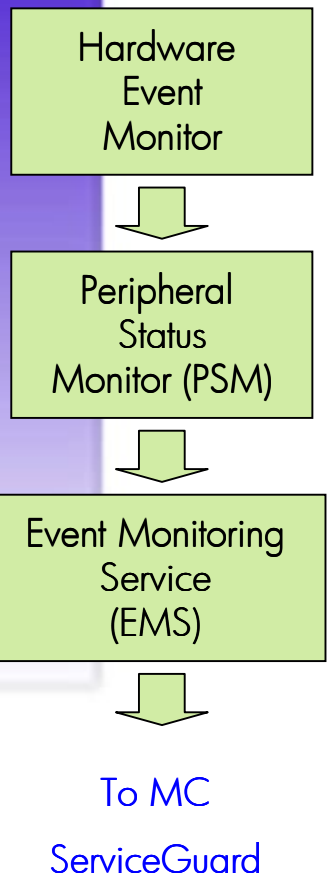
EMS Peripheral Status Monitor: Definition

- An extension to hardware monitoring
- Installed as a part of the H/W monitor software
- Converts hardware events detected by the EMS H/W monitors to an “UP” or “DOWN” status, which is used by MC ServiceGuard in controlling package fail-over
- Interface between the H/W event monitors and MC ServiceGuard

EMS Peripheral Status Monitor: Process



EMS Notification

The H/W event monitor assigns a severity level to each event and passes it to the PSM.

The PSM converts the severity level of the event to a device status (UP/DOWN) and passes the status to EMS.

If a PSM monitoring request has been created for the resource, the specified notification method is used to alert you.

If resource is configured as an MCSG package dependency, EMS alerts MCSG to change in state. If status of resource has changed to DOWN, MCSG will fail-over the package.

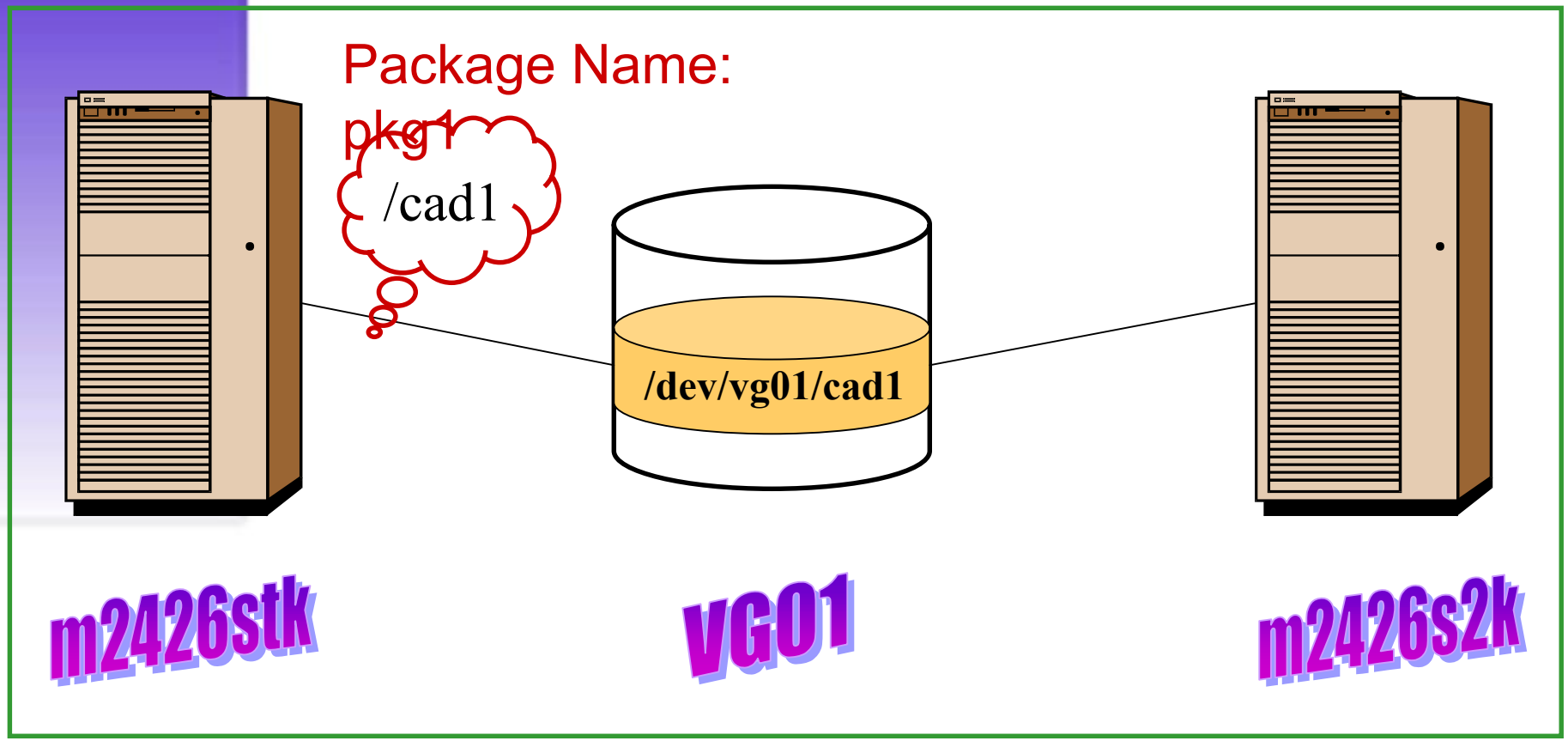
EMS Peripheral Status Monitor: States

Condition	Interpretation
Up	HW is operating normally
Down	An event has occurred that indicates a failure with the H/W
Unknown	Cannot determine the state of the H/W. This state is treated as DOWN by the PSM

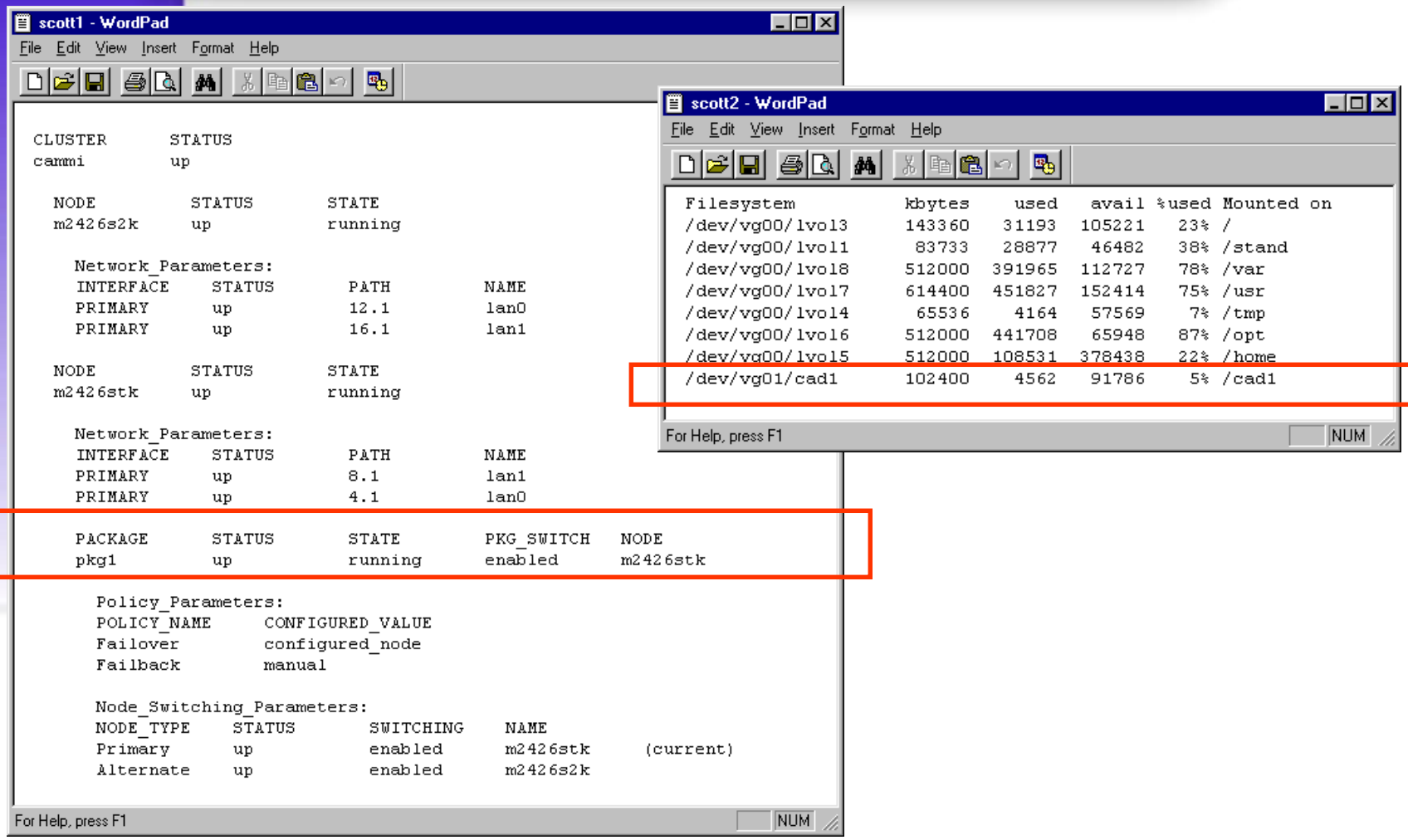
EMS will cause a package failover only with a severity level of Critical or Serious

EMS Peripheral Status Monitor: MC ServiceGuard Configuration

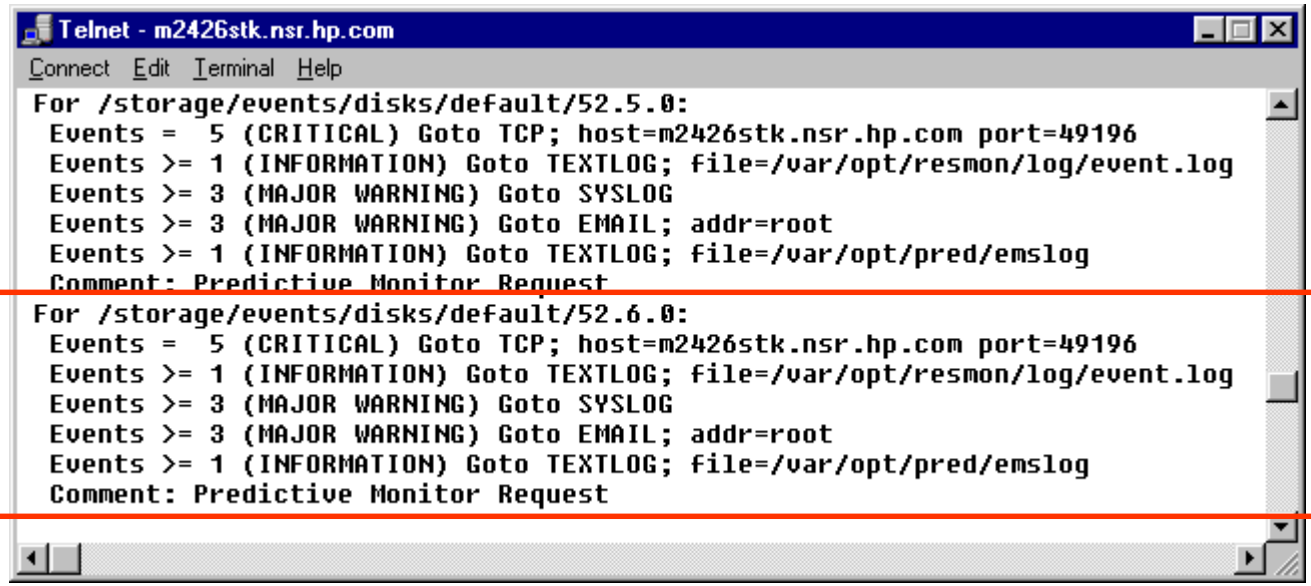
Cluster Name: cammi



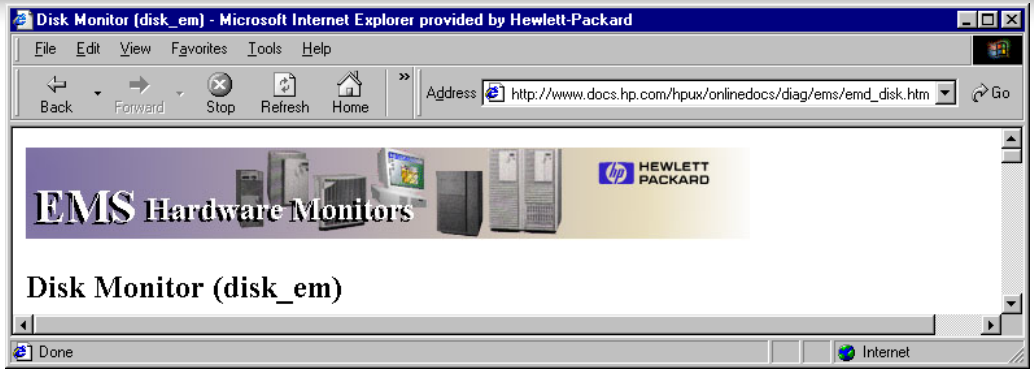
EMS Peripheral Status Monitor: m2426stk cmviewlcl & bdf output

