



Whitepaper



Enabling and Configuring SOL (Serial Over LAN) on an 8842 Blade Server

Written By: Mike Nolterieke
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I. Introduction

This white paper explains how to update and configure the various BladeCenter modules and 8842 Blade Server components used to enable Serial Over LAN, herein referred to as SOL.

There are several BladeCenter modules and 8842 Blade Server components that must be updated and configured correctly in order for SOL to function properly. This white paper details which modules and components are necessary and the steps to update and configure them properly. It is very important that all of the steps outlined in this document are carefully followed to enable SOL functionality.

This white paper was written for use with the IBM BladeCenter 1.0 chassis, IBM 4-Port Gigabit ESM (Ethernet Switch Module), Nortel Networks 4-Port Layer 2-7 Gigabit ESM (Ethernet Switch Module), Nortel Networks 6-Port Layer 2-3 Gigabit ESM (Ethernet Switch Module), Cisco Systems Intelligent Gigabit ESM (Ethernet Switch Module), 8842 Blade Server(s), and SUSE SLES 8 Release Candidate 7 with Service Pack 3a Release Candidate 1.

Notes:

This whitepaper provides instructions for updating and configuring the IBM 4-Port Gigabit ESM (Ethernet Switch Module), Nortel Networks 4-Port Layer 2-7 Gigabit ESM (Ethernet Switch Module), Nortel Networks 6-Port Layer 2-3 Gigabit ESM (Ethernet Switch Module), and the Cisco Systems Intelligent Gigabit ESM (Ethernet Switch Module). These are the only ESM's that currently support SOL. The terms "IBM ESM", "Nortel ESM", "Cisco ESM", and "ESM" will be used for the rest of this document to refer to the IBM 4-Port Gigabit, Nortel Networks 4-Port Layer 2-7 Gigabit, Nortel Networks 6-Port Layer 2-3 Gigabit, and Cisco ESM's unless otherwise specifically stated.

The SOL VLAN (Virtual Local Area Network) ID is an internal virtual network that the MM (BladeCenter Management Module) and ESM's use for SOL communications. This parameter is configurable and is different depending on which ESM you have installed. If you have either an IBM or Nortel ESM, the value of this parameter must be 4095. If you have a Cisco ESM, this parameter cannot be 4095. For the Cisco ESM, any value from 3 - 1001 is acceptable. You must ensure that the SOL VLAN ID for the MM and your ESM match and are the correct values.

In order for SOL to function properly, a supported ESM must be installed in the I/O Module Bay 1 of the BladeCenter chassis.



Technical Limitations:

SOL uses the first (Planar Ethernet 1) network interface of the 8842 Blade Server to communicate. When this network interface attempts to use BOOTP, the network interface is reset. This causes any current SOL session to be dropped and become "Not Ready". Due to this, you must not attempt to configure or use BOOTP on the first (Planar Ethernet 1) network interface. If you require BOOTP, you must use the second (Planar Ethernet 2) network interface. In order for the second network interface of the 8842 Blade Server to function, you must also install a supported ESM (Ethernet Switch Module) in I/O Module Bay 2.

In certain unknown circumstances, the 8842 Blade Server Broadcom Ethernet Controller may be unable to communicate for a few seconds while the 8842 Blade Server is rebooting. When this occurs, the current SOL session will be dropped, however, the SOL session can be reestablished immediately.

The current SOL session will be terminated when updating the 8842 Blade Server Open Firmware. The SOL session can be reestablished after the flashing operation has completed.



II. SOL Overview

SOL is accomplished in the following way: Serial data that flows to and from the 8842 Blade Server(s) COM port is routed through the network infrastructure of the BladeCenter chassis. This network infrastructure includes the BladeCenter Management Module, the ESM (Ethernet Switch Module), and the onboard NIC (Network Interface Controller) of the 8842 Blade Server(s). In addition the 8842 Blade Server(s) ISMP (Integrated System Management Processor) also assists in handling the serial data to and from the COM port. The BladeCenter Management Module acts as a proxy in the network infrastructure to couple a client running a telnet session to the BladeCenter Management Module with an SOL session to the 8842 Blade Server(s). This then allows the telnet client to interact with the serial port of the 8842 Blade Server over the network.

Since all of the SOL traffic is controlled by and routed through the BladeCenter Management Module, it is possible for administrators to segregate the management traffic of the BladeCenter from the data traffic of the Blade Server(s).

In order to initiate an SOL connection to an 8842 Blade Server, you must first establish a telnet CLI (Command Line Interface) session to the BladeCenter Management Module. Once the telnet CLI session to the BladeCenter Management Module has been established, you can then initiate a remote console SOL session to any individual 8842 Blade Server. You can establish as many as 20 separate telnet sessions to one BladeCenter Management Module. This gives you the ability to have a maximum of one SOL session active on all 14 8842 Blade Server(s) at the same time and also have 6 additional CLI sessions for BladeCenter chassis management. If security is a concern, SSH (Secure Shell) sessions are also available so users can establish secured telnet CLI sessions to the BladeCenter Management Module prior to starting an SOL console redirect session to the 8842 Blade Server(s).

