



Advanced Techniques for managing HP-UX with HP Systems Insight Manager



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Hewlett-Packard

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Agenda

- What is HP SIM?
- Installation of HP SIM
- Setup / configure SSH
- Importing (& exporting) tools with mxtool
- XML for copying script and executing it

“[System] administration can prove quite challenging. It takes skill and experience...”

Bruce Momjian

Core developer on PostgreSQL



Systems Management for HP-UX 11i: Delivering The Most Manageable Platforms with Best RoIT

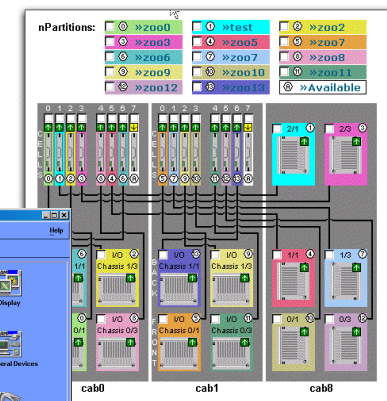
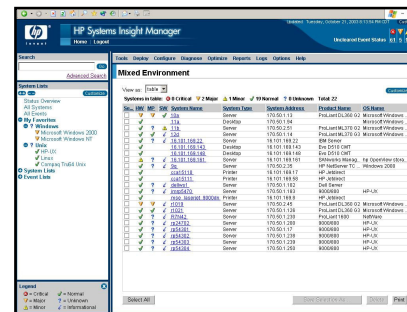


Central Point of Administration

Discovery, inventory,
fault & remote
management,
role-based security,
distributed tasks



•HP Systems Insight Manager



Software Deployment

- Ignite-UX
- Software Distributor-UX
- Update-UX
- Patch Assessment Tool

Configuration Management

- Systems Administration Manager (SAM)
- Partition Manager
- HP-UX Bastille
- HP-UX webmin-based Admin

Workload Management

- Process Resource Manager
- HP-UX Workload Manager
- GlancePlus Pak

Note: HP Systems Insight Manager replaces HP Servicecontrol Manager.

HP Systems Insight Manager: Built from a Strong Heritage



Insight Manager 7

- ProLiant servers
- Windows management
- Fault management
- Large installed base
- Remote management

Toptools

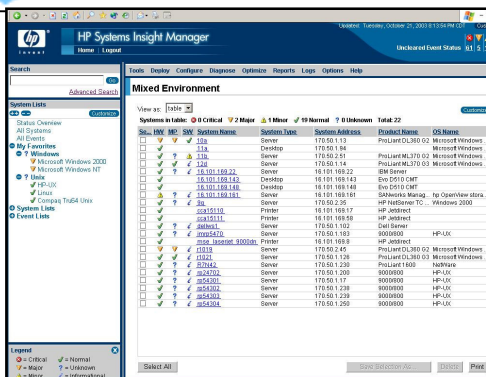
- Ease of use
- Multiple HP platforms
(IA-32 clients & servers,
printers, networking, storage)

Servicecontrol Manager

- HP-UX and Linux
- Multi-system administration
- Role-based security
- Central point of life-cycle management through modular plug-in structure
- GUI and command line

Brings together the strengths of
best-of-breed tools

HP Systems Insight
Manager
Simplify
Standardize
Modularize
Integrate

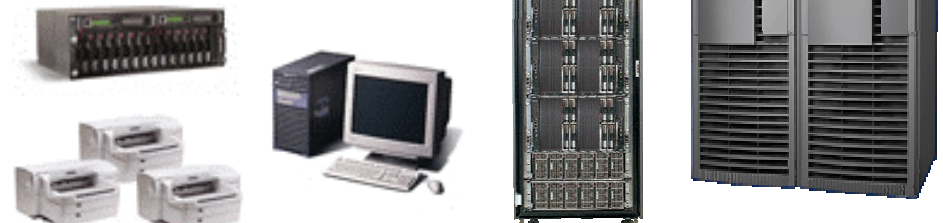
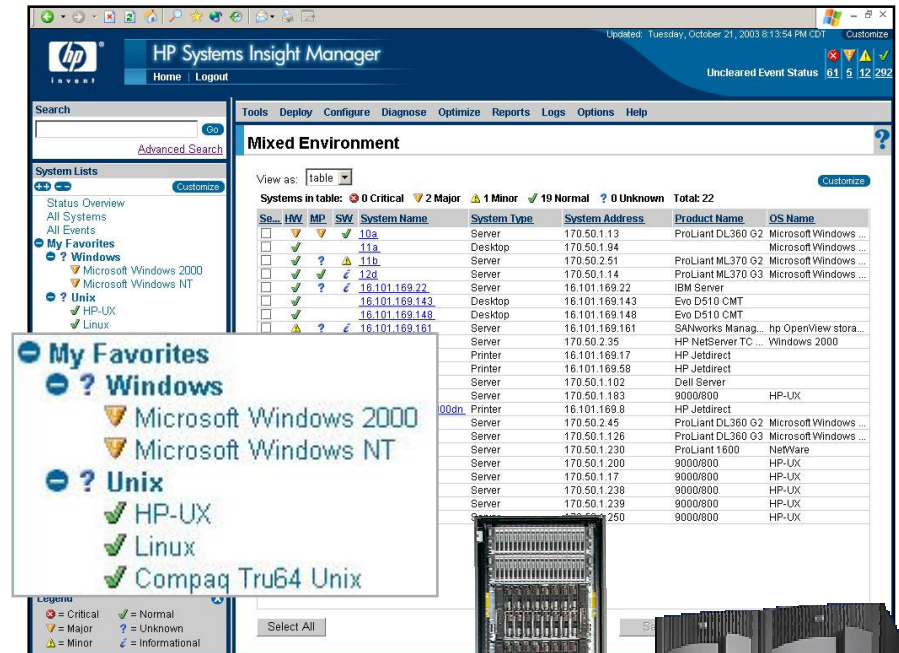


