Chapter 2. Configuring your BladeCenter unit

The BladeCenter unit automatically detects the modules and blade servers that are installed and stores the vital product data (VPD) information. When the BladeCenter unit is started, it automatically configures the remote-management port on the management module, so that you can configure and manage the BladeCenter unit and blade servers. You configure and manage the BladeCenter unit remotely through the management module using the Web-based user interface.

Note: You can also configure the I/O modules directly through an external I/O-module port using a Telnet interface or a Web browser. See the documentation that comes with the I/O module for more information.

For the management module to communicate with the blade servers in the BladeCenter unit, you will need to configure the IP addresses for the following internal and external ports:

- The external Ethernet (remote management) port on the management module (see the *User's Guide* or *Command-Line Interface Reference Guide* for your management module type for instructions). The initial management-module autoconfiguration enables the network-management station to connect to the management module to configure the port completely and to configure the rest of the BladeCenter unit.
- The internal Ethernet port on the management module for communication with the I/O modules (see the *User's Guide* or *Command-Line Interface Reference Guide* for your management module type for instructions).
- The internal Ethernet management port on each I/O module for communication with the management module. You configure this port by configuring the IP address for the I/O module (see the *User's Guide* or *Command-Line Interface Reference Guide* for your management module type for instructions).

  Note: Pass-thru modules have no internal Ethernet port.

To communicate with the blade servers for functions such as deploying an operating system or application program, you also will need to configure at least one external (in-band) port on an Ethernet switch module. See the *BladeCenter Management Module User's Guide* or the *BladeCenter Management Module Command-Line Interface Reference Guide* for information about configuring external ports on I/O modules.

Note: If a pass-thru module is installed in I/O-module bay 1 or 2 (instead of an Ethernet switch module), you will need to configure a port on the network switch to which the pass-thru module is connected.

Management module and advanced management modules support different types of remote access. See the documentation for your management module type for information and instructions.

The Web-based user interface and command-line interface communicate with the management and configuration programs that are part of the firmware that comes with the management module. You can use these programs to perform tasks such as:

- Defining the login IDs and passwords
- Selecting recipients for alert notification of specific events

- Monitoring the status of the BladeCenter unit and blade servers
- Controlling the BladeCenter unit and blade servers
- Accessing the I/O modules to configure them
- Changing the drive startup sequence in a blade server
- Setting the date and time
- Using a remote console for the blade servers
- Changing ownership of the keyboard, video, and mouse
- Changing ownership of the optical drive, and USB port. (The optical drive in the BladeCenter unit is viewed as a USB device by the blade server operating system.)

Note: The IBM Director program is a system-management tool that comes with the BladeCenter unit. To configure the remote alert recipients for IBM Director over LAN, the remote alert recipient must be an IBM Director-enabled server.

You also can use the management and configuration programs to view some of the blade server configuration settings. See the *User's Guide* or *Command-Line Interface Reference Guide* for your management module type for more information.

BladeCenter unit power requirement

The power supply modules in the BladeCenter unit must be connected to 220 V ac power only. The BladeCenter unit comes with two power cords to connect the BladeCenter unit to the power distribution unit (PDU).

BladeCenter power configuration

The power modules in power bays 1 and 2 provide power to blade bays 1 through 6 and to common components in the BladeCenter unit. The power modules in power bays 3 and 4 provide power to blade bays 7 through 14. Power modules must always be present in power bays 1 and 2.

Attention:

Non-redundant power is not supported by the BladeCenter E unit. Power modules must always be present in power bays 1 and 2. When any blade server or option is in blade bay 7 through 14, power modules must be present in power bays 1 and 2, and power modules must be present in power bays 3 and 4.

If a power module fails or an ac power failure occurs, a BladeCenter unit configured for redundant power operation will operate in a nonredundant mode, and the blower modules will run at full speed. You must replace the failing power module or restore ac power as soon as possible to regain redundant power operation and to reset the blower modules to their normal operating speed.