Notes:

SOL is required in order to initially install and configure the operating system of the 8842 Blade Server. Once the operating system has been completely installed and configured, you can use either telnet or SSH sessions to communicate directly with the 8842 Blade Server operating system.

Telnet sessions with the BladeCenter management module have a default timeout value of 120 seconds (2 minutes). If there is no Telnet or SOL traffic within the timeout interval, the Telnet session and any SOL session associated with this Telnet session will terminate.

See the *IBM Eserver BladeCenter Management Module Command-Line Interface Reference Guide* for information about configuring the Telnet session timeout value.

Due to the encryption of data on an SSH session there will be some performance impact as seen by the remote SSH client.



III. SOL BladeCenter Modules and 8842 Blade Server Components

Below is a table of BladeCenter modules and 8842 Blade Server components required to enable SOL. The latest updates for these modules and components should be obtained from the IBM web site prior to following the instructions outlined in this document.

BladeCenter Management Module
8842 Blade Server Open Firmware
8842 Blade Server ISMP
8842 Blade Server Broadcom Ethernet Controller Firmware
8842 Blade Server Broadcom Ethernet Controller Linux Device Driver
IBM 4-Port Gigabit ESM (Ethernet Switch Module)
Nortel Networks 4-Port 2-7 Layer ESM (Ethernet Switch Module)
Nortel Networks 6-Port 2-3 Layer ESM (Ethernet Switch Module)
Cisco Systems Intelligent Gigabit ESM (Ethernet Switch Module)



IV. BladeCenter Management Module

The following assumptions have been made for these directions

1. The BladeCenter Management Module External Network Interface (eth0) already has a valid configuration for your production network
2. You are able to and have already connected to the BladeCenter Management Module Web interface

The following considerations must to be taken into account prior to configuring the network settings to enable SOL.

The BladeCenter Management Module External Network Interface (eth0) configuration must have a valid configuration for your production network. This configuration may be obtained from a DHCP server or set statically.

The BladeCenter Management Module Internal Network Interface (eth1) and the ESM configuration can be different than that of the BladeCenter Management Module External Network Interface (eth0). However, the BladeCenter Management Module Internal Network Interface (eth1) and the ESM configuration must reside the within the same subnet. Keep in mind that the BladeCenter Management Module Internal Interface (eth1) is exposed to the external network via the BladeCenter Management Module so the configuration used must not conflict with other addresses on your production network. Also, if you use a configuration for the ESM that is not valid for your production network, you will not be able to update the firmware or manage your ESM via the telnet or Web interfaces.

The SOL BSMP (Blade System Management Processors) address range can be anything you wish as long as it does not conflict with any of the actual IP addresses of the 8842 Blade Servers. These addresses are used for internal communications only and are not exposed to the external network.

Below is the configuration that was used during the development of this document and will be used as reference and examples.

BladeCenter Management Module External Network Interface (eth0)

IP address: 9.xxx.xxx.173
Subnet mask: 255.255.255.128
Gateway address: 9.xxx.xxx.129

Note: The configuration above was obtained from a DHCP server on the production network

BladeCenter Management Module Internal Network Interface (eth1)

IP address: 9.xxx.xxx.151
Subnet mask: 255.255.255.128
Gateway address: 9.xxx.xxx.129

ESM

IP address: 9.xxx.xxx.147
Subnet mask: 255.255.255.128
Gateway address: 9.xxx.xxx.129

SOL BSMP

BSMP IP address range: 10.1.1.100



Follow the directions outlined below to update the firmware and configure the BladeCenter Management Module to enable SOL.

1. Update the BladeCenter Management Module firmware
 - a. Obtain the latest BladeCenter Management Module zip file
 - b. Unzip the file obtained above into a temporary directory
 - c. Update the BladeCenter Management Module firmware

Note: There are three packet files (cnet??us.pkt) required to update the firmware of the BladeCenter Management Module. You must repeat the steps below for each of the packet files

 - i. Click on the "Firmware Update" link in the "MM Control" section
 - ii. Click the "Browse..." button in the "Update MM Firmware" section
 - iii. Select one of the firmware files that has a ".pkt" extension from the temporary directory where you unzipped the latest build in step b above and click the "Open" button
 - iv. Click the "Update" button in the "Update MM Firmware" section and wait for the status window to close
 - v. Click the "Continue" button in the "Confirm Firmware Update" section and wait for the update to complete

Repeat these steps for the remaining firmware packet files
 - d. Restart the BladeCenter Management Module

Do not restart the BladeCenter Management Module until you have completed the steps above for ALL of the firmware packet files

