Automated Provisioning of a Blade Infrastructure

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Hewlett-Packard
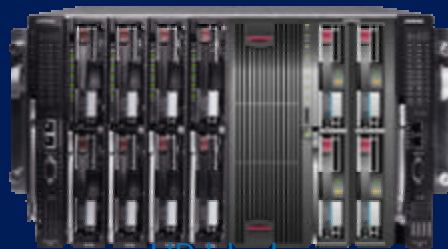
Blade Management

- Successful management is key to realizing all of the benefits that blades have to offer

- HP possesses a highly flexible management software toolkit to allow our customers to maximize their return on investment with blades

- Deployment of blades can be automated to reduce costs

HP Blades and management – A fast track to the Adaptive Enterprise

HP blades

HP Systems Insight Manager and ProLiant Essentials

Intelligent Integrated Infrastructure

Integrated management of compute nodes, network, and storage connectivity

Virtualization

Logical mapping (pre-definable bays/ports), foundation for virtualization

Automation

Enables automated scenarios such as node recovery and dynamic scaling

Foundation for delivering a service-oriented architecture

Business Reasons for Automated Management and Blades?

Business Objectives IT Helps Meet

- Improve margins by opening an e-commerce site on the web to begin direct selling to customers

- Improve employee productivity by providing a groupware solution to organize documents

- Improve customer satisfaction by providing a central view of the customer for customer service personnel to access and use in quick decision making situations

- Tasks IT Does Repeatedly to Achieve These Goals

  - Determine when computer is available

  - Ha...

  - ...VM ...e rack ...nstall

  - ...on and

  - ...access

These decrease the return on IT investment

Session Goals

- Demonstrate the steps needed to complete the provisioning of blade servers

- Discuss the tools used

- Show examples of custom alterations

- Lay the basis for a simplified management foundation

- Show how IT can better meet business goals

Provisioning Defined

- Provisioning
  - The joining of two or more resources to create a new resource
 - Ex. Join software and a blade to create a viable server resource

Provisioning Linux Blades

- ## What are we doing?
  - Automatically provisioning a blade infrastructure with Linux, loading the management agents, installing the Altiris agent and starting all services, grouping servers post install in SIM and patching the OS with latest software patches

- ## Core tool set
  - HP ProLiant Essentials RDP 1.6 for Windows
  - Smart Start Scripting Toolkit – 7.10
  - NFS Server (any flavor)
  - Kickstart file (Provided with RDP)
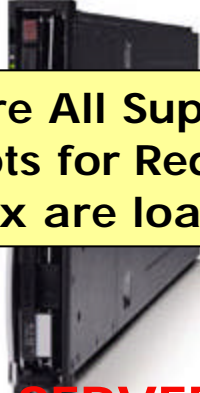 - HP Systems Insight Manager (SIM) for Linux or Windows
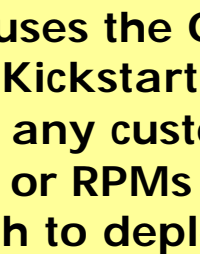
Setup
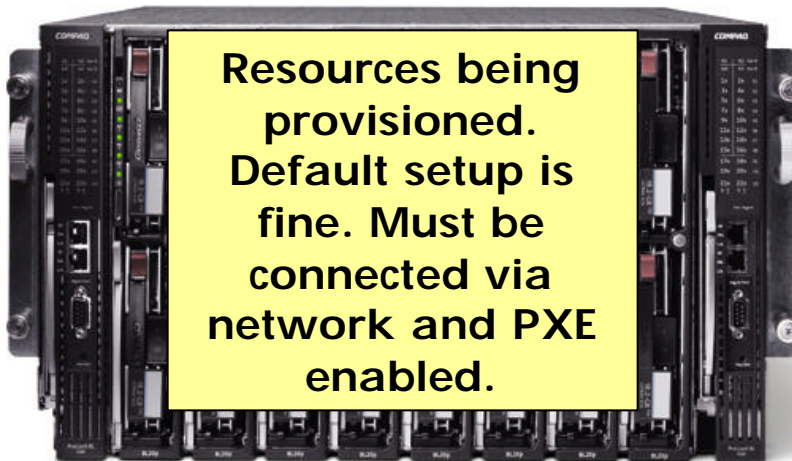
Resources being provisioned. Default setup is fine. Must be connected via network and PXE enabled.