See the *IBM BladeCenter Power Supply Modules* option documentation and the *BladeCenter Type 8677 Installation and User's Guide* for more information.

Firmware updates

The firmware for the management module and other BladeCenter components is periodically updated and is available for download on the Web. Go to http://www.ibm.com/support/ to get the latest level of firmware, such as BIOS code and device drivers.

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.

Note: When replacing BladeCenter components, you might have to update the management module or other components with the latest version of firmware.

Configuring the BladeCenter unit

General configuration of the BladeCenter unit and installed components is performed through the management module. See the *BladeCenter Management Module User's Guide* and the *BladeCenter Management Module Command-Line Interface Reference Guide* for information and instructions. Some devices in the BladeCenter unit, such as I/O modules and blade servers, might also require additional configuration. See the documentation that comes with each device for information and instructions.

Configuring the management module

All management modules are preconfigured with the same static IP address. You can use the management module to assign a new static IP address. To establish connectivity, the management module attempts to use Dynamic Host Control Protocol (DHCP) to acquire its initial IP address for the management-module Ethernet port. If DHCP is not installed or is enabled and fails, the management module uses the static IP address. Use the management module to configure other BladeCenter component settings such as user accounts, DHCP, or Wake on LAN. See the *BladeCenter Management Module User's Guide* and the *BladeCenter Management Module Command-Line Interface Reference Guide* for instructions.

Communicating with the IBM Director software

Notes:

1. See the illustration on page 27 for an example of a typical network configuration. See the *IBM BladeCenter Planning and Installation Guide* for more examples of network configurations. You can obtain the planning guide from http://www.ibm.com/systems/support/.
2. The IBM Director CD comes with the BladeCenter unit.

To communicate with the BladeCenter unit, the IBM Director software needs a managed object (in the Group Contents pane of the IBM Director Management Console main window) that represents the BladeCenter unit. If the BladeCenter management module IP address is known, the network administrator can create an IBM Director managed object for the unit. If the IP address is not known, the IBM Director software can automatically discover the BladeCenter unit (out-of-band, using the Ethernet port on the BladeCenter management module) and create a managed object for the unit.

For the IBM Director software to discover the BladeCenter unit, your network must initially provide connectivity from the IBM Director server to the BladeCenter management-module Ethernet port. To establish connectivity, the management module attempts to use DHCP to acquire its initial IP address for the Ethernet port. If the DHCP request fails, the management module uses a static IP address. Therefore, the DHCP server (if used) must be on the management LAN for your BladeCenter unit.

Notes:

1. All management modules are preconfigured with the same static IP address. You can use the management-module Web interface or command-line interface to assign a new static IP address for each BladeCenter unit. If DHCP is not used and you do not assign a new static IP address for each BladeCenter unit before attempting to communicate with the IBM Director software, only one BladeCenter unit at a time can be added to the network for discovery. Adding multiple units to the network without a unique IP address assignment for each BladeCenter unit results in IP address conflicts.

2. For I/O-module communication with the IBM Director server through the management-module external Ethernet port, the I/O module internal network interface and the management-module internal and external interfaces must be on the same subnet.

Configuring I/O modules

You must install and configure at least one external (in-band) port on an Ethernet switch module in I/O-module bay 1 to communicate with the Ethernet controllers that are integrated in each blade server. See the *BladeCenter Management Module User's Guide* and the *BladeCenter Management Module Command-Line Interface Reference Guide* for information about configuring external ports on I/O modules. For I/O-device settings, see the documentation that comes with your I/O device. See "I/O (switch) modules" on page 34 for information about the location and purpose of each I/O module.

Notes:

1. If a pass-thru module is installed in I/O-module bay 1, you must configure the network switch that the pass-thru module is connected to; see the documentation that comes with the network switch.