 - i. Click on the "Restart MM" link in the "MM Control" section
 - ii. Click the "Restart" button in the "Restart MM" section
 - iii. Click the "OK" button in the confirmation window
 - iv. Click "Yes" to close the current Web interface
 - v. Wait about 30 seconds or so, start a new Web browser, and reconnect to the BladeCenter Management Module Web interface
2. Configure the BladeCenter Management Module to enable SOL
 - a. Configure the "Internal Network Interface (eth1)" settings
 - i. Click on the "Network Interfaces" link in the "MM Control" section
 - ii. Ensure that the "Enabled" option is selected for the "Interface" field in the "Internal Ethernet Interface (eth1)" section
 - iii. Set and save the "Static IP Configuration" fields in the "Internal Network Interface (eth1)" section
 1. Set the "IP address" (9.xxx.xxx.151)
 2. Set the "Subnet mask" (255.255.255.128)
 3. Set the "Gateway address" (9.xxx.xxx.129)
Be sure to remember or write down the values of the "IP address" and "Subnet mask" fields as they will be needed in step 2, subsection d, of Section VII
 4. Click the "Save" button and click "OK" or "Yes" to any windows that may pop up

Do not restart the BladeCenter Management Module



- b. Configure the ESM network settings
 - i. Click on the "Management" link in the "I/O Module Tasks" section
 - ii. Configure and save the "New Static IP Configuration" fields in the "Bay 1 (Ethernet SM)" section if they are not already correct as listed in the "Current IP Configuration" section
 1. Set the "IP address" (9.xxx.xxx.147)
 2. Set the "Subnet mask" (255.255.255.128)
 3. Set the "Gateway address (9.xxx.xxx.129)
 4. Click the "Save" button
 - c. Configure the Serial Over LAN settings
 - i. Click on the "Serial Over LAN" link in the "Blade Tasks" section
 - ii. Configure and save the following fields in the "Serial Over LAN Configuration" section
 1. Select the "Enabled" option of the "Serial Over LAN" field
 2. Enter the correct "SOL VLAN ID"
IBM and Nortel ESM's:
If you have an IBM or Nortel ESM, the value MUST be 4095.
Cisco ESM's:
If you have a Cisco ESM, the value CANNOT be 4095. It can be any value you choose from 3 - 1001. You must remember this value as it will be used later in this document when configuring the Cisco ESM.
 3. Enter the "BSMP IP address range" (10.1.1.100)
 4. Set the "Accumulate timeout" field (default is 5) if it is not set
 5. Set the "Send threshold" field (default is 250) if it is not set
 6. Set the "Retry count" field (default is 3) if it is not set
 7. Set the "Retry interval" field (default is 250) if it is not set
 8. Click the "Save" button**Do not attempt to enable or disable SOL on any of the 8842 Blade Server's in the "Serial Over LAN Status" section**
3. Restart the BladeCenter Management Module
 - a. Click on the "Restart MM" link in the "MM Control" section
 - b. Click the "Restart" button in the "Restart MM" section
 - c. Click the "OK" button in the confirmation window
 - d. Click the "Yes" button to close the current Web interface
 - e. Wait about 30 seconds or so, start a new Web browser, and reconnect to the BladeCenter Management Module Web interface

The BladeCenter Management Module is now enabled for SOL.



V. 8842 Blade Server Open Firmware

The following assumptions have been made for these directions

1. The Linux Operating System is already installed and configured
2. You are logged in to the Linux Operating System as the "root" user
3. You are already connected to the 8842 Blade Server via a SOL session

Follow the directions outlined below to update and configure the 8842 Blade Server Open Firmware.

Note: These instructions must be performed prior to updating the 8842 Blade Server ISMP.

1. Update the 8842 Blade Server Open Firmware
 - a. Obtain and install the latest 8842 Blade Server update_flash utility
This utility and the instructions for installing it can be found on the IBM web site at the following location:
https://techsupport.services.ibm.com/server/Linux_on_pSeries/ServiceAids.html
Note: The web site referenced above was valid at the time this document was written, however, it is subject to change
 - b. Obtain the latest Open Firmware image
Note: The size of the image is greater than the size of a standard 1.44 MB diskette. Due to this, you will need to either zip up the image and then copy it to a diskette or create a CD that contains the image.
 - c. Mount the media that contains the image obtained above. Refer to Section XII for directions.
 - d. Copy the image from the media mounted above to a valid directory
Note: If you zipped up the image in step b, you must unzip it first
 - i. For example: Type "cp {image location and name} ." and press enter to copy the image to your current directory
 - e. Type "update_flash -f {image name}" and press enter

Notes:

This will cause the operating system to immediately start the shutdown procedure. The flashing procedure will occur while the operating system is shutting down. The 8842 Blade Server will reboot once the flashing has completed.