BLADE SERVER RESOURCES

Insure All Support Scripts for RedHat Linux are loaded

RDP SERVER

Houses the OS files, Kickstart file, and any custom tools or RPMs you wish to deploy

NFS SERVER

Steps for Initial Deployment

1. Server resource(s) startup and PXE boot

7. NFS server controls OS deployment via the instructions in the kickstart file

Server is now operational with an OS, Altiris Agent, and basic services running

2. RDP sees server(s)

6. Installer calls the NFS Server

3. Drop scripts onto new server(s)

5. RDP calls initial OS deployment from NFS server

4. Preparation scripts run (drive provisioned, OS set in RBSU)

Customizing

- All initial deployment server OS customizations can come from the kickstart file

- Kickstart file can provide post-install instructions to the servers
  - Install extra agents
  - Install custom RPMS
  - Configure services to start and stop in various runlevels

- Kickstart files are freely distributable and redistributable. If you find one you like – USE IT

- We provide useable kickstart files out of the box. Nothing proprietary – customize away.

What is in our standard kickstart?

- Basic OS deployment

- HP management agents for SIM are deployed

- High risk services are shut down

- Altiris Agent for Linux (Adlagent) is installed and started at boot time

Potential Enhancements

- All Linux hosts that appear are localhost.localdomain by default. You can use the following to configure a host name. Place it in the post-install section of the kickstart file:
  - # Update Hostname
  - HOST=`ifconfig eth0 | grep HWaddr | awk '{print $5}' | sed 's/://g'`
  - DOMAIN="hpworld.net"
  - /usr/bin/perl -pi -e "s/localhost/${HOST}/g,s/localdomain/${DOMAIN}/g" /etc/sysconfig/network
  - /usr/bin/perl -pi -e "s/localhost/${HOST}/g,s/localdomain/${DOMAIN}/g" /usr/lib/vmware-mui/apache/conf/httpd.conf
  - /usr/bin/perl -pi -e "s/localhost/${HOST}/g,s/localdomain/${DOMAIN}/g" /etc/hosts

Potential Enhancements 2

- Change kickstart file to stop any services at startup that are unnecessary and start any that may be needed

- Example (Included in default scripts)
  - # change runlevel configuration of services
  - Chkconfig --level 345 httpd on
  - Chkconfig --level 345 mysql on
  - Chkconfig nfs on
  - Chkconfig smb on

Enclosure Preparation

- All power connected

- GBE2 switches set in the enclosure and cabled to the DHCP (RDP) server

- Management connectors wired for power and communication on the enclosure

Switch Preparation

- The switch is shipped to accept a DHCP address

- No initial configuration is required if you are willing to perform setup with DHCP addresses

- The initial setup is performed with DHCP addresses

Switch Customization

- http://h200006.www2.hp.com/bc/docs/support/SupportManual/c00112018/c00112018.pdf

- Documentation and code for scripting the custom configuration of a ProLiant GBe2 switch

- Server side scripting

- Example given is in Perl and Perl has been tested

- Any scripting language capable of telnet scripting should work

Blade Preparation

- Hardware configuration
  - No configuration is necessary unless the device has been customized
    - Insure all hardware updates are applied before racking
    - Insure all hardware is properly seated
    - Insure blade cover is completely closed

- Firmware
  - Firmware can be applied before or after initial deployment (recommend before)

RDP Options

- Name the enclosures according to your own practices

- Setup any naming conventions and groups on the RDP servers prior to deployment

- Insure scripts point to any custom files you have written

System Power Up

- Insert a single blade and connect to the iLO. Name your enclosures and racks.

- Insert remaining blades into slots and they will power up automatically and PXE boot by default

- Each blade will appear in the Rapid Deployment Pack console as it becomes available

- The blade will appear named as Rack-Enclosure-Slot.

RDP Deployment

- Drag and drop
  - Servers can be bulk selected and dropped on a script
  - Script can be dropped on a group

- Time
  - A standard scripted installation can be completed in as little as 6 minutes
  - Custom post-install scripts embedded in the kickstart file will add time to the installation

Steps for Post-deployment Configuration

- Set up custom lists in SIM
  - Define a list based on a variety of parameters including enclosure, system name, searchable text, etc.

