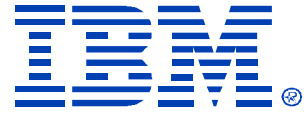


IBM GLOBAL SERVICES



R17

***Migrating from HP to IBM Systems
Management***

Marco Ferretti

IBM @server xSeries
Technical Conference

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IBM ~ xSeries Education
Building 205, Department LZSA
Post Office Box 12195
Research Triangle Park, North Carolina 27709-2195

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Safety Precautions and Housekeeping

General Safety Guidelines

1. Maintain good housekeeping in the area of the machines during and after completing maintenance/configuration.
2. Do not use solvents, cleaners, or oils that have not been approved by IBM.
3. Lift by standing or pushing up with stronger leg muscles to take the strain off back muscles. Do not attempt to lift any parts or equipment with which you feel uncomfortable. Service personnel are responsible for making certain that no action on his or her part renders a product unsafe or exposes the customer to hazards.
4. Place removed machine covers in a safe out-of-the-way location while servicing the machine. These covers must be back in place on the machine before the machine is returned to the customer.
5. Always place tool kits away from walk areas where no one can trip over them (for example, under a desk or table).
6. Avoid wearing loose clothing that may be caught in machinery. Shirt sleeves must be left buttoned or rolled up above the elbow. Long hair and scarves must be secured.
7. Remove all watches and rings before removing the cover of any system.
8. When servicing a machine, ties must be tucked into shirt or a tie clasp (preferably non-conductive) must be worn approximately three inches from the end.
9. Before starting equipment, make sure that other service or customer personnel are not in a hazardous position.
10. Do not place books, tools, or test equipment on top of the machine.

Lab 1. Preparing the HP ProLiant System

Time Required: 5 minutes

Scenario

The customer is evaluating the purchase of some IBM e(server) xSeries units and, after having been told about the capabilities of IBM Director, is looking for a proof of concepts that could demonstrate how IBM Director can be integrated in his current environment (where mainly Compaq units are installed).

You have been assigned a system that is currently running release 6.40 of the HP Management Agents and you have to pre-configure it in order to allow for manageability from a system where your IBM Director Server is installed

Objectives

The objectives of this lab are:

- Familiarize with the HP unit and the software running on it
- Modify the SNMP settings of the managed system

Lab Activity Preparation

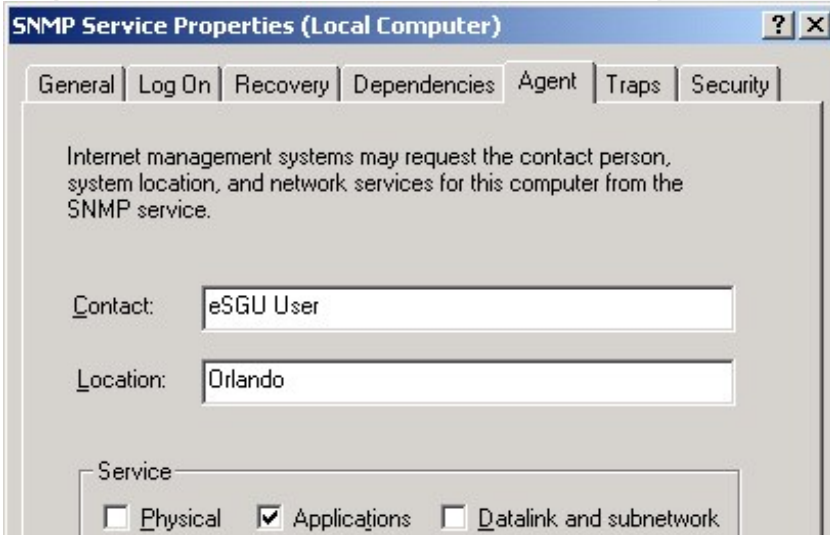
- Ensure that the HP Management Agents are installed on the HP unit

Modifying the SNMP settings in the managed system

You can achieve this objective in many ways. Here's two ways of doing it. We will start with exploiting the graphical interface of MS Windows for modifying the contact information, trap destinations, and security settings of its local SNMP agent. We will then show the steps required to achieve the objective by using the HP point-to-point systems management software. If you are not familiar with these tools, we recommend you perform both methods.

Method 1 – Using the MS SNMP Service Properties panel

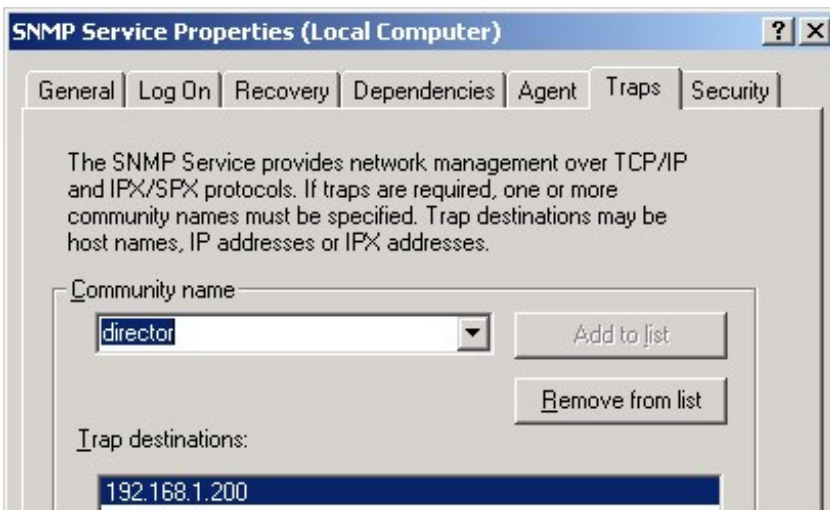
- ___ 1. At the ProLiant system, right click on the My Computer icon and select <Manage>
- ___ 2. From the left pane of the Computer Management window, expand the <Services and Application> tree and select <Services>
- ___ 3. Scroll down the list of services until you find **SNMP Service** and double-click on it
- ___ 4. In the SNMP Service Properties window, select the <Agent> tab and customize the **Contact** and **Location** information and then click <Apply>



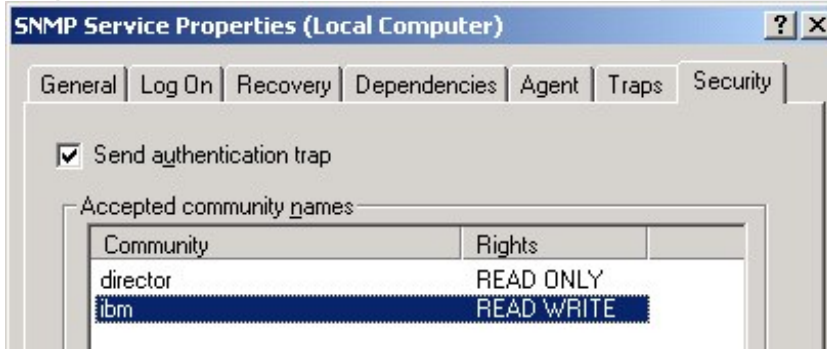
- ___ 5. Select the <Trap> tab and remove **public** from the list
- ___ 6. In the community name section, type **director**, click on <Add to list> and then on <Apply>
- ___ 7. To select the trap destination, click on <Add> and type 192.168.x.200 and click <Add> again

NB: Notice that *x* is your group number

- ___ 8. If you have availability of an Insight Manager server, ask your trainer for the relevant details and repeat the two steps with the additional values. Once done, click on <Apply> to confirm the changes

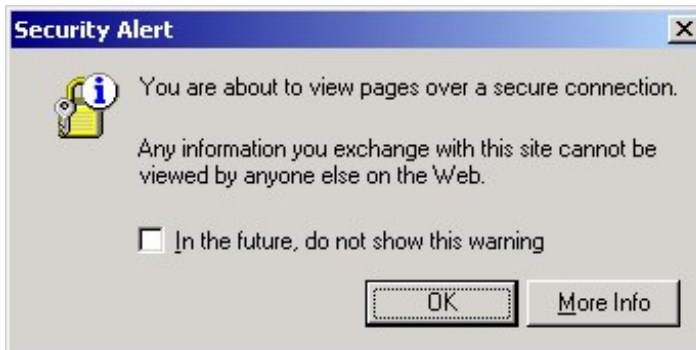


- ___ 9. Select the <Security> tab and remove any existing accepted community name
- ___ 10. Click on <Add> and type **director** in the community name box. Ensuring that READ ONLY community rights are selected, confirm by clicking again on <Add>.
- ___ 11. Repeat the operation by adding **ibm** as a community name but this time with READ WRITE community rights.
- ___ 12. Click on <Apply> and then <OK> to close the SNMP Service Properties window



Method 2 – Using the HP System Management Homepage

- ___ 13. At the ProLiant system, click on <Start> - <Programs> - <HP Management Agents> - <HP System Management Home Page>
- ___ 14. If a security alert comes on screen, press <Yes> to confirm being redirected to the secure connection



- ___ 15. If another security alert appears on screen, click <Yes> to allow for the secure connection to be setup





___ 16. At the Account Login page, insert the following combination and click on the <OK> button to continue

USER: **administrator**

PASSWORD: **password**

___ 17. From the System Management Homepage, select the <Settings> tab and then the <SNMP Configuration> link

___ 18. From the left pane, click on the <SNMP Agent> link to bring on screen the Agent Configuration page

___ 19. Customize the **Contact** and **Location** fields, then click on <Apply>

___ 20. On the left pane, click on <Security> to bring on screen the Security Configuration page

___ 21. Select and remove any entry that might be present and then click on <Add>

___ 22. Add the following community names:

	Community Name	Community Right
1 st string	director	READ ONLY
2 nd string	ibm	READ WRITE


___ 23. Click on <Apply> when done

___ 24. On the left pane, click on the <Trap> link to bring on screen the Trap Configuration page

___ 25. Select and remove any entry that might be present and then click on <Add>

___ 26. Type **director** as a community name and **192.168.x.200** as a trap destination and click on <Apply>

___ 27. If you have availability of an Insight Manager server, ask your trainer for the relevant details and add the additional values. Once done, click on <Apply> again to ensure the new values are committed



System Management Homepage for DL380

System Model: **ProLiant DL380 G2**
 System Status: ❌ **Failed**
 Current User: **administrator**
[logout](#)

Home

Settings

Tasks

Tools

Logs

[Agent Help](#)

settings -> snmp configuration

SNMP Configuration

[Snmp Agent](#)

[Security](#)

[Trap](#)

[Management Agents](#)

Restart Agents

Manually Refreshed
@ Saturday, November 22,
2003 7:57:57 PM

System Name : DL380
[Manually Refreshed](#) @ Saturday, November 22, 2003 7:58:02 PM

Trap Configuration

The SNMP Service provides network management over TCP/IP and IPX/SPX protocols. This page is for setting the trap community string for the server. If traps are required, one or more community names must be specified. Trap destinations may be host names, IP addresses, or IPX addresses.

Traps Configuration		
Index	Community Name	Trap Destinations
1	director	192.168.1.200
2	compaq	192.168.1.1

Add
Edit
Remove
Apply

Scroll-Up
Scroll-Down

___ 28. Browse the entries that you might find interesting to understand the capabilities of this tool. Use the on-line help to obtain clarification of the concepts.

___ 29. Logout from the HP System Management Homepage.



Lab 2. HP ProLiant System Discovery and Usage of MIBs

Time Required: 60 minutes

Scenario

Following on the scenario of the previous lab, the customer is showing more and more interest in your modifications. It is your task now to show the IBM Director interface and what it can do

Objectives

In this lab, you will learn how to:

- Configure IBM Director for the discovery of SNMP objects
- Verify IBM Director native capabilities of receiving/dealing with alerts from SNMP devices
- Configure IBM Director to monitor parameters from SNMP Devices

Lab Activity Preparation

- Ensure that IBM Director Server is installed on the management server.

Setup IBM Director SNMP Discovery Preferences

Regardless of the local SNMP agent settings, a fresh installation of IBM Director Server on a system will contain default parameters for SNMP discovery as part of its application configuration. Follow these steps to customize IBM Director for your environment

- ___ 1. At the IBM Director server, login into IBM Director
- ___ 2. If this is the first time that the server has been started, use your IBM Director knowledge to initiate a discovery of systems. Notice that there is no SNMP device present.
- ___ 3. In the Director Console, click on <Option> <Discovery Preferences> and then select the <SNMP Discovery> tab.
- ___ 4. Notice that by default IBM Director will listen for traps with the “public” community name. Notice also the default settings for SNMP devices discovery
- ___ 5. Add first **director** and then **ibm** as community names and then remove **public**
- ___ 6. On the left side of the window, select the IP address entry that is present and then modify the subnet mask value to 255.255.255.0
- ___ 7. Click on <Replace> and then click on <OK> to close the window

Modify the Director Server Preferences

- ___ 8. At the IBM Director console, click on <Options> <Server Preferences>

- 9. Make sure that the Inventory Collection Preferences tab is selected and tick the <Collect Software Data> checkbox
- 10. Click on <OK> to close this window

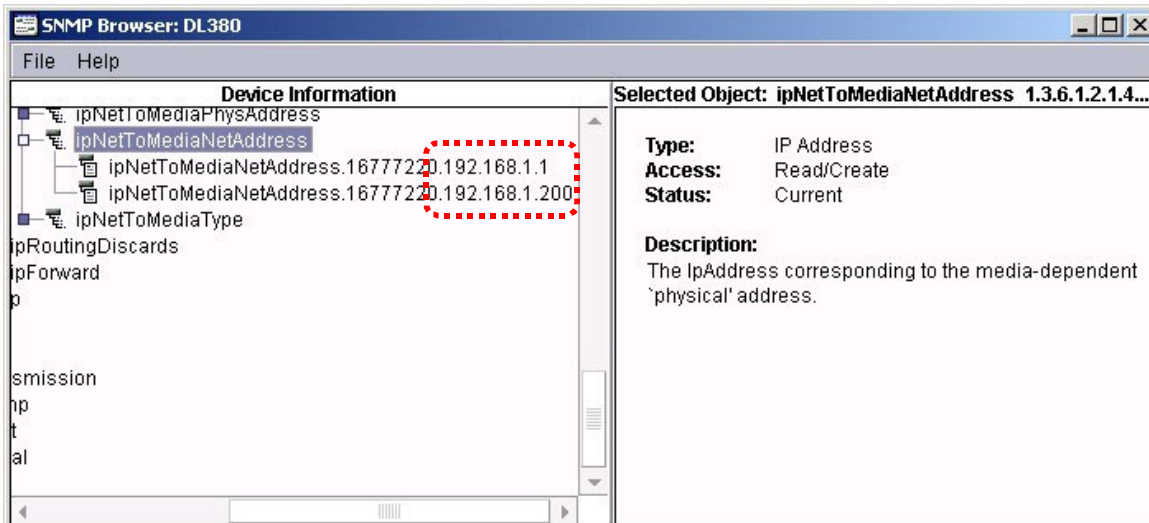
Discover the SNMP Devices

- 11. If the SNMP icon representing the IBM Director Server is not present already, click on <Task> <Discover Systems> <SNMP Devices> to add it.

NOTICE: In your environment, most likely, this operation will not discover the ProLiant system. This is due to the method used for SNMP discovery, which is different from the method for discovery of native Director Agents. In fact, the server does NOT perform a “ping spray” of IP devices in the local subnet to find agents listening on port 161. Instead, it uses the IP addresses configured in the Discovery Preferences for SNMP devices as seed addresses and uses the values in the **ipNetToMediaNetAddress** column of the **ipNetToMediaTable** variable of the seed addresses’ MIB as the candidate devices to discover. As you have noticed in the previous steps, the default seed address is the local Director Server host system. However, the best practice is to configure a more practical device as the seed address such as a router or a heavily used server such as an http server that is likely to have a lot of values in its **ipNetToMediaTable** variable. If the Director Server is newly installed, it’s likely that there will be few addresses in its **ipNetToMediaTable** variable, and hence selecting Discovery->SNMP Devices will discover few devices out of the box.

- 12. In order see the values of the **ipNetToMediaTable** variable, drag and drop the <SNMP Browser> task on the Director Server host and expand the tree structure until you reach/including

iso.org.dod.internet.mgmt.mib2.ip.ipNetToMediaTable.ipNetToMediaEntry.ipNetToMediaNetAddress



Can you find the entry as detailed above? Why?

- 13. You have now many options to add your ProLiant Device:
 - Add the IP address of the ProLiant box as an additional seed device in the <SNMP Discovery> section of the <Discovery Preferences> menu and then run the SNMP Discovery again
 - Generate traffic versus the ProLiant box (attaching to one of its shares, or pinging it) to ensure the ip address is added in the **ipNetToMediaTable** and then run the SNMP Discovery again
 - Manually add the device by right clicking the central pane of the IBM Director Console main window, selecting <New> <SNMP Devices> and inserting the ProLiant ip address and Community Name

Or (Preferred method for this exercise)

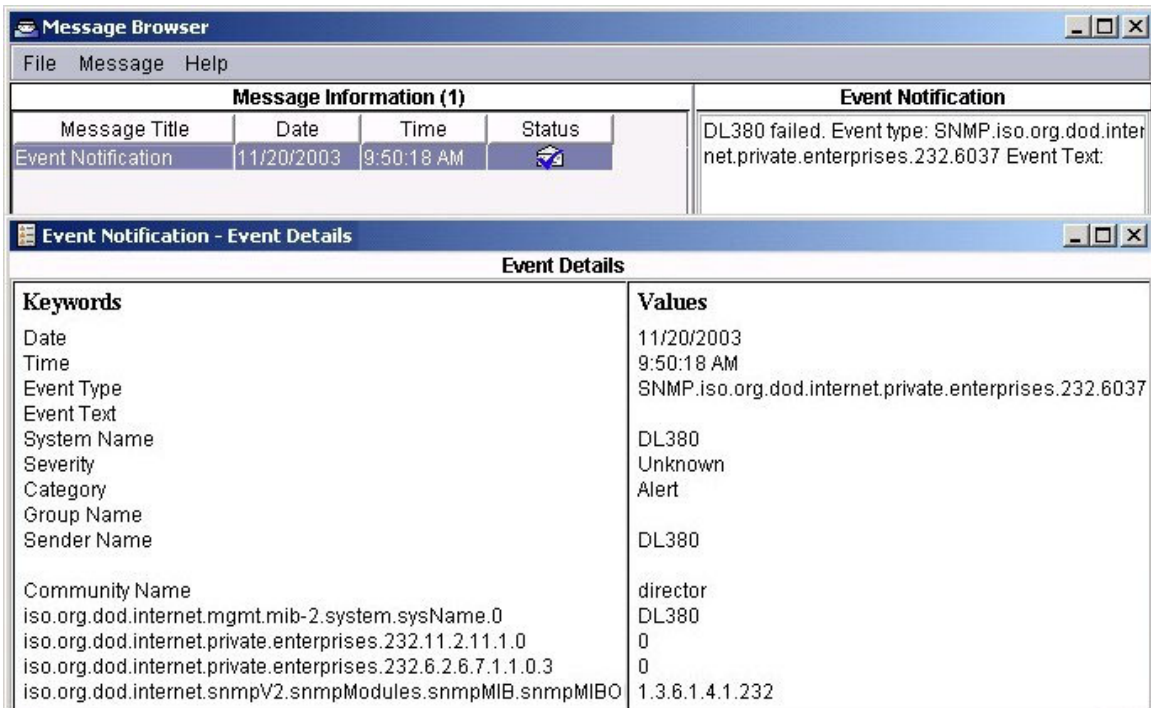
- Exploit the default option that allows IBM Director to add to its list of managed devices any SNMP devices that send to the Director server a trap (this can be turned off by simply removing the tick from the relevant checkbox in the SNMP Discovery Preferences).
- ___ 14. To use this last method, move to the ProLiant system and click on <Start> <Settings> <Control Panel> and the double click on the <HP Management Agents> icon
- ___ 15. Select the <SNMP Settings> tab and then click on <Send Test Trap>
- ___ 16. Notice the pop-up message that comes on screen and its date/time stamp
- ___ 17. Click <OK> to remove the pop-up message and close the <Management Agents...> window
- ___ 18. Still at the ProLiant system, open the **Event Viewer** and select the **System log**
- ___ 19. Double click on the event that has **Foundation Agents** as a source to verify it represents the test trap
- ___ 20. Move to the IBM Director Server and login into the IBM Director console.
- ___ 21. Notice that the ProLiant system should now appear in the list of discovered devices as an SNMP device. You can now try again to perform step 12
- ___ 22. Right click on the icon representing the ProLiant and select <Event Log>
- ___ 23. Select the available entry and read the event details to verify it is related to the test trap that was just sent
- ___ 24. Close the Event Log window

Testing “Vanilla” Management Capabilities of IBM Director

- ___ 25. At the IBM Director console, click on <Tasks> <Event Action Plan Builder>
- ___ 26. Double click on <Send an Event Message to a Console User> and type in
&system failed. Event Type: &type Event Text: &text
- ___ 27. Type * in the <User(s)> field and save the event, naming it **Pop-up Message**
- ___ 28. In the central pane of the **Event Action Plan Builder** window, right click on <Simple Event Filter> and select <New>
- ___ 29. In the **Simple Event Filter Builder: New** window, deselect the <Any> check box and expand the <SNMP> tree to reach/include the following level:
SNMP.iso.org.dod.internet.private.enterprises.232
Notice the limited number of events and their meaningless numeric nature
- ___ 30. Select the root of the <SNMP> tree and save the Event Filter, naming it **Generic SNMP Filter**
- ___ 31. In the left pane of the **Event Action Plan Builder** window, right click on <Event Action Plan> and select <New>
- ___ 32. As a description, type **Generic SNMP – Pop-up Msg** and click on <OK>
- ___ 33. Drag-and-drop the <Generic SNMP Filter> event filter over the newly created event action plan and drag-and-drop the <Pop-up Message> action over the filter you added to the newly created event action plan.
- ___ 34. Close the <Event Action Plan Builder> window



- ___ 35. From the <IBM Director Console> window, expand the tree related to the <Event Action Plans> task
 - ___ 36. Drag-and-drop the <Generic SNMP – Pop-up msg> EAP over the object that represents the ProLiant system and click on <OK> to confirm the success of the operation
 - ___ 37. To help you visualize which EAPs are associated with which system, from the menus at the top of the window, click on <Associations> and then select <Event Action Plans>
 - ___ 38. Open the lid of the ProLiant system, remove one of the fans and wait a few seconds until the Message Browser window appears.
 - ___ 39. Read the contents of the Event Notification and notice that:
 - The name of the system is identified
 - The Event Type refers to numeric codes for the enterprise number and the event number
 - There is no text associated with the event
 - ___ 40. Take a snapshot of the screen and save it for future reference
 - ___ 41. Click on <Event Details> to visualize the quality of the information that can be retrieved
- NOTE: Remember that you can retrieve the same information by right-clicking on the ProLiant object in the central pane and select <Event Log>
- ___ 42. Take a snapshot of the screen and save it for future reference. The combined pictures should look similar to this



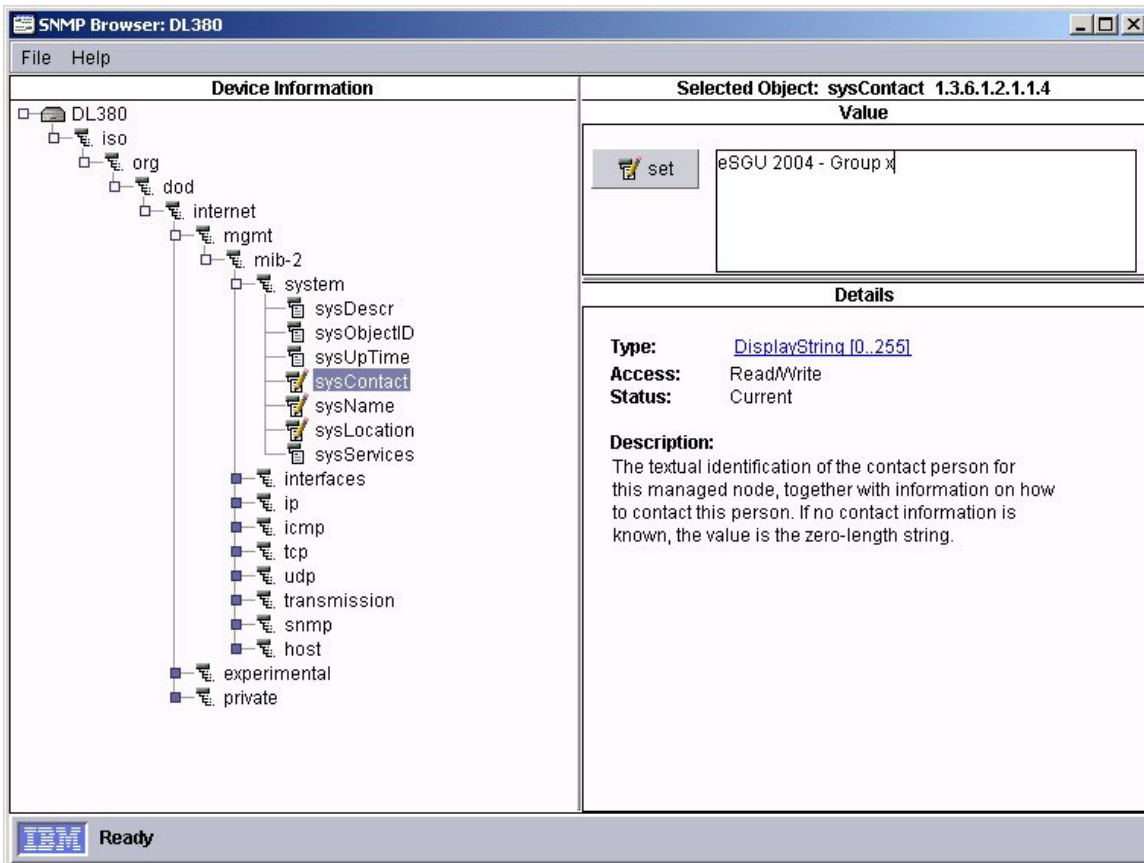
- ___ 43. Reinsert the fan and notice how the pop-ups still bring up information that contribute to the troubleshooting only for the identification of the failing system
- ___ 44. Now double-click on the ProLiant SNMP object in the central pane of the IBM Director Console main window to bring up the “system attributes”
- ___ 45. In the Display System Attributes: *SystemName* window select the <SNMP Devices> tab and ensure that **ibm** (or the Community Name with READ/WRITE capabilities) is reported. Modify the value, if required, and click on <OK> to close the window

NB: Where *SystemName* is the name of the ProLiant system

- ___ 46. Now right-click on the ProLiant object and select <SNMP Browser>
- ___ 47. In the SNMP Browser: *SystemName* window expand the tree until you reach and including this level:

SystemName.iso.org.dod.internet.mgmt.mib-2.system

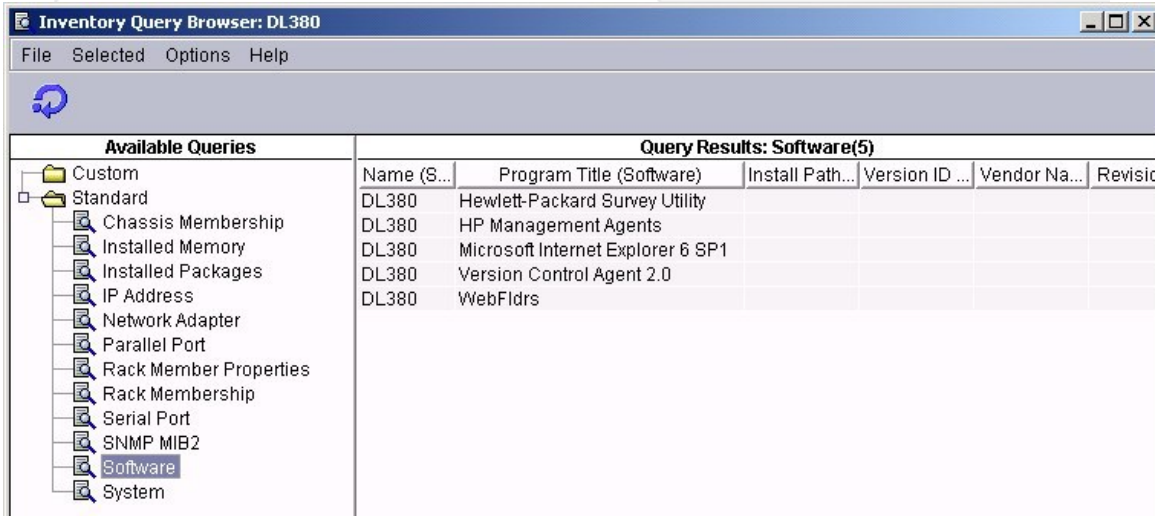
- ___ 48. Browse the entries to read the information that is available
- ___ 49. Select the <SysContact> entry and in the <Value> modify the entry to a custom name



- ___ 50. Select <Set> and notice the result of the operation.
- ___ 51. Now in the SNMP Browser: *SystemName* window expand the tree until you reach and including this level

SystemName.iso.org.dod.internet.private.enterprises.1.3.6.1.4.1.232

- ___ 52. This shows how the device returns information to the IBM Director Server. If no device-specific compiled MIBs are in the IBM Director Server, the information is represented in a dotted-decimal numerical format, rather than readable text.
- ___ 53. Right Click on the ProLiant system and select <View Inventory>
- ___ 54. In the Inventory Query Browser window, expand the <Standard> tree and browse all the available entries to see the quality of information available. Pay attention to the information reported by the <Software> query



Compiling the MIBs and Observing the Differences

- ___ 55. At the IBM Director Console, right click on the <SNMP Browser> task on the right pane and select <Compile a new MIB>
- ___ 56. Point to the C:\cpq\new_MIBs directory
- ___ 57. Select the cpqhost.mib file and click on <OK>



IMPORTANT: This MIB contains declarations of the root OIDs used by each branch of the other MIBs. Hence, the successful compilation of subsequent MIBs depends on this MIB being compiled first.