There is a known issue where the current SOL session will be terminated once the flashing procedure has completed. You will have to reestablish the SOL session once the 8842 Blade Server has rebooted.

The 8842 Blade Server Open Firmware is now enabled for SOL.



VI. 8842 Blade Server ISMP

The following assumptions have been made for these directions

1. You are already connected to the BladeCenter Management Module Web Interface

Follow the directions outlined below to update the 8842 Blade Server ISMP (Integrated Systems Management Processor). There is no configuration required for the 8842 Blade Server ISMP to enable SOL.

Note: You must ensure that you have updated the 8842 Blade Server Open Firmware before performing the steps below. Refer to Section V for instructions on updating the 8842 Blade Server Open Firmware.

Important Note:

Do not change the BladeCenter Media Tray owner either by pressing the button on the front of the 8842 Blade Server or via the BladeCenter Management Module Web interface during the flashing operation. This will cause the flashing procedure to be interrupted and can possibly render the 8842 Blade Server ISMP inoperable.

1. Flash the 8842 Blade Server ISMP
 - a. Obtain the latest 8842 Blade Server ISMP diskette image
 - b. Create a diskette from the image obtained above
 - c. Click on the "Firmware Update" link under the "Blade Tasks" section
 - d. Select the correct 8842 Blade Server from the "Target" option in the "Update Blade Firmware" section
 - e. Click the "Browse..." button in the "Update Blade Firmware" section
 - f. Select the file named "BQ8TXXA.PKT", where XX is the current build number, from the diskette that you created in step c above and press the "Open" button
 - g. Click the "Update" button in the "Update Blade Firmware" section and wait for the progress window to close
 - h. Click the "Continue" button in the "Confirm Firmware Update" section and wait for the update to complete

The 8842 Blade Server ISMP is now enabled for SOL.



VII. 8842 Blade Server Broadcom Ethernet Controllers

The following assumptions have been made for these directions

1. The Linux Operating System is already installed and configured
2. You are logged in to the Linux Operating System as the "root" user
3. You are already connected to the 8842 Blade Server via an SOL session

Notes:

After performing these steps, you must reboot before using SOL

The latest Broadcom Ethernet Controller network device driver (currently 7.1.22) must be installed and both interfaces (eth0 and eth1) must be configured prior to attempting to use the Broadcom Ethernet Controller diagnostic utility

You must not have any other Broadcom Ethernet Controller devices, such as the Broadcom Ethernet daughter card, activated

The ESM must be installed in Slot 1

Follow the directions outlined below to update the 8842 Blade Server Broadcom Ethernet Controllers to enable SOL. There is no configuration required for the 8842 Blade Server Broadcom Ethernet Controllers to enable SOL.

1. Obtain the latest Blade Server Broadcom Ethernet Controller Linux update package
2. Mount the media that contains the file obtained above. Refer to Section XII for directions.
3. Copy the update package to the root users home directory
 - a. Type "cp {source directory}/{file name}.tgz /root/." and press enter
4. Unmount the media that contained the file listed above. Refer to Section XII for directions.
5. Ensure you are in the /root directory
 - a. Type "cd /root" and press enter
6. Extract the contents of the update package
 - a. Type "tar zxvf {file name}.tgz" and press enter
7. Change to the directory that was created when extracting the contents above
 - a. Type "cd ./ {directory name}" and press enter
8. Update the Blade Server Broadcom Ethernet Controller firmware
 - a. Type "./update" and press enter
9. Reboot the 8842 Blade Server
 - a. Type "shutdown -r now" and press enter

The 8842 Blade Server Broadcom Ethernet Controllers are now enabled for SOL.



VIII. IBM 4-Port Gigabit ESM (Ethernet Switch Module)

The following assumptions have been made for these directions

1. You are already connected to the BladeCenter Management Module Web Interface

Note: You will not be able to perform the directions outlined below if you used values for the network configuration of the IBM ESM that are not within the same subnet as the BladeCenter Management Module network interfaces (eth0 and eth1). Refer to Section IV for additional information.

Follow the directions outlined below to update the firmware of the IBM ESM. There is no configuration required for the IBM ESM to enable SOL.

1. Connect to the IBM ESM Web interface
 - a. Click on the "Management" link under the "I/O Module Tasks" section

Ensure that the "Current IP Configuration" section contains values that are within the same subnet as the BladeCenter Management Module network interfaces (eth0 and eth1) as this will be required in order to access the Web interface of the IBM ESM. If they are not, you MUST modify them before proceeding. Refer to Section IV for additional information.

