

Best Practices

Frequently Asked Questions about System Maintenance with the IBM Smart Analytics System

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Executive Summary

This paper answers some frequently asked questions about system maintenance in IBM Smart Analytics System environments and InfoSphere™ Balanced Warehouse® environments.

Introduction

The frequently asked questions in this paper are grouped into the following categories:

- System administration
- Ongoing maintenance and upgrades

The questions and answers in this document apply to several generations of IBM Smart Analytics System configurations. The IBM Smart Analytics System family of offerings evolved from the InfoSphere Balanced Warehouse family of offerings. Both are based on the same storage and database design principles. This paper uses the term IBM Smart Analytics System except when referring to specific InfoSphere Balanced Warehouse configurations. Most content in this paper, however, applies to IBM Smart Analytics System configurations and InfoSphere Balanced Warehouse configurations. Unless otherwise indicated, all content applies to V9.5 and V9.7 levels of the InfoSphere Warehouse and DB2® software. If your data warehouse uses V9.1 or an earlier version of the software, some content might not apply.

System administration

How can the DB2 instance owner execute a command on all nodes in the DB2 instance?

Answer: There are two methods that the DB2 instance owner can use to execute a command on all nodes in the DB2 instance:

- Using the `rah` command.
- Using the `db2_all` command.

Using the `rah` command

By default, this command executes commands on all servers listed in the `db2nodes.cfg` file. Because the standby nodes in a high availability (HA) configuration are not listed in the `db2nodes.cfg` file, you cannot use this default behavior if your environment is configured for HA. If you have an HA configuration, you must instead define the `RAHOSTLIST` environment variable to specify the list of servers on which you want to execute commands: all administration nodes, data nodes, and standby nodes. All servers specified in the `RAHOSTLIST` environment variable must be listed in the `.rhosts` file on the server where you plan to run the `rah` command.

There are two ways to define the `RAHOSTLIST` environment variable:

1. Issue the following command as the root user:


```
export RAHOSTLIST='adminbcu001 databcu001 databcu002 ... standbybcu001
standbybcu002'
```

 where `adminbcu001`, `databcu001`, `databcu002`, `standbybcu001`, and `standbybcu002` are the host names of the administration, data, and standby nodes in your system.
2. Edit the `.profile` file of the instance owner to include the export command. Then close and re-open the command window to make the new `.profile` file take effect.

In addition to defining and exporting the `RAHOSTLIST` environment variable if you have an HA environment, you must complete several other setup steps for both HA and non-HA configurations. These steps are described in the [“Running commands in parallel”](#) topic in the DB2 Information Center.

After you complete the required setup steps, you can send a command to the defined nodes using the `rah` command. For example, to verify that the `db2inst1` user has the same user ID and group ID on all servers in the instance, issue the following command:

```
rah ";cat /etc/passwd | grep -i db2inst1"
```

The semicolon inside the quotation marks before the command specifies parallel execution. You can specify other prefixes to control the behavior of the command. Consult the [“rah and db2_all command prefix sequences topic”](#) in the DB2 Information Center for a complete list of these prefixes.

Using the `db2_all` command

The second method to execute a command on all nodes in the instance is the `db2_all` command. In contrast to the `rah` command, which sends commands to all *servers* listed in the `db2nodes.cfg` file, the `db2_all` command sends commands to all *DB2 database partitions* listed in the `db2nodes.cfg` file. Because the standby nodes do not host any database partitions, the `db2_all` command does not send commands to the standby nodes.

For example, to determine the first active log file on every database partition in the instance, issue the following command:

```
db2_all ";db2 get db cfg for db_name" |grep "First active log file"
```

where *db_name* is the name of the database.

Like with the `rah` command, the semicolon before the `db2 get db config` command specifies parallel execution. You can specify other prefixes to change how and where the command is executed. For example, the prefix "`<<+0<`" specifies that the command must be executed only on database partition 0, and the prefix "`<<-0<`" specifies that it must be executed on all database partitions except for database partition 0. Consult the "[rah and db2 all command prefix sequences topic](#)" in the DB2 Information Center for a complete list of prefixes.

Related topics in the DB2 Information Center:

- "Running commands in parallel" - [v9.5](#), [v9.7](#)
- "rah and db2_all commands overview" - [v9.5](#), [v9.7](#)
- "Specifying the list of machines in a partitioned database environment" - [v9.5](#), [v9.7](#)
- "rah and db2_all command prefix sequences" - [v9.5](#), [v9.7](#)
- "Determining problems with rah (Linux, UNIX)" - [v9.5](#), [v9.7](#)

May I change the user IDs or group IDs of IBM Smart Analytics System users?

