP Traps must be defined in a **MIB** (Management Information Base).

1.1.4 Hardware Manager

A **Hardware Manager** manages hardware for one or a set of servers.

1.1.5 Storage Manager

A **Storage Manager** manages storage for one or a set of servers or/and bays.

1.1.6 Virtualization Manager

A **Virtualization Manager** manages a set of virtual machines, viewed as Virtualization Platform.

1.2 Bull System Manager Server Add-ons

Bull System Manager Server Add-ons deliver optional management packages to extend Bull System Manager Server.

A Bull System Manager Server Add-on provides functional links (monitoring, GUI call, reporting ...) between a Bull System Manager Server and a third-party management tool.

All Server Add-ons are distributed on the *Bull System Manager Server* CD-ROM.

Note There is a difference between the Server Add-on and the third-party management tool. Even if the third-party management tool may be dedicated to an OS or/and a platform type, its Bull System Manager Server Add-on can be installed on a Bull System Manager Server machine (thus, on Linux and Windows, on IA32 and IA64 ...).

This release provides several Bull System Manager Server Add-ons. Some of them are free and delivered on the Bull System Manager CD-ROM. The others must be purchased.

System Domain	Server Add-on
Internal Storage (BSM Server CD)	LSI GAMTT Mgt Package
	LSI CIM Mgt Package
	LSI MegaRaid SAS Mgt Package
External Storage (BSM Server CD)	StoreWay FDA Mgt Package
	EMC CLARiiON
	NetApp
	StoreWay DPA
External Device (BSM Server CD)	Bull Water Cooled Door
Bull Tools Management (BSM Server CD)	Dynamic Domains Mgt Package
	Bull Video Service Mgt Package
	JOnAS framework Mgt Package
Virtualization Management (BSM Server CD)	Vmware ESX Mgt Package
	VMware Virtual Center Mgt Package
	Xen HyperNova Master Mgt Package
	Escala LPAR Mgt Package

Each Server Add-on is described in the following chapters.

Chapter 2. Bull System Manager Server Add-ons Installation and Configuration

2.1 General Installation Requirements

Before installing Bull System Manager, check that the environment meets the software and hardware requirements described below.

2.1.1 Supported Operating Systems

Bull System Manager Server Add-ons operate on Linux and Windows operating systems.

The principal Requirements are the Bull System Manager Server pre-installation and its own requirements. See *Bull System Manager Installation Guide* for details.

2.1.2 Required Disk Space

In general, each Server Add-on needs between 1 and 2 MB.

2.1.3 Required Memory

The following table indicates the required memory for the Management Server.

Bull System Manager	Memory
Management Server	512 MB

Table 2-1. Bull System Manager - Required Memory

2.1.4 Installation Requirements

Server Add-ons	Component
*	BSMServer1.1-x

Table 2-2. Management Server Add-ons Installation Requirements

2.1.5 Operational Requirements

Server Add-ons	Target Tools
BSMGAMTT	Linux GAM version 6.02.31 or higher. Windows GAM version 6.02-32 or higher. **Important:** Go to www.lsilogic.com Web site to download the above versions. If not on-line, contact the Bull support team. **Note:** For **IA32** machines the following previous versions are supported: Linux GAM version 6.02-21 or higher Windows GAM version 6.02-22 or higher.
BSMLSICIM	LSI CIM provider version 3.06 or higher. **Important:** Go to www.lsilogic.com Web site to download the above versions. If not on-line, contact the Bull support team. **Note:** Not supported on Linux IA64 system.
BSMMegaRaidSAS	LSI MegaRaid SAS (IR) SNMP agent version 3.09 or higher. Go to www.lsilogic.com Web site to download the above versions. If not on-line, contact the Bull support team.
BSMStoreWayFDA	StoreWay FDA embedded SNMP Agent.
BSMEmcClariion	EMC Navisphere SNMP agent
BSMNetApp	NetApp embedded SNMP agent
BSMStoreWayDPA	StoreWay DPA embedded SNMP agent
BSMDD4A	DDFA version 2.6.3 and higher
BSMBVS	BVS version 4.0 and higher
BSMJOnAS	JOnAS version 4.8 and higher
BSMVMwareESX	VMware ESX 3.0 and higher
BSMVMwareVirtualCenter	VMware Virtual Center 2.5 and higher **Important**: BSM Add-on uses and includes the VI Perl toolkit API. On Windows platform, the BSM Server uses ActivePerl with all requirements for the VI Perl toolkit API, but on Linux platform, you have to install the required packages. Go to the VMware documentation site to have the list of requirements http://www.vmware.com/support/developer/viperltoolkit/. If not on-line, contact the Bull support team.
BSMEscalaLPAR	IVM VIOS for Power5 and Power6 (Escala PL or EL Blade servers) or HMC version 6.1 and higher
BSMWaterCooledDoor	Device firmware: EMM release 1.1.0 build14

Table 2-3. Management Server Add-ons Operational Requirements

2.1.6 Restrictions

Windows

N/A

Linux

N/A

2.2 Installing Bull System Manager Server Add-ons for Windows

2.2.1 Prerequisites

To install Bull System Manager Server Add-ons on Windows:

- The user must be a member of an Administrators group. The default administrator login is Administrator.
- The installation program requires the Internet Explorer WEB browser. Other browsers, such as Netscape or Mozilla, cannot be used to install Bull System Manager on Windows.
- Management Server Add-ons are to be installed on the server dedicated to management.
- Acrobat Reader is required to view PDF versions of the Bull System Manager documentation.
- The Server Add-ons are present on the *Bull System Manager* CD-.

2.2.2 Installing Management Server Add-ons from the Bull System Manager CD-ROM

Management Server Add-ons, to be installed on the server dedicated to management, require the components indicated in 2.1.4 *Installation Requirements*, and must be installed from the CD-ROM.

To install **Management Server Add-ons** from the CD-ROM:

1. From the dedicated server, launch the installation program.
2. Log on as **Administrator**.
3. Insert the Bull System Manager CD-ROM in the drive.
   The installation program is launched automatically and opens the **Welcome** page.

Note	If the installation does not start automatically, double-click **<CD-ROM drive> / setup.exe**.

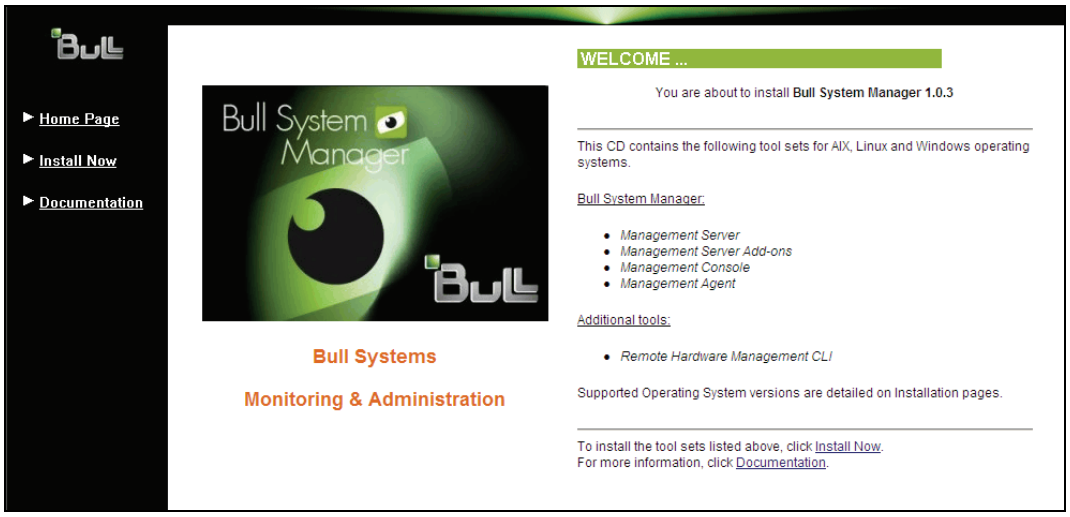


Figure 2-1. Windows Installation - Bull System Manager Welcome Page

4. Click **Install Now** to open the **Install** page, which allows the selection of the required Bull System Manager component:

   – Management Server Add-ons

   and provides the following information:

   – What to install?

   – What to do now?

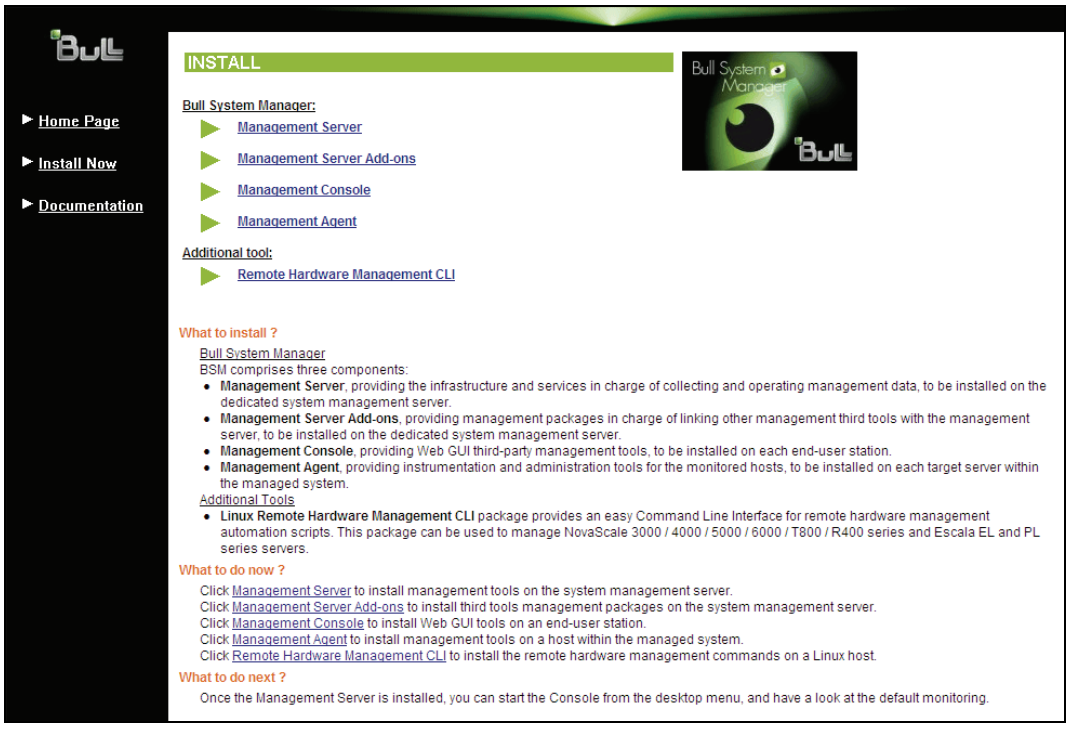


Figure 2-2. Windows Installation - Bull System Manager Install Page

Select **Management Server Add-ons**

Figure 2-3. Windows Installation - Selecting Bull System manager Server Add-ons

Select an Add-ons family (Storage, Virtualization, Bull Application or Other Devices), then **Windows 32 bits** operating system.

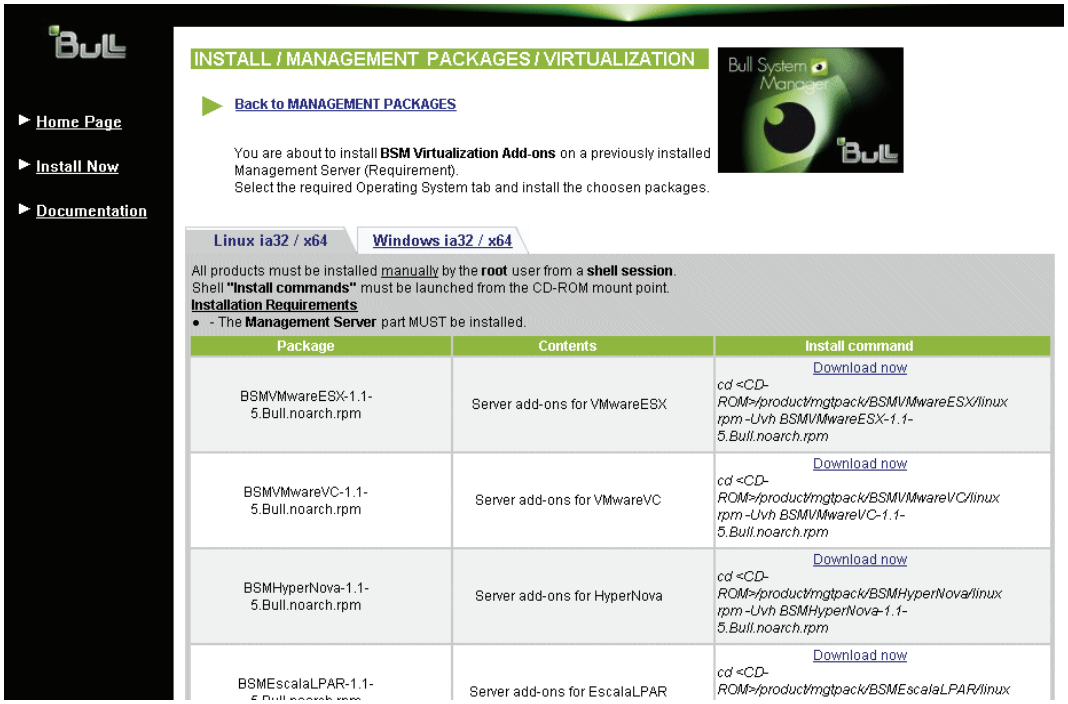


Figure 2-4. Windows Installation - Bull System Manager Server Add-ons Install Page

5. Click the corresponding **Install Package Now** link to install the **Server Add-ons** package. The wizard prompts for a destination folder. The default value can be changed if required.

At the end of the installation process, Management Server Add-ons components are automatically operational.

2.2.3 Un-installing Bull System Manager Server Add-ons Components

Un-installation operations must be launched locally. Launching the un-installation program removes all files and folders.

To un-install Bull System Manager Add-ons components:

1. From the Control Panel, launch **Add/Remove Programs**.
2. Select the required Bull System Manager Server Add-ons components and click **Remove**.

Note After un-installation operations, customized categories in previous version can remain in configuration. These elements must be removed using the BSM Configuration GUI.

2.2.4 Upgrading to a New Bull System Manager Server Add-ons Version

When upgrading to a new BSM Server Add-ons version, the existing BSM Server Add-ons environment that may have been customized is maintained.

BSM Server Add-ons are upgraded via the standard installation program.

Note When you upgrade the BSM Management Server, you must also upgrade BSM Server Add-ons to benefit from new improvements.

See the Release Notes for more details about specific Add-ons migration, where applicable.

2.3 Installing Bull System Manager Server Add-ons for Linux

2.3.1 Prerequisites

To install Bull System Manager Server Add-ons on Linux:

- The user must be logged as root.
- The installation program requires the **Mozilla** WEB browser (Version >**1.4.3** or **Firefox**):
  If Mozilla is not installed, launch another WEB browser and open file:
  <CD-ROM Mount point>/product /index.html
  It is advised to uninstall the previous version of Mozilla before installing a new version. This operation will not delete bookmarks, histories, cookies and other information stored in the profile directory.
  The Mozilla directory must be set in the root PATH environment variable. If a previous version of Mozilla has not been uninstalled, the Mozilla directory must be set at the beginning of the PATH variable.
- Management Server Add-ons are to be installed on the server dedicated to management.
- Acrobat Reader is required to view PDF versions of the Bull System Manager documentation.
- The Server Add-ons are present on the *Bull System Manager* CD-ROM or on the *Bull System Manager Add-ons* CD-ROM.

Notes

- You can check whether required packages from a given addOn are installed by launching:
  - `cd <CD-ROM mount point>`
  - `./checkEnvAddon.sh -a <addOn>`

  AddOn is the name of the RPM (BSM<addOnIdent>.<version>.Bull) or the short addOnIdent.
- The rpm packages listed above may have their own dependencies and require other rpm packages.
- If the rpm has been installed, the result of the checkEnvAddon is listed in the corresponding installation log (post_install_BSM<addonIdent>.log in the `<BSM Installation>/engine/tmp/` directory.

2.3.2 Installing Management Server Add-ons from the CD-ROM

Management Server Add-ons, to be installed on the server dedicated to management, require the components indicated in 2.1.4 *Installation Requirements*, and must be installed from the CD-ROM.

To install **Management Server Add-ons** from the CD-ROM:

1. From the dedicated server, launch the installation program.

2. Log on as **root**.

3. Insert the Bull System Manager CD-ROM in the drive.
   The CD-ROM filesystem is automatically mounted to one of the following directories:
   - **/mnt/cdrom** or **/mnt/dvd** (Red Hat and Advanced Server distributions)
   - **/media/cdrom** or **/media/dvd** (SuSE distribution).

4. Launch the following commands:
   ```
   cd <CD-ROM mount point>
   ./install.sh
   ```

The **install.sh** script automatically launches the Mozilla or Mozilla Firefox browser and opens the **Welcome** page.

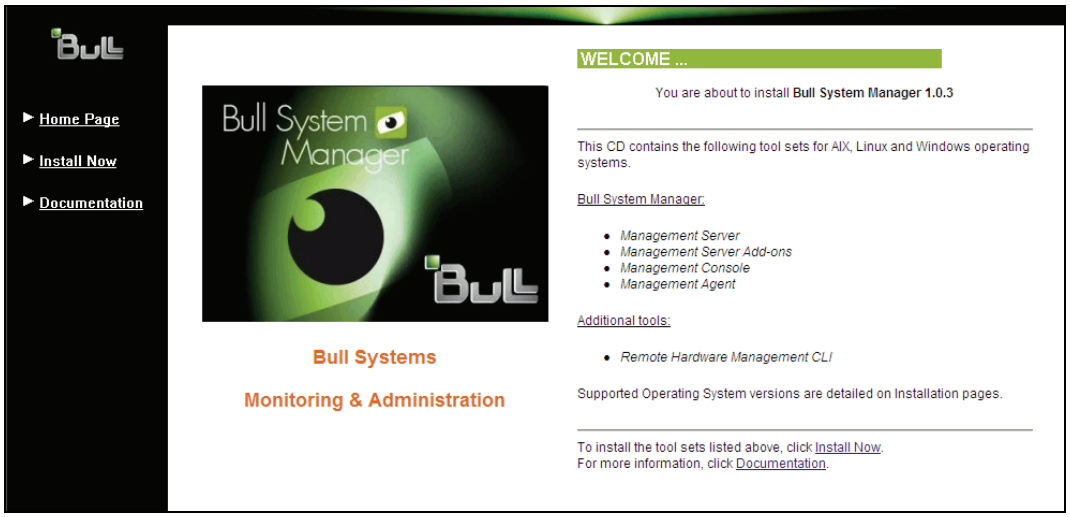


Figure 2-5. Linux Installation - Bull System Manager Welcome Page

5. Click **Install Now** to open the **Install** page, which allows the selection of the required Bull System Manager component:
   - Management Server Add-ons

   and provides the following information:
   - What to install?
   - What to do now?

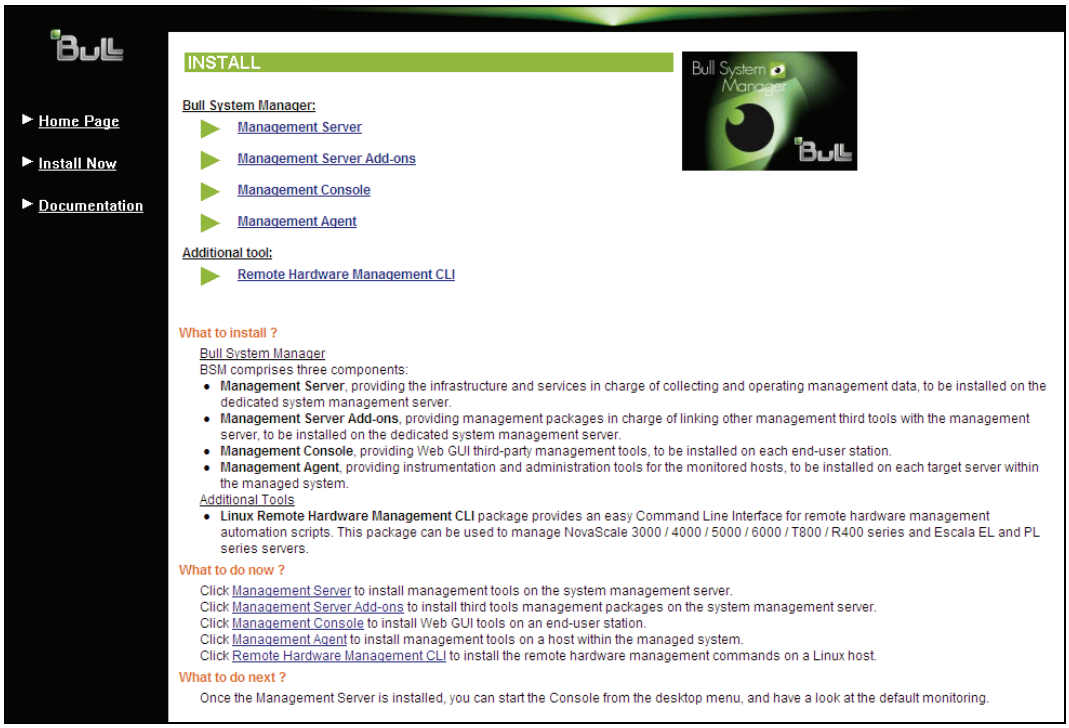


Figure 2-6. Linux Installation - Selecting Bull System Manager Components

6. Select **Management Server Add-ons**.

Figure 2-7. Linux Installation - Selecting Bull System Manager Server Add-ons

7. **Select an Add-ons family (Storage, Virtualization, Bull Application or Other Devices)**,

Select the **Linux 32 bits** operating system.

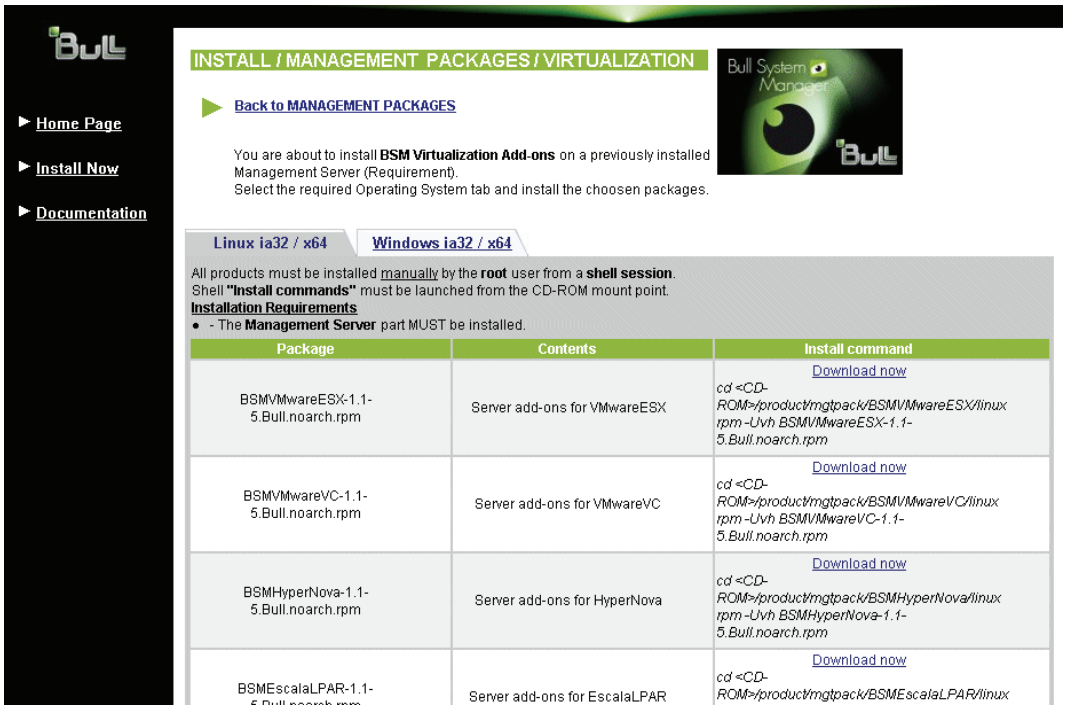


Figure 2-8. Linux Installation - Bull System Manager Server Add-Ons Install page

8. Install the selected **Bull System Manager Server Add-ons** packages as described below.

```
cd <CD-ROM mount point>/product/mgtpack/BSM<toolname>/linux

rpm –Uhv BSM<toolname>-1.1-x.noarch.rpm
```

2.3.3 Uninstalling Bull System Manager Server Add-on Components

1. Log on as **root**.
2. Launch the command:

```
rpm -e BSM<toolname>-1.1-x.noarch.rpm
```

2.3.4 Upgrading to a new Bull System Manager Server Add-ons Version

When upgrading to a new Bull System Manager Server Add-ons version, the existing Bull System Manager Add-ons environment that may have been customized is maintained.

Bull System Manager Add-ons are upgraded via the standard rpm installation command:

```
rpm -Uhv BSM<toolname>-1.1-x.noarch.rpm
```

Note When you upgrade the Bull System Manager Management Server, you MUST upgrade previous release installed server add-ons to benefit from new improvements.

See the *Release Notes* for more details about specific add-on migration, where applicable.

2.4 Monitoring Configuration

Configuring Bull System Manager Monitoring consists mainly in specifying the parameters required for monitoring tasks. Most configuration tasks are performed via the Bull System Manager Configuration GUI (Graphical User Interface).

Bull System Manager Server Add-ons extend the Monitoring configuration default rules the Administrator can customize. New monitoring categories and services are provided.

2.4.1 Configuration GUI

Bull System Manager provides a GUI to perform the main configuration tasks.

Starting the Configuration GUI

To start the Configuration GUI, either:

- From the Bull System Manager Console, click the  icon representing the Configuration GUI in the Administration zone (top right)
- Or click the **Configuration** link on the Bull System Manager Home Page, URL: **http://<Bull System Manager server name>/BSM**
- Or, from a WEB browser, go to the following URL: **http://<Bull System Manager server name>/BSM/config/**

2.4.2 Categories and Services

Bull System Manager Server Add-ons delivers more default monitoring categories and services. These categories and services depend on the Operating System running on the host:

- Services for Windows hosts will be applied to all hosts with a Windows operating system
- Services for Linux hosts will be applied to all hosts with a Linux operating system
- Services for hosts, independently of the Operating System, will be applied to all hosts.

The administrator can change the default-monitoring configuration by:

- **customizing services**, to define specific thresholds and monitoring properties or to modify the list of monitored hosts. A service can be customized to create one or more occurrences of this service with the same name. Each occurrence can have a different host list and different monitoring properties. For instance, if you do not want to monitor file systems in the same way on all Linux hosts, customize the **All** service in the **FileSystems** category.

Note The Administrator CANNOT modify the OS and/or model type of these monitoring services and categories, as internal tool semantic checks may reject such modifications.

- **cloning services**, to define new monitored elements. One or more services are created, with different names from the original names. All properties can be edited except the check command. For instance, to monitor a specific logical drive on a Windows system, clone the **C** service and modify the check command parameters,
- **customizing categories**, to restrict monitoring a whole category to a list of hosts,
- **creating a category**, to assign a set of cloned services to this category.

See the *Bull System Manager Administrator's Guide* for more details about configuration.

Chapter 3. Bull System Manager Server Add-ons Description

Bull System Manager Server Add-ons provides different functional items for each Management Package.

3.1 Internal Storage (Free)

3.1.1 BSMGAMTT for LSI MegaRAID 320-2x Management

GAMTT (or **GAM**) is the LSI tool used to survey, configure and control RAID provided by LSI MegaRAID Ultra320 SCSI cards.

See http://www.lsilogic.com/products/megaraid/index.html to download the GAMTT install package and for more information.

Note This tool runs on NovaScale machines under Linux or Windows.

The corresponding Bull System Manager Add-on creates monitoring links between Bull System Manager and the **GAM** SNMP agent.

The following figure shows the different monitoring components:

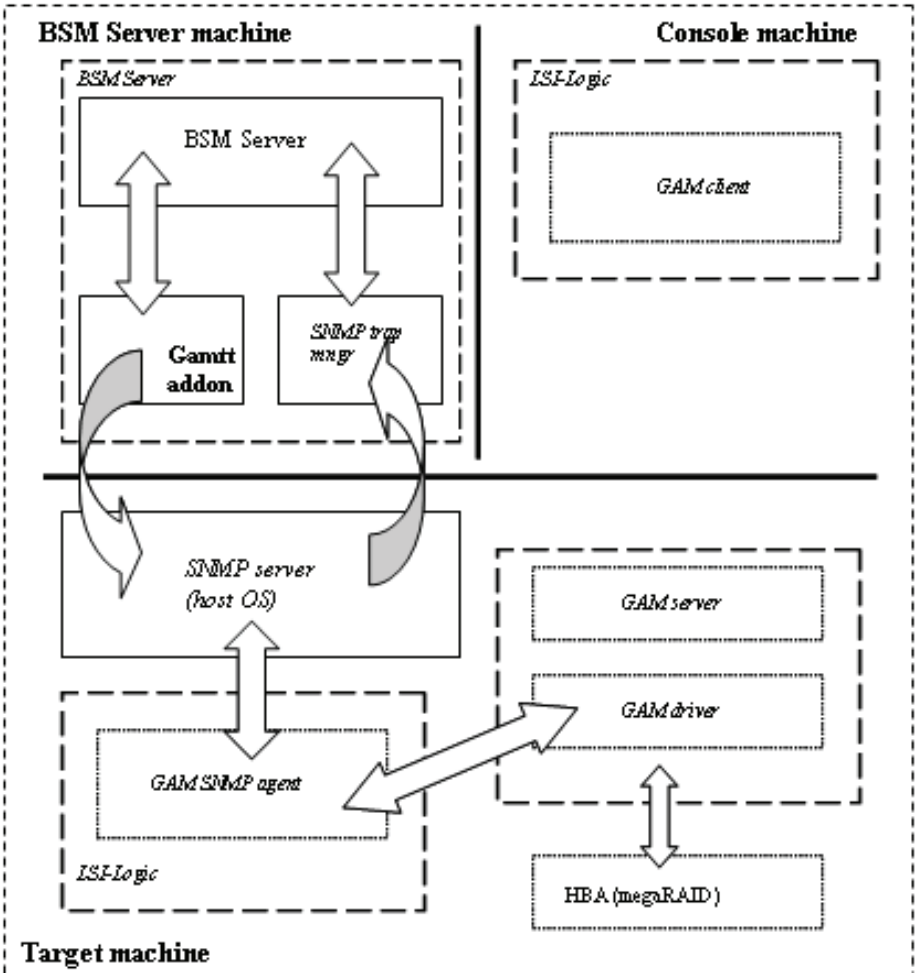


Figure 3-1. GAM Monitoring Components

3.1.1.1 Default Categories & Services (independent of OS type)

Targeted OS	Model	Category	Service	Check command
Any	any	GAMTTraid	Status	Check_gamttRAID
			Alerts	No check (SNMP trap receiver)

Table 3-1. GAMTT monitoring services

Notes

- This category is based on the **GAMTT** management product from **LSI**. This tool and especially its SNMP interface is a requirement for the **GAMTTraid** monitoring services. Check that this tool works on the targeted OS, if you want to use it for monitoring in Bull System Manager.
- The previous **MegaRAID** category (NovaScale Master release 4.0) is based on **PowerConsolePlus** management product from LSI. These two management products are functionally redundant but not compatible. So you need to replace the **MegaRAID** category and its services by **GAMTTraid** category and services, if you replace **PowerConsolePlus** by **GAMTT**.

3.1.1.2 GAMTTraid Category

Status For NovaScale and Express5800 hosts with an LSI (or Mylex) SCSI RAID card managed by GAMTT (or GAM) management tool. This service checks the Host RAID status reported by the associated GAMTT SNMP agent.

Alerts For NovaScale and Express5800 hosts. When an alert is sent from the GAMTT SNMP agent, it is processed by the Bull System Manager server.

Notes

- The **mlxraid.mib** mib is integrated in the Bull System Manager application.
- Do not forget to configure the agent to send SNMP traps to the Bull System Manager server by adding the Bull System Manager server host address to the SNMP managers list of this agent.

3.1.1.3 check_gamttRAID (any OS) Nagios command

The configurable Bull System Manager service check command syntax is:

```
check_gamttRAID!<community>!<port>!<timeout>!{ [-A {ALL|<Ct>}] |
[-P {ALL|<Ct>.<Ch>.<Tg>}] | [-L {ALL|<Ct>.<Ldn>}] }
```

Input

<community> SNMP community string (defaults to ”public”)

<port> SNMP port (defaults to 161)

<timeout> Seconds before timing out (defaults to Nagios timeout value)

-A, –adapter ALL | <Ct> Controller board

-P, –physical ALL | <Ct>.<Ch>.<Tg> Physical device addr

-L, –logical ALL | <Ct>.<Ldn> Logical drive addr

Output

See the output of the **check_gamttRAID** command in Appendix A.

Default syntax for "GAMTTraid.Status"

```
check_gamttRAID!public!161!60!-A ALL
```

3.1.2 BSMLSICIM for LSI 22320 Chip Management

LSI CIM is the LSI tool used to survey, configure and control RAID provided by LSI MegaRAID 22320 SCSI cards.

See http://www.lsilogic.com/products/megaraid/index.html for more information or for downloading the LSI CIM install package.

Note This tool runs on NovaScale machines under Linux or Windows.

The corresponding Bull System Manager Add-on creates monitoring links between Bull System Manager and the **LSI CIM** provider.

The following figure shows the different monitoring components:

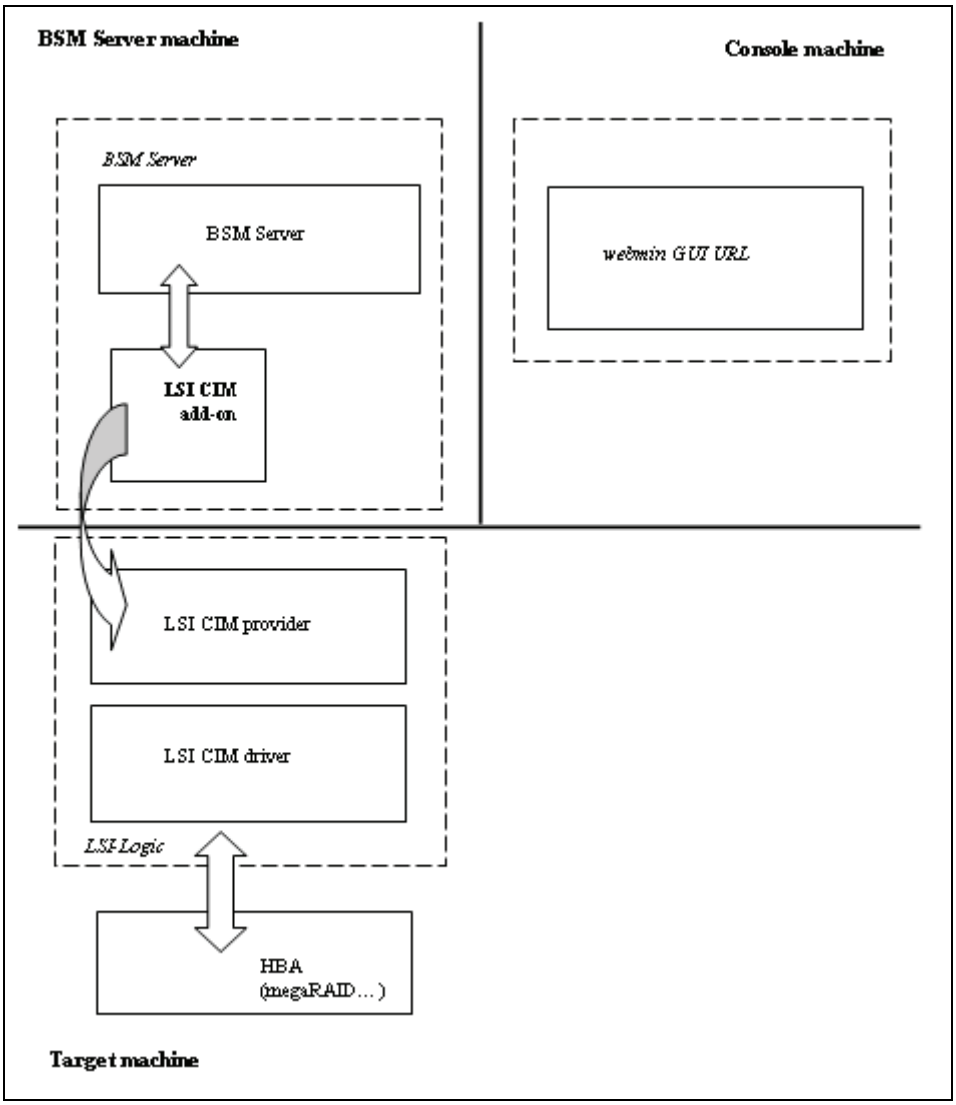


Figure 3-2. LSI CIM Monitoring Components

3.1.2.1 Default Categories & Services (independent of OS type)

Targeted OS	Model	Category	Service	Check command
Any	Any	LsiCIM	RAIDStatus	check_LSICIM
			CTRLstatus	check_LSICIM_ctrl

Table 3-2. LSI CIM monitoring services

Note This category is based on the LSI CIM management product. This tool is a requirement for the following **LsiCIM** monitoring services. Check that this tool works on the targeted OS, if you want to use it for monitoring in Bull System Manager.

LsiCIM Category

RAIDstatus For NovaScale and Express5800 hosts with an LSI SCSI RAID card managed by the LSI CIM management tool. This service checks the Host RAID status reported by the associated LSI CIM provider.

CTRLstatus For NovaScale and Express5800 hosts with an LSI SCSI RAID card managed by the LSI CIM management tool. This service checks the status of a specific RAID SCSI controller reported by the associated LSI CIM provider.

3.1.2.2 check_LSICIM (any OS) Nagios command

The configurable Bull System Manager service check command syntax is:

```
check_LSICIM
```

Input

N/A

Output

See the output of the **check_LSICIM** shell command in Appendix A.