- b. Click on the "Advanced Management" link under the "Bay 1 (Ethernet SM)**"
 - c. Scroll down to the bottom of the page and click the "Start Web Session" button in the "Start Telnet/Web Session" section

This will launch a new Web browser and connect to the IBM ESM Web interface
 - d. Log in to the IBM ESM (the default User name is "USERID" and the default Password is "PASSWORD")
2. Update the IBM ESM firmware
 - a. Obtain the latest IBM ESM firmware file
 - b. Click on the "Maintenance" link
 - c. Click on the "Using Browser" link
 - d. Click on the "Upgrade Firmware/Configuration" link
 - e. Click the "Browse" button and select the file obtained in step "1a" above
 - f. Click the "Start" button, answer "Yes" to any questions and wait for the firmware to be updated
 - g. Close the Web browser
 3. Restart the IBM ESM
 - a. From the Management Module Web Interface, click on the "Power/Restart" link under the "I/O Module Tasks" section
 - b. Check the box next to your IBM ESM and click on the "Restart Module(s) and Run Standard Diagnostics" link
 - c. Click the "OK" button on the confirmation screen

The IBM 4-Port Gigabit ESM (Ethernet Switch Module) is now enabled for SOL.



IX. Nortel Networks 4-Port Layer 2-7 and 6-Port Layer 2-3 Gigabit ESM (Ethernet Switch Module)

The following assumptions have been made for these directions

1. You are already connected to the BladeCenter Management Module Web Interface

Notes:

You will not be able to perform the directions outlined below if you used values for the network configuration of the Nortel ESM that are not within the same subnet as the BladeCenter Management Module network interfaces (eth0 and eth1). Refer to Section IV for additional information.

These directions require the presence of an accessible TFTP (Tiny FTP) server on your production network. Due to legal concerns, IBM can neither provide nor suggest any TFTP software products.

The latest firmware version should always be obtained from the IBM web site.

Follow the directions outlined below to update the firmware of the Nortel ESM. There is no configuration required for the Nortel ESM to enable SOL.

1. Update the Nortel ESM firmware
 - a. Obtain the latest Nortel ESM firmware zip file
 - b. Unzip the file obtained above into a temporary directory
 - c. Copy the two image files, GbESM-AOS-xx.x.x.xx-os.img and GbESM-AOS-xx.x.x.xx -boot.img, from the temporary directory to the root of the TFTP server
Where xx.x.x.xx is the current firmware version
 - d. Connect to the Nortel ESM telnet interface
 - i. Click on the "Management" link under the "I/O Module Tasks" section

Ensure that the "Current IP Configuration" section contains values that are within the same subnet as the BladeCenter Management Module network interfaces (eth0 and eth1) as this will be required in order to access the telnet interface of the Nortel ESM. If they are not, you MUST modify them before proceeding. Refer to Section IV for additional information.

- ii. Click on the "Advanced Management" link under the "Bay 1 (Ethernet SM)*"
- iii. Scroll down to the bottom of the page and click the "Start Telnet Session" button in the "Start Telnet/Web Session" section
This will launch a java telnet application and connect to the Nortel ESM
- iv. Log in to the Nortel ESM (the default Password is "admin")
- v. When prompted to run "Setup Up" to configure the Nortel ESM, type "n" and press enter



- e. Update the Nortel ESM OS image
- Note: There are two OS images (image1 and image2) that reside in the Nortel ESM. Normally, the Nortel ESM will boot image1. However, you must determine which OS image is being used before updating the Nortel ESM firmware.**
- Type “/boot/cur” at the telnet prompt to determine which OS image is being used. The output from the “/boot/cur” command will state the name of the image (image1 or image2) that is currently being used. The text will be something like “Currently set to boot software image1”.
- Note: You MUST use image2 for the command in the next step if the output from the /boot/cur command states that image2 is currently empty**
- Type “/boot/gtimg *imageX* *TFTPAddr* GbESM-AOS-*xx.x.x.xx*-os.img”, where *xx.x.x.xx* is the current firmware version, at the telnet prompt and press enter
Where *imageX* is the name of the OS image (image1 or image2) that was determined in previous step, *TFTPAddr* is the IP address of the TFTP server on your production network where the image files reside, and *xx.x.x.xx* is the current firmware version
 - Type “y” and press enter when prompted to “Confirm download operation”
 - Wait for the flashing operation to complete
- Note: Type “y” and press enter to boot from the new image if you were forced to update image2 because it was previously empty.**
- Type “exit” and press enter to terminate the Nortel ESM telnet interface
 - Close the window in which the Nortel ESM telnet session was running
- f. Restart the Nortel ESM
- From the Management Module Web Interface, click on the “Power/Restart” link under the “I/O Module Tasks” section
 - Check the box next to your Nortel ESM and click on the “Power Off Module(s)” link
 - Click the “OK” button on the confirmation screen
 - Check the box next to your Nortel ESM and click on the “Power On Module(s)” link
 - Click the “OK” button on the confirmation screen
- Note: You must wait approximately 60 seconds for the Nortel ESM to fully restart before continuing**
- g. Reconnect to the Nortel ESM telnet interface by repeating step “d” above
- h. Update the Nortel ESM boot image
- Type “/boot/gtimg boot *TFTPAddr* GbESM-AOS-*xx.x.x.xx*-boot.img” at the telnet prompt and press enter
Where *TFTPAddr* is the IP address of the TFTP server on your production network where the image files reside and *xx.x.x.xx* is the current firmware version