Answer: You cannot change the user IDs (UIDs) or group IDs (GIDs) for users and groups created by default when the environment is first deployed. Changing the UIDs or GIDs after installation is not a tested procedure and can lead to unanticipated problems that are difficult to diagnose.

If you create any additional users or groups after the system is deployed, you can change the UIDs and GIDs for these users and groups.

What are the recommended AIX and Linux kernel parameter settings?

Answer: When IBM deploys an IBM Smart Analytics System environment, it sets the following kernel parameters for each operating system and level.

If you have an older configuration and you update your operating system level, use the following information for guidance. For example, if you have an InfoSphere Balanced Warehouse E7000 environment and upgrade your AIX® operating system level from 5.3 to 6.1, modify all server-related kernel parameters to match the parameters listed below for the AIX 6.1 operating system ("AIX 6.1"), which have been validated on the IBM Smart Analytics System 7600 and 7700. Do not modify storage-related parameters that are specific to your storage subsystem.

AIX 6.1 operating system

Virtual memory manager (VMM) parameters

Use the following virtual memory manager settings. These settings are all default settings in AIX 6.1.

- `maxperm%=90`

- `minperm%=3`
- `maxclient%=90`

For more information, see the “[VMM page replacement tuning](#)” topic in the AIX 6.1 information center.

I/O parameters

Use the following I/O parameter settings:

- `j2_minPageReadAhead=32`
- `j2_maxPageReadAhead=512`

To set these parameters, issue the following command as the root user:

```
ioo -p -o j2_minPageReadAhead=32 -o j2_maxPageReadAhead=512
```

This change requires a reboot to take effect.

Use the default AIX 6.1 settings for all other I/O parameters.

AIO servers

There is no need to configure the number of AIO servers. Use the AIX 6.1 default value (`aio_maxservers = 30` per CPU).

Network parameters

Use the following network parameter settings:

- `sb_max=1310720`
- `rfc1323=1`
- `ipqmaxlen=250`
- `udp_sendspace=65536`
- `udp_recvspace=655360`
- `tcp_sendspace=221184`
- `tcp_recvspace=221184`

To set these parameters, issue the following commands as the root user:

```
no -p -o sb_max=1310720 -o rfc1323=1 -o udp_sendspace=65536 -o  
udp_recvspace=655360 -o tcp_sendspace=221184 -o tcp_recvspace=221184  
no -r -o ipqmaxlen=250
```

Use the default AIX 6.1 settings for all other network parameters.

Network-related device settings

For the interfaces on the internal application network (referred to as the DB2 FCM network in older configurations) only, enable jumbo frames by issuing the following command as the root user:

```
chdev -l entX -a jumbo_frames=yes
```

where `entX` is the name of the internal application network interface.

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For the logical port aggregation on this network, verify that the maximum transmission unit (MTU) is set to 9000. To determine the characteristics of the logical port aggregation, issue the following commands:

```
lsattr -H -E -l enX
ifconfig enX
```

where enX is the name of the logical port aggregation.

If the network switch used for the internal application network supports auto-negotiation, such as the Juniper EX4200-48T switch that is used with the IBM Smart Analytics System 7600, you can either leave the media speed of the interfaces at the default value or set the speed to auto-negotiation using the following command:

```
chdev -l entX -a media_speed=Auto_Negotiation
```

For more information about network and switch configuration, see the following article:

http://www.ibm.com/developerworks/aix/library/au-port_aggregation/

Maximum number of AIX processes per user

Increase the system limit for the maximum number of AIX processes per user to 4096 by issuing the following command as the root user:

```
chdev -l sys0 -a maxuproc=4096
```

This change applies to all users that log in after you issue the command.

User limits

Set the following user limit values to unlimited for all users on the system:

- core size (core)
- data size (data)
- file size (fsize)
- number of open file descriptors (nofiles)
- stack size (stack) - with a hard limit of 4 GB

To change these parameters dynamically, issue the following commands as the root user:

```
ulimit -c unlimited
ulimit -d unlimited
ulimit -f unlimited
ulimit -n unlimited
```

There are two ways to make these changes permanent:

1. As the root user, manually edit the `/etc/security/limits` file and set the core size, data size, file size, nofiles, and stack values to -1. If you choose this method, all users that you create from this point onwards inherit these limits.
2. Issue the following command as the root user for every user on the system:

```
chuser core=-1 data=-1 fsize=-1 nofiles=-1 stack=-1 userID
```

where *userID* is the user ID that you want to change the properties for.