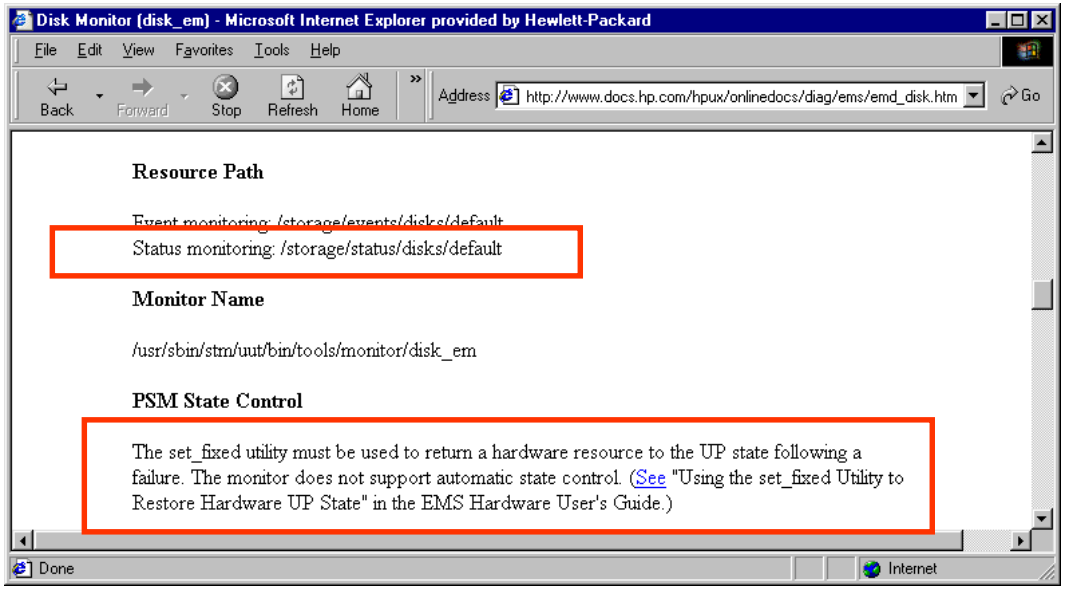


EMS Peripheral Status Monitor: Creating package dependency on root disk 52.6.0

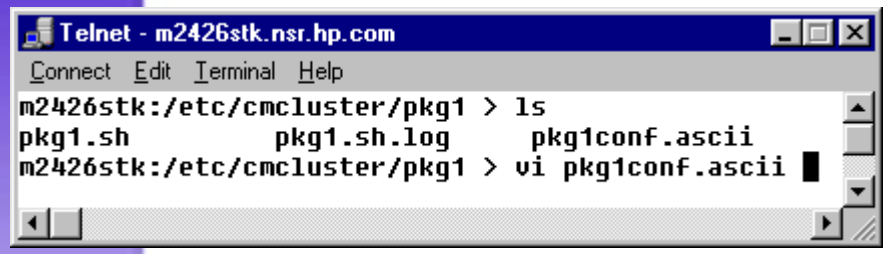


EMS Peripheral Status Monitor: disk_em data sheet

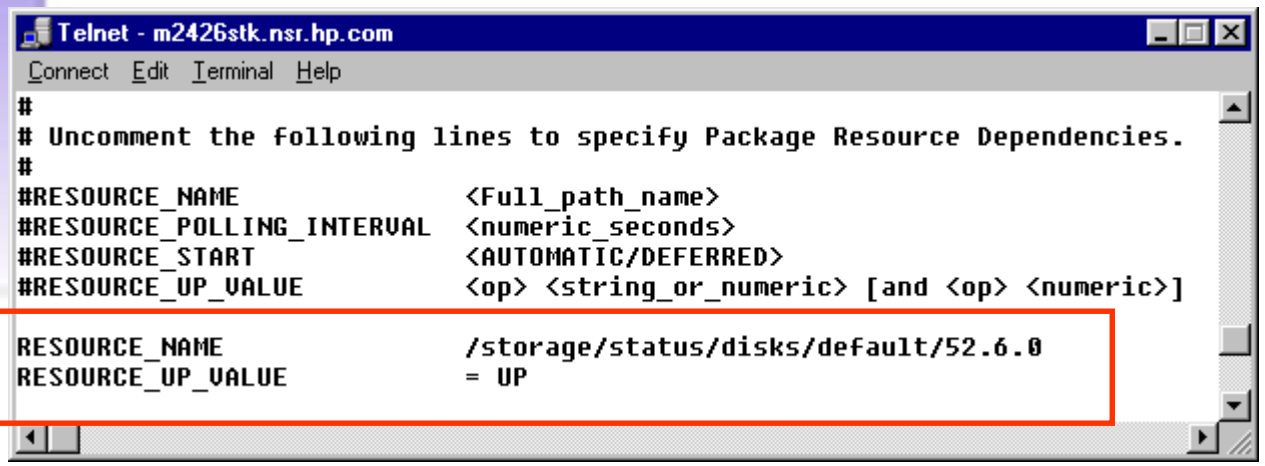




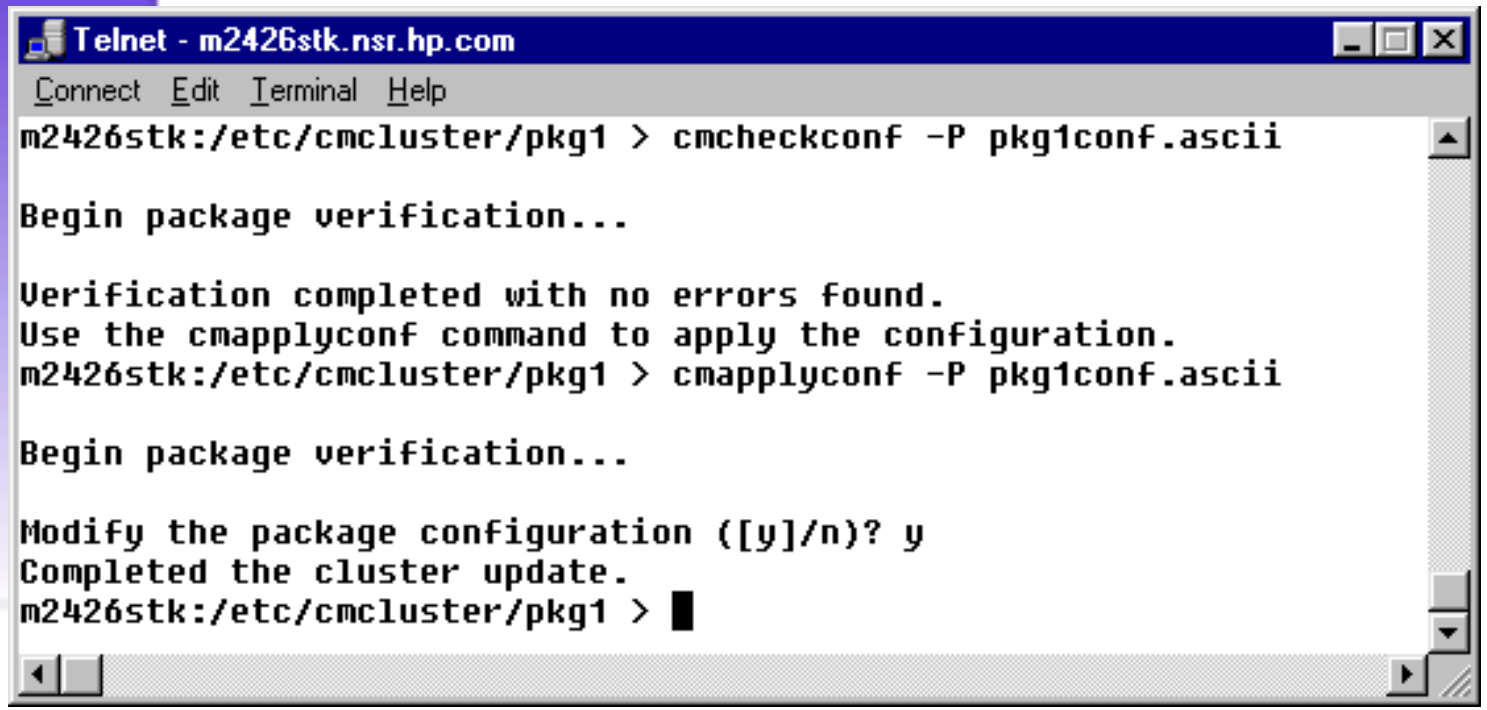
EMS Peripheral Status Monitor: Add PSM Package Dependencies



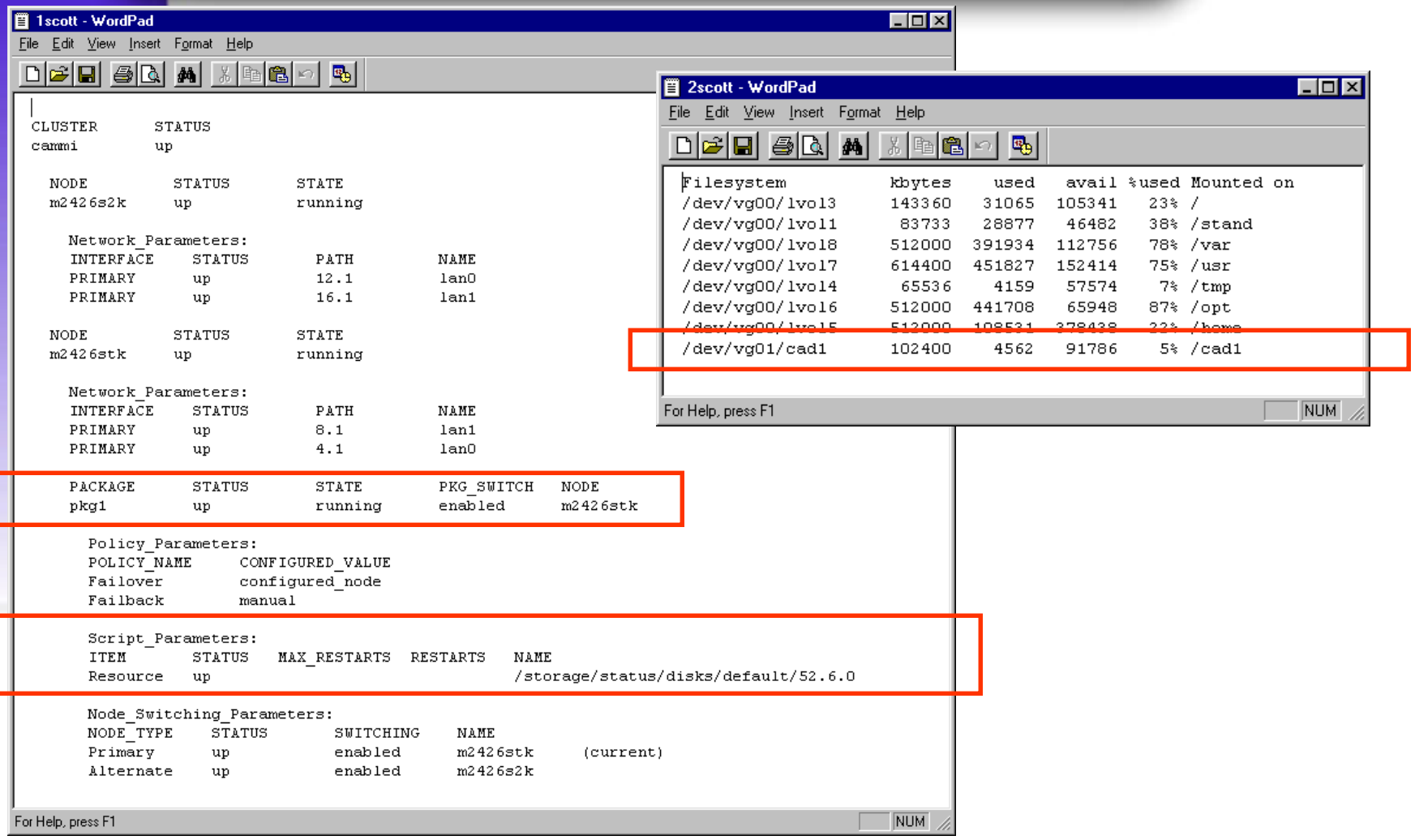
Package dependencies can be configured via SAM or manually



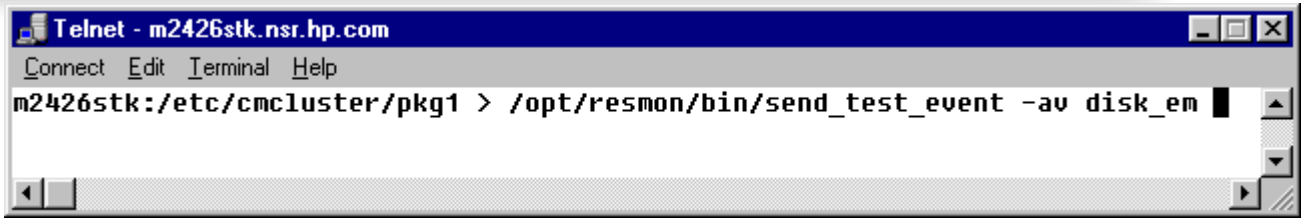
EMS Peripheral Status Monitor: Verify and apply package configuration



EMS Peripheral Status Monitor: m2426stk cmviewlcl & bdf output



EMS Peripheral Status Monitor: Test EMS PSM MCSG PKG Failover




```
Telnet - m2426stk.nsr.hp.com
Connect  Edit  Terminal  Help
  m2426stk      up            running

    Network_Parameters:
    INTERFACE     STATUS        PATH          NAME
    PRIMARY       up            8.1           lan1
    PRIMARY       up            4.1           lan0

    PACKAGE       STATUS        STATE         PKG_SWITCH    NODE
    pkg1          halting       halting       enabled       m2426stk

      Policy_Parameters:
      POLICY_NAME      CONFIGURED_VALUE
      Failover         configured_node
      Failback         manual

      Script_Parameters:
      ITEM        STATUS   MAX_RESTARTS  RESTARTS   NAME
      Resource    down                              /storage/status/disks/default
/52.6.0

      Node_Switching_Parameters:
      NODE_TYPE     STATUS        SWITCHING     NAME
      Primary       up            enabled       m2426stk      (current)
      Alternate     up            enabled       m2426s2k
m2426stk:/etc/cmcluster/pkg1 >
```

cmviewcl -v output while package is failing over

EMS Peripheral Status Monitor: m2426stk cmviewlcl & bdf output

3scott - WordPad

File Edit View Insert Format Help

```
CLUSTER       STATUS
cammi         up

  NODE          STATUS       STATE
  m2426s2k      up           running

    Network_Parameters:
    INTERFACE     STATUS       PATH         NAME
    PRIMARY       up           12.1         lan0
    PRIMARY       up           16.1         lan1

    PACKAGE       STATUS       STATE        PKG_SWITCH    NODE
    pkg1          up           running      enabled       m2426s2k

      Policy_Parameters:
      POLICY_NAME     CONFIGURED_VALUE
      Failover        configured_node
      Failback        manual

      Script_Parameters:
      ITEM       STATUS   MAX_RESTARTS  RESTARTS   NAME
      Resource   up                                /storage/status/disks

      Node_Switching_Parameters:
      NODE_TYPE    STATUS       SWITCHING    NAME
      Primary      up           enabled      m2426stk
      Alternate    up           enabled      m2426s2k      (current)

  NODE          STATUS       STATE
  m2426stk      up           running

    Network_Parameters:
    INTERFACE     STATUS       PATH         NAME
    PRIMARY       up           8.1          lan1
    PRIMARY       up           4.1          lan0
```

For Help, press F1 NUM

4scott - WordPad

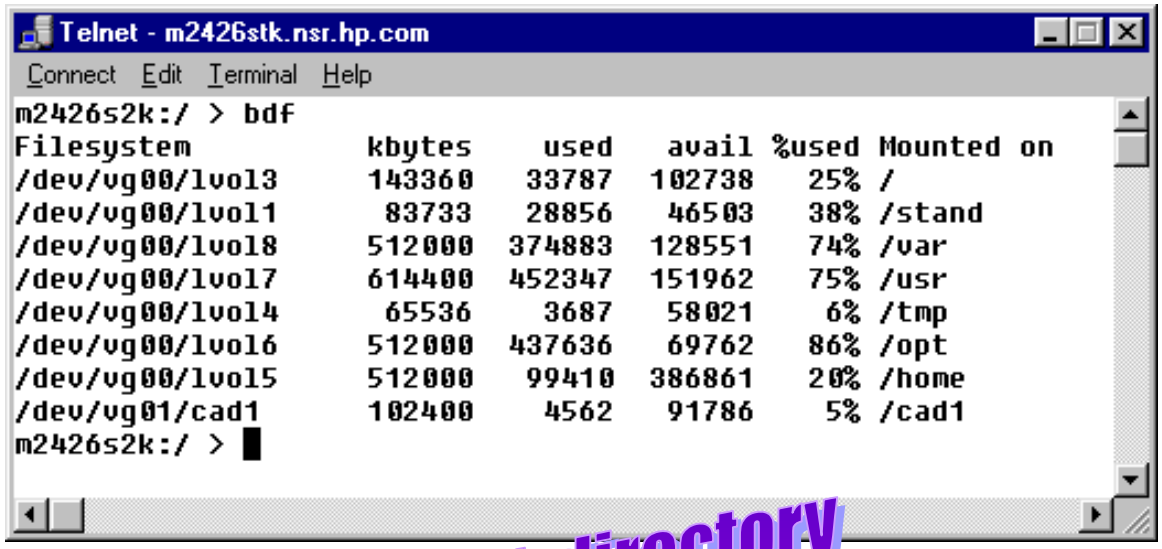
File Edit View Insert Format

```
Filesystem          kbytes    used   avail %used Mounted on
/dev/vg00/lvol3     143360   31193  105221   23% /
/dev/vg00/lvol1      83733   28877   46482   38% /stand
/dev/vg00/lvol8     512000  391965  112727   78% /var
/dev/vg00/lvol7     614400  451827  152414   75% /usr
/dev/vg00/lvol4      65536    4162   57571    7% /tmp
/dev/vg00/lvol6     512000  441708   65948   87% /opt
/dev/vg00/lvol5     512000  108531  378438   22% /home
```

For Help, press F1 NUM

m2426stk bdf output /cad1 directory is no longer mounted

EMS Peripheral Status Monitor: m2426s2k bdf output



/cad1 directory
is now mounted
on system m2426s2k

EMS Peripheral Status Monitor: configuration file .psmcfg

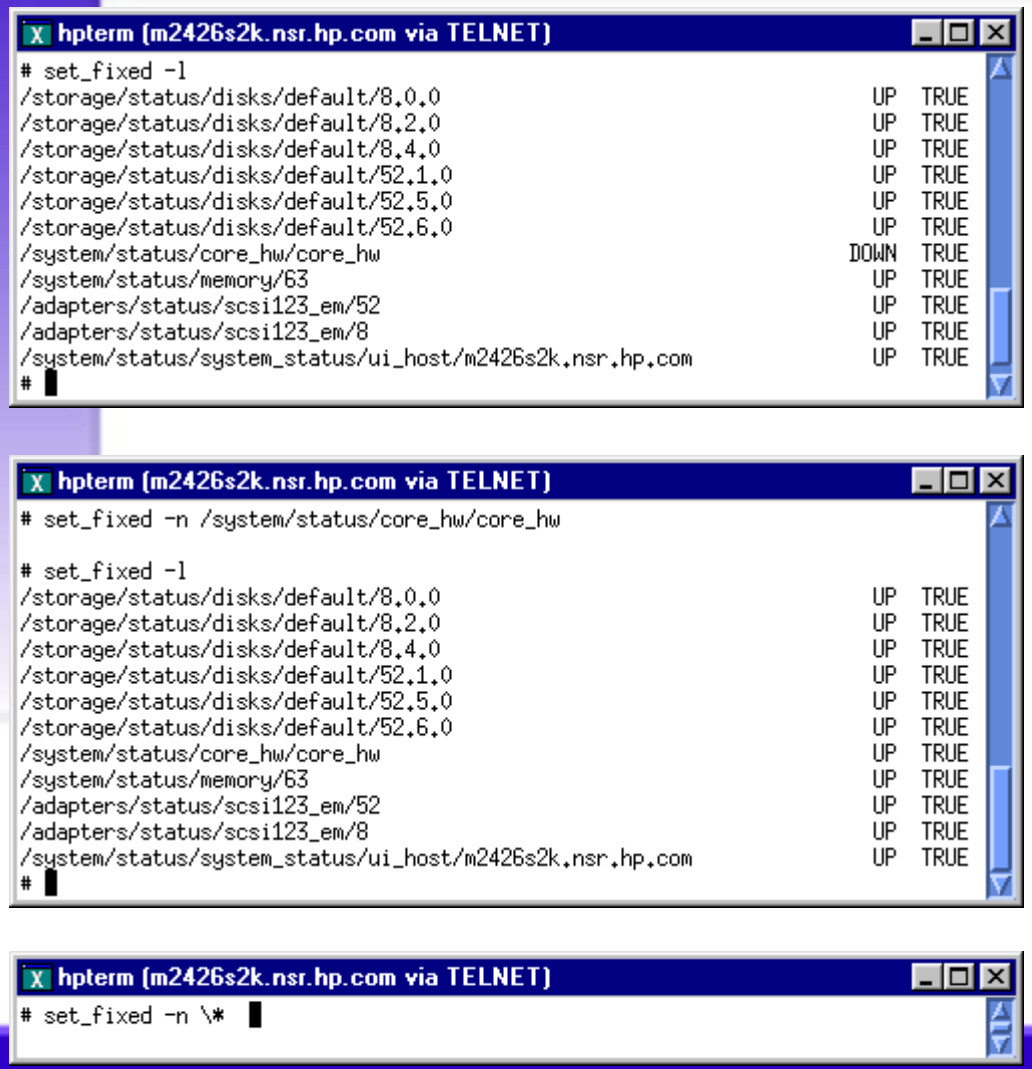
- /var/stm/config/tools/monitor/monitor_name.psmcfg
- Existence determine whether or not status monitoring is supported
- Defines event to state/status correlation