- ___ 58. Wait until the procedure has finished and then repeat it for the remaining files RESPECTING THIS LISTED ORDER

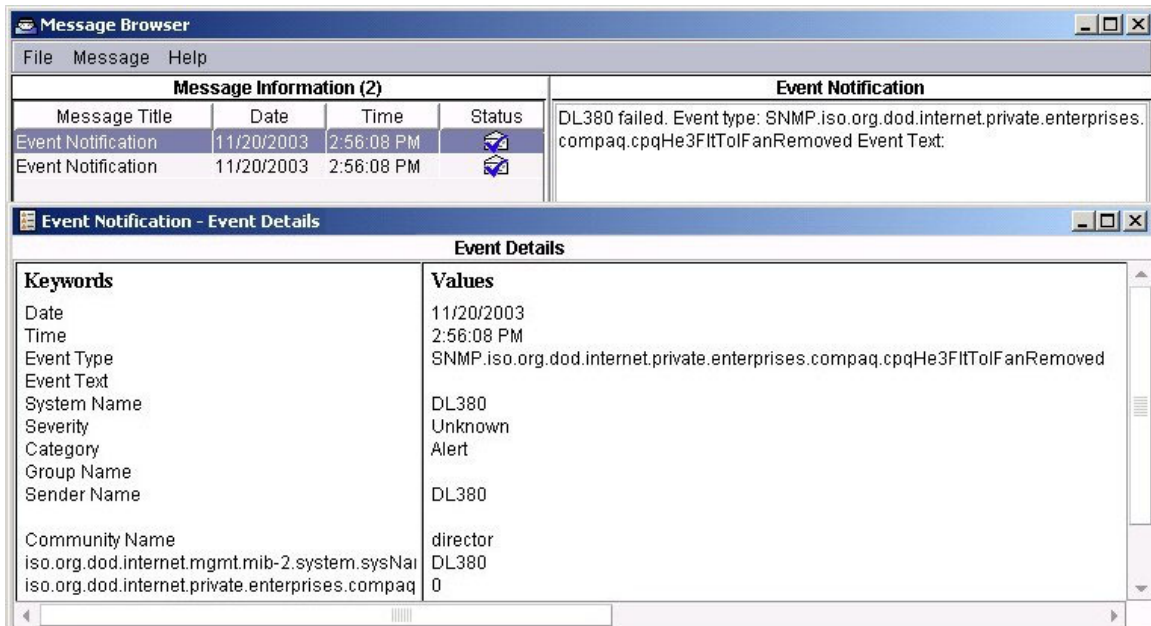
cpqida.mib
cpqhlth.mib



- cpqstd.mib
- cpqapli.mib
- cpqclus.mib
- cpqcmc.mib
- cpqcr.mib
- cpqfca.mib
- cpqide.mib
- cpqnic.mib
- cpqrack.mib
- cpqreco.mib
- cpqscsi.mib
- cpqsinf.mib
- cpqsm2.mib
- cpqstat.mib
- cpqstsy.mib
- cpqthrs.mib
- cpqups.mib
- cpqwino.mib
- symtrap.mib

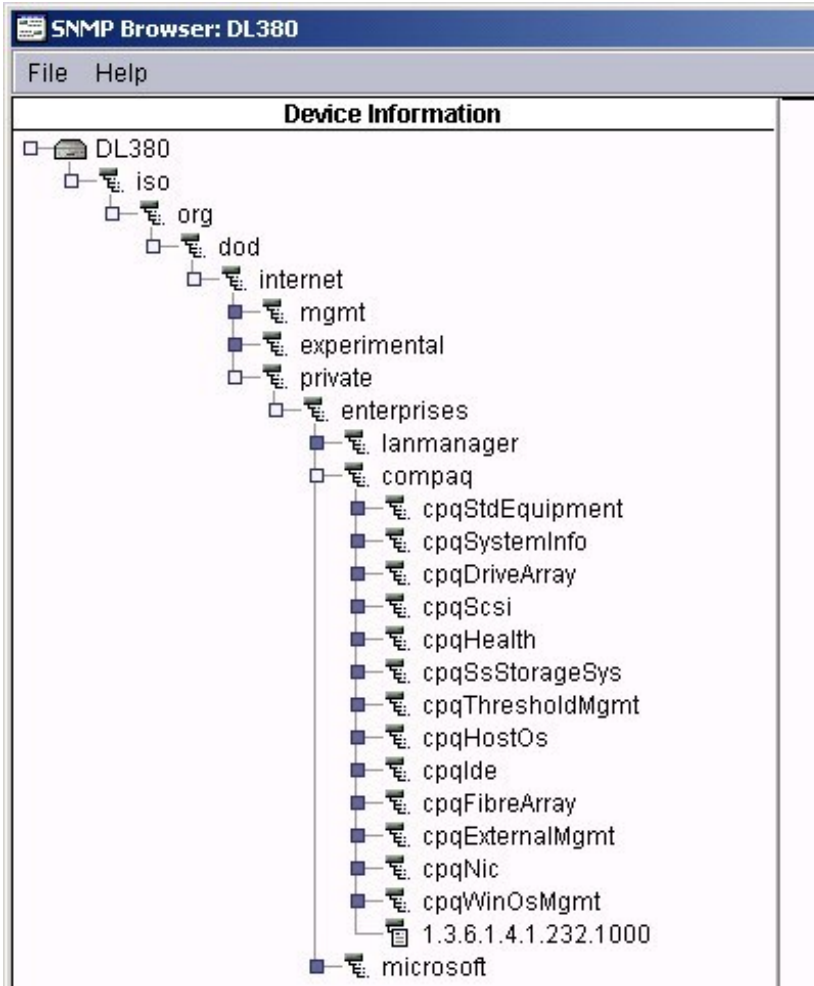
59. Now open the lid of the ProLiant system and pull one of the fans. Notice the message(s) that appear(s) on screen. Compare this with the quality of information you received before compiling the MIBs

60. Click on <Event Details> and verify again the differences from the first test.



61. Reinsert the fan and again pay attention to the information presented on screen

- ___ 62. Now right-click on the object representing the ProLiant server and select <SNMP Browser>.
- ___ 63. In the SNMP Browser: *SystemName* window, expand the trees until reaching/including ***SystemName.iso.org.dod.internet.private.enterprises***
- ___ 64. Notice how the “232” entry is now replaced by the “Compaq” entry
- ___ 65. Expand the Compaq tree and notice how the dotted-decimal numerical information is now replaced by readable text strings



Testing Alerts with the Compiled MIBs

- ___ 66. From the main IBM Director Console window, click on <Tasks> and select <Event Action Plan Builder>
- ___ 67. In the right pane of the Event Action Plan Builder, double click on <Start a Program on a System> and fill in the fields as follows:

System Address: **TCPIP::Localhost**

Program Specification: **C:\Program Files\Internet Explorer\iexplore.exe <https://192.168.x.2:2381>**

where *x* is your group number. Also notice the unusual syntax for the address to be reached by the browser.

- ___ 68. Save the action as <Launch HP System Management Homepage>

69. Additionally, if you have availability of an Insight Manager server, you could create a task to launch its console. To do so, first create a batch file on the C: drive of the IBM Director system and call it **startIM7.bat**. Then edit the file and type inside this single line:

start "C:\Program Files\Internet Explorer\iexplore.exe" <https://192.168.x.y:50000> /MAX

then, in the EAP Builder, create an action that starts **c:\startIM7.bat** on **localhost**

70. Now right-click on the <Simple Event Filter> icon in the central pane and click on <New>

71. In the Simple Event Filter Builder: New window, deselect the <Any> checkbox and expand the SNMP tree until you reach/including the following level

SNMP.iso.org.dod.internet.private.enterprises.compaq

72. Notices how a comprehensive list with an intuitive textual name is now available

73. Select the <Compaq> branch and save the event filter as **Compaq SNMP Filter**

74. In the left pane of the Event Action Plan Builder window, right-click on <Event Action Plan> and select <New>

75. Name the new event action plan as **Compaq SNMP – Pop-up msg+HP Homepage**

76. Add the <Compaq SNMP Filter> event filter to this new event action plan. Also add both the <Launch HP System Management Homepage> and the <Pop-up Message> actions

77. Close the Event Action Plan Builder window and apply the new action plan to the ProLiant system.

78. Now open the lid of the ProLiant System and pull one fan. Notice how, together with the pop-up messages that immediately appear on screen, you will have at least one session of Internet Explorer opening in a minimized state. Click on one of the Internet Explorer sessions and click on <OK> to acknowledge the Security Alert

79. Maximize the Internet Explorer session and login in the HP System Management Homepage

80. Click on the <Logs> tab and then click on the <Integrated Management Log> link

81. Notice if the removal of the fan and the loss of redundancy are logged

82. If they are not, refresh the page by clicking again on the <integrated management log> link in the centre of the page until the information appears on screen

System Model: **ProLiant DL380 G2**
 System Status: **Failed**
 Current User: **administrator**
[logout](#)

Home Settings Tasks Tools Logs Agent Help

logs ->integrated management log

Server Logs ?

Integrated Management Log

Index	Description	Time Of Event	Update Time	Count
1	System Fans Not Redundant (Location I/O Board)	11/20/2003 7:00PM	11/20/2003 7:00PM	1
2	System Fan Removed (Fan 3, Location I/O Board)	11/20/2003 7:00PM	11/20/2003 7:00PM	1
3	IML Cleared (SNMP Agents)	11/20/2003 7:00PM	11/20/2003 7:00PM	1

Legend:
 Information (blue circle) Repaired (green circle) Caution (yellow circle) Critical (red circle) Unknown (grey circle)

Mark Selected Items Repaired Mark All Items Repaired Clear All IML Entries

83. Click on the <Home> tab and from the homepage, under the <Recovery> section, click on the <Environment> link

84. Notice how the information is reported in the Fault Tolerant Fans section and how the overall status is still in “green” status

Fault Tolerant Fans							
Fan	Location	Type	Present	Hot Pluggable	Speed	Redundant	Redundant Partner
✓ 1	CPU	Spin Detect	Present	Hot Plug	Normal	Redundant	2
✓ 2	CPU	Spin Detect	Present	Hot Plug	Normal	Redundant	5
✗ 3	IO Board	Spin Detect	Absent	Hot Plug	Normal	Not Redundant	4
✓ 4	IO Board	Spin Detect	Present	Hot Plug	Normal	Not Redundant	3
✓ 5	CPU	Spin Detect	Present	Hot Plug	Normal	Redundant	6
✓ 6	CPU	Spin Detect	Present	Hot Plug	Normal	Redundant	1

85. Logout from the HP System Management Homepage and close the Internet Explorer Session

86. Now remove another fan from the unit ensuring the fan is member of the same redundant pair as the first one you removed. QUICKLY check again how the information is reported by the HP System Management Homepage, in the <Home>, the <Environment> and the <Integrated Management Log> pages.

System Model: ProLiant DL380 G2
 System Status: ✗ Failed
 Current User: administrator [logout](#)

Home Settings Tasks Tools Logs Agent Help

Thursday, November 20, 2003 7:05:57 PM [refresh: manual](#)

Failed & Degraded Items

- ✗ Home -> NIC -> HP NC3163 Fast Ethernet Embedded NIC I/O 2440 Port 2
- ✗ logs -> Integrated Management Log

System Model: ProLiant DL380 G2
 System Status: ✗ Failed
 Current User: administrator [logout](#)

Home Settings Tasks Tools Logs Agent Help

logs -> integrated management log

Server Logs

Integrated Management Log

Index	Description	Time Of Event	Update Time	Count
1	Automatic Operating System Shutdown Initiated Due to Fan Failure	11/20/2003 7:05PM	11/20/2003 7:05PM	1
2	System Fan Removed (Fan 4, Location IO Board)	11/20/2003 7:05PM	11/20/2003 7:05PM	1

87. You might want to notice how, as reported in the <Environment> page, the default action that the system takes in case of Thermal Degraded Action is a shut down, and how this action can be triggered by fans absence.

Home Settings Tasks Tools Logs Agent Help

home -> recovery -> environment

Environment

System

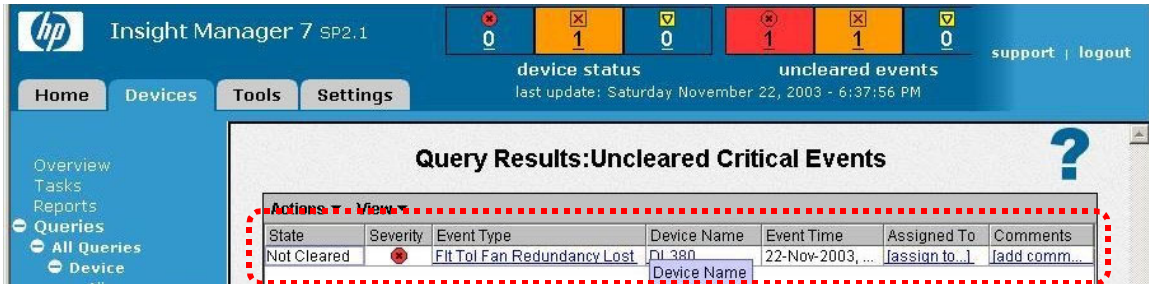
Thermal Degraded Action: Continue Shut Down

88. If you have availability of an Insight Manager server, you might want to repeat the test. The following pictures show an example of what will appear on screen

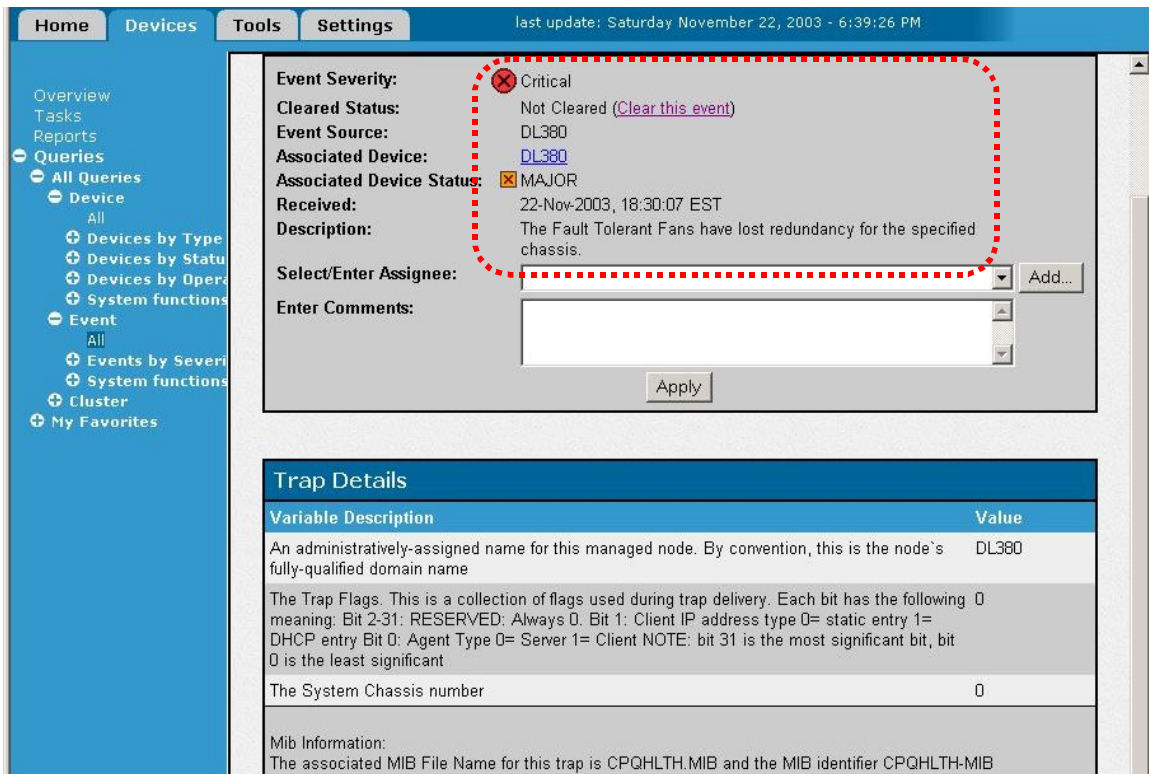
1) Single Fan Removal – Home



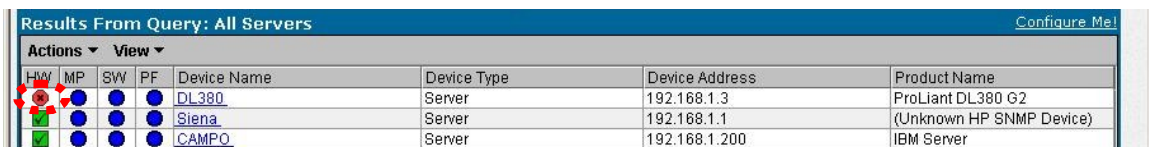
2) Single Fan Removal – Uncleared Critical Systems



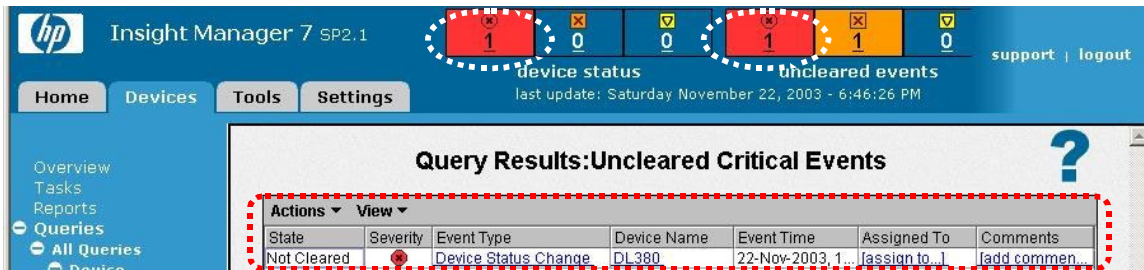
3) Single Fan Removal – Uncleared Critical Systems Details



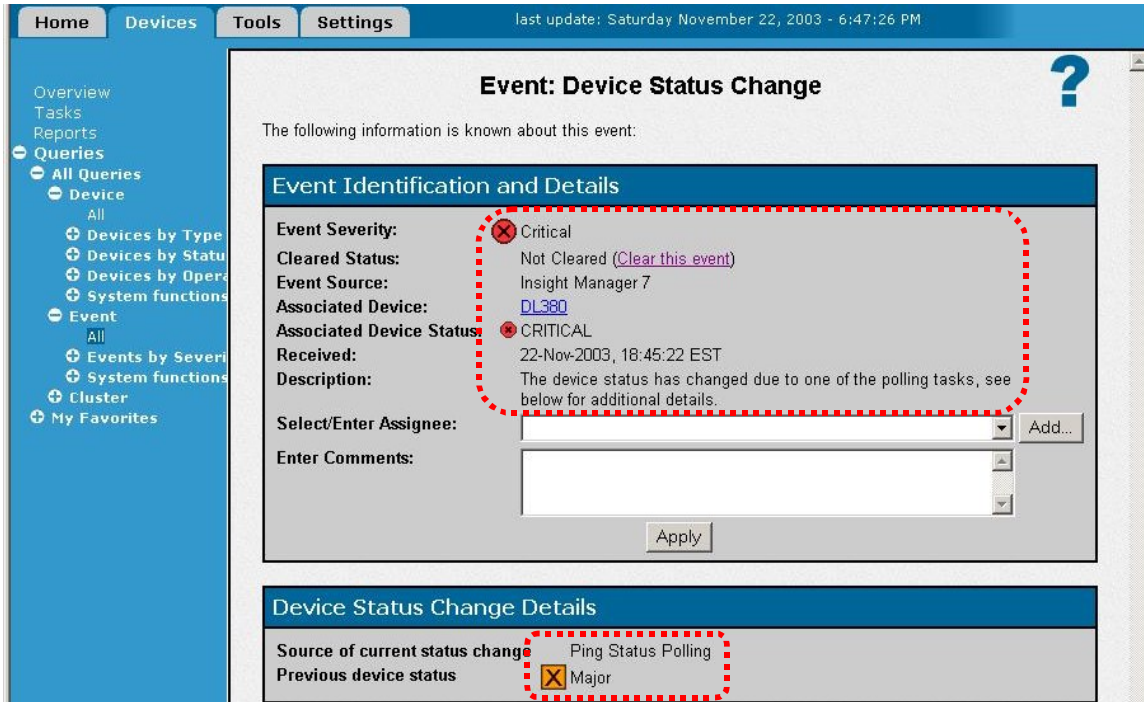
4) Second Fan Removal/Shutdown – Home





5) Second Fan Removal/Shutdown – Uncleared Critical Events



6) Second Fan Removal/Shutdown – Uncleared Critical Events Details




- ___ 89. When the ProLiant system has shut down, it will then try to restart at short intervals of time. To ensure the restart is successful, reinsert the fans you previously removed.
- ___ 90. When the unit has completely restarted, move to the IBM Director system and clean the screen from the pop ups generated by the operations you performed
- ___ 91. Director does not seem to surface any event related to the shutdown, but, in this scenario, an identical result as the one provided by Insight Manager might be achieved by:
 - Modifying the default value for the **Presence Check Period**: right-click on the SNMP object representing the ProLiant, select <Set Presence Check Interval> and change the value from <default> (15 minutes) to <2> minutes
 - Using an Event Action Plan with an Event Filter that contains the **Director** events. In fact, the following event would be logged if the non operational condition reaches the Presence Check Period limit


File Edit View Options Help					
 					
Events (1) - Last 24 Hours					
Date	Time	Event Type	Event Text	System Na...	Sev
11/22/2003	6:59:28 PM	Director.Topology.Offl...	System 'DL380' is offli...	DL380	Harmle
Event Details					
Keywords	Values				
Date	11/22/2003				
Time	6:59:28 PM				
Event Type	Director.Topology.Offline				
Event Text	System 'DL380' is offline				
System Name	DL380				
Severity	Harmless				
Category	Alert				
Group Name					
Sender Name	CAMPO				

92. Then, at the ProLiant system, remove the network cable that is connected to the RILOE II and plug it into the second network interface connector of the unit

93. In the IBM Director console, notice how a first pop-up appears immediately on screen and read it to understand what generates it

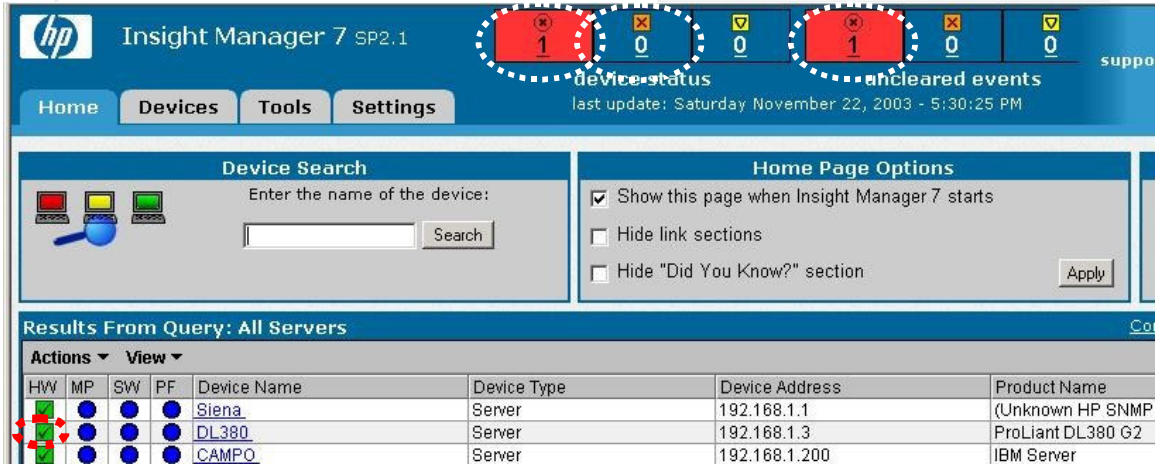
Message Browser				
File Message Help				
Message Information (1)			Event Notification	
Message Title	Date	Time	Status	DL380 failed. Event type: SNMP.iso.org.dod.internet.snmpV2.snmpModule.s.snmpMIB.snmpMIBObjects.snmpTraps.linkUp Event Text: A linkUp trap signifies that the SNMP entity, acting in an agent role, has detected that the ifOperStatus object for one of its communication links left the down state and transitioned into some other state (but not into the notPresent state). This other state is indicated by the included value of ifOperStatus.
Event Notification	11/20/2003	6:42:53 PM		

94. Wait until a second message is displayed on the screen and notice how this message is associated with the launch of the HP System Management Homepage

Message Browser				
File Message Help				
Message Information (1)			Event Notification	
Message Title	Date	Time	Status	DL380 failed. Event type: SNMP.iso.org.dod.internet.private.enterprises.com.paq.cpqNic2ConnectivityRestored Event Text:
Event Notification	11/20/2003	6:52:41 PM		

95. You might want to check how the HP System Management Homepage and Insight Manager (if available) report the event. Here we show the <Home> view of Insight Manager where you can see that:

- <Device Status> and <Uncleared> events receive “Critical” changes to reflect loss of connectivity from the RILOE II
- <Device Status> doesn’t show the “Major” entry for the ProLiant due to the lack of connectivity for one of its NICs
- The HW status of the DL380 changes to green



___ 96. Now remove the connection to the second network interface of the system and reconnect the RIOLE II

___ 97. Notice, again, how the alerts are presented on screen.

Using Resource Monitors and Thresholds with the ProLiant SNMP Object

___ 98. From the IBM Director console, drag and drop the <Resource Monitors> task to the ProLiant SNMP object and expand the sub-trees to notice the list of available resources that could be monitored

___ 99. In order to enhance the capabilities of IBM Director to monitor additional (and more proper) resources for this case, open the following file

C:\Program Files\IBM\Director\classes\com\tivoli\twg\monitor\RmonSubSys.properties

___ 100. Modify the line that contains the root OID

Root = 1.3.6.1.2.1

so that it reads

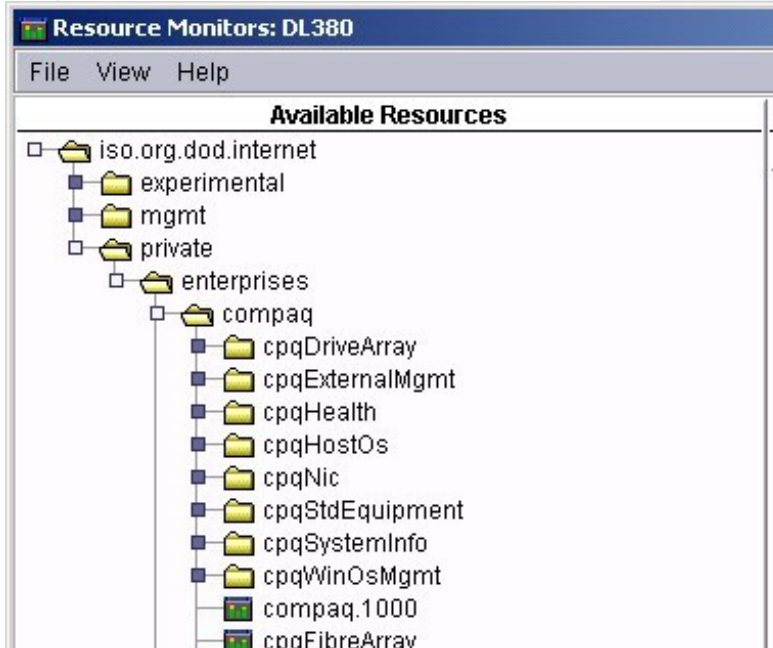
Root = 1.3.6.1

___ 101. Save the file and restart IBM Director by typing the following command from a command prompt

net stop twgipc & net start twgipc

___ 102. As IBM Director has restarted, login to the console and drag and drop again the <Resource Monitors> task to the ProLiant SNMP object

___ 103. Notice now the increased number of parameters that can be monitored: the root OID has been moved further up in the standard MIB tree so that monitors for variables from private MIBs can be configured as well as from the standard MIB II tree.