Regardless of which method you use, set the `stack_hard` limit in the `/etc/security/limits` file to 4194304.

I/O completion ports (IOCP)

The AIX 5.3 TL9 SP2 and AIX 6.1 TL2 operating systems have the IOCP file set included as part of the base installation. However, if you upgraded to either of these levels rather than using a new operating system installation, you must configure IOCP separately.

To enable IOCP, issue the following command as the root user:

```
chdev -l iocp0 -P -a autoconfig="available"
```

This change requires a reboot to take effect.

If your system was deployed with DB2 V9.5 software, you should only enable IOCP if you have upgraded to FP5, which contains the fix for APAR IZ54743. If your system was deployed with DB2 V9.7 software or higher, IOCP is enabled automatically by default, and you do not need to make any change.

SUSE Linux Enterprise Server (SLES) 10, SLES10 SP1, SLES10 SP2, and SLES10 SP3 operating system

The following non-default kernel limit values were validated for the most recent release of the IBM Smart Analytics System 5600:

- `kernel.msgmni=131072`
- `kernel.randomize_va_space=0`
- `kernel.sem=250 256000 32 32768`
- `kernel.shmmni=32768`
- `kernel.suid_dumpable=1`
- `vm.swappiness=0`
- `vm.dirty_ratio=10`
- `vm.dirty_background_ratio=5`

The `kernel.sem` and `kernel.shmmni` parameters listed here match the value recommended in the DB2 Information Center for a server with 128 GB memory. You can specify these values even if your servers have less than 128 GB of memory because the memory is not allocated unless it is needed. (The `kernel.sem` value is the fourth number listed for `kernel.sem`.)

If your kernel parameters do not match these settings, you do not need to adjust your values unless you have experienced any problems. If you have seen error messages about insufficient semaphores, you should increase your `kernel.sem` setting.

Use the default value for all other kernel parameters unless you have tuned other kernel parameters because of a specific problem on your system. To see the current value of a particular kernel parameter (for example, `kernel.sem`), issue the following command as the root user:

```
cat /proc/sys/kernel/sem
```

To increase the `kernel.sem` parameter and to configure the server to use the new value every time it is rebooted, change the existing `kernel.sem` entry in the `/etc/sysctl.conf` file to "250 256000 32 32768". Then load the new value from this file by issuing the following command:

```
sysctl -p
```

The following non-default user limit value is now recommended for all systems:

- `nfiles=65536`

If this parameter is set to a value higher than 65536 or to unlimited on your system, change the setting to 65536.

Use the default value for all other user limit parameters. To see the current ulimit values, issue the following command as the root user:

```
ulimit -a
```

To set the nfiles ulimit parameter to 65536, edit the `/etc/security/limits.conf` file so that it contains the following line:

```
*          hard    nfiles          65536
```

This change takes effect for any user who subsequently logs in.

Related topics in the DB2 Information Center:

- “Kernel parameter requirements (Linux)” - [v9.5](#), [v9.7](#)
- “Modifying kernel parameters (Linux)” - [v9.5](#), [v9.7](#)
- “OS user limit requirements (Linux and UNIX)” - [v9.5](#), [v9.7](#)

How are the networks set up for an IBM Smart Analytics System environment? Am I allowed to change host names and IP addresses in my system?

Answer: There are two types of networks in an IBM Smart Analytics System environment: private and public. There are two or more internal, private networks in your system. The function of these internal networks and the devices to which they attach depend on your specific configuration, but in general most configurations have an internal application network (also called FCM network, or fast communications manager network) and a management network. These networks exist only within the IBM Smart Analytics System environment. There is also a corporate network, which is a public network that connects some or all servers and some or all of the other devices (storage servers, network switches, and SAN switches) to your existing network infrastructure. The servers and devices on all of these networks are configured with the host names and IP addresses that you specified before deployment.

Changing the host names and IP addresses of the servers on the internal, private networks is a complex process because of the many interdependencies between the host names, IP addresses, and the other components in the system. Do not change any of the following elements without assistance from your IBM representative:

- The host name and IP addresses in the `/etc/hosts` file for the internal application (FCM) network and management network.
- The canonical host name (the value returned from the `hostname` command) for any server. The canonical host name is aligned with the internal application network name.