Default syntax for "LsiCIM.CTRLstatus"

```
check_LSICIM
```

3.1.2.3 check_LSICIM_ctrl (any OS) Nagios command

The configurable Bull System Manager service check command syntax is:

```
check_LSICIM_ctrl![<ctrlname>]
```

Input

<ctrlname> Name of the controller to check

Note	The name of the controller must be protected with a quote if the name contains blank characters.

Output

See the output of the **check_LSICIM** shell command in Appendix A.

Default syntax for "LsiCIM.CTRLstatus"

```
check_LSICIM!'ctrlname'
```

3.1.3 BSMMegaRaidSAS (LSI MegaRAID SAS (IR) Management)

The corresponding Bull System Manager Add-on creates monitoring links between Bull System Manager and the LSI MegaRAID SAS(IR) SNMP agent.

It supports the adapters from MegaRAID SAS/SATA Value and Feature Line and the LSI SAS ICs 1064, 1068 and 1078.

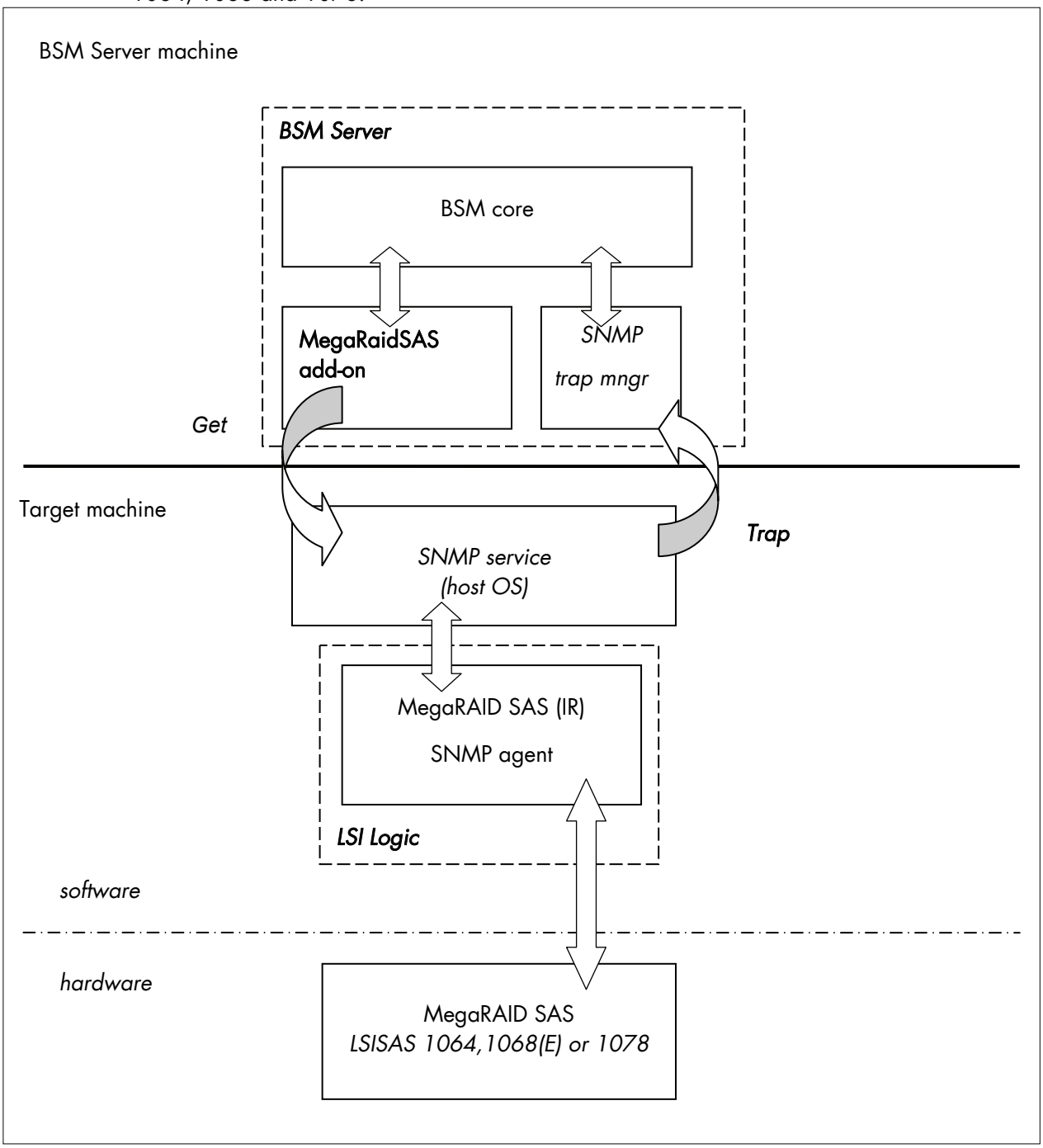


Figure 3-3. MegaRAID SAS Monitoring Components

3.1.3.1 Default Categories & Services (independent of OS type)

Targeted OS	Model	Category	Service	Check command
Any	Any	MegaRaidSAS	Status	check_MegaRAIDSAS
			Alerts	No check (SNMP trap receiver)
Any	Any	MegaRaidSAS_IR	Status	check_MegaRAIDSAS_IR
			Alerts	No check (SNMP trap receiver)

Table 3-3. MegaRaid SAS (IR) monitoring services

Note This category is based on the MegaRAID SAS (IR) SNMP agent. This SNMP interface is a requirement for the following MegaRaidSAS(-IR) monitoring services.

3.1.3.2 MegaRaidSAS(_IR) Category

Status For NovaScale hosts with a MegaRAID SAS card or an integrated LSI SAS chip managed by MegaRAID Storage Management tool. This service checks the MegaRAID SAS (IR) status reported by the MegaRAID SAS (IR) SNMP agent.

Alerts For NovaScale hosts with a MegaRAID SAS card or an integrated LSI SAS chip. When an alert is sent from the MegaRAID SAS (IR) SNMP agent, it is processed by the Bull System Manager Server.

Notes

- The **lsi-adaptersas(ir).mib** mib is integrated in the Bull System Manager application.
- Do not forget to configure the MegaRAID SAS (IR) SNMP agent to send SNMP traps to the Bull System Manager Server by adding the Bull System Manager Server host address to the agent's SNMP managers list.

3.1.3.3 check_MegaRaidSAS(_IR) (any OS) Nagios command

The configurable Bull System Manager service check command syntax is:

```
check_MegaRaidSAS(_IR)!<community>!<port>!<timeout>
```

See the **check_** `MegaRaidSAS(_IR)` command in Appendix A for parameters details.

Default syntax for "MegaRaidSAS(_IR).Status"

```
check_ MegaRaidSAS(_IR)!public!161!60
```

3.2 External Storage Server Add-ons

3.2.1 BSMStoreWayFDA (StoreWay FDA Management)

The corresponding Bull System Manager Add-on creates monitoring links between Bull System Manager and the StoreWay FDA SNMP agent and WEB GUI.

It supports the StoreWay FDA and StoreWay Optima families.

Note The access, through BSMConsole/Operations menu, to the administration Web GUI may not be operational for some StoreWay FDA or StoreWay Optima storage systems, due to a bug in their firmware release.

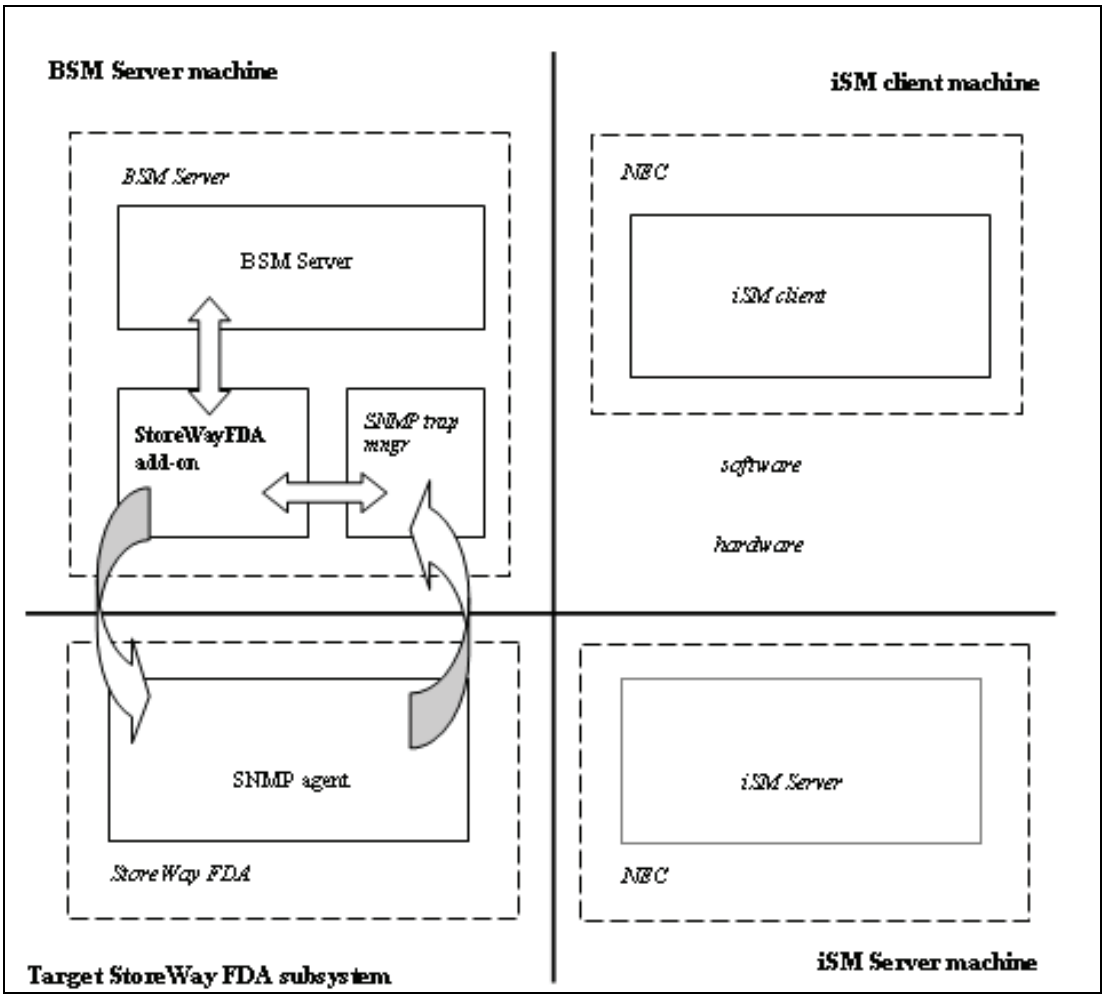


Figure 3-4. StoreWay FDA Monitoring Components

3.2.1.1 Default Categories & Services (independent of OS type)

Targeted OS	Model	Category	Service	Check command
Any	BayStoreWay FDA	StoreWayFDA	Status	check_NECFDA
			Alerts	No check (SNMP trap receiver)

Table 3-4. StoreWay FDA monitoring services

Note This category is based on the StoreWay FDA SNMP agent. This SNMP interface is a requirement for the StoreWayFDA monitoring services.

3.2.1.2 StoreWayFDA Category

Status For StoreWay FDA hosts managed via its SNMP agent. This service checks the StoreWay FDA status reported by the SNMP agent.

Alerts For StoreWay FDA hosts. When an alert is sent from the StoreWay FDA SNMP agent, it is processed by the Bull System Manager Server.

Notes

- The **Armg2_4.mib** mib is integrated in the Bull System Manager application.
- Do not forget to configure the StoreWay FDA agent to send SNMP traps to the Bull System Manager Server by adding the Bull System Manager Server host address to the agent's SNMP managers list.

3.2.1.3 check_NECFDA (any OS) Nagios command

The configurable Bull System Manager service check command syntax is:

```
check_storewayfda!<community>!<port>!<timeout>
```

See the **check_NECFDA** command in Appendix A for parameters details.

Default syntax for "StoreWayFDA.Status"

```
check_necfda!public!161!60
```

3.2.1.4 Bull System Manager Configuration

StoreWayFDA configuration for Bull System Manager is available from the configuration GUI by selecting **Topology** → **StoreWay** → **StoreWayFDAs**.

To edit a StoreWay FDA, select **Edit**.

To define a new StoreWay FDA in the Bull System Manager configuration database, click the **New StoreWay FDA** button and initialize the following attributes:

StoreWay FDA name name of the StoreWay FDA

description description

network name	bay netname
snmp port number	SNMP port number
snmp community	SNMP community

3.2.2 BSMEmcClariion (EMC CLARiiON Management)

The corresponding Bull System Manager Add-on creates monitoring links between Bull System Manager and the EMC Navisphere SNMP agent and WEB GUI.

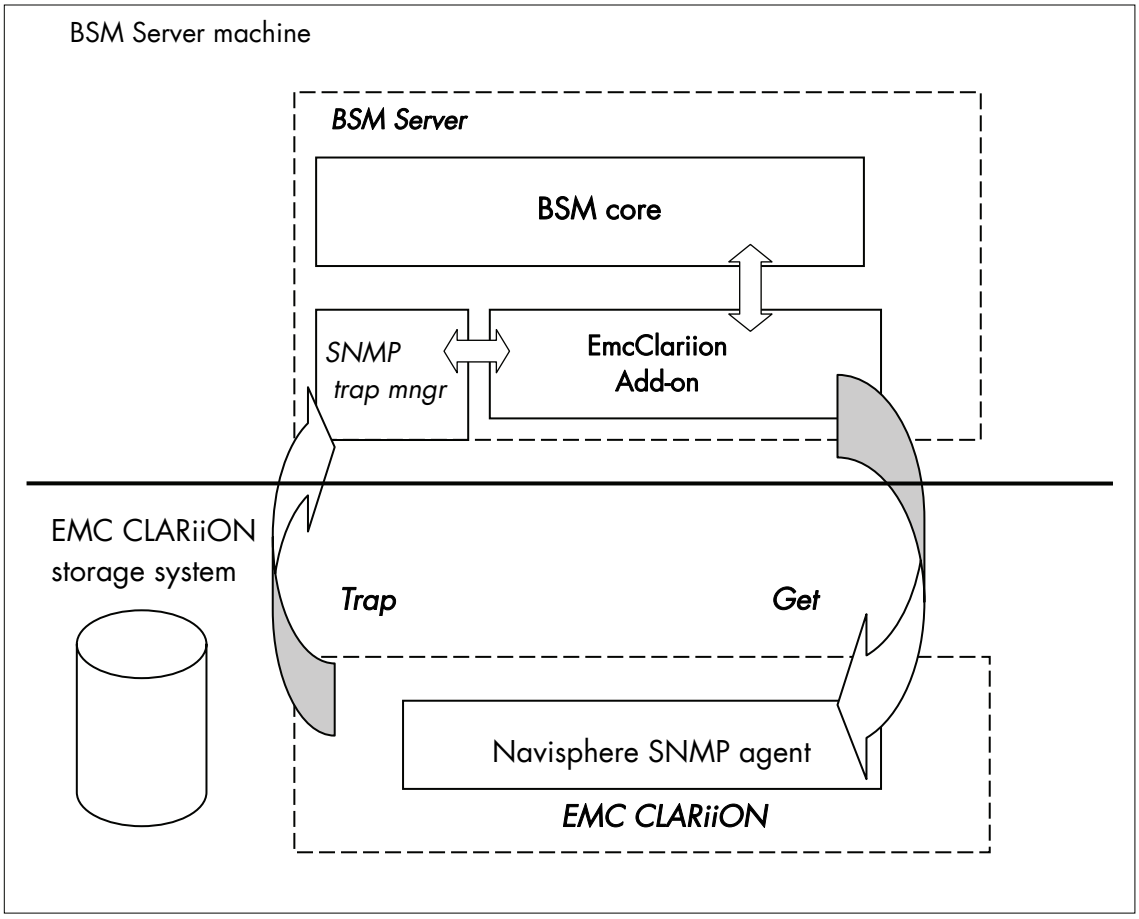


Figure 3-5. EMC CLARiiON Monitoring Components

3.2.2.1 Default Categories & Services (independent of OS type)

Targeted OS	Model	Category	Service	Check command
Any	bayEmcClariion	EmcClariion	Alerts	No check (SNMP trap receiver)
			Status	check_EMCCLARIION

Table 3-5. EmcClariion monitoring services

Note This category is based on the EMC Navisphere SNMP agent. This SNMP interface is a requirement for the EmcClariion monitoring services.

3.2.2.2 EmcClariion Category

Status For EMC CLARiiON hosts managed via Navisphere SNMP agent. This service checks the Emc Clariion status reported by the SNMP agent.

Alerts For EMC CLARiiON hosts. When an alert is sent from the Navisphere SNMP agent, it is processed by the Bull System Manager Server.

Notes

- The **clariion.mib** mib is integrated in the Bull System Manager application.
- Do not forget to configure the Navisphere agent to send SNMP traps to the Bull System Manager Server by adding the Bull System Manager Server host address to the agent's SNMP managers list.

3.2.2.3 check_EMCCLARIION (any OS) Nagios command

The configurable Bull System Manager service check command syntax is:

```
check_EmcClariion!<community>!<port>!<timeout>
```

See the **check_ EMCCLARIION** command in Appendix A for parameters details.

Default syntax for "EmcClariion.Status"

```
check_EmcClariion!public!161!60
```

3.2.2.4 Bull System Manager Configuration

EmcClariion configuration for Bull System Manager is available from the configuration GUI by selecting **Topology** → **StoreWay hosts** → **EmcClariions**.

To edit an EmcClariion, select **Edit**.

To define a new EmcClariion in the Bull System Manager configuration database, click the **New EMC CLARiiON** button and initialize the following attributes:

StoreWay EMC CLARiiON name	name of the EMC CLARiiON
description	description
network name	bay netname
SNMP port number	SNMP port number
SNMP community	SNMP community

3.2.3 BSMNetApp (NetApp Management)

The corresponding Bull System Manager Add-on creates monitoring links between Bull System Manager and the NetApp SNMP agent and WEB GUI.

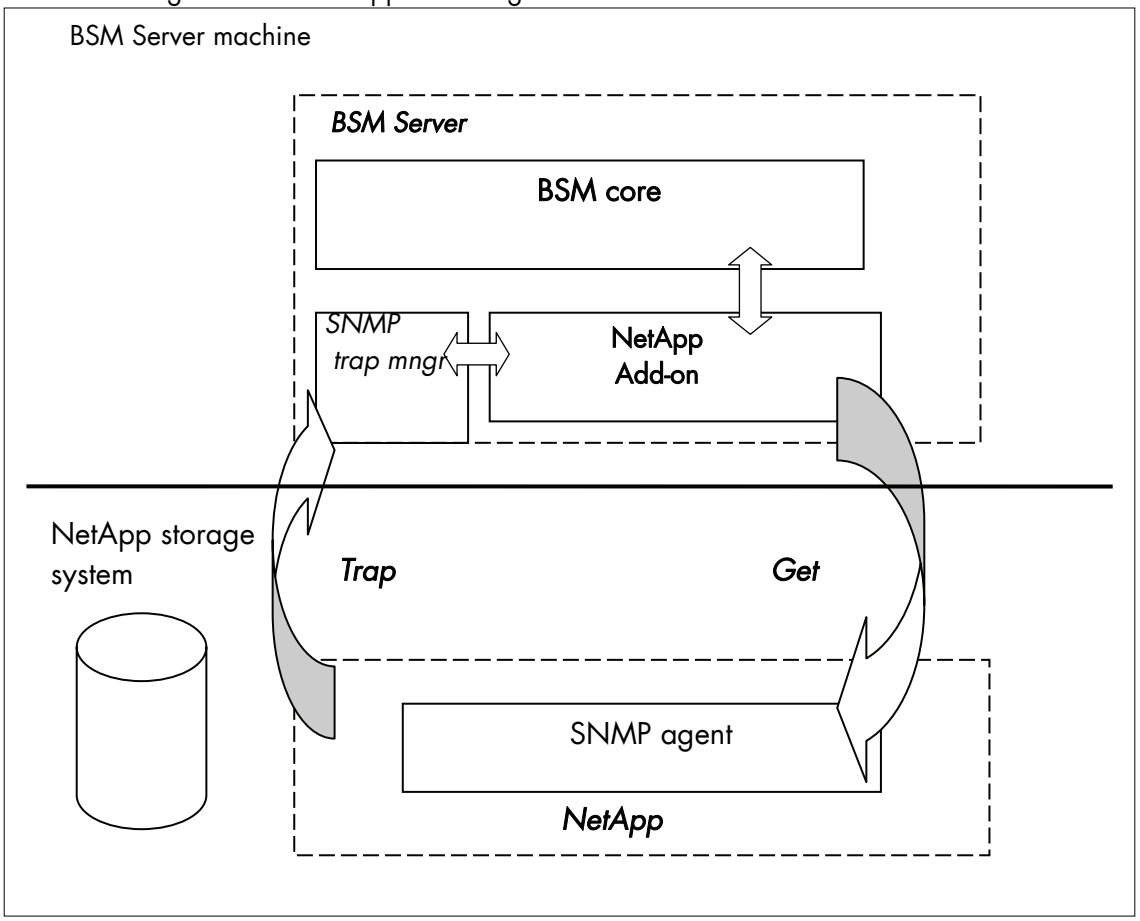


Figure 3-6. NetApp Monitoring Components

3.2.3.1 Default Categories & Services (independent of OS type)

Targeted OS	Model	Category	Service	Check command
any	bayNetApp	NetApp	Alerts	No check (SNMP trap receiver)
			CPULoad	check-netapp-cpuload
			Disks	check-netapp-numdisks
			Fans	check-netapp-failedfans
			GlobalStatus	check_netapp_globalstatus
			Power	check-netapp-failedpwr
			RAIDStatus	check_netappraid
			VolumeStatus	check_netappvol

Table 3-6. NetApp monitoring services

Note This category is based on the NetApp SNMP agent. This SNMP interface is a requirement for the NetApp monitoring services.

3.2.3.2 NetApp Category

CPULoad For NetApp hosts managed via its SNMP agent. This service checks the NetApp CPU load reported by the SNMP agent.

Disks For NetApp hosts managed via its SNMP agent. This service checks the status of the NetApp disks reported by the SNMP agent.

Fans For NetApp hosts managed via its SNMP agent. This service checks the status of the NetApp fans reported by the SNMP agent.

GlobalStatus For NetApp hosts managed via its SNMP agent. This service checks the NetApp Global Status reported by the SNMP agent.

Power For NetApp hosts managed via its SNMP agent. This service checks the status of the NetApp power supplies reported by the SNMP agent.

RAIDStatus For NetApp hosts managed via its SNMP agent. This service checks the NetApp RAID status reported by the SNMP agent.

VolumeStatus For NetApp hosts managed via its SNMP agent. This service checks the NetApp volume status reported by the SNMP agent.

Alerts For NetApp hosts. When an alert is sent from the NetApp SNMP agent, it is processed by the Bull System Manager Server.

Notes

- The **netapp.mib** mib is integrated in the Bull System Manager application.
- Do not forget to configure the NetApp agent to send SNMP traps to the Bull System Manager Server by adding the Bull System Manager Server host address to the agent's SNMP managers list.

3.2.3.3 Reporting Indicators

A reporting indicator is defined for the CPU load of the NetApp storage system. It gets values from the corresponding monitoring service.

Indicator applied to the NetApp Host

Indicator	Corresponding Service
<NetApp_host>_CPULoad	CPULoad

3.2.3.4 Nagios check commands

check-netapp-cpuload (any OS) Nagios command

The Bull System Manager service check command syntax is:

```
check_snmp -C public -o .1.3.6.1.4.1.789.1.2.1.3.0 -w 90 -c 95 -u '%' -l "CPU
LOAD"
```

See the **check-netapp-cpuload** command in Appendix A for details.

check-netapp-numdisks (any OS) Nagios command

The Bull System Manager service check command syntax is:

```
check_snmp -C public -o .1.3.6.1.4.1.789.1.6.4.1.0,
.1.3.6.1.4.1.789.1.6.4.2.0, .1.3.6.1.4.1.789.1.6.4.8.0,
.1.3.6.1.4.1.789.1.6.4.7.0 -u 'Total Disks','Active','Spare','Failed' -l ""
```

See the **check-netapp-numdisks** command in Appendix A for details.

check-netapp-failedfans (any OS) Nagios command

The Bull System Manager service check command syntax is:

```
check_snmp -C public -o .1.3.6.1.4.1.789.1.2.4.3.0 -l "Fans"
```

See the **check-netapp-failedfans** command in Appendix A for details.

check_netapp_globalstatus (any OS) Nagios command

The configurable Bull System Manager service check command syntax is:

```
check_NetAppGlobalStatus!<community>!<port>!<timeout>
```

See the **check_netapp_globalstatus** command in Appendix A for parameters details.

Default syntax for "NetApp.GlobalStatus":

```
check_ NetAppGlobalStatus!public!161!60
```

check-netapp-failedpwr (any OS) Nagios command

The Bull System Manager service check command syntax is:

```
check_snmp -C public -o .1.3.6.1.4.1.789.1.2.4.5.0 -l "Power"
```

See the **check-netapp-failedpwr** command in Appendix A for details.

check_netappraid (any OS) Nagios command

The configurable Bull System Manager service check command syntax is:

```
check_NetAppRaid!<community>!<port>!<timeout>
```

See the **check_netappraid** command in Appendix A for parameters details.

Default syntax for "NetApp.RAIDStatus":

```
check_NetAppRaid!public!161!60
```

check_netappvol (any OS) Nagios command

The configurable Bull System Manager service check command syntax is:

```
check_NetAppVol!<community>!<port>!<timeout>
```

See the **check_netappvol** command in Appendix A for parameters details.

Default syntax for "NetApp.VolumeStatus":

```
check_NetAppVol!public!161!60
```

3.2.3.5 Bull System Manager Configuration

NetApp configuration for Bull System Manager is available from the configuration GUI by selecting **Topology** → **StoreWay hosts** → **NetApps**.

To edit a NetApp, select **Edit**.

To define a new NetApp in the Bull System Manager configuration database, click the **New NetApp** button and initialize the following attributes:

StoreWay NetApp name	name of the NetApp
description	description
network name	bay netname
SNMP port number	SNMP port number
SNMP community	SNMP community

3.2.4 BSMWaterCooledDoor (Water Cooled Door Management)

The corresponding Bull System Manager Add-on creates monitoring links between Bull System Manager and the Baseboard Management Controller of the Bull Water Cooled Door device and its WEB GUI.

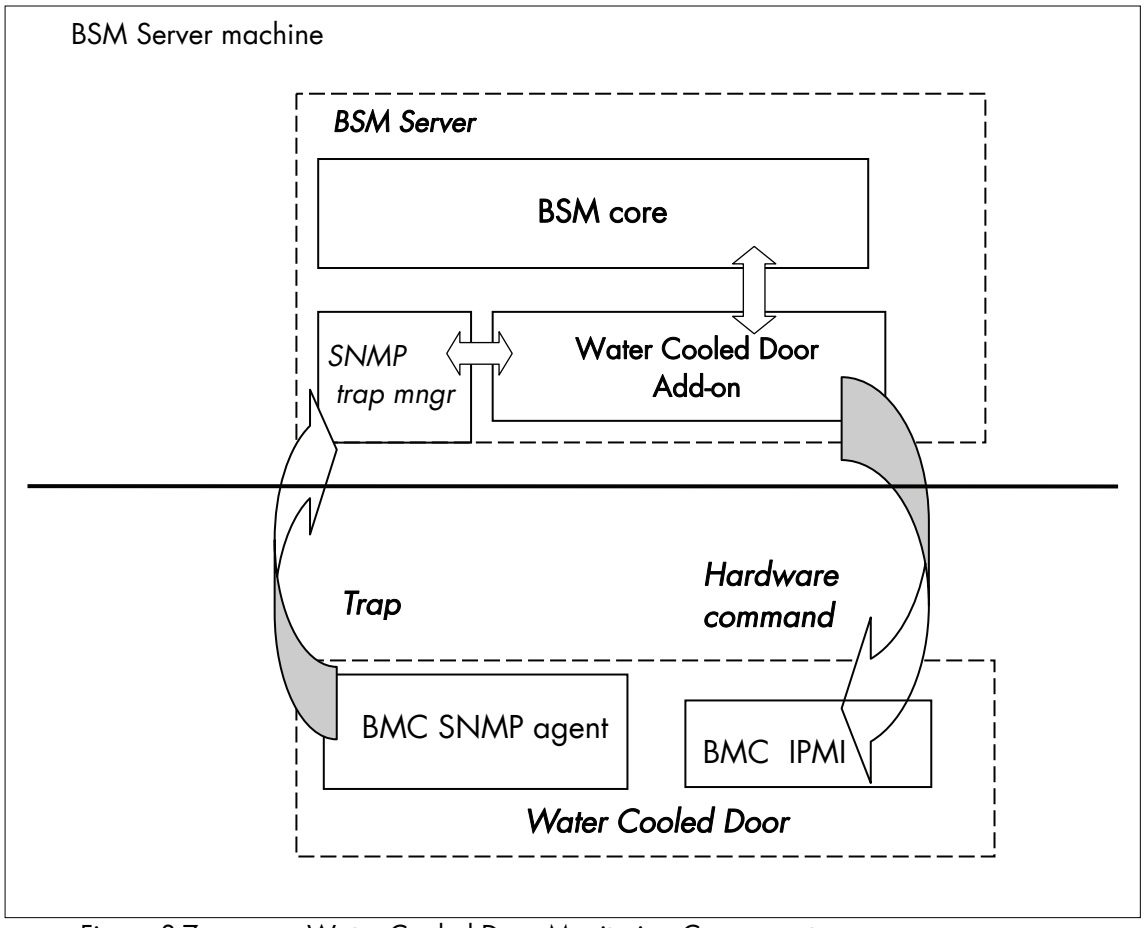


Figure 3-7. Water Cooled Door Monitoring Components

3.2.4.1 Default Categories & Services (independent of OS type)

Targeted OS	Model	Category	Service	Check command
any	devWaterCooledDoor	Hardware	Alerts	No check (SNMP trap receiver)
			PowerStatus	check_IPMI_powerstatus
		Sensors	CurrentPower	check_IPMI_sensor
			DeltaPressure	check_pressure
			TemperatureAverage	check_IPMI_sensor
			ValveAperture	check_IPMI_sensor

Table 3-7. Water Cooled Door monitoring services

Note These categories are based on the IPMI Hardware commands. The IPMI interface is a requirement for the WaterCooledDoor monitoring services.

3.2.4.2 Hardware Category

PowerStatus For **WaterCooledDoor** hosts managed via IPMI Hardware commands. This service checks the WaterCooledDoor power status reported by the BMC.

Alerts For **WaterCooledDoor** hosts. When an alert is sent from the WaterCooledDoor SNMP agent, it is processed by the Bull System Manager Server.

Note The **WaterCooledDoorMIB.mib** is integrated in the Bull System Manager application. The Alerts service inherits also from the **bmclanpet.mib**, which is also integrated in the Bull System Manager application.

3.2.4.3 Sensors Category

CurrentPower For WaterCooledDoor hosts managed via IPMI Hardware commands. This service checks the power consumption of the WaterCooledDoor reported by the BMC.

DeltaPressure For WaterCooledDoor hosts managed via IPMI Hardware commands. This service checks the in/out pressure difference of the water circuit of the WaterCooledDoor reported by the BMC.

TemperatureAverage For WaterCooledDoor hosts managed via IPMI Hardware commands. This service checks the temperature average of the different temperature sensors of the WaterCooledDoor reported by the BMC.

ValveAperture For WaterCooledDoor hosts managed via IPMI Hardware commands. This service checks the cooled water circuit valve aperture reported by the BMC.

Note Do not forget to configure the BMC's SNMP agent to send SNMP traps to the Bull System Manager Server by adding the BSM Server host address to the SNMP managers list.

3.2.4.4 Reporting Indicators

Reporting indicators are defined for the WaterCooledDoor host. They get values from the corresponding monitoring services.

Indicators applied to the WaterCooledDoor Host

Indicator	Corresponding Service
<WaterCooledDoor_host>_CurrentPower	Sensors.CPULoad
<WaterCooledDoor_host>_DeltaPressure	Sensors.DeltaPressure
<WaterCooledDoor_host>_TemperatureAverage	Sensors.TemperatureAverage
<WaterCooledDoor_host>_ValveAperture	Sensors.ValveAperture

3.2.4.5 Nagios check commands

check_IPMI_powerstatus (any OS) Nagios command

The Bull System Manager service check command syntax is:

```
check_IPMILAN_powerstatus
```

See the **check_IPMI_powerstatus** command in Appendix A for details.

check_pressure (any OS) Nagios command

The Bull System Manager service check command syntax is:

```
check_sensor!'Air Pressure'
```

See the **check-sensor** command in Appendix A for details.

check_IPMI_sensor (any OS) Nagios command

The configurable Bull System Manager service check command syntax is:

```
check_sensor!<sensor>
```

See the check_sensor command in Appendix A for parameters details.

3.2.4.6 Bull System Manager Configuration

WaterCooledDoor configuration for Bull System Manager is available from the configuration GUI by selecting **Topology** → **Device hosts** → **WaterCooledDoors**.

To edit a **WaterCooledDoor**, select **Edit**.

To define a new **WaterCooledDoor** in the Bull System Manager configuration database, click the **New Water Cooled Door** button and initialize the following attributes:

Water Cooled Door name	Name of the **Water Cooled Door**
description	Description
network name	Address IP of Water Cooled Door's BMC
user	User name to access the BMC
password	Password associated to the user name

3.2.5 BSMStoreWayDPA (StoreWay DPA Management)

The corresponding Bull System Manager Add-on creates monitoring links between Bull System Manager and the StoreWay DPA SNMP agent and WEB GUI.

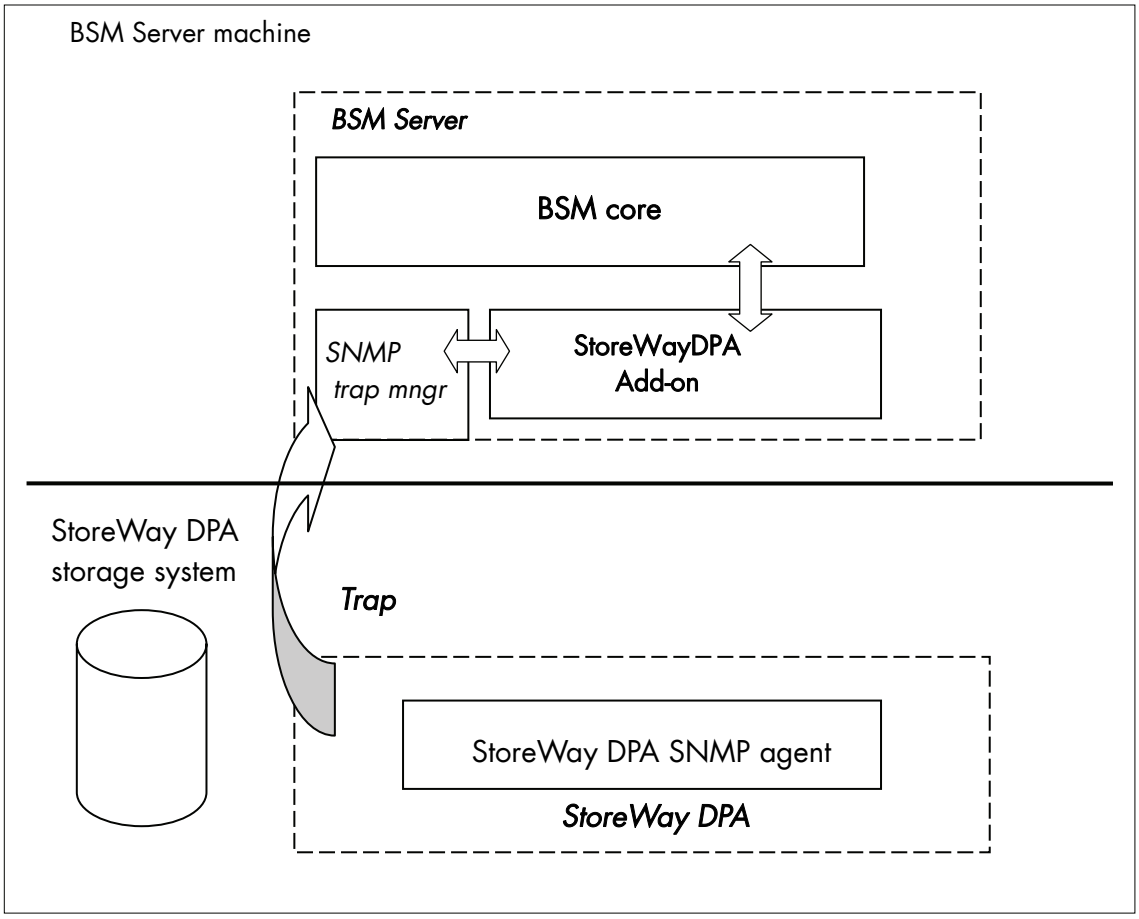


Figure 3-8. StoreWayDPA Monitoring Components

3.2.5.1 Default Categories & Services (independent of OS type)

Targeted OS	Model	Category	Service	Check command
Any	bayStoreWayDPA	StoreWayDPA	Alerts	No check (SNMP trap receiver)
			TaskStatus	check_StoreWayDPA

Table 3-8. StoreWayDPA monitoring services

Note This category is based on the StoreWay DPA SNMP agent. This SNMP interface is a requirement for the StoreWayDPA monitoring services.

3.2.5.2 StoreWayDPA Category

TaskStatus For StoreWay DPA hosts managed via its SNMP agent. This service checks the StoreWay DPA Backup Engine and Task Launcher status reported by the SNMP agent.

Alerts For StoreWay DPA hosts. When an alert is sent from the StoreWay DPA SNMP agent, it is processed by the Bull System Manager Server.

Notes

- The storewaydpa**.mib** mib is integrated in the Bull System Manager application.
- Do not forget to configure the StoreWay DPA agent to send SNMP traps to the Bull System Manager Server by adding the Bull System Manager Server host address to the agent's SNMP managers list.

3.2.5.3 Nagios check commands

Check_StoreWayDPA (any OS) Nagios command

The Bull System Manager service check command syntax is:

check_StoreWayDPA!<community>!<port>!<timeout>

See the **check_ StoreWayDPA** command in Appendix A for parameters details.