HP Systems Insight Manager

The best foundation for Adaptive Management



- **Comprehensive management through core services**
 - HP-UX, Windows, Linux, more...
 - Fault, configuration, asset, performance management
 - Role-based security; OS security integration; SSL, SSH support
- **Easily extend core services:**
 - Greater breadth of device coverage: servers, clients, storage, printers...
 - Complete device lifecycle management: rapid deployment, performance mgmt, workload mgmt.
- **Integrates with HP OpenView products**
 - End-to-end management from hardware to IT services



More control and flexibility through modularity and extensibility



Enterprise management integration modules

•HP OpenView •Tivoli •CA •BMC

HP Systems Insight Manager core services

Discovery, inventory, fault management, enhanced security, roles, distributed tasks,....

Server
management

Storage
management:
CommandView

Client
management:
Client Manager

Printer
management:
Web JetAdmin

And more...

Workload
Management

Security
Management

Deployment

Cluster
Management

Performance
Management

System-
specific
Administration

Partition
Management

3rd Party/
Home grown

Breadth of hardware management

Adaptable to your environment



Installing HP SIM on HP-UX

- Remove any older versions (including SCM)
 - Also remove directories left behind after uninstall
- `swinstall -s /opt/Nimbus.depot T1864AA`
- Initialize the database
 - `/opt/mx/bin/mxinitconfig -a`
- Wait for the initialization to complete
 - Check with `/opt/mx/bin/mxuser -lt`
 - If the user is present, init is complete
- Setup SSH
 - `cat /etc/opt/mx/config/sshtools/.dtfSshKey.pub >> ~/.ssh/authorized_keys2`
- Verify services started
 - `ps -ef | grep mx`
 - Look for `mxdomainmgr`, `mxinventory`, `mxadmin`, `mxdtf`, `mxagent`



Event Management (Faults)

Fault – HP-UX EMS



HP Systems Insight Manager - Mozilla

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Cupertino

HP-UX test servers

Event Lists

Legend

Critical Major Minor Normal Unknown Informational

Tools Deploy Configure Diagnose Optimize Reports Logs Options Help

HP-UX test servers

View as: table

Systems in table: 0 Critical 0 Major 0 Minor 32 Normal 0 Unknown Total: 32

	MP	SW	System Name	System Type	System Address	Product Name	OS Name
☐	✓	?	cupux01	Server	15.75.207.100	9000/800/A5...	HP-UX
☐	✓	?	cupux02	Server	15.75.207.101	9000/800/A5...	HP-UX
☐	✓	?	cupux03	Server	15.75.207.102	9000/800	HP-UX
☐	✓	?	cupux04	Server	15.75.207.103	9000/800	HP-UX
☐	✓	?	cupux05	Server	15.75.207.104	ia64	HP-UX
☒	✓	?	cupux08	Server	15.75.207.107	9000/800/A5...	HP-UX
☐	✓	?	cupux09	Server	15.75.207.108	9000/800/A5...	HP-UX
☐	✓	?	cupux11	Server	15.75.207.110	9000/800/A5...	HP-UX
☐	✓	?	cupux12	Server	15.75.207.111	9000/800/A5...	HP-UX
☐	✓	?	cupux13	Server	15.75.207.112	9000/800	HP-UX
☐	✓	?	cupux15	Server	15.75.207.114	ia64	HP-UX
☐	✓	?	cupux16	Server	15.75.207.115	ia64	HP-UX
☐	✓	?	cupux18	Server	15.75.207.117	9000/800/A5...	HP-UX
☐	✓	?	cupux19	Server	15.75.207.118	9000/800/A5...	HP-UX
☐	✓	?	cupux20	Server	15.75.207.119	9000/800	HP-UX
☐	✓	?	cupux21	Server	15.75.207.120	9000/800/A5...	HP-UX
☐	✓	?	cupux22	Server	15.75.207.121	9000/800/A5...	HP-UX

Save Selection As... Delete Print

Done

HP Systems Insight Manager - Mozilla

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HW status is based on connectivity based status poll for HP-UX servers