  SERIOUS and CRITICAL events usually map to DOWN status

- Determines what action, if any, is required to return the H/A to UP status

PSM does not have the ability to determine when a device's status has been returned to UP. Therefore the set_fixed command must be executed

EMS Peripheral Status Monitor: set_fixed command

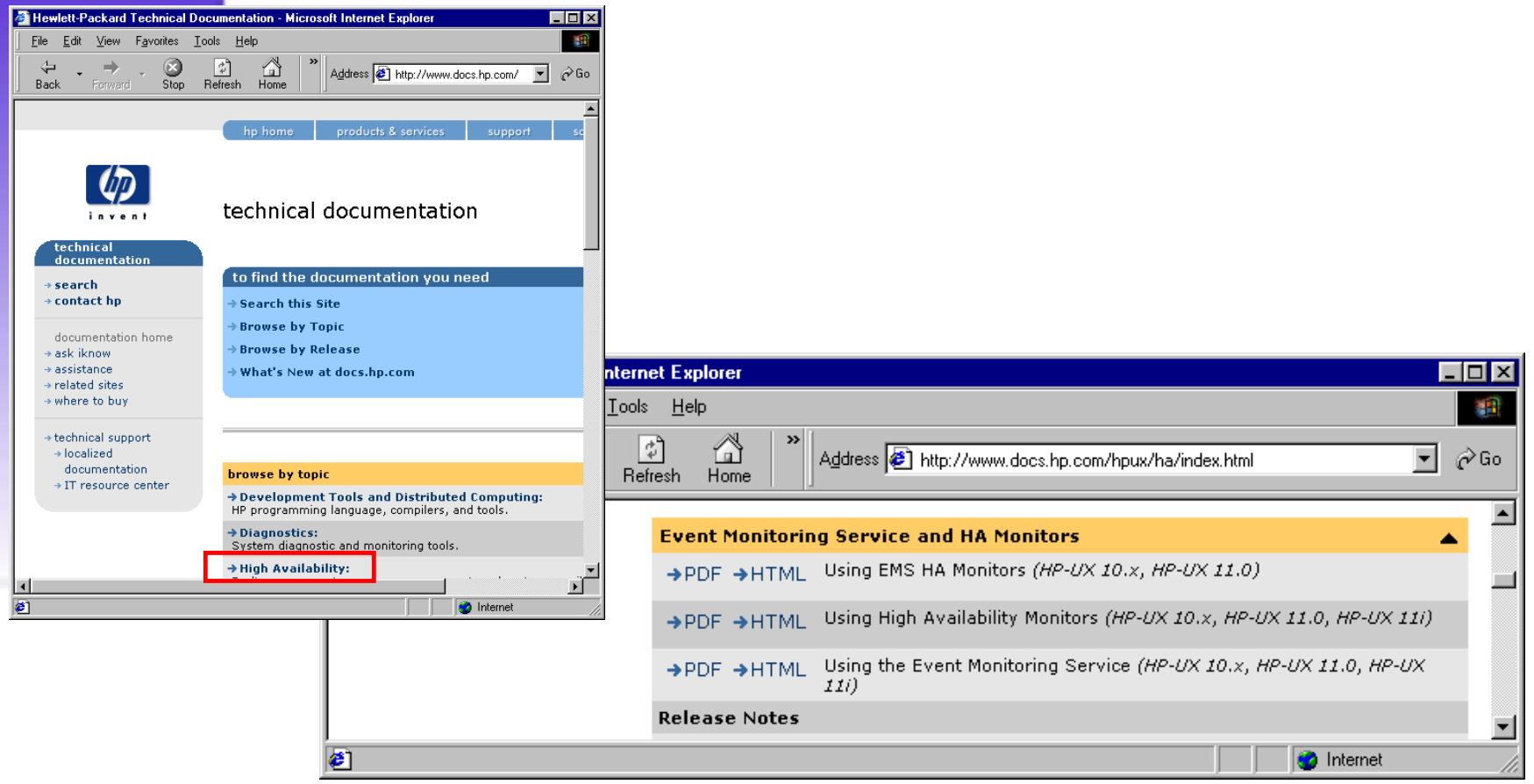


- **-l option shows the devices current status**
- **-n option sets the device to an UP status**
- **-n option and * sets all devices to an UP status**

EMS H/A Monitor Definition

- Set of monitors that poll a local system or application resource and sends messages when events occur
- Send events to a wide variety of software using multiple protocols
- Configuration interface is SAM

EMS H/A Monitor Overview



EMS H/A Monitor
Resource Classes

• Disk Monitor	Monitors LVM Disks
• Cluster Monitor	MC ServiceGuard
• Network Monitor	LAN Interface
• System Monitor	User, Job Queue, F/S
• Database Monitor	Database Resources

EMS H/A Monitor
Disk Monitor LVM

- **Physical Volume Status**
  - *summary status of all physical volumes in a volume group*
  - *useful for monitoring physical volume groups (PVGs)*
- **Physical Volume and Physical Volume Link Status**
  - *the status of a individual physical volumes and physical volume links (PV Links)*
  - *used to calculate physical volume status*

Both help to provide status on the accessibility of both active and inactive volume groups and logical volumes

EMS H/A Monitor
Disk Monitor LVM (con't)

- **Logical Volume Summary**
  - *summary status of all logical volumes in an active volume group*
  - *determines accessibility of data … sometimes the physical connection is working but the application cannot read or write data*
- **Logical Volume Status**
  - *status of each logical volume in a volume group*
  - *determines which specific logical volumes have failed*

EMS H/A Monitor
Disk Monitor LVM (con't)

- **Logical Volume Copies**
  - ***the number of copies of data in a volume group***
  - ***useful for monitoring mirrored disk configuration (MirrorDisk/UX)***

EMS H/A Monitor
Cluster Monitor

- **Cluster Status** *node accessing cluster*
- **Local Node Status** *see example below*
- **Package Status** *running on local node*

Node Status Example

EMS Interpreting Node Status - Notepad

File Edit Search Help

```
Interpreting Node Status

Condition       Value                       Interpretation

RUNNING           1          Node is accessible and operating normally
INITIALIZING      2          Node's daemon has started, but is not ready to
                                communicate with other nodes' daemons
RECONFIGURING     3          Node is running protocols to make sure all
                                other nodes agree to the new membership in
                                the cluster
INVALID           4          The cluster status may be DOWN
HALTED            5          Node has been removed from the cluster, with
                                the cmhaltnode command, for example
FAILED            6          Node is no longer a member of an active cluster
```

EMS H/A Monitor
Network Monitor

- **Status of whether or not the LAN interface is up or down**
- **MC ServiceGuard standby LANs are reported as DOWN unless they have been activated to replace a failed LAN interface**

EMS H/A Monitor
System Resources Monitor

- **Status of Number of Users**
  - *Total number of users logged on the system*
- **Status of Job Queues**
  - *Average number of jobs in the queue in the last minute*
  - *Average number of jobs in the queue in the last 5 minutes*
  - *Average number of jobs in the queue in the last 15 minutes*
- **File System Available space**
  - *checks number of megabytes available for use*
  - *file system must be mounted*

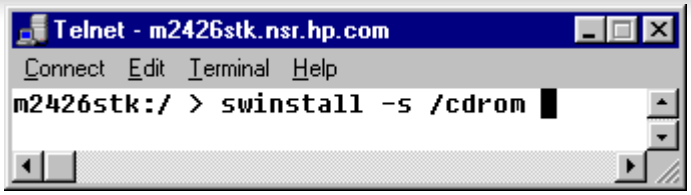
EMS H/A Monitor
Database Monitor

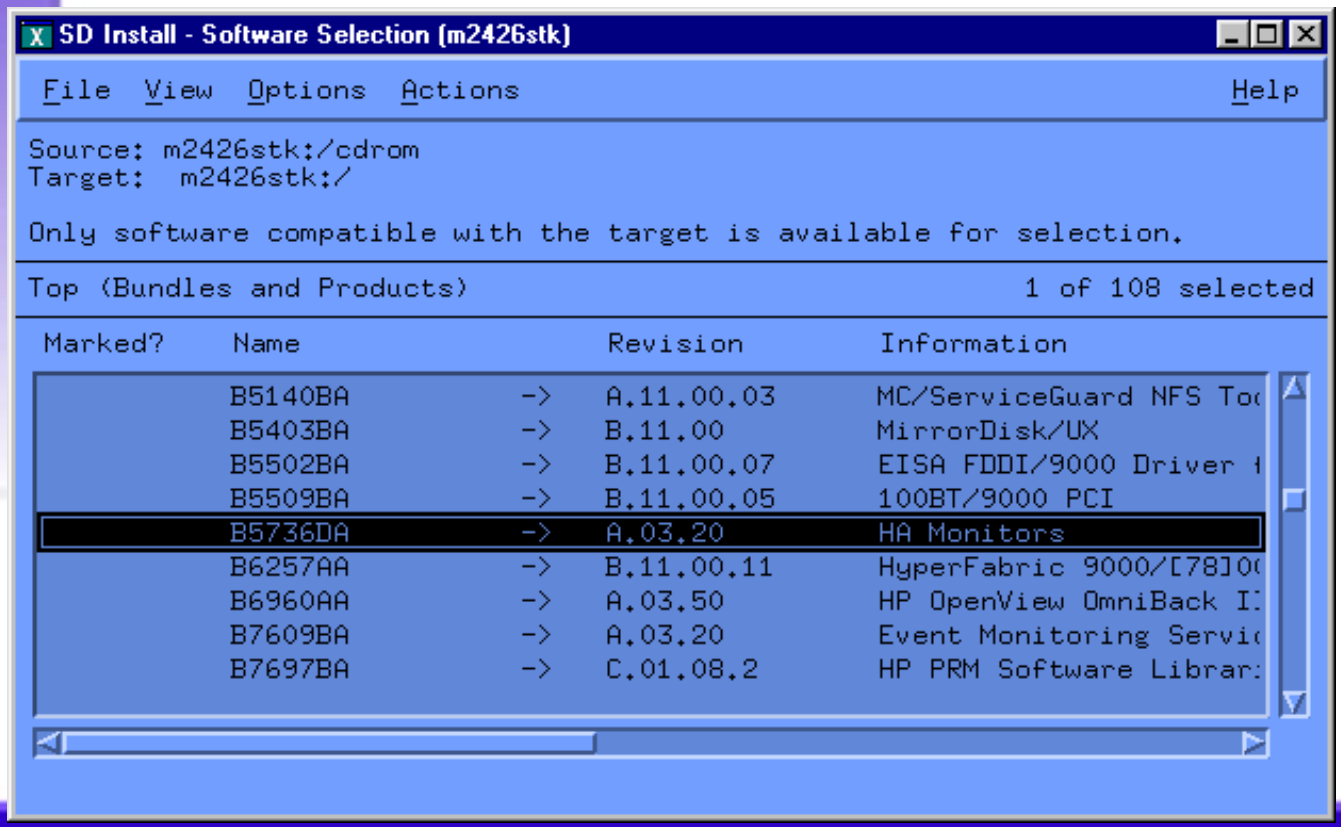
- Database status
- Allocated disk space for the database
- Percentage and amount of disk space used within the database
- Number of transactions completed by server
- Current number of connections to the server
- Peak connections made since server started

EMS H/A Monitor Requirements

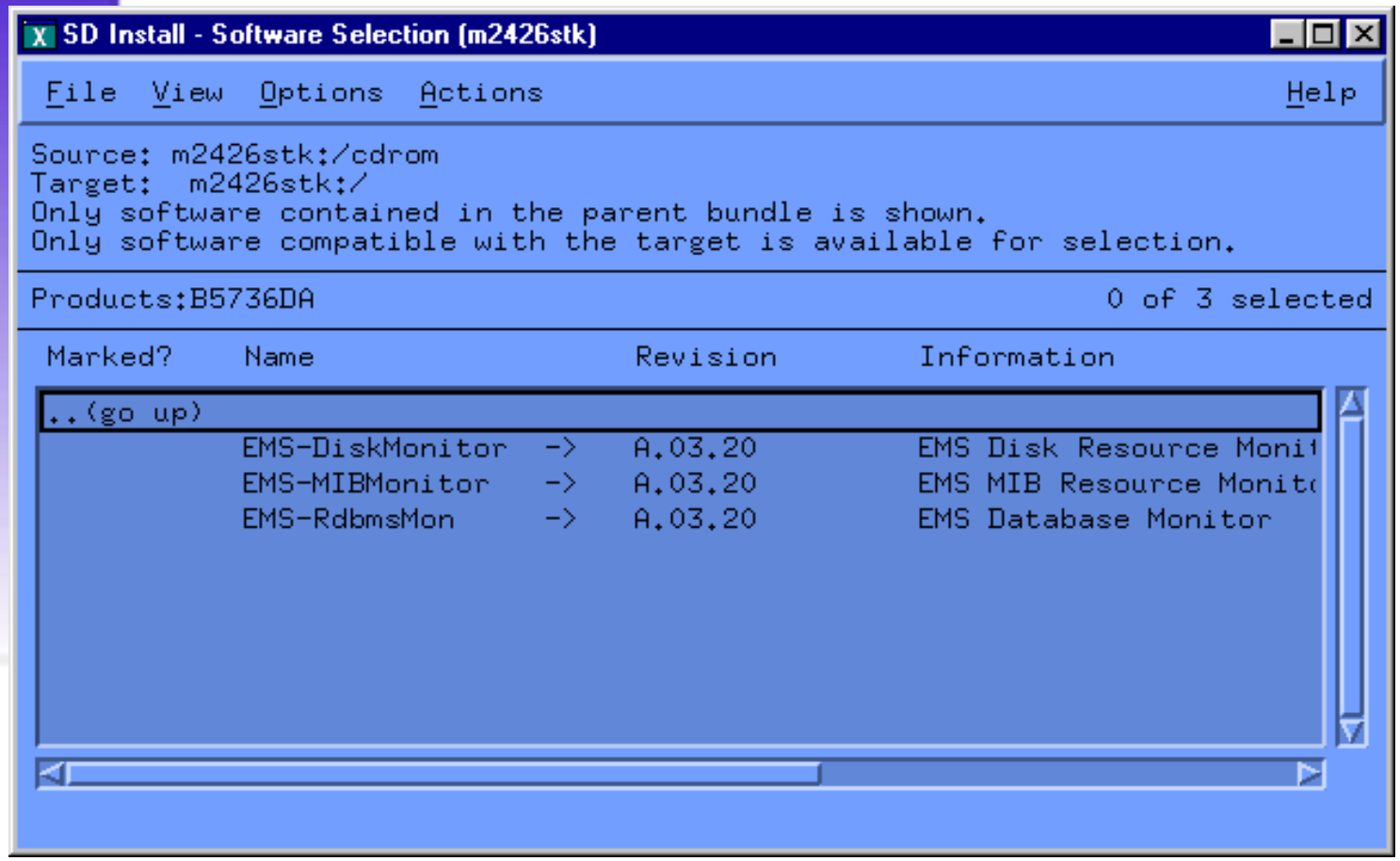
- Install off of the Application CDROM
- Must match Diagnostics and EMS version
- Applicable patches