Default syntax for "StoreWayDPA.TaskStatus"

`check_` StoreWayDPA`!public!161!60`

3.2.5.4 Bull System Manager Configuration

StoreWayDPA configuration for Bull System Manager is available from the configuration GUI by selecting **Topology** → **StoreWay hosts** → **StoreWayDPAs**.

To edit an StoreWayDPA, select **Edit**.

To define a new StoreWayDPA in the Bull System Manager configuration database, click the **New StoreWay DPA** button and initialize the following attributes:

StoreWay StoreWay DPA name	name of the StoreWay DPA
description	description
network name	bay netname
SNMP port number	SNMP port number
SNMP community	SNMP community

3.3 Virtualization Server Add-ons

3.3.1 Overview

The Bull System Manager Server Virtualization Add-ons deliver an optional management package to manage virtual machines. A virtualization Add-on can provide:

- Supervision features to detect abnormalities and notify them to defined entities,
- Administration features to perform actions on elements.

3.3.1.1 Definitions

Virtualization Add-ons use specific topology elements:

- **Native Operating System** (Native OS):
  the virtualization layer installed on a physical machine that hosts virtual machines. It is represented by a Bull System Manager host with a specific OS (specified by the Add-on).
- **Virtual Machine** (VM):
  a machine that is hosted by a native OS. It is represented by a Bull System Manager host with a specific model (specified by the Add-on).
- **Virtual Platform**:
  the set of virtual machines and native OS deployed on a physical machine.
- **Virtual Manager**:
  the interface used to manage the virtual elements.

3.3.1.2 Topology Representation

The elements of a virtual platform are displayed in the Bull System Manager Console views.

To load a specific view, click the  icon at the top of the Tree frame to select a view among available views, as displayed below :

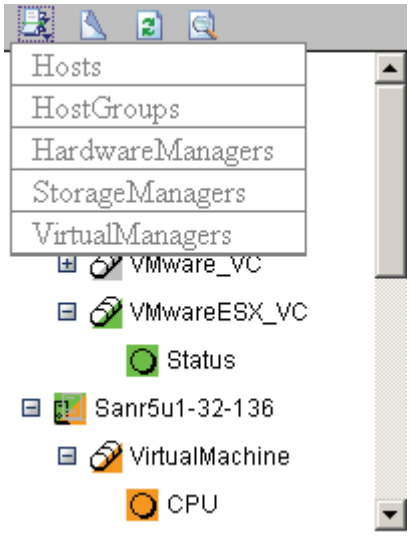


Figure 3-9. BSM Console Views

- From the **Hosts** view, only the native OS and VM hosts are displayed. VM hosts are represented with the specific icon .
- From the **Virtual Managers** view, the virtual platform is displayed as shown in the following figure:

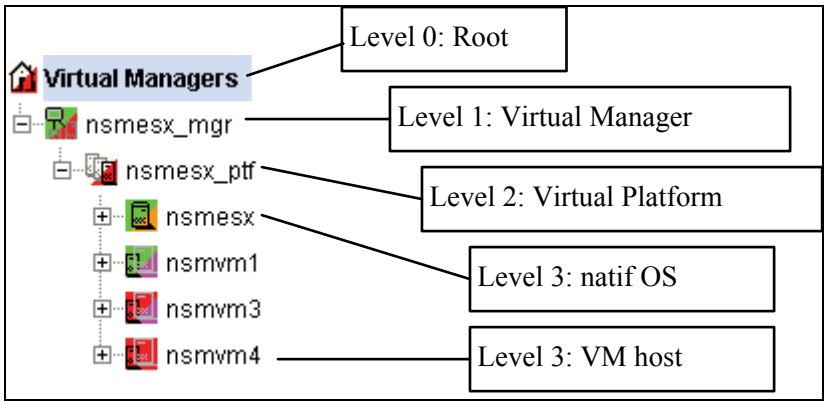


Figure 3-10. Virtual Managers view

Under the root node, the first node is the Virtual Manager that administrates the Virtual Platform. The Virtual Platform contains the native host and the VM hosts.
When you select a node, information about the elements are displayed in the Application pane.

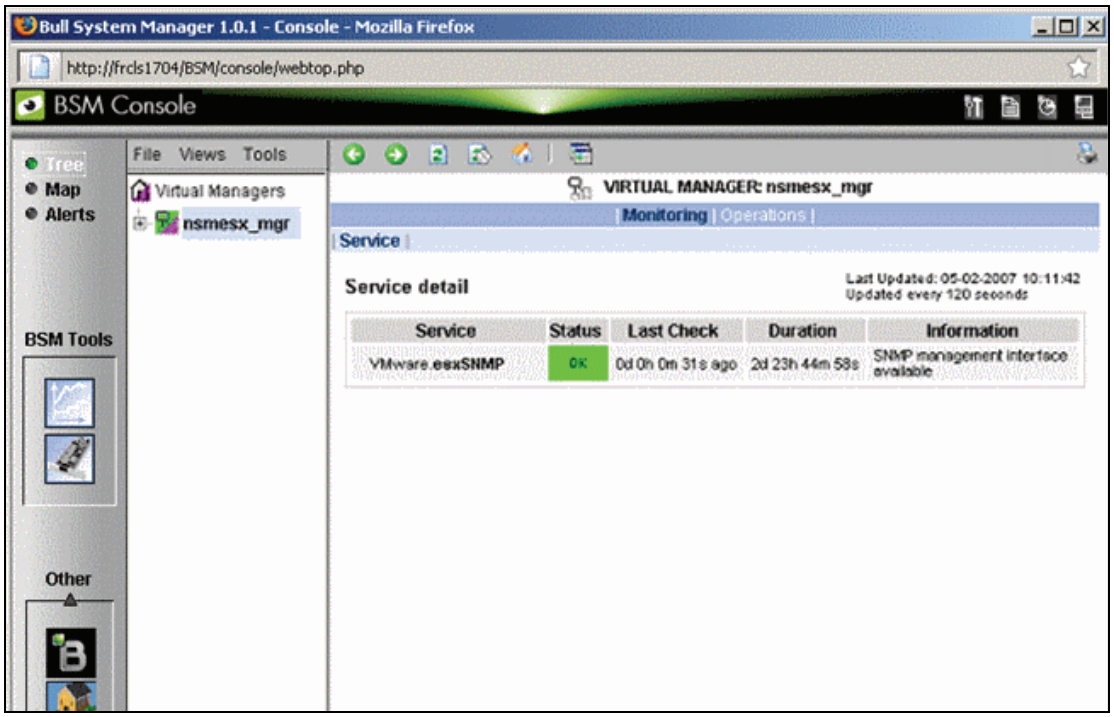


Figure 3-11. Virtual Manager information pane

3.3.2 BSMVMwareESX for "VMware ESX" Management

3.3.2.1 Overview

The **VMware ESX** server is a virtualization layer that abstracts processor, memory, storage and networking resources into multiple virtual machines.
The VMwareESX Add-on provides functional links to manage the virtual machines hosted by the ESX server.

Note The link is functional with the version 3 of the ESX server and with the version 4 with some restrictions (see *Virtualization Supervision* on page 50 for detailed informations).

The VMwareESX Add-on retrieves VM and native OS monitoring information via the VMware Service Console SNMP interface and allows the Web Virtual Interface to be launched from the Bull System Manager Console.
The following figure shows the link between each component:

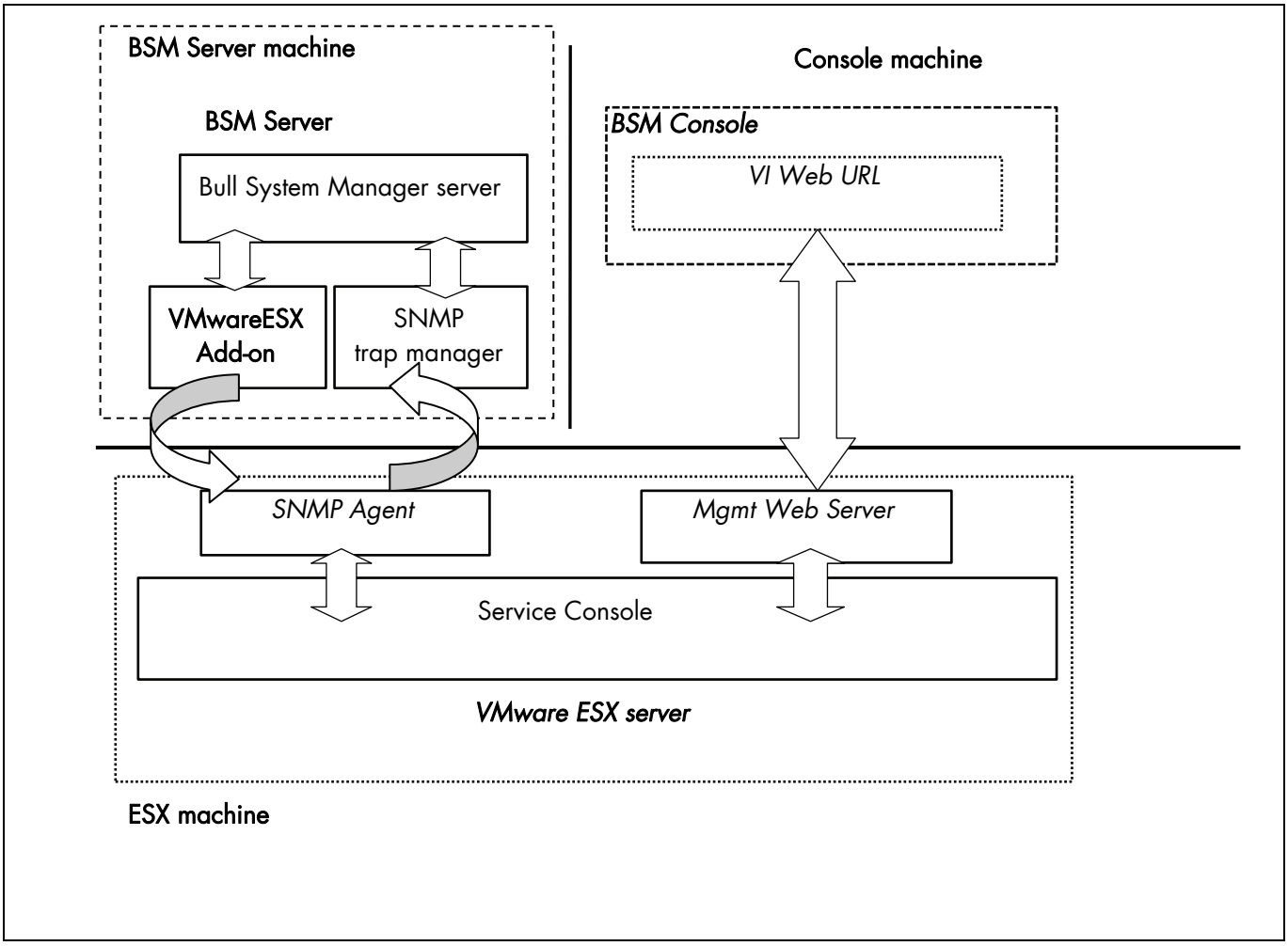


Figure 3-12. VMwareESX Add-on components

Note The SNMP agent of the ESX server must be configured to receive SNMP requests from and to send traps to the Bull System Manager Server. Web access requires specific configuration of the Web client. For detailed information about these procedures, see the VMware Infrastructure documentations available at http://www.vmware.com/support/pubs/vi_pubs.html (for ESX3) or at http://www.vmware.com/support/pubs/vs_pubs.html. (for ESX4)

3.3.2.2 Bull System Manager Configuration

To configure the monitoring elements for the VMwareESX Add-on, you have to define an ESX Virtual Platform from the Bull System Manager Configuration GUI. Native OS, VMs, related monitoring services and reporting indicators are defined in one easy step.
The native OS is represented by a BSM host with the OS: **ESX**.
VMs are represented by a BSM host with the model: **VMware**.

Notes

- ESX server can be supervised with the VMwareESX and with VMwareVC add-ons (see *BSMVMwareVC for "Virtual Center" Management*, on page *55*).
- VM must be supervised either with the VMwareESX or either with VMwareVC add-ons(see BSMVMwareVC for "Virtual Center" Management, on page *55*).

3.3.2.2.1 ESX Virtual Platform

To configure an ESX Virtual Platform, click the **VMware ESX** link in the Virtualization part of the Topology domain. The list of all configured platforms appears, as in the following example:

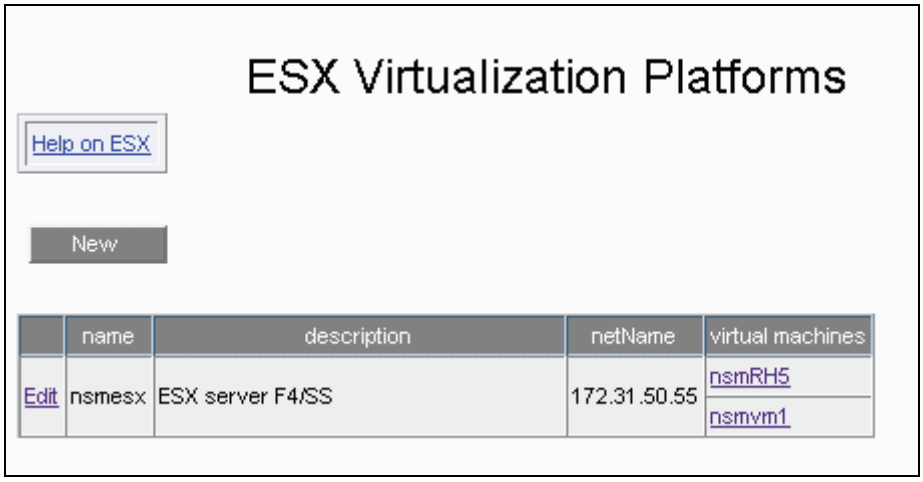


Figure 3-13. ESX Virtual Platforms page

It is possible:

- To create a new ESX Virtual Platform using the **New** button
- To edit or delete a resource using the **Edit** link
- To edit a virtual machine using the **<hostname>** link.

When you click the **New** button, the following display appears with all resource properties:

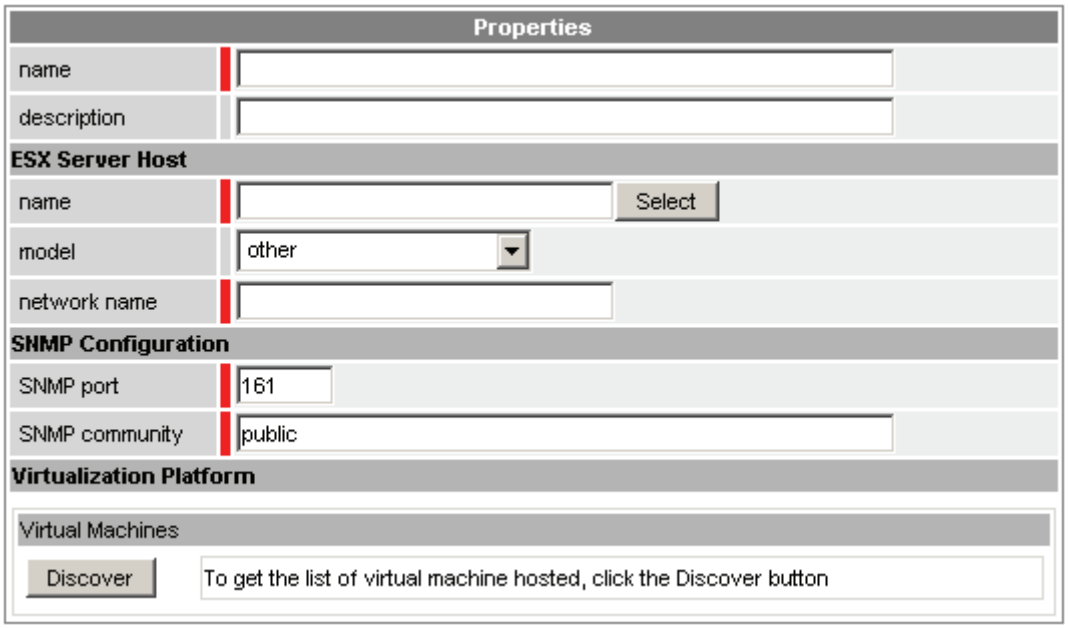


Figure 3-14. ESX Platform Properties

Besides the characteristics (name and description) of the main object, the properties of an ESX virtual platform are divided into three-parts:

- **ESX Server Host**: used to define the physical machine and the native OS.
- **SNMP Configuration**: used to configure SNMP interface data.
- **Virtualization Platform**: used to describe the Vmware ESX platform virtual machine.

ESX Server Host Properties

name	ESX host short name. This name is displayed in the Bull System Manager Console views. Click **Select** to choose a defined host from the BSM host list.
model	Host model (see the *Bull System Manager Administrator's Guide* for values).
network name	ESX host network name (hostname or IP address).

Note To supervise an ESX server supervised with the VMwareVC add-on and with the VMwareESX add-on, you must first define the ESX server as an ESX virtualization platform without VM.

SNMP Configuration Properties

SNMP port	SNMP agent port.
SNMP configuration	SNMP agent community.

Virtualization Platform Properties

Virtual Machines	List of the VMs established by selecting the VMs obtained by requests to the ESX server SNMP agent. The request is performed by clicking the **Discover** button (or **Re-discover** if in edition mode). See below the complete description of the procedure.

Note If VMs are linked to the ESX server, this could not be supervised later with the VMwareVC add-on.

Virtual Machines Discovery

The result of the discovery is displayed as a table composed of three parts:

- the left column allows you to select the VMs to be associated to the platform
- the center part displays Virtual Machine Configuration as defined on the VMware ESX server
- the right part allows you to edit the main properties (name, network name and OS) of the corresponding BSM host. The host can be edited only if the corresponding VM is selected. You can select an already defined host by clicking the **Select** button or you can create a host by completing the corresponding fields.

Note When you select an already defined host, you cannot change its network name and OS. But the Select contains a Default Option corresponding to the VM name, that can be edited. If the VM name contains space(s), they are replaced by underscore(s) in the host label.

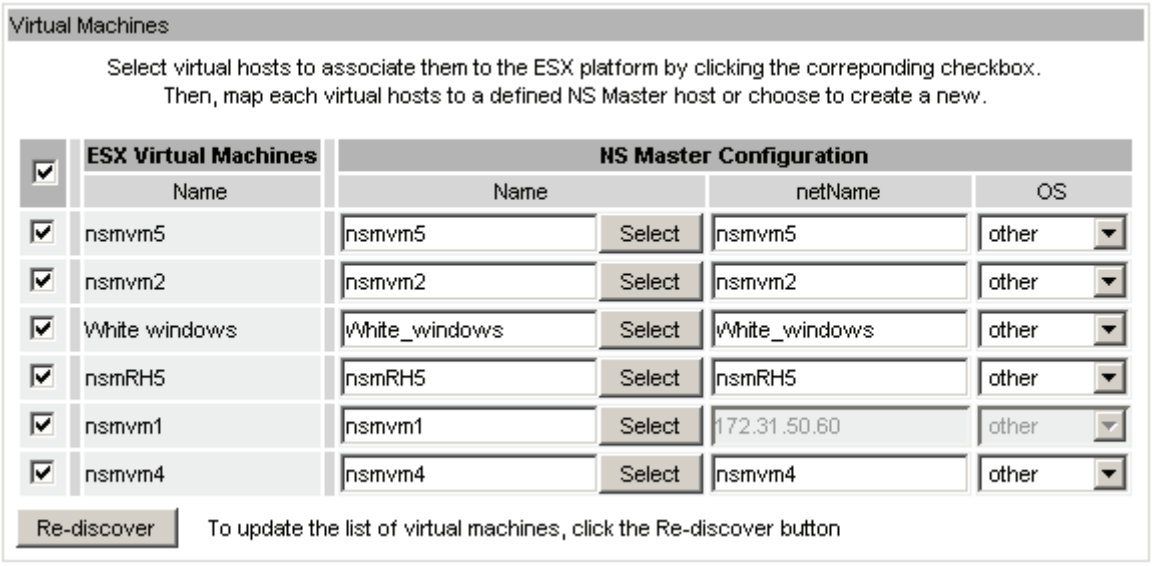


Figure 3-15. ESX Virtual Machines pane

Virtual Machines Re-Discovery

Re-Discovery is required to check that the current BSM configuration still matches the VMware ESX configuration in order to:

- Add virtual machine not yet registered in the VMware ESX Virtualization Platform
- Remove virtual machine no more defined in the VMware ESX configuration.

During the Re-discovery step, if the current configuration is not compatible with VMware ESX configuration, the invalid VMs are displayed in red and the VMs not referenced in the current BSM configuration are displayed in green.

VMs no longer defined in VMware ESX are automatically unchecked and will be removed from the platform on form validation. New VMs must be explicitly checked for being added in the platform to be linked to the platform on form validation.

Note How to Add, Delete or Modify Virtual Machine is detailed in 3.3.2.2.2 *Virtual Machine Edition*, on page 49.

After edition:

- Click **OK** to validate your edition
- Or click **Cancel** to return to Virtual Platforms pages without changes
- Or click **Delete** to remove the Virtual Platform and maintain the hosts corresponding to the VMs and the VMware ESX server
- Or click **DeleteAll** to remove the Virtual Platform and the hosts corresponding to the VMs and the VMwareESX server.

Note Edition with a **Topology modification** requires confirmation: a page listing all modifications to be applied to the Topology configuration is displayed, as shown in the following figure.

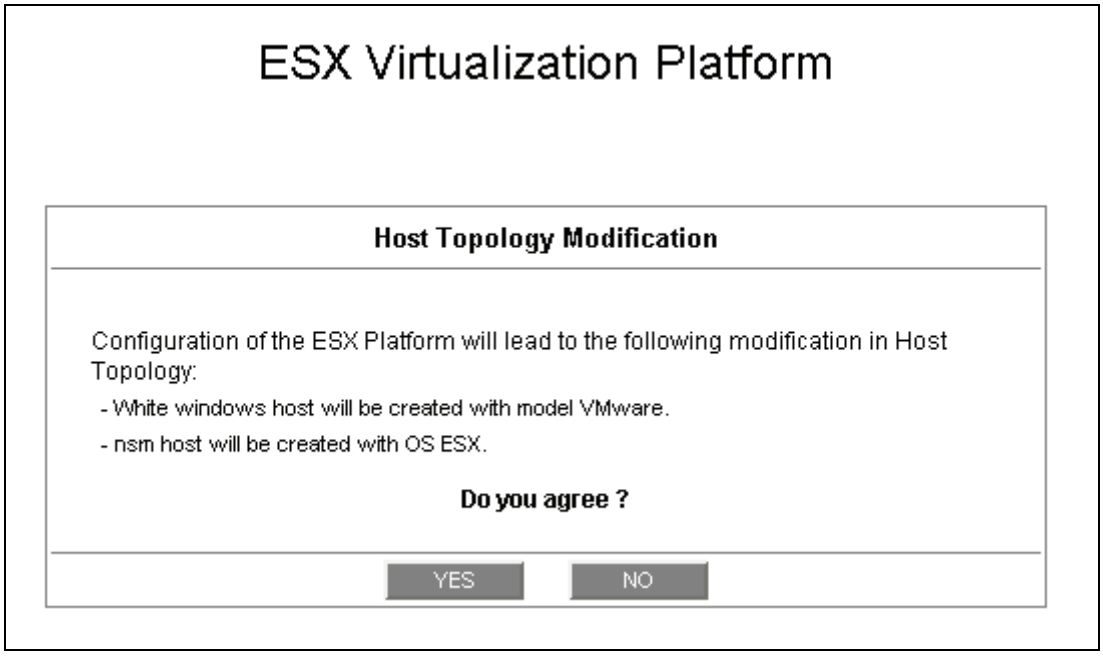


Figure 3-16. Host Topology modification confirmation

If you do not agree, click **NO** to return to the platform edition page, otherwise click **YES** to create the virtual platform.

Related ESX Virtualization platform Objects

When an ESX Virtualization platform is defined, related objects are automatically generated to configure the specific Supervision linked to this type of server. The following table describes the objects generated during the creation of the platform.

Type	Description
host VMware	As defined in the Virtual Machine configuration part of the edition page.
host ESX	Host corresponding to the virtualization layer, as defined in the ESX server Host configuration part.
hostgroup	hostgroup representing the physical platform, named <platformName>.
manager	Virtualization manager representing the management interface, named < platformName>_mgr.
categories and services	The VMwareESX category and related services are instantiated for the ESX host. The VirtualMachine category and related services are instantiated for each VMware host.

3.3.2.2.2 Virtual Machine Edition

A virtual machine is represented by a host linked to the VMware ESX Virtualization platform. It has properties linked to the platform and properties of a host object.

Adding, removing or modifying properties linked to the platform must be done from the VMware Virtualization platform edition page.

Modification of host properties must be done from the Host edition page.

Add a virtual machine to a platform

Adding a virtual machine is performed by checking the corresponding line in Virtual Machines part of the platform edition form and setting the host characteristics in BSM Configuration table zone (by filling in the corresponding fields or by selecting an already defined host).

Note When you edit a Virtualization platform, only the Virtual Machines defined as part of the Bull System Manager platform are displayed. To add a virtual machine, you must perform a Re-discovery to get the list of all machines defined on the Virtualization Server.

Remove a virtual machine from a platform

Removing a virtual machine is performed by unchecking the corresponding line in the Virtual Machines part of the platform.

Note The corresponding host remains in the Bull System Manager definition with model set to 'other'. To delete it, click the **Other Hosts** link to get the list of all Other Hosts configured, edit the corresponding host and click the **Delete** button.

Modify a virtual machine defined in a platform

To modify the name of the BSM host corresponding to a virtual machine, enter the new name in the corresponding field or choose it in the list of already defined hosts in Bull System Manager by clicking the **Select** button.

To modify other characteristics as netName or OS, the Host edition form must be used.

Note To get the Host edition form corresponding to the virtual machine, click the **Hostname** link displayed in the global platforms page.

Delete all virtual machines and corresponding hosts.

To delete all virtual machines and corresponding hosts, use the **DeleteAll** button of the Virtualization Platform Edition form. Beware: the virtualization server and the platform will be also deleted from the Bull System Manager configuration.

3.3.2.2.3 Virtualization Supervision

As specified above, services are instantiated for each host defined in the Virtualization Platform. You can disable virtualization supervision by editing the hostgroup or manager properties or by editing each service (refer to the *Bull System Manager Administration Guide* for details).

Note Du to change in SNMP agent on ESX4, the services Memory and CPU are no longer functional. Consequently, they are not instantiated for hosts depending from an ESX4 platform).

Monitoring Services

Monitoring services defined for the native OS are associated with the **VMwareESX** category.

Services Applied to the Native OS

Service	Description	Check_command
Status	Checks ESX server status	check_esx_server
SNMP	Checks the ESX SNMP interface	check_esx_snmp
Memory	Checks ESX memory avaibility Not available with ESX4	check_esx_mem
Alerts	Processes alerts received from the ESX SNMP agent	none (SNMP Trap receiver)

Monitoring services defined for VM hosts are associated with the **VirtualMachine** category.

Services Applied to the VM Host

Service	Description	Check_command
Status	Checks VM status	check_esx_vm
CPU	Checks VM CPU usage Not available with ESX4	check_esx_vm_cpu
Memory	Checks VM memory avaibility Not available with ESX4	check_esx_vm_mem

Monitoring services related to Virtual Platform elements are automatically created during the edition of the ESX Virtual Platform. Theses services can be displayed and edited from the Services page in the Supervision domain, but only attributes related to monitoring or notification can be edited.

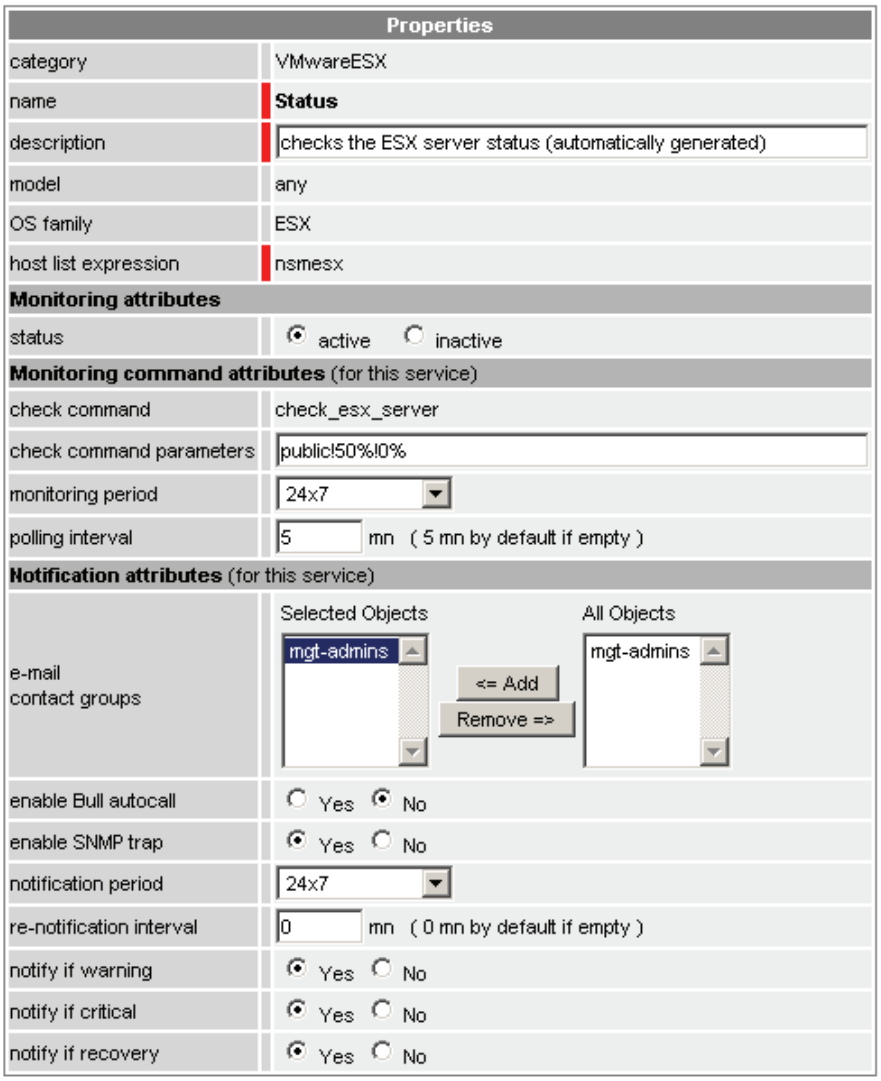


Figure 3-17. VMware service properties pane

Note During ESX Platform definition, all services are defined and activated for the ESX server and for each VM. To deactivate the monitoring of one service, set **status** (Monitoring attributes part) to inactive.

3.3.2.3 Nagios Check Commands

check_esx_server

The configurable Bull System Manager service check command syntax is:

```
check_esx_server!<snmp_community>!<wThres>%!<cThres>%
```

See the **check_esx3** command in Appendix A for parameters details.

check_esx_snmp

The configurable Bull System Manager service check command syntax is:

```
check_esx_snmp!<snmp_community>
```

See the **check_esx3** command in Appendix A for parameters details.

check_esx_mem

The configurable Bull System Manager service check command syntax is:

```
check_esx_mem!<snmp_community>!<wThres>!<cThres>
```

See the **check_esx3** command in Appendix A for parameters details.

check_esx_vm

The configurable Bull System Manager service check command syntax is:

```
check_esx_vm!<esx_server>!<snmp_community>!<vmname>
```

See the **check_esx3** command in Appendix A for parameters details.

check_esx_vm_memory

The configurable Bull System Manager service check command syntax is:

```
check_esx_vm!<esx_server>!<snmp_community>!<vmname><wThres>!<cThres>
```

See the **check_esx3** command in Appendix A for parameters details.

check_esx_vm_cpu

The configurable Bull System Manager service check command syntax is:

```
check_esx_cpu!<esx_server>!<snmp_community>!<vmname><wThres>!<cThres>
```

See the **check_esx3** command in Appendix A for parameters details.

3.3.2.4 Reporting Indicators

Reporting indicators are defined for VM hosts and for native OS. They get values from the corresponding monitoring services.

Indicators Applied to the Native OS

Indicator	Corresponding Service
<esx_server>_esxMemory	esxMemory

Indicators Applied to the VM Host

Indicator	Corresponding Service
<vm_host>_vmCPU	vmCPU
<vm_host>_vmMemory	vmMemory

Note During ESX Platform definition, all indicators are defined and activated for the ESX server and for each VM. To deactivate the reporting of one indicator, set it to inactive. Beware, **if you deactivate the corresponding service, the indicator will no longer be collected**.

3.3.2.5 Bull System Manager Console

VMwareESX Operation

From the Virtual Manager or from any element of the Virtual Platform, you can launch the **Virtual Infrastructure Web Interface** by selecting the following cascading menu:

Operation → **Application** → **VMware ESX Web Access**

VMwareESX Monitoring

From the platform or host elements, you can access monitoring information.
From the hosts element, you can display information related to associated services by selecting **Monitoring** menus.
From the platform element, you can display monitoring information related to all elements by selecting **Monitoring** menus. For instance, you can view all services of the hosts in the platform, as shown in the following figure:

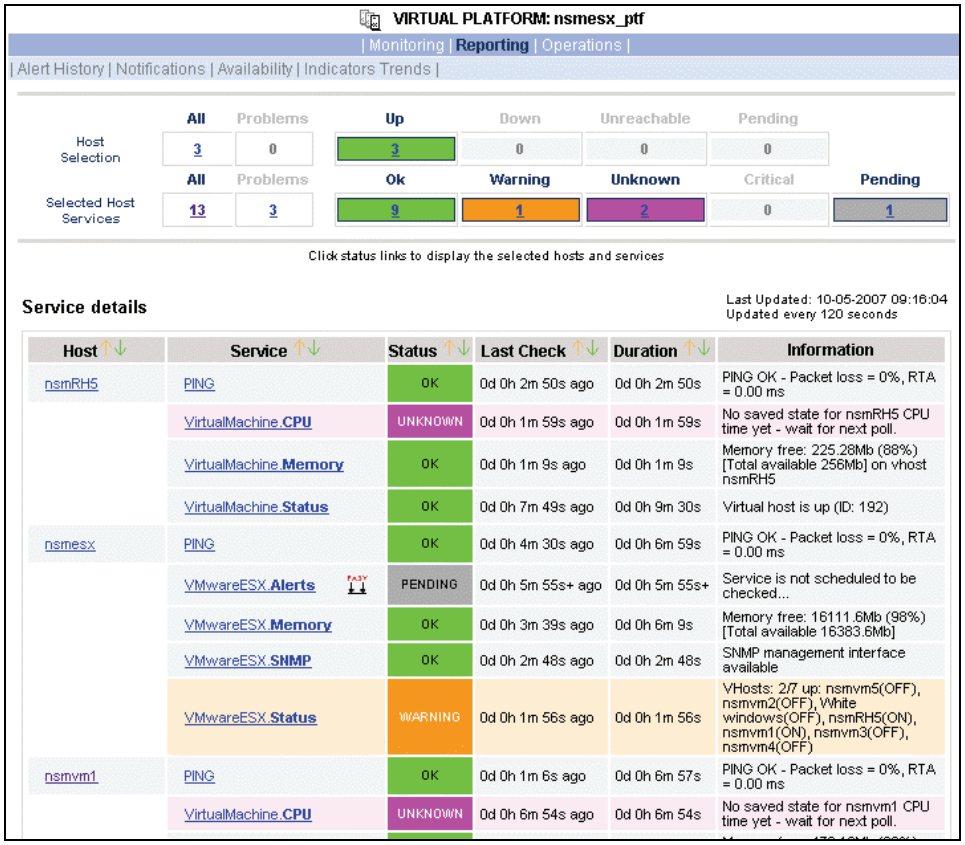


Figure 3-18. VMwareESX monitoring information

VMwareESX Reporting

From the platform or host elements, you can access reporting information by selecting **Indicators Trends** from the **Reporting** menu.

From the host element, you can display indicators related to this host as shown in the following figure:

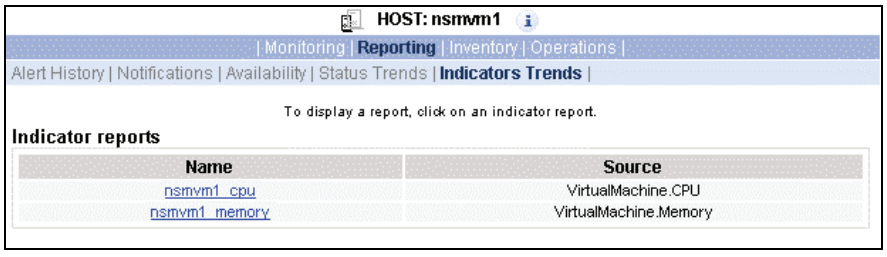


Figure 3-19. VMwareESX reporting information

From the platform element, you can display indicators related to all platform elements.