___ 104. Now expand the tree until you reach/including the following level:

iso.org.dod.internet.private.enterprises.compaq.cpqHostOs.cpqHoComponent.cpqHoUtil

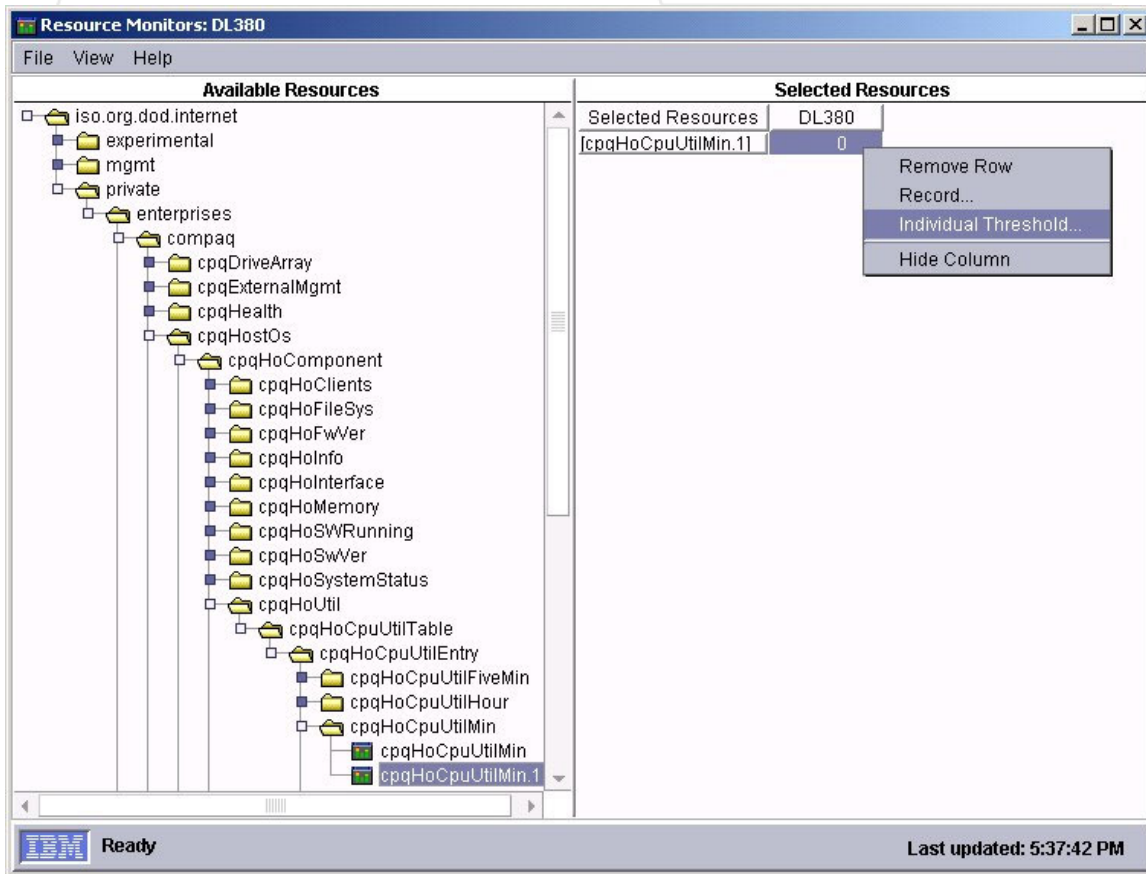
___ 105. From here expand the tree until you reach/including the following level:

..cpqHoCpuUtilTable.cpqHoCpuUtilEntry.cpqHoCpuUtilMin

___ 106. Drag and drop the <cpqHoCpuUtilMin.1> entry to the right pane and wait until the value is collected

___ 107. Save this set of monitored resources as **ProLiant CPU Monitor**

___ 108. Right click the value of the resource and click on <Individual Threshold>

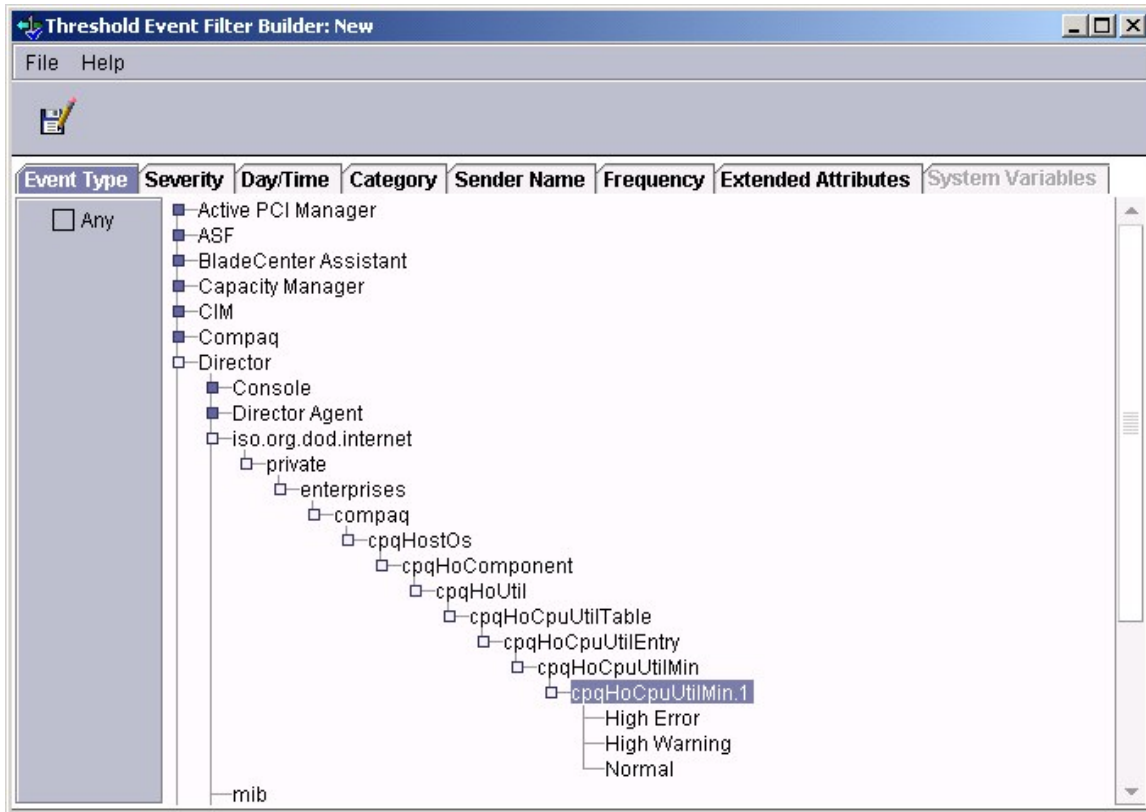


- ___ 109. Type a name and a description for threshold and ensure that the Enabled to Generate Events checkbox is marked
- ___ 110. Set the parameters as follows

Minimum Duration:	30	Seconds
Resend Delay:	0	Hours
Above Or Equal	High Error	70.0
	High Warning	40.0
- And click on <OK> to confirm
- ___ 111. Notice how the value has now a couple of icons next to it and then close this window
- ___ 112. Right-click on the ProLiant object in the central pane and select <All Available Thresholds> to verify that the resource is properly monitored.
- ___ 113. Open the Event Action Plan Builder to setup an event action plan that uses a threshold event filter
- ___ 114. In the right pane of the Event Action Plan Builder window, double-click on the <Add a Message to the Console Ticker Tape> and insert any message you prefer, ensuring that you have * (an asterisk) in the User(s) field. Save the action as **Threshold test**
- ___ 115. In the central pane of the Event Action Plan Builder window, right-click on <Threshold Event Filter> and select <New>
- ___ 116. From the window that appears on screen, now remove the tick from the <Any> checkbox and expand the Director tree until you reach/including the following level:

Director.iso.org.dod.internet.private.enterprises.compaq.....cpqHoCpuUtilMin.1

117. Select <cpqHoCpuUtilMin.1>



118. Now click on the <Category> tab and deselect the <Any> checkbox

119. Select ONLY the <Alert> checkbox and save the filter as **CPU Test Filter**

120. In the left pane of the Event Action Plan Builder window, right-click on <Event Action Plan> and select <New>

121. Name the Event Action Plan as **CPU Test EAP** and add the filter and the action you just created.

122. Close the Event Action Plan Builder window and, from the IBM Director Console main window, apply the <CPU Test EAP> the ProLiant SNMP object.

123. From the main window, drag and drop the <ProLiant CPU Monitor> resource monitor to the ProLiant SNMP object to have a visual indication of the collected value

124. Now, at the ProLiant system, generate CPU utilization to go over the set thresholds and wait until the event action plan performs its duty.

NOTE: you could use the Pinball.exe application running in demo mode to achieve such a task

125. As the alert is generated, clear the message browser and then stop generating a high CPU utilization on the ProLiant.



126. Right-Click the ProLiant object in the central pane of the IBM Director Console main window and select <Event Log>

127. Read the logs and notice also how a “resolution” entry has been created but it has not triggered any alert



Event Log: DL380

File Edit View Options Help

Events (2) - Last 24 Hours

Date	Time	Event Type	Event Text	System Na...	Severity	Category	Gro
11/21/2003	7:47:00 PM	Director.iso.org.dod.i...	Monitor 'SNMP-based ...	DL380	Harmless	Resolution	
11/21/2003	7:45:40 PM	Director.iso.org.dod.i...	Monitor 'SNMP-based ...	DL380	Warning	Alert	

Event Details

Keywords	Values
Date	11/21/2003
Time	7:47:00 PM
Event Type	Director.iso.org.dod.internet.private.enterprises.compaq.cpqHostOs.cpqHoComponent.cpqHoUtil.
Event Text	Monitor 'SNMP-based CPU Limit' Informational: 'cpqHoCpuUtilMin.1' has returned to normal.
System Name	DL380
Severity	Harmless
Category	Resolution
Group Name	
Sender Name	CAMPO
Threshold Name	SNMP-based CPU Limit
Monitor Resource	cpqHoCpuUtilMin.1
Threshold Value	0.0
Duration	40
Actual Value	16.0

NOTICE: The HP management solution has natively the capability of setting thresholds for a limited number of devices. A “Warning” and a “Critical” level of % **CPU Time** can be set by the user within the HP Management solution. As the values are exceeded for at least 15-consecutive intervals (default interval=2 minutes), a trap will be sent to signal the status change.

If you do not have an Insight Manager server available, please double check the following pictures (starting from next page) to compare the different solutions.

1) The setup page for the CPU threshold within the HP System Management Homepage

System Model: ProLiant DL380 G2
 System Status: ✘ Failed
 Current User: administrator [logout](#)

Home Settings Tasks Tools Logs Agent Help

home -> performance -> processors

Processors

CPU	Interrupts /Sec	% User CPU Time	% Privileged CPU Time	% DPC Time	% Interrupt Time	% CPU Time
0	67	0	0	0	0	0%
1	64	0	0	0	0	0%
_Total	132	0	0	0	0	0%

Manually Refreshed @ Saturday, November 22, 2003 2:37:11 PM

Setting Thresholds: Click on threshold indicator with mouse and drag to the desired threshold value and save to set it.

Warning Critical Disabled (below 5%)

Save Thresholds

2) The setup page for the CPU threshold within Insight Manager

HP Management Agents for Servers v6.40.0.0
 Agent Help Summary Device Home Options

Condition Legend
 Unknown OK
 Degraded Failed

Power Supply
 Power Converter
 Remote Communications

PERFORMANCE
 Server
 Memory
 Processors
 Physical Disk
 Logical Disk
 Network

Insight Manager 7 SP2.1
 device status: 0 OK, 1 Degraded, 0 Failed
 uncleared ever
 last update: Saturday November 22, 2003 - 3:23:14 PM

Processors

CPU	Interrupts /Sec	% User CPU Time	% Privileged CPU Time	% DPC Time	% Interrupt Time	% CPU Time
0	64	0	0	0	0	0%
1	64	6	0	0	0	6%
_Total	129	3	0	0	0	3%

Manually Refreshed @ Saturday, November 22, 2003 3:23:32 PM

Setting Thresholds: Click on threshold indicator with mouse and drag to the desired threshold value and save to set it.

Warning Critical Disabled (below 5%)

Save Thresholds

3) The notification that is received in Insight Manager

The screenshot shows the HP Insight Manager 7 SP2.1 interface. The top navigation bar includes 'Home', 'Devices', 'Tools', and 'Settings'. A status bar at the top right shows 'device status' with 0 errors, 1 warning, and 0 info, and 'uncleared events' with 1 error, 0 warning, and 0 info. The main content area displays a table of 'Query Results:Uncleared Critical Events' for device DL380.

State	Severity	Event Type	Device Name	Event Time	Assigned To	Comments
Not Cleared	⊕	Processor Time Degraded	DL380	21-Nov-2003, ...	[assign to...]	[add commen...]

4) How IBM Director receives the notification in our existing setup (notice that this does not require any additional step in IBM Director)

The screenshot shows the IBM Message Browser window. It displays a message titled 'Event Notification' received on 11/21/2003 at 8:27:51 PM. The message content is: 'DL380 failed. Event type: SNMP.iso.org.dod.internet.private.enterprises.compaq.cpqOsCpuTimeDegraded Event Text:'. There are buttons for 'Event Details' and 'Clear This Message'.

Message Title	Date	Time	Status
Event Notification	11/21/2003	8:27:51 PM	✉

Lab 3. Exploiting the Compaq Insight Manager Integration Toolkit (CIMIT)

Time Required: 60 minutes

Scenario

Following on the previous scenarios the customer seems to show appreciation for what you managed to achieve, however, he is not fully convinced by the results. He complains with you that the information reported is less accurate than what Insight Manager can give him. You are now under the pressure to demonstrate the flexibility of IBM Director.

Objectives

In this lab you will learn how to:

- Install the CIMIT and understand how it works
- Extend its capabilities to handle EVENTVAR and EVENTVARBIND variables

Lab Activity Preparation

- Ensure that IBM Director Server is installed on the management server.

What Is the CIMIT and What Does it Do?

The CIMIT is a small tool that enables customers to access the data, events and interfaces of the HP Insight Manager 7 product from an HP managed node within the IBM Director console

Because raw SNMP traps coming into the Director event log or other event actions can be hard to read and because the SNMP.iso.org... tree of the Event Filter Builder can make it hard to find event types, an extensible mapping facility was developed in IBM Director to allow users to map SNMP trap types and their varbinds to corresponding Director event types and details. An example of a mapping file can be found in the data\snmp directory on the Director server and is named TrapFilter.map.sample. In addition, there are some built-in mapped events from IBM manufactured SNMP devices and 3rd party tape backup software. These events are published under the SNMP.Hardware and SNMP.Software nodes of the Event Filter Builder respectively.

The CIMIT builds upon the capabilities provided by the Trap Mapper and other extensible interfaces of IBM Director 4.1 to provide:

- A mapping of select HP SNMP traps to native Director events
- An Event Action Plan that writes HP-Director events to the ticker tape
- An Event Filter for all HP Traps
- A Dynamic Group that will get populated with HP servers
- Simpler capability of configuring Resource Monitors against HP MIB variables

The tool is provided as a self-extractable archive, but it then requires a few simple additional steps post-install that we will describe in the later sections

Installing and Testing the CIMIT

The tool relies on the presence of the Compaq Management Agent on the monitored system and requires availability of the Compaq MIBs, which are not shipped with the tool itself. Therefore it is required that, before proceeding in the following set of instructions, the appropriate MIBs have been previously compiled in the IBM Director server. If you did not do so, please read and perform the related steps mentioned in the previous Lab activity.

As well, notice how the readme.lst file shipped with the tool (we placed it in the **C:\cpq\CIMIT** folder of your IBM Director system) refers to a set of MIB files which differs from the one we advised you to compile. This is due to the fact that the tool is based upon Compaq Insight Manager 7 SP1 and all the software that was available with that release. In our scenario, we are instead taking into consideration the updated version of the HP management suite (HP Insight Manager 7 SP2.1) which is what we would expect a customer to currently run. This involves some modifications for the basic functionalities and other implications for extending the CIMIT usage which we analyze later on.

The readme.lst also mentions, as dependencies, the modifications to the SNMP Discovery preferences and to the Inventory Collection Preferences which we asked you already to perform in the previous Lab activity. If you have not already done it, please ensure that those modifications have been applied before proceeding.

- ___ 1. At the IBM Director server, copy the **C:\cpq\CIMIT\compaq.exe** file to the **C:\Program Files\IBM\Director** folder (or to the “Director” folder in the IBM Director Server file tree, if IBM Director was installed to a drive/path different from the default)
- ___ 2. Close any running IBM Director Console
- ___ 3. Either double-click on the **compaq.exe** file in the new location or execute it from a command prompt.

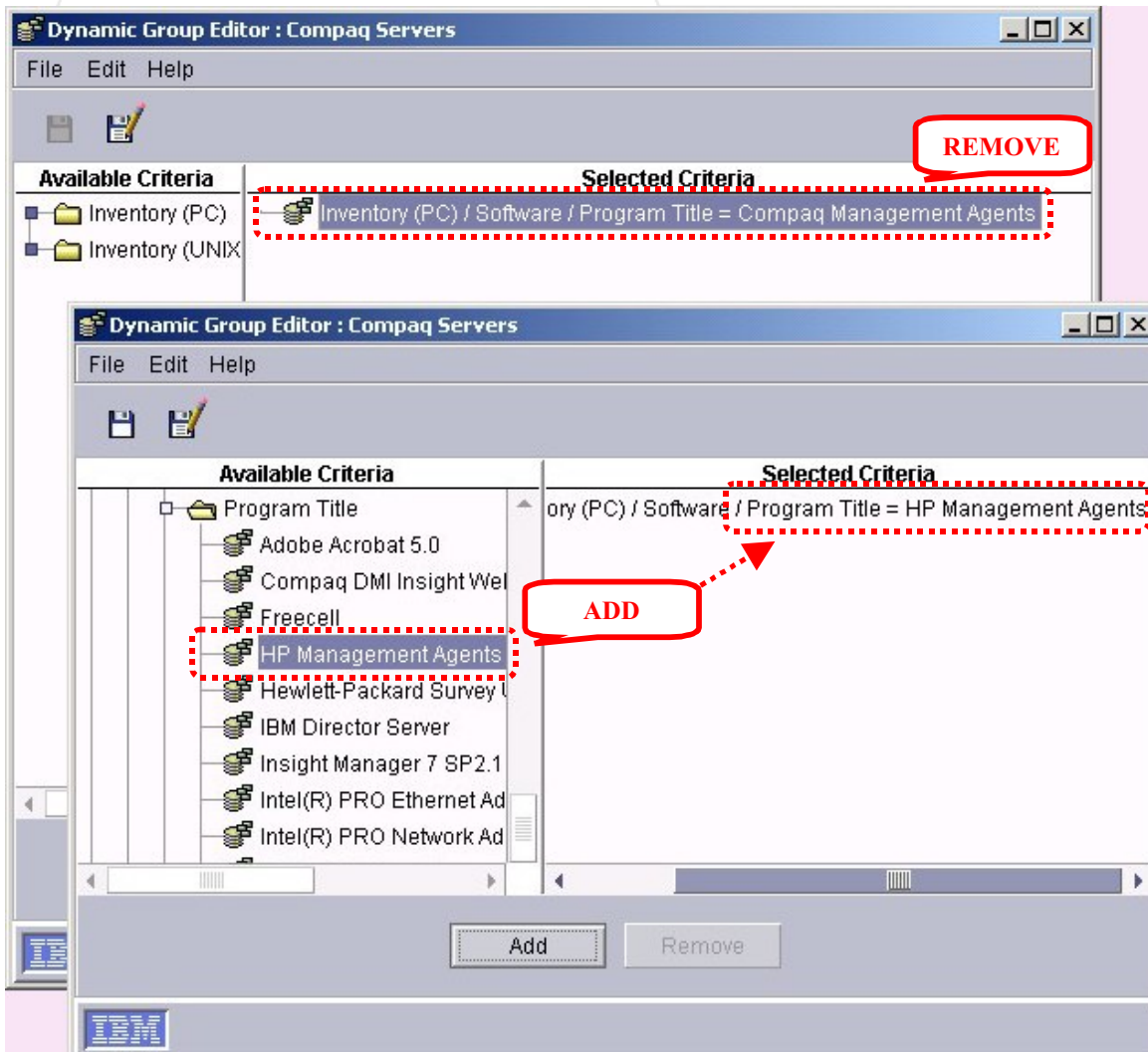
NOTICE: The executable file performs the following actions:

- It extracts a file called **compaq.bat** in **C:\Program Files\IBM\Director** which is later executed
 - It extracts a file called **CompaqSNMPTrapResources.properties** in **C:\Program Files\IBM\Director\classes\com\ibm\sysmgmt\snmp**
This file is used for the trap mapping and will be discussed in a later section
 - It extracts the **cpqhw.eap** and **cpqhw.properties** files into **C:\Program Files\IBM\Director\data\import\EventActionPlans**
These file contain the definition of an Event Action Plan that generates a ticker message when a mapped trap is generated by the Compaq Management Agents
 - It extracts the **cpqservers** file in **C:\Program Files\IBM\Director\data\import\Groups**
This file contains the definition of a dynamic group for systems running the Compaq Management Agents
 - It extracts a file called **CompaqTrapFilter.map** into **C:\Program Files\IBM\Director\data\snmp**
Also this file is used for the trap mapping and will be discussed in a later section
 - It launches the **compaq.bat** file which modifies the **RmonSubSys.properties** file under the **C:\Program Files\IBM\Director\classes\com\tivoli\twg\monitor** directory by changing the Root OID so that MIBs under the “private” branch of the standard MIB are visible in the Resource Monitor task. The batch then stops and restarts the IBM Director Server service
- ___ 4. Wait until the IBM Director Server has restarted and open an IBM Director Console
 - ___ 5. Right-click in the Groups pane and select <Import Groups...>
 - ___ 6. In the Group Import window, navigate to the **C:\Program Files\IBM\Director\data\import\Groups** directory

- ___ 7. Select **cpqservers** and click on <OK>
- ___ 8. In the **Group Import** window, select the group **Compaq Servers** and then click on <Function> <Non-duplicates> <Add All>
- ___ 9. With the group still selected, now click on <Import> <Import Selected Groups>
- ___ 10. Close the **Group Import** window and notice how the **Compaq Servers** dynamic group has been created in the left pane of the IBM Director Console

IMPORTANT: The next step assumes that the ProLiant server has already been discovered in IBM Director. If you did not do so, perform the SNMP discovery activity described in the previous Lab section

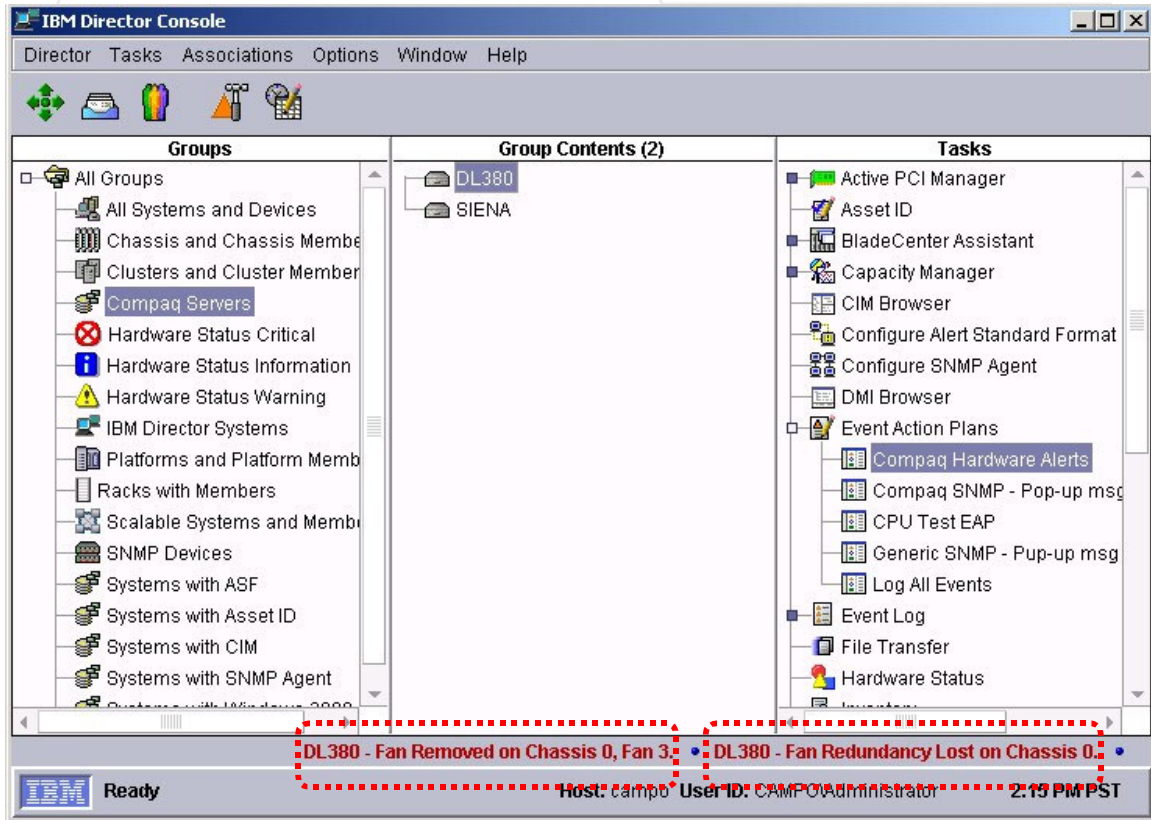
- ___ 11. Select the **Compaq Servers** group and notice how the SNMP icon representing the ProLiant server is not visualized, despite of being shown when you select either the **All Systems and Devices** or the **SNMP Devices** groups
- ___ 12. To correct this, right-click on the **Compaq Servers** group and select <Edit...>
- ___ 13. In the **Dynamic Group Editor** window, notice the entry present in the **Selected Criteria** pane
- ___ 14. Select that entry and click on <Remove>
- ___ 15. Expand the **Inventory (PC)** tree in the **Available Criteria** pane
- ___ 16. Expand the underlying **Software** branch and then the **Program Title** one
- ___ 17. Select the **HP Management Agents** entry and click on <Add>



- ___ 18. Save the changes and close the Dynamic Group Editor window
- ___ 19. Notice now how the dynamic group is correctly populated by the ProLiant unit

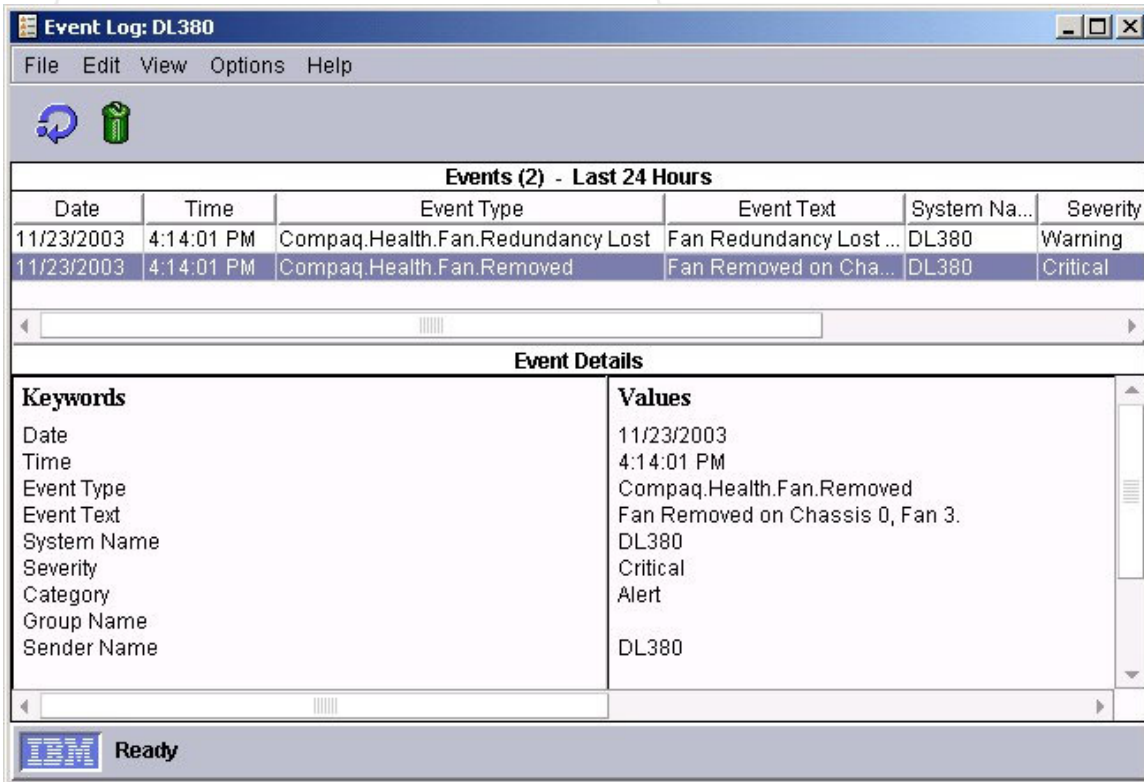
NOTICE: As previously mentioned, the CIMIT was created when Insight Manager 7 SP1 was available. The merger of Compaq with HP is reflected in the later versions of the software by a change in the official name of the software.