Your IBM representative can help you evaluate the impact of any potential changes before you proceed. You can also engage an IBM team to implement changes to these settings for you.

You can make changes to the corporate network settings. Changes such as adding alias host names in DNS or in the `/etc/hosts` file will not affect the proper operation of the system. Changes to the actual IP addresses or subnet details for the corporate network have small impacts on other components in the

system and therefore require planning. For example, changing the subnet mask for the corporate network affects any system that has one or more service IPs associated with the corporate network.

For more information, contact your IBM support representative.

Can I use the internal application network for backup traffic?

Answer: No. You cannot use the internal application (FCM) network for backup traffic because this network is internal to the IBM Smart Analytics System environment. You must use the corporate network for backup traffic.

What software should I use to back up the database and to manage the backup images?

Answer: Use the DB2 backup utility to take full or partial backups of the database. No specific software product is prescribed for managing the backup images in an IBM Smart Analytics System data warehouse. However, Tivoli® Storage Manager software is recommended. Tivoli Storage Manager software is not included with IBM Smart Analytics System offerings.

For information about planning a backup and recovery strategy, consult the best practices paper “Building a recovery strategy for an IBM Smart Analytics System data warehouse”. It is available from the following site:

<http://www.ibm.com/developerworks/data/bestpractices/db2luw/>

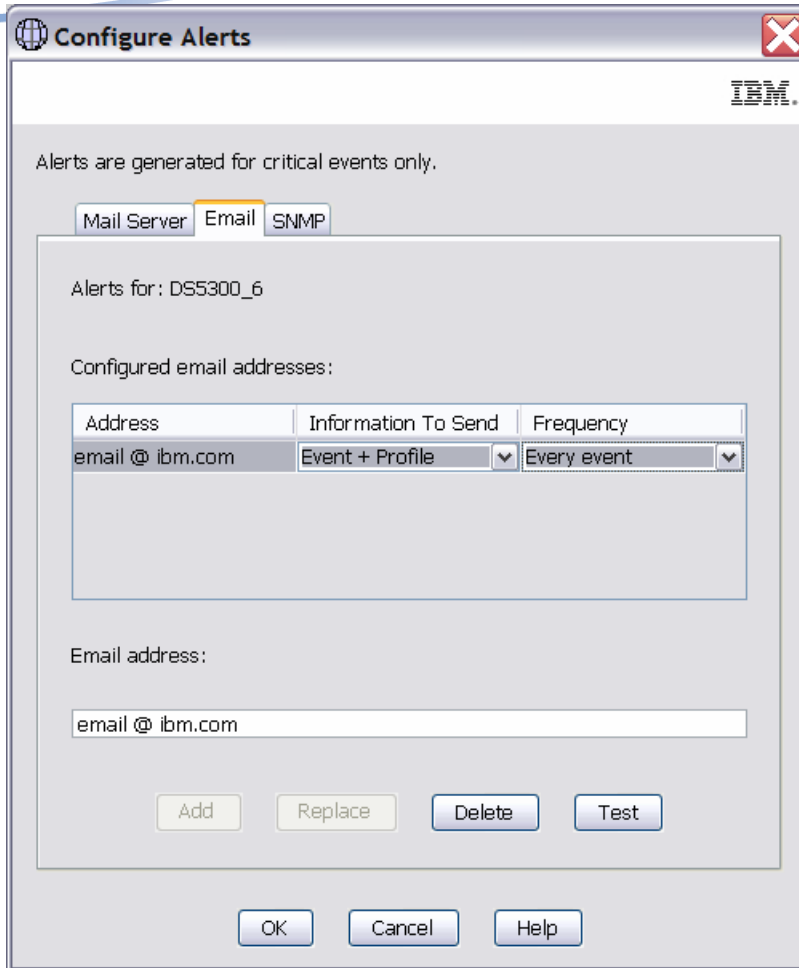
This paper provides best practices that you can apply regardless of the backup management software you choose. It focuses on Tivoli Storage Manager software and includes specific steps for implementing a backup and recovery scenario using Tivoli Storage Manager software.

How do I monitor the external storage servers in my IBM Smart Analytics System environment?

Answer: Use the Storage Manager client to monitor storage servers. If the Storage Manager client is not installed on your system already, download it from the [IBM Support Portal](#). Select the appropriate storage model and operating system and then download and install it.