Fault – HP-UX EMS



HP Systems Insight Manager - Mozilla

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HP-UX test servers

View as: table Customize

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☐	✓	?		cupux01	Server	15.75.207.100	9000/800/A5...	HP-UX
☐	✓	?		cupux02	Server	15.75.207.101	9000/800/A5...	HP-UX
☐	✓	?		cupux03	Server	15.75.207.102	9000/800	HP-UX
☐	✓	?		cupux04	Server	15.75.207.103	9000/800	HP-UX
☐	✓	?		cupux05	Server	15.75.207.104	ia64	HP-UX
☒	✓	?		cupux08	Server	15.75.207.107	9000/800/A1...	HP-UX
☐	✓	?		cupux09	Server	15.75.207.108	9000/800/A1...	HP-UX
☐	✓	?		cupux11	Server	15.75.207.110	9000/800/A1...	HP-UX
☐	✓	?		cupux12	Server	15.75.207.111	9000/800/A1...	HP-UX
☐	✓	?		cupux13	Server	15.75.207.112	9000/800	HP-UX
☐	✓	?		cupux15	Server	15.75.207.114	ia64	HP-UX
☐	✓	?		cupux16	Server	15.75.207.115	ia64	HP-UX
☐	✓	?		cupux18	Server	15.75.207.117	9000/800/A5...	HP-UX
☐	✓	?		cupux19	Server	15.75.207.118	9000/800/A5...	HP-UX
☐	✓	?		cupux20	Server	15.75.207.119	9000/800	HP-UX
☐	✓	?		cupux21	Server	15.75.207.120	9000/800/A5...	HP-UX
☐	✓	?		cupux22	Server	15.75.207.121	9000/800/A5...	HP-UX

Save Selection As... Delete Print

Done

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Select HP-UX system from list and then select EMS from tool menu

Fault – HP-UX EMS



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Legend

- Critical
- Major
- Minor
- Normal
- Unknown
- Informational

Tools Deploy Configure Diagnose Optimize Reports Logs Options Help

Event Monitoring Service

Description: Configure and view resource monitoring requests on the managed node.

Step 1: Verify Target Systems

System Name	OS	Type	Tool launch OK? ↑	Keep?
cupux08	HP-UX	Server	Yes	[Remove]