- ___ 20. Before proceeding with the testing, please remove the Event Action Plans you associated to the ProLiant system. To do so, in the central pane of the IBM Director Console, expand the tree structure linked to the icon related to the unit. Right-click on each EAP and click on <Delete>
- ___ 21. Now, in the Tasks pane, expand the Event Action Plans tree and drag and drop the **Compaq Hardware Alerts** entry to the **Compaq Servers** group
- ___ 22. Remove one of the fans from the ProLiant to test the EAP and notice the quality of the information that appears on the ticker tape.

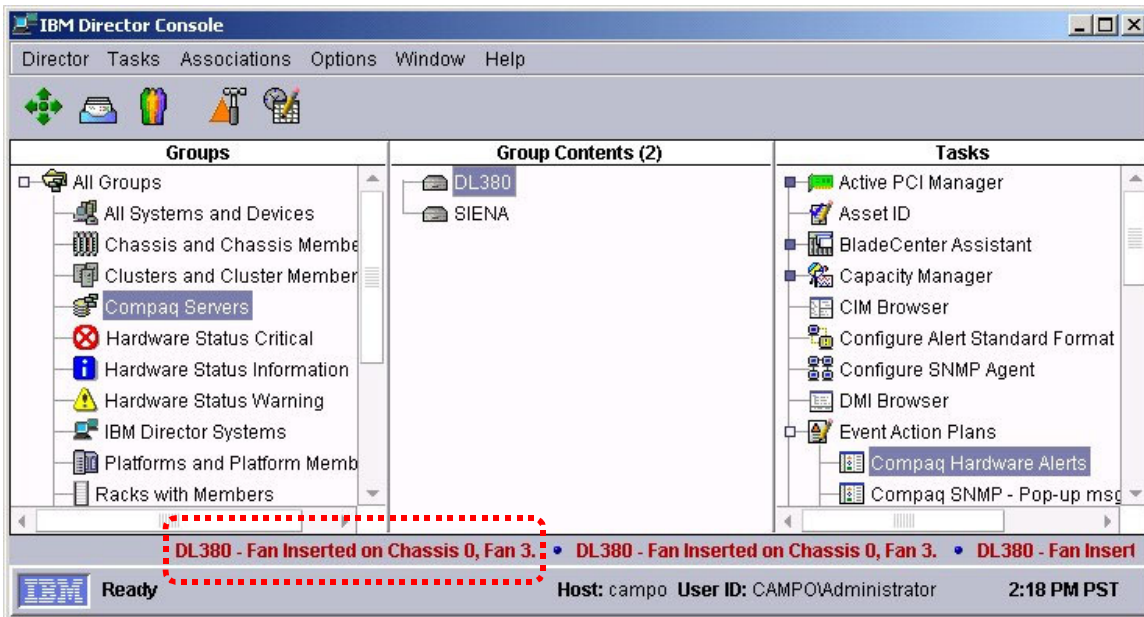


The CIMIT increases the accuracy of the alerts not only by indicating the type of event, but also by surfacing the information carried by the variables of the MIBs

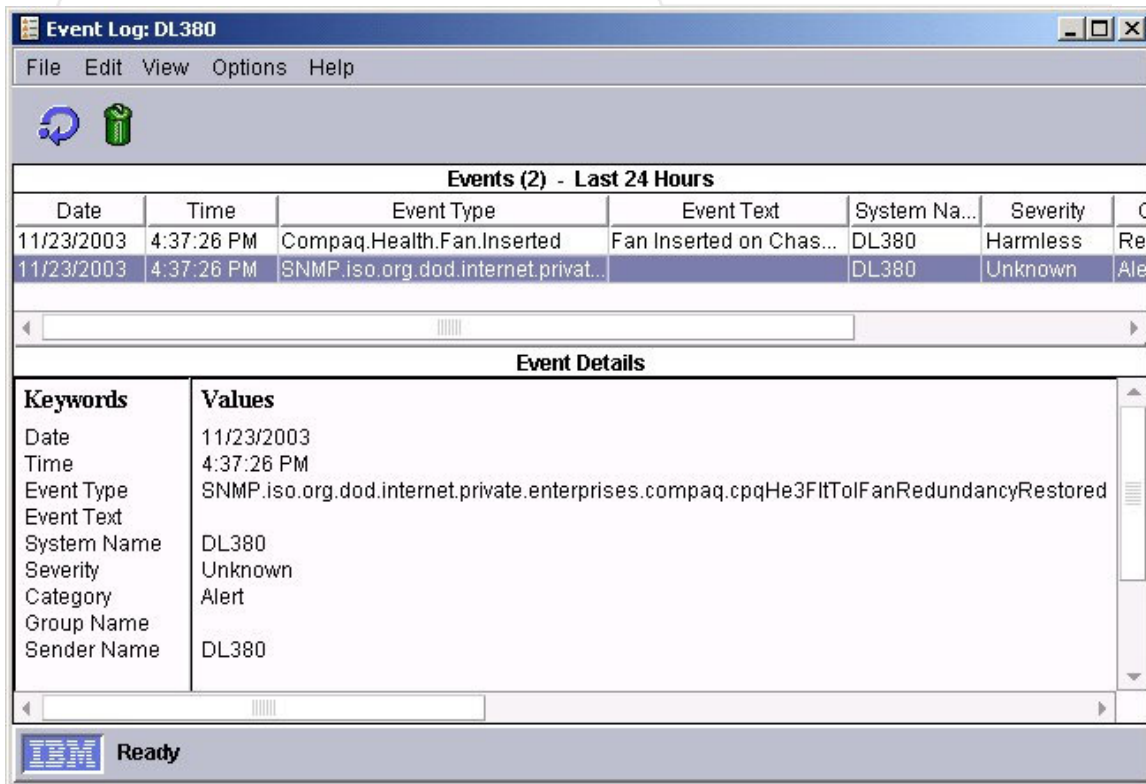
23. In IBM Director, open the Event Log for the ProLiant and notice, as a result of the mapping:
- The different string in the Event Type
 - The presence of data in the Event Text



- ___ 24. Clear the text on the console ticker tape and reinsert the fan
- ___ 25. Notice how the ticker tape shows again a message, but, this time, one only



- ___ 26. Open the Event Log again and verify instead that the ProLiant sent two traps. One seems to have been successfully mapped, while the other is instead still in the less readable (but still understandable) format we obtained by just compiling the latest MIB files



NOTICE: This situation is a consequence again of the MIBs available at the time that the CIMIT was written. In the next section we will show how to extend the CIMIT capabilities, allowing for the user to exploit the latest MIBs updates

Extending the CIMIT Capabilities

In order to extend the CIMIT capabilities, we need first to understand how the trap mapper that was introduced in IBM Director 4.1 works.

- ___ 27. Review previous pictures and focus again on the different string that now appears as Event Type for three of the four events that we generated by removing and reinserting the fan.
- ___ 28. Now open the **Event Action Plan Builder**. Right click on **Simple Event Filter** and select <New>
- ___ 29. Deselect the <Any> checkbox and notice the Event Type category called **Compaq**. This new category is the result of the presence of **CompaqSNMPTrapResources.properties** and **CompaqTrapFilter.map**. In fact, these two files “feed” the trap mapper with the information required to do its job.
- ___ 30. Expand the Compaq tree until you reach/including **Compaq.Health.Fan**
- ___ 31. Notice how we have entries that describe insertion, removal and loss of redundancy. By performing the previous tests you have realized of the occurrence of any of these events is what triggers the **Compaq Hardware Alerts** EAP. Now you can visually understand why its associated filter, defined versus the full Compaq category, is not capable of capturing the fourth event (fan redundancy restored). Let’s now have a look at the contents of the two “mapping” files for confirmation.
- ___ 32. Use Notepad to open **CompaqTrapFilter.map**

- ___ 33. The first not-commented line refers to an output file called **julie.csv** (which is located in the **C:\Program Files\IBM\Director\classes** folder).

```
ibm.snmplistener.output=julie.csv
```

- ___ 34. This file (best viewed with wordpad.exe) lists all the Compaq SNMP traps that the running session of IBM Director can (by processing the **CompaqTrapFilter.map** file) map to Director Native Events. Therefore, it could be used as a verification/debugging tool for any change you might attempt to implement. The file is created/modified anytime the IBM Director Server service is started.

NOTICE: The updates to this file are not performed by modifying/removing existing entries or by adding the delta. Instead a full list of mapped traps is appended. Therefore, if you intend to use the contents of this file to verify/predict the output of your changes, it might be useful to delete the file before restarting the IBM Director Server service, so that, as the file is recreated, you have only the mappings deriving from your last changes.

- ___ 35. Change the name (not the extension) of the output file at your leisure. Keep in mind that, in this document, we will still refer to it as **julie.csv**

- ___ 36. In the next commented lines we find reference to the fact that “keywords are looked up in event.bundle key value below”. We still have not found the definition of the keywords but it is useful to quickly skip to the end of the file and read the last entry

```
----- event.bundle=com.ibm.sysmgt.snmp.CompaqSNMPTrapResources defines
CompaqSNMPTrapResources.properties as the file that contains the keyword bundle.
```

IMPORTANT: This line HAS TO BE THE LAST and MUST NOT BE MODIFIED

- ___ 38. Now, move to the section that starts with `#Fan removed` to analyze a complete example of trap mapping. Notice how each line starts with `event.19` which defines how this event represents the 20th mapped trap in this mapping file (0based enumeration)

```
# Fan removed
event.19.family=Compaq
event.19.keyword.0=event.qualifier.subsystem.health
event.19.keyword.1=event.qualifier.component.fan
event.19.keyword.2=event.text.removed
# Severities:
#   FATAL           0
#   CRITICAL        1
#   MINOR           2
#   WARNING         3
#   HARMLESS        4
#   UNKNOWN         5
# (defaults to 3=warning)
event.19.severity=1
# 1=alert, 0=resolution (defaults to 1=alert)
event.19.category=1
event.19.text=event.text.FanRemoved
event.19.oid=1.3.6.1.4.1.232.0.6039
event.19.srcname=1.3.6.1.2.1.1.5.0
# Chassis
event.19.eventvar.index.0=4
# Fan
event.19.eventvar.index.1=5
event.19.proceedwithnormaltrap=false
```

- ___ 39. The first four not-commented lines define the logical structure in which the event type will be nested. Let’s understand their meaning.

___ 40. `event.19.family=Compaq` tells us that the event will be placed under the **Compaq** category. This emerges, in the Simple Event Filter Builder window, with the creation of the Compaq category under the Event Type tab

___ 41. `event.19.keyword.0=event.qualifier.subsystem.health` tells us two things

- The “0” value means that the event is logically situated at least one level under the Compaq category. A keyword defines this either the level or, in case this was the last of this kind of entries in the mapped trap, the event itself
- The part after the “=” tells us the name of that keyword (therefore naming the level/event) but not the alphanumeric value that will be displayed in the Simple Event Filter Builder window, one level under **Compaq**

___ 42. Since all the keywords are looked up in **CompaqSNMPTrapResources.properties**, use Notepad to open that file and read the value associated to that specific keyword

___ 43. You should find the following entry

```
event.qualifier.subsystem.health=Health
```

this means that the value of the “event.qualifier.subsystem.health” keyword is “Health” and, therefore, the last observed statement in **CompaqTrapFilter.map** defines the **Compaq.Health** level/event

NOTICE: The entry might appear to be under the “Power Supply” section, however, each entry is fully reusable and not linked to a specific section (in fact it could be move anywhere else). The location of the entry is just casual and due to the fact that the definition of the “Health” level was first required when the CIMIT developer created the trap mapping for the Power Supply events.

___ 44. Go back now to the trap mapping example and analyze the next line

___ 45. `event.19.keyword.1=event.qualifier.component.fan` tells us that:

- **Compaq.Health** was a level
- The event is situated at least two levels under the Compaq category. By looking at the keyword definition in the **CompaqSNMPTrapResources.properties** file, you can realize how we now have defined the **Compaq.Health.Fan** level/event. Let’s consider the next entry

___ 46. `event.19.keyword.2=event.text.removed` tells us that:

- **Compaq.Health.Fan** was a level
- The event is situated at least three levels under the Compaq category
- Being this the last line of this kind for event 19, **Compaq.Health.Fan.Removed** is the event

NOTICE: The section of the **CompaqSNMPTrapResources.properties** file in which the `event.text.removed` entry is placed is, this time, not casual. The CIMIT developer grouped at the bottom of the file all the keywords that were believed to be quite generic and therefore highly reusable. In case you wanted to apply changes to the trap mapping, it might be a good idea to first check in here if existing keywords definitions could be used, instead of creating new ones.

___ 47. The next not-commented line is: `event.19.severity=1` which states the urgency with which to mark the event.

___ 48. Then you will find: `event.19.category=1` defines the status (alert or resolution) of the event

___ 49. `event.19.text=event.text.FanRemoved` defines the keyword to be used in the Event Text field. This capability represents what the CIMIT uniquely introduces in order to provide the highest possible accuracy and completeness of information.

- ___ 50. Using the same logic as in previous steps, look in **CompaqSNMPTrapResources.properties** for the string associated with this keyword. You will find the following entry:

```
event.text.FanRemoved=Fan Removed on Chassis { 0 } , Fan { 1 } .
```

- ___ 51. This line shows how two variables are substituted by the mapper to populate the **Event Text** field. The IBM Director alerting tools that exploit that field (in our previous examples: the event log and the ticker tape) can report which exact component of which specific subsystem has failed in the affected unit.

IMPORTANT: Customers can customize the message to contain text in their native language

- ___ 52. The text helps understanding what these variables are, but in order to know how they are defined, please return to **CompaqTrapFilter.map** and focus on the next entry you find

- ___ 53. `event.19.oid=1.3.6.1.4.1.232.0.6039` tells us the exact object identifier of the trap of which, in this case, only the final number (6039) is interesting to us

- ___ 54. Use Notepad.exe to open **C:\cpq\new_MIBs\cpqhlth.mib**

- ___ 55. In the file, make a search for “6039”. You should find the following section

```
cpqHe3FltTolFanRemoved TRAP-TYPE
    ENTERPRISE Compaq
    VARIABLES { sysName, cpqHoTrapFlags, cpqHeFltTolFanChassis,
                cpqHeFltTolFanIndex }
    DESCRIPTION
        "A Fault Tolerant Fan has been removed from the specified
        chassis and fan location."

    --#TYPE "Fan Removed"
    --#SUMMARY "The Fan Removed on Chassis %d, Fan %d."
    --#ARGUMENTS { 2, 3}
    --#SEVERITY CRITICAL
    --#TIMEINDEX 99
    --#STATE    DEGRADED

    ::= 6039
```

IMPORTANT: The trap numeric identifier is always put at the end of its related section

- ___ 56. This file tells us which information the MIB is capable of surfacing. The number and type of variables reflect the quantity and quality of information that the manufacturer allows to the SNMP based system management tools (including its own). In this case we can see four listed variables. That the list has to be considered as ordered from left to right.

- ___ 57. Going back to **CompaqTrapFilter.map**, skip the line (irrelevant for this discussion and always the same in all the mapped traps) that reads `event.19.srcname=1.3.6.1.2.1.1.5.0` and focus on the next four ones

- ___ 58. The first line is a comment that the CIMIT developer inserted to provide a simple and quick explanation of the meaning of the variable mentioned immediately. The second line contains the definition of the variable.

- ___ 59. `event.19.eventvar.index.0=4` means that

- The variable is of the EVENTVAR type. This type is used to build a custom Event Text string for a trap by indexing on the varbinds in the trap whose values will be placed into the Event Text.
- Within the definition of event 19, IBM Director associates this EVENTVAR instance with the index number “0”

- The EVENTVAR indexed as “0” assumes the same value as the variable with a varbind number of “4”, among the list that the manufacturer defines, for that given trap (6039), in its MIB.

NOTICE: The varbind number can be retrieved by using a “1based + 1” enumeration when counting from left to right in the list of variables defined by the MIB. The following table should help clarify

VARIABLE	ORDINAL NUMBER (A)	CORRECTION (B)	VARBIND NUMBER (A+B)
sysName	1	+1	2
cpqHoTrapFlags	2		3
cpqHeFltTolFanChassis	3		4
cpqHeFltTolFanIndex	4		5

___ 60. Having said this, you should now be able to understand how this EVENTVAR corresponds to `cpqHeFltTolFanChassis`

___ 61. Make a search in the MIB for the variable until you find the section that reads as follows:

```
cpqHeFltTolFanChassis OBJECT-TYPE
    SYNTAX      INTEGER
    ACCESS      read-only
    STATUS      mandatory
    DESCRIPTION
        "The System Chassis number."
    ::= { cpqHeFltTolFanEntry 1 }
```

___ 62. This section explains that `cpqHeFltTolFanChassis` represents the chassis number where the fan fault tolerant event has happened. Use the same rationale when reading the next not-commented line

___ 63. `event.19.eventvar.index.1=5` in fact, means that

- The variable is, again, of the EVENTVAR type
- Within event 19, IBM Director associates this EVENTVAR with the index number “1”
- The EVENTVAR indexed as “1” assumes the same value as the variable with a varbind number of “5”, among the list that the manufacturer defines, for that given trap (6039), in its MIB.

Therefore this EVENTVAR will carry the information about which specific fan was removed within the previously identified chassis

___ 64. `event.19.proceedwithnormaltrap=false` is the last entry for this trap mapping example, and it means that the corresponding (and considered “normal”) event type **SystemName.iso.org.dod.internet.private.enterprises.compaq.cpqHe3FltTolFanRemoved** will not be surfaced, by CIMIT, in the Director event log for the unit. The condition can be changed to “true” so that there will be two events logged for the same condition.

___ 65. Now, with the knowledge you have gained, extend the trap mapping in order to include the trap that is generated when fan redundancy is restored. Then test your modifications, remembering that any change to **CompaqTrapFilter.map** and **CompaqSNMPTrapResources.properties** requires a restart of the IBM Director Server service.

IMPORTANT: When you create the keywords and the textual entries, try to

- Reuse existing keywords

- To ensure a migration as transparent as possible, try to maintain consistency with the textual message that the manufacturer has put in its MIB
- Remember you can use your native language to be displayed in the Event Text field

TIP: Start by analyzing the event type string that is surfaced in the Event Log. In the last part of the string identify the words that should direct you to the MIB file that contains the definition of the trap. In our example, see how the letters in bold direct you to the cpqhlth.mib

cpq**He**3F**l**t**o**l**F**anRedundancyRestored

Then, in the cpqhlth.mib file, look for the above string and find out the trap definition and all the needed parameters

- ___ 66. Please find in appendix A, all the needed information from the MIB and an example of the modifications you could add in order to achieve the result

Further Extending the CIMIT Capabilities

In the previous section we have analyzed an example of mapping of a trap which was uniquely associated to a specific condition for the affected component: the FAN was REMOVED, the REDUNDANCY was LOST, etc...However, some trap types are re-used to notify the user of different conditions. For example, the MIBs often define a different typology of traps that correspond to the “status change” condition for the affected component. Those traps then use the different values of an internal variable, such as severity, to identify the exact status in which the affected component is (i.e.: The CONTROLLER STATUS has CHANGED: but the CONTROLLER might be now either POWERED OFF, or FAILED, or BACK TO NORMAL or in any other defined status). The CIMIT handles traps that contain this additional level of variability by introducing a second variable into the mapper called EVENTVARBIND. EVENTVARBIND is indexed on the varbinds of the trap the same way EVENTVAR is. However, the purpose is to build a query filter on the values of the varbinds that will map a unique Director event type to an instance of status change rather than building a unique Event Text string.

Let’s analyze how this is achieved and how to modify it. This time, we will start by understanding the MIB file contents.

- ___ 67. If all the previous steps have been successfully accomplished, we suggest you clear the IBM Director event log for the ProLiant system
- ___ 68. Now, use Notepad to open the following MIB file: **C:\new_MIBs\cpqida.mib**
- ___ 69. In the file, make a search for the 3029 event. You should find the following section

```
cpqDa5PhyDrvStatusChange TRAP-TYPE
    ENTERPRISE compaq
    VARIABLES { sysName, cpqHoTrapFlags, cpqDaPhyDrvStatus,
                cpqDaPhyDrvCntlrIndex, cpqDaPhyDrvBusNumber,
                cpqDaPhyDrvBay, cpqDaPhyDrvModel, cpqDaPhyDrvFWRev,
                cpqDaPhyDrvSerialNum, cpqDaPhyDrvFailureCode }
    DESCRIPTION
        "Physical Drive Status Change.

        This trap signifies that the agent has detected a change
        in the status of a drive array physical drive. The
        variable cpaDaPhyDrvStatus indicates the current
        physical drive status.

        User Action: If the physical drive status is failed(3) or
        predictiveFailure(4), replace the drive."

    --#TYPE "Physical Drive Status Change"
```

```
--#SUMMARY "Physical Drive Status is now %d."
--#ARGUMENTS { 2}
--#SEVERITY CRITICAL
--#TIMEINDEX 99
```

```
::= 3029
```

70. The description tells us clearly that this trap deals with physical drive status changes. As well, the description tells us also something more, identifying the `cpaDaPhyDrvStatus` variable as the carrier of the information about the status that the physical disk is, as the trap is sent.

71. Now, double-check again in the above list of variables and notice that such a variable does not exist! This seems to be a genuine and relatively harmless typo of the manufacturer's MIB developer (the typo will not affect the correct "functioning" of the MIB). You can cross-check that the correct name of the variable is:

```
cpqDaPhyDrvStatus
```

72. From the text we learn that when `cpqDaPhyDrvStatus` has a value of "3", then the disk is in "failed" state, and we also get to know that if the value is instead "4", then we have a PFA condition. But are these all the values that the variable can assume?

73. To answer this question, make a search in the MIB file for the `cpqDaPhyDrvStatus` variable. From the position you are currently at in the file, we suggest you search in the "up" direction.

74. Your answer is in section that starts with the entry `cpqDaPhyDrvStatus OBJECT-TYPE`

75. There, we learn that the variable can assume 4 values and we also find described the meaning of each of the status that the values correspond to

The following values are valid for the physical drive status:

```
other (1)
    Indicates that the instrument agent does not recognize
    the drive. You may need to upgrade your instrument agent
    and/or driver software.
ok (2)
    Indicates the drive is functioning properly.
failed (3)
    Indicates that the drive is no longer operating and
    should be replaced.
predictiveFailure(4)
    Indicates that the drive has a predictive failure error
    and should be replaced
```

76. Now, use Notepad.exe to open **CompaqTrapFilter.map** and focus on how trap 3029 is mapped. First of all, we notice that it corresponds to the "Physical Drive Failure" event and that it is the first of the trap mappings (it is listed as event "0"). Use the contents of the MIB and of **CompaqSNMPTrapResources.properties** to understand as much as possible from the entries.

77. You should be able to determine:

- Which logical structure will contain the event and will be shown in the Simple Event Filter Builder window (**Compaq.Intelligent Drive Array.Physical Drive.Failure**)
- What will be the Severity and Category of the event in IBM Director (**Fatal** and **Alert**)
- Which will be message that will be presented in the Event Text field (**Drive Array Device Failure (Slot {0}, Bus {1}, Bay {2})**)

- Which variables of the **cpqida.mib** correspond to the EVENTVAR {0}, {1} and {2} of this specific event (`cpqDaPhyDrvCntlIndex`, `cpqDaPhyDrvBusNumber`, `cpqDaPhyDrvBay`)

- That the trap mapper will not ask IBM Director to also process the trap in its standard format

___ 78. The last line of the section presents instead a new construct and contains the definition of a variable of the EVENTVARBIND type.