Using the Storage Manager client, you can view information about critical events in the Storage Manager event log, which you can access by selecting a storage subsystem and opening the Support tab for that subsystem. Examples of critical events include an impending or actual drive failure, an ESM failure, a controller cache battery failure, or a significant configuration error. Consult the documentation for your specific storage subsystem for more information.

You can also configure the Storage Manager client to send email to you about critical events. In the Devices tab, right-click the storage subsystem you want to configure and select **Configure Alerts**. The following picture shows some of the information you are prompted to enter about your environment and the types of notifications you want to receive.



The Storage Manager client does not include call-home functionality. For call-home functionality, you must add a Remote Support Manager for Storage device to your environment. You can then configure the Storage Manager client to forward SNMP traps to the Remote Support Manager for Storage device so that the Remote Support Manager for Storage device can contact IBM Support if a failure occurs.

How do I monitor the Ethernet switches and SAN switches in my IBM Smart Analytics System environment?

Answer: The Ethernet switches and SAN switches provide GUI consoles that you can log into to monitor the switches for errors.

In some configurations the Ethernet switches are on the corporate network, which means that you can check the switches from a remote machine. The SAN switches are generally only on the internal private network. You can use an xterm session to log on to the management node and start a web browser session from the management node.

Ongoing maintenance and upgrades

Can I apply a software or firmware upgrade in my IBM Smart Analytics System environment?

Answer: If you have the IBM Smart Analytics System Control Console in your environment, always apply software and firmware upgrades using the control console. If you do not have the control console, you can manually apply software and firmware upgrades. It is recommended that you contact customer support before doing so. It is important to consider all other software and firmware components on the system, and to validate that all prerequisites and corequisites are met. For full details and explanation, refer to the following technote:

<http://www.ibm.com/support/docview.wss?uid=swg21328726>

What configurations are compatible with the IBM Smart Analytics System Control Console? Is the control console backwards compatible with older InfoSphere Balanced Warehouse systems?

Answer: As of March 2011, the IBM Smart Analytics System Control Console supports the following configurations:

- 7700: Systems that have been upgraded to the November 2010 software levels (IBM Smart Analytics System 7700 Enterprise Software stack v2.0.1) support the control console.
- 7600: Systems that have been upgraded to the June 2010 software levels (IBM Smart Analytics System 7600 Software v1.2 or v1.0.1) support the control console.
- 5600: Contact IBM Smart Analytics support for questions about the control console.

The control console is not compatible with InfoSphere Balanced Warehouse environments, even if you have added IBM Smart Analytics System data or user modules to the environment. The control console also does not apply to IBM Smart Analytics System 1050, 2050, and 9600 environments.

How do I find IBM Smart Analytics System fix packs?

Answer: You can download fix packs for all IBM Smart Analytics System configurations supported by the IBM Smart Analytics System Control Console from IBM Fix Central. If the management node in your IBM Smart Analytics System environment is connected to the internet, you can also view the fix packs that are available using the `midownload -l` command.

Can I use the control console to selectively apply certain updates within an IBM Smart Analytics System fix pack?

Answer: No. You must apply all software and firmware updates included in an IBM Smart Analytics System fix pack. There is no way to selectively apply updates within a fix pack.

I need to apply a firmware update, software update, or operating system patch that is not included in the latest fix pack for my configuration. Can I apply the update or security patch manually?

Answer: No. In this situation you must contact IBM Smart Analytics System support and request a special build or alternate instructions for the patch you need to apply.

How can I use the IBM Smart Analytics System Control Console to determine if the software and firmware levels on the system are correct?

Answer: From the management node issue the `miinfo -c -d` command to list the software and firmware levels that are currently installed and to validate that they are correct.

How can I determine the version of the InfoSphere Warehouse components on my system?

Answer: If you have the IBM Smart Analytics System Control Console in your environment, use the `miinfo` command to determine the version of the InfoSphere Warehouse components. If you do not have the control console, you can verify the version of the InfoSphere Warehouse software and all installed components using the `db2ls` command (for Linux and UNIX platforms only) or the `ENV_PROD_INFO` administrative database view (for all operating systems).

The following example shows how to run the `db2ls` command:

```
db2ls -q -a -b /opt/IBM/dwe/db2/V9.7
```

You can also issue the `db2ls` command without any arguments to display the installation path.

To determine the version using an administrative view, issue the following statement:

```
SELECT * FROM SYSIBMADM.ENV_PROD_INFO;
```

Related topics in the DB2 Information Center:

- “db2ls - List installed DB2 products and features command” - [v9.5](#), [v9.7](#)
- “ENV_PROD_INFO administrative view - Retrieve information about installed DB2 products” - [v9.5](#), [v9.7](#)

Should all the DB2 components be at the same level?