- Copy any update RPMs to systems
  - Can be done via RDP, SIM or other utilities
  - Must place rpms in a common directory structure

Set Up Custom SIM List
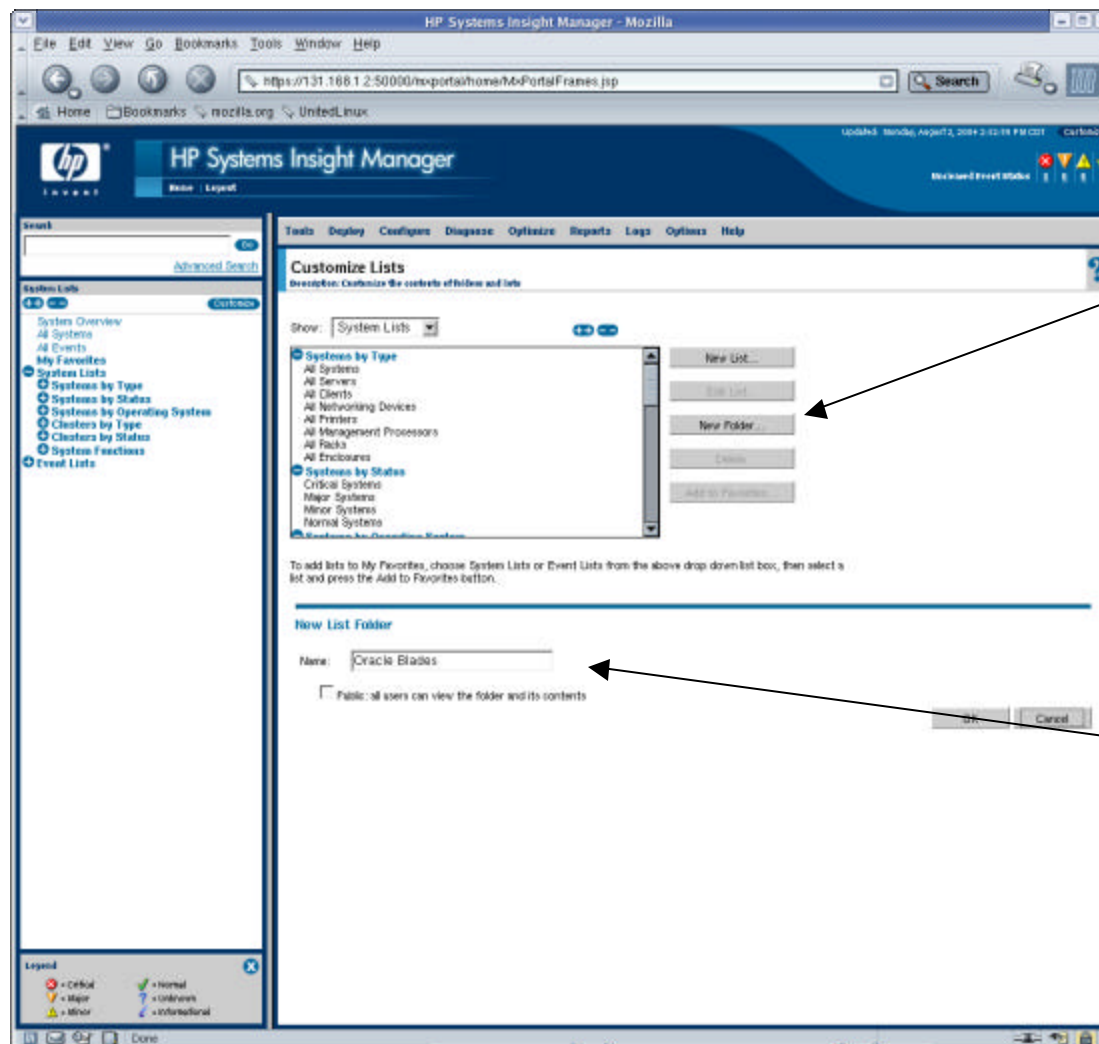
Create a New Folder