EMS H/A Monitor Install

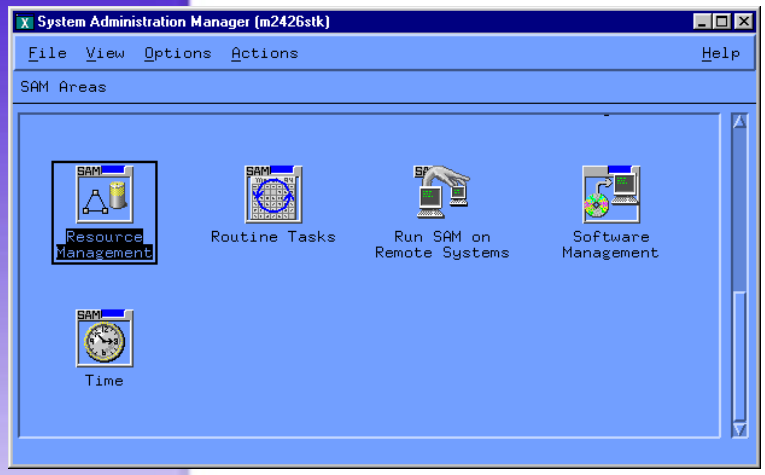


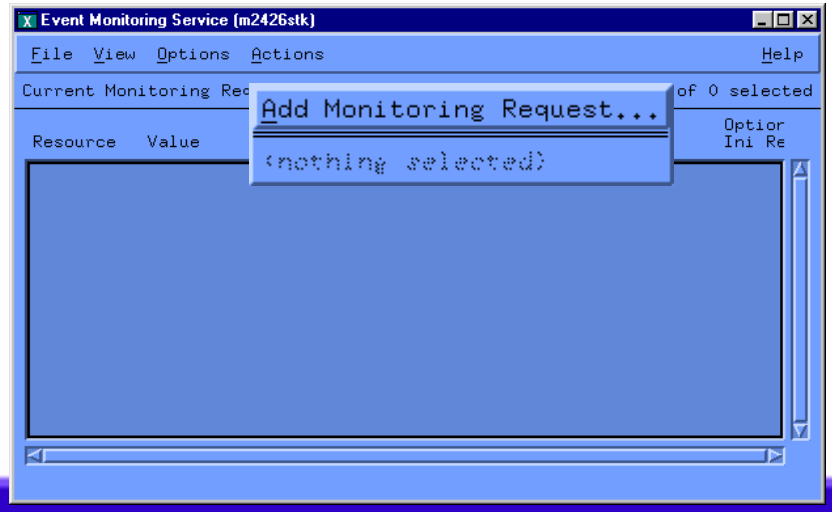


EMS H/A Monitor Install

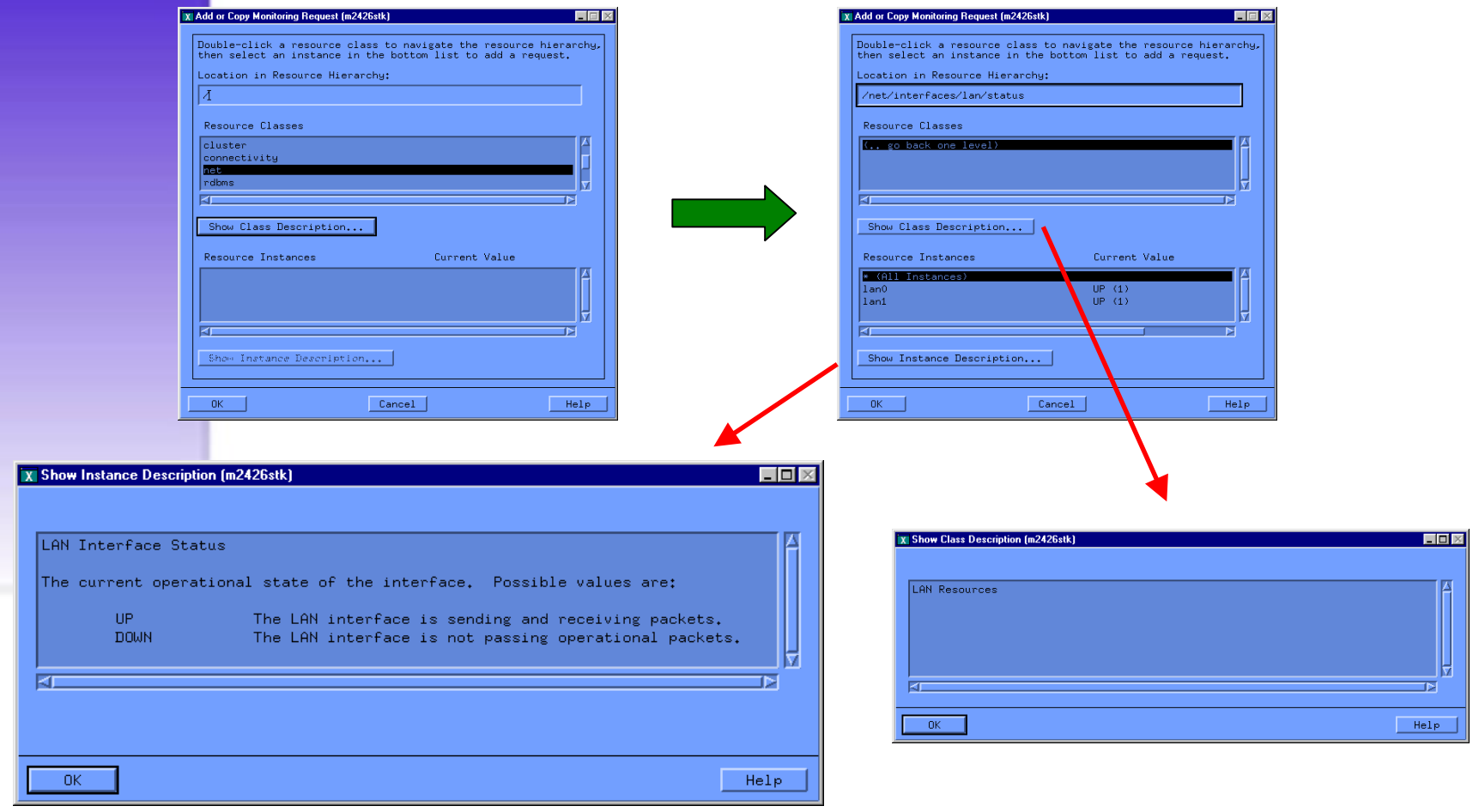


EMS H/A Monitor
Configure Network Monitor

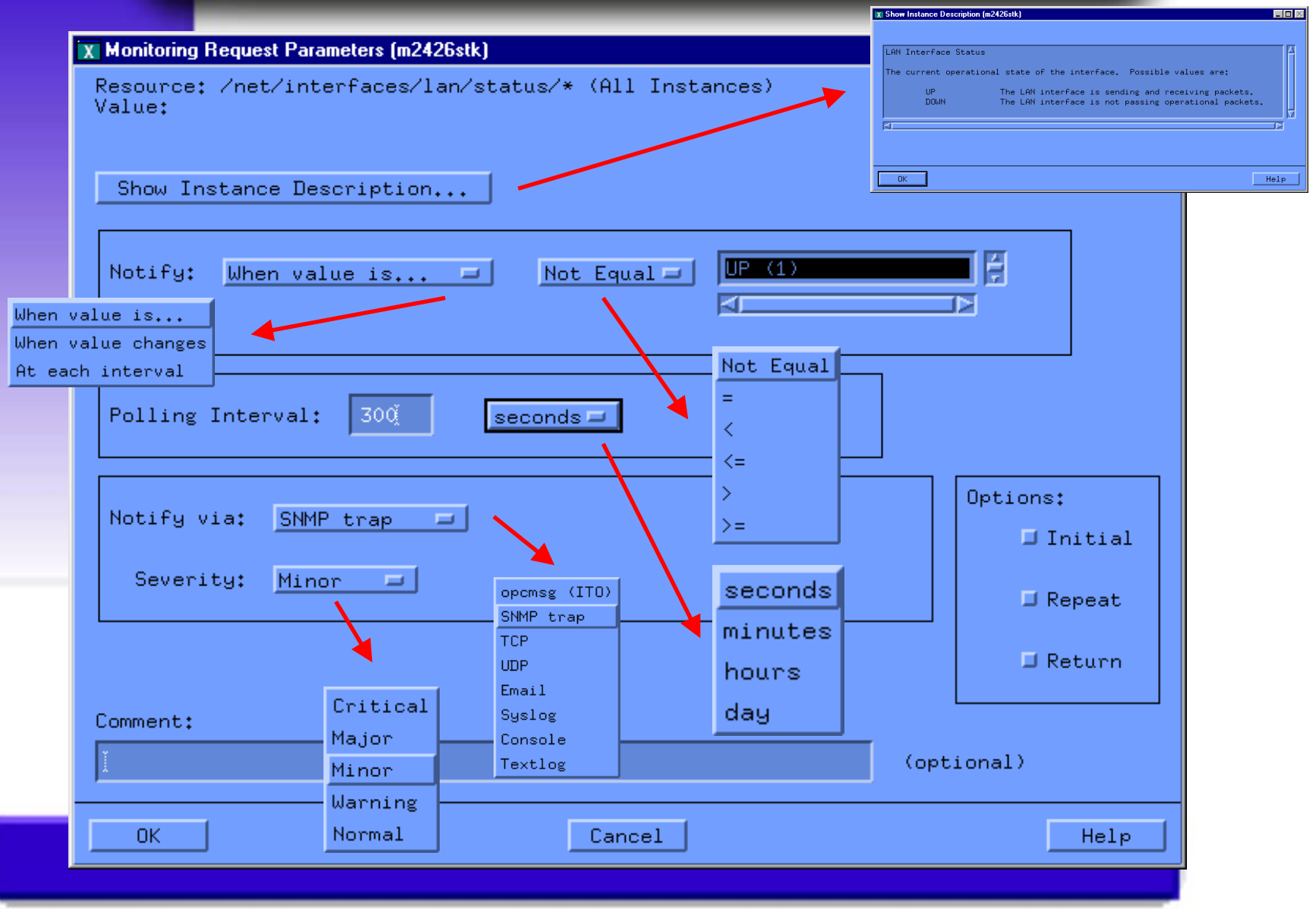




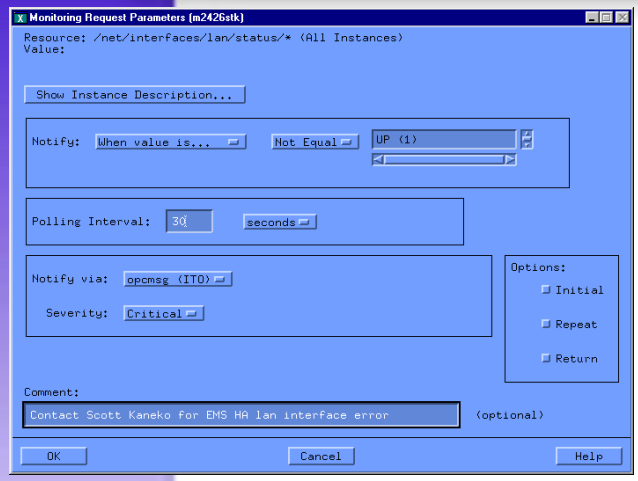
EMS H/A Monitor
Configure Network Monitor

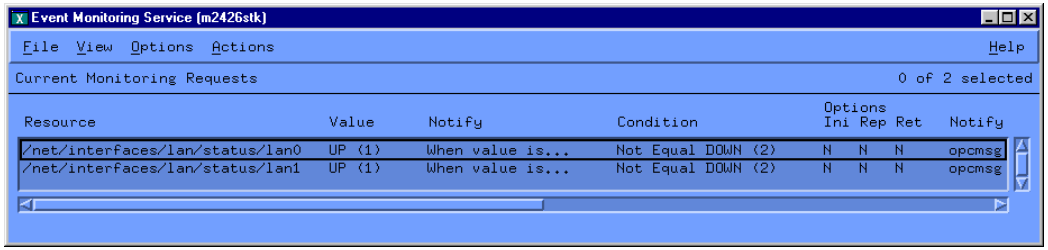


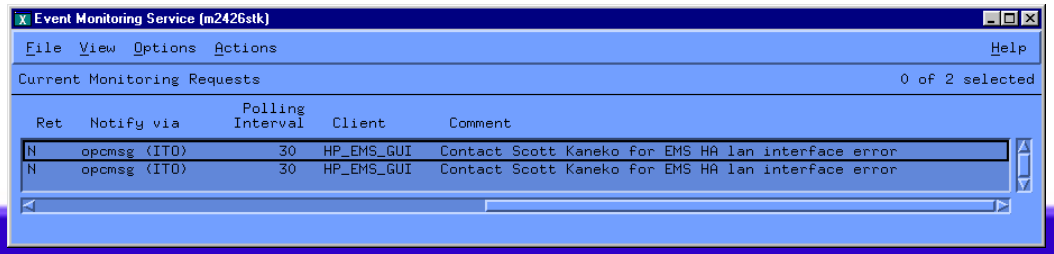
EMS H/A Monitor
Configure Network Monitor



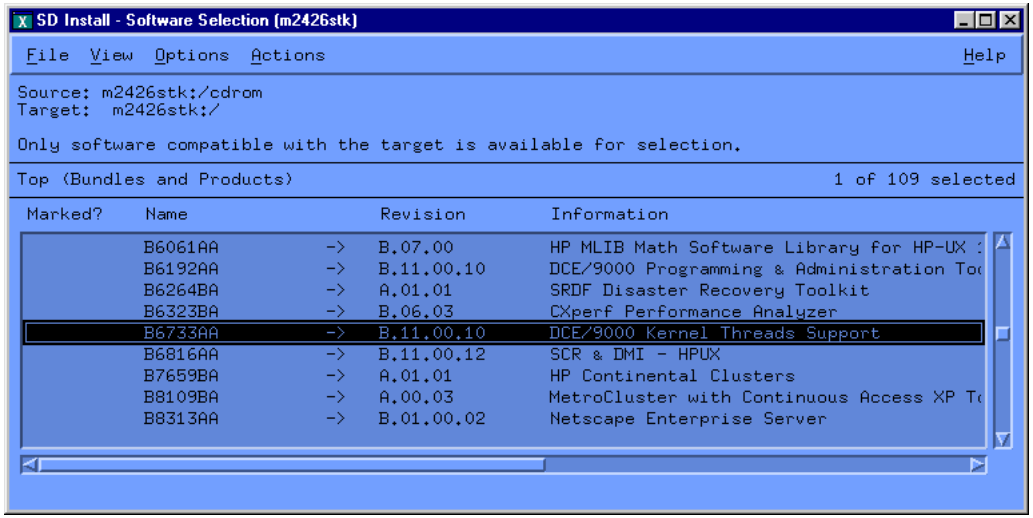
EMS H/A Monitor
Configure Network Monitor

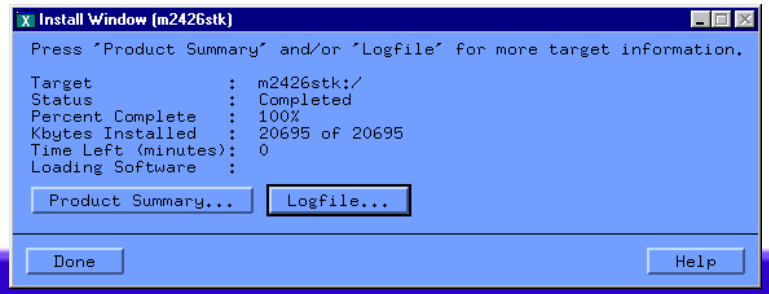




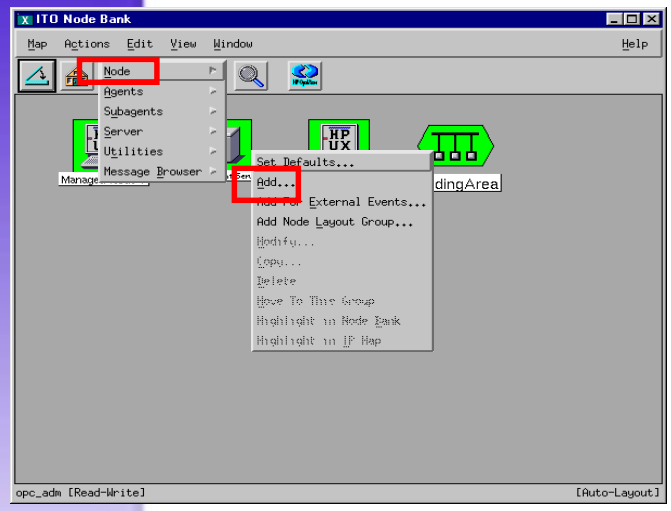


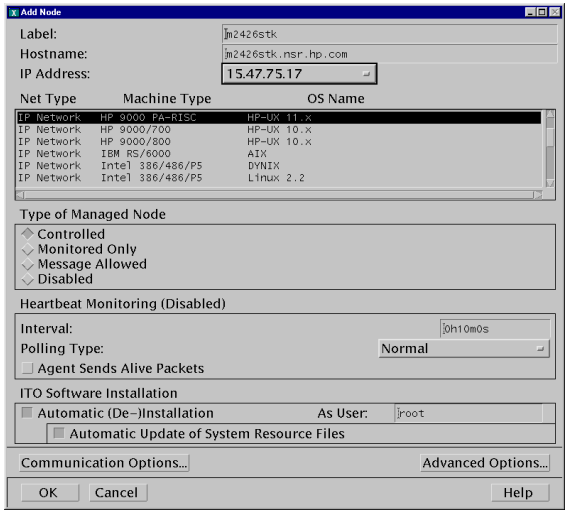
EMS H/A Monitor
OpenView Operations Configuration

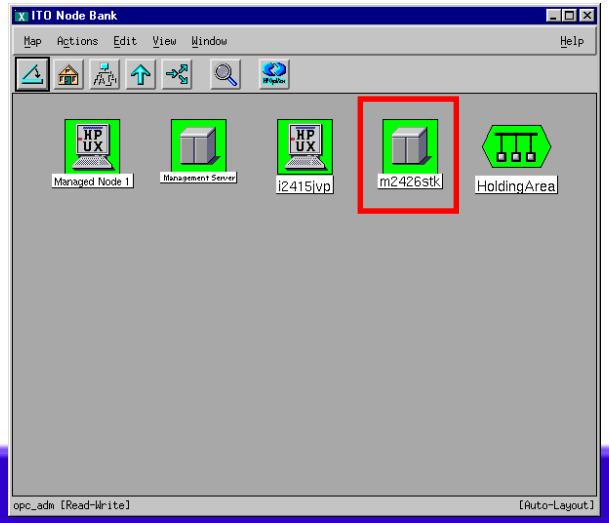




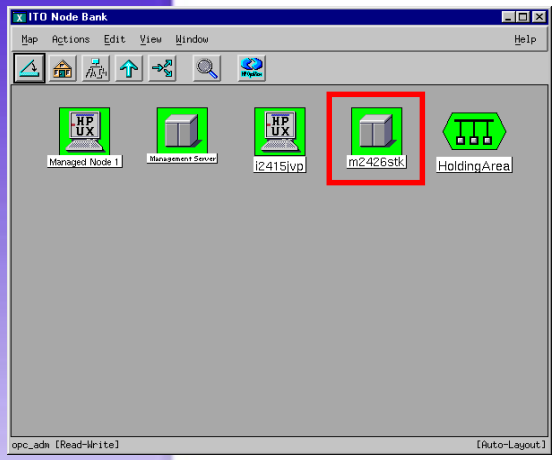
EMS H/A Monitor
OpenView Operations - Adding Node