Answer: Depending on which modules you have, your environment might include several copies of the DB2 software. In general, all DB2 server components within a particular copy of the DB2 software must be at the same level.

All of the DB2 server components in the core warehouse must be at the same fix pack level. If you upgrade the level of the DB2 server, you should also upgrade Query Patroller and WebSphere® Relational Wrappers to the same level if you use these components. You can upgrade the levels of the DB2 server components beyond the level of the non-DB2 components that are included with your version of InfoSphere Warehouse. These non-DB2 components include Intelligent Miner®, the InfoSphere

Warehouse components installed on the warehouse applications module, and InfoSphere Warehouse Design Studio clients.

If you have a business intelligence (BI) module, the nodes in the module are installed with a separate copy of the DB2 software. The level of the DB2 software in the BI module does not need to match the level of the DB2 software in the core warehouse. In some cases, you might upgrade the DB2 level in the core warehouse after IBM validates a new level, but the same level might not yet have been validated for the BI module.

There might also be cases in which the level of the DB2 server components in your warehouse applications module does not match the level in your core warehouse.

For a list of the available fix packs for the DB2 software, see the following site:

<http://www.ibm.com/support/docview.wss?uid=swg27007053>

How should I apply fix packs to the DB2 software?

Answer: If you have the IBM Smart Analytics System Control Console in your environment, always apply fix packs to the InfoSphere Warehouse and DB2 software using the control console. If you do not have the control console, upgrade the software manually. Although you can download the individual fix packs for each DB2 software component and apply each one separately, instead always install a DB2 universal fix pack because installing a universal fix pack updates all components to the same fix pack level.

Does the level of the client components of the InfoSphere Warehouse and DB2 software need to match the level of the server components?

Answer: For client software on the client side, it is recommended but not necessary that you bring the client fix pack level up to the same level as the server fix pack level. Because the client software on the server side is embedded within the server components, these client components are upgraded automatically when you apply a fix pack to the server.

How can I determine the version of the firmware in my system?

Answer: If you have the IBM Smart Analytics System Control Console in your environment, use the `miinfo` command to determine the firmware levels in your system. If you do not have the control console, use the following commands and procedures as the root user to determine the firmware levels.

Firmware components for systems based on the Linux operating system:

The simplest method is to use the IBM Systems Director (called IBM Director prior to V6) graphical user interface to check all firmware and driver levels. You can also use command-line tools as follows. Specific commands might not always work because of differences within releases of a particular server and because of different drivers, adapters, and software that might be installed on your system.

- BIOS (IBM System x3650 or x3655)
`hwinfo --bios`

A portion of sample output for a System x3650 server follows. In this example, the BIOS is at level 1.14:

```
BIOS Info: #0
  Vendor: "IBM"
  Version: "-[GGE143AUG-1.14]-"
```

- IMM (IBM System x3650 M2 or x3650 M3)

Issue the following command from the management node:

```
ipmitool -I lanplus -H imm_ip_address -U imm_user -P imm_password bmc info
```

A portion of sample output follows:

```
Firmware Revision          : 1.14
```

- UEFI (IBM System x3650 M2 or x3650 M3)
hwinfo --bios

A portion of sample output for a System x3650 M3 server follows. In this example, the UEFI is at level 1.08:

```
BIOS Info: #47
  Vendor: "IBM Corp."
  Version: "-[D6E148BUS-1.08]-"
```

- Intel PRO/1000 driver
cat /sys/module/e1000/version
or
modinfo e1000 | grep version
If your system is installed with the e1000e driver instead of the e1000 driver, substitute e1000e for e1000 in these commands. If you do not know which driver is installed on your system, use the lsmod command to generate a list of devices.
- Broadcom NetXtreme II driver
cat /sys/module/bnx2/version
or
modinfo bnx2 | grep version
- ServeRAID driver
cat /sys/module/aacraid/version
or
modinfo aacraid | grep version
- MegaRAID driver
cat /sys/module/megaraid_sas/version
or
modinfo megaraid_sas | grep version
- ServeRAID-8k and 8k-l, ServeRAID-MR10i, and ServeRAID-M5014 controller firmware

Use the MegaCLI tool to determine the controller firmware level using commands similar to the following example:

```
cd /opt/IBM/DSA/megalsi
./MegaCli -AdpAllInfo -aALL | grep Build
```


Sample output follows:

```
FW Package Build: 12.0.1-0090
```

In your environment the path to the MegaCLI tool might be different from the path shown here.

