



Advanced Techniques for managing Linux with HP Systems Insight Manager

Scott Shaffer Manager, Insight Manager development Hewlett-Packard

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Agenda

- HP SIM?
- SSH
- Have to configure Java in the browser
- Importing (& exporting) tools with mxtool
- XML for tools
 - Use Perl to call loconfig
 - Getting data from rpm
 - Controlling iLO/RILOE
 - ROM flashing through scripts
- Version Control (including FW updates)





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

Bruce Momjian Core developer on PostgreSQL



HP Systems Insight Manager

Comprehensive management through core services

- Installs on HP-UX, Windows, and Linux
- Manages all HP server platforms
- Delivers fault, configuration, asset management
- Tool definitions enable remote execution of scripts, batch files, and applications
- Role-based security; OS security integration; SSL, SSH support



Proactive fault management





- HP Systems Insight Manager automatically or manually discovers and identifies managed systems
- HP Systems Insight Manager detects problems before they result in server downtime.
 - Disks, CPU, memory, fans, IO, server environmentals
 - Serviceguard High Availability and MSCS Clusters
- HP Systems Insight Manager speeds failure diagnosis and resolution
 - Status drill down leads the way to failed components
 - Enables remote event notification and forwarding
 Enables remote event notification and HP WORLD 2004 Solutions and Technology Conference & Exercised

Inventory collection and reporting



- Save device hardware asset inventory configurations
- Create custom reports of inventory details
- Flexible search simplifies location of specific devices
- Configuration snapshot single and multi-system comparisons for consistency management and troubleshooting
- Extensive database support



Customizing HP SIM

- Distributed task facility and tool definitions facilitate integration of scripts, OS commands, and other tools into HP SIM.
- Integrated tools can take advantage of HP SIM scheduling and security.
- Remote tool execution conducted through secure SSH session.
- All tool output captured and displayed on task results page.





Schedule and execute custom scripts



Schedule and launch OS commands



In-context launch of administration top SORLD 2004 Solutions and Technology Conference & Experiment



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 <u>ssh-add</u>, <u>ssh-agent</u>, <u>ssh-keysign</u>, ssh-keyscan, ssh-keygen and sftp-server.
 - OpenSSH supports SSH protocol versions 1.3, 1.5, and 2.0.
- O'Reilly's <u>SSH book</u> 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:
 - <u>Server authentication</u> 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
 - <u>User authentication</u> 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 Windows managed devices through HP SIM
- Or, deploy manually and run mxagentconfig from HP SIM 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





CLI for Tools

- mxtool •
 - Main command to import, export, and modify tools
 - mxtool -a : add a tool
 - mxtool –lf : export a tool (in XML)
 - mxtool m : modify a tool
 - mxtool –r : remove a tool
 - 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>
```





Simple example: rpm

XML file

```
<?xml version="1.0" encoding="UTF-8" ?>
<tool-list>
        <ssa-command-tool name="List installed packages">
        <category>General Tools</category>
        <description>Return package information.</description>
        <execute-as-user>root</execute-as-user>
        <toolbox-enabled value="true" />
        <include-filter type="os">
            <node-filter name="OSName" operator="eq" value="Linux" />
        </include-filter>
        <ssa-block>
            <command command-type="stdout" log="false">
      rpm -qa --queryformat `%%30{NAME} installed on %%{INSTALLTIME:date}\n`
            </command>
        </ssa-block>
        <attribute name="menu-path">
            Tools | Command Line Tools | Linux
        </attribute>
        <attribute name="i18n-attrs">TOOL,mxtools</attribute>
       </ssa-command-tool>
</tool-list>
```





Copying files: crontab replacement

```
XML file
 <?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 -1 > ~root/.crontab.old;
      /usr/bin/crontab /var/tmp/root_crontab;
                                                      NOTE: >
      rm /var/tmp/root crontab
    </command>
                                                      replaced by >
 </ssa-block>
                                                      on exec!
 </ssa-command-tool>
 </tool-list>
```



iLO/RILOE configuration

Via Perl

 Requires IO-Socket-SSL & Net SSLeav modules from cpan.org added to Perl

-You can

- Add/delete/modify users
- Change passwords
- Configure iLO settings
- Control the UID
- Reboot the server (including a cold reboot)
- Flash the firmware
- HP Lights-Out Perl Scripting Sample (on hp.com)
 - locfg.pl

./locfg —s ilo-dnsname —f command.xml —l result.log





ProLiant ROM Flash - scripted

- Find the ROM (cpXXXX.scexe) on hp.com
 - -www.hp.com/support/files
 - Select your model & OS choice (eg. DL360 G3, Red Hat EL 2.1)
 - Download the "Online ROM Flash Component for Linux"
 - Example: CP004612.scexe (ver. 2004.05.01 for DL360G3)
- Deliver it to the node
- Execute it with paramters
 - --s : silent mode
 - --f : force mode (reinstall existing or overwrite newer ver)
 - -r : reboot (shuts down & reboots after flashing)



Linux flash from HP SIM

XML file

```
 <?xml version="1.0" encoding="UTF-8"?>
  <tool-list>
  <ssa-command-tool name="Flash ROM">
  <category>General Tools</category>
  <description>Flash ROM on Linux server</description>
  <owner>root</owner>
  <execute-as-user>root</execute-as-user>
  <ssa-block>
    <copy-block>
      <source>/usr/root/roms/cp004612.scexe</source>
      <destination>/usr/root/cp004612.scexe</destination>
    </copy-block>
    <command log="true">
      /usr/root/cp004612.scexe -s -r
    </command>
  </ssa-block>
  </ssa-command-tool>
  </tool-list>
```



Version Control

Simplifying maintenance of ProLiant system software



- Version Control Repository Manager
 - Catalogs components downloaded from HP website
 - Allows creation of custom system software baselines
- Version Control Agent
 - Catalogs software on the end node
 - Displays software status
- VCRM and VCA work together to create software status and update BIOS, drivers, and agents