2. You can set up Ethernet failover by installing an Ethernet switch module in I/O-module bay 2.

Configuring blade servers

To achieve communication redundancy on a blade server, you must configure the Ethernet controllers on the blade servers for failover. When failover occurs on a blade server, the secondary Ethernet controller takes over network communications, using the I/O module that is associated with that controller. Install a pair of Ethernet switches in I/O-module bays 1 and 2; then, configure them and your network infrastructure so that they can direct traffic to the same destinations. You can also install a pass-thru module that is connected to an external Ethernet switch in either or both of these I/O-module bays. See the documentation that comes with your blade server and operating system for instructions.

Using IBM Director

The IBM Director program is a system-management product that comes with the BladeCenter unit. Through the remote connection on the management module, you can use the IBM Director software at the IBM Director console to configure the BladeCenter unit, modify the configuration, and set up more advanced features.

Notes:

1. Some tasks, such as software distribution, require an in-band connection from the Director server through a campus (public) LAN to an I/O module port.

2. To manage BladeCenter redundant management modules with the IBM Director software, IBM Director version 4.1.01 or greater is required.

The IBM Director software includes the IBM BladeCenter Deployment Wizard.

About the wizard

The BladeCenter Deployment Wizard is integrated into the IBM Director management software. The wizard walks you through initial startup and configuration of one or more BladeCenter units.

In addition to performing initial configuration on BladeCenter units, you can use the built-in IBM Director tasks in the wizard to modify the configuration and to set up more advanced features.

You can also create a reusable profile in the wizard for configuring or reconfiguring BladeCenter units. The profile is a noninteractive script that can run as scheduled or as part of an Event Action Plan. With this feature you can define policies to reconfigure a BladeCenter unit on demand, responding to hardware failures or other IBM Director events.

Specifically, you can use the BladeCenter Deployment wizard to perform the following tasks:

- Perform all initial network configuration, including configuring IP addresses for the management module and the I/O-module internal configuration ports.
- Set up the initial security profile for the BladeCenter unit, including user names, passwords, enablement or disablement of management services, and so forth.
- Optionally configure external switch module ports for multi-port link aggregation (trunking).

Starting the wizard

Start the wizard from the IBM Director Management Console on the Director server.

1. Select one or more BladeCenter units from the middle (contents) pane of the console window.

   Note: A lock icon beside a newly discovered BladeCenter unit indicates that the Director server cannot log into the management module for that BladeCenter unit, which can mean that the management module has not been configured yet. You might want to select that BladeCenter unit for initial configuration through the wizard.

2. Perform either of the following actions:
   - Right-click the selected BladeCenter units (managed objects).
   - Drag the wizard task from the right-most pane (under BladeCenter in the task list) to any of the selected BladeCenter units (managed objects).

   The wizard starts, and guides you through the login and configuration tasks needed.