- RDAC driver

```
cat /sys/module/mppUpper/version  
or
```

```
modinfo mppUpper | grep version
```

Both the mppUpper and mppVhba modules are part of the RDAC driver. You can check the version of either module because both versions always match.

- QLogic driver

```
modinfo qla2xxx | grep version
```

- QLogic firmware

```
cat /sys/class/scsi_host/host*/fw_version
```

Sample output from this command follows:

```
5.03.07 (d5)  
5.03.07 (d5)  
5.03.07 (d5)  
5.03.07 (d5)
```

If this command does not work, try the following command:

```
cat /proc/scsi/qla2xxx/* | grep version
```

Firmware components for systems based on the AIX operating system:

- Power™ system firmware (IBM Power 550, Power 570, and Power 740)

```
prtconf |grep Firmware
```
- Network and storage adapters

Determine the devices on your system that have diagnostic services to manage microcode by issuing the command:

```
lsmcode -A
```

To obtain detailed information about a specific device listed, use the command:

```
lscfg -vl devicename
```

Make a note of the description and part number for every device. For example:

```
[root] # lscfg -vl ent2  
ent2 U787B.001.DNWX5ZP-P1-C1-T1 2-Port 10/100/1000 Base-TX PCI-X Adapter  
(14108902)  
2-Port 10/100/1000 Base-TX PCI-X Adapter:  
Part Number.....03N5298  
FRU Number.....03N5298  
EC Level.....H13845$  
Brand.....H0  
Manufacture ID.....YL1021  
Network Address.....00145E48EFDC  
ROM Level.(alterable).....DV0210  
Device Specific.(YL).....U787B.001.DNWX5ZP-P1-C1-T1
```

You can also use the following command to determine the firmware level on a device:

```
lsmcode -d devicename
```

HMC

1. Start an SSH session to the HMC: `ssh hmcIP`
where *hmcIP* is the IP address of the HMC.
2. Log in as the "root", "hscroot", or "hscpe" user.
3. Issue the following command to view the version of the operation code:
`lshmc -V`

External storage (DS3000, DS4000®, or DS5000)

Use the Storage Manager client to determine the levels of the controller firmware, controller NVSRAM, ESM firmware, and hard disk drive firmware. You must check the level for every storage controller and hard disk drive.

Method #1: Go to the Subsystem Management window and select **Storage Subsystem > View Profile**. When the Storage Subsystem Profile window opens, select the **All** tab and scroll through **Profile For Storage Subsystem** to locate the following information. Because the profile includes a large amount of information, you will need to scroll through it to find the relevant information.

The following sample output shows the controller firmware and NVSRAM level for one controller:

```
Controller in Enclosure 0, Slot A
Status: Online
Current configuration
Firmware version: 07.10.23.00.
Appware version: 07.10.23.00.
Bootware version: 07.10.23.00.
NVSRAM version: N1814D47R1010V05
```

The following sample output shows the ESM level for one controller:

```
ESM card status: Optimal
Firmware version: 9898
Configuration settings version: FD 00.52 03/08/2007
```

The following sample output shows the vendor and firmware level for one drive. A typical storage system contains disks manufactured by several different vendors.

```
Product ID: ST3750640NS 43W9715 42D0003IBM
Package version: EP58
Firmware version: 3.AEP
ATA Translator
Product ID: BR-2401-3.0
Vendor: SLI
Firmware Version: LP1158
```

Method #2: Use the Physical View pane of the Subsystem Management window to determine the firmware levels.

To obtain the controller firmware version:

Right-click the **Controller** icon in the Physical View pane of the Subsystem Management window, and select **Properties**. The Controller Enclosure properties window opens and displays the properties for that controller.

To obtain the ESM firmware version:

1. In the Physical View pane of the Subsystem Management window, click the **Drive Enclosure Component** icon, which is the icon furthest to the right. The Drive Enclosure Component Information window opens.
2. Click the **ESM** icon in the left pane. The ESM information displays in the right pane of the Drive Enclosure Component Information window.
3. Locate the firmware version of each ESM in the drive enclosure.

To obtain the drive firmware version:

Right-click the **Drive** icon in the Physical View pane of the Subsystem Management window and select **Properties**. The Drive Properties window opens and displays the properties for that drive.