Name the folder based on criteria

Setup Custom List
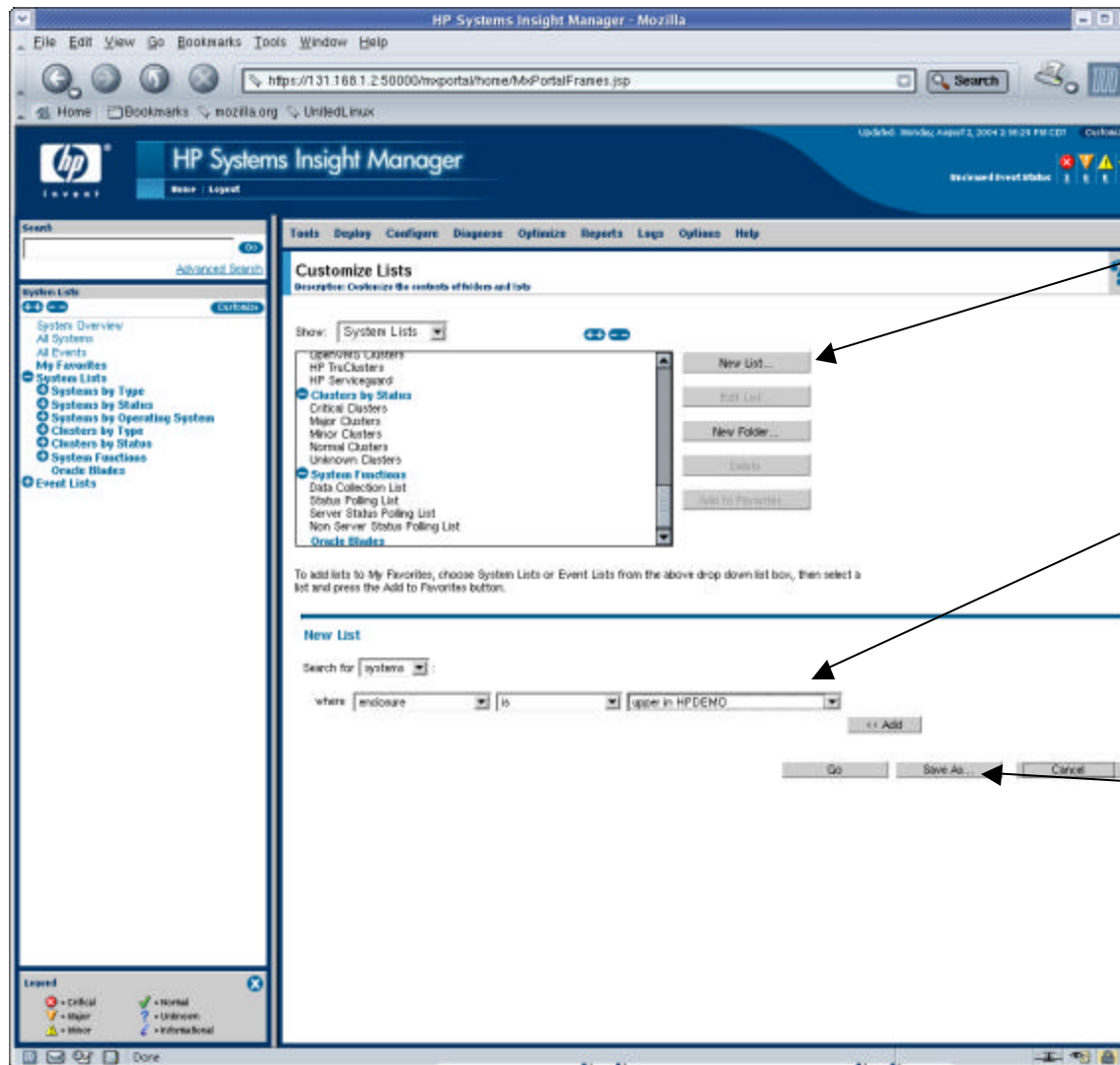