___ 79. `event.0.eventvarbind.index.0=4==3` means that:

- Within event type 0, IBM Director associates this EVENTVARBIND with the index number “0”
- The EVENTVARBIND indexed as “0” assumes the same value as the one that the TRAP-TYPE variable with a varbind number of “4” (among the list that the manufacturer defines, for that given trap (3029), in its MIB) has when it is equal to “3”

Therefore you can now understand how this EVENTVARBIND will carry the information that the status of the physical disk drive has changed to FAILED

___ 80. Now move to the next defined trap mapping (Physical Drive Predictive Failure, event “1”)

___ 81. Notice how this event has only 4 differences (reported below in **bold**) from the previous one:

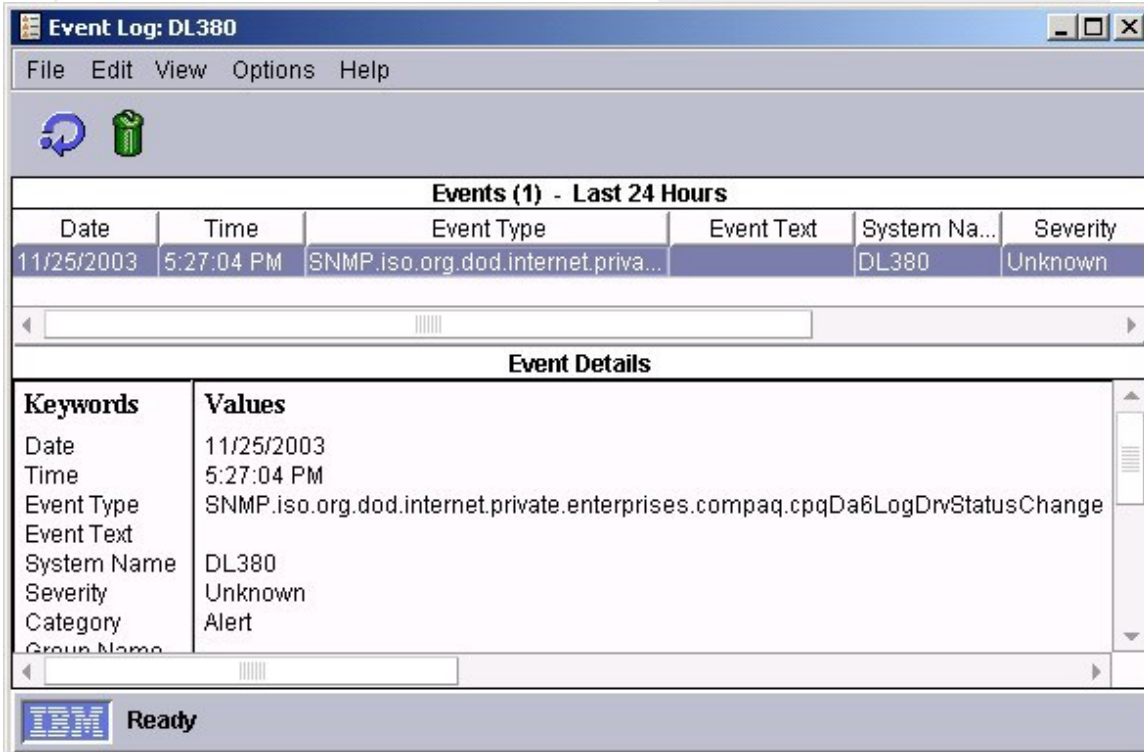
- It is contained in its unique logical structure (`event.1.keyword.2=event.text.pfa`)
- It has a lower severity (`event.1.severity=1`)
- It will carry a different Event Text (`event.1.text=event.text.PhysDrivePFA`)

but, most important,

- For the mapping to the Director Event Type to occur, not only must trap 3029 be sent, but also the “Physical Drive Status” variable has to assume a specific value (`event.1.eventvarbind.index.0=4==4`) which is not the same as in event “0”

___ 82. So theoretically, all the potential values of the `cpqDaPhyDrvStatus` variable should be reflected in a separate IBM Director native event, however, the CIMIT developer decided to map only the variable values that were thought to be more relevant and useful

___ 83. Since, as seen previously, new traps have been defined in the latest available MIBs, we invite you to test the gained knowledge by updating **CompaqTrapFilter.map** and **CompaqSNMPTrapResources.properties** in order to let IBM Director properly face the following status change



IMPORTANT: IF YOU PULL OR INSERT ONE DRIVE TO TEST YOUR CHANGES, ENSURE THAT ANY REBUILD OPERATION HAS SUCCESSFULLY COMPLETED BEFORE PERFORMING ANOTHER ACTION ON THE DRIVES. This can be checked by using the hp Array Configuration Utility which can be launched by clicking on <Start> <Programs> <hp Array Configuration Utility> <hp Array Configuration Utility>

PLEASE, CONSULT WITH YOUR INSTRUCTOR IF YOU ARE NOT 100% SURE OF WHICH IS THE CURRENT STATUS OF YOUR DRIVES

Lab 4. Testing IBM Director Agent Capabilities on the HP system

Time Required: 60 minutes

Scenario

Following on the previous scenarios the customer seems extremely happy of the capabilities of IBM Director and he looks extremely satisfied by the level of integration that has been shown. Now it is time to move one step further by demonstrating what could be further achieved by installing the IBM Director Agent on the HP system.

Objectives

In this lab you will learn how to exploit IBM Director Agent presence in the HP unit by:

- Enforcing strong security for the communication between the monitored and the monitoring system
- Using the enhanced Inventory capabilities offered by the Agent
- Using Process Management in conjunction with Remote Control and Resource Monitors
- Using the Software Distribution Premium Edition

Lab Activity Preparation

- Ensure that IBM Director Server is installed on the management server.
- Double-check with your trainer about the location of the Server Plus Pack content
- Double-check with your trainer about the location of the MS Hotfix

Customizing the IBM Director Agent unattended installation response file

- ___ 1. On your IBM Director Server unit, create a folder on the desktop called **IDAgent**
- ___ 2. Insert the IBM Director CD-ROM in the server running IBM Director Server and copy the contents of `x:\director\agent\windows\i386` to the IDAgent folder
- ___ 3. Use Windows Explorer to open the IDAgent folder and modify the attributes of the **diragent.rsp** file so that its contents can be changed
- ___ 4. Modify the file to match the following changes:

```
RemoteControl = Y
```

```
WebBasedAccess = Y
```

```
P2PHelpFiles = Y
```

```
EncryptCommunication = Y
```

Driver.NETBIOS = 0

WakeOnLan = 1

AddKnownServerAddress=TCPIP::192.168.x.200

- ___ 5. In the IBM Director Console, click on <Options> <Encryption Administration>
- ___ 6. In the Encryption Administration window select the <Enable encryption of data using:> checkbox and select **Triple Data Encryption Standard**. Click on <OK> to confirm
- ___ 7. Read the warning message and confirm by clicking on <Yes>. As the operation is successful, acknowledge the related pop-up message



Performing the unattended installation of IBM Director Agent

- ___ 8. From your IBM Director Console, click on <Options> <Discovery Preferences> and ensure that the two checkboxes (Automatically secure unsecured systems and Auto-add unknown agents which contact server) are both selected
- ___ 9. Copy the IDAgent folder to the root of the C: drive of the HP unit
- ___ 10. At the HP unit, open a command prompt and start the installation with the following command

C:\IDAgent\ibmsetup UNATTENDED rsp="C:\IDAgent\diragent.rsp" WAITFORME

NOTE: The installation could be run by exploiting the presence of the HP Insight Manager server. In this way, multiple units could be simultaneously installed with the IBM Director Agent

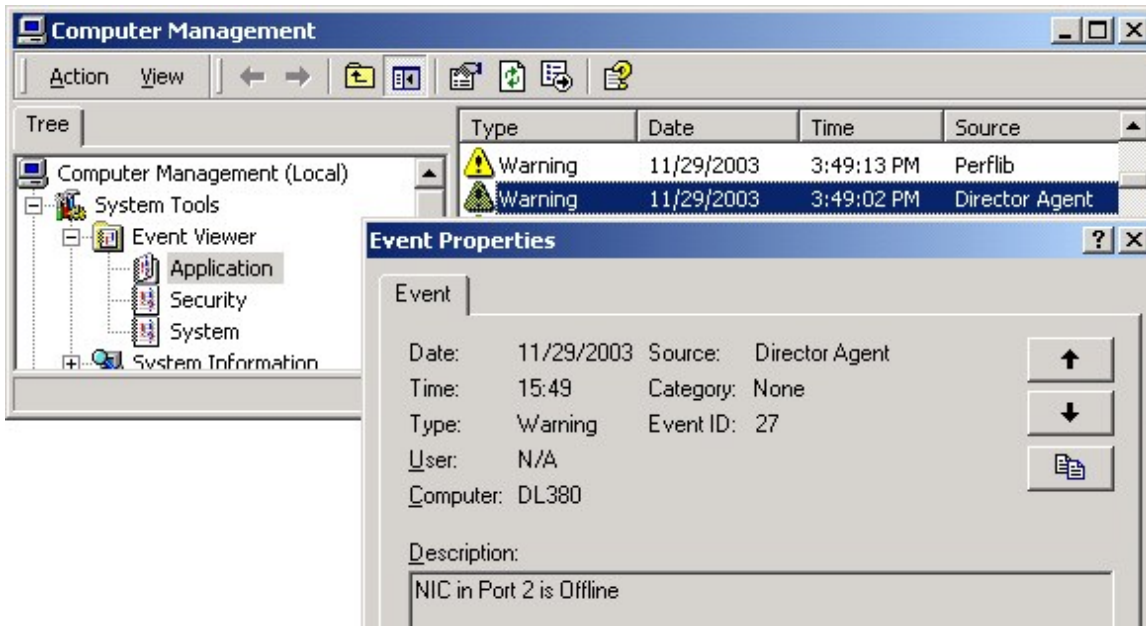
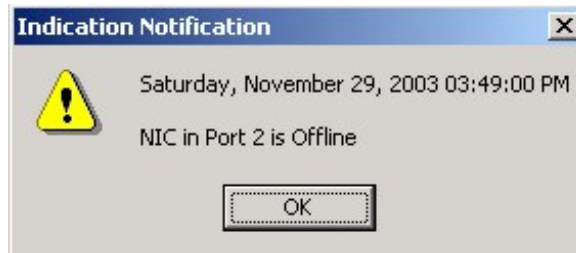
- ___ 11. Wait for the procedure to complete and then verify in the system's event log, under the Application category, that the MsiInstaller returns the success of the operation. As well, check under the list of running services that

IBM Director Agent Web Server

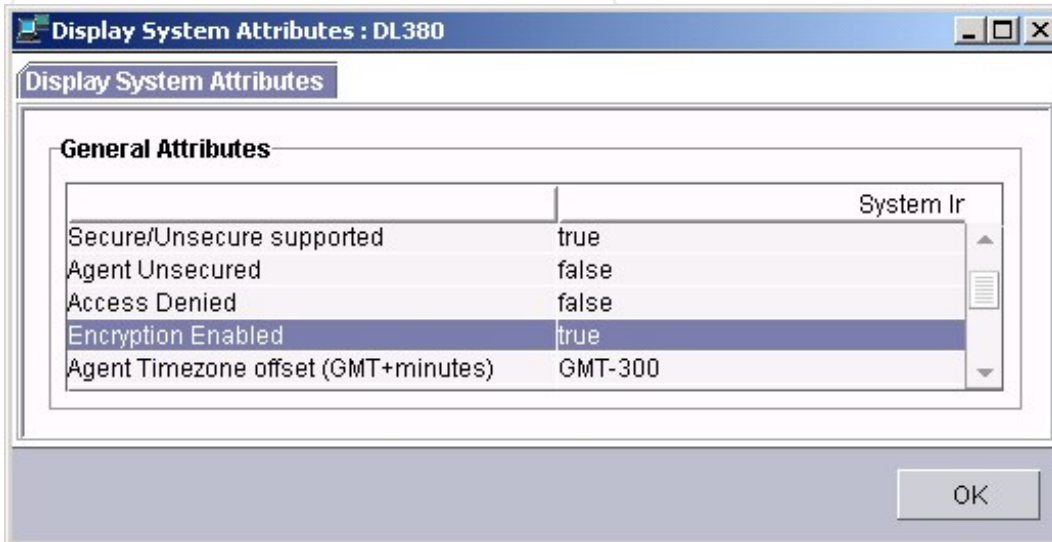
IBM Director Support Program

Are both listed and running

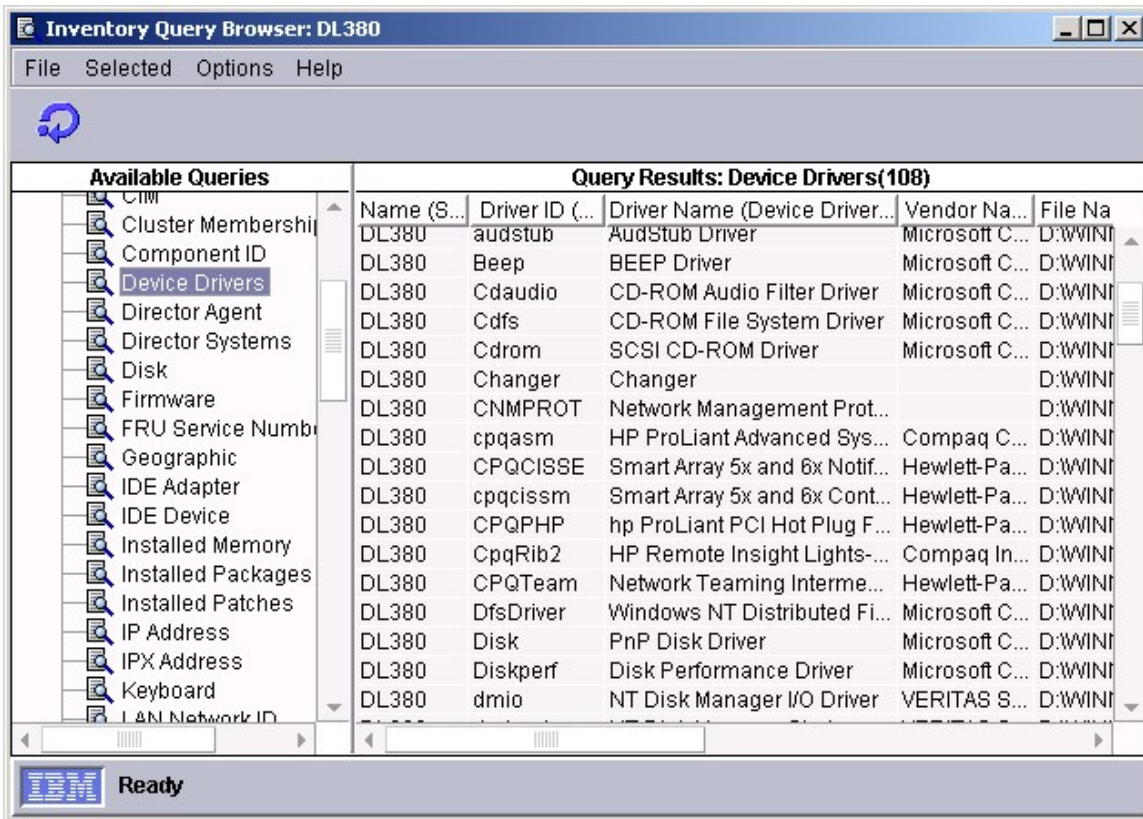
NOTE: Due to your existing setup, you should be noticing that the agent is running also by the appearing of a pop-up message to indicate that one of the NICs is offline. A similar entry is also present in the event log (if you want to turn that off, Disable the offending NIC in the Network Configuration window).



- ___ 12. Simulating a scheduled reboot, you can now restart the ProLiant system.
- ___ 13. Once the unit is back online, verify on the IBM Director Console that a new object of the “IBM Director System” type, representing the HP server, has been added to the list of discovered devices.
- ___ 14. Double-click on the object and verify in the Display System Attributes window that the communication is secure by the enablement of the triple DES encryption algorithm



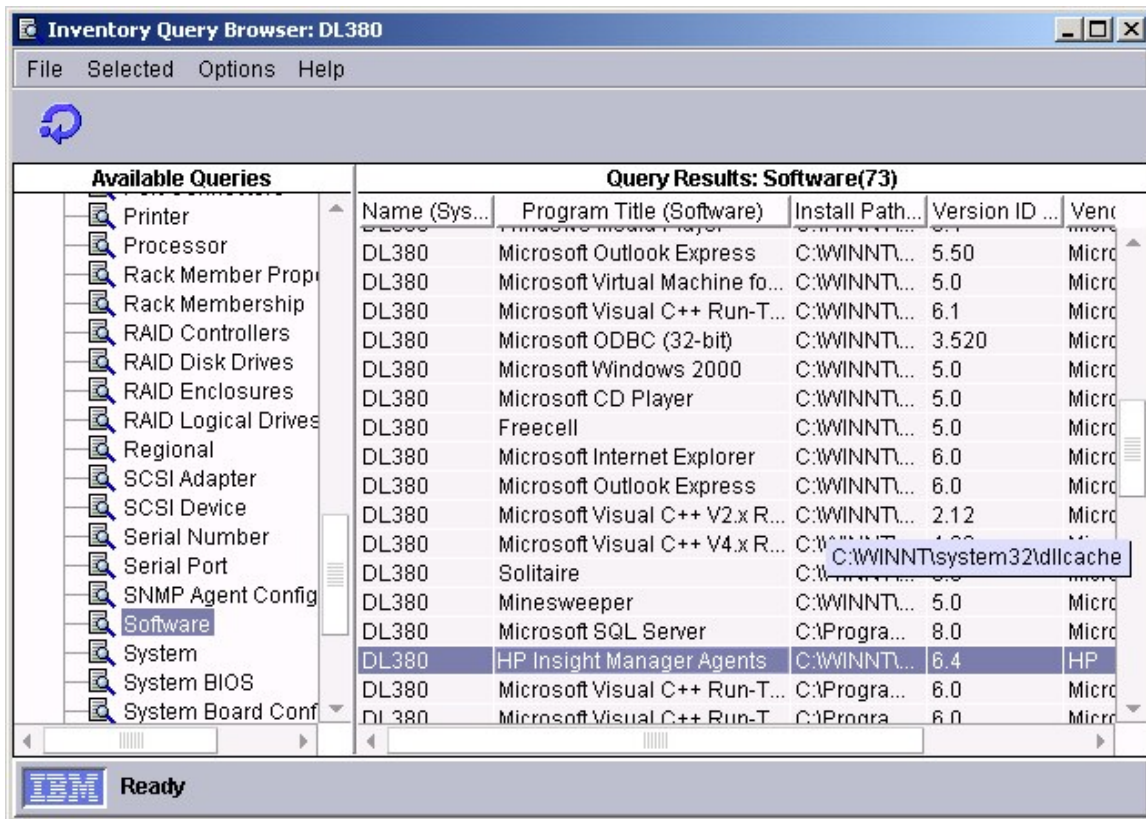
- 15. Right-click on the object and click on <Perform Inventory Collection> to ensure that the inventory is populated
- 16. Right-click on the object and select <View Inventory>. Verify the quantity and quality of information that you can now achieve by comparing this with what was available through the SNMP object representing the same system. What inventory did you get from CIM with just the CIM agent on the box?



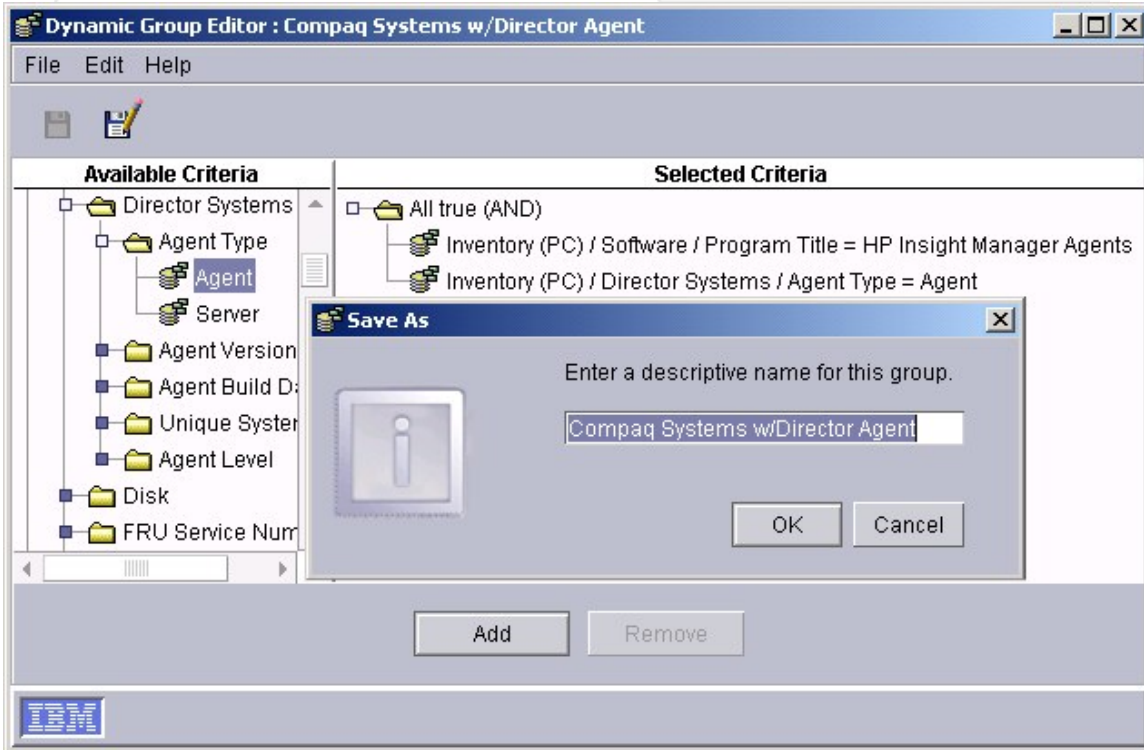
- 17. From the Inventory Query Browser window, select <Options> <Edit Software Dictionary>
- 18. Fill in the fields as follows

Title: **HP Insight Manager Agents**
 Vendor: **HP**
 Entry Type: **Systems Management**
 Version: **6.4**

- ___ 19. Now click on <Selected> <Add File> and then press on <OK> to insert the file information manually
- ___ 20. Type in **cmgmserv.exe** as the associated file name and click on <OK>
- ___ 21. Save the new entry of the software dictionary, verify it is now correctly listed and then close the Inventory Software Dictionary Editor window
- ___ 22. Perform the inventory collection again and this time, verify that the inventory contains, under the Software category, the **HP Insight Manager Agents** entry

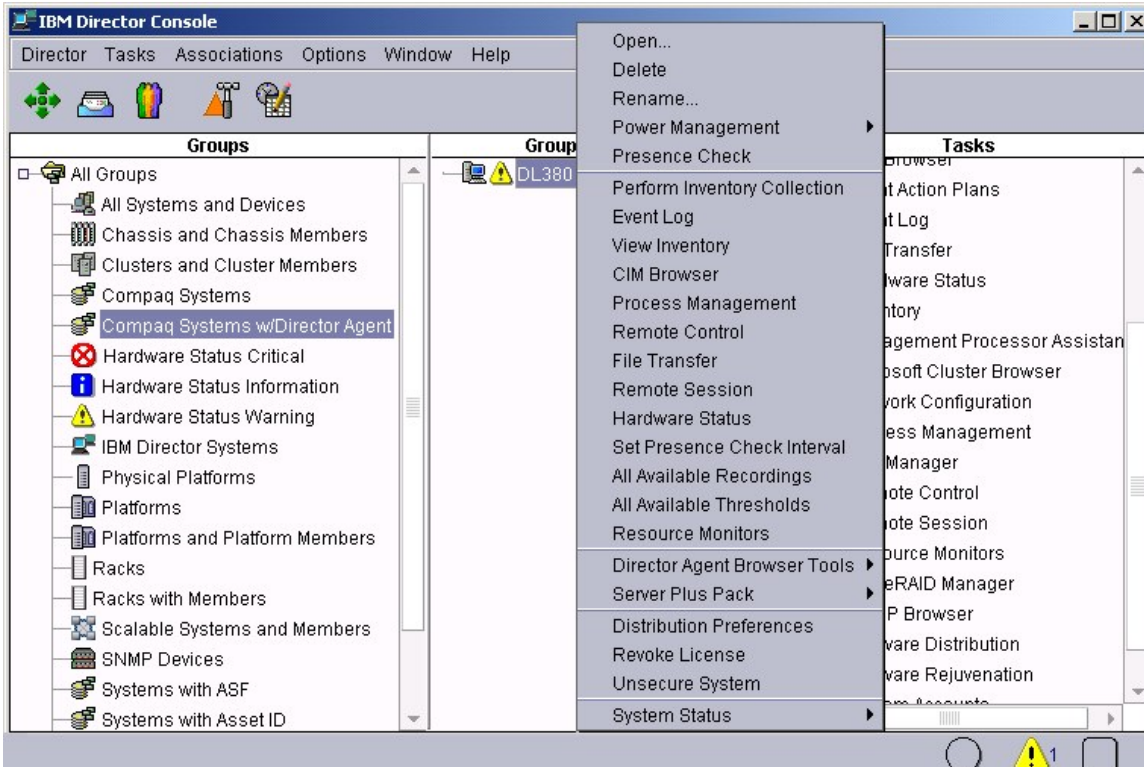


- ___ 23. Now right-click on the Groups pane and select <New dynamic...>
- ___ 24. Add the **HP Insight Manager Agents** criteria as learnt in the previous labs
- ___ 25. Then, expand the Inventory (PC) tree and then the Director Systems and, with that, the Agent Type branches.
- ___ 26. Select **Agent** and click on <Add>
- ___ 27. Confirm to use the “And” logical operator by clicking on <OK> on the window that appears on screen
- ___ 28. Save the new group as **Compaq Servers w/Director Agent** and verify that the new discovered object is the only member of that group



Exploring the added capabilities

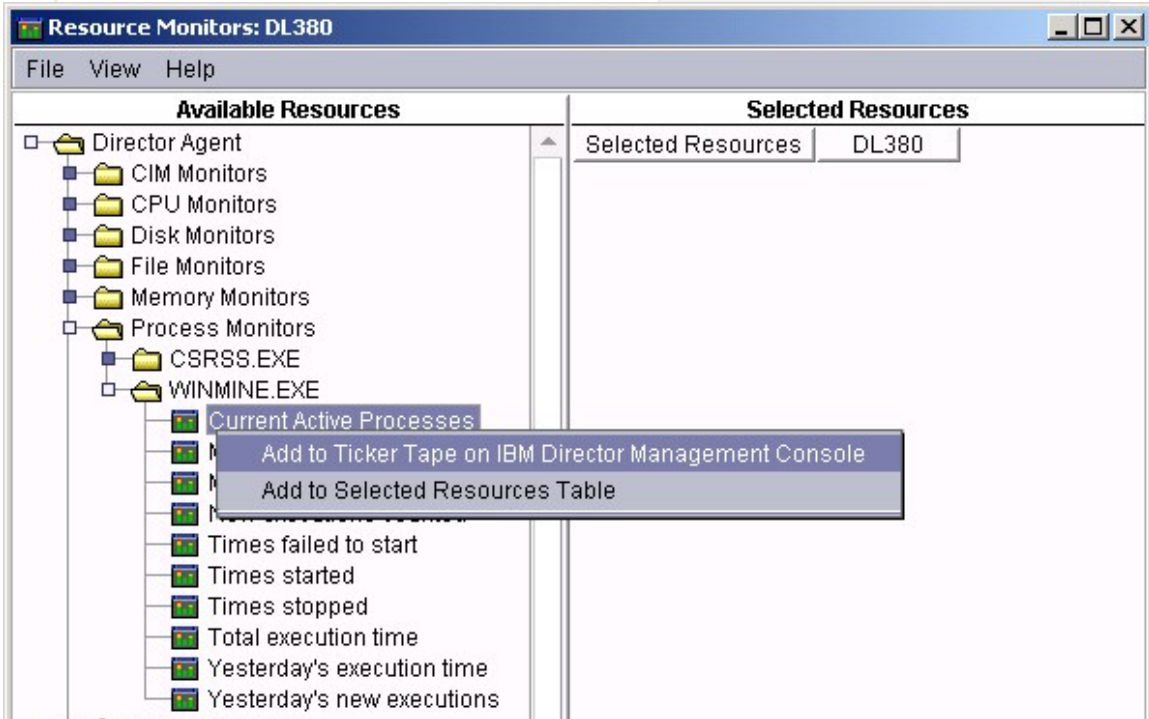
29. From your IBM Director Console, right-click on the HP object and notice all the added capabilities



- ___ 30. You should have already noticed, above, the improvements of the View Inventory task. Let's focus on the application of some of the other added features
- ___ 31. Select <Process Management> and notice that the related window displays the list of all the applications that are currently running on the system.
- ___ 32. Now click on <Actions> <Execute Command>, then type **winmine** as the command and click on <Execute>
- ___ 33. As the program appears now at the bottom of the list of running applications, close the **Execute Command** window. Instead, right-click on the ProLiant object in the IBM Director Console again and select <Remote Control> to verify that the Minesweeper application has been launched
- ___ 34. In the **Remote Control** window, select <File> <Start Session Logging...> or click on the red RECORD button at the bottom of the screen.
- ___ 35. Type in a custom name for the recording and confirm.
- ___ 36. Start a new game of Minesweeper and play it for a few seconds. Then, either select <File> <Stop Session Logging...> or click on the STOP button at the bottom of the screen.
- ___ 37. Close the **Remote Control** session and, in the <Tasks> pane of the IBM Director Console, expand the <Remote Control> tree to reveal the custom name that you gave to the just performed recording.
- ___ 38. Double click on the name of the session and select the **Play** button at the bottom of the screen to review what you previously performed on screen. Close this window when done.
- ___ 39. From the **Process Management** window, now, right-click on the entry related to the Minesweeper and select <Add To Monitors>.
- ___ 40. Drag and drop the <Resource Monitor> task to the ProLiant icon in the IBM Director Console
- ___ 41. In the **Resource Monitors** window, expand the <Director Agent> tree and explore the content of the various branches. Compare the capabilities provided by the Director Agent with what is possible through the management of the SNMP object.