Change Targets Next >

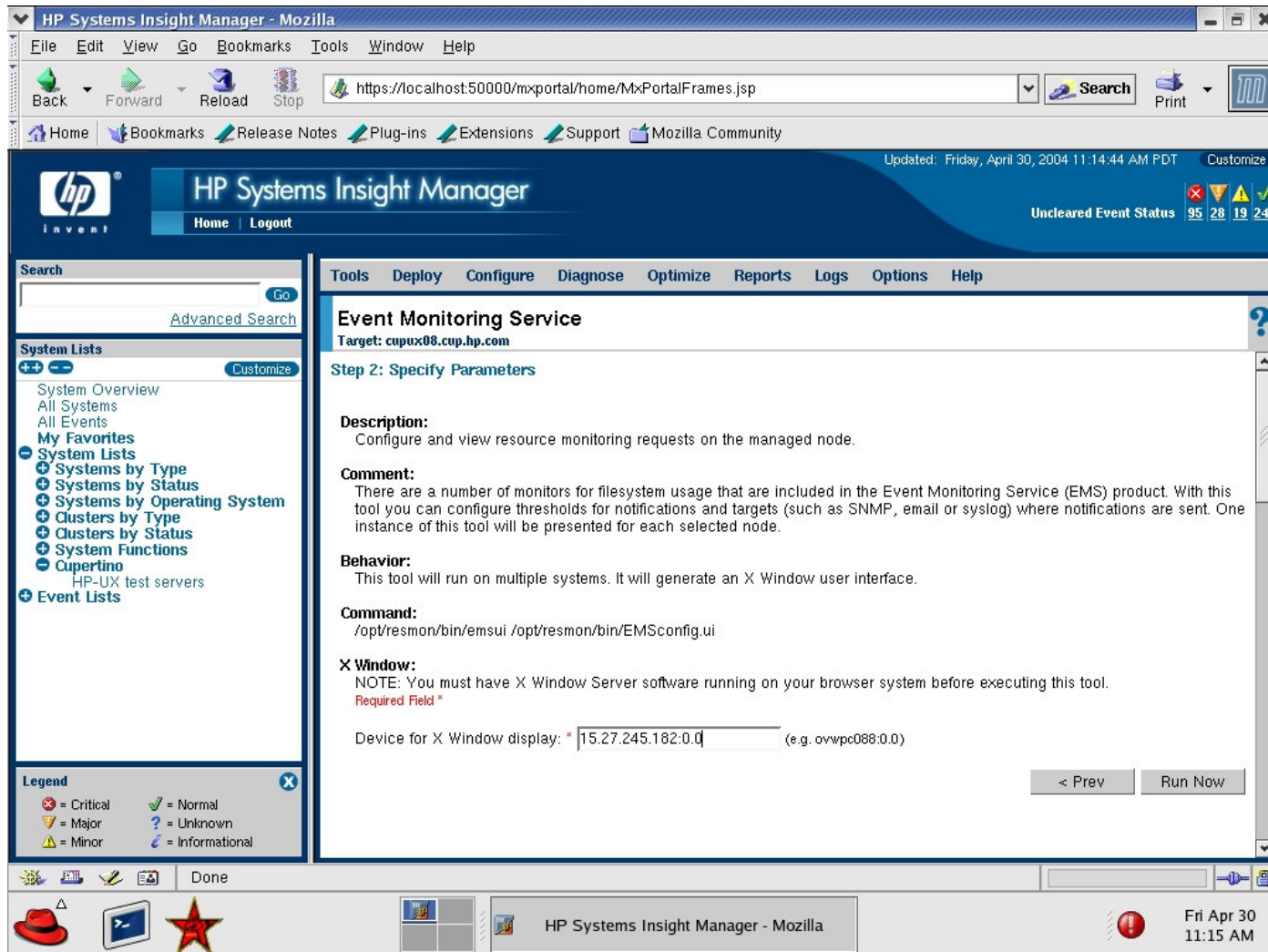
Done

HP Systems Insight Manager - Mozilla

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Verify HP-UX server to run EMS on

Fault – HP-UX EMS



Since EMS has an X based GUI we need to specify where the GUI should be displayed (IP address where browser is being run)

Fault – HP-UX EMS



The screenshot displays the HP-UX Event Monitoring Service (cupux08) GUI. The main window shows a summary status of 1 Running task. A pop-up window displays target details for cupux08.cup.hp.com, which is running with exit code 0. The GUI includes a menu bar (File, View, Options, Actions, Help), a search bar, and a sidebar with navigation options like Systems by Status, Systems by Operating System, Clusters by Type, Clusters by Status, System Functions, Cupertino, HP-UX test servers, and Event Lists. A legend at the bottom left defines event severity levels: Critical (red X), Major (yellow triangle), Minor (yellow circle), Normal (green checkmark), Unknown (blue question mark), and Informational (blue circle).

Summary status: 0 Failed 0 Killed 0 Cancelled 0 Complete 1 Running 0 Copying 0 Pending