3.3.3 BSMVMwareVC for "Virtual Center" Management

3.3.3.1 Overview

The **VMware Virtual Center** or **vCenter** provides a central point of control for managing, monitoring, provisioning and migrating virtual machines (VM).
The VMwareVC Add-on provides functional links to supervise the virtual machines and the ESX servers managed by vCenter

The VMwareVC Add-on retrieves VM and ESX monitoring information via the VI Perl toolkit API and allows the Web Virtual Interface to be launched from the Bull System Manager Console. It can be also process trap sent by vCenter, if the vCenter alarms are configured to send it.
The following figure shows the link between each component:

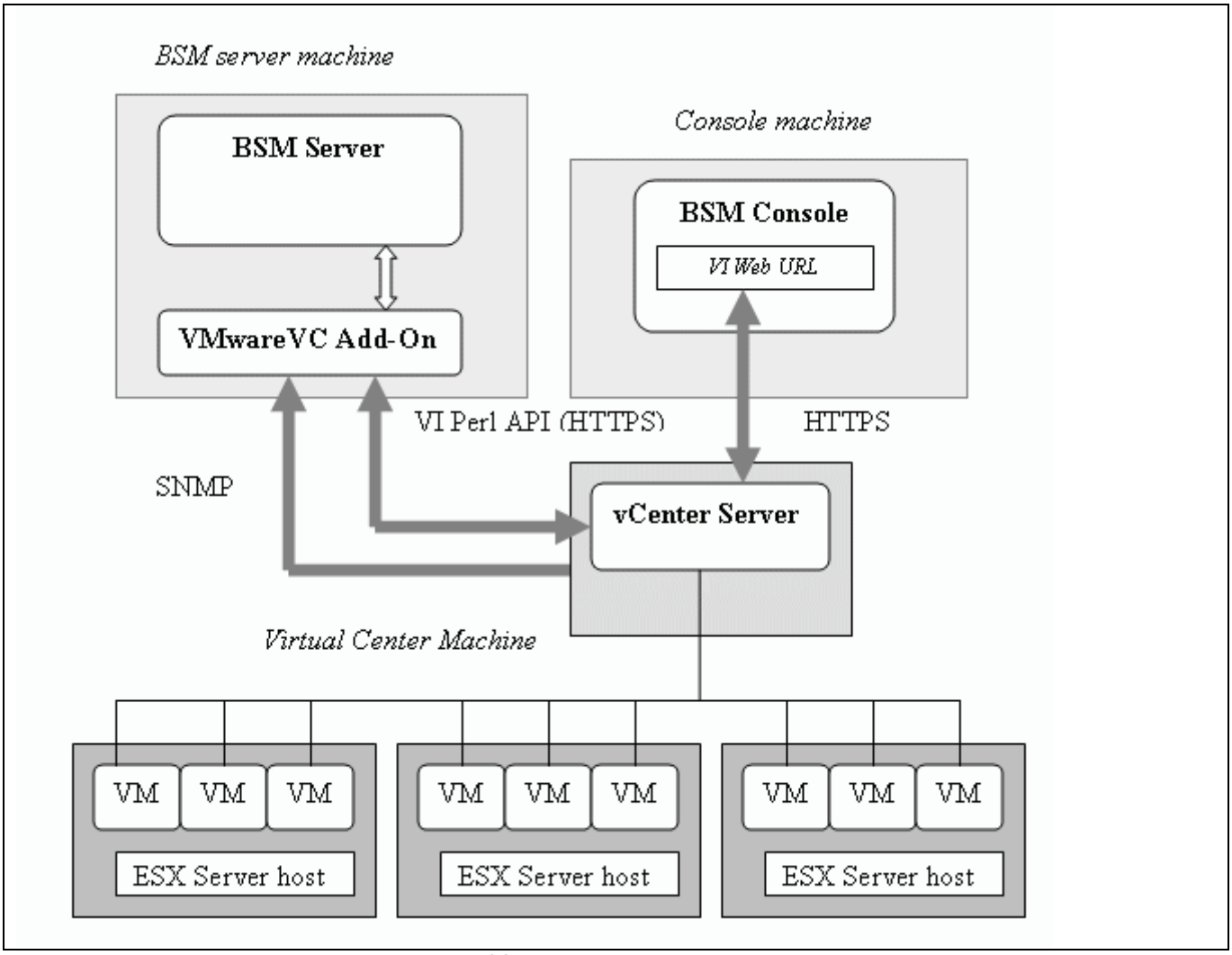


Figure 3-20. VMwareVC Add-on components

Note The SNMP agent of the vCenter server must be configured to send traps to the Bull System Manager Server. Web access requires specific configuration of the Web client. For detailed information about these procedures, see the VMware Infrastructure documentations available at **http://www.vmware.com/support/pubs/vi_pubs.html**.

3.3.3.2 Bull System Manager Configuration

Virtual Center uses, as top-level structure, the datacenter to group hosts and VMs that reside on the hosts.

This organization will be kept in BSM Topology: VMs or hosts managed by a vCenter server are represented as element of a Datacenter platform (virtualization platform). The vCenter server is defined as a virtualization manager.

The configuration of the monitoring elements for the VMwareVC Add-on is easily performed. In one step, you define the set of Datacenters managed by a given vCenter Server, with the hosts and VMs they contain and all related monitoring services.
Host representing the ESX server is defined with the OS: **ESX**.
VM is represented by a BSM host with the model: **VMware**.

Notes

- ESX server can also be supervised with the VMwareESX add-ons if no VM is associated to it (see *BSMVMwareESX for "VMware ESX" Management*, on page 43).
- VM supervised with the VMwareESX cannot be supervised by the VMwareVC add-ons.

3.3.3.2.1 VirtualCenter managed DataCenter Platform

To configure a set of Datacenter Platforms managed by vCenter, click the **VMware DataCenters** link in the Virtualization part of the Topology domain. The list of all configured platforms appears, as in the following example:

VMware DataCenter Platforms

Help on DataCenter

New

Datacenter	Type	Host name	description	Manager
DC2	VM	rhel5	VM host (automatically generated with DC2 VMware DataCenter Platform)	VC1
		sles10	VM host (automatically generated with DC2 VMware DataCenter Platform)	
		vmx	VM host (associated to DC2 VMware DataCenter Platform)	
	ESX	172.31.50.55	ESX server (automatically generated with DC2 VMware DataCenter Platform)	
DC1	VM	rhel6	VM host (automatically generated with DC1 VMware DataCenter Platform)	VC1
		sles9	VM host (automatically generated with DC1 VMware DataCenter Platform)	
	ESX	esx1	ESX server (automatically generated with DC1 VMware DataCenter Platform)	

Figure 3-21. VMware DataCenter Platforms page

It is possible:

- To create a new set of platforms managed by vCenter using the **New** button
- To edit or delete a platform using the **<Datacenter>** link
- To edit or delete a vCenter using the **<Manager>** link
- To edit a virtual machine or ESX using the **<hostname>** link.

When you click the **New** button, the following display appears with all resource properties:

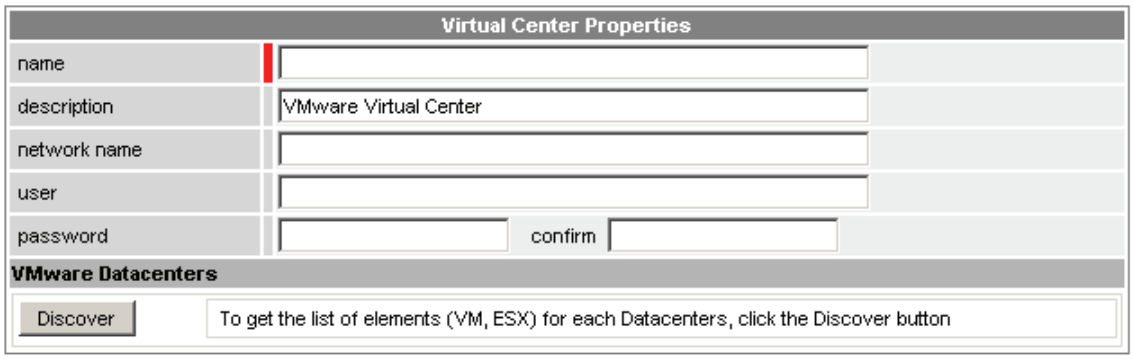


Figure 3-22. Virtual Center Properties

The first part of the form allows to define the characteristics of the VirtualCenter server.

The second part is used to describe the datacenters and their elements to be managed by Virtual Center.

Virtual Center Properties

name	Virtual Center short name. This name is used to define the Virtualization Manager
network name	Virtual Center network name (hostname or IP address).
user	username used to connect the VirtualCenter through the VI Perl Toolkit
password	password of the user

Datacenters Properties

Datacenters	List of the datacenters and their elements established by selecting the datacenters obtained by requests to the VirtualCenter server. The request is performed by clicking the **Discover** button (or **Re-discover** if in edition mode). See below the complete description of the procedure.

DatataCenters Discovery

The result of the discovery is displayed as set of tables (one for each datacenter), composed of three parts:

- the left column allows you to select the VMs or the ESX to be associated to the platform,
- the center part displays element Configuration as defined on the VMware Virtual Center server
- the right part allows you to edit the main properties (name, network name and OS) of the corresponding BSM host. The host can be edited only if the corresponding element is selected. You can select an already defined host by clicking the **Select** button or you can create a host by completing the corresponding fields.

Notes

- When you select an already defined host, you cannot change its network name and OS. But the Select contains a Default Option corresponding to the element name, that can be edited. If the name contains space(s), they are replaced by underscore(s) in the host label.
- The OS of ESX server cannot be changed (set to ESX).

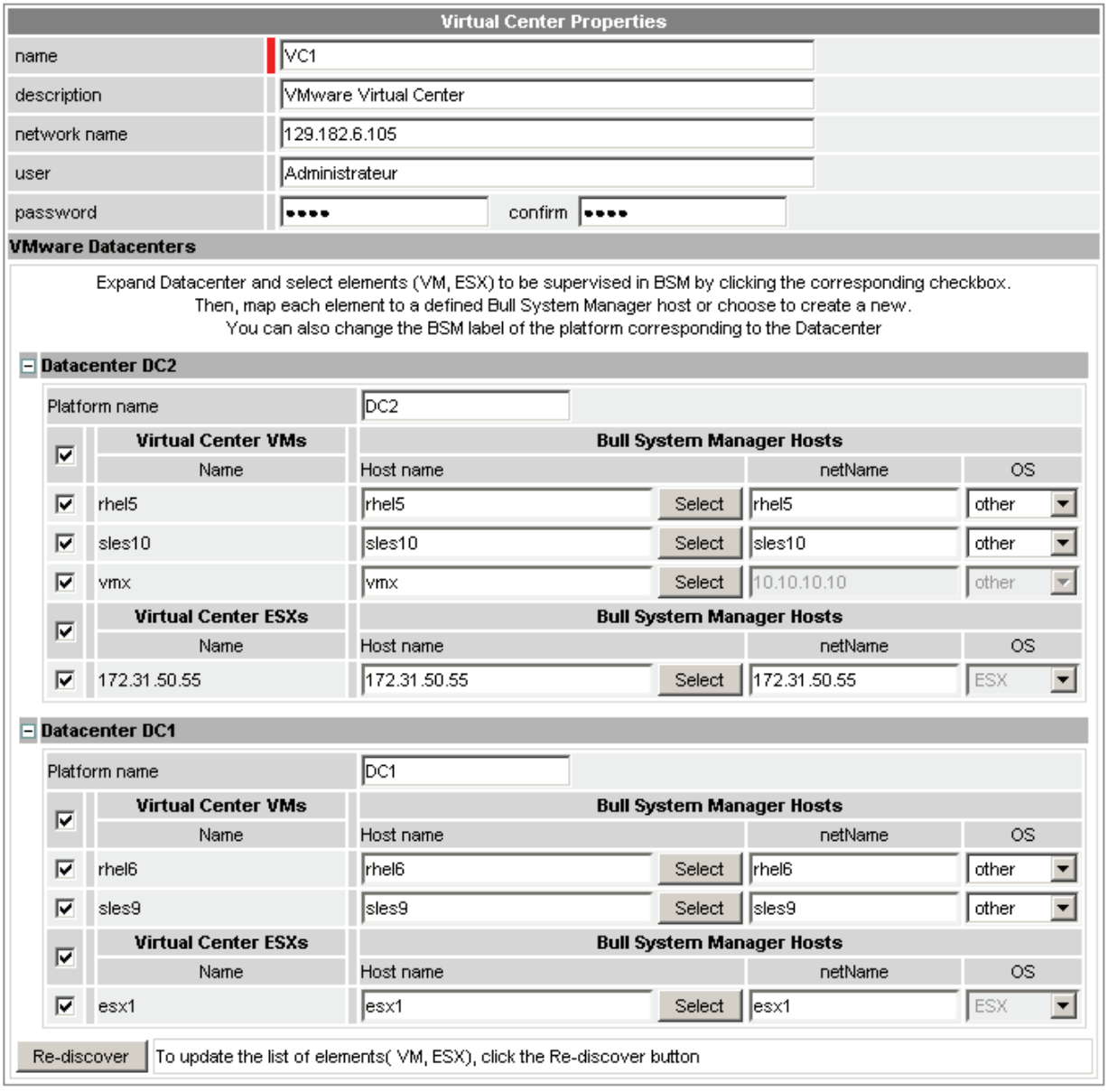


Figure 3-23. Datacenters panel

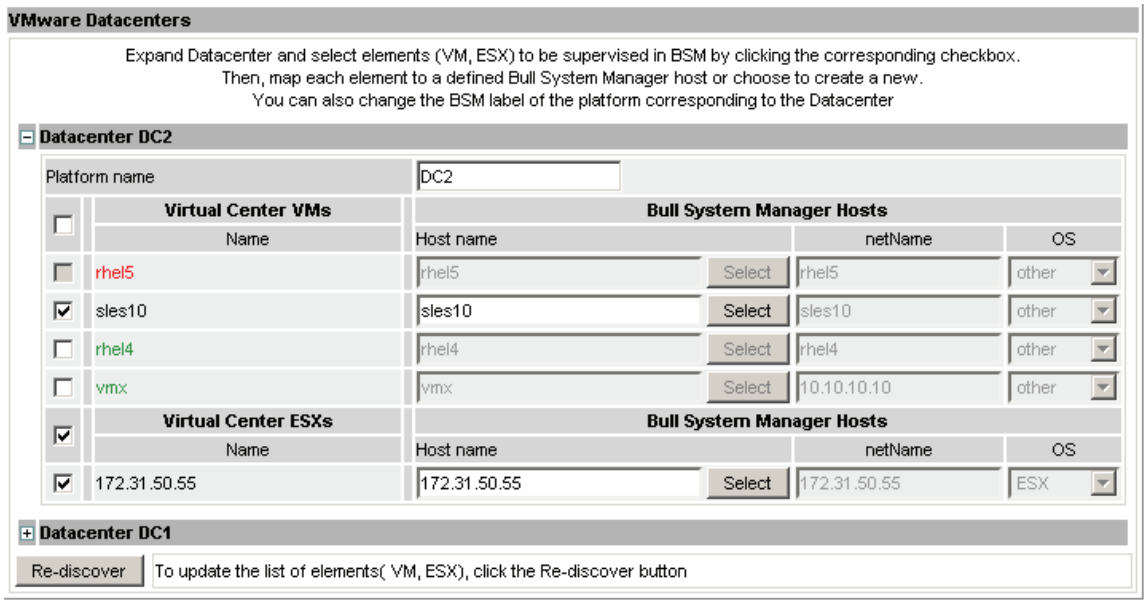
Datacenters Re-Discovery

Re-Discovery is required to check that the current BSM configuration still matches the Virtual Center configuration in order to:

- Add element not yet registered in the Datacenter Platform
- Remove element no more defined in the Virtual Center configuration.

During the Re-discovery step, if the current configuration is not compatible with Virtual Center configuration, the invalid elements are displayed in red and the elements not referenced in the current BSM configuration are displayed in green.

Elements no longer defined in Virtual Center are automatically unchecked and will be removed from the platform on form validation. New elements must be explicitly checked for being added in the platform to be linked to the platform on form validation.



Note How to Add, Delete or Modify Datacenter elements is detailed in 61, on page 49.

After edition:

- Click **OK** to validate your edition
- Or click **Cancel** to return to Datacenter Platforms pages without changes
- Or click **Delete** to remove the VirtualCenter and managed Datacenter platforms and maintain the hosts corresponding to the VMs and the ESX server
- Or click **DeleteAll** to remove the VirtualCenter, managed Datacenter platforms and the hosts corresponding to the VMs and the VMwareESX server.

Note Edition with a **Topology modification** requires confirmation: a page listing all modifications to be applied to the Topology configuration is displayed, as shown in the following figure.

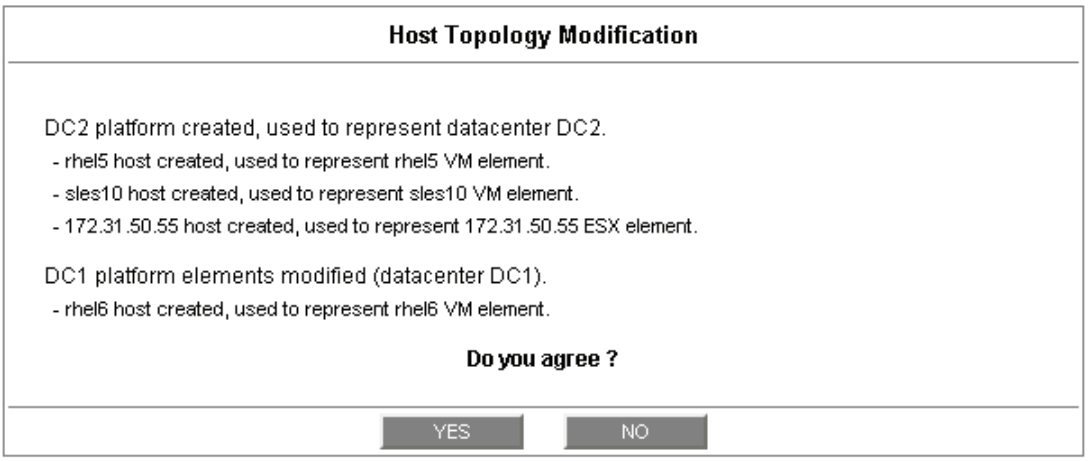


Figure 3-24. Topology modification confirmation

If you do not agree, click **NO** to return to the edition page, otherwise click **YES** to create the datacenters.

Related Datacenters platform Objects

When a Datacenter platform is defined, related objects are automatically generated to configure the specific Supervision linked to this type of server. The following table describes the objects generated during the creation of the platform.

Type	Description
host VM	As defined in the Virtual Machine configuration part of the edition page.
host ESX	Host corresponding to the virtualization layer, as defined in the ESX server Host configuration part.
hostgroup VM	hostgroup representing the datacenter for VM part, named <platformName>.
hostgroup ESX	hostgroup representing the datacenter for ESX part, named <platformName>_ESX.
manager	Virtualization manager representing the management interface, named < platformName>_mgr.
categories and services	The VMwareESX_VC category and related services are instantiated for each ESX host. The VirtualMachine_VC category and related services are instantiated for each VM host. The VMware_VC category and related services are instantiated for each VM and ESX host.

Note No link between an ESX and a VM machine is configured, due to vMotion functionality.

3.3.3.2.2 Datacenter Elements Edition

A VM or an ESX is represented by a host linked to the Datacenter Virtualization platform. It has properties linked to the platform and properties of a host object.

Adding, removing or modifying properties linked to the platform must be done from the VMware Datacenter platform edition page.

Modification of host properties must be done from the Host edition page.

Add an element (VM or ESX) to a datacenter

Adding an element is performed by checking the corresponding line in element part of the platform edition form and setting the host characteristics in BSM Configuration table zone (by filling in the corresponding fields or by selecting an already defined host).

Note When you edit a Datacenter platform, only the element defined as part of the Bull System Manager platform are displayed. To add an element, you must perform a Re-discovery to get the list of all elements defined in the datacenter.

Remove an element from a datacenter

Removing an element is performed by unchecking the corresponding line in the element part of the platform.

Notes

- The corresponding host remains in the Bull System Manager definition with model set to 'other'. To delete it, click the **Other Hosts** link to get the list of all Other Hosts configured, edit the corresponding host and click the **Delete** button.
- If all element of a platform are deleted, the platform itself is deleted.

Modify an element defined in a datacenter

To modify the name of the BSM host corresponding to an element, enter the new name in the corresponding field or choose it in the list of already defined hosts in Bull System Manager by clicking the **Select** button.

To modify other characteristics as netName or OS, the Host edition form must be used.

Note To get the Host edition form corresponding to the virtual machine, click the **Hostname** link displayed in the global platforms page.

Delete all elements and corresponding hosts.

To delete all elements managed by a VirtualCenter and corresponding hosts, use the **DeleteAll** button of the page Edition form.

3.3.3.2.3 Virtualization Supervision

As specified above, services are instantiated for each host defined in the Virtualization Platform. You can disable virtualization supervision by editing the hostgroup or manager properties or by editing each service (refer to the *Bull System Manager Administration Guide* for details).

Monitoring Services

Services Applied to the ESX

Categorie	Service	Description	Check_command
VMwareESX_VC	Status	Checks ESX server status	check_esx_virtualcenter
VMwareESX_VC	CPU	Check CPU usage as computed by vCenter	check_esx_virtualcenter
VMwareESX_VC	Memory	Check Memory usage as computed by vCenter	check_esx_virtualcenter
VMware_VC	Alerts	Processes alerts received from vCenter	none (SNMP Trap receiver)

Services Applied to the VM Host

Categorie	Service	Description	Check_command
VirtualMachine_VC	Status	Checks VM status	check_ vm_virtualcenter
VirtualMachine_VC	CPU	Check CPU usage as computed by vCenter	check_vm_virtualcenter
VirtualMachine_VC	Memory	Check Memory usage as computed by vCenter	check_vm_virtualcenter
VMware_VC	Alerts	Processes alerts received from vCenter	none (SNMP Trap receiver)

Monitoring services related to managed VirtualCenter elements are automatically created during the edition of the Datacenters Platform. Theses services can be displayed and edited from the Services page in the Supervision domain, but only attributes related to monitoring or notification can be edited.

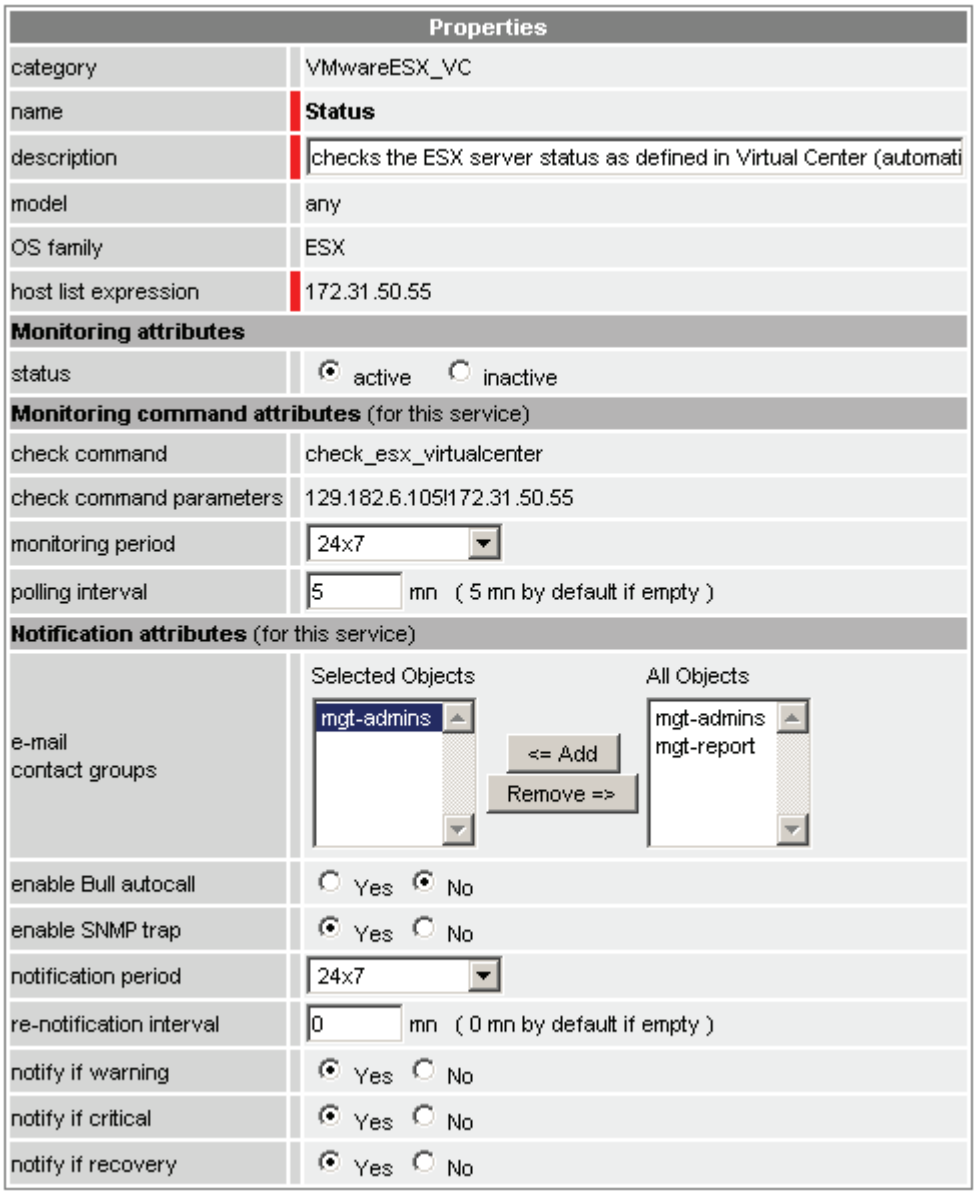


Figure 3-25. VMwareESX service properties pane

Note During Platform definition, all services are defined and activated for each selected ESX server and VM. To deactivate the monitoring of one service, set **status** (Monitoring attributes part) to inactive.

3.3.3.3 Nagios Check Commands

check_esx_virtualcenter

The configurable Bull System Manager service check command syntax is:

`check_esx_virtualcenter!<vcenter-netname>!<esx_name>`

See the **check_virtualcenter** command in Appendix A for parameters details.

check_vm_virtualcenter

The configurable Bull System Manager service check command syntax is:

`check_` vm_virtualcenter`!<vcenter-netname>!<vm_name>`

See the **check_virtualcenter** command in Appendix A for parameters details.

3.3.3.4 Reporting Indicators

Reporting Indicators are defined for ESX and VM hosts. They get values from the corresponding monitoring services.

Indicators applied to ESX host:

Indicator	Corresponding Service
<esx_server>_CPU_vc	VMwareESX_VC .CPU
<esx_server>_Memory_vc	VMwareESX_VC .Memory

Indicators applied to VM host:

Indicator	Corresponding Service
<vm_name>_CPU_vc	VirtualMachine_VC .CPU
<vm_name>_Memory_vc	VirtualMachine_VC .Memory

Note During Datacenter definition, all indicators are defined and activated for the ESX server and for each VM. To deactivate the reporting of one indicator, set it to inactive. Beware, **if you deactivate the corresponding service, the indicator will no longer be collected**.

3.3.3.5 Bull System Manager Console

VMwareVC Operation

From the Virtual Manager or from any element of the Virtual Platform, you can launch the **Virtual Infrastructure Web Interface** by selecting the following cascading menu:

Operation → Application → VMware vCenter Web Web

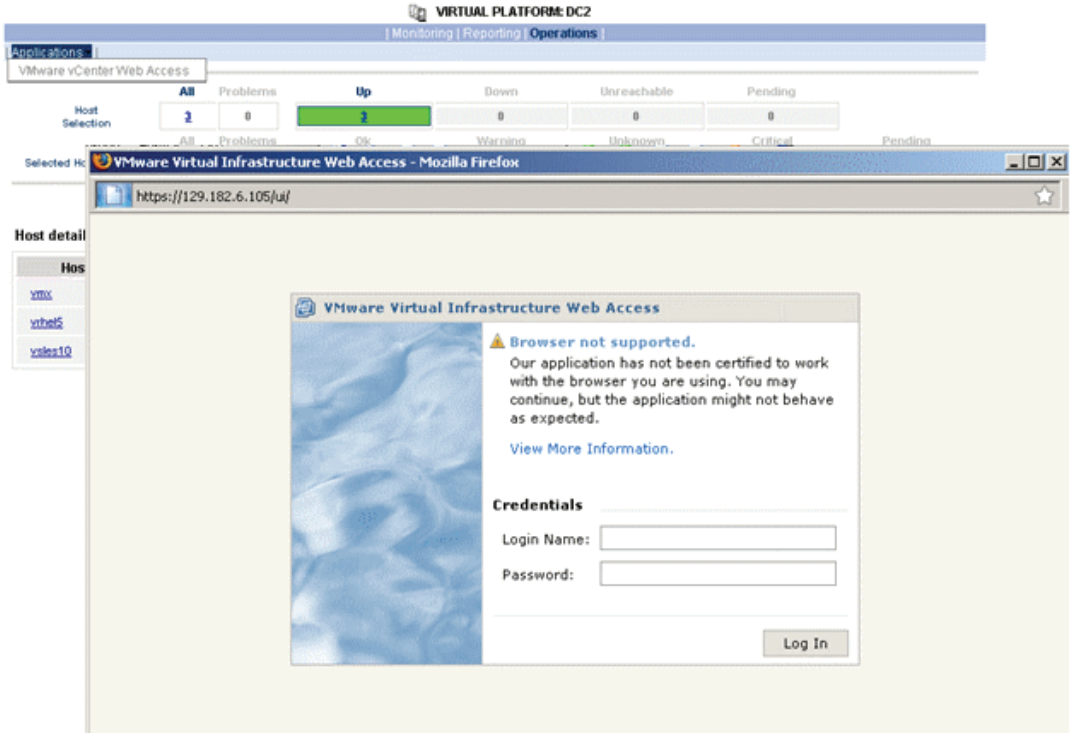


Figure 3-26. Virtual Center Web Access

VMwareVC Monitoring

From the platform or host elements, you can access monitoring information.
From the hosts element, you can display information related to associated services by selecting **Monitoring** menus.
From the platform element, you can display monitoring information related to all elements by selecting **Monitoring** menus. For instance, you can view all services of the hosts in the platform, as shown in the following figure:

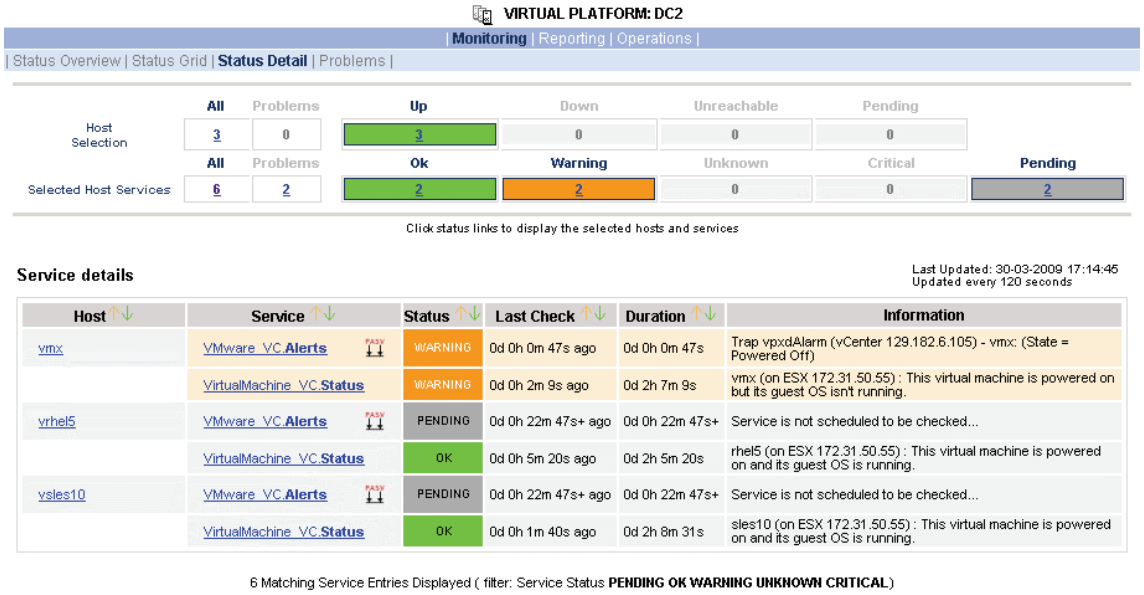


Figure 3-27. VMware Datacenter monitoring information

VMwareVC Reporting

From the platform or host elements, you can access reporting information by selecting **Indicators Trends** from the **Reporting** menu.

From the host element, you can display indicators related to this host as shown in the following figure.

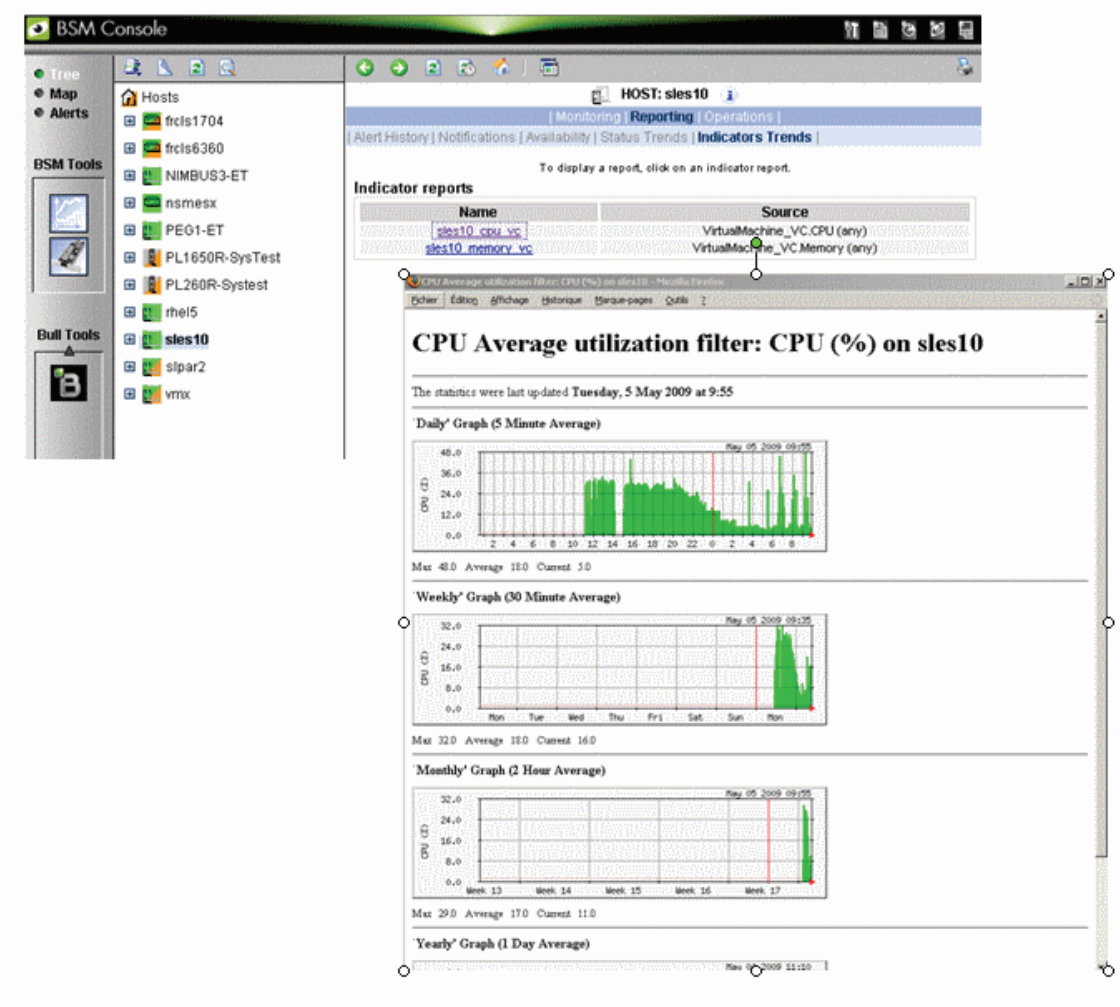


Figure 3-28. CPU Performance indicator for Virtual Machine

From the platform element, you can display indicators related to all platform elements (VM and ESX host).

3.3.4 BSMHyperNova for "HyperNova" Management

3.3.4.1 Overview

The HyperNova server is a virtualization layer that abstracts processor, memory, storage and networking resources into multiple virtual machines.
The HyperNova Add-on provides functional links to manage the virtual machines hosted by the HyperNova server, by requesting the administration tool, HyperNova Master (HN Master).

The following figure shows the link between each component:

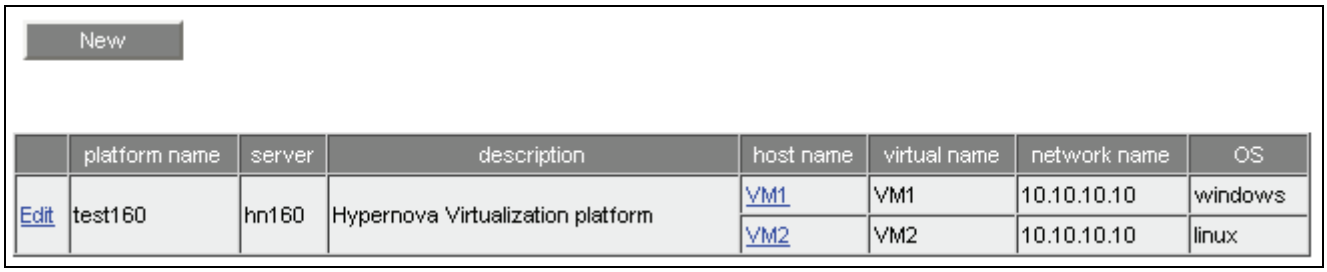


Figure 3-29. HyperNova Add-on components

3.3.4.2 Bull System Manager Configuration

To configure the monitoring elements for the HyperNova Add-on, you have to define an HyperNova Virtualization Platform from the Bull System Manager Configuration GUI. Native OS, VMs and related monitoring services are defined in one easy step.

The native OS is represented by a BSM host with the OS: **Xen**.

VMs are represented by a BSM host with the model: **HyperNova**.

3.3.4.2.1 HyperNova Virtualization Platform

To configure a HyperNova Virtualization Platform, click the **HyperNova** link in the Virtualization part of the Topology domain. The list of all configured platforms appears, as in the following example:

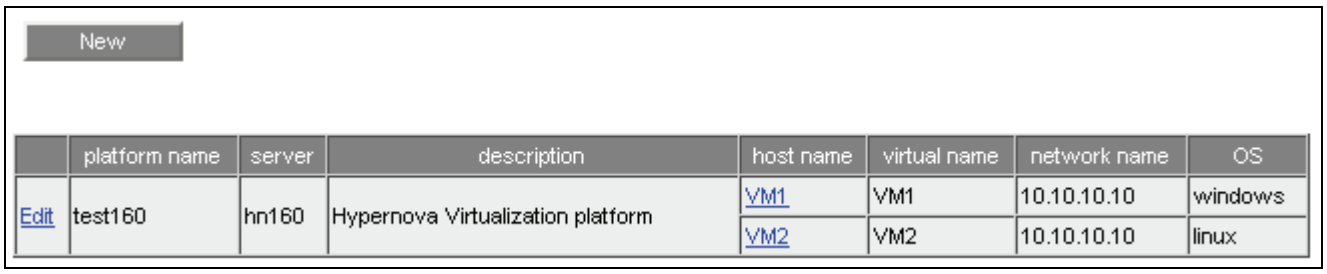


Figure 3-30. HyperNova Virtualization Platforms page

It is possible:

- To create a new HyperNova Virtualization Platform using the **New** button
- To edit or delete a resource using the **Edit** link
- To edit a virtual host using the **<hostname>** link.