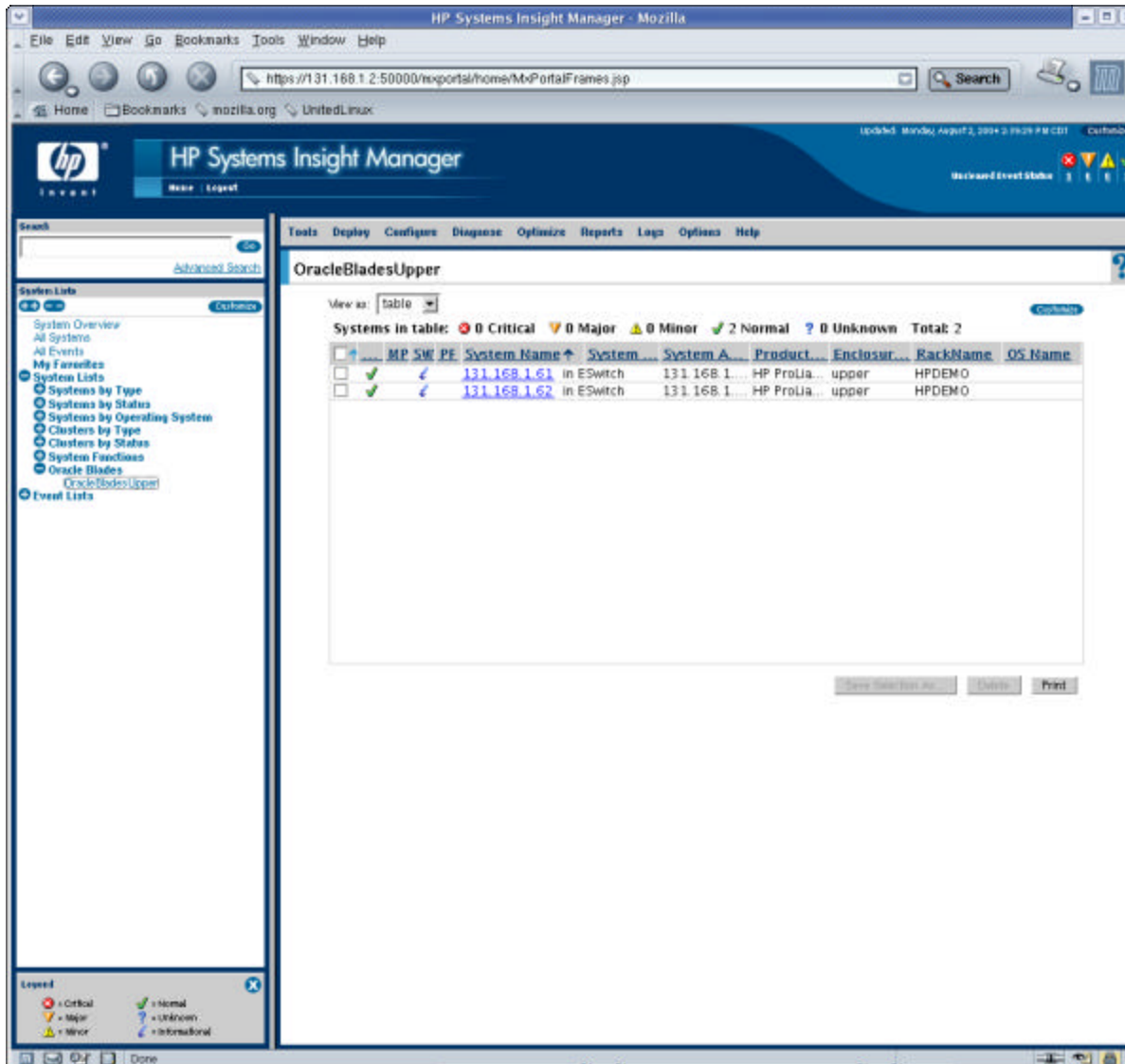
Create a New List