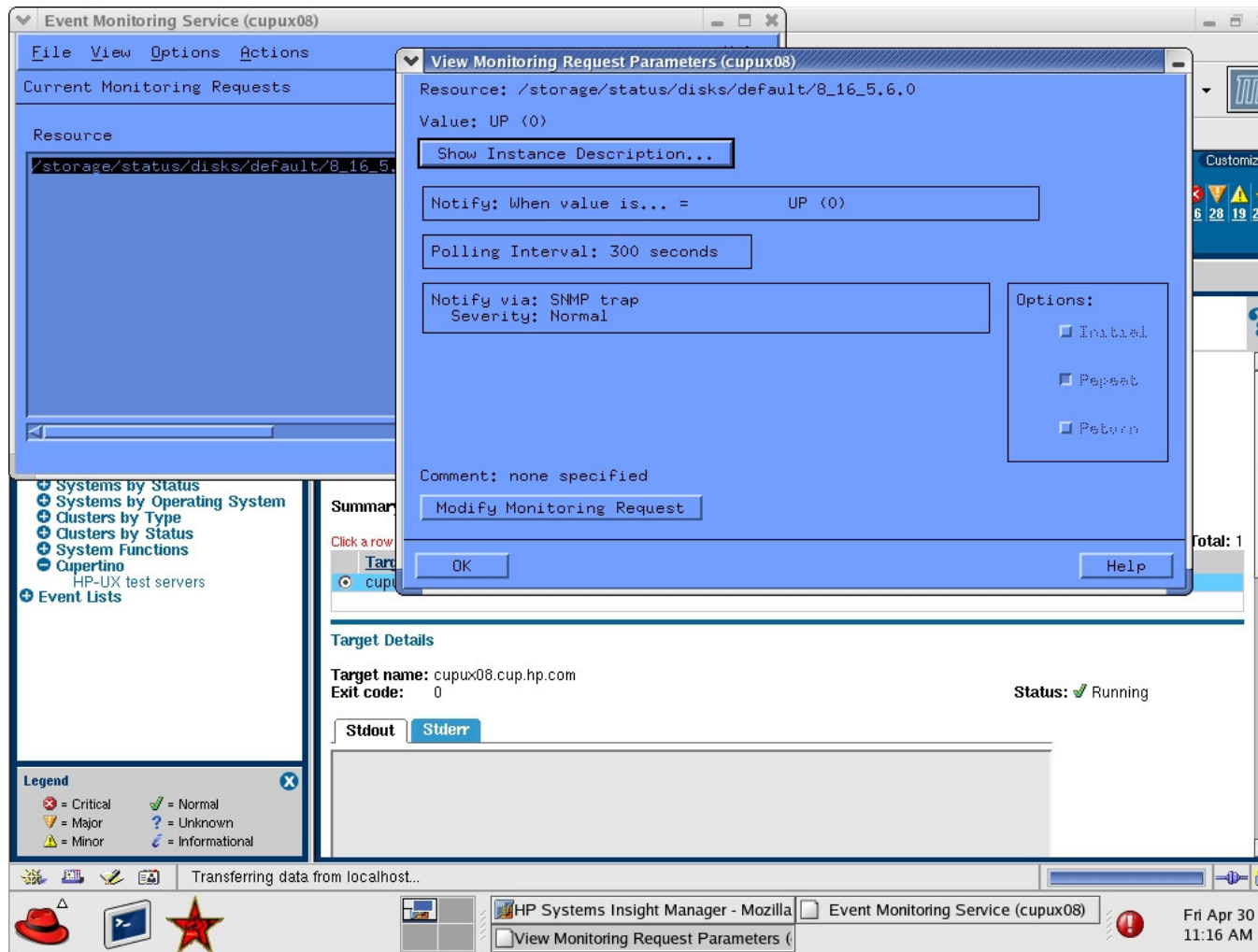
Target Details

Target name: cupux08.cup.hp.com
Exit code: 0
Status: Running

Target Name	Status	Exit Code	Stdout	Stderr
cupux08.cup.hp.com	Running	0	No	No

HP SIM will show new task is running on selected HP-UX server. The tool's X based GUI will pop-up in separate window.

Fault – HP-UX EMS



With EMS you can select from a large number of resources to monitor and send an SNMP trap when a threshold is reached

Fault – HP-UX EMS



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Legend

⊗ = Critical

⚠ = Major

⚡ = Minor

✓ = Normal

❓ = Unknown

ℹ = Informational

Tools Deploy Configure Diagnose Optimize Reports Logs Options Help

All Events

To view event details, make sure 'Event Type' column is displayed and click on desired link.

Events in table: 349 Critical 30 Major 19 Minor 252 Normal 692 Informational Total: 1342

State	Severity	Event Type	System	Event	Assigne	Comme
Not cleared	⊗	System is unreachable	ldcp2155	4/30/04...		
Not cleared	ℹ	HP-UX EMS Normal Severity Event	cupux08	4/30/04...		
Not cleared	ℹ	Successful Login	albus	4/30/04...		
Not cleared	✓	System is reachable	HP-UX EMS Normal Severity Event	cupux08	4/30/04...	
Not cleared	ℹ	HP-UX EMS Normal Severity Event	cupux08	4/30/04...		
Cleared	⊗	System is unreachable	nstlhp04	4/30/04...		
Not cleared	ℹ	Discovered System	16.129...	4/30/04...		
Not cleared	ℹ	HP-UX EMS Normal Severity Event	cupux08	4/30/04...		
Not cleared	ℹ	HP-UX EMS Normal Severity Event	cupux08	4/30/04...		
Not cleared	ℹ	HP-UX EMS Normal Severity Event	cupux08	4/30/04...		
Not cleared	ℹ	Logout	albus	4/30/04...		
Not cleared	ℹ	HP-UX EMS Normal Severity Event	cupux08	4/30/04...		
Not cleared	⊗	System is unreachable	ldcp2140	4/30/04...		
Not cleared	ℹ	Discovered System	16.101...	4/30/04...		
Not cleared	ℹ	Discovered System	hpsm00lo	4/30/04...		
Not cleared	ℹ	HP-UX EMS Normal Severity Event	cupux08	4/30/04...		
Not cleared	ℹ	Discovered System	16.101...	4/30/04...		

Clear Delete Assign To... Enter Comment... Print

javascript:MxPortalWorkspaceCreateUrl("All Events", "/...entmenu=ManageDevices&viewid=42&ViewType=EventViews")

HP Systems Insight Manager - Mozilla

Event Monitoring Service (cupux08)

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The SNMP traps from the HP-UX server show up in the Event List.

Fault – HP-UX EMS



HP Systems Insight Manager - Mozilla

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Updated: Friday, April 30, 2004 11:18:24 AM PDT Customize

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Legend

- = Critical
- = Major
- = Minor
- = Normal
- = Unknown
- = Informational

Tools Deploy Configure Diagnose Optimize Reports Logs Options Help

All Events

Trap Details

Variable Description	Value
Full EMS name of the resource being monitored	/storage/status/disks/default/8_16_5.6.0
A unique identifier for the monitoring request	1438449667
Operator indicates poll, change or threshold condition operator: >, >=, <, <=, ==, !=	==
Integer representing the resource type: 3009= String 3010= Sbit32 (signed 32 bit integer) 3011= Ubit32 (unsigned 32 bit integer) 3012= Sbit64 (future use) 3013= Ubit64 (future use) 3014= Float64 (64 floating point number) 3015= Enumerated Type 3016= Error	3015
Quoted string representing resource value, should be converted using the Resource Type indicated in Variable #4 Not applicable if Resource Type is Error	"UP(0)"
Integer representing the threshold type, this is usually the same as resource type. Integer representing the threshold type: 3009= String 3010= Sbit32 (signed 32 bit integer) 3011= Ubit32 (unsigned 32 bit integer) 3012= Sbit64 (future use) 3013= Ubit64 (future use) 3014= Float64 (64 floating point number) 3015= Enumerated Type 3016= Error Not applicable if operator is poll or change; or if Resource Type is Error Note: enumerated type is not supported as threshold type.	3010
Quoted string representing threshold value, should be converted using the Threshold Type indicated in Variable #6. Not applicable if operator is poll or change; or if Resource Type is Error	"0"
Indicates that additional user data is available from EMS 0= no user data 1=	0

Done

HP Systems Insight Manager - Mozilla

Event Monitoring Service (cupux08)

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Drilling down into the event shows the resource name being monitored

Fault – HP-UX EMS Tips

1. To set up trust relationship between CMS and managed HP-UX server use **mxagentconfig** command on the CMS.
2. To run a X based tool like EMS you need to make sure you can display the X window from the computer you are browsing from. To add a X host to a Red Hat Linux computer use: **xhost +hostname**. On Windows computer you will need to run an Xserver tool like ReflectionX.
3. To add a trap destination to a managed HP-UX server, on that server:

Use: **/sbin/init.d/SnmpMaster stop** to stop SNMP process.