When you click the **New** button, the following display appears with all resource properties:

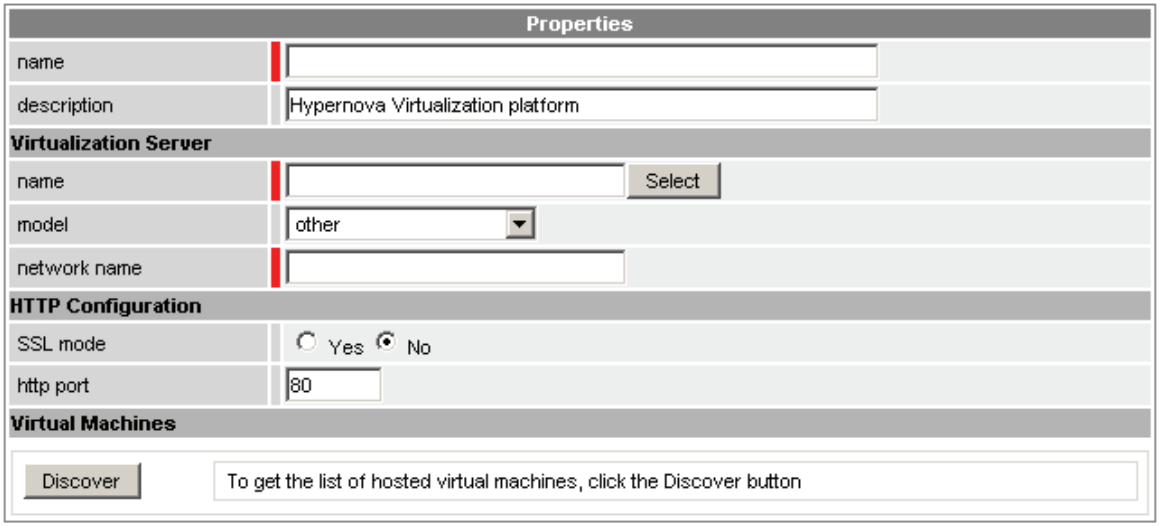


Figure 3-31. HyperNova Platform Properties

Besides the characteristics (name and description) of the main object, the properties of an HyperNova virtual platform are divided into two-parts:

- **Virtualization Server**: used to define the physical machine and the native OS.
- **HTTP Configuration**: used to set the HTTP mode access.
- **Virtual Machines**: used to describe the HyperNova platform virtual machine.

Virtualization Server Properties

name — Server host short name.
This name is displayed in the Bull System Manager Console views.
Click **Select** to choose a defined host from the BSM host list.

model — Host model (see the *Bull System Manager Administrator's Guide* for values).

network name — Server network name (hostname or IP address).

HTTP Configuration

SSL mode — To enable or disable SSL mode for HTTP

Default value: no

Note:

SSL option in not available on Windows platform. If the HNMaster access is securized, contact the HNMaster administrator to authorized non secure access for the Bull System Manager server.

Virtual Machines Properties

Virtual Machines — List of the VMs established by selecting the VMs obtained by XML/HTTP requests to HN Master.
The request is performed by clicking the **Discover** button (or-**Re-discover** if in edition mode).
See below the complete description of the procedure.

Virtual Machines Discovery

The result of the discovery is displayed as a table composed of three parts:

- the left column allows you to select the VMs to be associated to the platform
- the center part displays Virtual Machine Configuration as defined on the virtualization server
- the right part allows you to edit the main properties (name, network name and OS) of the corresponding BSM host. The host can be edited only if the corresponding VM is selected. You can select an already defined host by clicking the **Select** button or you can create a host by completing the corresponding fields.

	HyperNova Virtual Machines		NS Master Configuration			
	Name	Type	Name		netName	OS
☑	Rhel5Para	Para	Rhel5Para	Select	Rhel5Para	other
☑	Rhel5VT	Full	Rhel5VT	Select	Rhel5VT	other
☑	win2003	Full	win2003	Select	win2003	other
☑	Win2003s	Full	Win2003s	Select	Win2003s	other

Re-discover To update the list of virtual machines, click the Re-discover button

Figure 3-32. Virtual Machines display after Discover step

Notes

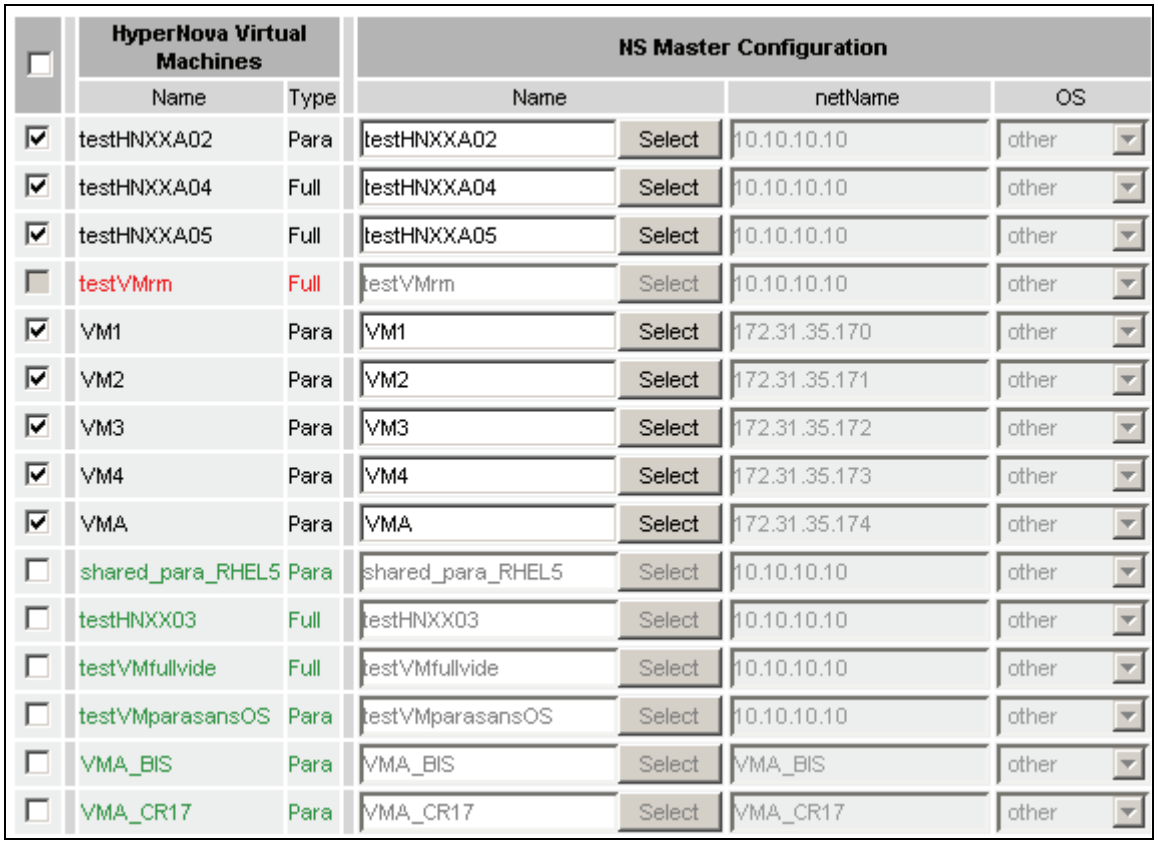
- When you select an already defined host, you cannot change its network name and OS. But **Select** contains a Default Option that corresponds to the VM name, which can be edited.
- If the VM name contains space(s), they are replaced by underscore(s) in the host label.

Virtual Machines Re-Discovery

Re-Discovery is required to check that the current BSM configuration still matches the HyperNova configuration in order to:

- Add virtual machine not yet registered in the HyperNova Virtualization Platform
- Remove virtual machine no more defined in the HyperNova configuration.

During the Re-discovery step, if the current configuration is not compatible with HyperNova configuration the invalid VMs are displayed in red and the VMs not referenced in the current BSM configuration are displayed in green, as shown in the following figure:



	HyperNova Virtual Machines		NS Master Configuration		
	Name	Type	Name	netName	OS
☑	testHNXXA02	Para	testHNXXA02 Select	10.10.10.10	other
☑	testHNXXA04	Full	testHNXXA04 Select	10.10.10.10	other
☑	testHNXXA05	Full	testHNXXA05 Select	10.10.10.10	other
☐	testVMrm	Full	testVMrm Select	10.10.10.10	other
☑	VM1	Para	VM1 Select	172.31.35.170	other
☑	VM2	Para	VM2 Select	172.31.35.171	other
☑	VM3	Para	VM3 Select	172.31.35.172	other
☑	VM4	Para	VM4 Select	172.31.35.173	other
☑	VMA	Para	VMA Select	172.31.35.174	other
☐	shared_para_RHEL5	Para	shared_para_RHEL5 Select	10.10.10.10	other
☐	testHNXX03	Full	testHNXX03 Select	10.10.10.10	other
☐	testVMfullvide	Full	testVMfullvide Select	10.10.10.10	other
☐	testVMparasansOS	Para	testVMparasansOS Select	10.10.10.10	other
☐	VMA_BIS	Para	VMA_BIS Select	VMA_BIS	other
☐	VMA_CR17	Para	VMA_CR17 Select	VMA_CR17	other

Figure 3-33. Virtual Machines display after Re-iscover step

VMs no longer defined in HNmaster are automatically unchecked and will be removed from the platform on form validation. New VMs must be explicitly checked for being added in the platform to be linked to the platform on form validation.

Note How to Add, Delete or Modify Virtual Machine is detailed in 3.3.4.2.2 *Virtual Machine Edition*, on page 73.

After edition:

- Click **OK** to validate your edition
- Or click **Cancel** to return to Virtual Platforms pages without changes
- Or click **Delete** to remove the Virtual Platform and maintain the hosts corresponding to the VMs and the Virtualization server
- Or click **DeleteAll** to remove the Virtual Platform and the hosts corresponding to the VMs and the Virtualization server.

Note Edition with a **Topology modification** requires confirmation: a page listing all modifications to be applied to the Topology configuration is displayed, as shown in the following figure.

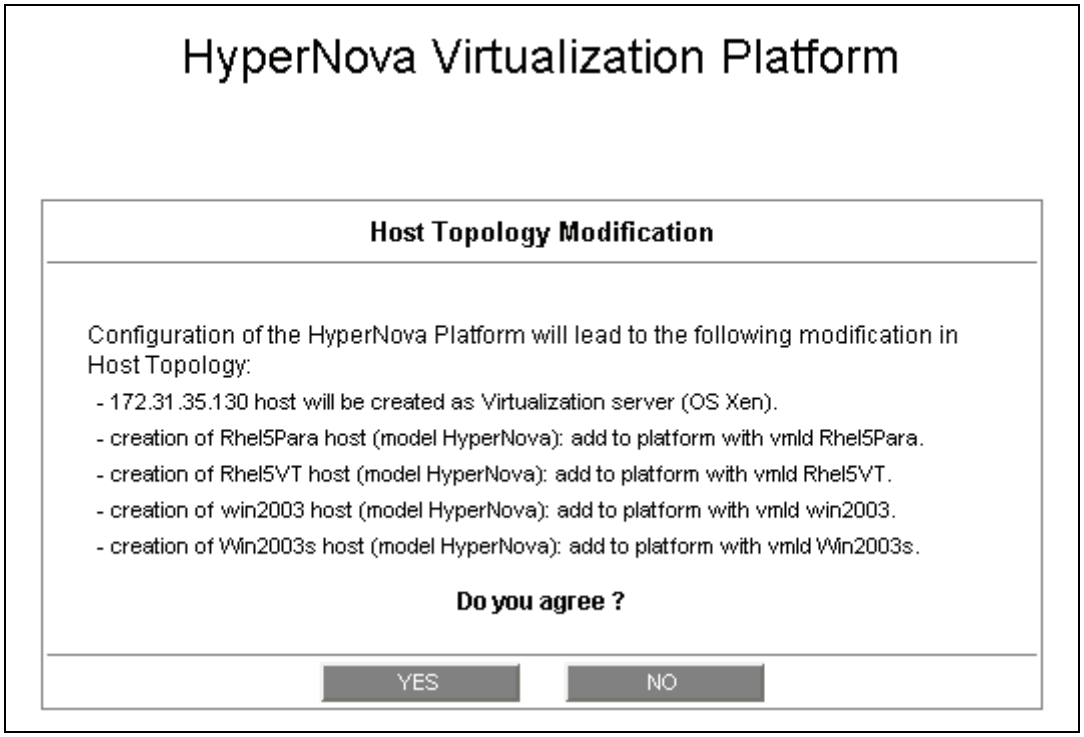


Figure 3-34. Host Topology modification confirmation

If you do not agree, click **NO** to return to the platform edition page, otherwise click **YES** to create the virtual platform.

Related HyperNova Virtualization platform Objects

When a HyperNova Virtualization platform is defined, related objects are automatically generated to configure the specific Supervision linked to this type of NovaScale server. The following table describes the objects generated during the creation the platform.

Type	Description
host HyperNova	As defined in the Virtual Machine configuration part of the edition page.
host HNMaster	Host corresponding to the virtualization layer and hosting the HNMaster application, as defined in the Virtualization Server configuration part.
hostgroup	hostgroup representing the physical platform, named <platformName>.
manager	Virtualization manager representing the management interface, named <platformName>_HNMaster
categories and services	The HyperNova category and related services are instantiated for the HNMaster host. The VirtualMachine category and related services are instantiated for each HyperNova host.

Note A hostgroup representing the virtual platform, a virtualization manager and instances of services for the virtualization server (**HyperNova** category) and for the hosts representing the virtual machine (**VirtualMachine** category) are also created.

3.3.4.2.2 Virtual Machine Edition

A virtual machine is represented by a host linked to the HyperNova Virtualization platform. It has properties linked to the platform and properties of a host object.

Adding, removing or modifying properties linked to the platform must be done from the HyperNova Virtualization platform edition page.

Modification of host properties must be done from the Host edition page.

Add a virtual machine to a platform

Adding a virtual machine is performed by checking the corresponding line in Virtual Machines part of the platform edition form and setting the host characteristics in BSM Configuration table zone (by filling in the corresponding fields or by selecting an already defined host).

Note When you edit a Virtualization platform, only the Virtual Machines defined as part of the Bull System Manager platform are displayed. To add virtual machine, you must perform a Re-discovery to get the list of all machines defined on the Virtualization Server.

Remove a virtual machine from a platform

Removing a virtual machine is performed by unchecking the corresponding line in the Virtual Machines part of the platform.

Note The corresponding host remains in the Bull System Manager definition with model set to ‘other’. To delete it, click the 'Other Hosts' link to get the list of all Other Hosts configured, edit the corresponding host and click **Delete**.

Modify a virtual machine defined in a platform

To modify the name of the BSM host corresponding to a virtual machine, enter the new name in the corresponding field or choose it in the list of already defined hosts in Bull System Manager by clicking the Select button.

To modify other characteristics as netName or OS, Host edition form must be used.

Note To get the Host edition form corresponding to the virtual machine, click the Hostname link displayed in the global platforms page.

Delete all virtual machines and corresponding hosts.

To delete all virtual machines and corresponding hosts, use the **DeleteAll** button of the Virtualization Platform Edition form. Beware: the virtualization server and the platform will be also deleted from the Bull System Manager configuration.

3.3.4.2.3 Virtualization Supervision

As specified above, services are instantiated for each host defined in the Virtualization Platform. You can disable virtualization supervision by editing the hostgroup or manager properties or by editing each service (refer to the *Bull System Manager Administration Guide* for details).

Monitoring Services

Monitoring services defined for the native OS are associated with the **HyperNova** category.

Services Applied to the Native OS

Service	Description	Check_command
Status	Checks global status	check_hn_server_status
HTTP	Check availability of supervision page	check_http

Monitoring services defined for VM hosts are associated with the **VirtualMachine** category.

Services Applied to the VM Host

Service	Description	Check_command
Status	Checks VM status	check_hn_vm_status

Monitoring services related to Virtual Platform elements are automatically created during the edition of the HyperNova Virtualization Platform. Theses services can be displayed and edited from the Services page in the Supervision domain, but only the attributes related to monitoring or notification can be edited.

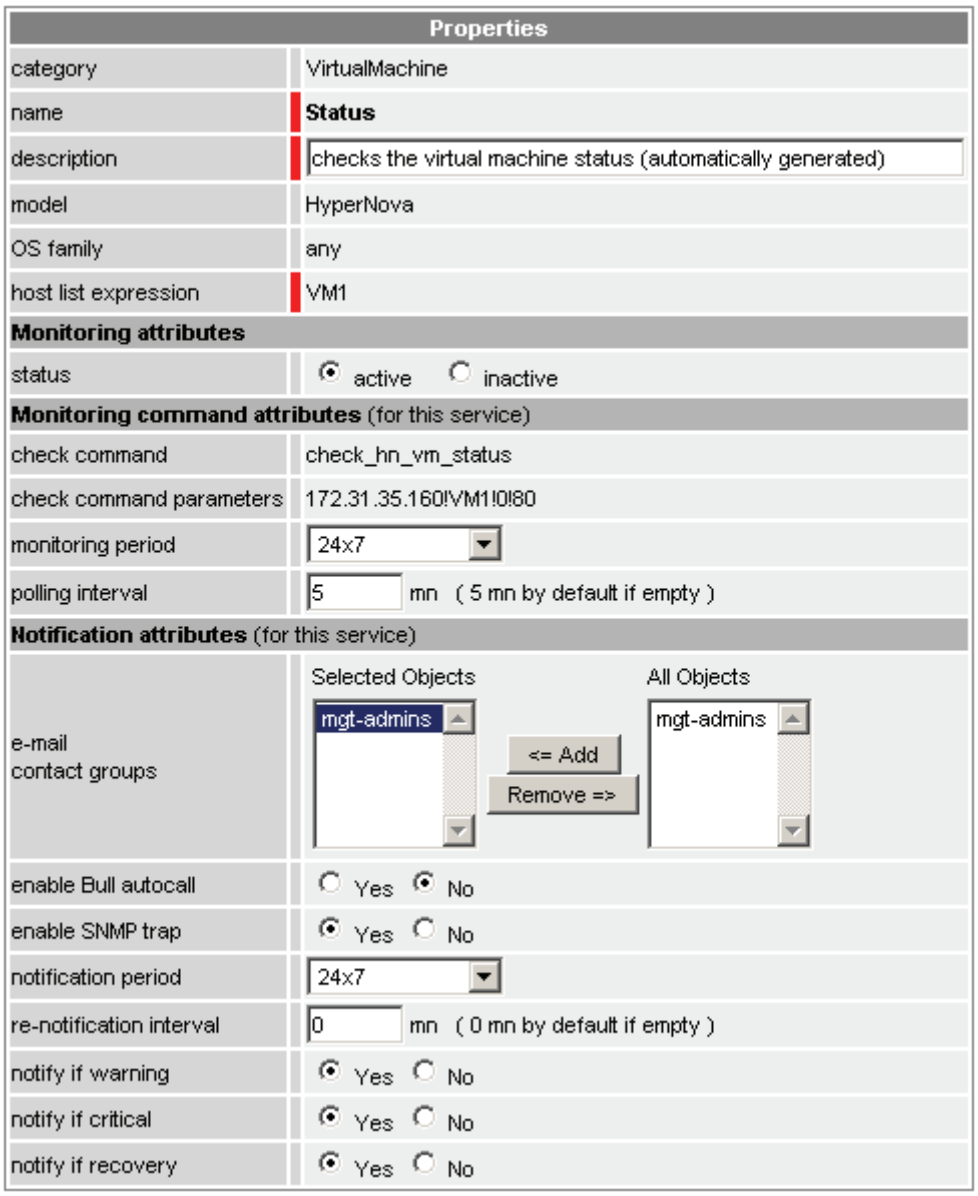


Figure 3-35. Virtual Machine Properties pane

Notes

- Status is determined by requesting the **HNMaster** application. To avoid overload, the result of the request is stored in a cache on the BSM server. The cache is refreshed each time the **GlobalStatus** service is checked or if the cache is not up-to-date (last update more than 10 minutes).
- During **HyperNova** Platform definition, all services are defined and activated for the server and for each VM. To deactivate the monitoring of one service, set **status** (Monitoring attributes part) to inactive.

3.3.4.2.4 Domain0 Supervision

The monitoring functions to control the resources of the **domain0** are not automatically setup at the platform definition. To enable them, you have to activate the corresponding categories and services.
HyperNova Add-on delivers the following monitoring definitions:

Category	Service
Dom0SystemLoad	CPU(*)
	Memory(*)
	Processes(*)
	Users
	Swap(*)
	Zombies
Dom0FileSystems	All(*)
	/usr
Dom0LinuxServices	syslogd(*)
Dom0Syslog	AuthentFailures
	RootAccess(*)

(*) indicates services that are automatically activated when the corresponding category is instantiated.

Examples

To activate the de **Dom0SystemLoad** related services, do as follows:

1. Click the Categories/Services link in the Supervision tab.

2. Apply a filter (by HOST(s) or by OS) to select only the hosts corresponding to **domain0** of an HyperNova system, as in the following example:

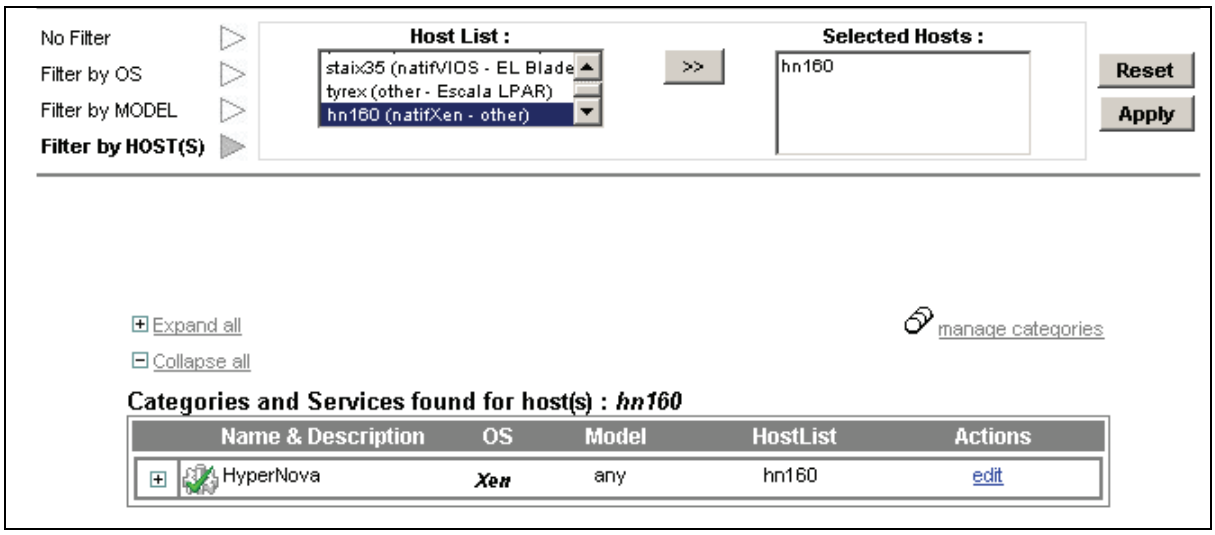


Figure 3-36. Categories filter for domain0 Host

3. Click the **manage categories** link and choose the **Add from an unused category template (user or predefined)** option to display the categories available for the corresponding hosts.

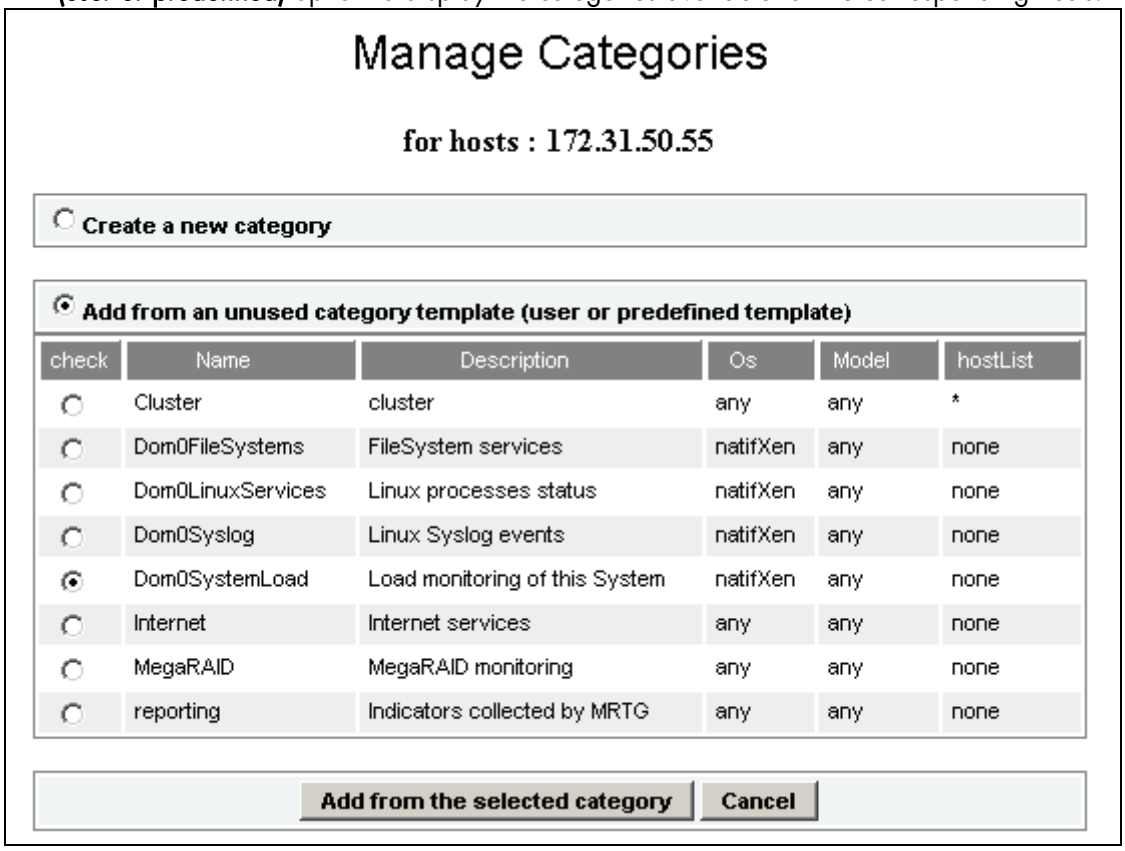


Figure 3-37. Available categories for domain0 Host

4. Select the **Dom0SystemLoad** category and click **Add from the selected category**.

5. The edition form for the corresponding category is displayed with all fields filled in. Click **OK**.

6. The Categories and Services page now displays **Dom0SystemLoad** category in the list of used categories for the selected hosts. Expand the category to display the list of the used services.

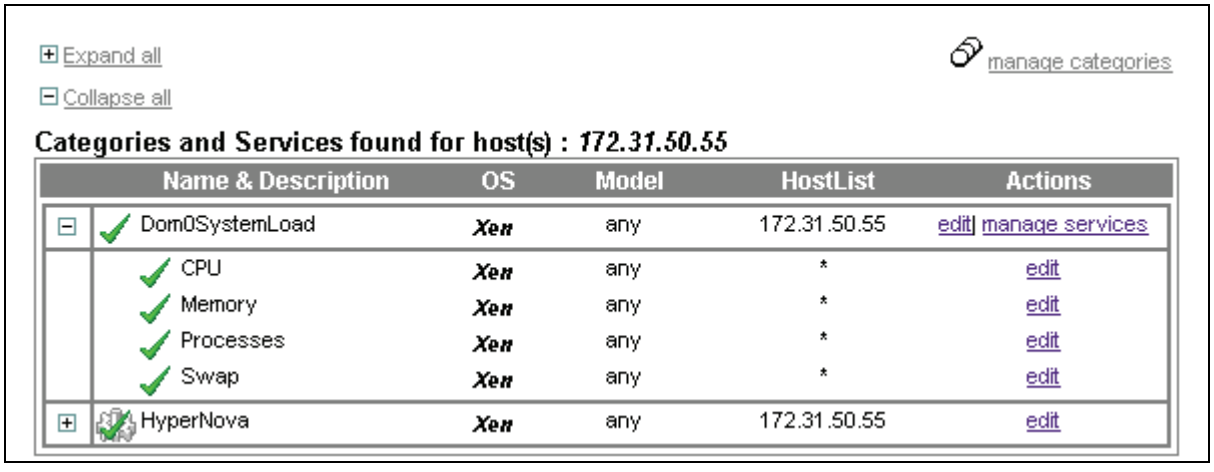
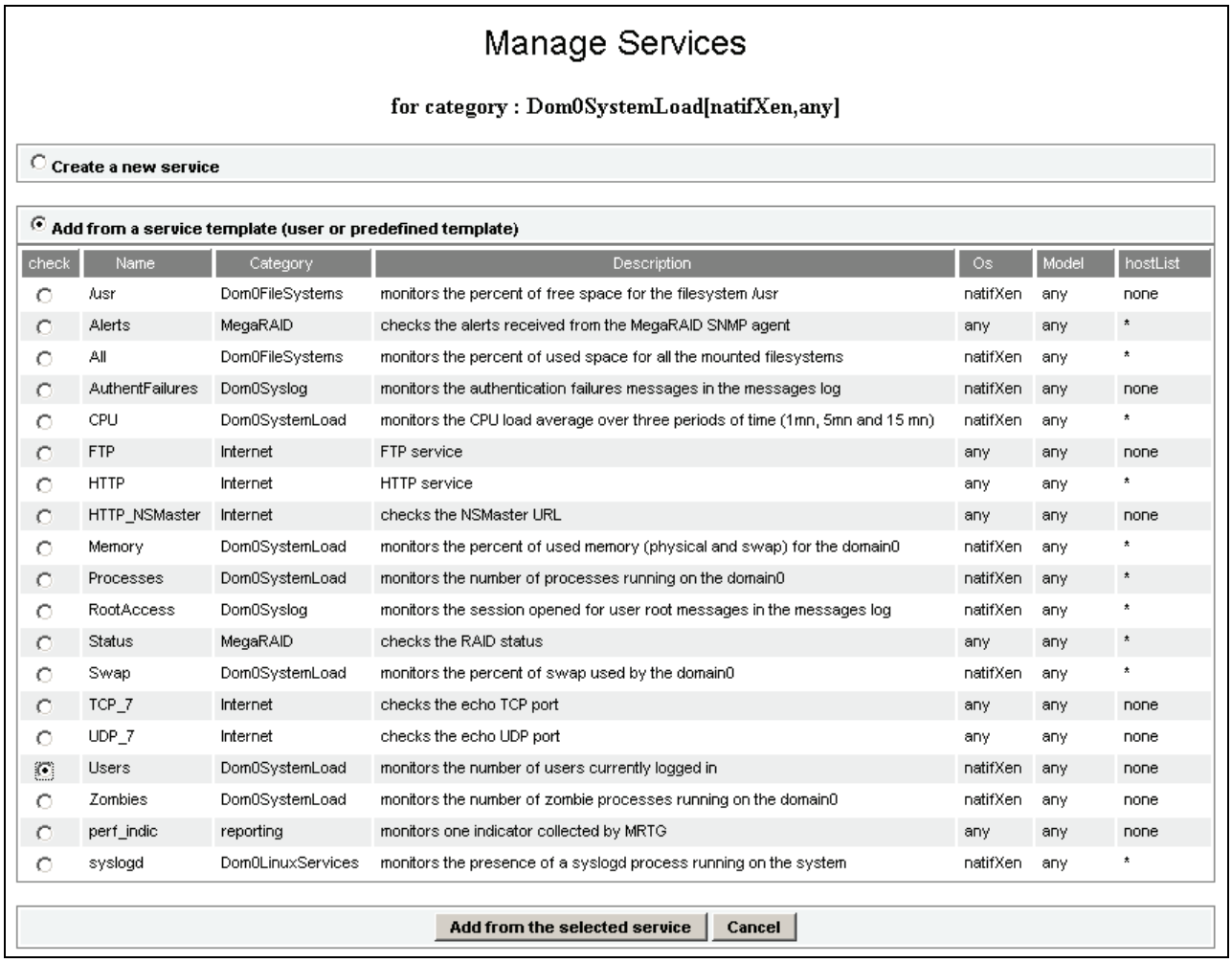


Figure 3-38. Used services for domain0 Host

Note The Zombies and Users services are not present. To activate them, you have to associate them explicitly to the hosts (see below).

To activate the Users service, do as follows:

1. Click the **manage services** link of the **Dom0SystemLoad** category and choose the option **Add from a service template (user or predefined)** to display the available services.



Manage Services

for category : Dom0SystemLoad[natifXen,any]

Create a new service

Add from a service template (user or predefined template)

check	Name	Category	Description	Os	Model	hostList
○	/usr	Dom0FileSystems	monitors the percent of free space for the filesystem /usr	natifXen	any	none
○	Alerts	MegaRAID	checks the alerts received from the MegaRAID SNMP agent	any	any	*
○	All	Dom0FileSystems	monitors the percent of used space for all the mounted filesystems	natifXen	any	*
○	AuthentFailures	Dom0Syslog	monitors the authentication failures messages in the messages log	natifXen	any	none
○	CPU	Dom0SystemLoad	monitors the CPU load average over three periods of time (1mn, 5mn and 15 mn)	natifXen	any	*
○	FTP	Internet	FTP service	any	any	none
○	HTTP	Internet	HTTP service	any	any	*
○	HTTP_NSMaster	Internet	checks the NSMaster URL	any	any	none
○	Memory	Dom0SystemLoad	monitors the percent of used memory (physical and swap) for the domain0	natifXen	any	*
○	Processes	Dom0SystemLoad	monitors the number of processes running on the domain0	natifXen	any	*
○	RootAccess	Dom0Syslog	monitors the session opened for user root messages in the messages log	natifXen	any	*
○	Status	MegaRAID	checks the RAID status	any	any	*
○	Swap	Dom0SystemLoad	monitors the percent of swap used by the domain0	natifXen	any	*
○	TCP_7	Internet	checks the echo TCP port	any	any	none
○	UDP_7	Internet	checks the echo UDP port	any	any	none
◉	Users	Dom0SystemLoad	monitors the number of users currently logged in	natifXen	any	none
○	Zombies	Dom0SystemLoad	monitors the number of zombie processes running on the domain0	natifXen	any	none
○	perf_indic	reporting	monitors one indicator collected by MRTG	any	any	none
○	syslogd	Dom0LinuxServices	monitors the presence of a syslogd process running on the system	natifXen	any	*

Add from the selected service | Cancel

Figure 3-39. Available services for Dom0SystemLoad category

2. Select the Users service and click **Add from the selected services**. The edition form for the corresponding service is displayed with all fields filled in. Click **OK**.

3. The Categories and Services page now displays the **Users** service in the list of the used **Dom0SystemLoad** services.

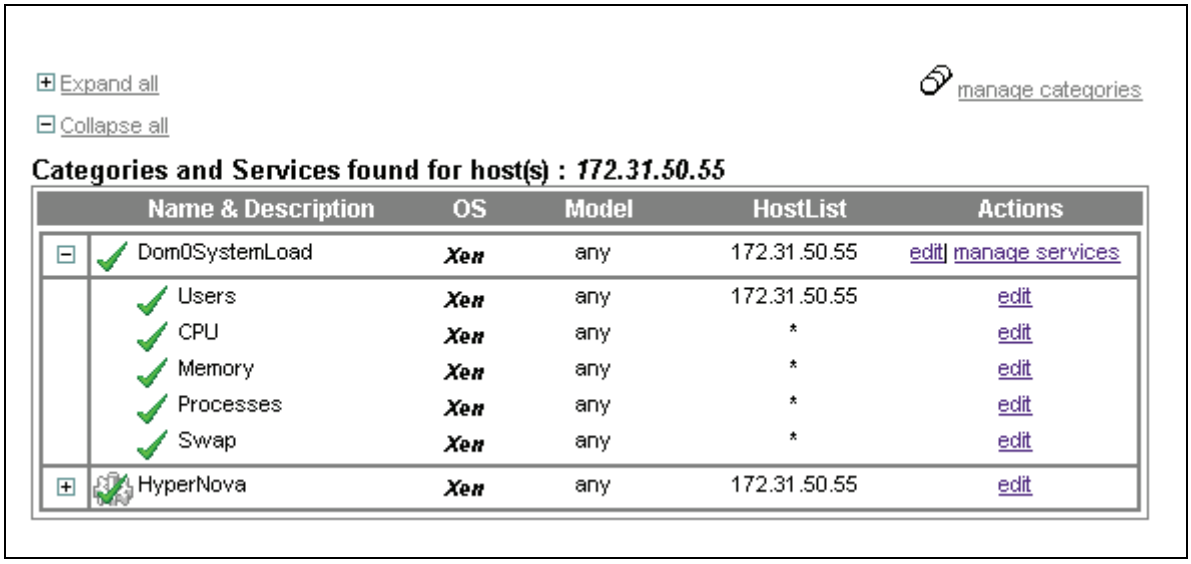


Figure 3-40. Users service for domain0 Host

To get detailed information about the Categories and Services configuration, refer to the *Bull System Manager Administrator's Guide*.

3.3.4.3 Nagios Check Commands

check_hn_server_status

The configurable Bull System Manager service check command syntax is:

```
check_hn_server_status
```

See the **check_NSM_hypernova_xen** command in Appendix A for parameters details.

check_hn_vm_status

The configurable Bull System Manager service check command syntax is:

```
check_hn_vm_status!<hypernova_server>!<vmname>
```

See the **check_NSM_hypernova_xen** command in Appendix A for parameters details.

domain0 supervision related commands

The commands used for **domain0** supervision services are those used for Linux supervision. To get detailed information about them, refer to the *Bull System Manager Administrator's Guide*.

The following table lists the commands used by the services.