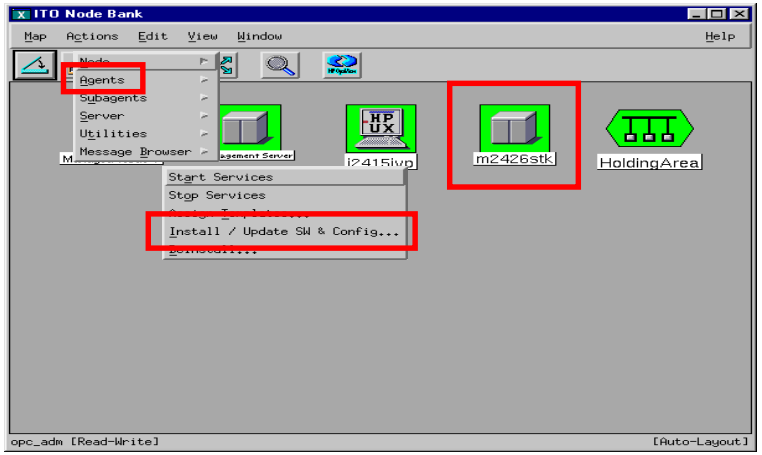


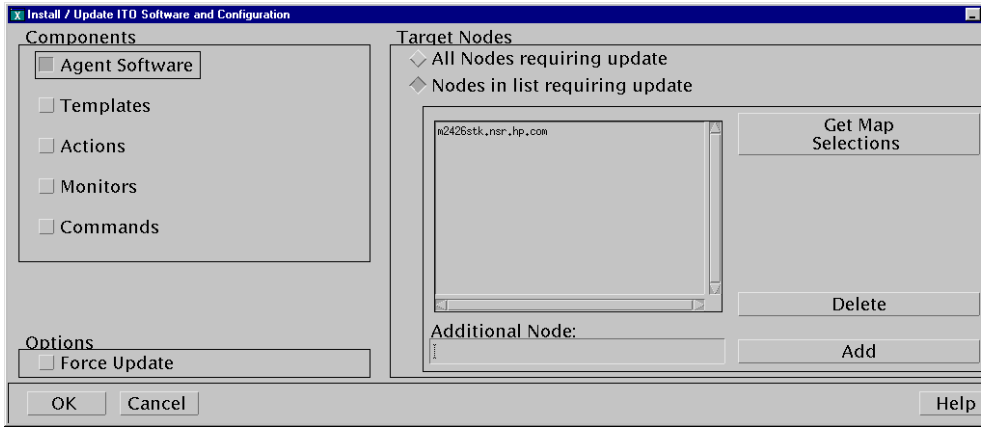




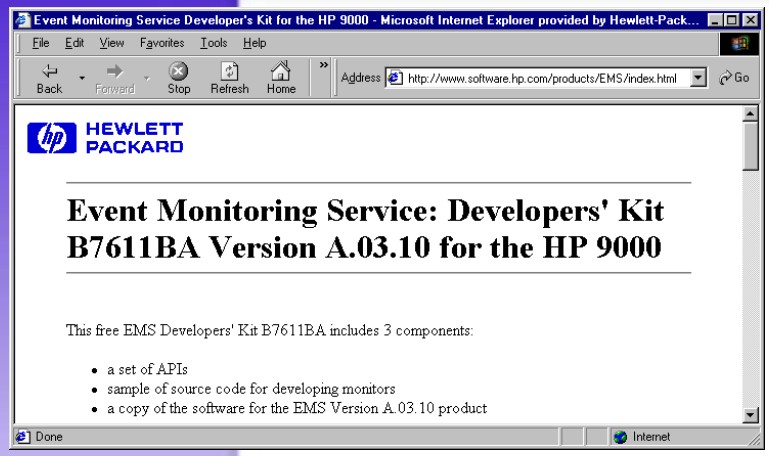
EMS H/A Monitor
OpenView Operations – Adding Agent

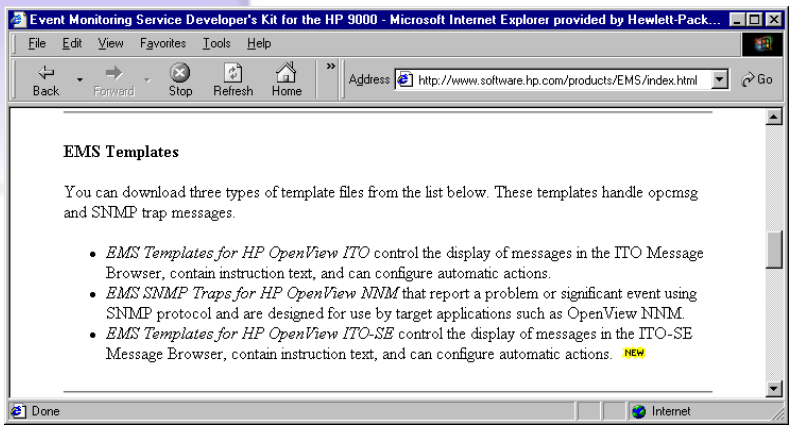


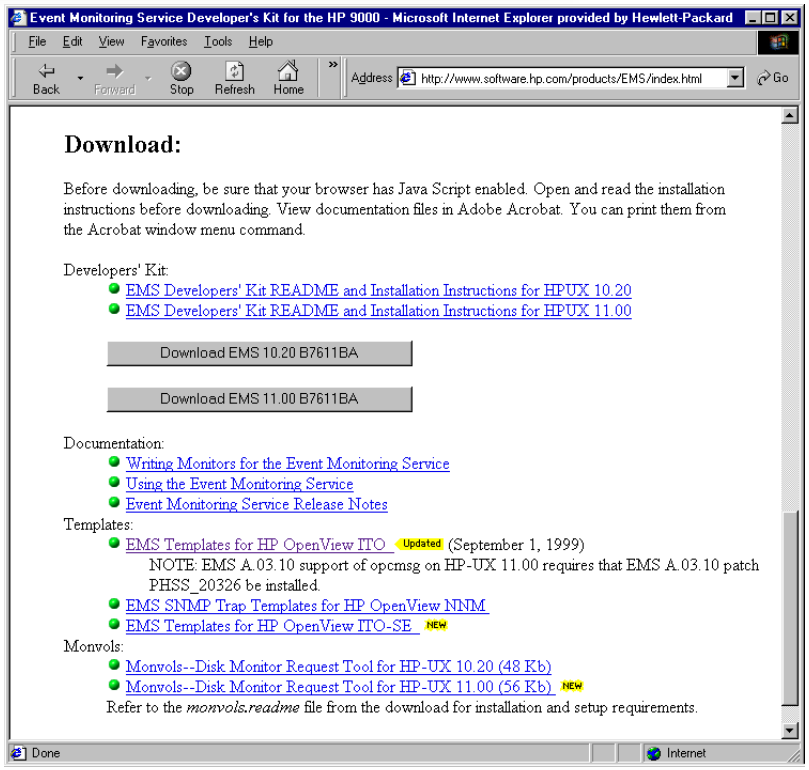




EMS H/A Monitor
OpenView Operations – Installing Templates







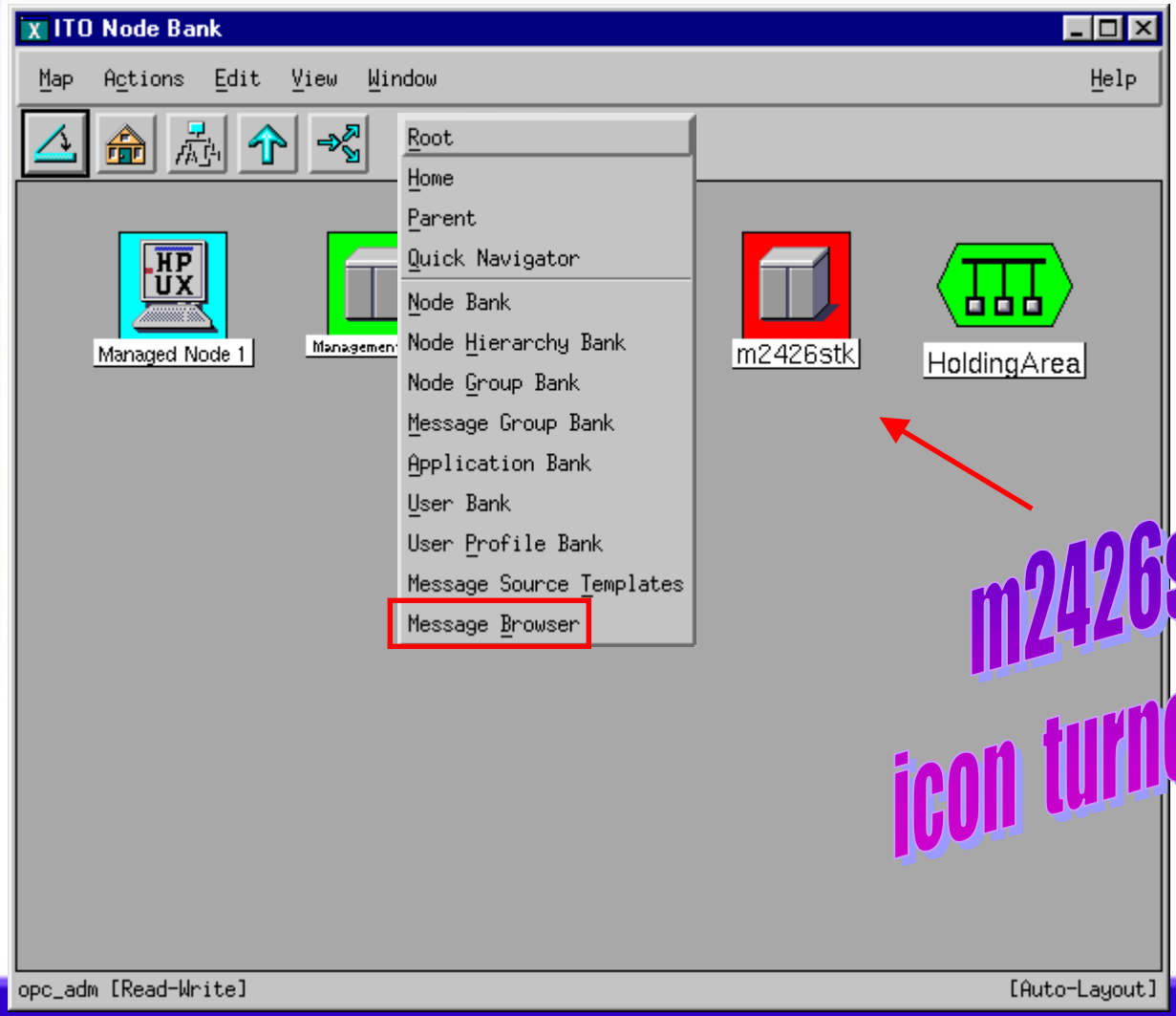
http://www.software.hp.com/products/EMS/index.html

EMS H/A Monitor
OpenView Operations EMS Integration

- Physically disconnected lan0 cable
- Executed command:

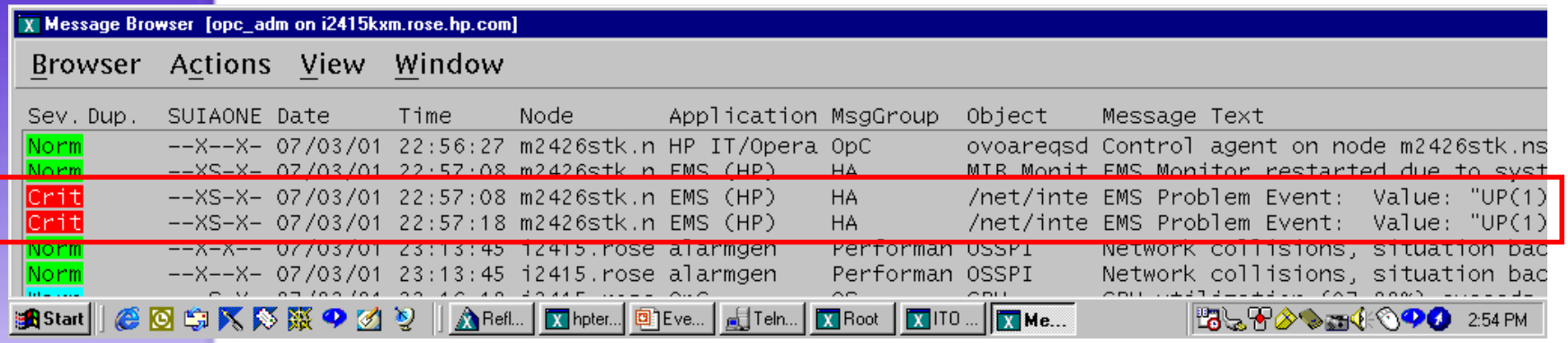
  ifconfig lan1 down

EMS H/A Monitor
OpenView Operations EMS Integration



m2426stk icon turned red

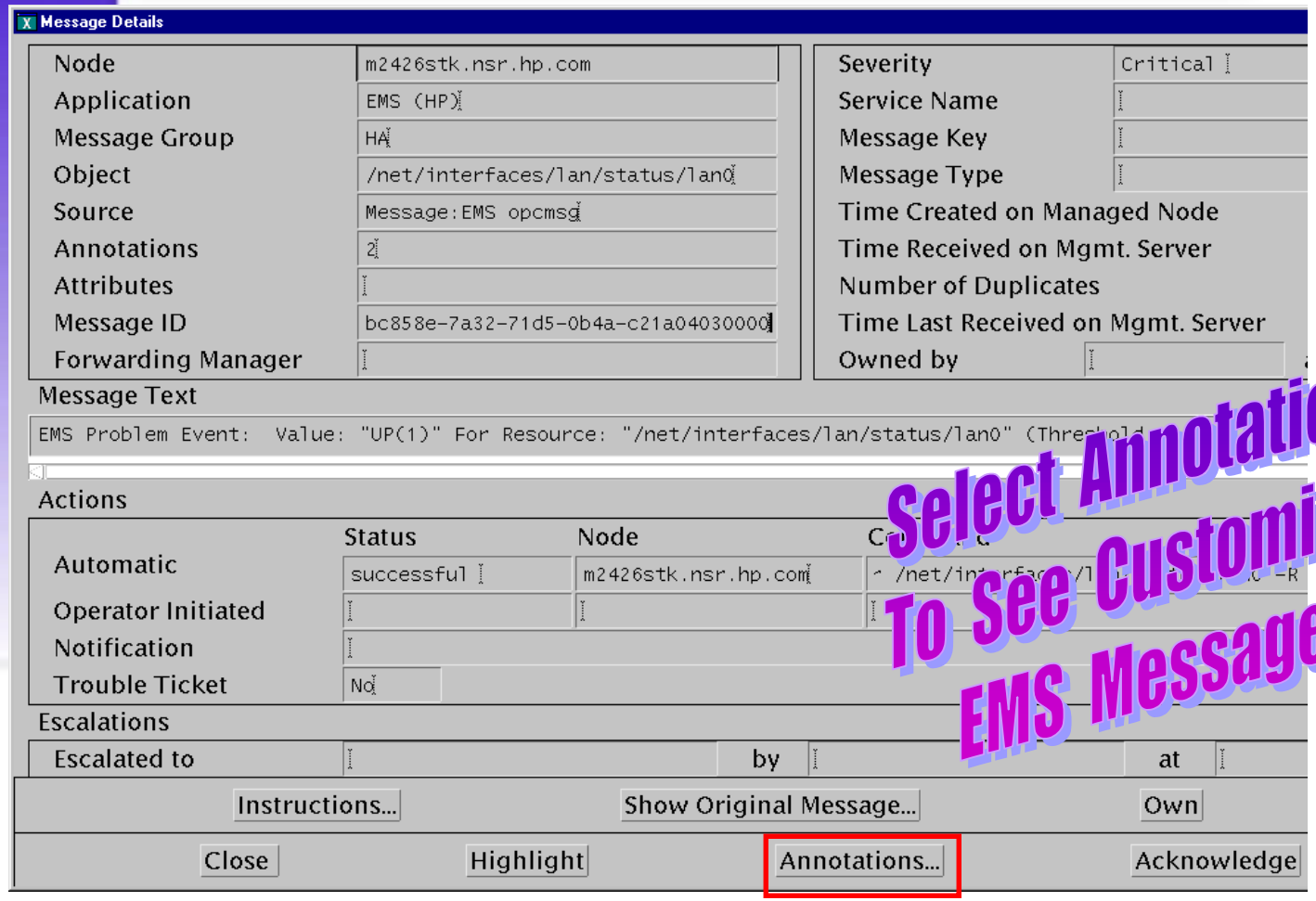
EMS H/A Monitor
OpenView Operations EMS Integration



1st Critical Message: disconnected lan0 cable

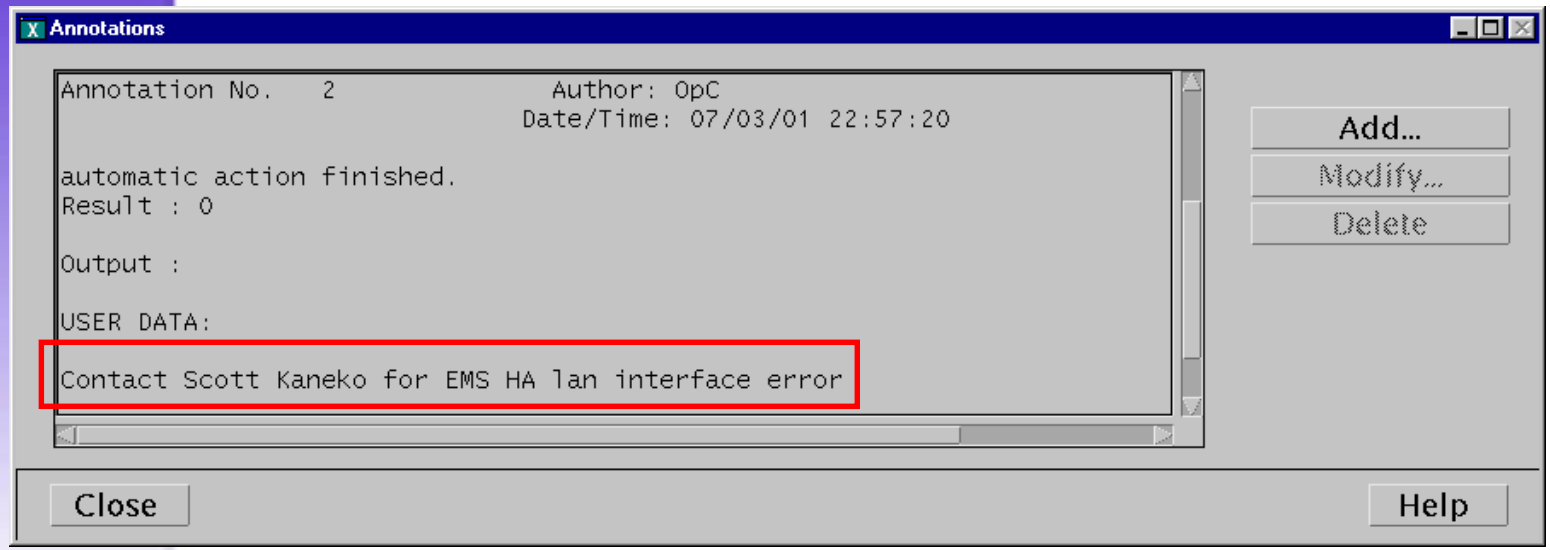
2nd Critical Message: ifconfig lan1 down

