Blueprint

Configuring and Deploying a Virtual Infrastructure 3 with ESX3i on a BladeCenter S Chassis and Blade Servers

Contents

Chapter 1. Introduction

This document describes how to implement a VMware infrastructure that uses VMware ESX3i and an IBM® BladeCenter® S chassis. It includes IBM tested configurations, best practices, and troubleshooting procedures.

The ESX3i hypervisor (VMvisor) is preinstalled in IBM HS21XM blade servers. You must install it in HS21 blade servers. You can use tools such as VMware Distributed Resource Scheduler (DRS), VMware High Availability (HA), VMware VMotion, and VMware Storage VMotion and maintain the entire infrastructure within a single BladeCenter S chassis.

The SAN fabric is managed through two SAS RAID controller modules and monitored through the IBM Storage Configuration Manager (SCM).

This document contains procedures from the initial setup of the blade servers and BladeCenter S chassis through the point at which VMware Infrastructure 3 is running, configured, and hosting virtual machines. This document contains detailed instructions for configuring the BladeCenter S chassis and the SAS RAID controller modules. For common configuration and administrative tasks, you are referred to VMware documentation.

Intended audience

This document is intended for system administrators who have basic knowledge of Virtual Infrastructure 3 configuration and SAN. The procedures require you to perform an initial configuration of the BladeCenter S chassis, configure a RAID array, share LUNs, and set up VMware VMotion, HA, and a DRS cluster.

Hardware and software requirements

To complete the procedures in this document, you must have the following hardware and software:

- A BladeCenter S chassis
- A network connectivity module in bay 1 of the BladeCenter S chassis
- SAS RAID controller modules in bay 3 and bay 4 of the BladeCenter S chassis
- Two or more HS21XM blade servers or two or more HS21 blade servers with installed operating systems and ESX3i
- One SAS expansion card in each blade server
- VMware VirtualCenter 2.5
- IBM Storage Configuration Manager (SCM)
- Licenses for the following VMware software:
    - Distributed Resource Scheduler (DRS)
    - ESX3i
    - High Availability (HA)
    - VirtualCenter
    - VMotion

Tested firmware versions

The following tables list the firmware versions that have been tested with the procedures in this document.

Table 1. Blade server vital product data

Firmware type	Build ID	Release date	Revision
BIOS	BCE136AUS	6 June 2008	1.13 (HS21) 1.10 (HS21XM)
Diagnostics	BCYT18AUS	23 February 2007	1.02
Service processor	BCBT29D		1.07

Table 2. Storage-module vital product data

Firmware type	Build ID	Release date	Revision
Storage module	S4SM06101.DS1	2008-07-08T23:23:53Z	1.01

Table 3. LSI SAS controller

Controller ID	Controller type	Release
SAS 1064	Adapter	1.23.18.00 (preferred) 1.22.00.00
SAS 1064E	Integrated	1.18.84.00

Table 4. I/O-module vital product data

Firmware type	Build ID	Release date	Revision
Boot ROM	WMY01001	12 April 2006	0100
Main application 1	WMY01000	12 April 2006	0100
Boot ROM	S0CD00L	21 December 2007	0308
Main application 1	S0SW00L	25 July 2008	R018
Main application 2	S0CP006	1 January 2000	C006
Main application 3	S0RC538	24 July 2008	1642
Main application 4	S0BT04G	11 July 2008	0120
Main application 5	S0SE00A	28 January 2008	0100
Boot ROM	S0CD00L	21 December 2007	0308
Main application 1	S0SW00L	25 July 2008	R018
Main application 2	S0CP006	1 January 2000	C006
Main application 3	S0RC538	24 July 2008	1642
Main application 4	S0BT04G	11 July 2008	0120
Main application 5	S0SE00A	28 January 2008	0100

Table 5. Advanced management module vital product data

File name	Build ID	Release date	Revision
CNETCMUS.PKT	BPET42H	20 June 2008	4

Chapter 2. Setting up the hardware

Set up the BladeCenter S chassis and the BladeCenter HS21 or HS21XM blade servers.

Setting up the BladeCenter S chassis

After you have installed all hardware components in the BladeCenter S chassis, complete the following steps to set up the chassis:

1. From an external management computer (a personal computer or notebook computer) that is connected to the Ethernet (remote management) connector on the advanced management module in the BladeCenter S chassis, open a Web browser and log in to the advanced management module.

   Note: The external management computer must be on the same IP subnet as the advanced management module. The default subnet is 255.255.255.0. If you have not already done so, consider defining a static IP address, such as 192.168.70.120, for the external management computer.

   Default address (example): 192.168.70.125

   Default user name: USERID

   Default password: PASSW0RD (zero, not uppercase O)

2. Using the advanced management module initial setup wizard, set up the BladeCenter S chassis. When you log in to the advanced management module for the first time, the initial setup wizard starts automatically.

3. Set the IP addresses for each SAS RAID controller module. Each SAS RAID controller module has two IP addresses: one for the SAS switch and one for the RAID controller.