Category.Service	Command
Dom0SystemLoad.CPU	check_cpuload
Dom0SystemLoad.Memory	check_memory
Dom0SystemLoad.Processes	check_procs
Dom0SystemLoad.Users	check_procs
Dom0SystemLoad.Zombies	
Dom0SystemLoad.Swap	check_swap
Dom0FileSystems.All	check_disks.pl
Dom0FileSystems./usr	
Dom0LinuxServices.syslogd	check_procs
Dom0Syslog.AuthentFailures	check_log2.pl
Dom0Syslog.RootAccess	

3.3.4.4 Bull System Manager Console

Operation

From the Virtual Manager or from any element of the Virtual Platform, you can launch the **HN Master Web Interface** by selecting the following cascading menu:

Operation → Application → HN Master

3.3.4.5 HyperNova Monitoring

From the platform or host elements, you can access monitoring information.
From the hosts element, you can display information related to associated services by selecting **Monitoring** menus.
From the platform element, you can display monitoring information related to all elements by selecting **Monitoring** menus. For instance, you can view all services of the hosts in the platform, as shown in the following figure:

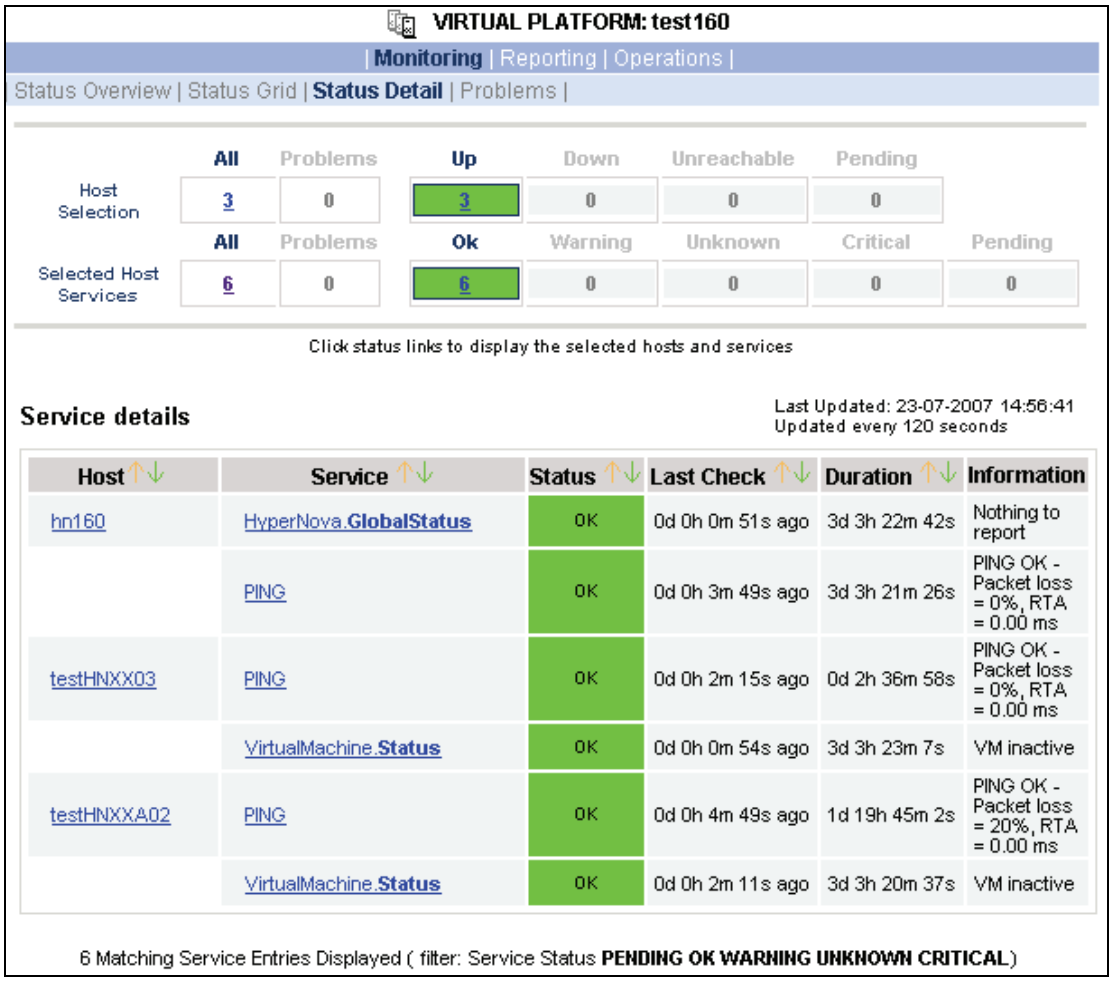


Figure 3-41. Virtual Platform monitoring

3.3.5 BSMEscalaLPAR "EscalaLPAR" Management

3.3.5.1 Overview

Dynamic logical partitioning (LPAR) is a system architecture delivered on Escala systems that allows the division of a single server into several completely independent virtual servers or logical partitions.

The **HMC (Hardware Management Console)** is a special-purpose system that provides management tools for controlling one or more Escala Privilege Line servers and associated logical partitions (LPARs). Management can be performed either through the HMC GUI or through the command-line interface (using a ssh connection to the HMC).

For system not managed by an HMC, **Integrated Virtualization Manager (IVM)** provides a local management of the partitions. IVM, which is part of the Virtual I/O Server, is a special purpose partition that provides virtual I/O resources to other partitions.

The **EscalaLPAR** Add-on provides functional links to supervise the logical partitions by requesting the HMC system or the IVM component.

Important

Escala Supervision with HMC or IVM requires the setting of a non-prompt ssh connection between the Bull System Manager Server and the manager. Private key for the Bull System Manager server is automatically generated at the installation of Bull System Manager server under `<BSM installation directory>/engine/etc/ssh` (see Appendix F for detailed information). To allow non-prompt connection between the BSM Server and the HMC, the public key must be installed on the HMC or IVM hosting server. Refer to the HMC or IVM documentation to see how to install the key

The following figure shows the link between each component, for system managed with HMC:

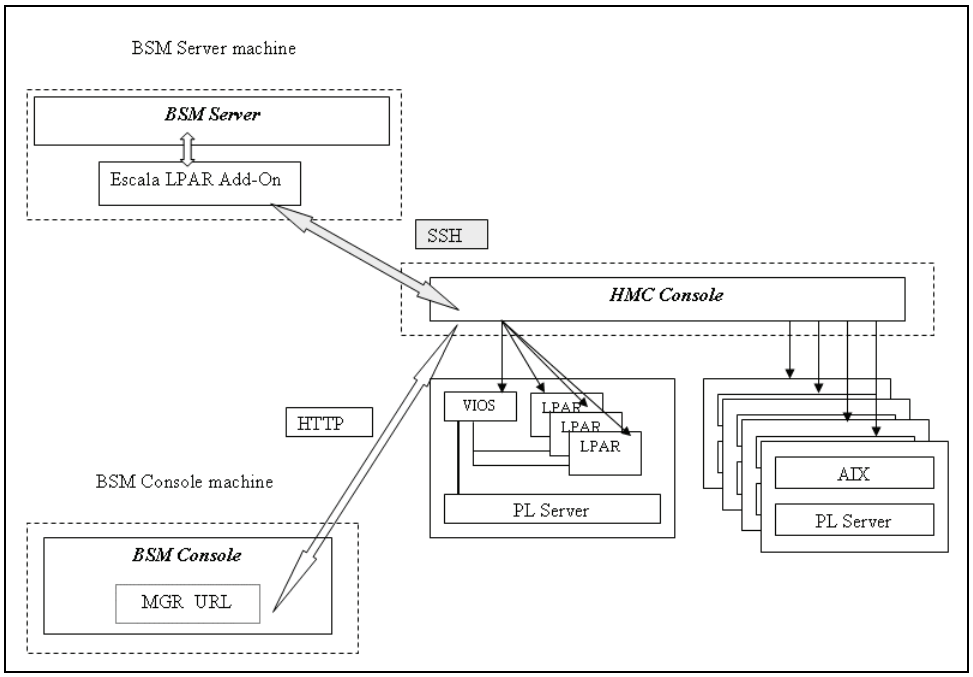


Figure 3-42. EscalaLPAR Add-on components for HMC managed systems

The following figure shows the link between each component, for system managed with IVM:

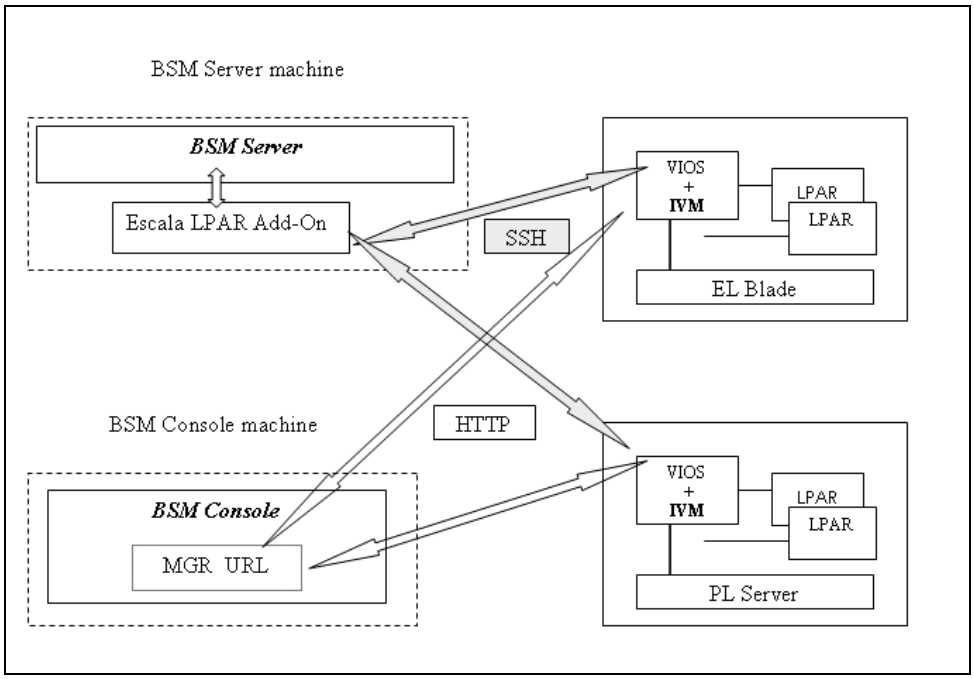


Figure 3-43. EscalaLPAR Add-on components for IVM managed systems

3.3.5.2 Bull System Manager Configuration

To configure the monitoring elements for the EscalaLPAR Add-on, you have to define an Escala Platform from the Bull System Manager Configuration GUI.
The definition of an Escala Platform is done in two steps:

- initialization of the Escala Server
- definition of the partitioning (LPARs).

HMC managed Escala Server

The initialization of an HMC managed system is done through the **PL Server** link under Hosts Definition/Escala hosts menu of the **Topology** domain.

IVM managed Escala Server

The initialization of an IVM managed Escala Server requires that this server contains a VIOS partition. This is done through the **EL Blade** or **PL Server** links under the Hosts Definition/Escala hosts menu of the **Topology** domain.

Non managed Escala Server

The initialization of a non managed Escala Server is done through the **PL Server** links under the Hosts Definition/Escala hosts menu of the **Topology** domain.

Escala Server Partitioning

The definition of the partitioning is done through the LPARs links

To get detailed information about How to define Escala Hosts, see the *Bull System Manager Administrator's Guide*.

3.3.5.2.1 Virtualization Supervision

Services and associated performance indicators are instantiated for each host defined in the Escala LPAR platform.

You can disable virtualization supervision by editing the hostgroup or manager properties or by editing each service (refer to the *Bull System Manager Administration Guide* for details).

Monitoring Services applied to the server managed by IVM

Monitoring services defined for the server managed by IVM (hosting the VIOS partition) are associated with the **VIOS** category.

Service	Description	Check_command
Status	Checks the status of the Virtual I/O server	check_vios_status
UsedPool	Checks the utilization of the processing pool on server	check_vios_pool

Monitoring Services applied to the server managed by HMC

Monitoring services defined for the PL server managed by an HMC are associated with the **PowerHypervisor** category.

Service	Description	Check_command
UsedPool	Checks the utilization of the processing pool on the server	ceck_cec_used_pool

Monitoring Services Applied to the LPAR Host

Monitoring services defined for LPAR hosts are associated with the **VirtualMachine** category.

Service	Description	Check_command
Status	Checks LPAR status	check lpar_status
UsedCPU	Checks the utilization of the entitled CPU by the partition	check_lpar_used_cpu

Monitoring services related to Escala Platform elements are automatically created during the edition of the Platform. Theses services can be displayed and edited from the **Services** page in the Supervision domain, but only the attributes related to monitoring or notification can be edited.

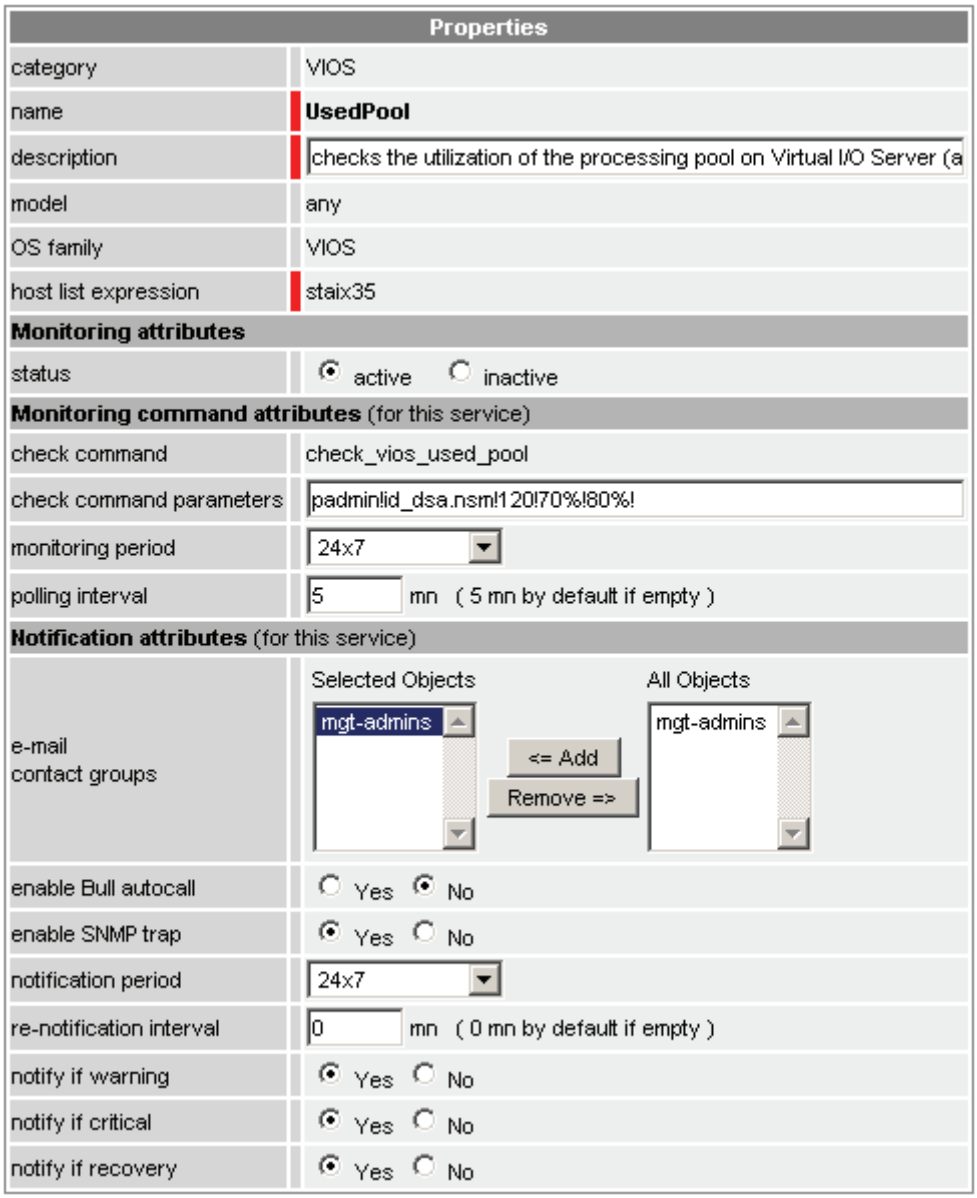


Figure 3-44. VIOS.UsedPool Service Properties pane

Note During Platform definition, all services are defined and activated for the server and for each LPAR. To deactivate the monitoring of one service, edit it and set its **status** (Monitoring attributes part) to **inactive**.

Reporting indicators

A performance indicator is defined for the Escala server to describe the utilization of the processing pool. This indicator is identified as **<escalaServer>_UsedPool**.

A reporting indicator is defined for each LPAR to describe the utilization of the entitled CPU of a given LPAR. This indicator is identified as **<lpar_host>_UsedCPU**.

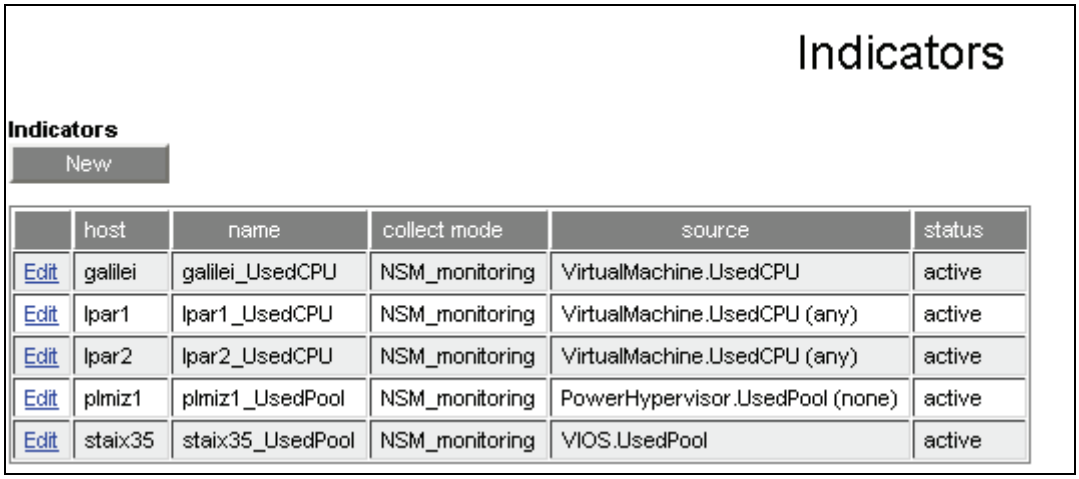


Figure 3-45. Reporting indicators

Note The collection of all these indicators is activated during the Platform definition. To deactivate some of them, edit the indicator and set its **status** to **inactive**.

3.3.5.3 Nagios Check Commands

check_vios_status

The configurable BSM service check command syntax is:

```
check_vios_status!<ssh_user>!<identity_file>
```

See the **check_NSM_escala_lpar** command in Appendix A for parameters details.

check_vios_used_pool

The configurable BSM service check command syntax is:

```
check_vios_used_pool!<ssh_user>!<identity_file>!<sample_time>!<warning_thresho
ld>!<critical_threshold>
```

See the **check_NSM_escala_lpar** command in Appendix A for parameters details.

check_cec_used_pool

The configurable BSM service check command syntax is:

```
check_cec_used_pool!<hmc_netname>!<ssh_user>!<identity_file>!<cec_name>!<sampl
e_time>!<warning_threshold>!<critical_threshold>
```

See the **check_NSM_escala_lpar** command in Appendix A for parameters details.

check_lpar_status

The configurable BSM service check command syntax is:

```
check_lpar_status!<mgr_type>!<mgr_netName>!<ssh_user>!<identity_file>!<system_
name>!<lpar_name>
```

See the **check_NSM_ escala_lpar** command in Appendix A for parameters details.

check_lpar_used_cpu

The configurable BSM service check command syntax is:

```
check_vios_lpar_used_cpu!<mgr_type>!<mgr_netName>!<ssh_user>!<identity_file>!<
system_name>!<lpar_name>!<sample_time>!<warning_threshold>!<critical_threshold
>
```

See the **check_NSM_ escala_lpar** command in Appendix A for parameters details.

3.3.5.4 Bull System Manager Console

3.3.5.4.1 Operation

From the Virtual Manager or from any element of the Escala Platform, do as follows:

- If the system is managed by HMC, you can launch the **HMC Web Interface** by selecting the following cascading menu:

  Operation → Virtualization → HMC

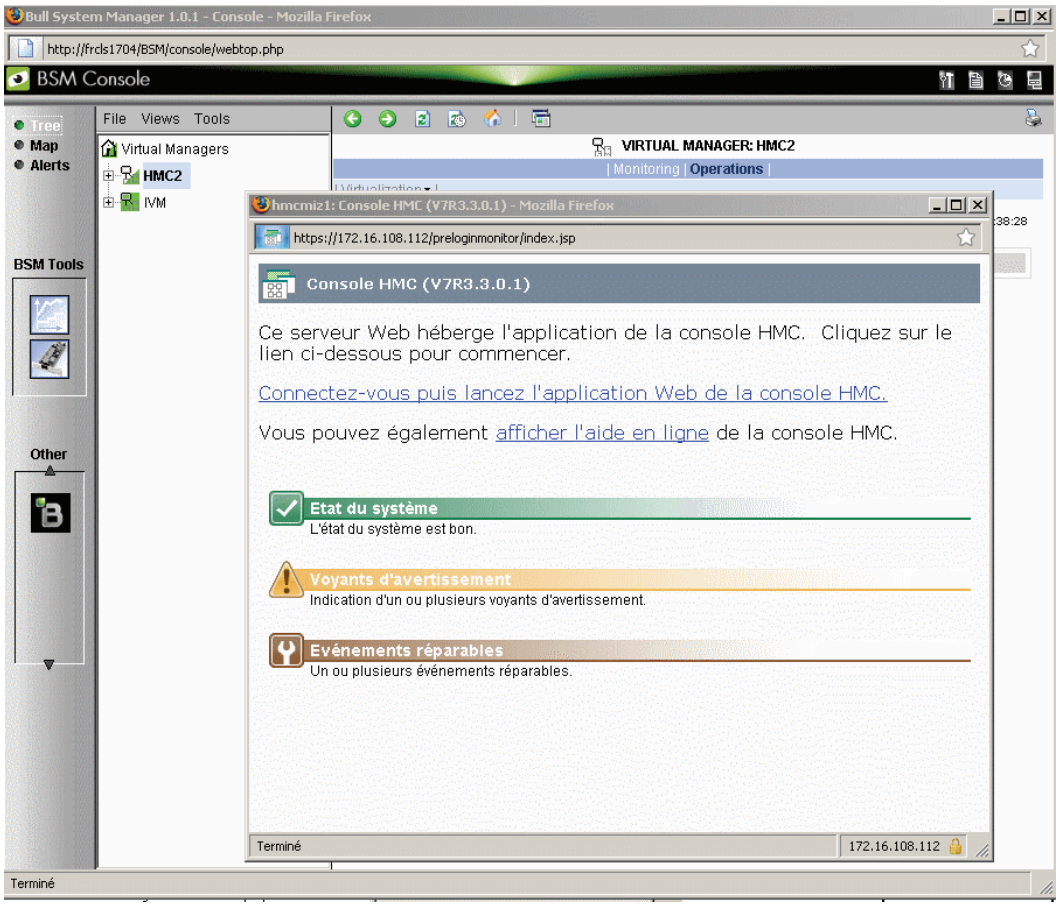


Figure 3-46. HMC activation from Bull System Manager Console

- If the system is managed by IVM, you can launch the **IVM Web Interface** by selecting the following cascading menu:

  Operation → Virtualization → IVM

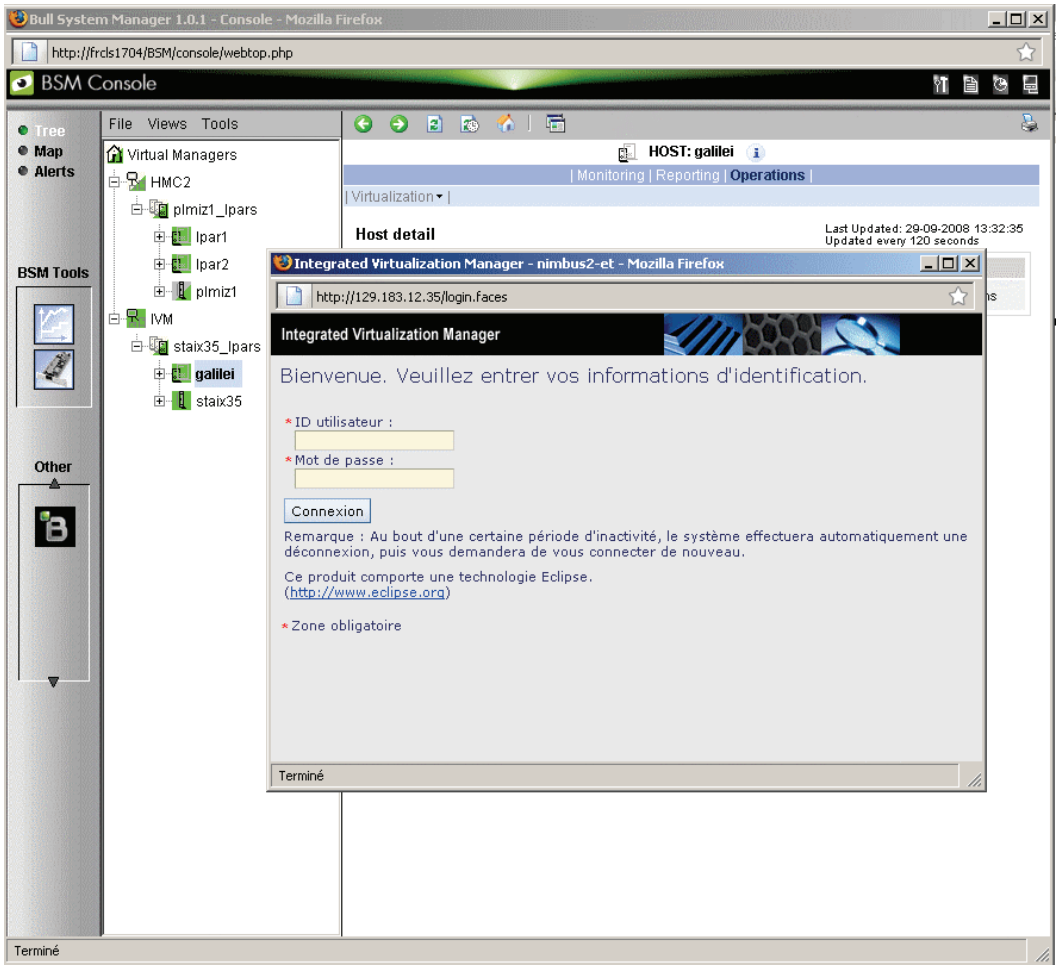


Figure 3-47. IVM activation from Bull System Manager Console

3.3.5.4.2 Escala Supervision

To see all services related to an HMC managed Escala server, use the **Virtual Managers** view, click the platform node and select Monitoring/Status detail menu. The following page is displayed:

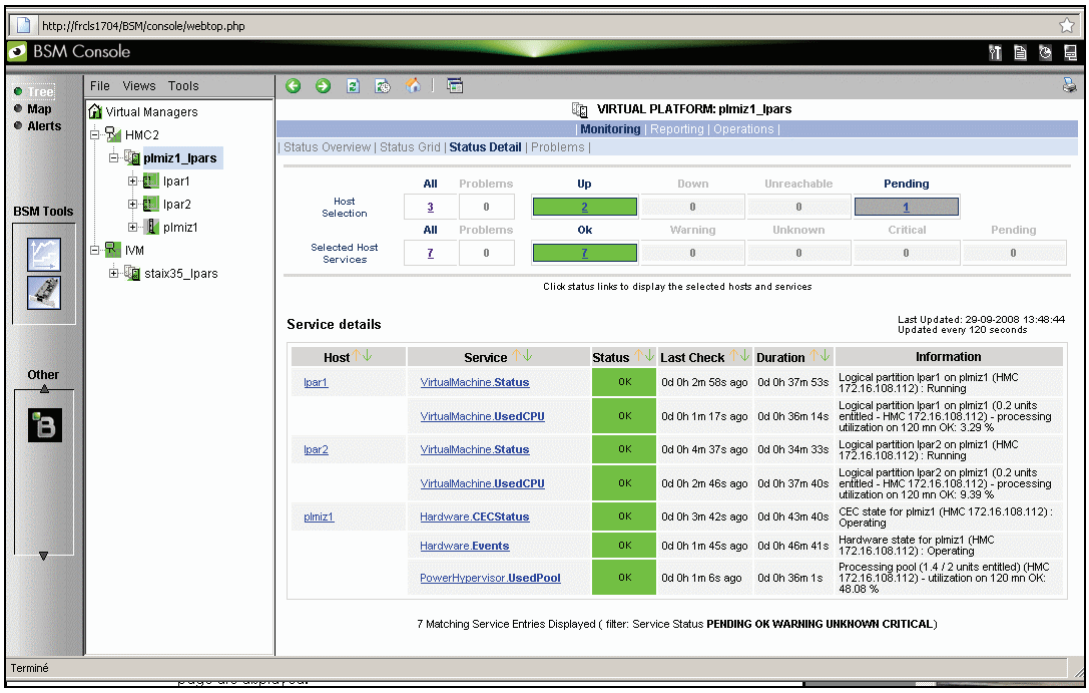


Figure 3-48. Escala HMC reported Supervision

To see all services related to an IVM managed Escala server, use the Virtual Managers view, click the platform node and select Monitoring/Status detail menu. The following page is displayed:

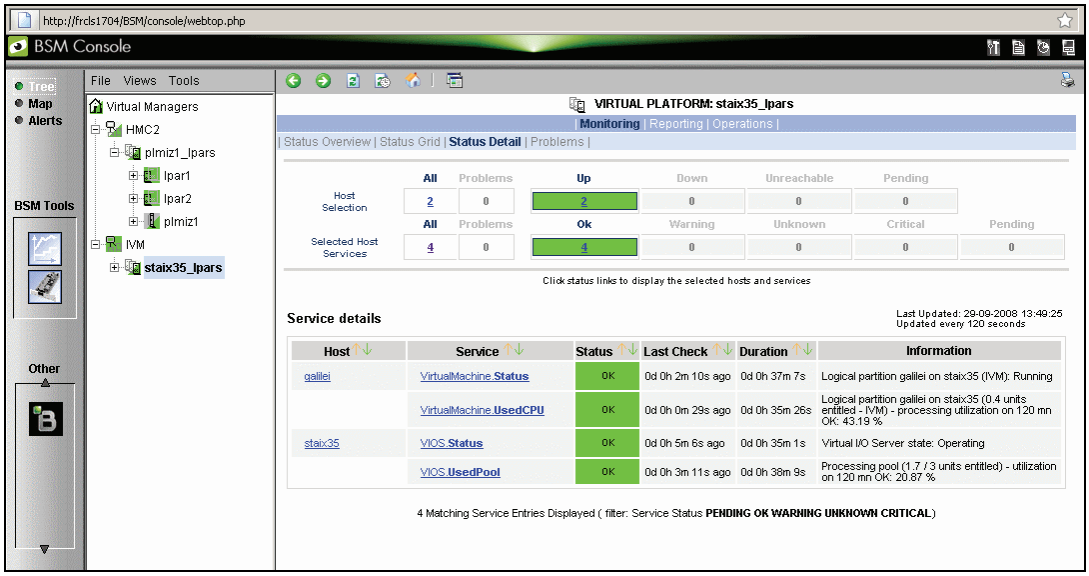


Figure 3-49. Escala IVM reported supervision

3.3.5.4.3 Escala Reporting

From the host hosting the Vios partition or from host representing the hardware of HMC managed PL Escala, you can display reporting indicators to get evolution of the processing pool utilization.

From any LPAR host, you can display reporting indicators to get evolution of the utilization of the CPU entitled to the partition.

3.4 Bull Products Server Add-ons

3.4.1 BSMDD4A for Bull "Dynamic Domains For Applications" Management

The **Dynamic Domains For Applications** (DDFA) software is a tool that can be used on the Linux operating system for simulating the partitioning of a multi-CPU machine at application level. Dynamic Domains for Applications can be used with standard Linux distributions and can be managed using the Webmin standard administration tool.
See the *Dynamic Domains for Applications User's Guide* (ref 86 A2 63ER) for more information.
You can install DDFA from the *Bull Extension Pack for RedHat* CD.

Note DDFA runs only on Linux machines and uses a Webmin module for its management. You can download the prerequisite Webmin package from the web site: http://www.webmin.com

This Add-on creates monitoring links between Bull System Manager and the **DDFA** management webmin module.

The following figure shows the different components used for monitoring:

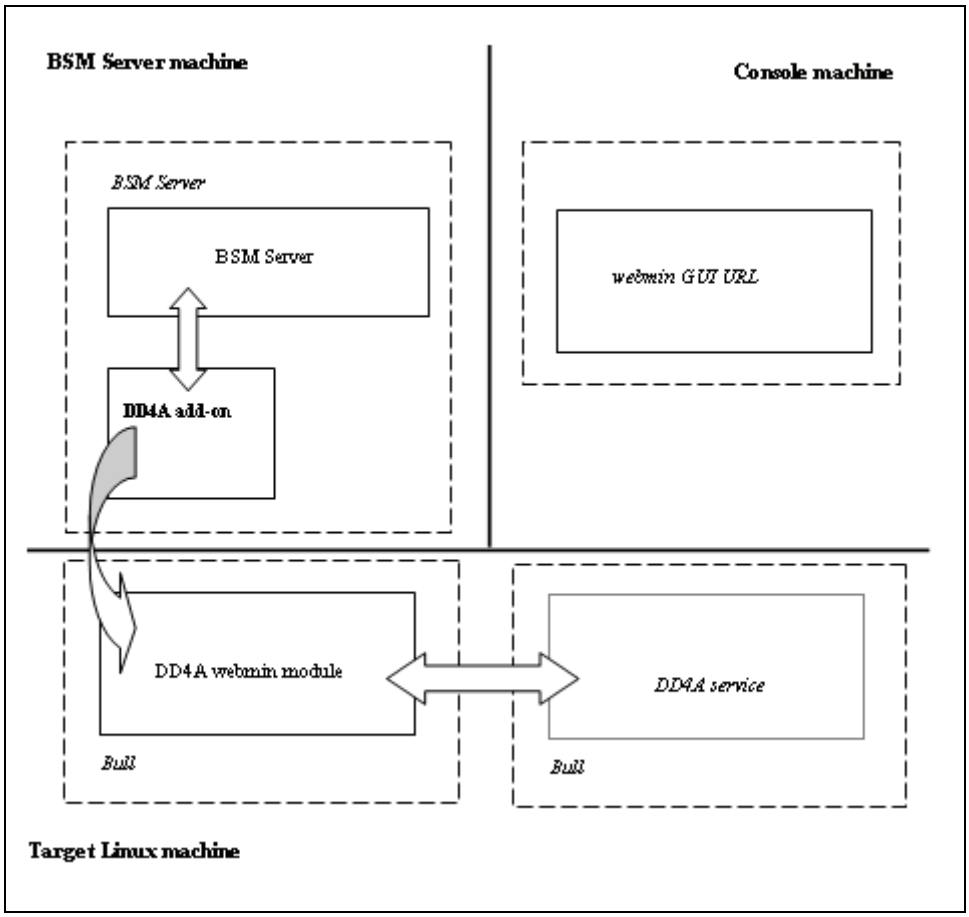


Figure 3-50. DDFA Monitoring Components

Bull System Manager Server Add-ons provides the default Bull product categories by Management Package described below.

3.4.1.1 Default Categories & Services Proposed for Linux Hosts

Targeted OS	Model	Category	Service	Check command
Linux	Any	DynamicDomains	All	check_dd4a
			Default	

Table 3-9. DDF4 categories and services

3.4.1.2 DynamicDomains Category

All Service

For NovaScale and Express5800 Linux hosts with the Dynamic Domains management tool. This service dynamically checks global status reported by the associated webmin module for all defined Dynamic Domains.

Note There is no need to reconfigure the tool to survey new defined Dynamic Domains.

default Service

For NovaScale and Express5800 Linux hosts with the Dynamic Domains management tool. This service checks the status of the default Dynamic Domain.

Note When creating a new Dynamic Domain, statically clone the default monitoring service to survey the new dynamic domain.

3.4.1.3 check_DynamicDomains (Linux OS) Nagios Command

The configurable Bull System Manager service check command syntax is:

```
check_DynamicDomains!<{ALL|<DomainName>}
```

Default syntax for **DynamicDomains.All**:

```
check_DynamicDomains!ALL
```

Default syntax for **DynamicDomains.default**:

```
check_DynamicDomains!default
```

3.4.2 BSMBVS for Bull Video Services Management

Bull Video Services (BVS) software is a tool that can be used with standard Linux distributions and Windows and can be managed using Web server.

See the *Bull Video Services User's Guide* for more information.

You can install BVS from the Bull Video Services CD (ref 36673900-xxx).

Note BSMBVS supports only BVS version 4.x on Linux machines and uses an non-secure HTTP access to integrated Web server for management.
The access to BVS administration Web tool through BSMConsole/Operations menu is not implemented.

This Add-on creates monitoring links between Bull System Manager and the **BVS** management Web server module.