Select criteria for list

Save the list

Setup Custom List

Existing systems appear immediately. Others will appear as SIM is alerted to their presence (SNMP).

System Updates

- Copy update RPMs to each server
  - Use SIM, RDP or another tool

- Run commands from SIM
  - Option 1 – Use RPM install command in SIM
  - Option 2 – Create custom commands for update installs
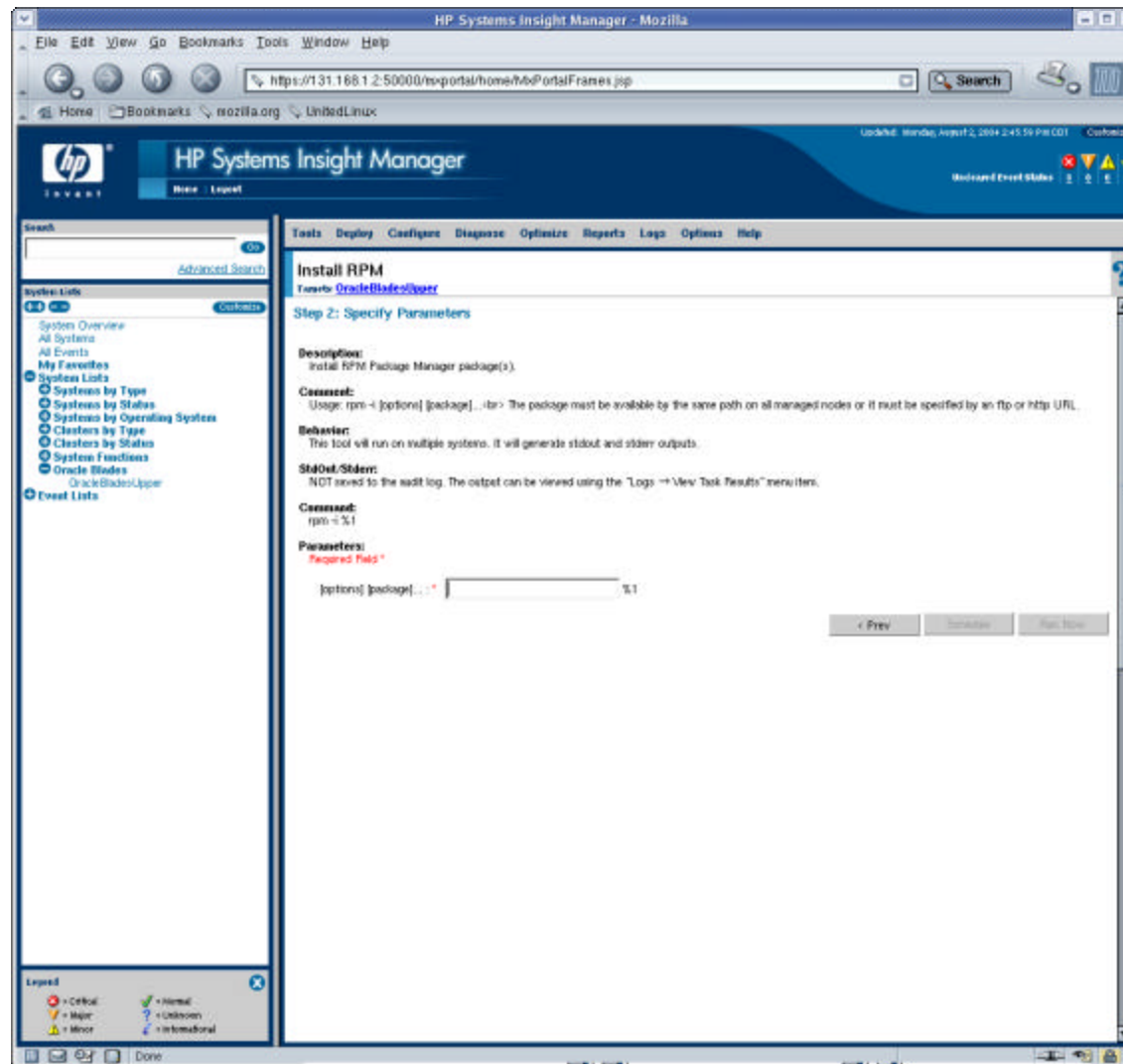 - Option 3 – Custom scripting of software updates in RDP