IMPORTANT: Notice how the Director Agent provides very intuitive access to monitors that are also present within the SNMP-only solution (i.e.: CPU utilization, and as you will now see, Process Monitors) and completes such a solution by even adding more monitors.

- ___ 42. Focus your attention on the **Process Monitors** section, where you should find the WINMINE.EXE entry you just added.
- ___ 43. Under WINMINE.EXE, right click on <Current Active Processes> and select <Add to Ticker Tape on IBM Director Management Console>

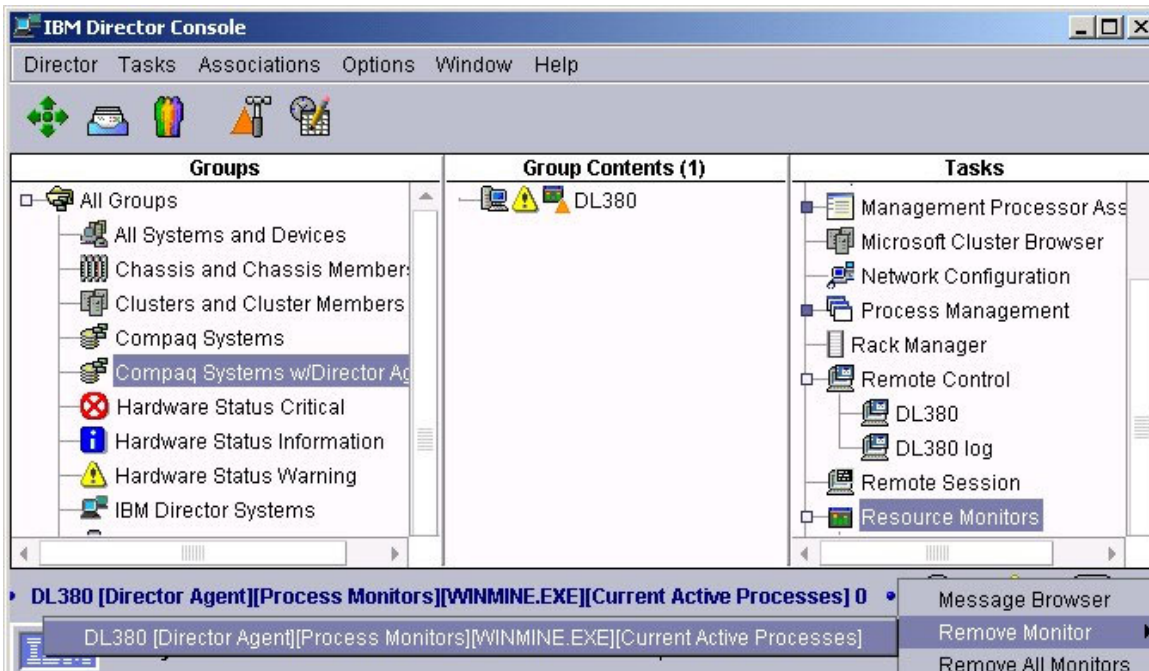


44. Check on the IBM Director Console that a message (this time blue) appears on the “Ticker Tape” area, showing the value of the monitored variable.

NOTE: It might take a few seconds for the data to be collected, so wait until the value is correctly displayed

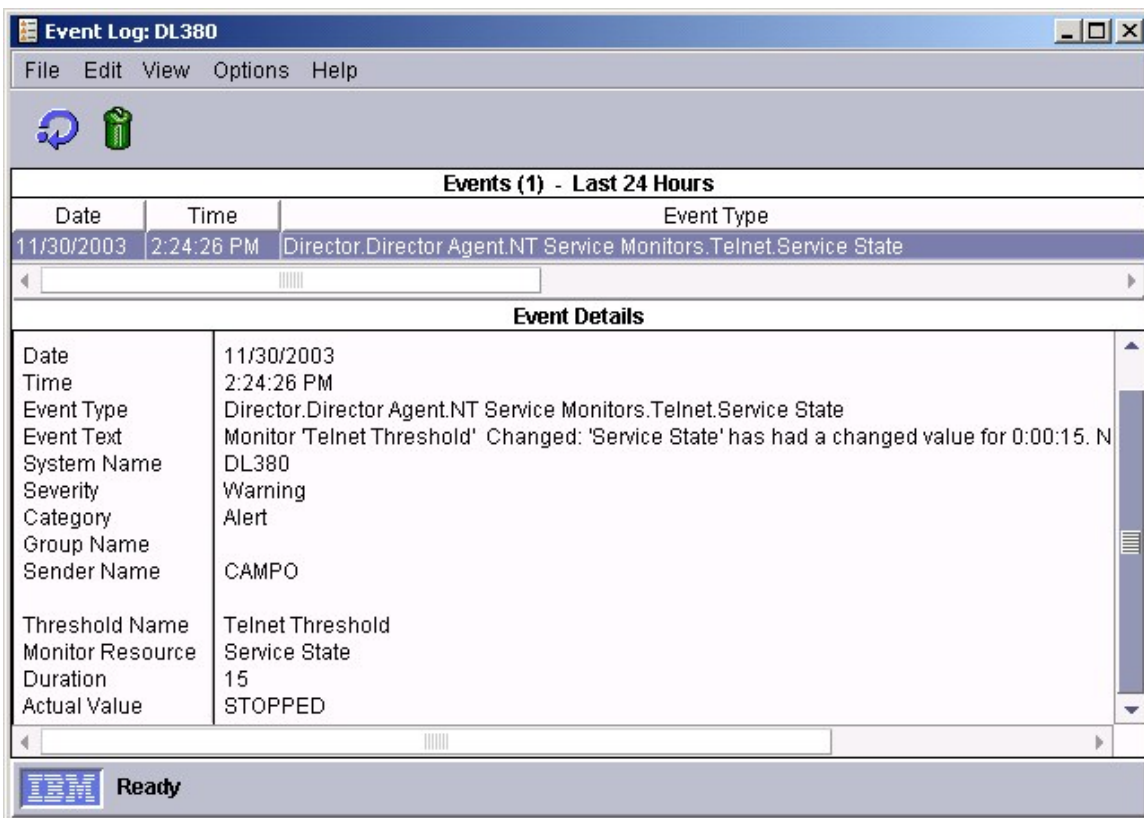
45. From the Process Management window, close the **winmine.exe** application, and verify the change of value on the Ticker Tape

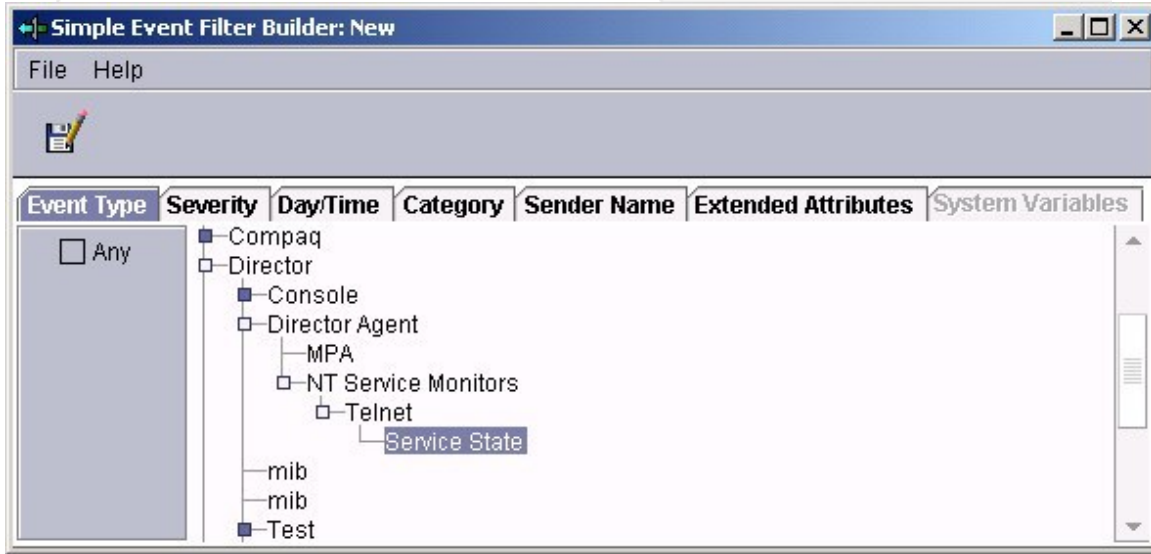
46. Right-click on the “Ticker Tape” area and select <Remove Monitor> <SystemName [Director Agent][Process Monitors][WINMINE.EXE][Current Active Processes]>



47. In the Process Management window, select the <Services> tab and browse the list until you find the **Telnet** entry. Right-click on the entry and start the service.
48. As the service is in “Running” status, right click on the entry again and select <Add Service Threshold>
49. In the Service Monitor Threshold window, type **Telnet Threshold** in the Name field.
50. Then ensure that both <Enabled to generate events> and <Generate events on value change> are selected.
51. Change the Minimum Duration value to 10 seconds and click on <OK> to close the window.
52. Now from the Process Management window, stop the telnet service and verify, after the 10 seconds timeout has expired, that an event is generated in the Director Event Log of the ProLiant unit

NOTE: Take note of the exact path that describes how this event type is published, and verify this by opening one instance of the Simple Event Filter Builder window. This will help you understand how to properly setup an **Event Action Plan** if you wanted to surface the event in a way different than the default action of appending an entry to the Event Log.





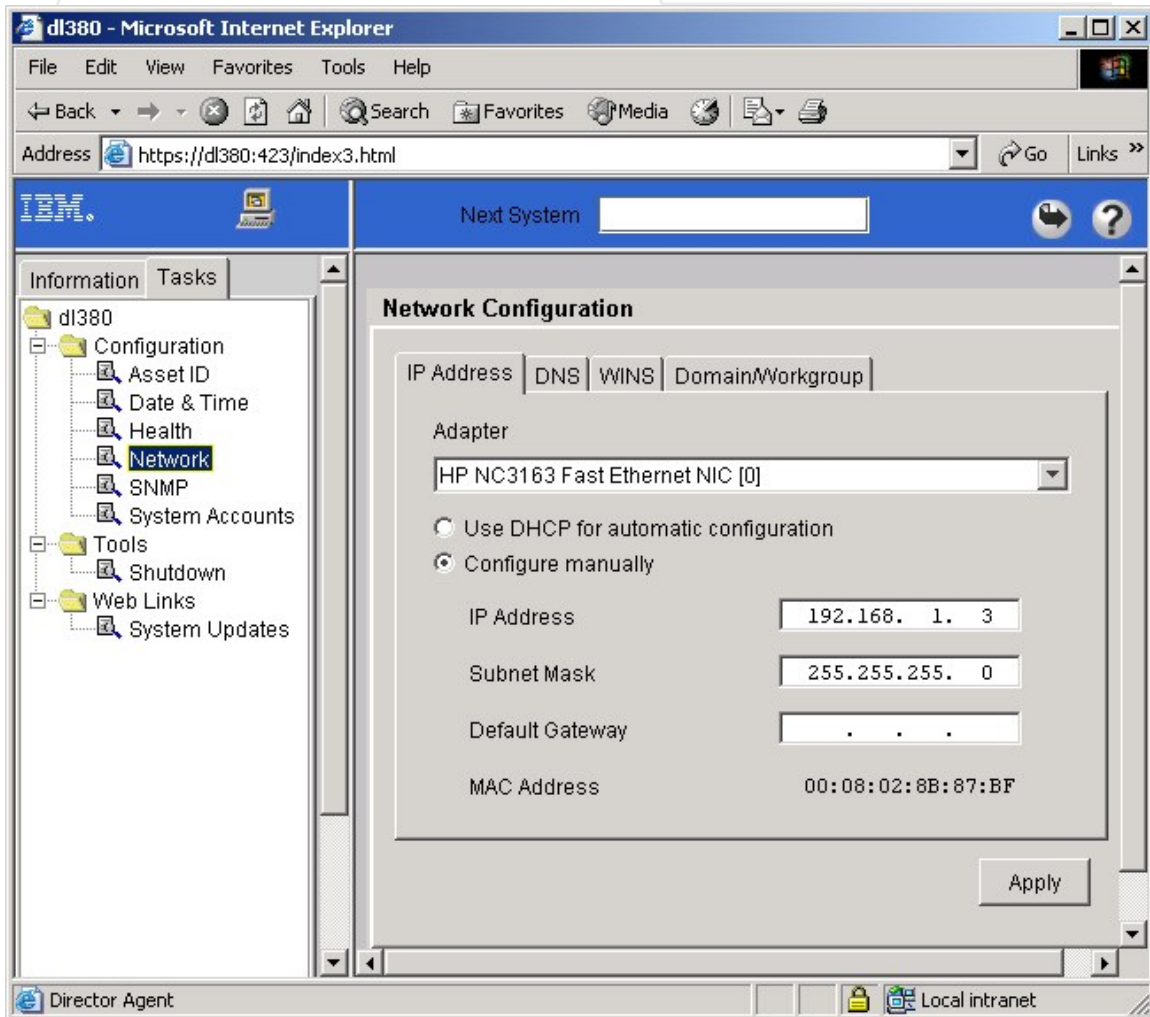
- ___ 53. Verify now the <File Transfer> and the <Remote Session>
- ___ 54. A few words have to be spent about the capabilities of the <Hardware Status> menu. In your configuration, it should show the information about the lack of connectivity for one of the NICs. However, this tool is not capable of detecting the status of all of the HP hardware unless the HP systems management software publishes this information in the CIM layer of the operating system using the same set of CIM classnames that the native Director agent uses.

NOTE: As previously seen, this doesn't mean that IBM Director cannot receive notifications of changes of status of HP hardware components, but this is done by exploiting the SNMP protocol and the traps that the HP systems management software sends out (as its primary mean of communication) to HP Insight Manager 7

- ___ 55. You can verify this by pulling again one of the fans, and noticing that the **Environmental** section of the **Hardware Status** window doesn't detect the change. Since, as a result of this action, an SNMP trap is generated by the HP Systems Management Agents, you can check the "Director" Event Log of the ProLiant unit to verify that the alert condition has been correctly detected
- ___ 56. The last entry that you should now explore (Director Agent Browser Tools) reveals a set of tasks that could be extremely useful when doing remote management of the units. Remember that all of these tasks can also be performed through the web interface available as you connect through to port 411 of the ProLiant unit IP Address

NOTE: In reality IBM Director uses SSL encryption to transmit the data, so, you will be automatically redirected to port 423 and your browser will automatically switch to HTTPS

If you wish to do so, please explore the information that is available through this interface



Using the Software Distribution task to deploy Server Plus Pack components and other software

The Software Distribution task that is included within IBM Director, offers the capability of importing, building and silently distributing system updates and other software to managed systems. The capabilities of this task depend on the edition that the user is licensed to use.

IBM Director ships with the Standard Edition of the tool, which allows only for importing software that is distributed by IBM by using the Director Update Assistant wizard. The tool can import from the UpdateXpress media, the IBM Director CDs and from files downloaded from an IBM Web site. In our scenario, the customer could use the tool to distribute select components of the Server Plus Pack (Capacity Manager, System Availability, Software Rejuvenation)

By purchasing the Premium Edition, the user has the chance to:

- Import software that is not distributed by IBM and build a software package using one of the following wizards:
 - o InstallShield Package wizard (for Windows)
 - o Microsoft Windows Installer Package wizard (for Windows)
 - o RPM Package wizard (for Linux)
- Import software that is distributed by IBM and build a software package using the Director Update Assistant wizard

- Import non-IBM or IBM software and build a software package using the Custom Package Editor, which is a custom alternative to using a wizard
- Export a software package for use on another management server
- Import a software package created in IBM Director using the Director File Package wizard

Your IBM Director system has been updated to contain the Software Distribution Premium Edition. We will test its capabilities in distributing both IBM and other vendors' software

Deploying a Microsoft Hotfix

In the following instructions, we will explore how to use the Software Distribution Premium Edition tool to distribute a MS Hotfix to the HP unit. We will assume the presence of the code on the following location of the IBM Director Server:

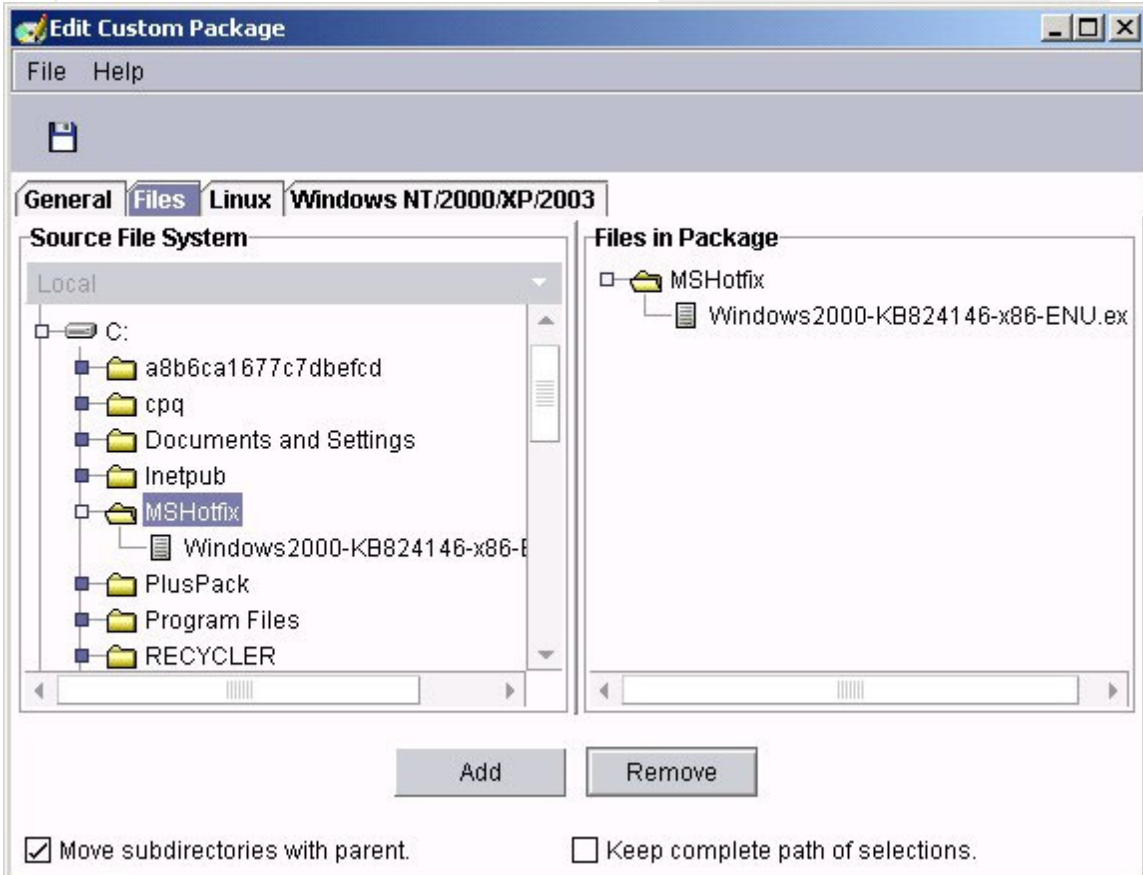
C:\MSHotfix

Please double check with your instructor if this differs and modify, in the following instructions, any reference to that path as appropriate

57. In the IBM Director Console, from the list of tasks, double click on <Software Distribution>
58. In the Software Distribution Manager window, double-click on <Custom Package Editor>

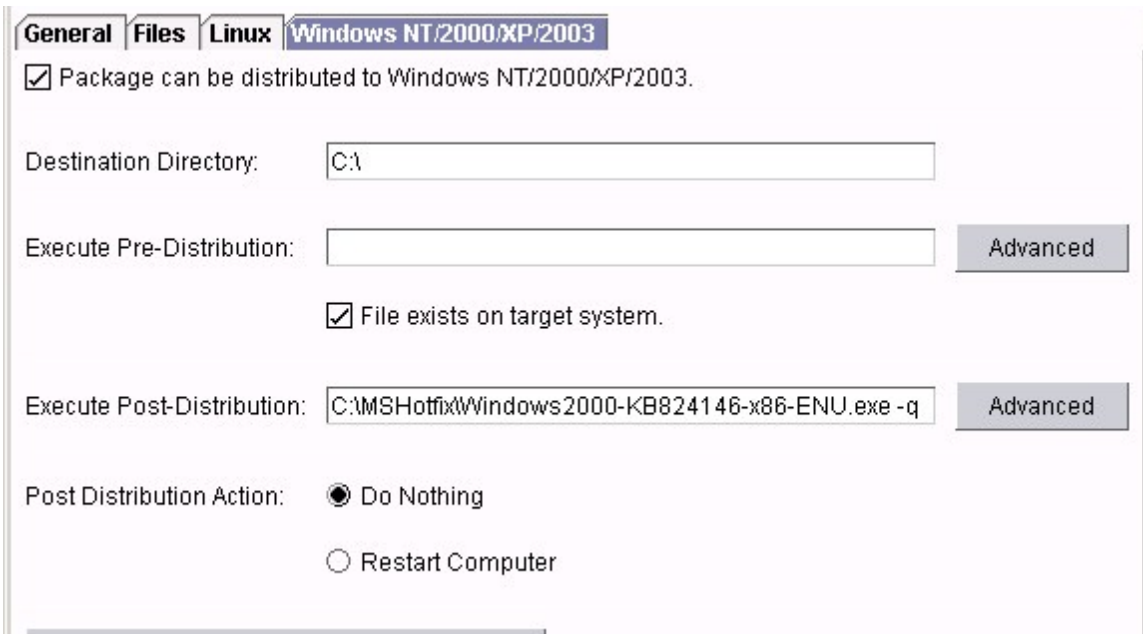


59. In the Create Custom Package window, ensure you are in the **General** tab and type **Blaster Worm Hotfix** as the package name
60. Then, select the **Files** tab and expand the contents of the **C:** drive
61. Select the <MSHotfix> directory and, ensuring that the <Move Subdirectories with parent> is selected, click on <Add>

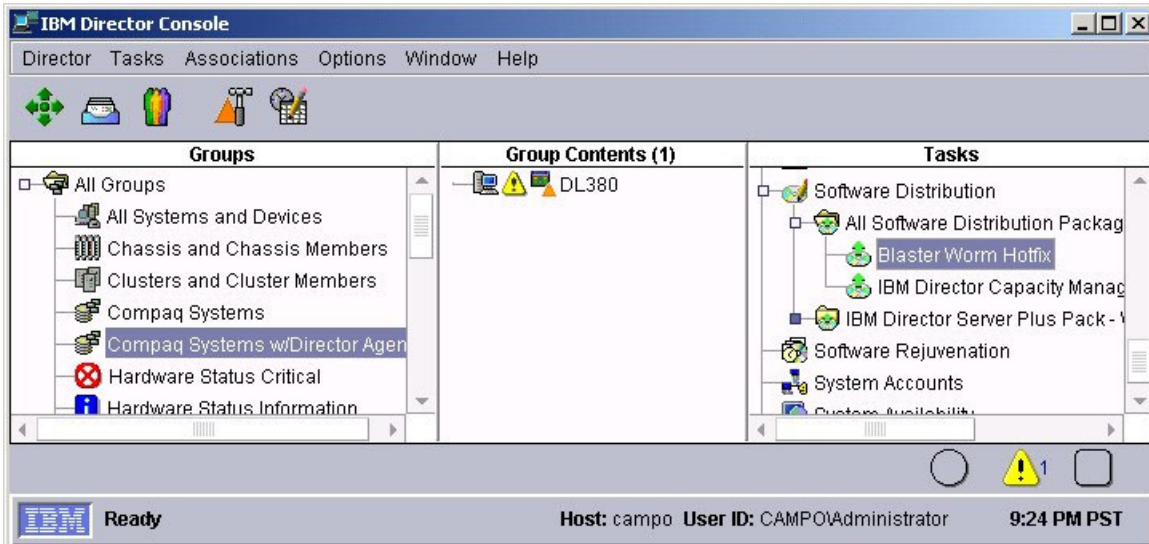


62. Now move to the WindowsNT/2000/XP/2003 tab and select the <Package can be distributed to Windows NT/2000/XP/2003> checkbox

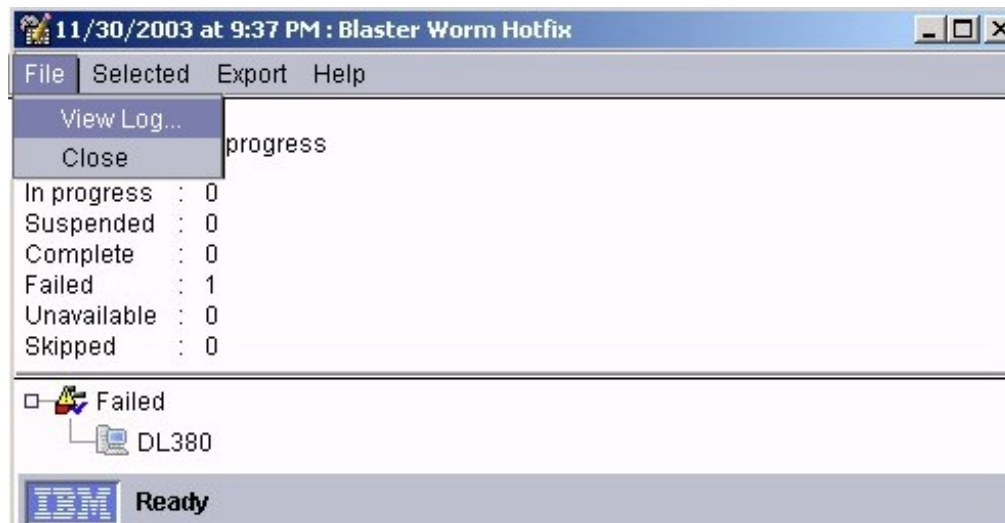
63. As destination directory, type C:\ and, in the Execute Post-Distribution field, type C:\MSHotfix\Windows2000-KB824146-x86-ENU.exe -q