EMS H/A Monitor
OpenView Operations EMS Integration



Select Annotations To See Customized EMS Message

EMS H/A Monitor
OpenView Operations EMS Integration



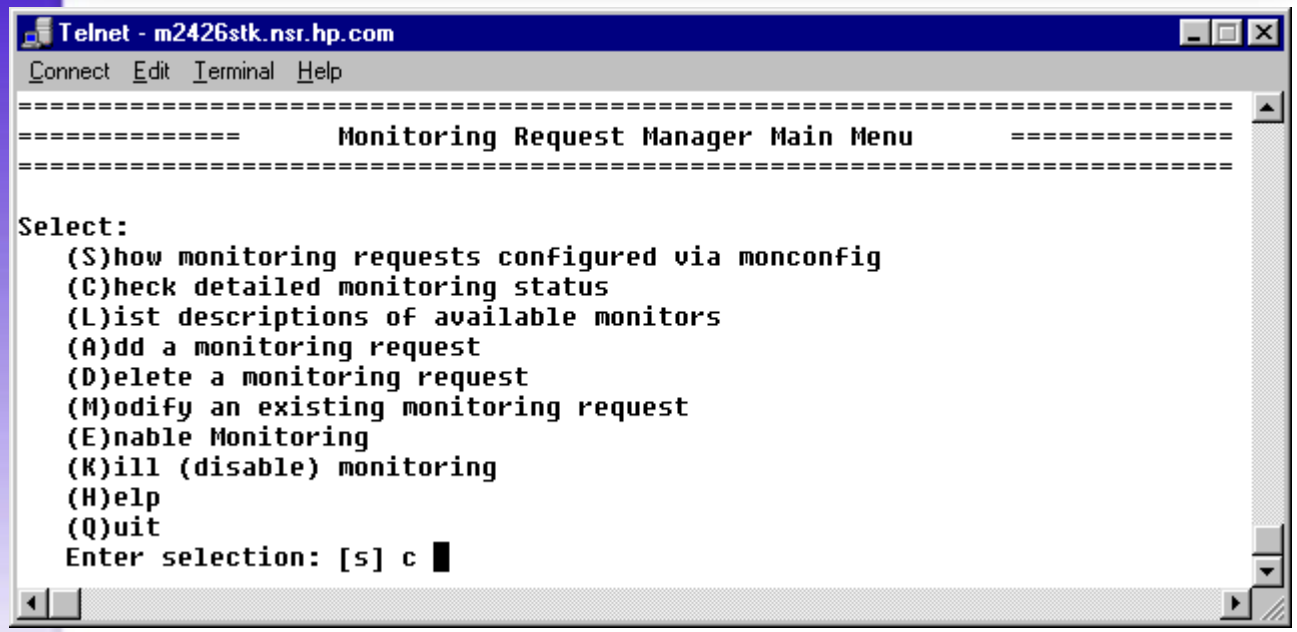
EMS Additional Notes
Disabling EMS

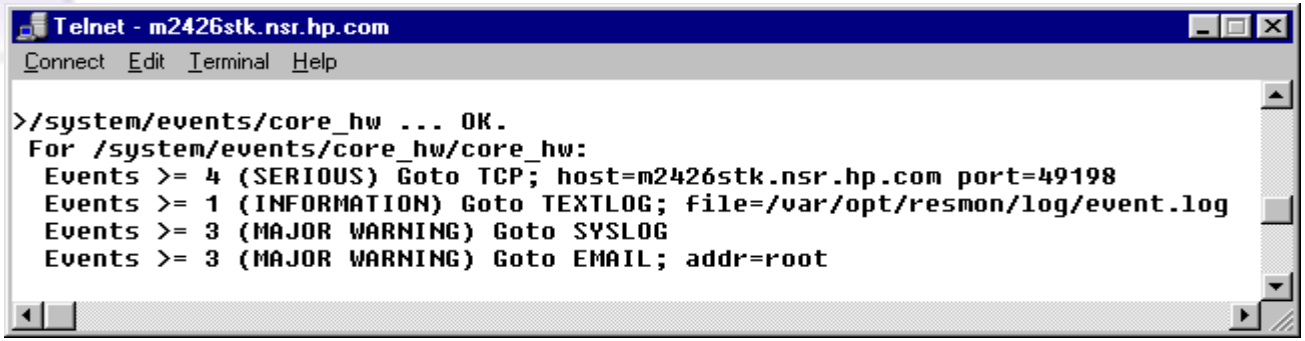
- **Disable Entire EMS Monitor**
- **Disable EMS Events**
- **Disable EMS Instance**

EMS Additional Notes
Steps To Disable Entire EMS Monitor

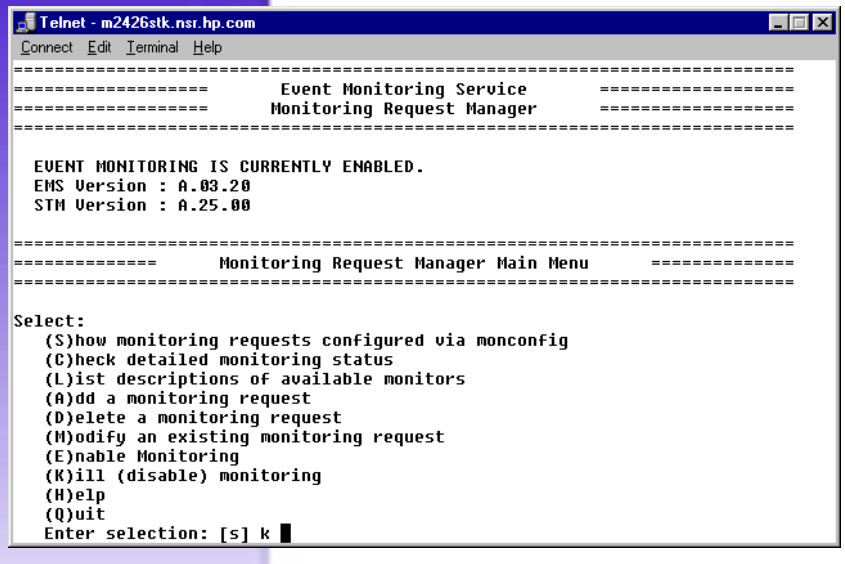
1) Disable monitoring
2) Move the executable
3) Move the dictionary entry
4) Move the .hwa existence file
5) Enable monitoring
6) Verify

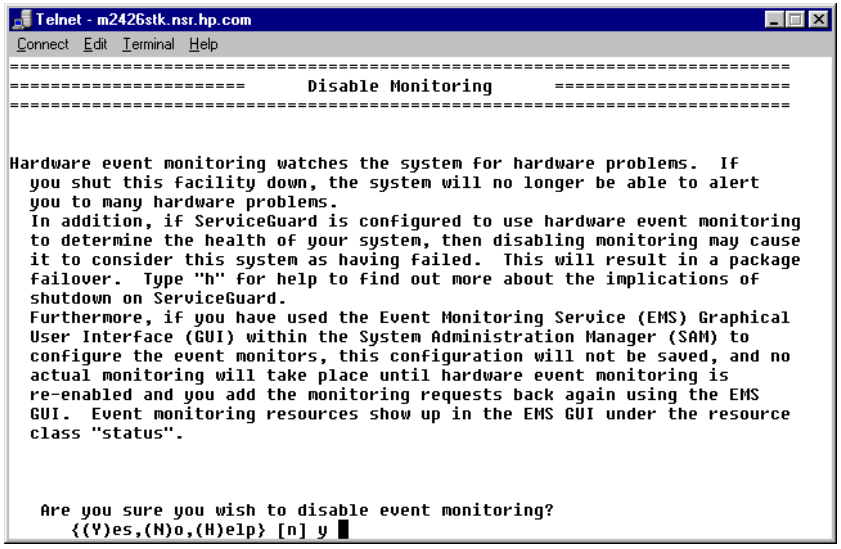
EMS Additional Notes
Disable Entire EMS Monitor

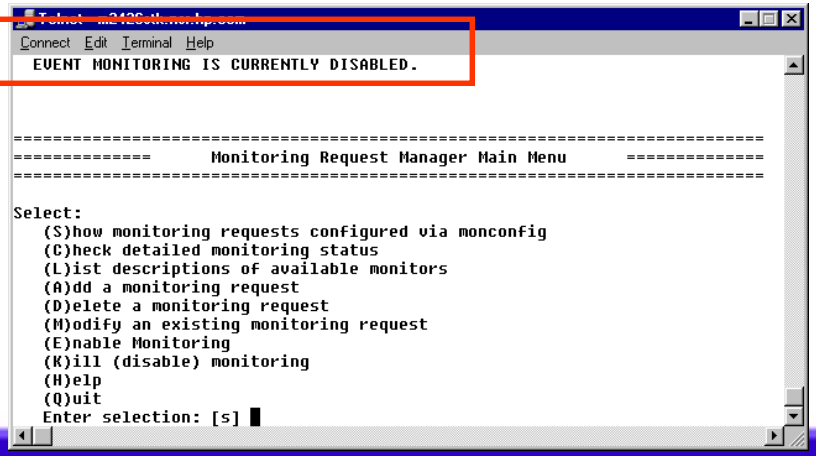




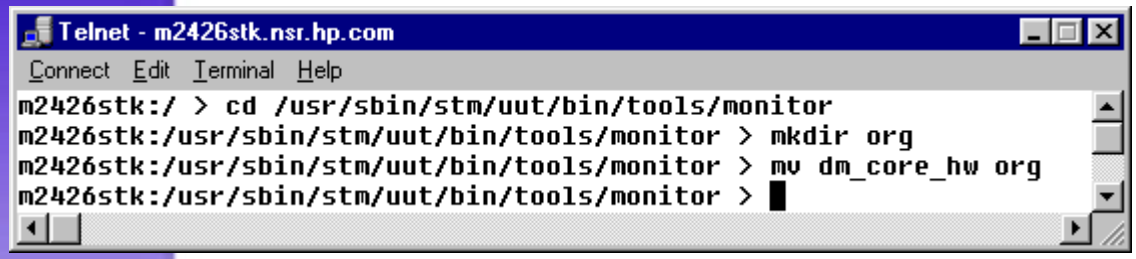
EMS Additional Notes
Disable Entire EMS Monitor



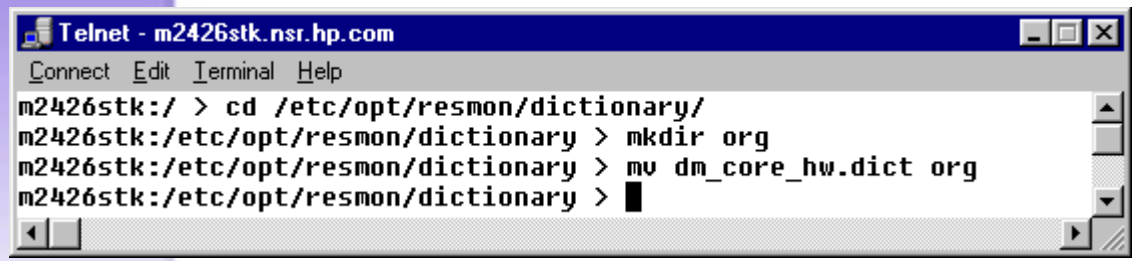




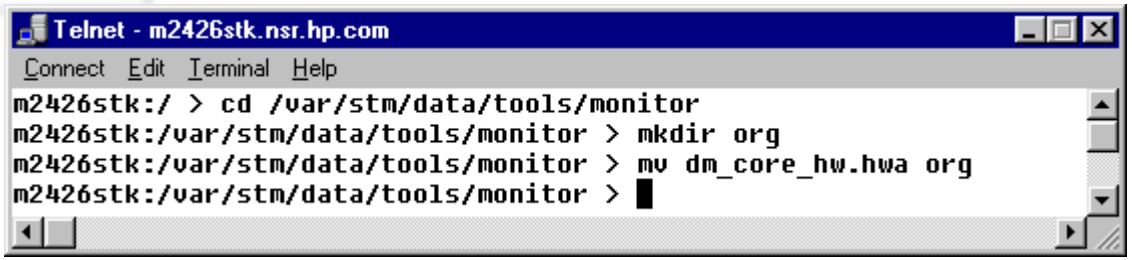
EMS Additional Notes
Disable Entire EMS Monitor