- i. Type "y" and press enter when prompted to "Confirm download operation"
- j. Wait for the flashing operation to complete
- k. Type "exit" and press enter to close the Nortel ESM telnet interface
- l. Close the window in which the Nortel ESM telnet session was running
- m. Restart the Nortel ESM by repeating step "f" above

The Nortel Networks 4-Port Layer 2-7 or 6-Port Layer 2-3 ESM (Ethernet Switch Module) is now enabled for SOL.



X. Cisco Systems Intelligent Gigabit ESM (Ethernet Switch Module)

The following assumptions have been made for these directions

1. You are already connected to the BladeCenter Management Module Web Interface

Notes:

You will not be able to perform the directions outlined below if you used values for the network configuration of the Cisco ESM that are not within the same subnet as the BladeCenter Management Module network interfaces (eth0 and eth1). Refer to Section IV for additional information.

VLAN ID 3 will be used for demonstration purposes. You must use the value you assigned to the "SOL VLAN ID" of the BladeCenter Management Module in step 2, c, ii, 2 of Section IV.

These directions include removing the SOL VLAN ID from the external ports of the Cisco ESM. You must complete these steps. There could be a security risk if you do not.

The internal interfaces of the Cisco ESM must be set to trunk mode not access mode in order for SOL to function. Trunk mode is the default configuration however the instructions for configuring the mode are included below and should be performed to ensure that the configuration is correct.

Follow the directions outlined below to configure the Cisco ESM to enable SOL.

1. Configure the Cisco ESM
 - a. Connect to the Cisco ESM telnet interface
 - i. Click on the "Management" link under the "I/O Module Tasks" section

Ensure that the "Current IP Configuration" section contains values that are within the same subnet as the BladeCenter Management Module network interfaces (eth0 and eth1) as this will be required in order to access the telnet interface of the Cisco ESM. If they are not, you MUST modify them before proceeding. Refer to Section IV for additional information.

- ii. Click on the "Advanced Management" link under the "Bay 1 (Ethernet SM)*"
- iii. Scroll down to the bottom of the page and click the "Start Telnet Session" button in the "Start Telnet/Web Session" section
This will launch a java telnet application and connect to the Cisco ESM
- iv. Log in to the Cisco ESM (the default User Name is "USERID" and the default Password is "PASSWORD")



- b. Activate the SOL VLAN ID of the Cisco ESM
 - i. Type "en" and press Enter
 - ii. Type "config t" at the prompt and press Enter
 - iii. Type "vlan 3" and press Enter
 - iv. Type "state active" and press Enter
 - v. Type "end" and press Enter
 - vi. Type "wri" and press Enter to save the configuration

Note: Do not exit the telnet interface at this time
- c. Remove the SOL VLAN ID from the external ports of the Cisco ESM
 - i. Type "config t" at the prompt and press Enter
 - ii. Type "int range gi0/17 - 20" and press Enter
 - iii. Type "switchport trunk allowed vlan remove 3" and press Enter
 - iv. Type "end" and press Enter
 - v. Type "wri" and press Enter to save the configuration

Note: Do not exit the telnet interface at this time
- d. Configure the internal interfaces for trunk mode and add the SOL VLAN ID
 - i. Type "config t" at the prompt and press Enter
 - ii. Type "int range gi0/1 - 14" and press Enter
 - iii. Type "switchport mode trunk" and press Enter
 - iv. Type "exit" and press Enter
 - v. Type "int range gi0/1 - 16" and press Enter
 - vi. Type "sw trunk allow vlan add 3" and press Enter
 - vii. Type "end" and press Enter
 - viii. Type "wri" and press Enter to save the configuration
- e. Exit the Cisco ESM telnet session
 - i. Type "exit" and press enter to terminate the Cisco ESM telnet interface
 - ii. Close the window in which the Cisco ESM telnet session was running

The Cisco Systems Intelligent Gigabit ESM (Ethernet Switch Module) is now enabled for SOL.



XI. Completing the Configuration

The following assumptions have been made for these directions

1. You are already connected to the BladeCenter Management Module Web Interface

Now that all of the required items have been updated and configured, follow the directions outlined below to complete the configuration.