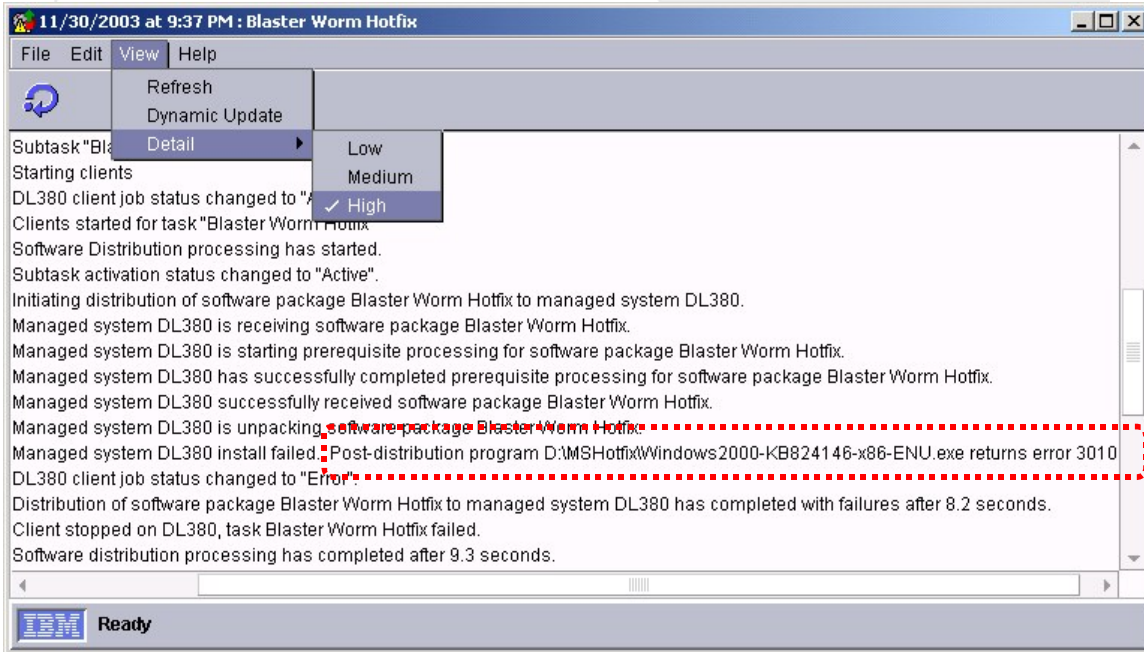
64. Click on the <Save> icon to close the Custom Package Editor window and notice in the IBM Director Console, the presence of the newly created package



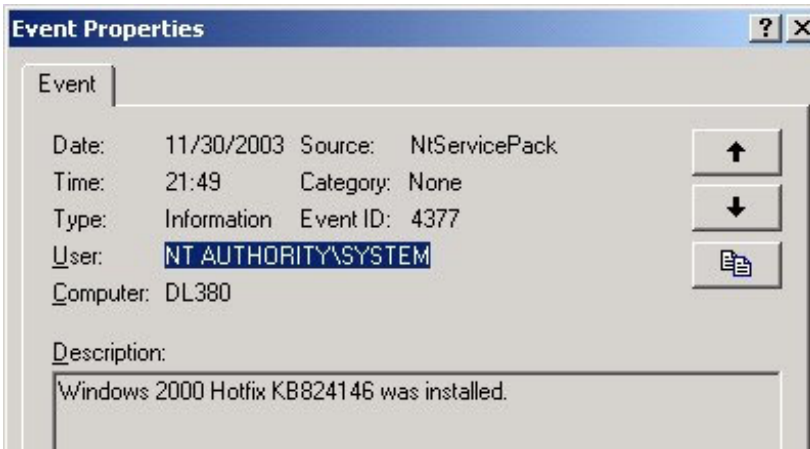
65. Drag and drop the task to the Compaq Servers w/Director Agent group, and select the <Execute Now> button as the option is presented on screen
66. Wait until the task appears to fail and click on <File> <View Log>

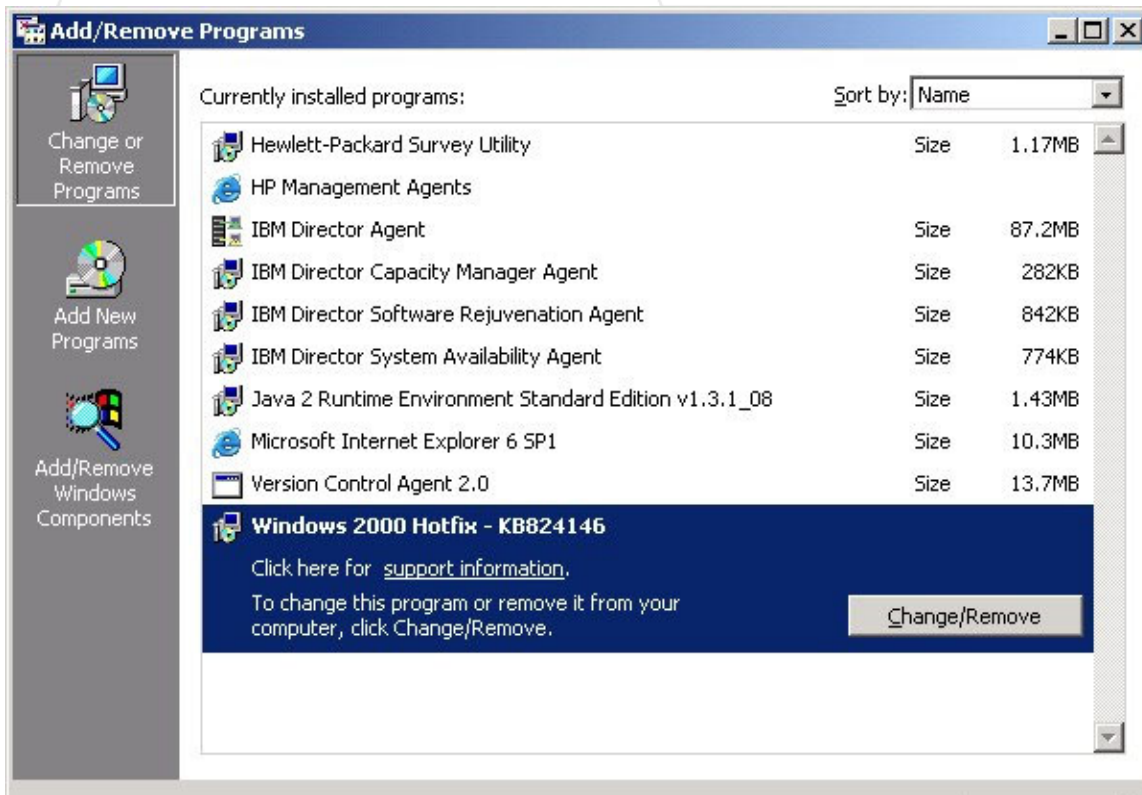


67. In the Log window, click on <View> <Detail> and select **High**
68. Read the log and find out that what generated the “failed” status is the fact that the Microsoft application returned an error code of “3010”.
69. As documented in the following Microsoft Knowledge Base article <http://www.microsoft.com/smsrver/downloads/20/servicepacks/sms20sp3/operation.asp>, you can learn that this code translates to “ERROR_SUCCESS_REBOOT_REQUIRED” which means that “The requested operation is successful. Changes will not be effective until the system is rebooted”.



- ___ 70. Software Distribution interprets anything other than “0” as a failure so, regardless of the bogus error message, the patch has been correctly installed, and the ProLiant unit will be rebooting in a few seconds.
- ___ 71. As the unit has rebooted, you can verify that both in the Control Panel and in the Windows 2000 Event Log, that the installation was successful





Deploying a component of the HP ProLiant Support Pack for Microsoft Windows 2000

In the following instructions, we will explore how to use the Software Distribution Premium Edition tool to deploy software updates for components of the HP unit. We will demonstrate how the tool can be used to update the drivers of the NIC in your ProLiant by exploiting the script available in the HP ProLiant Support Pack. We will assume the presence of the code on the following location of the IBM Director Server:

C:\Repository

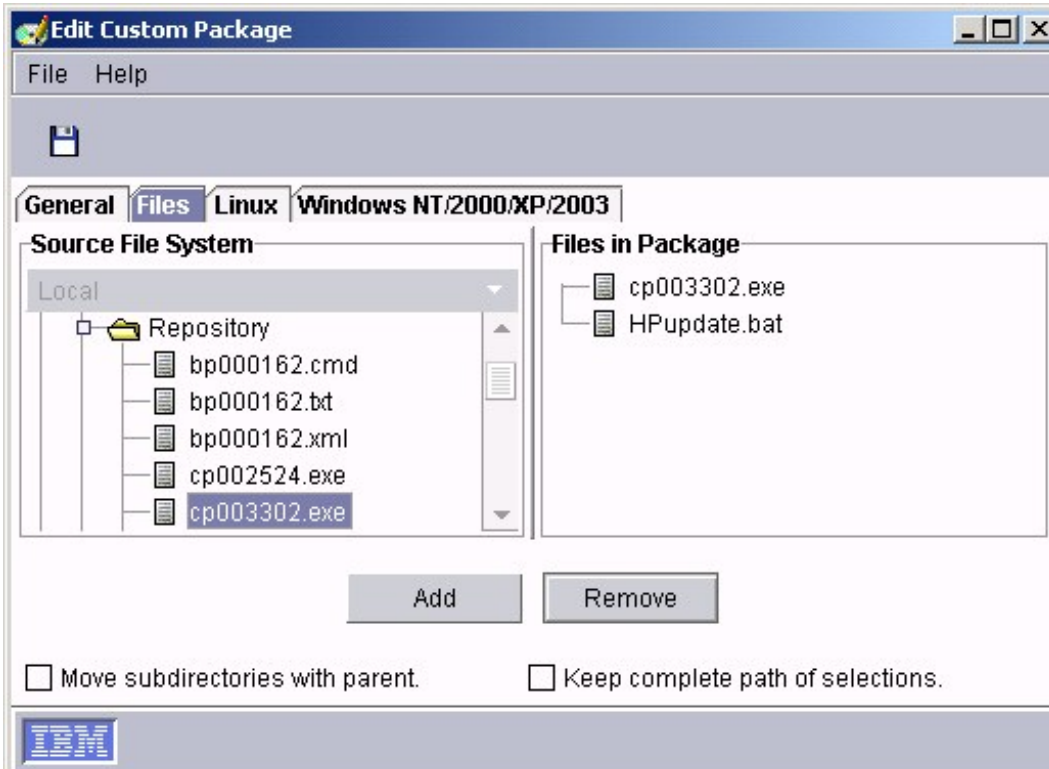
Please double check with your instructor if this differs and modify, in the following instructions, any reference to that path as appropriate

- ___ 72. At the IBM Director Server system, point your browser to the **C:\Repository** folder and edit **bp000162.cmd**
- ___ 73. After having determined which model of NIC you have in your ProLiant unit, remove most of the entries of the batch. Keep the lines referring to the update package specific to your NIC (add the full path and the /force parameter) and ensure the batch looks like the following one

```
@echo off
echo hp ProLiant Support Pack for Microsoft Windows 2000
echo -----
set _cpq_reboot_reqd=
echo Installing hp ProLiant NC31xx Fast Ethernet NIC Driver for Windows 2000 ...
C:\cp003302.exe /silent /force
if "%errorlevel%"=="2" set _cpq_reboot_reqd=yes
if "%_cpq_reboot_reqd%"=="yes" echo One or more components require a reboot
echo Installation complete
pause
```


IMPORTANT: THE PACKAGE YOU HAVE TO LAUNCH MIGHT DIFFER, DEPENDING ON THE UNIT YOU HAVE AVAILABLE. PLEASE DOUBLE CHECK WITH YOUR INSTRUCTOR

- ___ 74. Save this file as **C:\Repository\HPupdate.bat**
- ___ 75. In the IBM Director Console, from the list of tasks, double click on <Software Distribution>
- ___ 76. In the Software Distribution Manager window, double-click on <Custom Package Editor>
- ___ 77. In the Create Custom Package window, ensure you are in the **General** tab and type **HP NIC Update** as the package name
- ___ 78. Then, select the **Files** tab and expand the contents of the C: drive
- ___ 79. Expand the <Repository> directory, select **HPupdate.bat** and click on <Add>. Repeat the procedure for the .exe package that is called by the batch file. In our case we add **cp003302.exe**



- ___ 80. Now move to the **WindowsNT/2000/XP/2003** tab and select the <Package can be distributed to Windows NT/2000/XP/2003> checkbox
- ___ 81. As destination directory, type **C:** and, in the **Execute Post-Distribution** field, type **C:\HPupdate.bat**

Package can be distributed to Windows NT/2000/XP/2003.

Destination Directory:

Execute Pre-Distribution: Advanced

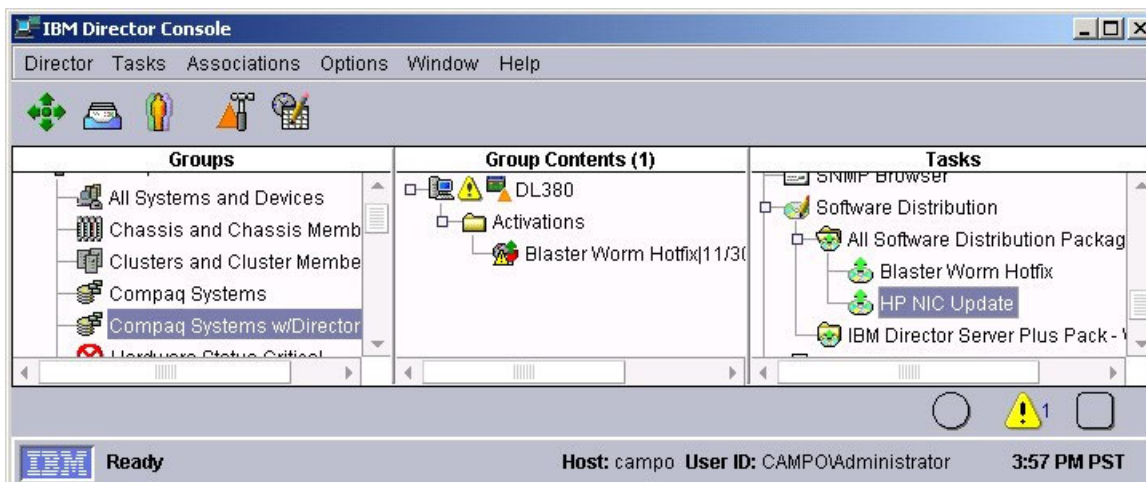
File exists on target system.

Execute Post-Distribution: Advanced

Post Distribution Action: Do Nothing
 Restart Computer

Windows NT/2000/XP/2003 Configuration

82. Click on the <Save> icon to close the Custom Package Editor window and notice in the IBM Director Console, the presence of the newly created package

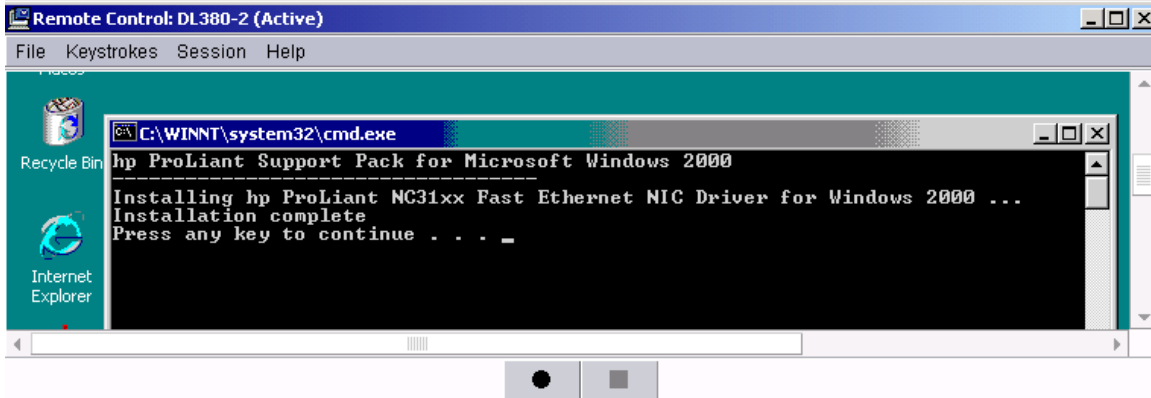


83. Drag and drop the task to the Compaq Servers w/Director Agent group, and select the <Execute Now> button as the option is presented on screen

84. As the task starts either use the Remote Control function to monitor what happens on the HP unit. You will notice how a small light-blue box appears on the system tray to indicate that the silent install of the NIC is being performed. The installation will complete in a few minutes.



85. As well, notice how a command prompt session will open on the HP system, providing locally the status of the operation. The PAUSE command we put in the batch file serves the purpose of allowing you to understand the steps behind the deployment operation. This requires your manual input to terminate the operation (IBM Director will still treat the task as “in progress” until the command prompt is open) so it would not be recommended in a real deployment



Deploying Capacity Manager

IMPORTANT: THESE DIRECTIONS ARE FOR DEMONSTRATION PURPOSE ONLY: SERVER PLUS PACK AGENTS ARE NOT SUPPORTED ON OEM SYSTEMS

In the following instructions, we will explore how to use this powerful tool to distribute the Capacity Manager agent (From the IBM Director Server Plus Pack) to the HP unit. We will assume the presence of the Server Plus Pack code on the following location of the IBM Director Server

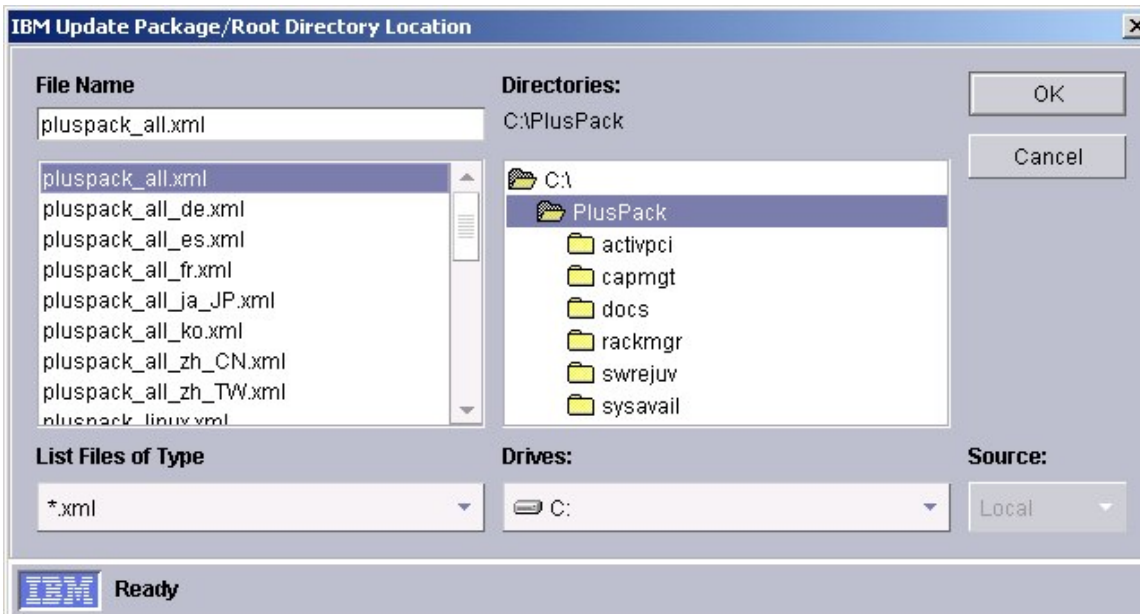
C:\PlusPack

Please double check with your instructor if this differs and modify, in the following instructions, any reference to that path as appropriate

86. In the IBM Director Console, from the list of tasks, double click on <Software Distribution>.
87. In the Software Distribution Manager window, expand the Wizards tree and double-click on <Director Update Assistant>

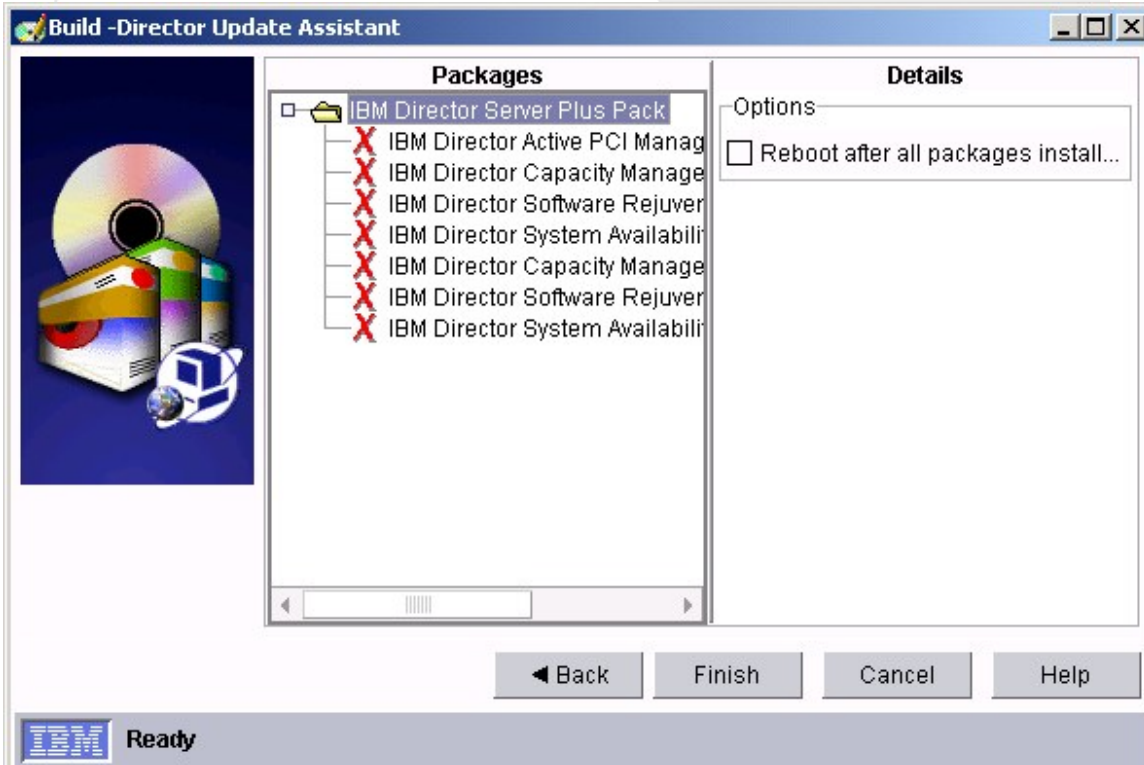


88. Click on the <Browse> button and point to the C:\PlusPack directory. There, select **pluspack_all.xml** and click on <OK> to continue

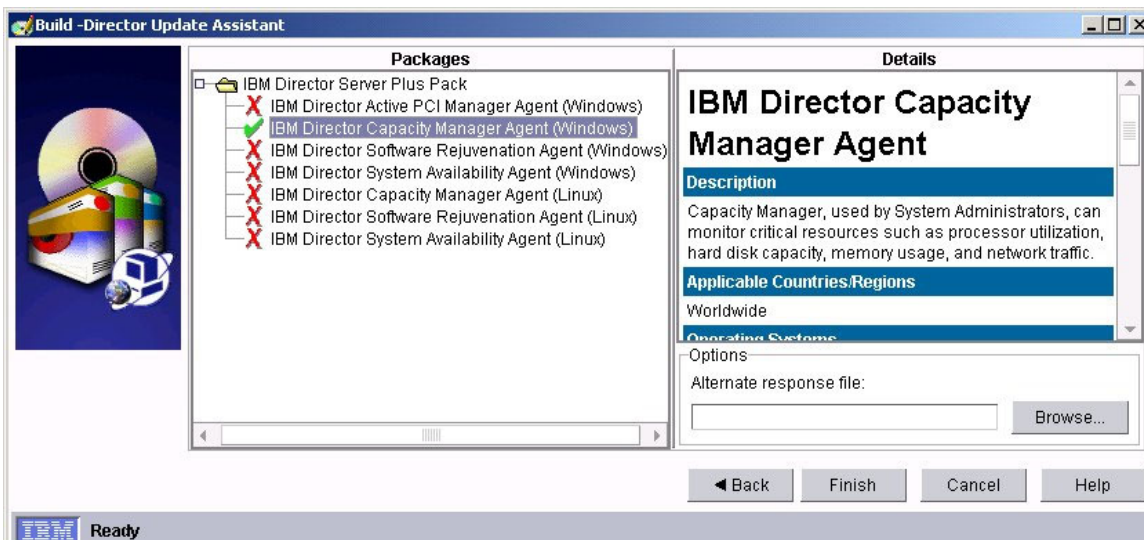


89. Select <Next> to proceed and, on the left pane of the window that appears, expand the list of component that could be installed

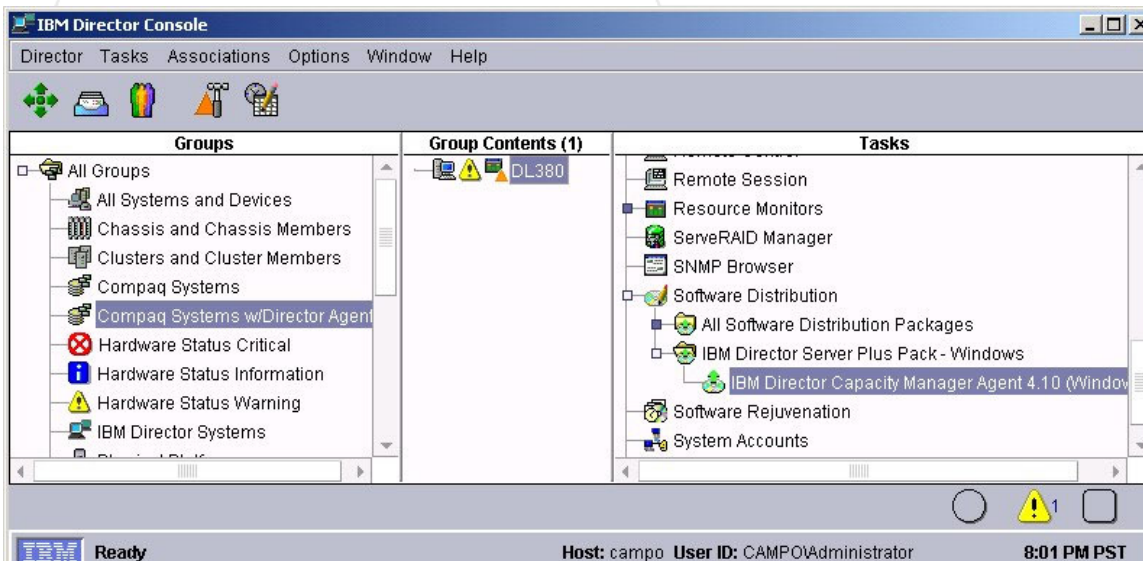
NOTE: It is not necessary to select the **Reboot after all packages installed** check box. Installing the Server Plus Pack extension forces a restart of IBM Director Agent, if needed.



90. Double-click on the IBM Director Capacity Manager Agent (Windows) entry to change the red X to a green check mark. This will also bring a description of the package on the right pane

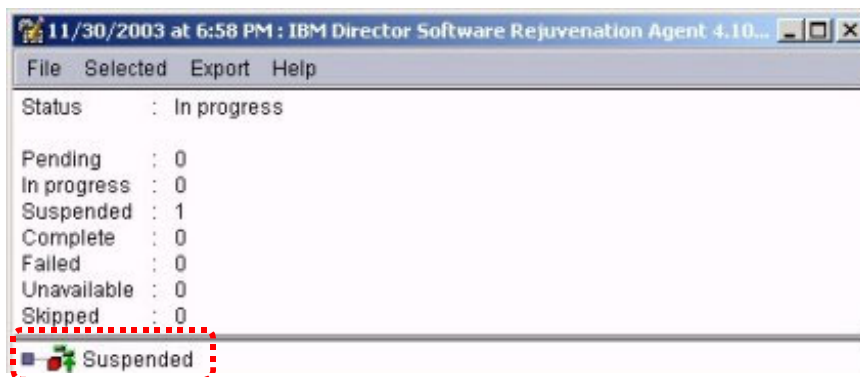


91. To confirm that you want to import the installation package, click on <Finish>. You should now be able to see the package listed in the Tasks pane under the <Software Distribution><All Software Distribution Packages> section



92. Drag and drop the package to the ProLiant unit and select to execute the task immediately.

NOTE: The status will remain “In progress” even if the execution will look “Suspended”. THIS IS NORMAL



93. Wait until the distribution of the package completes. You could now start customizing the monitors on the ProLiant system and generate reports.