Move Executable File

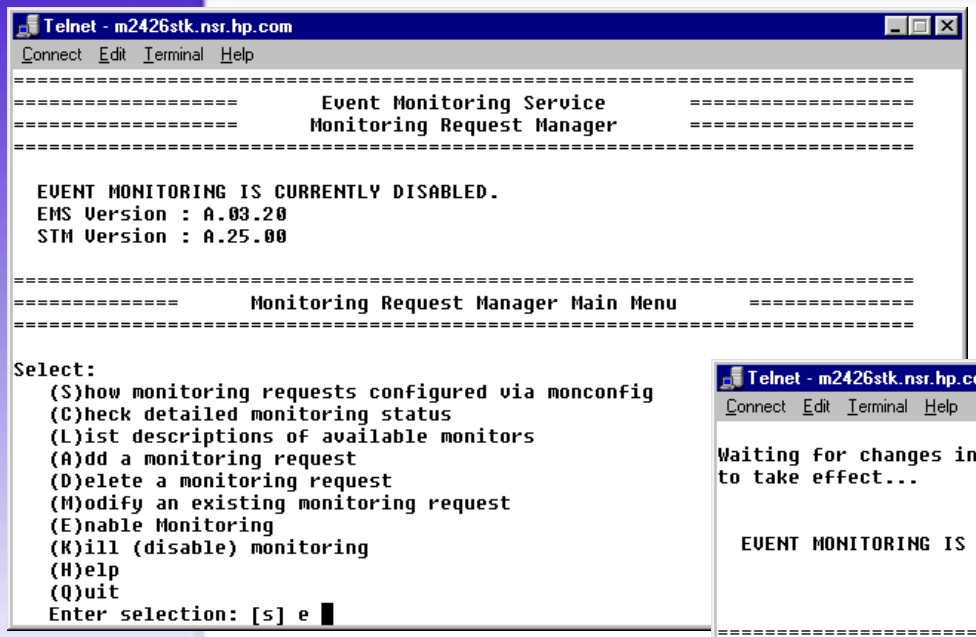


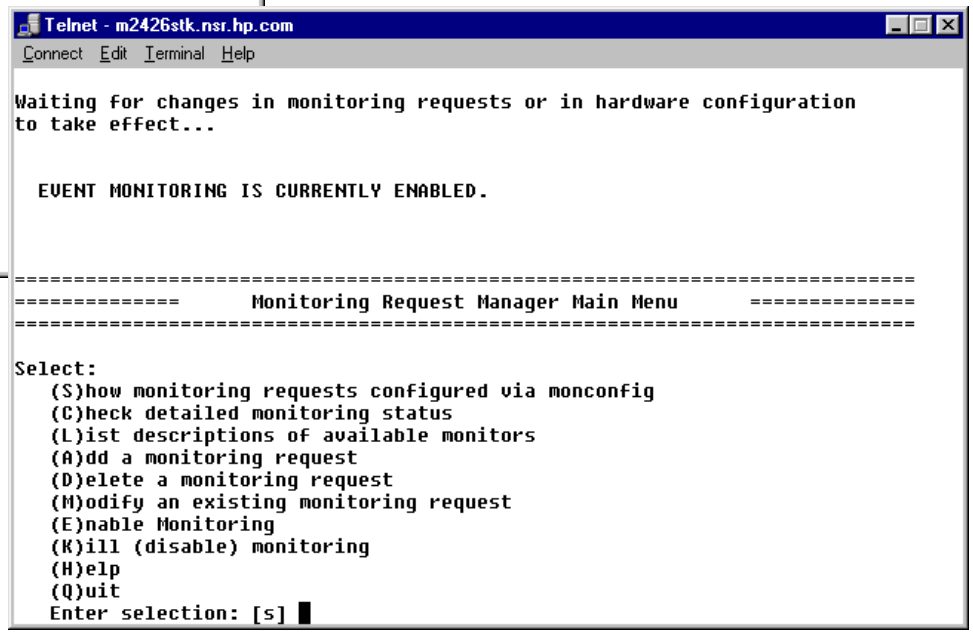
Move Dictionary File



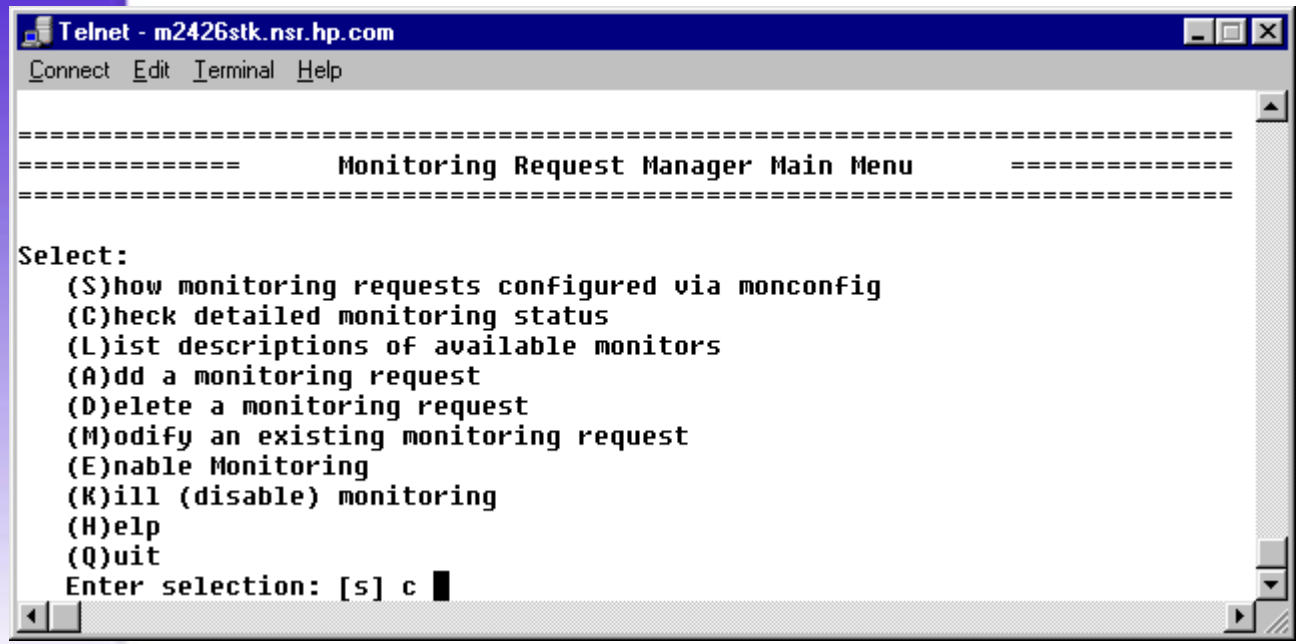
Move Existence File

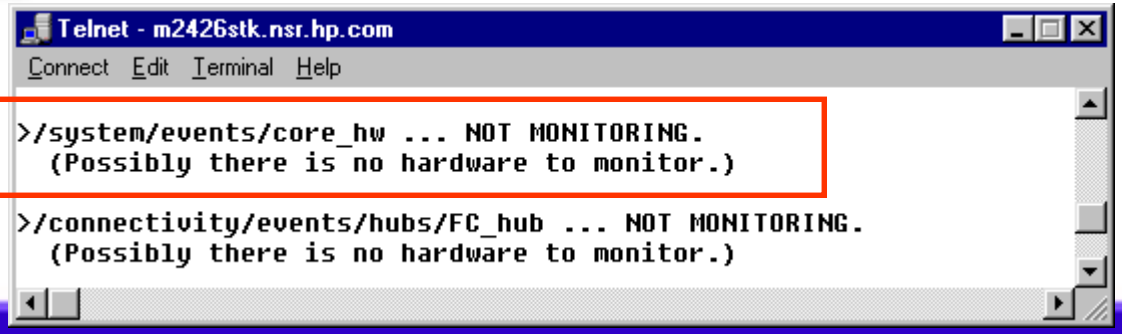
EMS Additional Notes
Disable Entire EMS Monitor





EMS Additional Notes
Disable Entire EMS Monitor

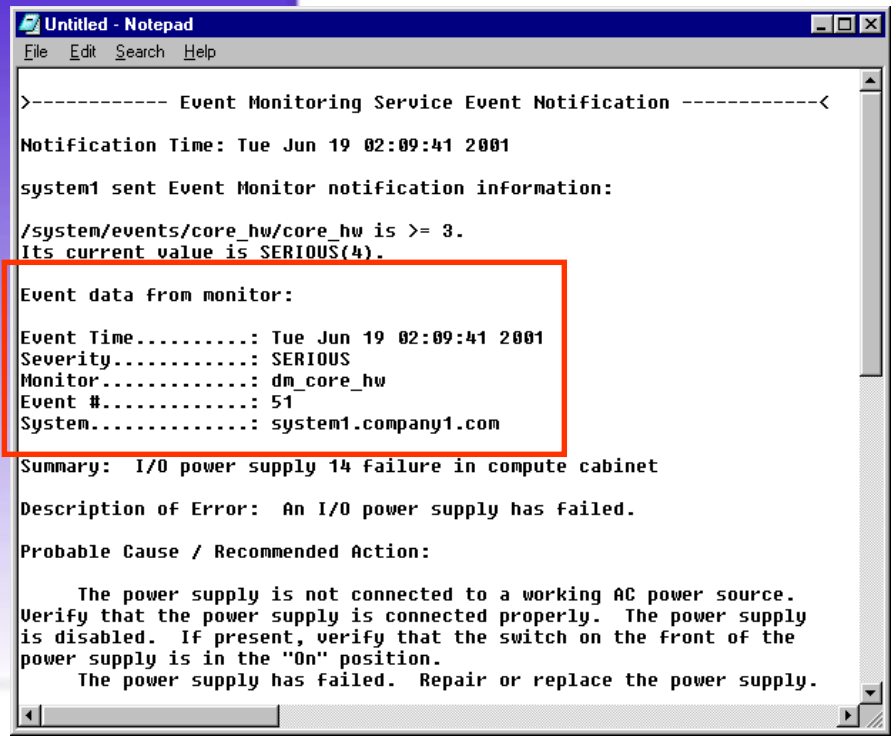


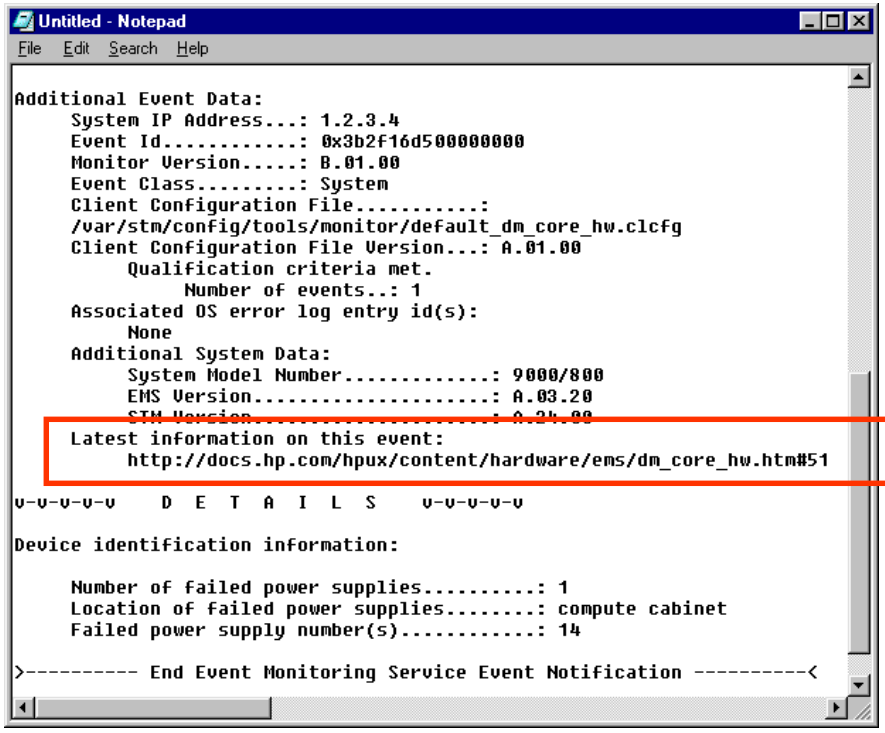


EMS Additional Notes
Disabling EMS

- **Disable Entire EMS Monitor**
- **Disable EMS Events**
- **Disable EMS Instance**

EMS Additional Notes
dm_core_hw events 51 & 55

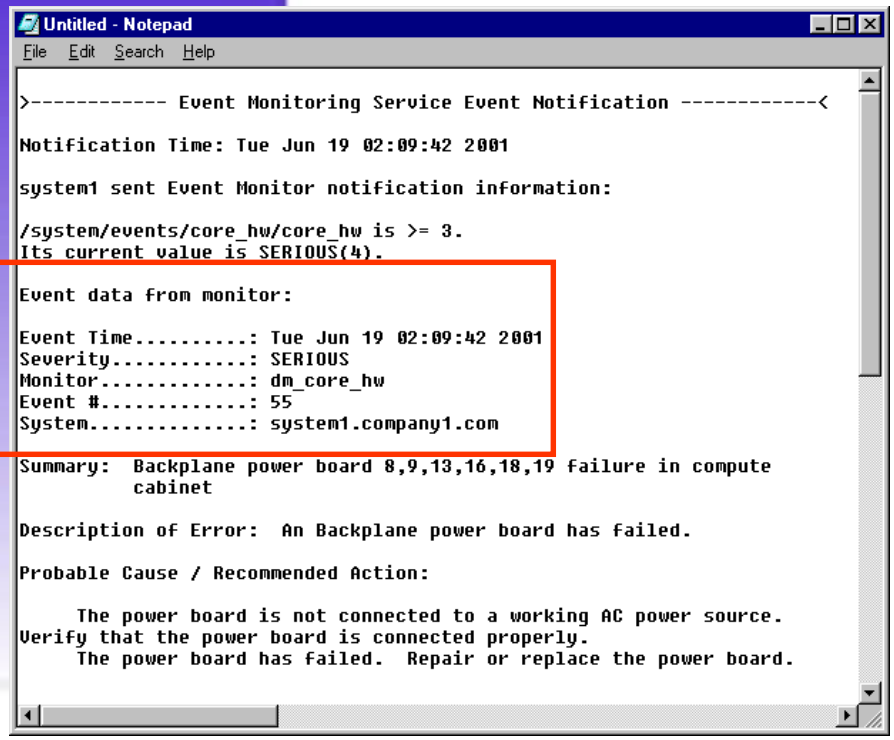


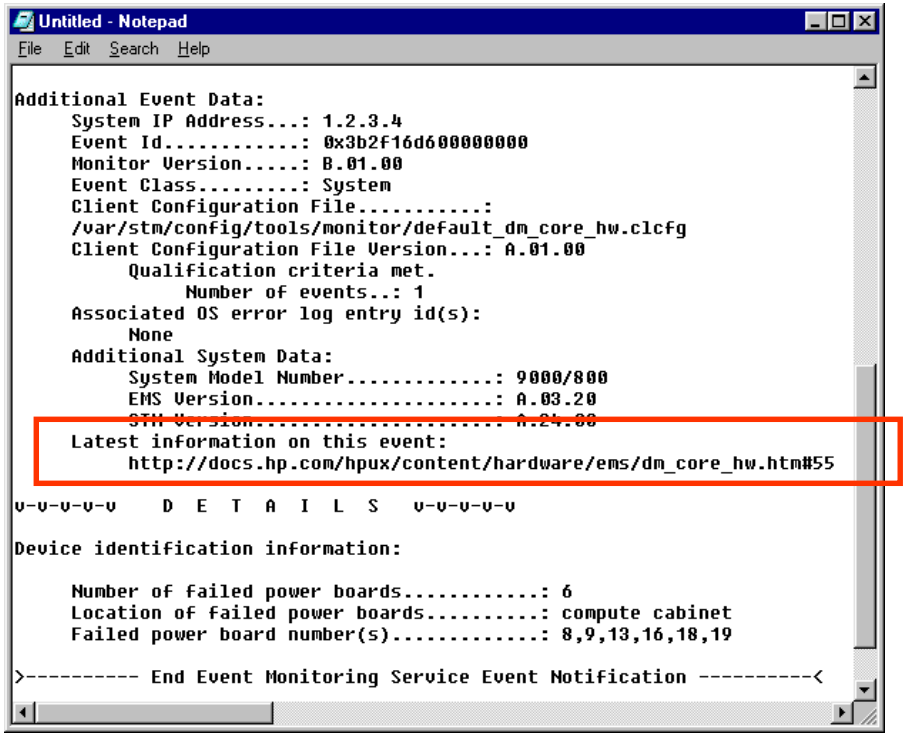


ONLY APPLIABLE TO SYSTEMS (N AND L CLASS)

LOADED FROM DECEMBER 2000 SUPPORT PLUS CD-ROM

EMS Additional Notes
dm_core_hw events 51 & 55

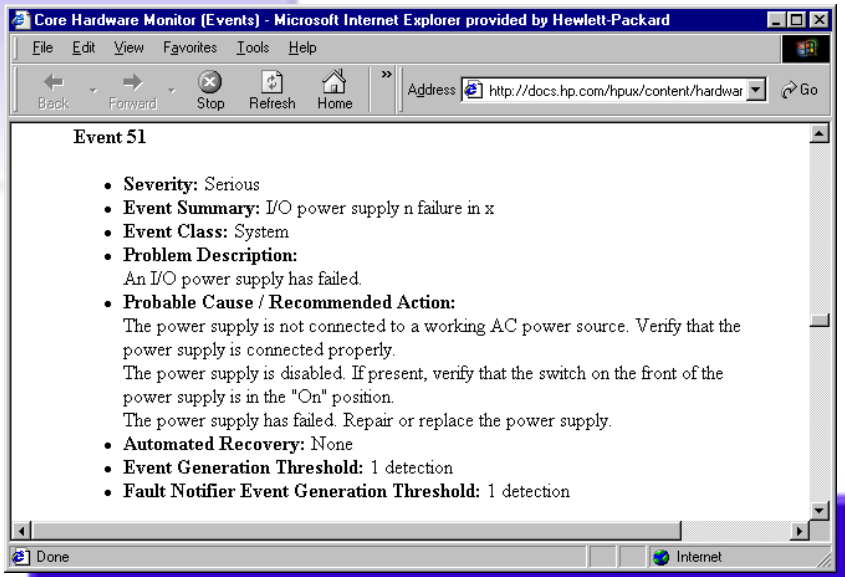


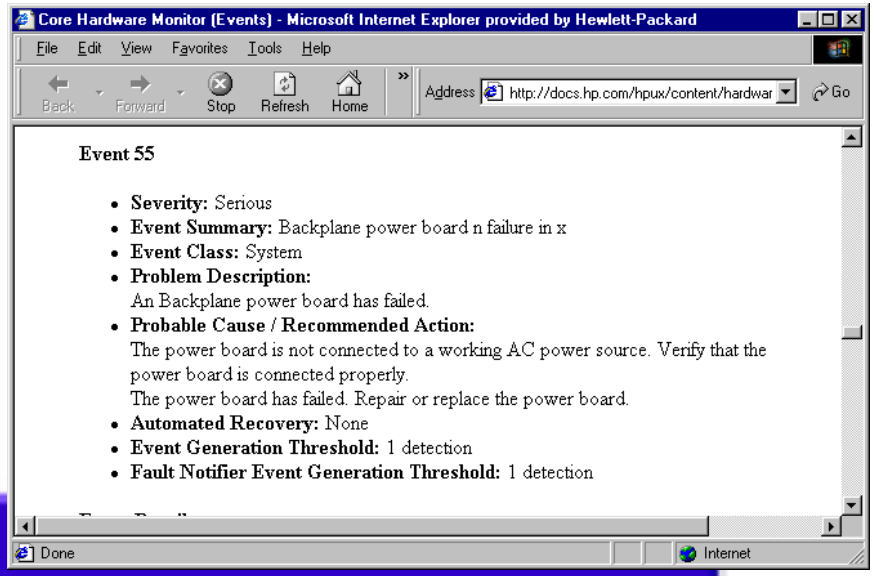


ONLY APPLIABLE TO SYSTEMS (N AND L CLASS)