The following illustration shows the main window on the BladeCenter Deployment wizard.
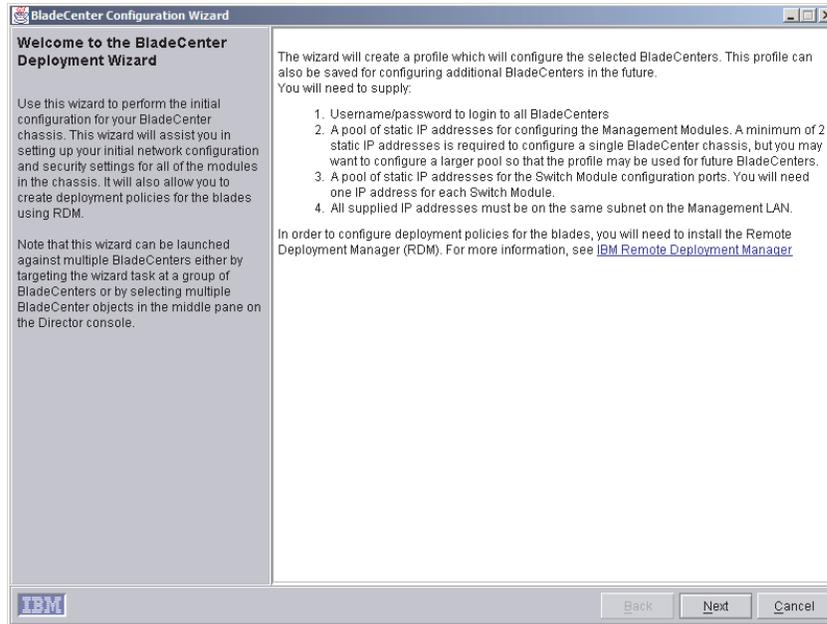
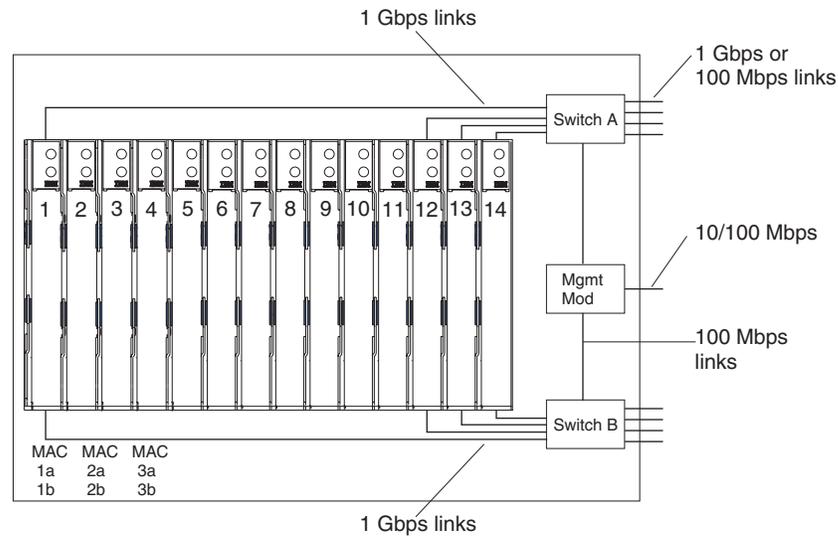# Using Remote Deployment Manager Version 4.1 or later

You can use the Remote Deployment Manager (RDM) Version 4.1 (or later) program to install a supported Microsoft Windows operating system or a BIOS update onto a blade server. Follow the instructions in the documentation that comes with the RDM program to log into the BladeCenter system and install a supported Microsoft Windows operating system or BIOS update.

Go to http://www-03.ibm.com/systems/management/director/about/director52/ extensions/rdm.html on the World Wide Web for updated information about the RDM program and to download the software:

BladeCenter networking guidelines

Your networking administrator should assist in the configuration of the network infrastructure prior to connecting the BladeCenter unit to the LAN switch or similar network device. This section provides additional guidelines that might be useful in setting up your system.

A BladeCenter chassis with two Ethernet switch modules and one management module has the following internal configuration:

1 Gbps links

1 Gbps or
100 Mbps links

10/100 Mbps

100 Mbps
links

Switch A

Mgmt
Mod

Switch B

1 2 3 4 5 6 7 8 9 10 11 12 13 14

MAC   MAC   MAC
1a   2a   3a
1b   2b   3b

1 Gbps links

Note: 2nd switch module is optional

Each blade server has two independent Ethernet controllers, each with its own MAC address and a dedicated 1000-Mbps link to one of the I/O modules (Controller 1 to Switch A and Controller 2 to Switch B in this diagram). In this configuration (the default), the blade servers share access to four external ports on each I/O module. There is no internal data path between the two switches within the BladeCenter chassis; an external network device is required for data packets to flow from one internal switch to the other.

The management module has a separate internal 100-Mbps link to each switch. These links are for internal management and control only. No data packets are allowed to flow from application programs on the blade servers to the management module over this path. A separate, nonswitched path (not shown) is used for communication between the management module and a service processor on each blade server.

A typical, preferred BladeCenter network topology is shown in the following illustration. See the *IBM BladeCenter Planning and Installation Guide* for more information and other topologies and guidelines.