Ethernet switches

- SMC 8848M switch firmware
 - Using the command-line interface:
 1. Telnet to the switch: `telnet switchIP`
where *switchIP* is the IP address of the switch. Telnet must be enabled on the switch.
 2. Log in. The default user name is "admin" and the default password for this user is "admin".
 3. Issue the following command to view the version of the operation code:
`show version`
 - Using the web interface:
 1. Navigate to the IP address for the switch.
 2. Log in. The default user name is "admin" and the default password for this user is "admin".
 3. From the main menu, expand **System > Switch Information**.
- IBM J48E / Juniper EX4200-48T and Juniper EX4500 switch firmware
 - Using the command-line interface:
 1. Telnet to the switch: `telnet switchIP`
where *switchIP* is the IP address of the switch. Telnet must be enabled on the switch.
 2. Log in as the "admin" or "root" user.
 3. Issue the following command to view the firmware level:
`show version`
 - Using the web interface:
 1. Navigate to the IP address for the switch.

2. Log in as the “root” user.
3. In the Dashboard view, the JUNOS software version is listed in the System Information box.

SAN switches

- Brocade firmware
 - Using the command-line interface:
 1. Telnet to the switch: `telnet switchIP`
where *switchIP* is the IP address of the switch.
 2. Log in. The default user name is “admin” and the default password is “password”.
 3. Determine the current version of the firmware on the switch using one of the following commands:
`version`
`firmwareshow`

Do I need to change the batteries in my storage server?

Answer: Yes. The batteries are not covered by warranty because they are considered to be a consumable component. You must monitor the batteries and replace them when they start to wear out. A warning message is displayed in the storage controller thirty days before the battery expiration date.

More information about replacing batteries is available in the *Installation, User’s, and Maintenance Guide* for your specific storage server.

Problem determination and customer support

What do I do if I need help with my IBM Smart Analytics System or InfoSphere Balanced Warehouse?

Answer: The recommended method is to submit a new service request by using IBM Service Request. IBM Service Request is an online problem management tool that you can access from the following Web site:

<https://www.ibm.com/support/servicerequest>

All problems, including hardware problems, are managed through the software problem reporting structure. This is because the IBM Smart Analytics System offerings and InfoSphere Balanced Warehouse offerings include integrated software and hardware support, using a single problem queue. Your service request connects you with an IBM Remote Technical Support Representative who can help you diagnose your problem and, if the problem is not immediately resolved, can help you create a plan to resolve it.

Collect the following information before contacting support:

- Your IBM Customer Number (ICN)
- Your Passport Advantage® Agreement number (PPA)
- The machine type, model number, and serial number
- A clear definition of the problem

For more information, use the following link to search for all customer support plans for IBM Smart Analytics System offerings:

[http://www-03.ibm.com/support/techdocs/atmastr.nsf/WebDocs/?Search&Query=\[HTMLDocumentName=WM_CSP\]+AND+%28smart%20%29](http://www-03.ibm.com/support/techdocs/atmastr.nsf/WebDocs/?Search&Query=[HTMLDocumentName=WM_CSP]+AND+%28smart%20%29)

Another option is to call support directly. Use the telephone number for IBM Software Support, and specifically the one for Information Management (if provided), that you find listed for your country here:

<http://www.ibm.com/planetwide/>

Education: Training and references

Training and education roadmap for IBM Smart Analytics System and InfoSphere Balanced Warehouse offerings

<http://www.ibm.com/software/data/education/roadmaps.html#isas>

Useful links

IBM Smart Analytics System external web site:

<http://www.ibm.com/software/data/infosphere/smart-analytics-system/>

Download site for IBM Smart Analytics System and InfoSphere Balanced Warehouse documentation:

https://www14.software.ibm.com/webapp/iwm/web/preLogin.do?lang=en_US&source=idwbcu

IBM Smart Analytics System support portal:

http://www.ibm.com/support/entry/portal/Overview/Software/Information_Management/IBM_Smart_Analytics_System

InfoSphere Balanced Warehouse support portal:

http://www.ibm.com/support/entry/portal/Overview/Software/Information_Management/InfoSphere_Balanced_Warehouse

All validated stack pages for IBM Smart Analytics System and InfoSphere Balanced Warehouse configurations:

<http://www.ibm.com/support/docview.wss?uid=swg21429594>

Further Reading

- Information Management Best Practices - <http://www.ibm.com/developerworks/data/bestpractices/>

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