LOADED FROM DECEMBER 2000 SUPPORT PLUS CD-ROM

EMS Additional Notes
dm_core_hw events 51 & 55

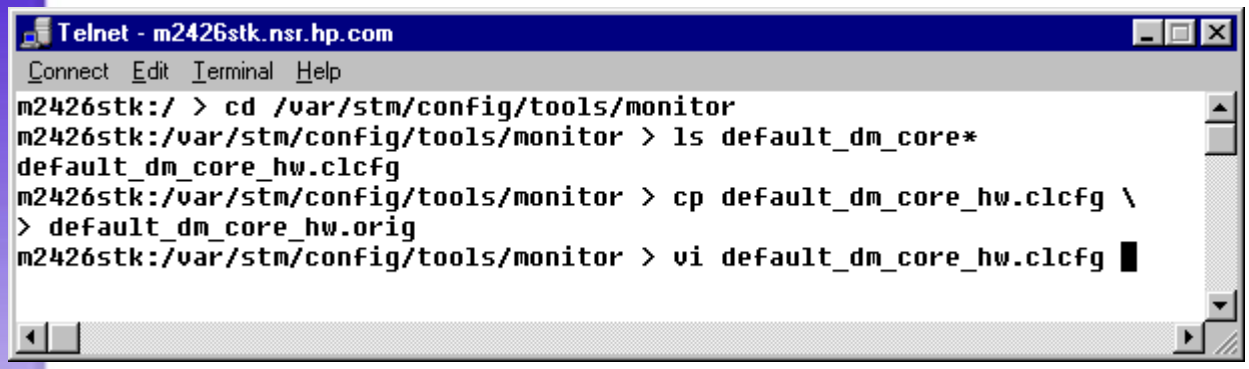


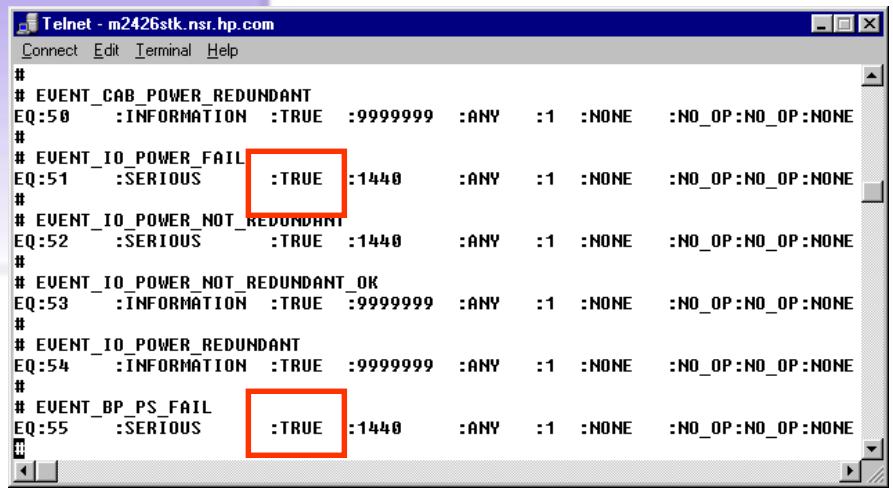


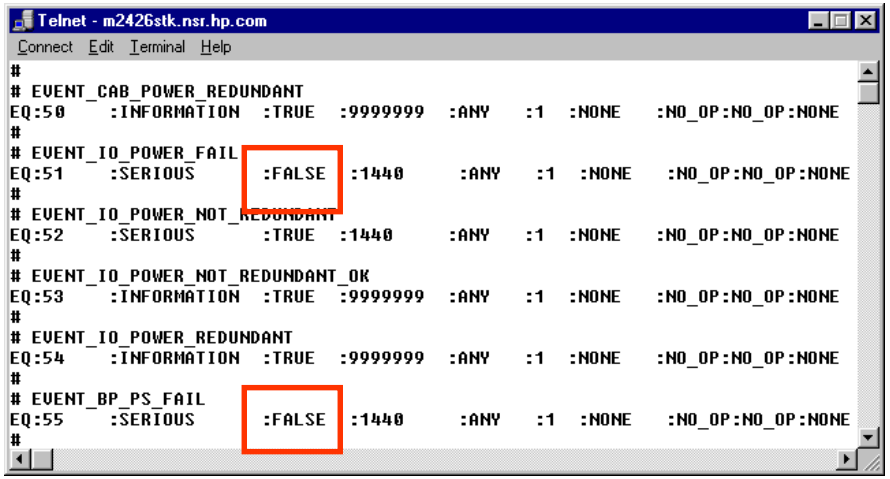
EMS Additional Notes
Steps To Disable EMS Events

1) Disable monitoring
2) Change directory to var/stm/config/tools/monitor
3) Edit the appropriate .clcfg file
4) Enable monitoring
5) Verify

EMS Additional Notes
Disable EMS Events







EMS Additional Notes
Disable EMS Events .clcfg Definitions

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File Edit Search Help

```
#
# : event:severity     :en_flg:supp_time:window:thr:val_th1:opr 1:opr 2:val_th2
# :------:-------------:------:---------:------:---:-------:-----:-----:-------
#
# EVENT_IO_POWER_FAIL
EQ:51    :SERIOUS      :FALSE  :1440     :ANY   :1  :NONE   :NO_OP:NO_OP:NONE
#
# EVENT_BP_PS_FAIL
EQ:55    :SERIOUS      :FALSE  :1440     :ANY   :1  :NONE   :NO_OP:NO_OP:NONE
#
```

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File Edit Search Help

```
#
# event_number : the number of the event
#
# severity : the severity of the event.  Valid values are:
# severity : the severity of the event.  Valid values are:
#       CRITICAL
#       SERIOUS
#       SERIOUS
#       MAJOR_WARNING
#       MINOR_WARNING
#       INFORMATION
#
# enable flag : whether the event is enabled.  Valid values are:
#       TRUE  - event is enabled
#       FALSE - event is not enabled
#
# suppression time : time, in minutes, to suppress generation and trending
# for this event after generating the event.
# Valid values are:
#       NOT_USED - Never suppress the event
#       1 - maxint - number of minutes to suppress
#       9999999 - This value is used so that an event will only be generated
#                 once.  In the dm_core_hw monitor, informational events
#                 stating that a component is OK use this value.  The event
#                 will be cleared if a failure occurs, so that the event
#                 will be re-generated when the problem is fixed.
#
# time window: amount of time, in minutes, event must be seen to
# qualify event.  Valid values are:
#       NOT_USED - time window thresholding not used
#       ANY - time window thresholding used but no time window specified
#       1-maxint - time need to see threshold events to qualify
#
```

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File Edit Search Help

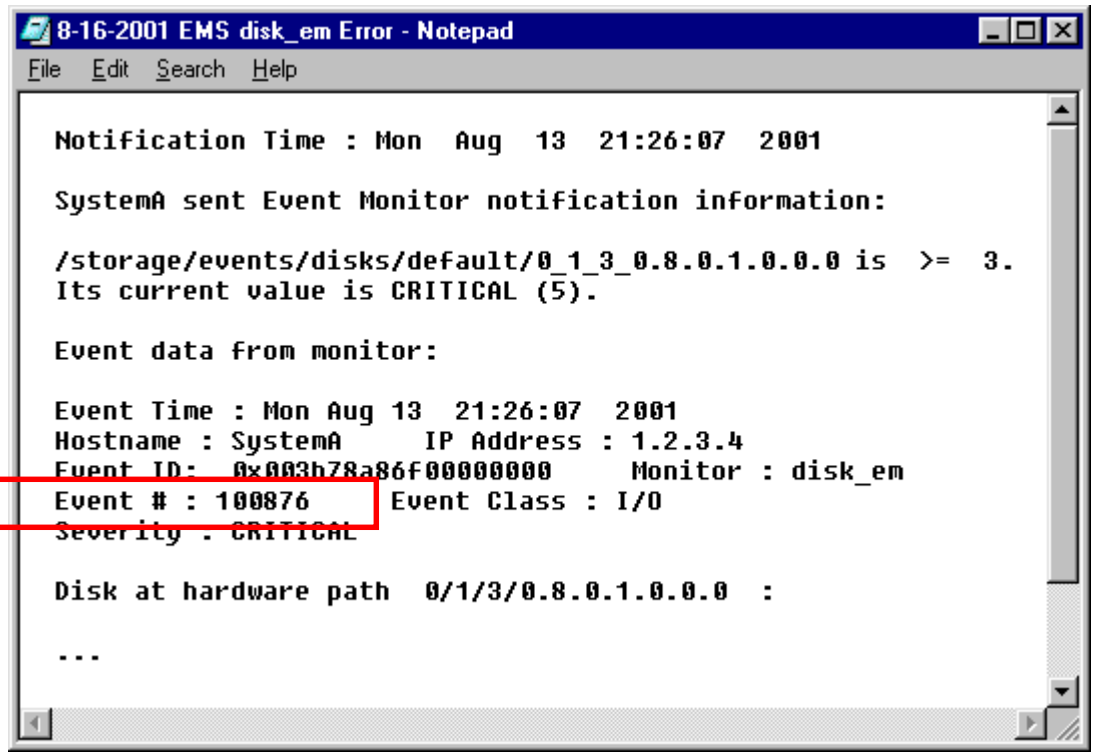
```
#
# threshold : number of times in time window event must be seen to qualify
# event.  Valid values are:
#       1-maxint
# NOTE: to configure event to always be generated every time it is seen,
# threshold should be set to 1 and time window should be set to "ANY"
# value threshold X, operator X : value thresholds to qualify event.
# Valid values for value threshold depend on the type of value associated
# with the event.  However, predefined value of "NONE" means this value
# threshold is not used.  Valid values for operator X are:
#       NO_OP - this operator not used
#       >, < , >=, <=,==, !=.
# These values are used to qualify the event using the following logic:
#  value threshold 1 operator 1 value operator 2 value threshold 2
# For example, if the value is an integer and want to qualify event if
# value is between 60 and 70, inclusive, the entry would be:
# 60 : <= : <= 70.  If the value is an integer and want to qualify event
# if value is > 70, the entry would be : NONE : NO_OP : > : 70.
#
```

EMS Additional Notes – Another Example
Disable EMS Events

What if the appropriate .clcfg file doesn't exist?

If the .clcfg file doesn't exist then the monitor is not predictive enabled and therefore the .cfg file must be modified

EMS Additional Notes – Another Example
Disable EMS Events



EMS Additional Notes – Another Example
Steps To Disable EMS Events

cd /var/stm/config/tools/monitor

cp disk_em.cfg disk_em.cfg.orig

Modify the disk_em.cfg file:

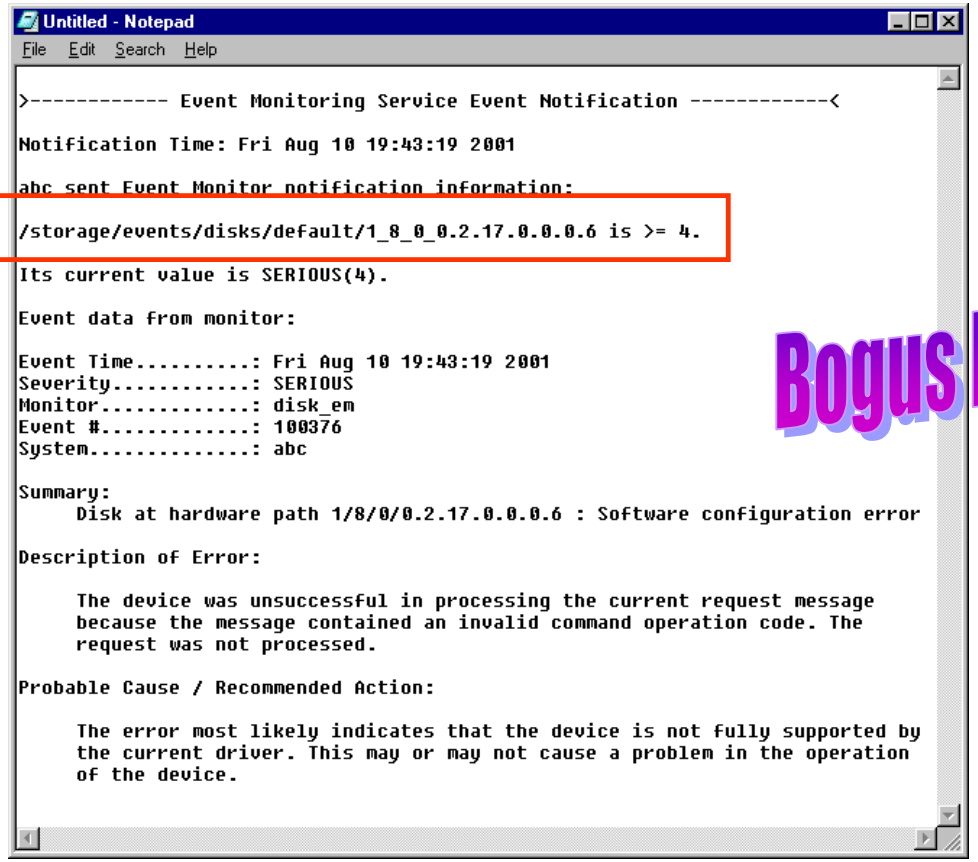
Add the following line to the end of the file:

DEFINE_EVENT 100876 CRITICAL IGNORE # msg num127

EMS Additional Notes
Disabling EMS

- **Disable Entire EMS Monitor**
- **Disable EMS Events**
- **Disable EMS Instance**

EMS Additional Notes
Steps To Disable EMS Instance



Bogus Message

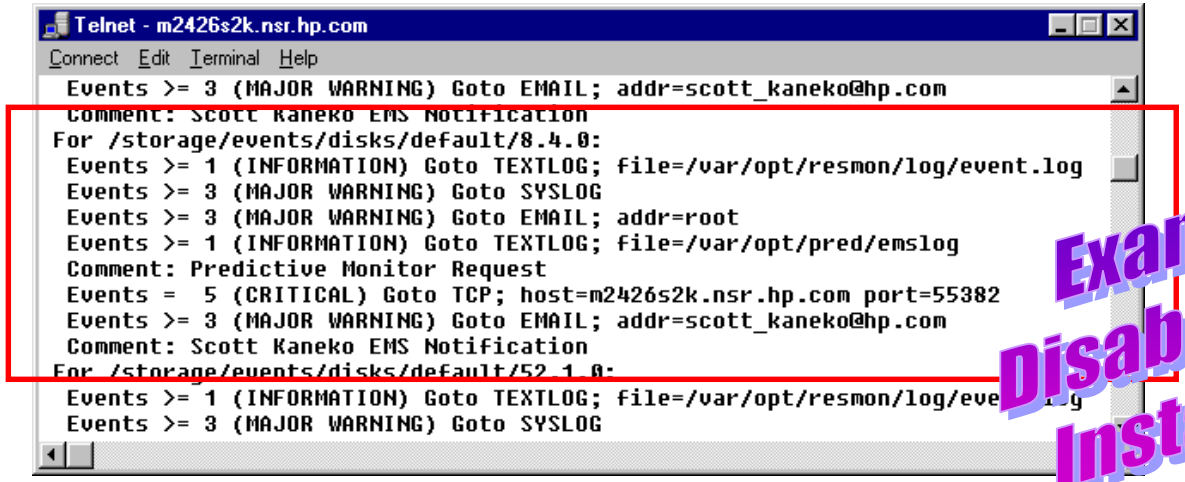
EMC Generated EMS Message

EMS Additional Notes
Steps To Disable EMS Instance

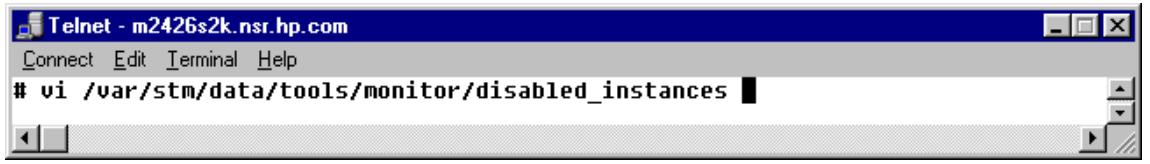
1) Disable monitoring
2) Edit the instance file:
   /var/stm/data/tools/monitor/disabled_instances
3) Add disk resource name
4) Enable monitoring
5) Verify

EMS Additional Notes
Steps To Disable EMS Instance

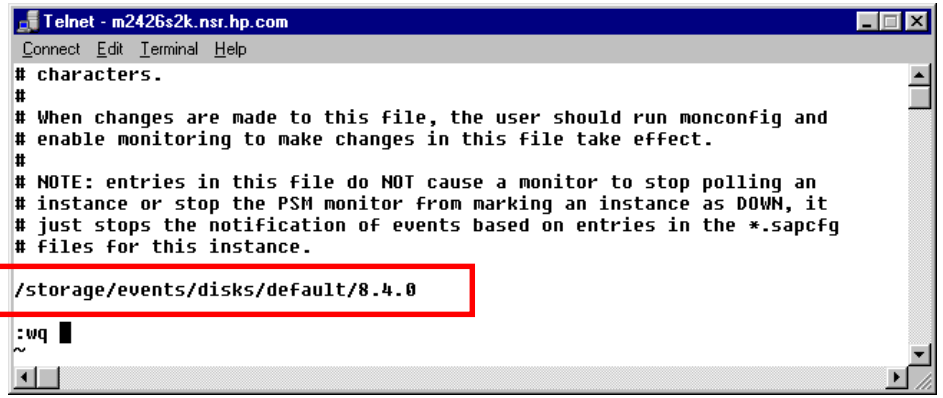
Output from main menu monconfig
Select (C) heck detailed monitoring status



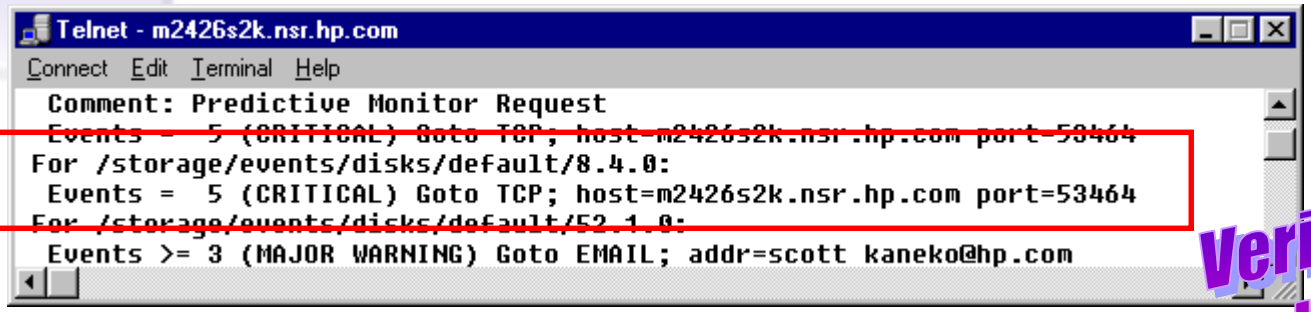
Example: Disable This Instance



EMS Additional Notes
Steps To Disable EMS Instance



Output from main menu monconfig
Select (C) heck detailed monitoring status



Verified:
Instance Is Disabled

EMS Additional Notes
Restoring EMS To Defaults