Multiport aggregation group
1 Gbps or 100 Mbps links
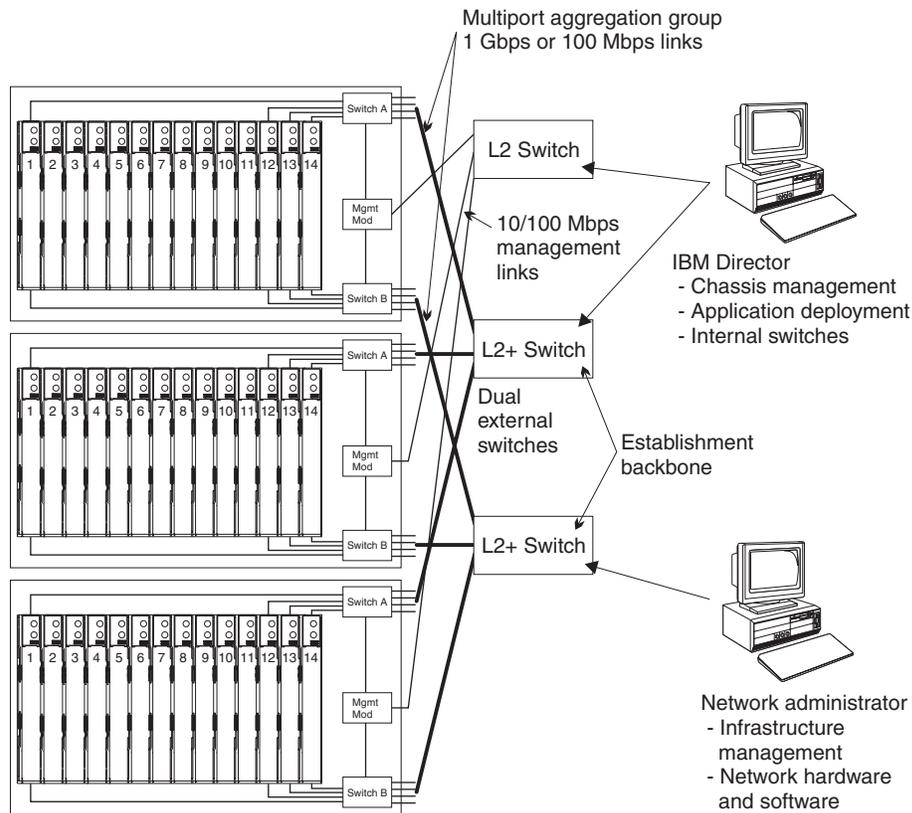
In this configuration, each BladeCenter unit contains two Ethernet switch modules and one management module. The external ports on the switch modules are configured for multi-port link aggregation groups, or trunks, as are the corresponding ports on the attaching external LAN switches. Additionally, every port in the switch module in I/O-module bay 1 (switch A in this illustration) in the BladeCenter units is connected to the same external LAN switch and every port in the switch module in I/O-module bay 2 (switch B in this illustration) in the BladeCenter units is connected to the second external LAN switch.

Observe the following guidelines when creating this topology:

1. The external ports on the BladeCenter switch modules are designed for point-to-point, full-duplex operation to a compatible LAN switch or router. Configure a corresponding multi-port link aggregation group, or trunk, in both the switch module and the attaching LAN switch prior to installing the cables. The connection options are as follows, in order of preference:

   • Multi-port Link Aggregation Group or Trunk, 1 Gbps (1000 Mbps) per port
   • Single-uplink port, 1 Gbps
   • Multi-port Link Aggregation Group or Trunk, 100 Mbps per port

2. Connect the management module 10/100 Mbps Ethernet port to a separate Layer 2 network if possible, for the best security. If a separate network is not available, you can attach the Ethernet ports of the management module and switch modules to the same Layer 2 network.

3. Avoid network configurations that could lead to data loops, if possible. Loops will be created if you connect multiple ports from the same switch module to the same Layer 2 network device without first enabling link aggregation. If you implement configurations that include data loops, it is essential that you enable Spanning Tree Protocol on the I/O module external ports.