Updates from SIM
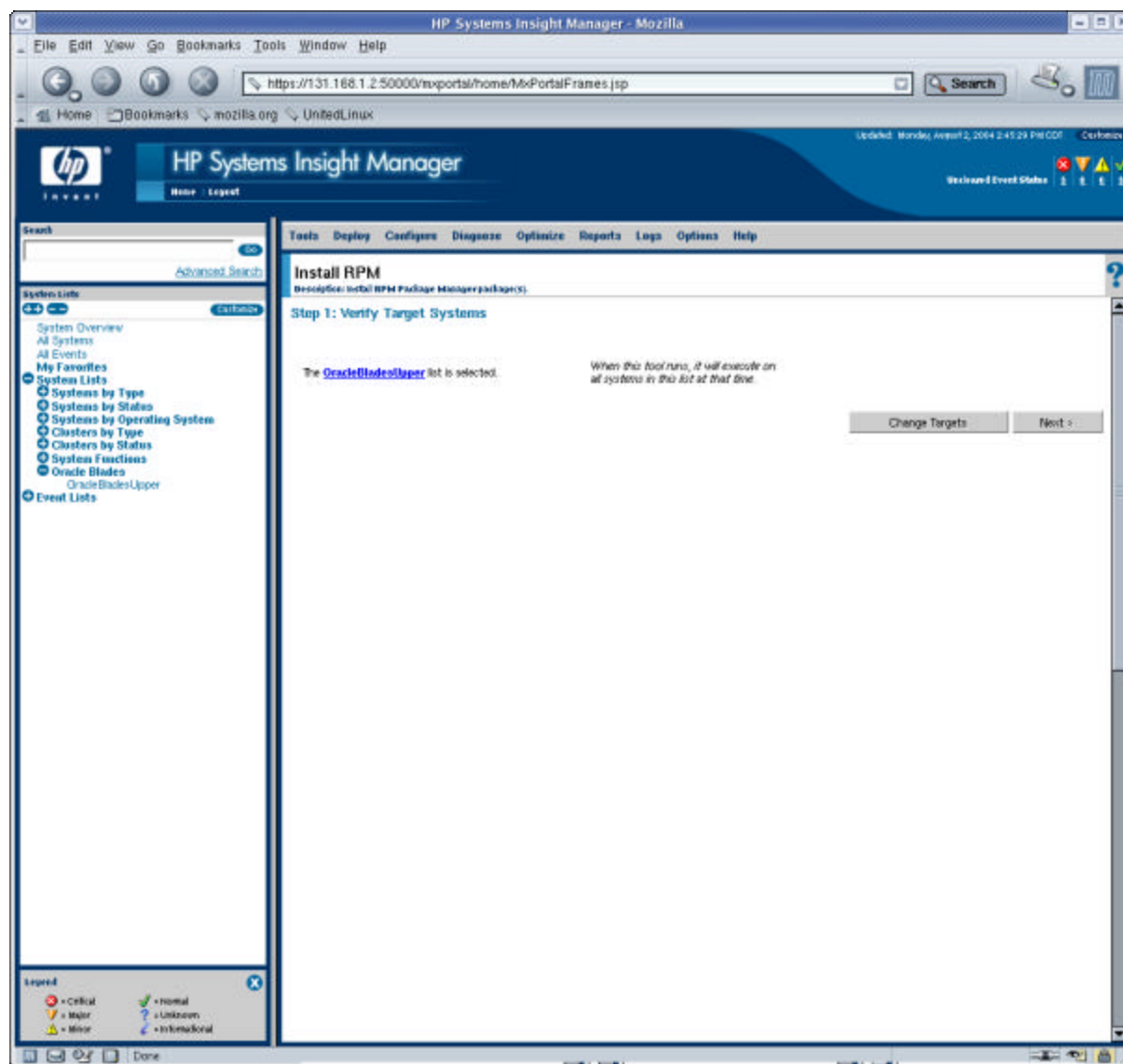
Group that was created is used as the update target

Update from SIM

RPM command is run from a central location

Other methodologies exist for deploying updates including custom command scripts

Other Opportunities

- This same infrastructure can be used to:
  - Provision SAN
  - Update systems over time
  - Schedule reprovisioning
  - Do automated server recovery
  - Dynamically flex infrastructure based on demand
  - React to system issues and respond
  - Virtual compute node recovery
  - ……

References

- Visit HP on the web for information at
  - http://www.hp.com

- Blades are at:
  - http://www.hp.com/go/blades

- HP Software
  - http://h18004.www1.hp.com/products/servers/proliantessentials/index.html

Q&A

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