4. From the **Storage Configuration** menu, select **Do not change the zone configuration at this time**.

Setting up a BladeCenter HS21 or HS21XM blade server

Complete the following steps to set up a BladeCenter HS21 or HS21XM blade server:

1. Install a SAS expansion card (LSI SAS 1064 release 1.23.18.00 or compatible) in the blade server.

2. Install the blade server in the BladeCenter S chassis.

3. Make sure that the latest firmware and BIOS codes updates are installed in the blade server. If necessary, download the updates from http://www.ibm.com/systems/support/.

   Important: Some cluster solutions require specific code levels or coordinated code updates. If the device is part of a cluster solution, verify that the latest level of code is supported for the cluster solution before you update the code.

4. Start the blade server. When you are prompted, press Ctrl+C to start the LSI configuration utility.

5. Select the SAS expansion card, and click **RAID properties**. Record the worldwide name (WWN) ID. You will need this information when you configure the SAS RAID controller module.

Chapter 3. Configuring the hardware

Configure the SAS RAID controller module and the virtual infrastructure.

Configuring the SAS RAID controller module

Use SAS RAID CLI or IBM Storage Configuration Manager to configure the SAS RAID controller module through an external management computer (a personal computer or notebook computer) that is connected to the Ethernet (remote management) connector on the advanced management module in the BladeCenter S chassis.

Using SAS RAID CLI

The following instructions assume that the BladeCenter S chassis is fully populated. You might have to revise your procedure for different resource availability and configuration needs.

Important: A network connectivity module must be installed in I/O-module bay 1 of the BladeCenter S chassis for the external management computer to communicate with the SAS RAID controller module through Secure Shell (SSH).

To set up and configure the SAS RAID controller module, complete the following steps:

1. Using Telnet, log in to the RAID controller in the SAS RAID controller module. Use the IP address that you set when you set up the BladeCenter S chassis, and use the default user name, USERID, and the default password, PASSW0RD (zero, not uppercase O).
2. Type `list controller` to display a list of the controllers. The following table illustrates an example of a list of controllers.

Ctrl#	Controller	Status	Ports	LUNs
0	Ctlr0	PRIMARY	1	0
1	Ctlr1	SECONDARY	1	0

3. Verify that one controller has a status of PRIMARY and one controller has a status of SECONDARY.
4. Complete the following steps to create the applicable storage pools:
   a. Type `create pool -drives 1:1 1:2 1:3 1:4 1:5 1:6 -raidtype 5 -port 0 -name leftdrives`.
   b. Type `create pool -drives 2:1 2:2 2:3 2:4 2:5 2:6 -raidtype 5 -port 0 -name rightdrives`.
5. Type `list pool` to display a list of the storage pools. The following table illustrates an example of a list of storage pools.

Pool #	ID	Name	RaidType	OwnerCtlr	TotalCap	AvailCap	Status	State	Degraded
0	1	Leftdrives	5	Slot 0	320GB	0MB	Viable	ONV	No
1	2	Rightdrives	5	Slot 0	320GB	0MB	Viable	ONV	No

The storage-pool states are as follows:

OFF: Offline failed

OFN: Offline nonviable

OFV: Offline viable

ONF: Online failed

ONN: Online nonviable*

ONV: Online viable

SF: Service failed

SN: Service nonviable

SV: Service viable

* If one or more drives are missing from the pool and you acknowledge the alert, the state changes to OFN. If the missing drives return to the pool, the state changes to ONV.

6. Complete the following steps to create volumes from each of the storage pools:

a. Type `create volume -name leftdrives:volume1 -size 100%`.

b. Type `create volume -name rightdrives:volume2 -size 100%`.

7. Type `list volume` to display a list of the volumes. The following table illustrates an example of a list of volumes.

Vol#	VolumeName	Cap	RaidType	Status
0	leftdrives:volume1	320GB	5	VBL INI
1	rightdrives:volume2	320GB	5	VBL INI

The statuses are as follows:

DEG: Degraded

INI: Initiated

NVBL: Nonviable

TRN: In transition

VBL: Viable

8. Complete the following steps to map each blade server (host) to the newly created volume. The variable *wwn* is the worldwide name that you recorded in step 5 on page 3 when you set up the blade server.

Note: In this scenario, volume2 is not mapped or used.

a. Type `hostlun -map -volume leftdrives:volume1 - permission rw -wnn` *wwn* `-lun1`.

b. Type `hostlun -map -volume leftdrives:volume1 - permission rw -wnn` *wwn* `-lun1`.

9. Type `host -get` to view the mapped hosts. The following tables illustrate the resulting mapped hosts.

HostWWN 500062b00008ae34, HostName CliHost2 :

LUNs Mapped :

LUN	Permission	Volume
1	ACCESS_READWRITE	leftdrives:volume1

HostWWN 500062b00008b48c, HostName CliHost1 :

LUNs Mapped :

LUN	Permission	Volume
1	ACCESS_READWRITE	leftdrives:volume1

Using IBM Storage Configuration Manager

The following instructions assume that no storage pools or volumes have been created for the SAS RAID controller module. You might have to revise your procedure for different resource availability and configuration needs. Install IBM Storage Configuration Manager on an external management computer (a personal computer or notebook computer) that is connected to the Ethernet (remote management) connector on the advanced management module in the BladeCenter S chassis.