Use: **chmod +w snmmpd.conf** to allow file to be written to.

Edit: **/etc/SnmpAgent.d/snmpd.conf** and uncomment “# trap-dest” and add the IP address of the HP SIM CMS

Use: **/sbin/init.d/SnmpMaster start**



Remote Command Execution & Management

OpenSSH

- OpenSSH is a **FREE** version of the SSH protocol suite
- OpenSSH encrypts all traffic (including passwords)
- The password for telnet, rlogin, ftp, and other such programs is transmitted across the Internet unencrypted
- OpenSSH provides a myriad of secure tunneling capabilities, as well as a variety of authentication methods.
- The OpenSSH suite includes
 - [ssh](#) program which replaces rlogin and telnet
 - [scp](#) which replaces rcp
 - [sftp](#) which replaces ftp
 - [sshd](#) which is the server side of the package
 - and other basic utilities like [ssh-add](#), [ssh-agent](#), [ssh-keysign](#), [ssh-keyscan](#), [ssh-keygen](#) and [sftp-server](#).
 - OpenSSH supports SSH protocol versions 1.3, 1.5, and 2.0.
- O'Reilly's [SSH book](#) by Daniel Barrett and Richard Silverman is an excellent reference.



The SSH Protocol

- Authentication
 - Reliably determines someone's identity. If you try to log into an account on a remote computer, SSH asks for digital proof of your identity (key-based or password-based.) If you pass the test, you may log in; otherwise SSH rejects the connection
- Encryption
 - Scrambles data so it is unintelligible except to the intended recipients. This protects your data as it passes over the network.
- Integrity
 - Guarantees the data traveling over the network arrives unaltered. If a third party captures and modifies your data in transit, SSH detects this fact.

Authentication and Authorization

- Every SSH connection involves two authentications in the following order:
 - Server authentication – the SSH client verifies the identity of the SSH server
 - This ensures the SSH server is genuine, not an imposter, guards against an attacker redirecting the network connection to a different machine
 - User authentication – the SSH server verifies the identity of the user requesting access
- Authorization – occurs after authentication
 - Privileges granted after authentication (after knowing who they are)
 - Controlled at the user account level after SSH login

Use of SSH features

- OpenSSH runs natively on HP-UX and Linux
- HP has provided OpenSSH for Windows
- SSH's most immediately useful features
 - Logging into a remote computer over a secure connection
 - Transferring files between computers over a secure connection
- HP SIM uses the features of SSH to remotely manage target systems, including the CMS as a managed platform
- The HP SIM role-based security either allows or disallows a CMS logged-in user to use CMS tools to managed authorized systems
- HP SIM uses SSH for initiating the CMS SSH client login to managed systems (public key) and execute a command securely