1. Enable SOL on the 8842 Blade Server(s)
 - a. Click on the "Serial Over LAN" link in the "Blade Tasks" section
 - b. Check the boxes next to the 8842 Blade Server(s) that you wish to enable SOL on in the "Serial Over LAN Status" section
 - c. Click on the "Enable Serial Over LAN" link at the bottom
 - d. After the page reloads, the "SOL" section on the table should say "Enabled" for the 8842 Blade Server(s) you selected
 - e. The "SOL Session" section of the table should say "Not Ready" for the 8842 Blade Server(s) you selected
2. Power Up or Restart the 8842 Blade Server(s)
 - a. Click on the "Power/Restart" link in the "Blade Tasks" section
 - b. Check the 8842 Blade Server(s) that you have enabled SOL on and click on either the "Power On Blade" or "Restart Blade" depending on the current status of your 8842 Blade Server(s)
 - c. Click the "OK" button on the confirmation window
 - d. Click the "OK" button on the information window and wait for the Web page to refresh
3. Check the status of the 8842 Blade Server(s)
 - a. Click on the "Serial Over LAN" link in the "Blade Tasks" section
 - b. Scroll down and ensure that the "SOL Session" section of the table in the "Serial Over LAN Status" for the selected 8842 Blade Server(s) now says "Ready"

The SOL configuration is now complete.



XII. Mounting and Unmounting Media for Linux Operating Systems

Follow the directions outlined below to mount and unmount media for Linux Operating Systems on the 8842 Blade Server.

1. Mounting media for Linux Operating Systems on the 8842 Blade Server
 - a. If the media is a CD
 - i. Ensure the /media/cdrom directory exists, type "mkdir /media/cdrom" and press enter if it does not
 - ii. Type "mount /dev/scd0 -t iso9660 -o ro /media/cdrom" and press enter
 - b. If the media is a diskette
 - i. Ensure the /media/sda directory exists, type "mkdir /media/sda" and press enter if it does not
 - ii. Type "mount /dev/sda -o auto /media/sda" and press enter
2. Unmounting media for Linux Operating Systems on the 8842 Blade Server
 - a. Type "cd" and press enter
 - b. If the media is a CD
 - i. Type "umount /media/cdrom" and press enter
 - c. If the media is a diskette
 - i. Type "umount /media/sda" and press enter



XIII. Installing the 8842 Blade Server Broadcom Ethernet Controller Device Driver for Linux Operating Systems

The following assumptions have been made for these directions

1. You are logged in as the "root" user
2. The development tools packages have already been installed
3. The cross-compile utilities have already been installed

Follow the directions outlined below to install the 8842 Blade Server Broadcom Ethernet Controller device driver.

Note that a default installation of SUSE SLES 8 Release Candidate 7 with Service Pack 3a Release Candidate 1 was used while developing this document. The file names, structures, and commands described in this document may differ from other versions of Linux.

The latest device driver and kernel versions should always be obtained from the IBM web site. The versions listed in these instructions are for example purposes only.

The kernel source and development tools packages must be installed before attempting to use the directions outlined below.

1. Remove SUSE SLES 8 RC 7 kernel source if it is installed
 - a. Determine if the SUSE SLES 8 RC 7 kernel source is installed
 - i. Type "rpm -q -a | grep kernel" and press enter
 - b. Perform the following step only if the output from the command above lists "kernel-source-x.x.xx.SuSE-74" where x.x.xx is the current version
 - i. Type "rpm --erase kernel-source.x.x.xx.SuSE.74" and press enter
 2. Install the Service Pack 3a Release Candidate 1 kernel source package
 - a. Obtain the latest kernel source package
 - b. Mount the media containing the kernel source obtained above. Refer to the directions in Section XII.
 - c. Change directory to where the source package is located
 - d. Type "rpm -i kernel-source-2.4.21-146.ppc.rpm" and press enter
 3. Cross compile the kernel source
 - a. Change directory to the source directory
 - i. Type "cd /usr/src/linux" and press enter
 - b. Append "/opt/cross/bin/powerpc64-linux-" to the "CROSS_COMPILE = " line of the "Makefile"
 - i. Load the "Makefile" in your favorite editor
 1. Type "vi Makefile" and press enter for example
 - ii. Find the "CROSS_COMPILE = " line
 - iii. Append "/opt/cross/bin/powerpc64-linux-" to the "CROSS_COMPILE" line
- Original Line:
"CROSS_COMPILE ="
- Modified Line:
"CROSS_COMPILE = /opt/cross/bin/powerpc64-linux-"
- c. Type "make distclean" and press enter
 - d. Copy the configuration file
 - i. Type "cp arch/ppc64/defconfig.pseries64 .config" and press enter
 - e. Type "make oldconfig" and press enter
 - f. Type "make dep" and press enter