The following figure shows the different monitoring components:

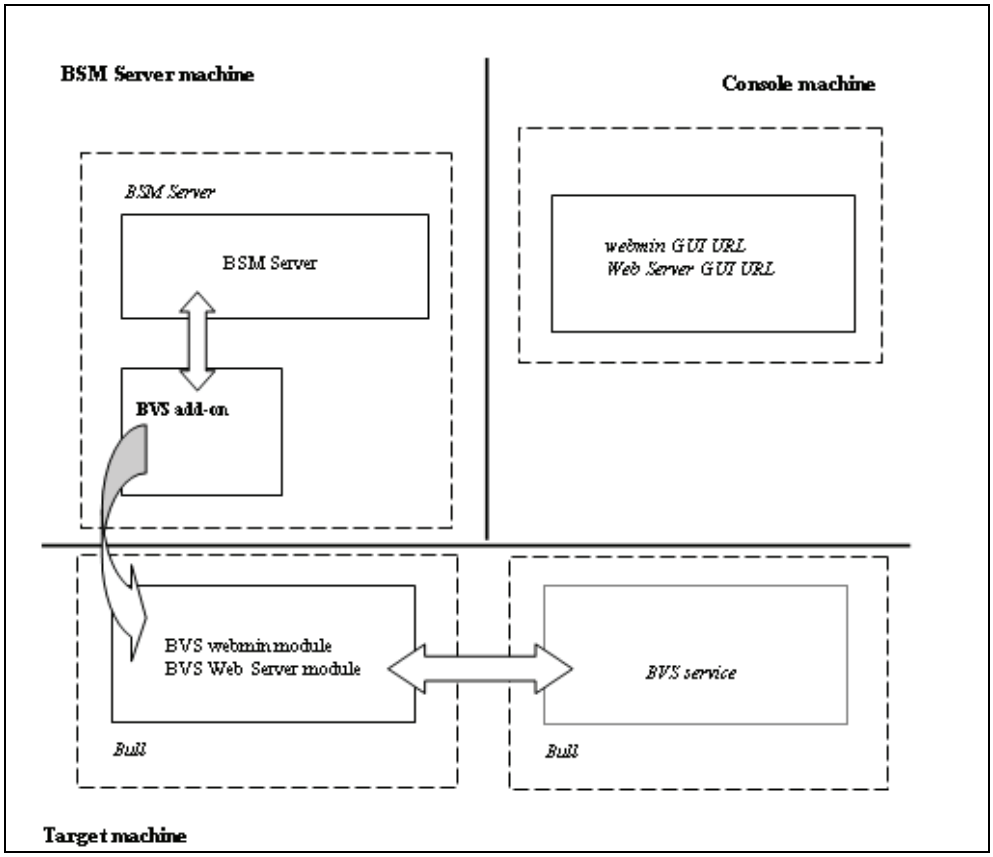


Figure 3-51. BVS Web Server Monitoring Components

Targeted OS	Model	Category	Services	Check command
Linux	any	BullVideoServices	Streaming Recording Datagrams	check_BullVideoServices

Table 3-10. Bull Video Services categories and services

3.4.2.1 BullVideoServices Category

Streaming For NovaScale hosts acting as Bull video server. This service checks the status of the video streaming service.

Recording For NovaScale hosts acting as Bull video server. This service checks the status of the video recording service.

Datagrams For NovaScale hosts acting as Bull video server. This service checks the status of the video datagram errors.

3.4.2.2 check_BVS Nagios Command

The configurable Bull System Manager service check command syntax is:

```
check_BVS!<serviceName>
```

See the **check_BVS** command, in Appendix A for parameters details.

For instance, Default syntax for **BullVideoService.Streaming** is:

```
check_BVS!Streaming
```

3.4.3 BSMJOnAS for JOnAS Management

3.4.3.1 JOnAS Overview

JOnAS is a pure Java, open source application server. Its high modularity allows it to be used as:

- A J2EE server, for deploying and running EAR applications (i.e. applications composed of both web and ejb components)
- An EJB container, for deploying and running EJB components (e.g. for applications without web interfaces or when using JSP/Servlet engines that are not integrated as a JOnAS container)
- A WEB container, for deploying and running JSPs and Servlets (e.g. for applications without EJB components).

The JOnAS architecture is illustrated in the following figure, showing WEB and EJB containers relying on JOnAS services.

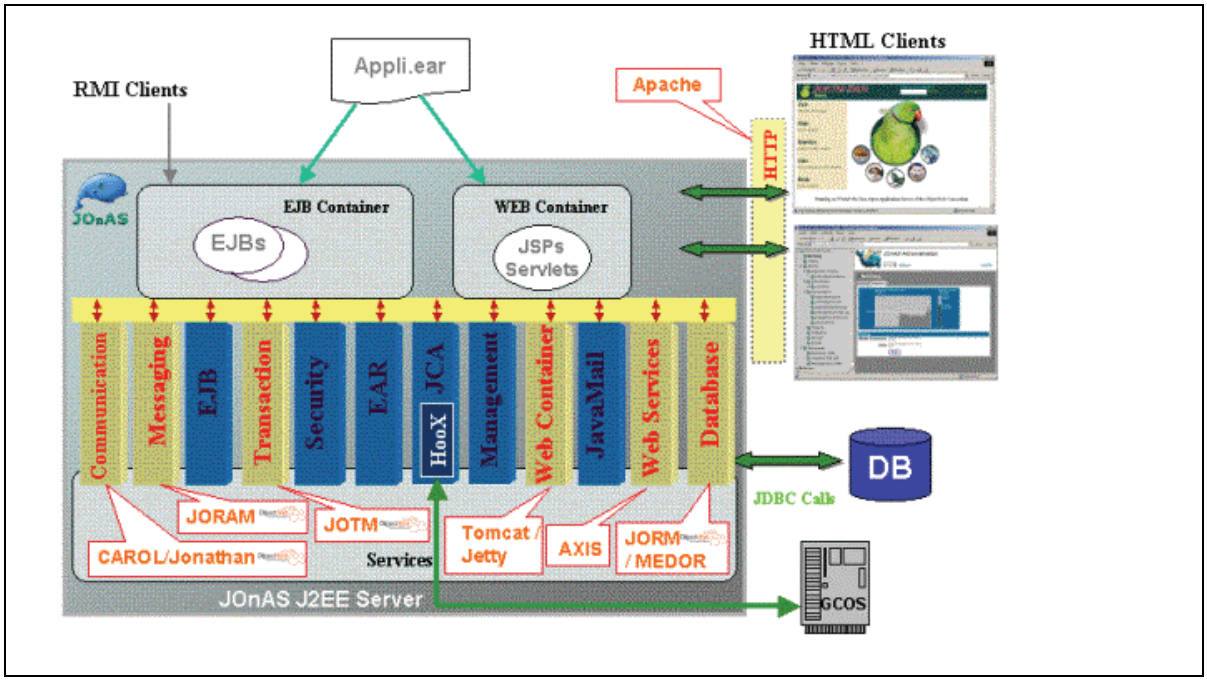


Figure 3-52. JOnAS Architecture

See http://jonas.objectweb.org/doc/index.html for more information.

3.4.3.2 JOnAS Domain Topology

A JOnAS management domain is composed of a set of JOnAS servers that are running under the same management authority. All the servers in the domain must have a distinct **server name** and a common **domain name**.

The servers in a domain can be administered by a management application running on a server playing the role of **administrator** or **master**. The managed servers play the role of **slaves**.

A default domain configuration is provided in $JONAS_ROOT/conf/domain.xml. This configuration corresponds to a domain named **jonas** managed by a server also named **jonas**.

JOnAS administrators are responsible for the configuration and administration of JOnAS servers running within a management domain.

3.4.3.3 JOnAS Monitoring Information

Bull System Manager retrieves domain and server monitoring information from JOnAS (administrator or master) server via the WEB services.

Note WEB services are operational only if the **conf/server.xml** file on JOnAS (administrator or master) server is correctly configured as follows:
The **localhost** value must be replaced by the **DNS host name**.

3.4.3.4 Bull System Manager Configuration

JOnAS configuration for Bull System Manager is available from the configuration GUI by selecting **Third-Party Application** → **JOnAS**.

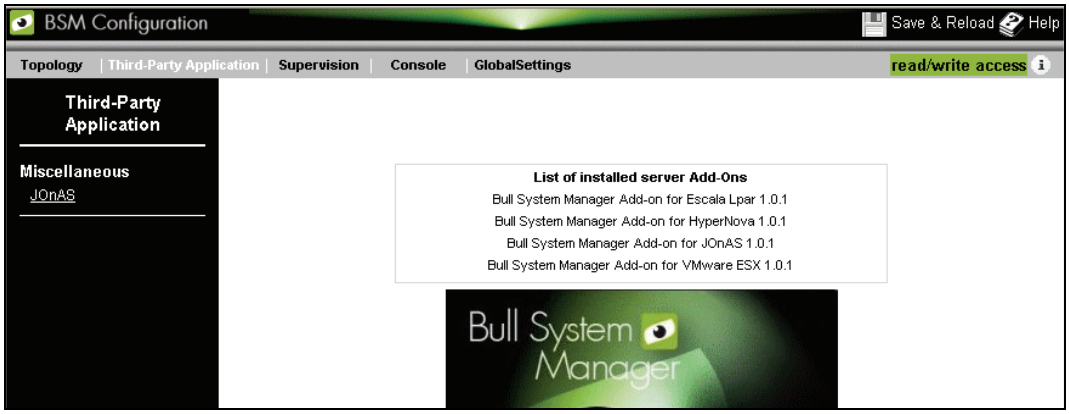
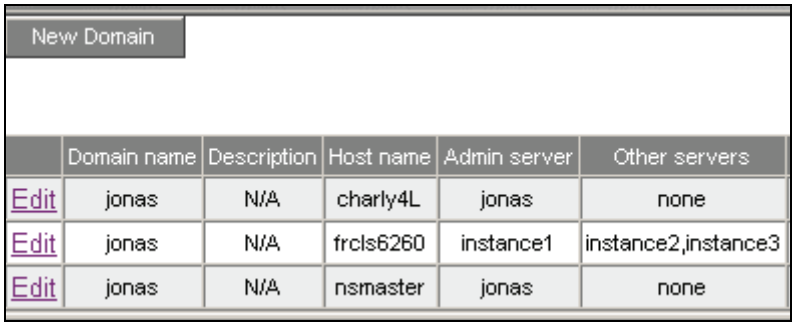


Figure 3-53. JOnAS configuration

JOnAS Domain Definition

To display the JOnAS domains already defined, click **Third-Party Application** → **JOnAS**.



	Domain name	Description	Host name	Admin server	Other servers
Edit	jonas	N/A	charly4L	jonas	none
Edit	jonas	N/A	frcls6260	instance1	instance2,instance3
Edit	jonas	N/A	nsmaster	jonas	none

Figure 3-54. JOnAS domains

To edit a domain, click **Edit**.

To define a new JOnAS domain in the Bull System Manager configuration database, click the **New Domain** button and initialize the following attributes:

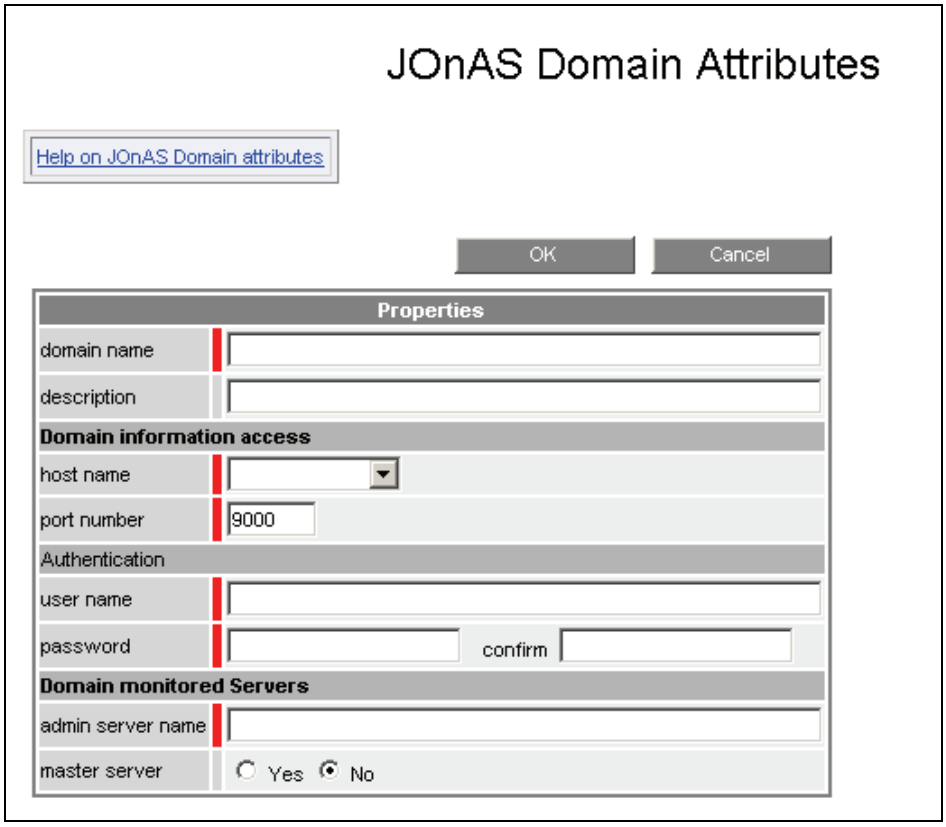


Figure 3-55. JOnAS properties

domain name name of JOnAS domain

description description of the domain

Domain information access

host name name of the host

port number port number

user name name of the user

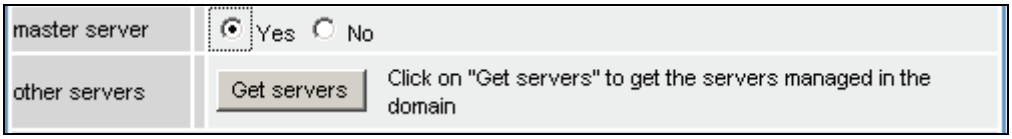
password password

Domain monitored Servers

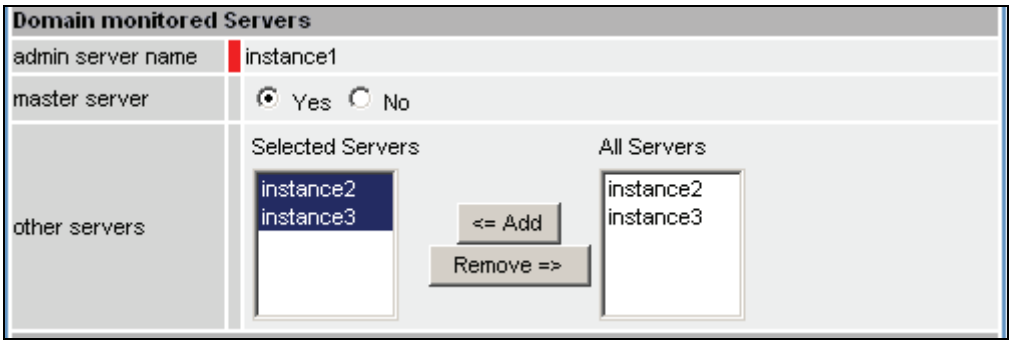
admin server name name of JOnAS administator or master server

master server master server flag

If the master server flag is set to **Yes**, the **Get Servers** button is displayed:



Click the **Get Servers** button to list all the servers belonging to the specified domain:



other servers the selected servers will be monitored by Bull System Manager.

3.4.3.5 JOnAS Category and Service

The definition of a domain creates or updates a **JOnAS** category and creates one service by JOnAS server identified by the JOnAS server name.

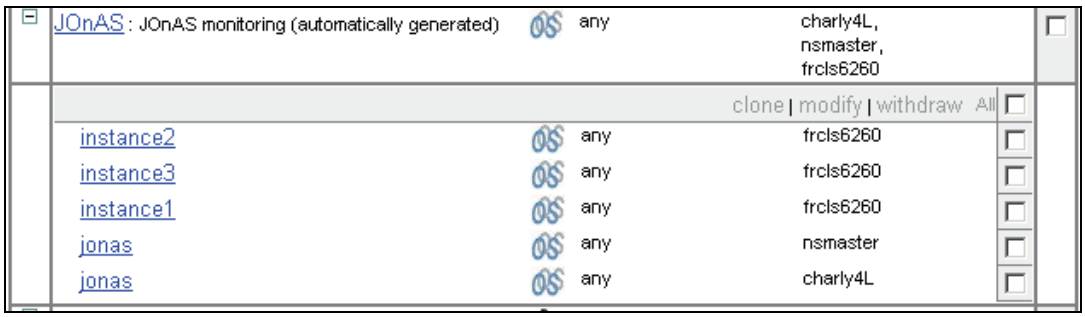


Figure 3-56. JOnAS category and services

The **check_NSM_JOnAS** command defined for the service returns the state of the server (**RUNNING, STOPPED, FAILED, UNREACHABLE**). If the server is running, the following attributes are returned:

- Threads count
- Memory allocated and used
- HTTP requests count
- Committed transactions count

3.4.3.6 JOnAS Reporting Indicators

Threads and **MemoryUsed** indicators are created for each JOnAS service.

- The **Threads** indicator returns the current threads count.
- The **MemoryUsed** indicator returns the current memory used.

	host	name	collect mode	source	status
Edit	charly4L	JOnASjonas.MemoryUsed	NSM_monitoring	JOnAS.jonas	active
Edit	charly4L	JOnASjonas.Threads	NSM_monitoring	JOnAS.jonas	active

Figure 3-57. JOnAS indicators

3.4.3.7 Bull System Manager Console

JOnAS Monitoring Representation

The JOnAS category groups services monitoring for all the servers in the domain.

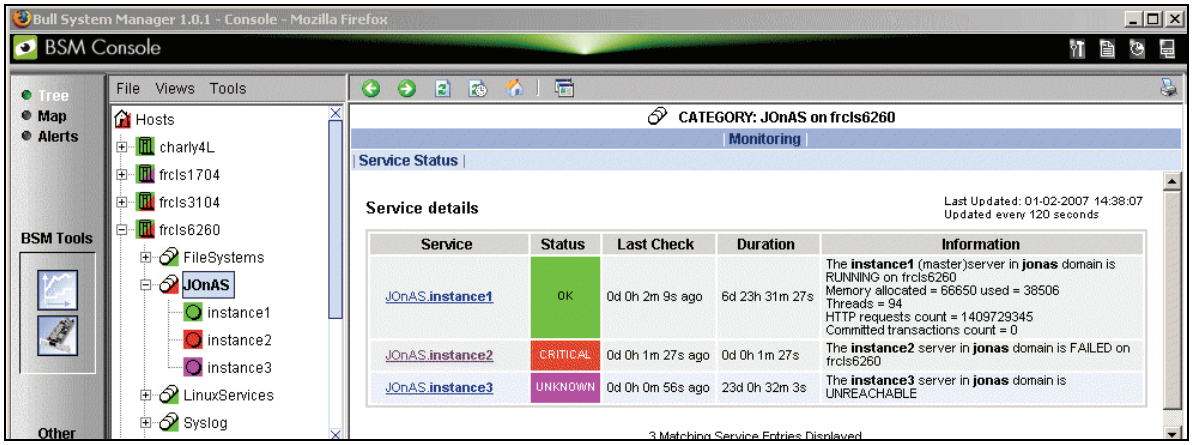


Figure 3-58. JOnAS category view

Launching the jonasAdmin Application

The JOnAS administration tool, **jonasAdmin**, can be contextually launched from a service node on the Bull System Manager console by clicking:
Operations → Application → jonasAdmin

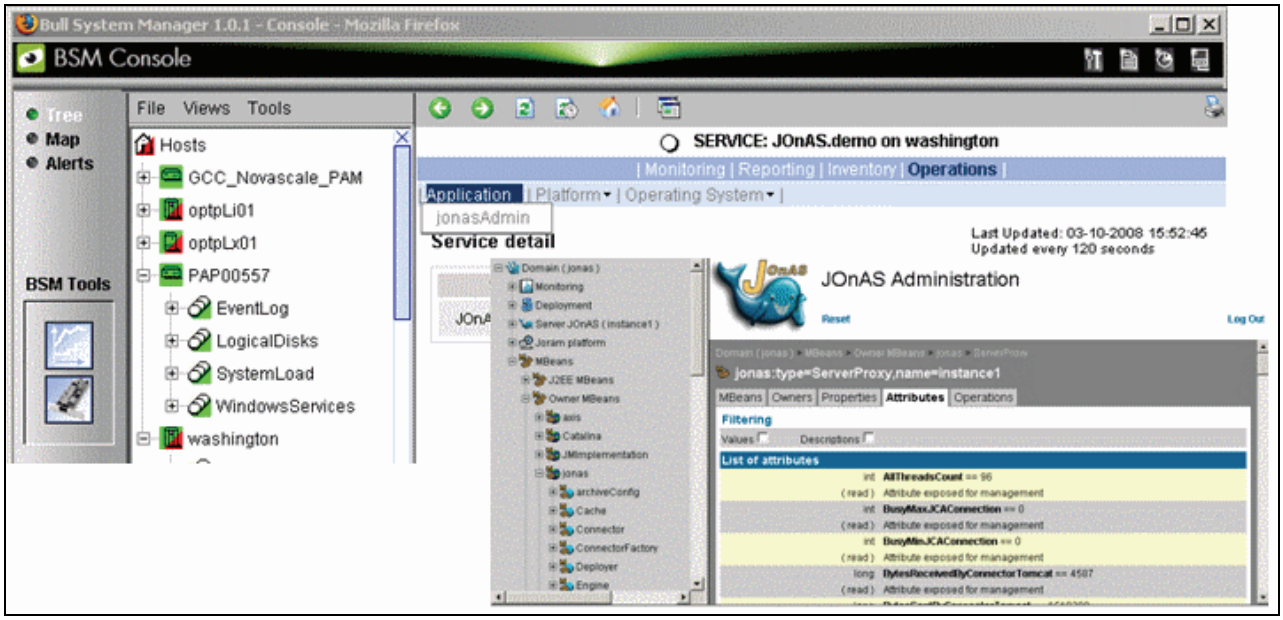


Figure 3-59. jonasAdmin launching

Appendix A. Check Commands for Customizable Services of Add_ons

This appendix describes the usage of the check commands by customizable services. These commands are Linux commands. They run only under CYGWIN on Windows.

A.1 Internal Storage Management

A.1.1 BSMGAMTT

A.1.1.1 check_gamttRAID

check_gamttRAID uses the following shell (PERL) command:

Usage

```
check_gamttraid -H <host> [-C <community>] [-p <port>] [-t <timeout>]
{ [-A {ALL|<Ct>}] | [-P {ALL|<Ct>.<Ch>.<Tg>}] | [-L {ALL|<Ct>.<Ldn>}] }
[-v <vl>] [-f <f>]
```

-H, –hostname <host>	Hostname or IP address of target to check
-C, –community <community>	SNMP community string (defaults to ”public”)
-p, –port <port>	SNMP port (defaults to 161)
-t, –timeout <timeout>	Seconds before timing out (defaults to Nagios timeout value)
-A, –adapter ALL | <Ct>	Controller board
-P, –physical ALL | <Ct>.<Ch>.<Tg>	Physical device addr
-L, –logical ALL | <Ct>.<Ldn>	Logical drive addr
-v, —verbosity <vl>	Verbosity level: ”0” None ”1” Adds the <CtrlModel> and the status of all controller boards filtered
-f, –format <f>	”0” Carriage Return in ASCII mode (\n) ”1” Carriage Return in HTML mode ( )

Return code

OK (0), WARNING (1), CRITICAL (2), UNKNOWN (3)

- OK:
  All ”logical drives” and all ”physical devices” run normally.
- WARNING:
  At least one ”logical drive” or one ”physical device” is in a WARNING state.

- CRITICAL:
  At least one "logical drive" or one "physical device" is in a CRITICAL state.
- UNKNOWN
  All other types of processing errors (bad parameter, no response, and so on…).

Note In the case of multiple errors, the global state will be the worst one;
CRITICAL > WARNING > OK.

Output

A string composed with a global state descriptor followed, if they exist, by error states of concerned component (controller, Logical Device, Physical Device).

global state descriptor:

The first line shows the global state. The syntax is:

```
GAMTT RAID [CT |PD |LD ]<GlobalStatus>
```

"CT " if "-A".

"PD " if "-P".

"LD " if "-L".

state descriptor by controller

They may be present after the global state descriptor if an error exists.

The syntax is:

```
[ CT(Ct<Ct>) <CtrlModel> <CtrlStatus>
[{LD(Ct<Ct> Nu<Ldn>) <LDType> <LDStatus>[, ] …}]
[{PD(Ct<Ct> Ch<Ch> Tg<Tg>) <PDType> <PDStatus>[, ] …}]
…]
```

<GlobalStatus>	worst detected status
<CtrlModel>	controller model
<CtrlStatus>	worst state detected for an element of this controller (LD and PD)
<Ct>	controller number
<Ldn>	"logical drive" number
<LDType>	"logical drive" type: "RAIDx" or "JBOD"
<LDStatus>	"logical drive" status
<Ct>	controller number
<Ch>	"channel" number
<Tg>	target number
<PDType>	"physical device" type: "Disk", "Processor", "Ctrl Channel", □
<PDStatus>	"physical device" status

Examples:

- If global state is OK:

```
> check_gamttraid -H <host>
GAMTT RAID OK
>
> check_gamttraid -H <host> -P 0.0.1
GAMTT RAID PD OK
>
> check_gamttraid -H <host> -L 0.0
GAMTT RAID LD OK
>
> check_gamttraid -H <host> -v 1
GAMTT RAID OK
CT(Ct0) MegaRAID Ultra320-2x OK
CT(Ct1) DAC960FFX2 OK
CT(Ct2) MegaRAID Ultra320-2x OK
>
> check_gamttraid -H <host> -A 1 -v 1
GAMTT RAID CT OK
CT(Ct1) DAC960FFX2 OK
>
```

- If global state is CRITICAL or WARNING, only concerned elements are displayed:

```
> check_gamttraid -H <host>
GAMTT RAID CRITICAL
CT(Ct0) MegaRAID Ultra320-2x CRITICAL
PD(Ct0 Ch0 Tg1) Disk Dead
>
> check_gamttraid -H <host> -L 0.1
GAMTT RAID LD CRITICAL
CT(Ct0) MegaRAID Ultra320-2x CRITICAL
LD(Ct0 Nu1) RAID5 Critical
>
```

- If return code is UNKNOWN:

```
> check_gamttraid -H <host>
GAMTT RAID UNKNOWN - snmp query timed out
>
```

A.1.2 BSMLSICIM

A.1.2.1 check_LSICIM

check_LSICIM uses the following shell (PERL) command:

Usage

```
check_LSICIM -H <host> [-C <ctrlname>]
```

-H, –hostname <host>	Hostname or IP address of target to check
-C, –ctrlname <ctrlname>	Name of the controller to check

Note The name of the controller must be protected with a quote if the name contains blank characters.

Return code

OK (0), WARNING (1), CRITICAL (2), UNKNOWN (3)

- OK:
  All "Controllers" run normally.
- WARNING:
  At least one " Controllers" is in a WARNING state.
- CRITICAL:
  At least one "Controllers" is in a CRITICAL state.
- UNKNOWN
  All other types of processing errors (bad parameter, no response, etc…).

Note In the case of multiple errors, the global state will be the worst one;
CRITICAL > WARNING > OK.

Output

A string indicates the state of mirroring followed, where applicable, by concerned component error states (controller, Logical Device, Physical Device).

If the GlobalStatus determined by the worst status of components is not OK, the state of the component is reported with the following format:

```
[CT(Ct<Ct>) <CtrlName> <CtrlStatus>
[{> LD(Ct<Ct> Nu<Ldn>) <LDType> <LDStatus>[, ] …}]
[{  - PD(Ct<Ct> Ch<Ch> Tg<Tg>) <PDManufacturer> <PDModel> <PDStatus>[,
[{> PD(Ct<Ct> Ch<Ch> Tg<Tg>) <PDManufacturer> <PDModel> <PDStatus>[, ] …}]
```

<Ct>	controller number
<CtrlModel>	controller model
<CtrlStatus>	worst state detected for an element of this controller (LD and PD)
<Ldn>	"logical drive" number
<LDType>	"logical drive" type: IM
<LDStatus>	"logical drive" status as reported by the LSI CIM provider
<Ch>	"channel" number
<Tg>	target number
<PDManufacturer>	"physical device" manufacturer
<PDModel>	"physical device" model
<PDStatus>	"physical device" status as reported by the LSI CIM provider

Examples:

```
$ ./check_LSICIM -H 172.31.50.71
: LSI SCSI storage - Integrated Mirroring not available -

LSI SCSI storage - Integrated Mirrored available -
CT(0) LSI 53C1030 CRITICAL
> LD(Ct0 Ch2 Tg0) IMVolume: Degraded Redundancy
  - PD(Ct0 Ch3 Tg0) SEAGATE ST373454LC: Error



$ ./check_LSICIM -H 172.31.50.71 -C 'LSI SCSI1030 - 0'

> CT(0) LSI 53C1030 OK

$ ./check_LSICIM -H 172.31.50.71 -C 'LSI SCSI1030 - 0'
> CT(0) LSI 53C1030 CRITICAL
  - PD(Ct0 Ch0 Tg0) MAXTOR ATLAS10K4_36SCA CRITICAL
```

A.1.3 BSMMegaRaidSAS

A.1.3.1 check_MegaRaidSAS(_IR)

check_MegaRaidSAS(_IR) uses the following shell (PERL) command:

Usage

check_MegaRaidSAS(_IR) `-H <host> [-C <community>] [-p <port>] [-t <timeout>] { [-A {ALL|<Ct>}] | [-P {ALL|<Ct.Pdn>}] | [-L {ALL|<Ct.Ldn>}] } [-f <f>]`

-H, –hostname <host>	Hostname or IP address of target to check
-C, –community <community>	SNMP community string (defaults to ”public”)
-p, –port <port>	SNMP port (defaults to 161)
-t, –timeout <timeout>	Seconds before timing out (defaults to Nagios timeout value)
-A, –adapter ALL | <Ct>	Controller board
-P, –physical ALL | <Ct.Pdn>	Physical device identifier
-L, –logical ALL | <Ct.Ldn>	Virtual drive identifier
-f, –format <f>	”0” Carriage Return in HTML mode ( ) ”1” Carriage Return in ASCII mode (\n)

Return code

OK (0), WARNING (1), CRITICAL (2), UNKNOWN (3)

- OK:
  All ”logical drives” and all ”physical devices” run normally.
- WARNING:
  At least one ”logical drive” or one ”physical device” is in a WARNING state.
- CRITICAL:
  At least one ”logical drive” or one ”physical device” is in a CRITICAL state.
- UNKNOWN
  All other types of processing errors (bad parameter, no response, and so on…).

Note In the case of multiple errors, the global state will be the worst one;
CRITICAL > WARNING > OK.

Output

A string composed with a global state descriptor followed, if they exist, by error states of concerned component (controller, Logical Device, Physical Device).

Global state descriptor

The first line shows the global state. The syntax is:

```
MegaRAID SAS [CT |PD |LD ]<GlobalStatus>
```

"CT " if "-A".

"PD " if "-P".

"VD " if "-L".

state descriptor by controller

They may be present after the global state descriptor if an error exists.

The syntax is:

```
[ CT(Ct<Ct>) <CtrlModel> <CtrlStatus>
[PD(CT<id> DEV<id> ENC<id> SLOT<id> SN<number>) <PDType>
<PDStatus> …]
[VD(CT<id> DEV<id>) <RAIDLevel> <VDStatus> …]
…]
```

<CtrlModel>	controller model
<CtrlStatus>	worst state detected for an element of this controller
<id>	controller or Drive or Logical drive index
<RAIDLevel>	RAID level (0,1,5,10,50,60)
<VDStatus>	"logical drive" status
<PDType>	"physical device" type: "Disk", "Processor", "Ctrl Channel",
<PDStatus>	"physical device" status
<SN>	serial number of physical drive

Examples:

- If global state is OK:

```
> check_MegaRaidSAS -H <hostname>
MegaRAID SAS CT OK
CT0 MegaRAID SAS 8408E OK
PD: 4
VD: 2 ( RAID0, 1 RAID1)
>

> check_MegaRaidSAS -H < hostname > -A ALL
MegaRAID SAS CT OK
CT0 MegaRAID SAS 8408E OK
PD: 4
VD: 2 ( RAID0, 1 RAID1)
>

> check_MegaRaidSAS-H < hostname > -L ALL
MegaRAID SAS VD OK
>

> check_MegaRaidSAS-H < hostname > -P  ALL
MegaRAID SAS PD OK
>
```

```
> check_MegaRaidSAS-H < hostname > -P 0.2
MegaRAID SAS PD OK
>

> check_MegaRaidSAS-H < hostname > -L 0.1
MegaRAID SAS VD OK
>
```

- If global state is CRITICAL or WARNING, only concerned elements are displayed:

```
> check_MegaRaidSAS -H <hostname> -L ALL
MegaRAID SAS VD WARNING
VD(CT0 DEV0) RAID1 degraded
VD(CT0 DEV2) RAID1 degraded>
>

> check_MegaRaidSAS -H <hostname>
MegaRAID SAS CT CRITICAL
CT0 MegaRAID SAS 8408E CRITICAL
PD: 4
VD: 2 ( RAID0, 1 RAID1)
PD(CT0 DEV0 ENC1 SLOT0 SN50010b90000972e2) DISK offline>
VD(CT0 DEV0) RAID1 degraded
VD(CT0 DEV1) RAID0 offline>
>
```

- If return code is UNKNOWN:

```
> check_MegaRaidSAS-H <hostname>
MegaRAID SAS UNKNOWN - no MegaRAID SAS Adapter present
>
```

A.2 External Storage Management

A.2.1 BSMStoreWayFDA

A.2.1.1 check_NECFDA

check_NECFDA uses the following shell (PERL) command:

Usage

```
check_necfda -H <host> [-C <community>] [-p <port>] [-t <timeout>] [-f
<f>]
```

-H, –hostname <host>	Hostname or IP address of the target to check
-C, –community <community>	SNMP community string (defaults to ”public”)
-p, –port <port>	SNMP port (defaults to 161)
-t, –timeout <timeout>	Seconds before timing out (defaults to Nagios timeout value)
-f, –format <f>	”0” Carriage Return in ASCII mode (\n) ”1” Carriage Return in HTML mode ( )

```
check_necfda –help
```

-h, –help Display help

```
check_necfda –version
```

-V, –version Display version

Return code

OK (0), WARNING (1), CRITICAL (2), UNKNOWN (3)

Output

The first line shows the global state with the following format:

```
necfda <GlobalStatus>
```

<GlobalStatus> Most severe state detected on a controller.

Examples:

- If the global state is « OK »

```
> check_necfda -H <host>
necfda OK
>
```

- If the global state is CRITICAL or WARNING, only errors are displayed :
- When the return code is UNKNOWN:

```
> check_necfda -H <host>
necfda CRITICAL
>
> check_necfda -H <host>
necfda WARNING
>
> check_necfda -H <host>
necfda UNKNOWN - snmp query timed out
>
> check_necfda -H <host>
necfda UNKNOWN - no data received
>
```

A.2.2 BSMEmcClariion

A.2.2.1 check_EMCCLARIION

check_EMCCLARIION uses the following shell (PERL) command:

Usage

```
check_EmcClariion -H <host> [-C <community>] [-p <port>] [-t <timeout>]
[-f <f>]
```

-H, –hostname <host>	Hostname or IP address of the target to check
-C, –community <community>	SNMP community string (defaults to ”public”)
-p, –port <port>	SNMP port (defaults to 161)
-t, –timeout <timeout>	Seconds before timing out (defaults to Nagios timeout value)
-f, –format <f>	”0” Carriage Return in HTML mode ( ) ”1” Carriage Return in ASCII mode (\n)

```
check_EmcClariion –help
```

-h, –help Display help

```
check_EmcClariion –version
```

-V, –version Display version

Return code

OK (0), WARNING (1), CRITICAL (2), UNKNOWN (3)

Output

The first line shows the global state with the following format:

```
EmcClariion <GlobalStatus>
```

<GlobalStatus> Most severe state detected on a controller.

Examples:

- If the global state is « OK »

```
> check_EmcClariion -H <host>
EmcClariion CX200 B-APM00024600159 OK
>
```

- If the global state is CRITICAL or WARNING, only errors are displayed :

```
> check_EmcClariion -H <host>
EmcClariion CX200 B-APM00024600159 CRITICAL
>
> check_EmcClariion -H <host>
EmcClariion CX200 B-APM00024600159 WARNING
>
```

- When the return code is UNKNOWN:

```
> check_EmcClariion -H <host>
EmcClariion UNKNOWN - snmp query timed out
>
> check_EmcClariion -H <host>
EmcClariion UNKNOWN - no data received
>
```

A.2.3 BSMNetApp

A.2.3.1 check-netapp-cpuload

check-netapp-cpuload uses the following shell (PERL) command:

Usage

```
check_snmp -H <host> -C <community> -o <OID> -w <warning range>]
-c <critical range> -u <unit label>  -l <label>
```

-H, –hostname <host>	Hostname or IP address of the target to check
-C, –community <community>	SNMP community string (defaults to ”public”)
-o, –oid <OID>	object identifier to query
-w, –warning <int>	range which will not result in a WARNING status
-c, –critical <int>	range which will not result in a CRITICAL status
-u, –units <string>	units label for output data (e.g., ‘sec.’, ‘%’)
-l, –label <string>	prefix label for output data from plugin (default: –s ‘SNMP’)

Return code

OK (0), WARNING (1), CRITICAL (2), UNKNOWN (3)

Output

The output shows the state with the following format:

```
CPU LOAD <Status> - <int> %
```

<Status>	status of the command
<int>	CPU load.

Examples:

- If the state is “OK”

```
> check_snmp -H $HOSTADDRESS$ -C public -o .1.3.6.1.4.1.789.1.2.1.3.0
-w 90 -c 95 -u '%' -l "CPU LOAD"
CPU LOAD OK - 8%
>
```

- If the global state is “CRITICAL” or “WARNING”:

```
> check_snmp -H $HOSTADDRESS$ -C public -o .1.3.6.1.4.1.789.1.2.1.3.0
-w 90 -c 95 -u '%' -l "CPU LOAD"
CPU LOAD WARNING - 92%
```

```
> check_snmp -H $HOSTADDRESS$ -C public -o .1.3.6.1.4.1.789.1.2.1.3.0
-w 90 -c 95 -u '%' -l "CPU LOAD"
CPU LOAD CRITICAL - 99%
```

A.2.3.2 check-netapp-numdisks

check-netapp-numdisks uses the following shell (PERL) command:

Usage

```
check_snmp -H <host> -C <community> -o <OID1,OID2,OID3,OID4>
-u <unit label>  -l <label>
```

-H, –hostname <host>	Hostname or IP address of the target to check
-C, –community <community>	SNMP community string (defaults to ”public”)
-o, –oid <OID>	object identifiers to query
-u, –units <string>	units label for output data (e.g., ‘sec.’, ‘%’)
-l, –label <string>	prefix label for output data from plugin (default: –s ‘SNMP’)

Return code

OK (0), WARNING (1), CRITICAL (2), UNKNOWN (3)

Output

The output shows the state with the following format:

```
<Status> - <int> Total Disks <int> Active <int> Spare <int> Failed
```

<Status>	status of the command
<int>	number of disks.