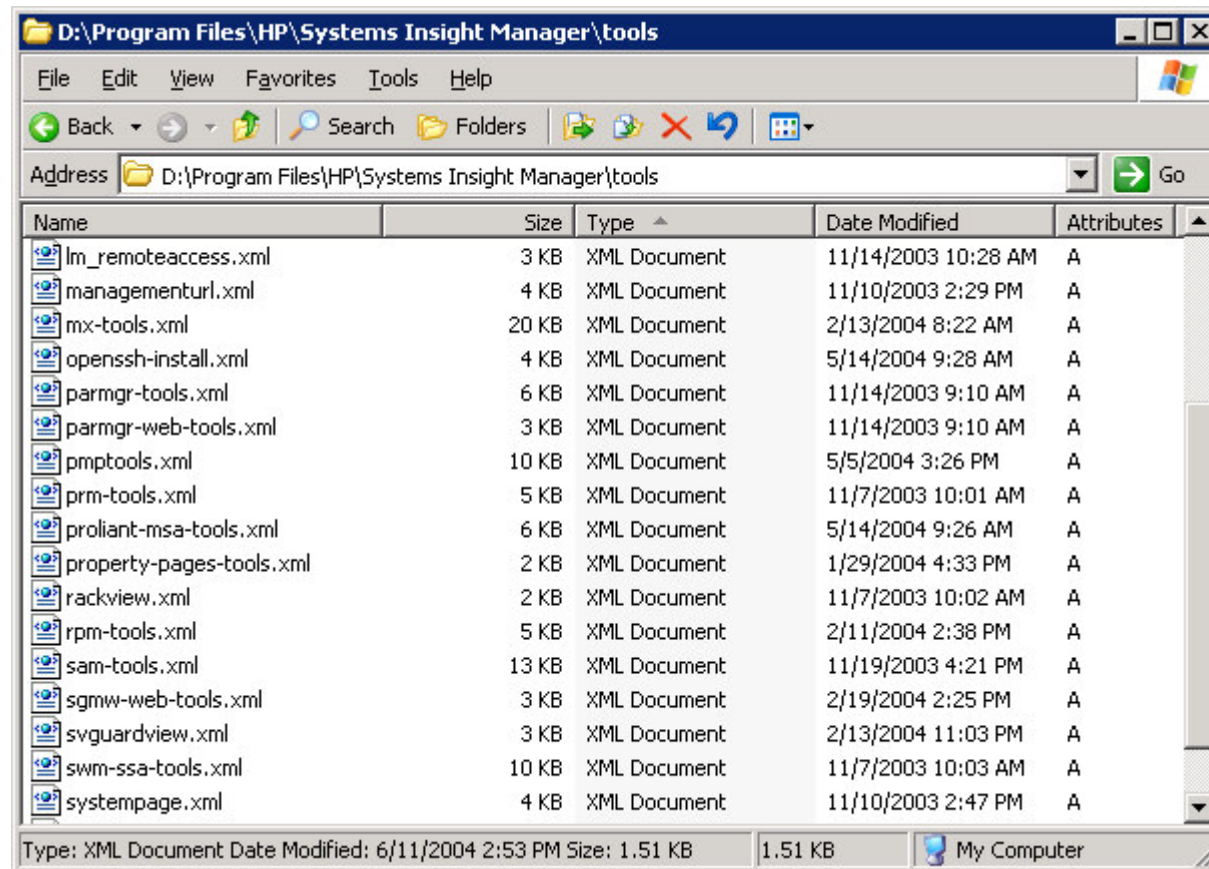
Setup of SSH

- Deploy HP's OpenSSH to the managed devices through HP SIM
- Or, deploy manually and run mxagentconfig from the CMS to connect to the remote system and setup the keys
- Manually copy the HP SIM keys to the target nodes

Tools in HP SIM

- My Custom Commands
 - Managed through GUI
 - Runs on the CMS
- TDEFs
 - Managed through CLI
 - Can run on the CMS or the managed device
 - Can be restricted per user per device
 - Part of an authorization
 - 3 types of tools: web-launch, CLI, and X Windows tool

Distributed Task Facility



Note: All the command tools are based on tool definitions shipped with HP SIM.

Each tool definition can be found in an XML file.

CLI for Tools

- mxtool
 - Main command to import, export, and modify tools
 - mxtool -a : add a tool
 - mxtool -l : export a tool
 - mxtool -m : modify a tool
 - mxtool -r : remove a tool
 - -f <filename> - works with any of the command to read/write to a file (easiest way to work with mxtool)

MXTOOL – XML file

- XML file – web-launch tool

```
<?xml version="1.0" encoding="UTF-8" ?>
<tool-list>
  <web-launch-tool name="WebJetAdmin" max-targets="1">
    <category>Local Tools</category>
    <description>View printer via WebJetAdmin.</description>
    <execute-as-user>root</execute-as-user>
    <toolbox-enabled value="true" />
    <include-filter type="hardware">
      <node-filter name="DeviceType" operator="eq"
value="Printer"/>
    </include-filter>
    <web-block accepts-targets="true">
      <main-url>http://rook:8000/device/%n/</main-url>
    </web-block>
    <attribute name="menu-path">Tools|System
Information</attribute>
    <attribute name="target-frame">WJAFrame</attribute>
  </web-launch-tool>
</tool-list>
```