NOTE: The Capacity Manager Agent start collecting values for the monitors from the moment it is installed, therefore running a report immediately will not return very valuable information

IMPORTANT: REMEMBER THAT THIS PACKAGE IS NOT SUPPORTED ON OEM PLATFORMS

Appendix A: Examples of Extensions of the CIMIT

In this appendix you will find a working set of “answers” for the challenges proposed to you in Lab Activity 3

Adding the “Fault Tolerant Fan Redundancy Restored” mapping

Relevant information from the cpqhlth.mib

```

cpqHe3FltTolFanRedundancyRestored TRAP-TYPE
    ENTERPRISE compaq
    VARIABLES { sysName, cpqHoTrapFlags, cpqHeFltTolFanChassis }
    DESCRIPTION
        "The Fault Tolerant Fans have returned to a redundant state for
        the specified chassis."

    --#TYPE "Fan Redundancy Restored"
    --#SUMMARY "The Fans are now redundant on Chassis %d."
    --#ARGUMENTS {2}
    --#SEVERITY INFORMATIONAL
    --#TIMEINDEX 99
    --#STATE OPERATIONAL

 ::= 6055

```

Example of the modifications to apply to CompaqTrapFilter.map

```

# Fan Redundancy Restored
event.74.family=Compaq
event.74.keyword.0=event.qualifier.subsystem.health
event.74.keyword.1=event.qualifier.component.fan
event.74.keyword.2=event.text.redres
# Severities:
# FATAL    0
# CRITICAL 1
# MINOR    2
# WARNING  3
# HARMLESS 4
# UNKNOWN  5
# (defaults to 3=warning)
event.74.severity=4
# 1=alert, 0=resolution (defaults to 1=alert)
event.74.category=0
event.74.text=event.text.FanRedundancyRecovered
event.74.oid=1.3.6.1.4.1.232.0.6055
event.74.srcname=1.3.6.1.2.1.1.5.0
# Chassis
event.74.eventvar.index.0=4
event.74.proceedwithnormaltrap=false

```

Example of the modifications to apply to CompaqSNMPTrapResources.properties

Modifications in **bold**

```
#### Fan
```

```

event.qualifier.component.fan=Fan
event.text.FanFailure=Fan Failure on Chassis {0}, Fan {1}.
event.text.FanRedundancyLost=Fan Redundancy Lost on Chassis {0}.
event.text.FanRedundancyRecovered=Fan Redundancy Restored on Chassis {0}.
event.text.FanDegraded=Fan Degraded on Chassis {0}, Fan {1}.
event.text.FanInserted=Fan Inserted on Chassis {0}, Fan {1}.
event.text.FanRemoved=Fan Removed on Chassis {0}, Fan {1}.

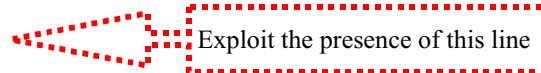
```

```
#
```

```

event.text.failure=Failure
event.text.degraded=Degraded
event.text.recovery=Recovery
event.text.stopped=Stopped
event.text.started=Started
event.text.stopped_started=Stopped or Started
event.text.redlost=Redundancy Lost
event.text.redres=Redundancy Restored

```



Extending the “Logical Drive Status Change” mapping

Comments

After analyzing the trap definition, we decided to include the information about the affected controller and logical drive in the trap mapping.

As we realized that the EVENTVARBIND was identical to the one defined in the events mapped out of the documented trap 3008, we exploited as much as possible the existing entries

Due to the lack of EVENTVAR definitions in the events mapped out of trap 3008, we decided to create a new set of entries in the CompaqSNMPTrapResources.properties for surfacing in the Event Text field the value of the chosen variables

For simplicity and higher clearness of the files, we decided to keep the simple logical structure that is associated with this group of events (**Compaq.Intelligent Drive Array.Logical Drive**) rather than creating in the Simple Event Filter Builder window 14 new entries (one for each of the possible status)

Relevant information from the cpqida.mib

```

cpqDa6LogDrvStatusChange TRAP-TYPE
  ENTERPRISE compaq
  VARIABLES { sysName, cpqHoTrapFlags, cpqDaCntlrHwLocation,
              cpqDaLogDrvCntlrIndex, cpqDaLogDrvIndex,
              cpqDaLogDrvStatus }
  DESCRIPTION

```


"Logical Drive Status Change.

This trap signifies that the agent has detected a change in the status of a drive array logical drive. The variable cpqDaLogDrvStatus indicates the current logical drive status."

```
--#TYPE "Logical Drive Status Change"
--#SUMMARY "Status is now %d."
--#ARGUMENTS {5}
--#SEVERITY CRITICAL
--#TIMEINDEX 99
```

```
::= 3034
```

Example of the modifications applied to CompaqTrapFilter.map

```
# Logical Drive Status Change Da6 - Other
event.75.family=Compaq
event.75.keyword.0=event.qualifier.subsystem.ida
event.75.keyword.1=event.qualifier.component.logdrive
# Severities:
# FATAL    0
# CRITICAL 1
# MINOR    2
# WARNING  3
# HARMLESS 4
# UNKNOWN  5
# (defaults to 3=warning)
event.75.severity=5
# 1=alert, 0=resolution (defaults to 1=alert)
event.75.category=1
event.75.text=event.text.LogDriveStatusChangeDa6Other
event.75.oid=1.3.6.1.4.1.232.0.3034
event.75.srcname=1.3.6.1.2.1.1.5.0
# Controller Number
event.75.eventvar.index.0=5
# Logical Drive Number
event.75.eventvar.index.1=6
event.75.proceedwithnormaltrap=false
event.75.eventvarbind.index.0=7==1

# Logical Drive Status Change Da6 - OK
event.76.family=Compaq
event.76.keyword.0=event.qualifier.subsystem.ida
event.76.keyword.1=event.qualifier.component.logdrive
# Severities:
# FATAL    0
# CRITICAL 1
# MINOR    2
# WARNING  3
# HARMLESS 4
# UNKNOWN  5
# (defaults to 3=warning)
event.76.severity=4
```

```
# 1=alert, 0=resolution (defaults to 1=alert)
event.76.category=0
event.76.text=event.text.LogDriveStatusChangeDa6OK
event.76.oid=1.3.6.1.4.1.232.0.3034
event.76.srcname=1.3.6.1.2.1.1.5.0
# Controller Number
event.76.eventvar.index.0=5
# Logical Drive Number
event.76.eventvar.index.1=6
event.76.proceedwithnormaltrap=false
event.76.eventvarbind.index.0=7==2
```

.....

(We skip the representation of a few events for simplicity)

.....

```
# Logical Drive Status Change Da6 - Ready for rebuild
event.80.family=Compaq
event.80.keyword.0=event.qualifier.subsystem.ida
event.80.keyword.1=event.qualifier.component.logdrive
# Severities:
# FATAL    0
# CRITICAL 1
# MINOR    2
# WARNING  3
# HARMLESS 4
# UNKNOWN  5
# (defaults to 3=warning)
event.80.severity=4
# 1=alert, 0=resolution (defaults to 1=alert)
event.80.category=1
event.80.text=event.text.LogDriveStatusChangeDa6RRRebuild
event.80.oid=1.3.6.1.4.1.232.0.3034
event.80.srcname=1.3.6.1.2.1.1.5.0
# Controller Number
event.80.eventvar.index.0=5
# Logical Drive Number
event.80.eventvar.index.1=6
event.80.proceedwithnormaltrap=false
event.80.eventvarbind.index.0=7==6
```

```
# Logical Drive Status Change Da6 - Rebuilding
event.81.family=Compaq
event.81.keyword.0=event.qualifier.subsystem.ida
event.81.keyword.1=event.qualifier.component.logdrive
# Severities:
# FATAL    0
# CRITICAL 1
# MINOR    2
# WARNING  3
# HARMLESS 4
# UNKNOWN  5
# (defaults to 3=warning)
event.81.severity=4
# 1=alert, 0=resolution (defaults to 1=alert)
event.81.category=0
```

```
event.81.text=event.text.LogDriveStatusChangeDa6Rebuilding
event.81.oid=1.3.6.1.4.1.232.0.3034
event.81.srcname=1.3.6.1.2.1.1.5.0
# Controller Number
event.81.eventvar.index.0=5
# Logical Drive Number
event.81.eventvar.index.1=6
event.81.proceedwithnormaltrap=false
event.81.eventvarbind.index.0=7==7
```

.....

(We skip the representation of a few events for simplicity)

.....

```
# Logical Drive Status Change Da6 - Queued
event.88.family=Compaq
event.88.keyword.0=event.qualifier.subsystem.ida
event.88.keyword.1=event.qualifier.component.logdrive
# Severities:
# FATAL      0
# CRITICAL   1
# MINOR      2
# WARNING    3
# HARMLESS   4
# UNKNOWN    5
# (defaults to 3=warning)
event.88.severity=4
# 1=alert, 0=resolution (defaults to 1=alert)
event.88.category=0
event.88.text=event.text.LogDriveStatusChangeDa6Queued
event.88.oid=1.3.6.1.4.1.232.0.3034
event.88.srcname=1.3.6.1.2.1.1.5.0
# Controller Number
event.88.eventvar.index.0=5
# Logical Drive Number
event.88.eventvar.index.1=6
event.88.proceedwithnormaltrap=false
event.88.eventvarbind.index.0=7==14
```

Example of the modifications applied to CompaqSNMPTrapResources.properties

```
##### Logical Drive Da6
```

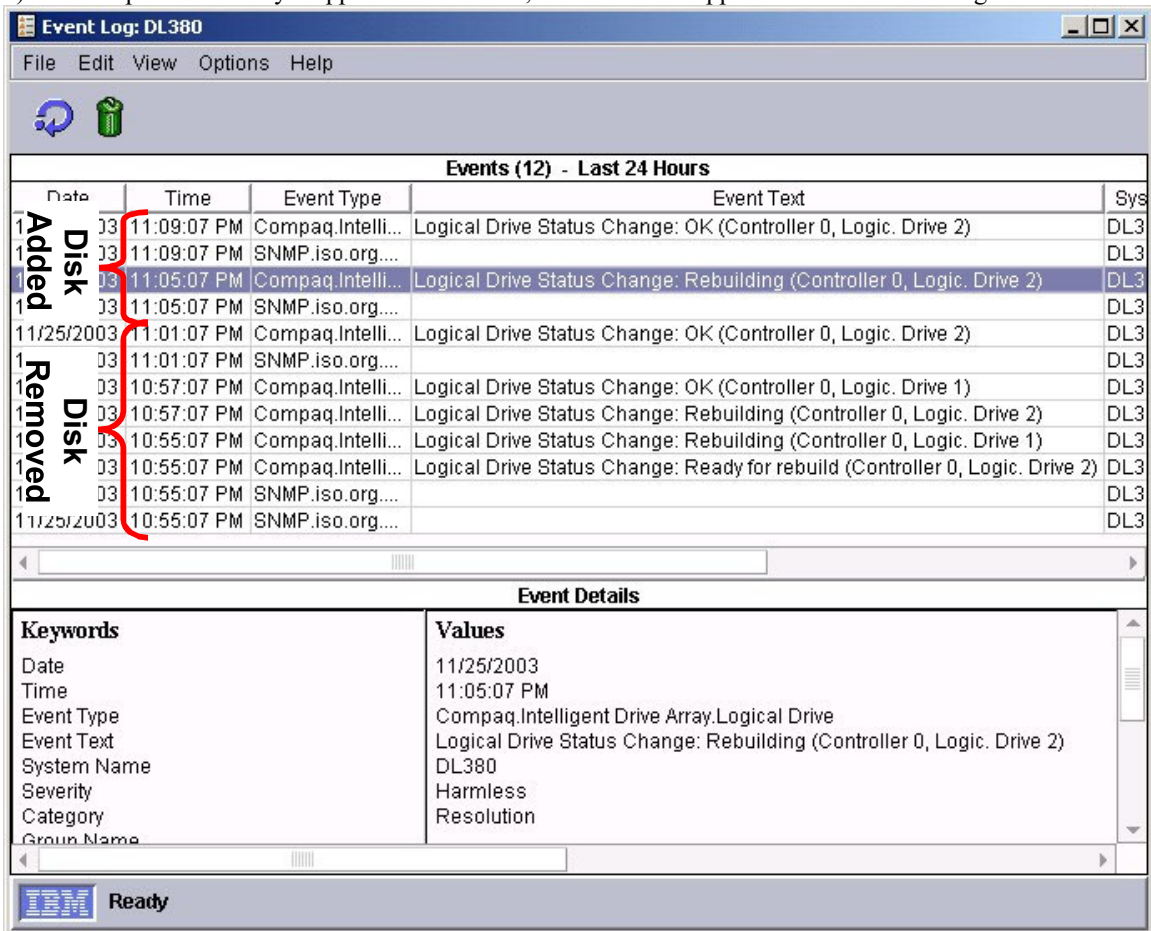
```
event.text.LogDriveStatusChangeDa6Other=Logical Drive Status Change (Controller {0}, Logic. Drive {1})
event.text.LogDriveStatusChangeDa6OK=Logical Drive Status Change: OK (Controller {0}, Logic. Drive {1})
event.text.LogDriveStatusChangeDa6Failed=Logical Drive Status Change: Failure (Controller {0}, Logic. Drive {1})
event.text.LogDriveStatusChangeDa6Unconfigured=Logical Drive Status Change: Unconfigured (Controller {0}, Logic. Drive {1})
event.text.LogDriveStatusChangeDa6Recovering=Logical Drive Status Change: Recovering (Controller {0}, Logic. Drive {1})
```



event.text.LogDriveStatusChangeDa6RRRebuild=Logical Drive Status Change: Ready for rebuild (Controller {0}, Logic. Drive {1})
 event.text.LogDriveStatusChangeDa6Rebuilding=Logical Drive Status Change: Rebuilding (Controller {0}, Logic. Drive {1})
 event.text.LogDriveStatusChangeDa6WrongDrive=Logical Drive Status Change: Wrong drive (Controller {0}, Logic. Drive {1})
 event.text.LogDriveStatusDa6BadConnect=Logical Drive Status Change: Bad Connect (Controller {0}, Logic. Drive {1})
 event.text.LogDriveStatusChangeDa6OverHeat=Logical Drive Status Change: Overheating (Controller {0}, Logic. Drive {1})
 event.text.LogDriveStatusChangeDa6Shutdown=Logical Drive Status Change: Shutdown (Controller {0}, Logic. Drive {1})
 event.text.LogDriveStatusChangeDa6Expanding=Logical Drive Status Change: Expanding (Controller {0}, Logic. Drive {1})
 event.text.LogDriveStatusChangeDa6NA=Logical Drive Status Change: Not available (Controller {0}, Logic. Drive {1})
 event.text.LogDriveStatusChangeDa6Queued=Logical Drive Status Change: Queued for expansion (Controller {0}, Logic. Drive {1})

Screenshots obtained after applying the changes

1) Some traps are correctly mapped as we wanted, but others still appear in the SNMP.iso.org format.....



Date	Time	Event Type	Event Text	Sys
11/25/2003	11:09:07 PM	Compaq.Intelli...	Logical Drive Status Change: OK (Controller 0, Logic. Drive 2)	DL3
11/25/2003	11:09:07 PM	SNMP.iso.org....		DL3
11/25/2003	11:05:07 PM	Compaq.Intelli...	Logical Drive Status Change: Rebuilding (Controller 0, Logic. Drive 2)	DL3
11/25/2003	11:05:07 PM	SNMP.iso.org....		DL3
11/25/2003	11:01:07 PM	Compaq.Intelli...	Logical Drive Status Change: OK (Controller 0, Logic. Drive 2)	DL3
11/25/2003	11:01:07 PM	SNMP.iso.org....		DL3
11/25/2003	10:57:07 PM	Compaq.Intelli...	Logical Drive Status Change: OK (Controller 0, Logic. Drive 1)	DL3
11/25/2003	10:57:07 PM	Compaq.Intelli...	Logical Drive Status Change: Rebuilding (Controller 0, Logic. Drive 2)	DL3
11/25/2003	10:55:07 PM	Compaq.Intelli...	Logical Drive Status Change: Rebuilding (Controller 0, Logic. Drive 1)	DL3
11/25/2003	10:55:07 PM	Compaq.Intelli...	Logical Drive Status Change: Ready for rebuild (Controller 0, Logic. Drive 2)	DL3
11/25/2003	10:55:07 PM	SNMP.iso.org....		DL3
11/25/2003	10:55:07 PM	SNMP.iso.org....		DL3

Keywords	Values
Date	11/25/2003
Time	11:05:07 PM
Event Type	Compaq.Intelligent Drive Array.Logical Drive
Event Text	Logical Drive Status Change: Rebuilding (Controller 0, Logic. Drive 2)
System Name	DL380
Severity	Harmless
Category	Resolution
Group Name	

2) It's ok! The ones that are not mapped depend on a different trap definition (Hot-spare Status change and Physical Drive Status Change)! As requested, all the ones depending on **cpqDa6LogDrvStatusChange** have been mapped

Event Log: DL380

File Edit View Options Help

Events (12) - Last 24 Hours

Date	Time	Event Type	
11/25/2003	11:09:07 PM	Compaq.Intelligent Drive Array.Logical Drive	Logical Driv
11/25/2003	11:09:07 PM	SNMP.iso.org.dod.internet.private.enterprises.compaq.cpqDa6SpareStatusChange	
11/25/2003	11:05:07 PM	Compaq.Intelligent Drive Array.Logical Drive	Logical Driv
11/25/2003	11:05:07 PM	SNMP.iso.org.dod.internet.private.enterprises.compaq.cpqDa6PhyDrvStatusChange	
11/25/2003	11:01:07 PM	Compaq.Intelligent Drive Array.Logical Drive	Logical Driv
11/25/2003	11:01:07 PM	SNMP.iso.org.dod.internet.private.enterprises.compaq.cpqDa6SpareStatusChange	
11/25/2003	10:57:07 PM	Compaq.Intelligent Drive Array.Logical Drive	Logical Driv
11/25/2003	10:57:07 PM	Compaq.Intelligent Drive Array.Logical Drive	Logical Driv
11/25/2003	10:55:07 PM	Compaq.Intelligent Drive Array.Logical Drive	Logical Driv
11/25/2003	10:55:07 PM	Compaq.Intelligent Drive Array.Logical Drive	Logical Driv
11/25/2003	10:55:07 PM	SNMP.iso.org.dod.internet.private.enterprises.compaq.cpqDa6PhyDrvStatusChange	
11/25/2003	10:55:07 PM	SNMP.iso.org.dod.internet.private.enterprises.compaq.cpqDa6SpareStatusChange	

Event Details

Keywords	Values
Date	11/25/2003
Time	10:55:07 PM
Event Type	SNMP.iso.org.dod.internet.private.enterprises.compaq.cpqDa6PhyDrvStatusChange
Event Text	
System Name	DL380
Severity	Unknown
Category	Alert
Group Name	

3) What IBM Director shows on the console without any intervention

IBM Director Console

Director Tasks Associations Options Window Help

Groups

- All Groups
 - All Systems and Devices
 - Chassis and Chassis Member
 - Clusters and Cluster Member
 - Compaq Servers
 - Hardware Status Critical
 - Hardware Status Information
 - Hardware Status Warning
 - IBM Director Systems
 - Platforms and Platform Member
 - Racks with Members
 - Scalable Systems and Member
 - SNMP Devices

Group Contents (2)

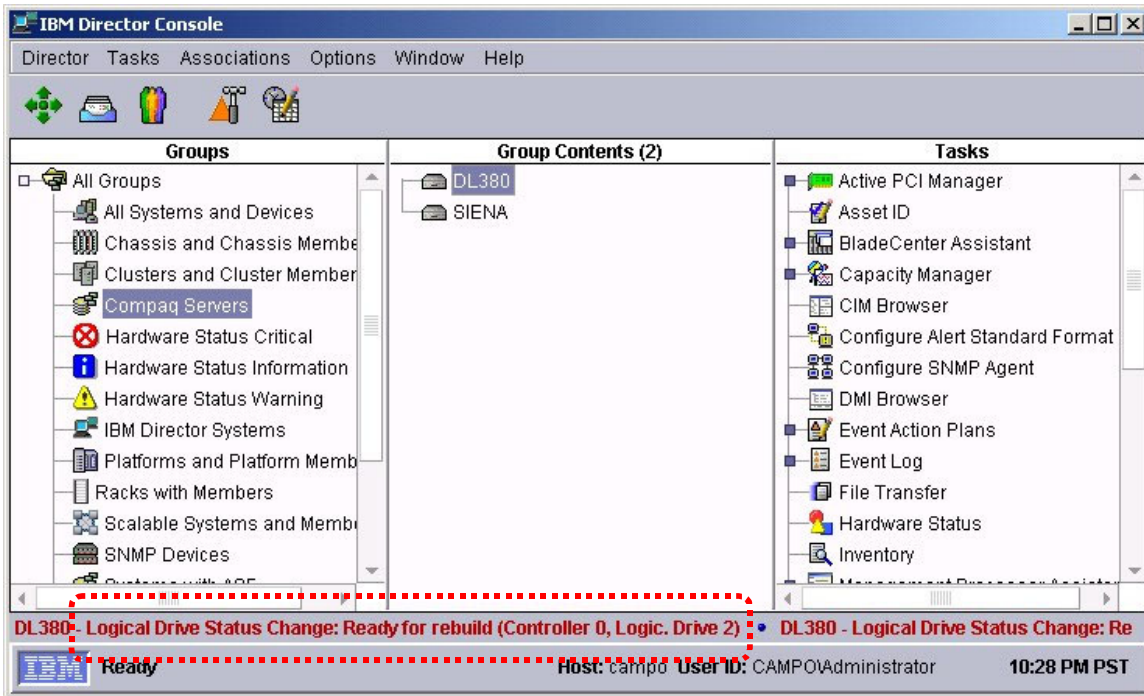
- DL380
- SIENA

Tasks

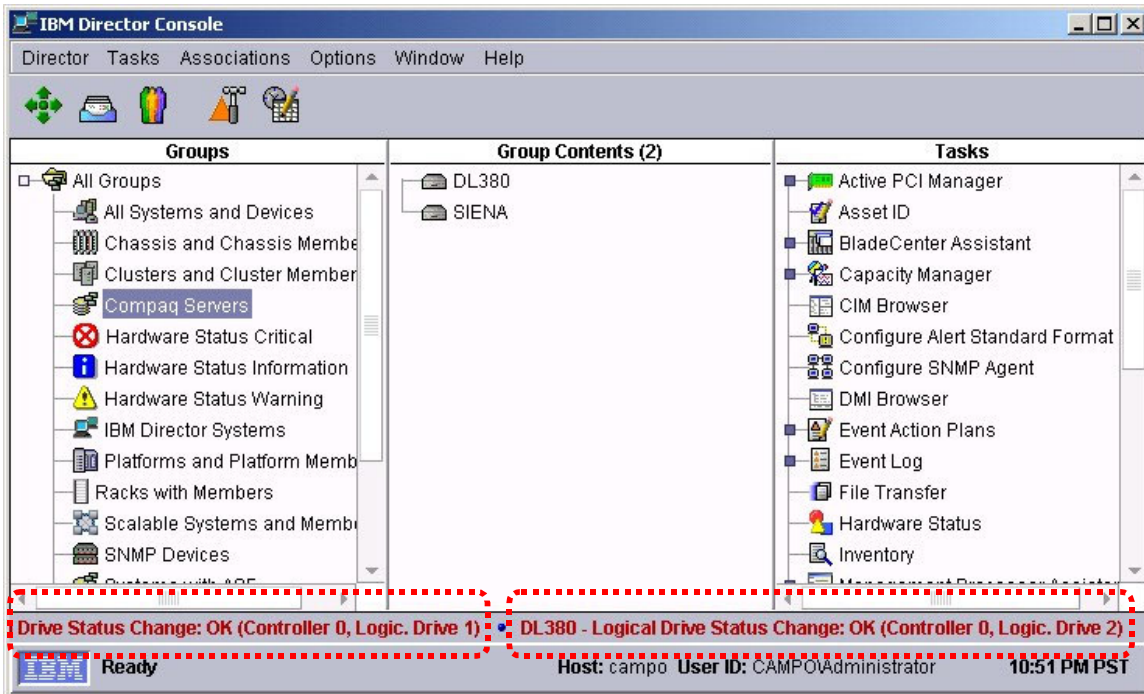
- Active PCI Manager
- Asset ID
- BladeCenter Assistant
- Capacity Manager
- CIM Browser
- Configure Alert Standard Format
- Configure SNMP Agent
- DMI Browser
- Event Action Plans
- Event Log
- File Transfer
- Hardware Status
- Inventory

DL380 - Logical Drive Status Change: Rebuilding (Controller 0, Logic. Drive 1) • DL380 - Logical Drive Status Change: Rebuilding

Ready Host: campo User ID: CAMPOAdministrator 10:29 PM PST



The screenshot shows the IBM Director Console interface. The 'Groups' pane on the left lists various system categories, with 'Compaq Servers' selected. The 'Group Contents (2)' pane shows 'DL380' and 'SIENA'. The 'Tasks' pane on the right lists various management tasks. A red dashed box highlights a status message at the bottom: 'DL380 - Logical Drive Status Change: Ready for rebuild (Controller 0, Logic. Drive 2)'. The status bar at the bottom indicates 'Ready', 'Host: campo', 'User ID: CAMPOAdministrator', and '10:28 PM PST'.



The screenshot shows the IBM Director Console interface, similar to the first one. The 'Groups' and 'Group Contents' panes are the same. The 'Tasks' pane is also the same. A red dashed box highlights a status message at the bottom: 'DL380 - Logical Drive Status Change: OK (Controller 0, Logic. Drive 2)'. The status bar at the bottom indicates 'Ready', 'Host: campo', 'User ID: CAMPOAdministrator', and '10:51 PM PST'.

4) What Insight Manager 7 shows (if you click on the red square)

The screenshot shows the HP Insight Manager 7 SP2.1 interface. At the top, there are status indicators for various components: 0 (critical), 1 (warning), 0 (info), 7 (critical), 0 (warning), and 0 (info). The main content area displays 'Query Results:Uncleared Critical Events' for device DL380. A table lists several events, with the first row highlighted by a red dashed box.

State	Severity	Event Type	Device Name	Event Time	Assigned To	Comments
Not Cleared	Critical	Logical Drive Status Change	DL380	29-Nov-2003, ...	[assign to...]	[add comm...]
Not Cleared	Critical	Physical Drive Status Change	DL380	29-Nov-2003, ...	[assign to...]	[add comm...]
Not Cleared	Critical	Logical Drive Status Change	DL380	29-Nov-2003, ...	[assign to...]	[add comm...]
Not Cleared	Critical	Logical Drive Status Change	DL380	29-Nov-2003, ...	[assign to...]	[add comm...]
Not Cleared	Critical	Physical Drive Status Change	DL380	29-Nov-2003, ...	[assign to...]	[add comm...]
Not Cleared	Critical	Spare Drive Status Change	DL380	29-Nov-2003, ...	[assign to...]	[add comm...]
Not Cleared	Critical	Logical Drive Status Change	DL380	29-Nov-2003, ...	[assign to...]	[add comm...]