4. Install the 8842 Blade Server Broadcom Ethernet Controller device driver source package
 - a. Obtain the latest version of 8842 Blade Server Broadcom Ethernet Controller device driver source package
 - b. Mount the media containing the 8842 Blade Server Broadcom Ethernet Controller device driver source obtained above. Refer to the directions in Section XII.
 - c. Change directory to where the source package is located
 - d. Type "rpm -i bcm5700-7.1.22-1.src.rpm"
 - e. Unmount the media containing the 8842 Blade Server Broadcom Ethernet Controller device driver source. Refer to the directions in Section XII.
5. Build the 8842 Blade Server Broadcom Ethernet Controller device driver
 - a. Change to the /usr/src/packages directory
 - i. Type "cd /usr/src/packages"
 - b. Type "rpm -bb SPECS/bcm5700.spec" and press enter
6. Install the 8842 Blade Server Broadcom Ethernet Controller device driver package built in the step above
 - a. Type "rpm -i RPMS/ppc64/bcm5700-7.1.22-1.ppc64.rpm --force" and press enter
7. Install the 8842 Blade Server Broadcom Ethernet Controller device driver module
 - a. Type "insmod bcm5700"
8. Configure the network interfaces for the SUSE SLES 8 Release Candidate 7 operating system
Configuring the network interfaces and settings of the SUSE SLES 8 Release Candidate 7 operating system is beyond the scope of this document. Please refer to the documentation provided for these instructions.

The installation of the 8842 Blade Server Broadcom Ethernet Controller device driver is complete.



XIV. Using SOL

This section describes how to start and stop BladeCenter Management Module telnet CLI and SOL sessions as well as other special key sequences you can use while in an SOL session.

Starting BladeCenter Management Module Telnet CLI Sessions:

1. From any command prompt, type "telnet {location}", where location is the hostname or IP address of the BladeCenter Management Module
2. Log in to the BladeCenter Management Module (the default user name is USERID and the default password is PASSWORD)

Starting SOL Sessions:

1. Type "console -T system:blade[x]" from a BladeCenter Management Module telnet CLI prompt, where blade[x] (note that the brackets "[]" are required) is the number of the 8842 Blade Server (1 -14 in the chassis) that you wish to start the SOL session with.

Note: The BladeCenter Management Module automatically stores the previous 8 KB (Kilobytes) of serial data that was transmitted by each 8842 Blade Server even when SOL sessions are not active. When an SOL session is established, all of the previous serial data, up to 8 KB, is automatically displayed. If there is no previous data available when the SOL session is started, the cursor will remain on the command line until new serial data is transmitted.

Rebooting 8842 Blade Server(s) via SOL sessions:

You no longer have to exit the current SOL and use the telnet CLI of the BladeCenter Management Module to reboot the 8842 Blade Server. Instead, you can type the following sequence of commands from within the SOL session.

1. Key sequence ("Esc" → "R" → "Esc" → "r" → "Esc" → "R")
 - a. Press the escape ("Esc") key
 - b. Type a capital "R" by pressing the "Shift" and "r" keys at the same time
 - c. Press the escape ("Esc") key again
 - d. Type a lowercase "r"
 - e. Press the escape ("Esc") key again
 - f. Type a capital "R" by pressing the "Shift" and "r" keys at the same time

Exiting SOL Sessions:

1. Key sequence ("Esc" → "(")
 - a. Press the escape ("Esc") key
 - b. Type a "(" by pressing the "Shift" and the "9" key at the same time

Note: Exiting an SOL session does not stop the flow of serial data

Exiting BladeCenter Management Module Telnet CLI Sessions:

1. Type "exit" at the BladeCenter Management Module telnet CLI prompt after exiting an SOL session



XV. Installing and Configuring SSH (Secure Shell Server) for SOL

The following assumptions have been made for these directions

1. You are already connected to the BladeCenter Management Module Web Interface
2. You can connect to the external IBM web site

Follow the directions outlined below to install and configure SSH for SOL. You can omit step 1 if you have previously installed the SSL/SSH security key file.

1. Obtain and install the SSL and SSH security file from IBM
 - a. Click on the "Security" link under the "MM Control" section
 - b. Obtain the latest SSL/SSH security key file from IBM by clicking on the "BladeCenter firmware update" link in the "Install SSL/SSH" section and following the directions
 - c. Click the "Browse..." button and select the file you downloaded in the previous instruction
 - d. Click the "Install SSL/SSH" button
 - e. Click on the "configure and enable" link in the "Install SSL/SSH" section
2. Generate the SSH Server Private Key
 - a. Click the "Generate SSH Server Private Key" button in the "SSH Server Key Management" section
 - b. Click the "OK" button in the confirmation window and wait for the process to complete
3. Enable SHH
 - a. Set the "SSH Server" option in the "Secure Shell (SSH) Server" section to "Enabled" and press the "Save" button
 - b. Click the "OK" button in the confirmation window
4. Restart the Management Module
 - a. Click on the "Restart MM" link in the "MM Control" section
 - b. Click the "Restart" button in the "Restart MM" section
 - c. Click the "OK" button in the confirmation window

The installation and configuration of SSH is complete, you can now use your favorite SSH client to start secured telnet and SOL sessions to the Management Module and 8842 Blade Server(s).