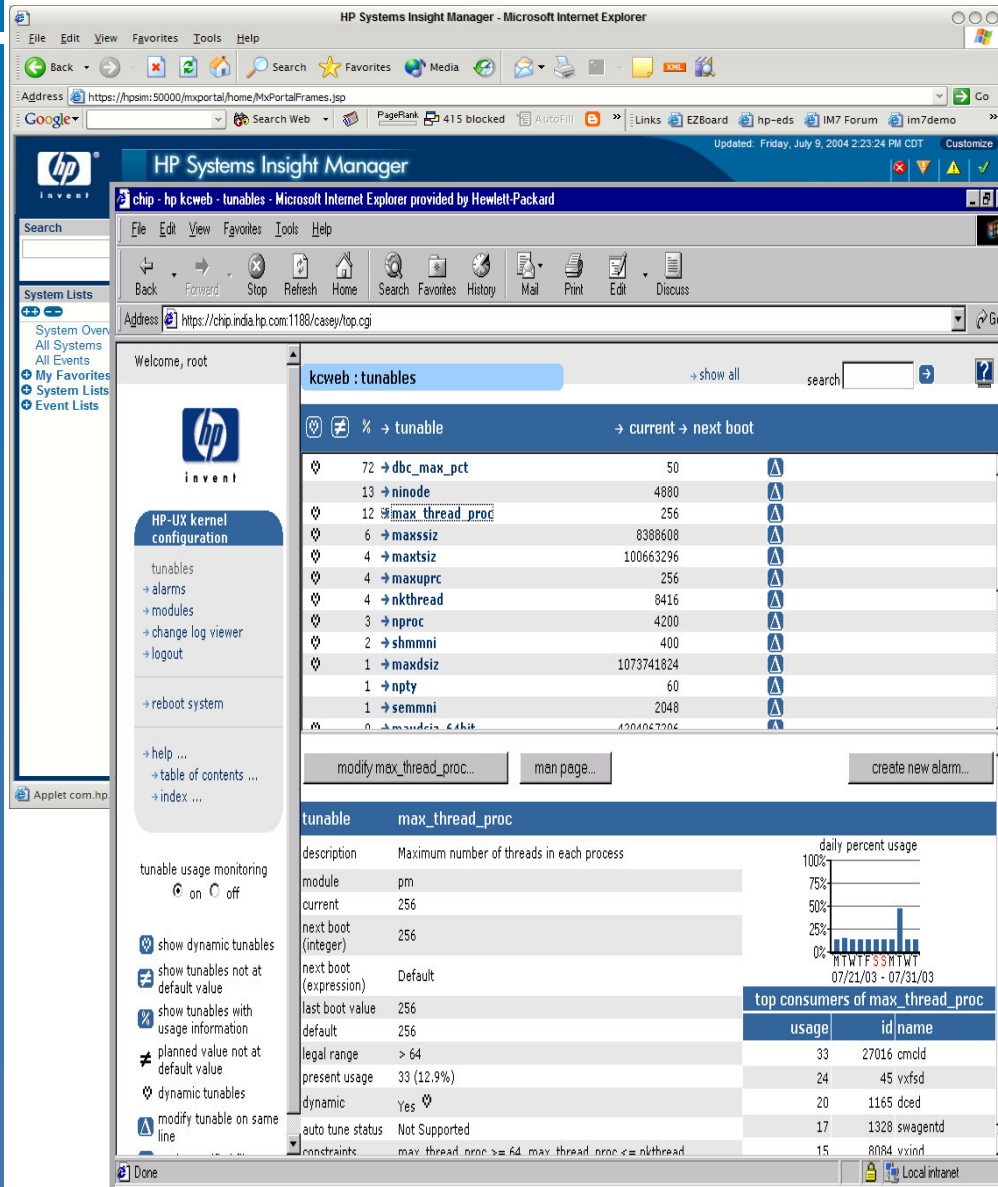
Copying files: crontab replacement

- XML file – UX command

```
<?xml version="1.0" encoding="UTF-8"?>
<tool-list>
<ssa-command-tool name="Replace root crontab" >
<category>General Tools</category>
<description>Replace the root crontab with the one from the
  CMS</description>
<owner>root</owner>
<execute-as-user>root</execute-as-user>
<ssa-block>
  <copy-block>
    <source>/var/spool/cron/crontabs/root</source>
    <destination>/var/tmp/root_crontab</destination>
  </copy-block>
  <command log="true">
    /usr/bin/crontab -l &gt; ~root/.crontab.old;
    /usr/bin/crontab /var/tmp/root_crontab;
    rm /var/tmp/root_crontab
  </command>
</ssa-block>
</ssa-command-tool>
</tool-list>
```

NOTE: >
replaced by >
on exec!

Kernel Configuration



HP Systems Insight Manager - Microsoft Internet Explorer

Address: https://hpsim:50000/mxportal/home/MxPortalFrames.jsp

HP Systems Insight Manager

chip - hp kcweb - tunables - Microsoft Internet Explorer provided by Hewlett-Packard

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change log viewer

logout

reboot system

help ...

table of contents ...

index ...

Applet com.hp

kcweb : tunables

show all

search

tunable

current

next boot

tunable	current	next boot
72 → dbc_max_pct	50	
13 → ninode	4880	
12 → max_thread_proc	256	
6 → maxssiz	8388608	
4 → maxtsiz	100663296	
4 → maxuprc	256	
4 → nkthread	8416	
3 → nproc	4200	
2 → shmni	400	
1 → maxdsiz	1073741824	
1 → npty	60	
1 → semni	2048	

modify max_thread_proc...

man page...

create new alarm...

tunable max_thread_proc

description	Maximum number of threads in each process
module	pm
current	256
next boot (integer)	256
next boot (expression)	Default
last boot value	256
default	256
legal range	> 64
present usage	33 (12.9%)
dynamic	Yes
auto tune status	Not Supported
constraints	max_thread_proc >= 64, max_thread_proc <= nkthread

daily percent usage

0% 25% 50% 75% 100%

MTWTFSSMTWT

07/21/03 - 07/31/03

top consumers of max_thread_proc

usage	id/name
33	27016 cmld
24	45 vxfsd
20	1165 doed
17	1328 swagentd
15	8084 vxind

Features

- ✓ Replaces SAM's kernel configuration area
- ✓ Dynamic discovery of kernel tunable updates
- ✓ Kernel tunable usage charts
- ✓ Static/dynamic kernel tunable tuning
- ✓ DLKM support
- ✓ Set alarms for kernel tunables
- ✓ Easy access to kernel monitoring information
- ✓ Capability to analyze top consumers of certain kernel parameters
- ✓ Displays kernel tunable man pages

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