Examples:

- If the state is “OK”

```
> check_snmp -H $HOSTADDRESS$ -C public -o
.1.3.6.1.4.1.789.1.6.4.1.0,.1.3.6.1.4.1.789.1.6.4.2.0,.1.3.6.1.4.1.789.1.
6.4.8.0,.1.3.6.1.4.1.789.1.6.4.7.0 -u 'Total
Disks','Active','Spare','Failed' -l ""
OK - 8 Total Disks 7 Active 1 Spare 0 Failed
>
```

- If the state is WARNING

```
> check_snmp -H $HOSTADDRESS$ -C public -o
.1.3.6.1.4.1.789.1.6.4.1.0,.1.3.6.1.4.1.789.1.6.4.2.0,.1.3.6.1.4.1.789.1.
6.4.8.0,.1.3.6.1.4.1.789.1.6.4.7.0 -u 'Total
Disks','Active','Spare','Failed' -l ""
WARNING - 8 Total Disks 6 Active 1 Spare 1 Failed
>
```

A.2.3.3 check-netapp-failedfans

check-netapp-failedfans uses the following shell (PERL) command:

Usage

```
check_snmp -H <host> -C <community> -o <OID> -l <label>
```

-H, –hostname <host>	Hostname or IP address of the target to check
-C, –community <community>	SNMP community string (defaults to ”public”)
-o, –oid <OID>	object identifiers to query
-l, –label <string>	prefix label for output data from plugin (default: –s ‘SNMP’)

Return code

OK (0), WARNING (1), CRITICAL (2), UNKNOWN (3)

Output

The output shows the state with the following format:

```
Fans <Status> - < msg>
```

<Status>	status of the command
<msg>	msg concerning failed fans.

Examples:

- If the state is “OK”

```
> check_snmp -H $HOSTADDRESS$ -C public -o .1.3.6.1.4.1.789.1.2.4.3.0 -l
"Fans"

Fans OK - There are no failed fans.
>
```

- If the state is WARNING

```
> check_snmp -H $HOSTADDRESS$ -C public -o .1.3.6.1.4.1.789.1.2.4.3.0 -l
"Fans"

Fans WARNING - There are 2 failed fans.
>
```

A.2.3.4 check-netapp-failedpwr

check-netapp-failedpwr uses the following shell (PERL) command:

Usage

```
check_snmp -H <host> -C <community> -o <OID> -l <label>
```

-H, –hostname <host>	Hostname or IP address of the target to check
-C, –community <community>	SNMP community string (defaults to ”public”)
-o, –oid <OID>	object identifiers to query
-l, –label <string>	prefix label for output data from plugin (default: –s ‘SNMP’)

Return code

OK (0), WARNING (1), CRITICAL (2), UNKNOWN (3)

Output

The output shows the state with the following format:

```
Power <Status> - < msg>
```

<Status>	status of the command
<msg>	msg concerning failed power supplies.

Examples:

- If the state is “OK”

```
> check_snmp -H $HOSTADDRESS$ -C public -o .1.3.6.1.4.1.789.1.2.4.5.0 -l
"Power"

Power OK - There are no failed power supplies.
>
```

- If the state is WARNING

```
> check_snmp -H $HOSTADDRESS$ -C public -o .1.3.6.1.4.1.789.1.2.4.5.0 -l
"Power"

Power WARNING - There are 2 failed power supplies.
>
```

A.2.3.5 check_netapp_globalstatus

check_netapp_globalstatus uses the following shell (PERL) command:

Usage

```
check_NetAppGlobalStatus -H <host> [-C <community>] [-p <port>]
[-t <timeout>] [-f <f>]
```

-H, –hostname <host>	Hostname or IP address of the target to check
-C, –community <community>	SNMP community string (defaults to ”public”)
-p, –port <port>	SNMP port (defaults to 161)
-t, –timeout <timeout>	Seconds before timing out (defaults to Nagios timeout value)
-f, –format <f>	”0” Carriage Return in HTML mode ( ) ”1” Carriage Return in ASCII mode (\n)

```
check_NetAppGlobalStatus –help
```

-h, –help Display help

```
check_NetAppGlobalStatus –version
```

-V, –version Display version

Return code

OK (0), WARNING (1), CRITICAL (2), UNKNOWN (3)

Output

The output shows the global state with the following format:

```
<GlobalStatus> - <msg>
```

<GlobalStatus>	Global state of the NetApp storage system.
<msg>	message explaining the global state

Examples:

- If the global state is « OK »

```
> check_NetAppGlobalStatus –H <host>
OK – The system’s global status is normal
>
```

- If the global state is CRITICAL or WARNING:

```
> check_NetAppGlobalStatus –H <host>
WARNING – /vol/luns is full (using or reserving 100% of space and 0% of inodes, using
63% of reserve).
>
```

A.2.3.6 check_netappvol

check_netappvol uses the following shell (PERL) command:

Usage

```
check_NetAppVol -H <host> [-C <community>] [-p <port>] [-t <timeout>]
[-f <f>]
```

-H, –hostname <host>	Hostname or IP address of the target to check
-C, –community <community>	SNMP community string (defaults to ”public”)
-p, –port <port>	SNMP port (defaults to 161)
-t, –timeout <timeout>	Seconds before timing out (defaults to Nagios timeout value)
-f, –format <f>	”0” Carriage Return in HTML mode ( ) ”1” Carriage Return in ASCII mode (\n)

```
check_NetAppGlobalVol –help
```

-h, –help Display help

```
check_NetAppGlobalVol –version
```

-V, –version Display version

Return code

OK (0), WARNING (1), CRITICAL (2), UNKNOWN (3)

Output

The first line shows the global volume state with the following format:

```
NetApp <model> <GlobalVolumeStatus>
```

<GlobalVolumeStatus>	Global state of all volumes of the NetApp storage system.
<model>	model of NetApp storage system

The following lines show the status of each volume

```
Volume <name>, <status> (<raidtype, <voltype>, <aggregateName>)
```

Examples:

- If the global state is « OK »

```
> check_NetAppGlobalStatus -H <host>
NetApp FAS3020 RAID OK
Volume vol0, online (raid_dp, flexible, aggr0)
Volume BULL_TRAVAIL, online (raid_dp, flexible, BULL)
Volume luns, online (raid_dp, flexible, BULL)
Volume GORKI, online (raid_dp, flexible, aggr1)
>
```

- If the global state is CRITICAL or WARNING:

```
> check_NetAppGlobalStatus -H <host>
NetApp FAS3020 RAID WARNING
Volume vol0, online (raid_dp, flexible, aggr0)
Volume BULL_TRAVAIL, online (raid_dp, flexible, BULL)
Volume luns, online (raid_dp, flexible, BULL)
Volume GORKI, offline (raid_dp, flexible, aggr1)
>
```

A.2.3.7 check_netappraid

check_netappraid uses the following shell (PERL) command:

Usage

```
check_NetAppGlobalRaid -H <host> [-C <community>] [-p <port>] [-t
<timeout>] [-f <f>]
```

-H, –hostname <host>	Hostname or IP address of the target to check
-C, –community <community>	SNMP community string (defaults to ”public”)
-p, –port <port>	SNMP port (defaults to 161)
-t, –timeout <timeout>	Seconds before timing out (defaults to Nagios timeout value)
-f, –format <f>	”0” Carriage Return in HTML mode ( ) ”1” Carriage Return in ASCII mode (\n)

```
check_NetAppRaid –help
```

-h, –help Display help

```
check_NetAppRaid –version
```

-V, –version Display version

Return code

OK (0), WARNING (1), CRITICAL (2), UNKNOWN (3)

Output

The first line shows the global state of all RAID groups with the following format:

```
NetApp <model> <GlobalRgStatus>
```

<GlobalRgStatus>	Global state of all raid groups of the NetApp storage system.
<model>	model of NetApp storage system

The following lines show the status of each RAID group

```
RAID group <name> <status>
```

Examples:

- If the global Raid group state is « OK »

```
> check_NetAppRaid -H <host>
NetApp FAS3020 RAID OK
RAID group /aggr0/plex0/rg0 active
RAID group /BULL/plex0/rg0 active
RAID group /aggr1/plex0/rg0 active
>
```

- If the global Raid group state is CRITICAL or WARNING:

```
> check_NetAppRaid -H <host>
NetApp FAS3020 RAID WARNING
RAID group /aggr0/plex0/rg0 active
RAID group /BULL/plex0/rg0 active
RAID group /aggr1/plex0/rg0 reconstructionInProgress
>
```

A.2.4 BSMWaterCooledDoor

A.2.4.1 check_sensor

check_sensor uses the following shell (PERL) command:

Usage

```
check_sensor [-h] -m model [-H host] [-u user] [-p password] -s sensorid
[-F factor] [-c lowercrit] [-w lowerwarn] [-W upperwarn] [-C uppercrit]
```

-h	Help
-m model	Remote host model: ipmilan
-H host	Remote host name or ipaddr
-u user	Remote SMU username
-p password	Remote SMU or MWA password
-s sensorid	Specify the sensor id string
-F factor	Specify the factor to apply to the reading value
-c lowercrit	Specify the sensor lower critical level
-w lowerwarn	Specify the sensor lower warning level
-C uppercrit	Specify the sensor upper critical level
-W upperwarn	Specify the sensor upper warning level

Return code

OK(0), WARNING(1), CRITICAL(2), UNKNOWN(3).

Output

The output shows the state and the value of the sensor in the following format:

```
<sensor status> : <value>
```

Examples:

```
> check_sensor -m ipmilan -H 172.31.50.71 -u super -p pass -s 'Pwr
Consumption'

OK : 142.480 Watts
>

> check_sensor -m ipmilan -H 172.31.50.71 -u super -p pass -s 'Valve
Vperture'

OK : 21.750 %
>
```

```
> check_sensor -m ipmilan -H 172.31.50.71 -u super -p pass -s 'Air
Pressure' -F 1000

OK : 19 Pa
>
```

```
check_sensor -m ipmilan -H 172.31.50.71 -u super -p pass -s ’Average
Temp.’

OK : 18.3 degrees C
>
```

A.2.5 BSMStoreWayDPA

A.2.5.1 check_StoreWayDPA

check_StoreWayDPA uses the following shell (PERL) command:

Usage

```
check_StoreWayDPA -H <host> [-C <community>] [-p <port>] [-t <timeout>]
[-f <f>]
```

-H, –hostname <host>	Hostname or IP address of the target to check
-C, –community <community>	SNMP community string (defaults to ”public”)
-p, –port <port>	SNMP port (defaults to 161)
-t, –timeout <timeout>	Seconds before timing out (defaults to Nagios timeout value)
-f, –format <f>	”0” Carriage Return in HTML mode ( ) ”1” Carriage Return in ASCII mode (\n)

```
check_StoreWayDPA –help
```

-h, –help Display help

```
check_StoreWayDPA –version
```

-V, –version Display version

Return code

OK (0), WARNING (1), CRITICAL (2), UNKNOWN (3)

Output

The first line shows the task state with the following format:

```
StoreWay DPA <TaskStatus>
```

<TaskStatus> Most severe task state detected on a StoreWay DPA system.

Examples:

- If the task state is « OK »

```
> check_StoreWayDPA -H <host>
StoreWay DPA OK
>
```

- If the global state is CRITICAL, only the tasks with state “stopped” are displayed :

```
> check_StoreWayDPA -H <host>
StoreWay DPA  CRITICAL
Backup Engine stopped
>
> check_StoreWayDPA -H <host>
StoreWay DPA CRITICAL
Task Launcher stopped
>

> check_StoreWayDPA -H <host>
StoreWay DPA CRITICAL
Backup Engine and Task Launcher stopped
>
```

- When the return code is UNKNOWN:

```
> check_StoreWayDPA -H <host>
StoreWay DPA UNKNOWN - snmp query timed out
>
> check_StoreWayDPA -H <host>
StoreWay DPA UNKNOWN - no data received
>
```

A.3 Virtualization Management

A.3.1 BSMVMwareESX

A.3.1.1 check_esx3

The Nagios check commands used by BSMrVMwareESX Add-on uses the shell (PERL) command **check_esx3**.

Usage

```
check_esx3 -H esxname [-N|-M|-B] [-C community] [-v virtualhost]
[-l thing [-w warn -c crit]] [-t timeout]
```

-H <esxname>	Hostname or IP address of the ESX server to check
-N, -M, -B	Set context for check execution -N for Nagios mode, -M for MRTG mode, -B for BSM mode.
-C <community>	SNMP community string (defaults to "public")
-v <virtualhost>	Name of the virtual host to check
-l <thing>	Specify what to check Available **thing** values: CPU, MEM, SNMP, STATE, LIST, LISTNET.
-w <warnThreshold>	Warning threshold
-c <criticalThreshold>	Critical threshold.
-h, –help	Display help

Return code

OK(0), WARNING(1), CRITICAL(2), UNKNOWN(3).

Output

The output depends on the calling Nagios command. See detailed cases below.

check_esx_server case

The check_esx3 shell is called with the following syntax:

```
check_esx3 -B -H <esxname> -C <community> -l LIST -w <warn>% -c <crit>%
```

Output:

```
VHosts: <nb-up>/<nb-all> up: <VMname> (<status>), .
```

Example:

```
check_esx3 -H esx -C public -w 50% -c 0%
VHosts: 2/4 up: nsmvm5(OFF), nsmvm1(ON), nsmvm3(ON), nsmvm4(OFF)
```

Status is set to **WARNING** if more than 50% of VMs are down.
Status is set to **CRITICAL** if all VMs are down.

Note The list of VMs used to establish ESX server status corresponds to all the VMs declared on the ESX server and not only to those declared on the Bull System Manager ESX platform. The VMname is that declared on the VMware ESX server (this name can be different from the BSM hostname).

check_esx_snmp case

The check_esx3 shell is called with the following syntax:

```
check_esx3 -B -H <esxname> -C <community> -l SNMP
```

Output:

OK	SNMP management interface available
CRITICAL	SNMP management interface not available

check_esx_mem case

The check_esx3 shell is called with the following syntax:

```
check_esx3 -B -H <esxname> -C <community> -l MEM -w <warn>% -c <crit>%
```

Output:

```
Memory free: <free>Mb (<percent_free>) [Total available <total>Mb]
```

Example:

```
check_esx3 -H esx -C public -l MEM -w 20% -c 10%
Memory free: 16111.6Mb (98%) [Total available 16383.6Mb]
```

Status is set to **WARNING** if less than 20% of memory is available.
Status is set to **CRITICAL** if less than 10% of memory is available.

check_esx_vm

The check_esx3 shell is called with the following syntax:

```
check_esx3 -B -H <esxname> -C <community> -v <virtualHost> -l STATE
```

Output:

OK	`VHost <VMname>is up (ID: <id>)`
CRITICAL	`VHost <VMname>is down (ID: <id>)`

Example:

```
check_esx_vm -H esx -C public -v nsmvm1 -l STATE
VHost nsmvm1 is up (ID: 48)
```

Status is set to OK if the VM is up.
Status is set to CRITICAL if the VMs are down.

Note The VMname is that declared on the ESX server (this name can be different from the BSM hostname).

check_esx_vm_memory

The check_esx3 shell is called with the following syntax:

```
check_esx3 -B -H <esxname> -C <community> -v <virtualHost> -l MEM
-w <warn>% -c <crit>%
```

Output:

```
Memory free: <free>Mb (<percent_free>) [Total available <total>Mb] on
vhost <VMname>
```

Example:

```
check_esx_vm_mem -B -H esx -C public -v nsmvm1 -w 20% -c 10%
Memory free: 460.8Mb (90%) [Total available 512Mb] on vhost smvm1
```

Status is set to **WARNING** if less than 20% of memory is available.
Status is set to **CRITICAL** if if less than 10% of memory is available.

Note The VMname is that declared on the ESX server (this name can be different from the BSM hostname).

check_esx_vm_cpu

The check_esx3 shell is called with the following syntax:

```
check_esx3 -B -H <esxname> -C <community> -v <virtualHost> -l CPU
-w <warn>% -c <crit>%
```

Output:

```
CPU usage is <percent_used> on <VMname> nsmvm1 (<time>average)
```

Example:

```
check_esx_vm_cpu -B -H esx -C public -v nsmvm1 -w 80% -c 90%
CPU usage is 3% on nsmvm1 (301s average)
```

Status is set to WARNING if more than 80% of CPU is used.
Status is set to CRITICAL if if more than 90% of CPU is used.

Note The VMname is that declared on the ESX server (this name can be different from the BSM hostname).

A.3.2 BSMVMwareVC

A.3.2.1 check_virtualcenter

The Nagios check commands used by BSMVMwareVC Add-on uses the shell (PERL) command **check_virtualcenter**.

Usage

```
check_virtualcenter --server <vCenter>
                    --vmname <VM_id>
                    --hostname <ESX_id>
                    --stat <cpu|mem>
                    --crit <nb>
                    --warn <nb>
where:
```

–server <vCenter>	Hostname or IP address of the vCenter
–vmname <VM_id>	Name of the VM (in vCenter context)
–hostname <ESX_id>	Name of the ESX host (in vCenter context)
–stat <type>	Type of performance statistics to check. Two values are available: • cpu: check the average percentage of CPU usage • mem: check the average percentage of Memorty usage
–warn <nb>	Warning threshold for performance statistics
–crit <nb>	Critical threshold for performance statistic
–help	Display help

Return code

OK(0), WARNING(1), CRITICAL(2), UNKNOWN(3).

Output

The output depends on the calling Nagios command. See detailed cases below.

check_esx_virtualcenter case

The check_virtualcenter shell is called with the following syntax:

```
check_virtualcenter --server <vCenter> --hostname <ESX_id>  [--stat
<CPU|Memory> --warn <nb> --crit <nb>]
```

Output:

```
<ESXhost>: <message>
```

Example 1:

```
check_ virtualcenter –server 129.182.6.105 –hostname 172.31.50.55

172.31.50.55: Nothing to report about this host.
```

The status returned is those determined by the vCenter server.

Example 2:

```
check_ virtualcenter –server 129.182.6.105 –hostname 172.31.50.55 –stat
mem –crit 80 –warn 70

172.31.50.55: Memory usage is 24.95 (sampling period 20 sec)
```

The status returned is dependant of the threshold setting. In this example, the status returned is good.

check_vm_virtualcenter

The check_vm_virtualcenter shell is called with the following syntax:

```
check_virtualcenter –-server <vCenter> --vmname <VM_id>  [--stat
<CPU|Memory> --warn <nb> --crit <nb>]
```

Output:

```
<VMhost> (on ESX <ESXhost>): <message>
```

Example 1:

```
check_virtualcenter –server 129.182.6.105 –vmname sles10

sles10 (on ESX 172.31.50.55) : This virtual machine is powered on and its
guest OS is running)
```

The status is those determined by the vCenter servern except in the case of the OperatingSystem is not running (status set to warning).

Example 2:

```
check_virtualcenter –server 129.182.6.105 –vmname sles10 –stat mem –crit
80 –warn 70
```

sles10 (on ESX 172.31.50.55): Memory usage is 11.99 (sampling period 20 sec)

The status returned is dependant of the threshold setting. In this example, the status returned is good.

A.3.3 BSMHyperNova

A.3.3.1 check_NSM_hypernova_xen

The Nagios check commands used by BSMHyperNova Add-ons uses the shell (PERL) command check_NSM_hypernova_xen.

Usage

```
check_NSM_hypernova_xen -H <hnname> [-m <virtualhost>][-t timeout]
```

-H <hnname>	Hostname or IP address of the HyperNova server to check
-v <virtualhost>	name of the virtual host to check
-h, –help	Display help

Return code

OK(0), WARNING(1), CRITICAL(2), UNKNOWN(3).

Output

The output is the StatusText as setting by HNMaster. For the list of values, refer to the HyperNova documentation

Examples:

Check_hn_server_status

The check_NSM_hypernova_xen shell is called with the following syntax:

```
check_NSM_hypernova_xen –H <hnserver>
```

Output:

StatusText as returned by HNMaster

Example:

```
check_NSM_hypernova_xen –H hnserver

Nothing to report
```

Status is set to OK.

Check_hn_vm_status

The check_NSM_hypernova_xen shell is called with the following syntax:

```
check_NSM_hypernova_xen –H <hnserver> -m <virtualhost>
```

Output:

<virtualHost>: StatusText as returned by HNMaster

Example:

```
check_NSM_hypernova_xen -H hnserver -m VM1

VM1: VM inactive
```

Status is set to WARNING.

Note	The VMname is those declared on the HyperNova Server (this name can be different from the BSM hostname).

A.3.4 BSMEscalaLpar

A.3.4.1 check_NSM_escala_lpar

The Nagios check commands used by BSMEscalaLPAR Add-on uses the shell (PERL) command check_NSM_escala_lpar.

Usage

```
check_NSM_escala_lpar –M manager [HMC|IVM] -H <netname> -U <remote_user>
-I <identity_file> [-l <lpar_name>] [-i <STATUS|CPU|POOL>]
[-e sample_time] [-w <warn>%] [-c <crit>%] [-N < name>] [-t timeout]
```

-M <manager>	Type of manager used to retrieve plugin information. Available value are: IVM, when the Escala is managed by an IVM installed on Vios partition, HMC, when the Escala is managed by a remote station.
-H < netname>	Hostname or IP address of the manager used for checking
-U <remote_user>	User for remote connection
-I <identity_file>	Name of the file from which the identity (private key) for RSA or DSA authentication is read. The file must be localized into the directory <BSM Installation Directory>/engine/etc/ssh. To use it as authentication file for Vios platform, you have to install the corresponding public key on the VIO server.
-N < name>	Name of the CEC or Vios LPAR (used in output of the plugin related to a given logical partition).
-l <lpar_name>	Name of the logical partition to check
-i <check information>	Available values are: STATUS (to check the status of the VIO server or of a logical partition), POOL (to check the utilization of the processing pool), CPU (to check the utilization of the CPU entitled to a partition). Default value is STATUS
-e <sample time>	Sample time in minutes used to perform calculation on utilization. Default value is 5.
-w <warnThreshold>	Warning threshold
-c <criticalThreshold>	Critical threshold.
-h, –help	Display help

Return code

OK(0), WARNING(1), CRITICAL(2), UNKNOWN(3).

Output

The output depends on the type of check performed. See below to get detailed information.

check_vios _status case

The check_NSM_escala_lpar shell is called with the following syntax:

```
check_NSM_escala_lpar -M IVM -H <vios_netName> -N <server_name> -U <user>
-I <identity_file>
```

Output:

Only two states are possible for Vios status: OK or UNKNOWN:

- for OK state, the output is "`Virtual I/O Server state: Operating`"
- for UNKNOWN state, the output is "`Unable to determine Virtual I/O Server state`", following the reason.

Note The check_vios_status command is based on the state given by the **lssyscfg** IVM command to obtain the state of the Vios system.

Example:

```
check_NSM_escala_lpar -H ivm1 -U padmin -I id_dsa_nsm
```

Output: `Virtual I/O Server state: Operating`
Return code: `OK`.

check_vios_used_pool case

The check_NSM_escala_lpar shell is called with the following syntax:

```
check_NSM_escala_lpar -M IVM -H <vios_netName> -U <user>
-I <identity_file> -N <server_name> -i POOL -e <sample_time> -w <warn>%
-c <crit>%
```

Output:

```
Processing pool (nbCPU / CPUTotal units entitled) - utilization on
<sampleTime> mn <check_status>: <utilization percent>%
```

Note The check_vios_used_pool command is based on pool_cycle metrics (total_pool_cycle, utilized_pool_cycle) obtained by the **lslparutil** IVM command.

It requires that data collection is activated by the **chlparutil** command:
`chlparutil -r config -s 30`

Example:

```
check_NSM_escala_lpar -H 192.168.207.60 -U padmin -I id_dsa_nsm -i POOL
-e 5 -w 70% -c 80%
```

Output:

```
Processing pool (1.4 / 2 units entitled) - utilization on 5 mn OK: 2.16 %
```

Return code: OK

check_cec_used_pool case

The check_NSM_escala_lpar shell is called with the following syntax:

```
check_NSM_escala_lpar -M HMC -H <hmc_netName> -U <user>
-I <identity_file> -N <cecname>-i POOL -e <sample_time> -w <warn>%
-c <crit>%
```

Output:

```
Processing pool (nbCPU / CPUTotal units entitled) (HMC <hmc_netname>
- utilization on <sampleTime> mn <check_status>: <utilization percent>%
```

Note The check_cec_used_pool command is based on pool_cycle metrics (total_pool_cycle, utilized_pool_cycle) obtained by the **lslparutil** HMC command.

It requires that data collection is activated for the system by the **chlparutil** command:

```
chlparutil -r config -s 3600 [-m <systemName>]
```

If the systemName parameter is not specified, the data collection is activated for all managed systems.

Example:

```
check_NSM_escala_lpar -H 192.168.207.60 -U padmin -I id_dsa_nsm -i POOL -
e 5 -w 70% -c 80%
```

Output:

```
Processing pool (1.4 / 2 units entitled) (HMC 172.16.108.112) -
utilization on 120 mn OK: 52.83 %
```

Return code: OK

check_lpar_status case

The check_NSM_escala_lpar shell is called with the following syntax:

```
check_NSM_escala_lpar -M [IVM|HMC] -H <netName> -U <user>
-I <identity_file> -l <lpar_name> -N <name>
```

Output:

```
Logical partition <lpar_name> on <server_name> (HMC or IVM):
<lpar_status>
```

Note The check_vios_lpar_status command is based on Lpar state obtained by the **lssyscfg** IVM command.

Examples:

```
check_NSM_escala_lpar -H 192.168.207.60 -U padmin -I id_dsa_nsm
-N ivm1 l part1
```

Output:

```
Logical partition galilei on staix35 (IVM): Running
```

Return code: OK.

```
check_NSM_escala_lpar -H 192.168.207.60 -U padmin -I id_dsa_nsm
-N ivm1 l part2
```

Output:

```
Logical partition tyrex on staix35 (IVM): Not Available
```

Return code: CRITICAL.

check_lpar_used_cpu case

The check_NSM_escala_lpar shell is called with the following syntax:

```
check_NSM_escala_lpar -M [IVM|HMC] -H <mgr_netName> -U <user> -I
<identity_file>
-N <server_name> -l <lpar_name> -i CPU -e <sample_time> -w <warn>%
-c <crit>%
```

Output:

```
Logical partition <lpar_name> on <server_name> (<nbCPU> units entitled -
IVM or HMC) - processing utilization on <sample_time>mn <check_status>:
<utilization percent>%
```

Note The check_lpar_used_CPU command is based on cycles metrics (entitled_cycles, capped_cycles, uncapped_cycles) obtained by the **lslparutil** command (see above how to activate data collection on HMC or IVM).

Example:

```
check_NSM_escala_lpar -H 192.168.207.60 -U padmin -I id_dsa_nsm -N ivm1 -
l part1 -I CPU-e 5 -w 10% -c 20%
```

Output:

```
Logical partition part1 on blade_js21 (0.4 units entitled - IVM) -
processing utilization on 5 mn WARNING: 17.77 %
```

Return code: `WARNING`

A.4 Bull Products Management

A.4.1 BSMDD4A

A.4.1.1 check_DynamicDomains

check_DynamicDomains uses the check_DD4A shell (PERL) command:

Usage

```
check_DD4A -H <host> [-w ] [-D <domainName>]
```

-H, --hostname <host>	Hostname or IP address of target to check
-D, --domain ALL | <domainName>	ALL domains or a specific one: <domainName>
-w, --web	WEB HTML output format

Return code

OK (0), WARNING (1), CRITICAL (2), UNKNOWN (3)

- OK:
  All "Dynamic Domains" run normally.
- WARNING:
  At least one "Dynamic Domain" is in a WARNING state.
- CRITICAL:
  At least one " Dynamic Domain " is in a CRITICAL state.
- UNKNOWN
  All other types of processing errors (bad parameter, no response, etc…).

Note In the case of multiple errors, the global state will be the worst one;
CRITICAL > WARNING > OK.

Output

A string with a global state descriptor followed, if they exist, by error states of the concerned component (controller, Logical Device, Physical Device).

If `-D ALL` or without `-D` parameter is used, the first line displays the defined Dynamic Domains number. Then, only Dynamic Domains with issues are displayed with their status, their number of used CPUs, their CPU load (and the associated threshold) and their number of tasks.

Note The global state is not displayed textually, only the command return code contains this status information.

If `-D <domainName>` is used, the command output displays the defined Dynamic Domain name with its number of used CPUs, its CPU load (and the associated threshold) and its number of tasks.

Examples:

- `check_DD4A -H <host>`
- `check_DD4A -H <host> -D ALL`

```
4 Dyn.Domains.
- domain2 : WARNING
CPUs: 4 / 4, tasks: 70
load: 80% ( > 75% )
- domain3 : CRITICAL
CPUs: 4 / 4, tasks: 110
load: 100% ( > 75% )
```

- `check_DD4A -H <host> -D default`

```
default : OK
CPUs: 7 / 8, tasks: 37
load: 0.56% ( < 75% )
```

A.4.2 BSMBVS

A.4.2.1 check_BVS

check_BullVideoServices uses the check_BVS shell (PERL) command:

Usage

```
check_BVS -H <host> -S {Streaming|Recording|Datagrams}
[{-p <period>} | { -l <begin> -t <end> }] [-w]
```

-H, –hostname <host> Hostname or IP address of target to check

-S, –service Streaming|Recording|Datagrams

-p, –period <period> | -l <begin> -t <end>
indicates to the Bull Video Server the period in seconds to calculate the average values

-w, –web WEB HTML output format

Return code

OK (0), WARNING (1), CRITICAL (2), UNKNOWN (3)

- OK:
  "Bull Video Server" runs normally.
- WARNING:
  "Bull Video Server" is in WARNING state.
- CRITICAL:
  "Bull Video Server" is in CRITICAL state.
- UNKNOWN
  All other type of processing errors (bad parameter, and so on…).

The BVS state "UNREACHABLE" (*Bull Video Server* is in " UNREACHABLE " state (daemon not started, communication timeout, …)).will be transformed to Nagios "UNKNOWN" status.

The status values (OK, WARNING, CRITICAL) are fixed by the video server itself according to criteria's indicated by a Bull Video Server administrator.

Output

The following information is displayed. Average values are calculated using the value specified by the 'polling interval' textbox from the service configuration screen. The default value is 1 min. A modification of this value will be automatically taken into account by the check_BVS plugin.

'Streaming' service

Status	global status of 'Streaming' service
Channels	number of channels used for streaming (average)
Rate	average rate in MB/s
Load	percentage of disk rate in relation to a value declared on BVS server

Example:

```
check_BVS -H <host> -S Streaming
    Status: OK
    channels: 17.00,
    rate (MB/s): 38.84,
    load: 12.69 %
```

'Recording' service

Status	global status of 'Recording' service
Channels	number of channels used for recording (average)
Rate	average rate in MB/s
Load	percentage of disk rate in relation to a value declared on BVS server.

Example:

```
check_BVS -H <host> -S Recording
    Status: OK
    channels: 7.00,
    rate (MB/s): 3.84,
    load: 7.69 %
```

'Datagrams' service

Status	global status of 'Datagram' service
Nb of late dg	number of UDP datagram's sent late per second (average)
Avg late value	average delay value in ms. A delay value between 0 and 10 ms is considered as a normal value.
Nb of deleted dg	number of deleted UDP datagrams per second (average).

Example:

```
check_BVS -H <host> -S Datagrams
    Status: OK
    nb of late dg: 128.67,
    avg late value: 1.03 ms,
    nb of deleted dg: 3.08
```

Service Inaccessible

In case of inaccessible service only the RC will be displayed.

Example:

```
check_BVS -H <host> -S <service>
    Status: UNREACHABLE
```

A.4.3 BSMJOnAS

A.4.3.1 Check_JOnAS

Check_JOnAS uses the following shell (PERL) command:

Usage

```
check_JOnAS -H <host> -N <network name> -a <jonas master> -d <domain>
-s <server> -p <port number> [-u <user> -p <password> ] [ -m] -w
```

-H host	host name
-N network name	network name
-a <jonas master>	JOnAS server name Administrator or master
-d <domain>	domain name
-s <server>	target server name
-p <port number>	port number
-u <user name>	user name(mandatory if called outside BSM)
-p <password>	password (mandatory if called outside BSM)
-m	set if JOnAS server is master
-w	command output in HTML

Return Code

OK (0), WARNING (1), CRITICAL (2), UNKNOWN (3)

- OK:
  JOnAS server runs normally.
- WARNING:
  JonAS server is in "STOPPED" state.
- CRITICAL:
  JOnAS server is in "FAILED" state.
- UNKNOWN:
  JOnAS server is in "UNREACHABLE" state.

Example:

```
check_JOnAS -H nasmaster -N BSM.frcl.bull.fr -a jonas -d jonas -s jonas -p 9000

    The jonas server in jonas domain is RUNNING on BSM.frcl.bull.fr
    Memory allocated = 57700 used = 39949
    Threads = 95
    HTTP requests count = 0
    Committed transactions count = 0
    check_JOnAS -H frcls6260 -N frcls6260.frcl.bull.fr -a instance1 -d
    jonas -s instance1 -p 9000 -m
```

```
The instance1 (master)server in jonas domain is RUNNING on frcls6260
Memory allocated = 64315 used = 36359
Threads = 98
HTTP requests count = 478157905
Committed transactions count = 0
```

Appendix B. Third Party Licence Agreement

B.1 VMware(R) Infrastructure Perl Toolkit Agreement

VMware, Inc. ("VMware") provides the VMware Infrastructure Perl Toolkit ("Toolkit") to you subject to the following terms and conditions. If you disagree with any of the following terms, then do not use this Toolkit.

1. This Toolkit contains a variety of materials, including but not limited to, interface definitions, documentation, sample utility applications and sample code regarding programming interfaces to one or more VMware products as referenced in such materials ("VMware Software"). This Toolkit is intended to be used to execute supplied sample utilities or to serve as a guide for writing programs to interact with the VMware Software.

2. Subject to the restrictions below, you may download and make a reasonable number of copies of the Toolkit contents for your personal use solely for the purpose of creating software that communicates with VMware Software ("Developer Software"). You agree to defend, indemnify and hold harmless VMware, and any of its directors, officers, employees, affiliates or agents, from and against any and all claims, losses, damages, liabilities and other expenses (including reasonable attorneys' fees), arising from your modification and distribution of the utility applications or sample code or breach of this Toolkit Terms and Conditions.

3. Restrictions: You may not (1) use the Toolkit to design or develop anything other than Developer Software; (2) make any more copies of the Toolkit than are reasonably necessary for the authorized use and backup and archival purposes; (3) modify, create derivative works of, reverse engineer, reverse compile, or disassemble the Toolkit, except that you may modify and create derivative works of the utility applications and sample code and distribute the modified utility applications and sample code in connection with Developer Software; (4) distribute, sell, lease, rent, lend, or sublicense any part of the Toolkit to any third party except as provided herein; (5) use the Toolkit to (a) design or develop programs to circumvent or over-ride the display of any VMware End User License Agreements to end customers and (b) design or develop software to upload or otherwise transmit any material containing software viruses or other computer code, files or programs designed to interrupt, destroy, or limit the functionality of any software or hardware.

4. VMware retains ownership of the Toolkit, including without limitation all copyrights and other intellectual property rights therein.

5. You may not represent that the programs you develop using the Toolkit are certified or otherwise endorsed by VMware. You may not use the VMware name or any other trademarks or service marks of VMware in connection with programs that you develop using the Toolkit.

6. If you are currently entitled to support from VMware, you may submit a support request for installation assistance of this Toolkit and assistance in executing unmodified utility applications provided with this Toolkit. Except as provided herein, you are not entitled any VMware support for this Toolkit or any other services from VMware in connection with this Toolkit.

7. Term, Termination and Changes: This Agreement shall continue as long as you are in compliance with the terms specified herein or until otherwise terminated. You and or VMware each may terminate this Agreement for any reason at any time. You agree, upon termination, to destroy all copies of the Toolkit within your possession or control. The Confidential Information, Limitations of Warranties, Liability and Indemnification sections set out in this Agreement shall survive any termination or expiration of this Agreement.

8. Limitations of Warranties and Liability: THE TOOLKIT IS PROVIDED "AS IS" WITHOUT ANY WARRANTIES OF ANY KIND. TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, VMWARE DISCLAIMS ANY IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NON-INFRINGEMENT OF INTELLECTUAL PROPERTY RIGHTS.

TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, IN NO EVENT WILL VMWARE BE LIABLE FOR ANY LOST PROFITS OR BUSINESS OPPORTUNITIES, LOSS OF USE, BUSINESS INTERRUPTION, LOSS OF DATA, OR ANY OTHER INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE TOOLKIT OR YOUR USE OF THE TOOLKIT, UNDER ANY THEORY OF LIABILITY, WHETHER BASED IN CONTRACT, TORT, NEGLIGENCE, PRODUCT LIABILITY, OR OTHERWISE. BECAUSE SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF LIABILITY FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES, THE PRECEDING LIMITATION MAY NOT APPLY TO YOU.

VMWARE'S LIABILITY ARISING OUT OF THE TOOLKIT PROVIDED HEREUNDER WILL NOT, IN ANY EVENT, EXCEED US$5.00.

THE FOREGOING LIMITATIONS SHALL APPLY TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, REGARDLESS OF WHETHER VMWARE HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES AND REGARDLESS OF WHETHER ANY REMEDY FAILS OF ITS ESSENTIAL PURPOSE.

9. These terms are governed by the laws of the State of California and the United States of America without regard to conflict of laws principles. You may not assign any part of this Agreement without the prior written consent of VMware. Any attempted assignment without consent shall be void. These terms constitute the entire agreement between you and VMware with respect to the Toolkit, and supersede all prior written or oral communications, understandings and agreements. Any waiver of these terms must be in writing to be effective. If any provision of these terms is found to be invalid or unenforceable, the remaining terms will continue to be valid and enforceable to the fullest extent permitted by law.

Index

A

B

C

D

E

F

G

H

I

J

V

W

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

REFERENCE
86 A2 59FA 01