IBM Storage Configuration Manager works only with the following operating systems:
- Microsoft® Windows® Server 2003 or Windows Server 2003 R2
  - Enterprise Edition
  - Enterprise x64 Edition
  - Standard Edition
  - Standard x64 Edition
  - Web Edition
- Red Hat Enterprise Linux
  - Version 4 AS for x86, AMD64, and EM64T
  - Version 4 ES for x86, AMD64, and EM64T
  - Version 5 AS for x86, AMD64, and EM64T
  - Version 5 ES for x86, AMD64, and EM64T
- SUSE Linux
  - Enterprise Server 9 for x86, AMD64, and EM64T
  - Enterprise Server 10 for x86, AMD64, and EM64T

To download and install IBM Storage Configuration Manager, complete the following steps.

Note: Changes are made periodically to the IBM Web site. The actual procedure might vary slightly from what is described in this document.

1. Go to http://www.ibm.com/systems/support/.
2. On the left side of the page, click **Systems Management software**.
3. From the **Product family** list, select **IBM Storage Configuration Manager**, and click **Go**.
4. Select the latest version of Storage Configuration Manager, and follow the instructions that come with the downloaded files.

To set up and configure the SAS RAID controller module, complete the following steps:

1. Start IBM Storage Configuration Manager. A browser window opens.
2. In the "Getting Started" window, click **Initial Setup Wizard**.
3. Type the IP address of the SAS switch, and type the user ID and password of the SAS RAID controller module (for example, USERID and PASSW0RD). Click **Next**.
4. Select the **Set SAS Switches time now** check box, select **Set SAS Switches current date and time now**, set the date and time, and click **Next**.
5. Select the **Set RAID Controller current date and time now** check box, select **Set with current SAS Switch time**, and click **Next**.
6. (Optional) Modify the security credentials of the SAS switches and RAID subsystem, and click **Next**. If you do not want to modify the security credentials, click **Next** without modifying any settings.
7. Select **Create a custom configuration** and **Allow system to choose drives (easy)**. A wizard guides you through the configuration. Click **Next**.
8. (Optional) Select the amount of spare disk drive coverage and click **Next**.
9. In the **Storage pool name** field, assign a name to your storage pool (for example, leftdrives). Select the RAID level and the available storage pool capacity, and click **Next**.
10. Verify the information in the confirmation window and click **OK**.
11. For each volume, specify a name (note that volume names cannot contain numerals), the capacity (in GB), and the quantity (the number of drives). Click **Add** and **Next**.
12. Verify that all hosts (blade servers) are displayed with orange borders in the Select Hosts column and all volumes are displayed with orange borders in the Select Volumes column. Click **Map Volumes** and **Next**.
13. When a summary of your selections is displayed, verify your selections and click **Finish**.

Configuring the virtual infrastructure

This procedure assumes that VMware VirtualCenter is already installed. For information about installing VirtualCenter, see http://www.vmware.com/support/vc/doc/c2installintro.html. To configure the virtual infrastructure, complete the following steps. For more detailed instructions, see the VMware documentation.

1. Create a new datacenter.
2. Add a new host to the datacenter.
3. Create virtual machines on the host, and make sure that the virtual machines are installed on shared storage.
4. Install VMware Tools. For instructions, see http://www.vmware.com/support/ws5/doc/new_guest_tools_ws.html.
5. Configure VMware Distributed Resource Scheduler (DRS). For instructions, see http://www.vmware.com/pdf/vmware_drs/wp.pdf.
6. Configure the host for VMotion. For instructions, see http://www.vmware.com/support/vc11/doc/c13vmotionenable.html#1031215.

Configuring additional HS21 or HS21XM blade servers

When you add an HS21 or HS21XM blade server (host) to the BladeCenter S chassis, configure the SAS RAID controller modules to map the host to the volume and LUN (see step 8 on page 6) and add the new host to the datacenter that you created in step 1 on page 8.

Chapter 4. Troubleshooting

The following problems might occur during the procedures in this document.

Problem	Solution
The Secure Shell cannot connect to the SAS RAID controller module.	Make sure that an Ethernet module is installed in bay 1 of the BladeCenter S chassis (pass-thru modules are not supported), and make sure that the IP addresses of the SAS RAID controller module and RAID controllers are set correctly in the BladeCenter management console.
The LSI SAS adapter cannot be flashed, and the LSI Logic Configuration Utility program cannot be started.	Upgrade the blade server BIOS code to the latest level. **Important:** Some cluster solutions require specific code levels or coordinated code updates. If the device is part of a cluster solution, verify that the latest level of code is supported for the cluster solution before you update the code.

Appendix. Notices

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