ESX Server 2.x Releases

- VMware ESX 2.x products use x.y.z version format
  - “x” position identifies a major release – e.g. major feature introduction
  - “y” position identifies a minor release – e.g. feature enhancements
  - “z” position identifies a maintenance release – e.g. fix rollup
- ESX product has a regular “z” maintenance release schedule for fix rollup and new hardware enablement
  - Typically 3-4 times a year frequency
- ESX has a monthly release “train” for security/critical fixes
- All other VMware products use the “z” maintenance release as-needed for their security/critical fix release
ESX Server 2.x Maintenance Releases

- Upgrades are for the latest x.y.z maintenance release
  - Roll-up of all previous patches and fixes
  - New features and/or hardware support
- The size of each maintenance release has grown:
  - ESX 2.5.1 Mar 2005 216M
  - ESX 2.5.2 Sep 2005 216M
  - ESX 2.5.3 Mar 2006 292M
  - ESX 2.5.4 Oct 2006 303M
- Upgrading ESX Server 2.x involved significant downtime:
  - Shutting down virtual machines
  - Rebooting into Linux
  - Running upgrade.pl
  - Rebooting into Vmniix
ESX Server 2.x Patch Updates

- Patches come out monthly as needed
  - Critical bugs and hot customer escalations need to be handled immediately
  - Security updates cannot wait 6 months
  - New GOS support may be needed immediately
- Most ESX Server 2.x patches tended to be as large as maintenance releases
  - 2 reboots are still required
  - New patches roll up previous fixes as well
    - 2.5.2-patch3 Jan 2006 216M
    - 2.0.2-patch1 Jun 2006 263M
Patch Contents in ESX 2.x

```
[govindarajan@phoenix misc]$ ls -lh esx-2.5.3-22981-upgrade.tar.gz
-rw-r--r--  1 govindarajan  mts   292M  Apr 13 03:51 esx-2.5.3-22981-upgrade.tar.gz
[govindarajan@phoenix misc]$
[govindarajan@phoenix misc]$ ls -lh esx-2.5.3-22981-upgrade
esx-2.5.3-22981-upgrade/ esx-2.5.3-22981-upgrade.tar.gz
total 44K
-drwxr-xr-x  4 govindarajan  mts   120  Apr  1 08:36 drivers/
-rw-r--r--  1 govindarajan  mts    1.2K  Apr  1 08:35 README
-rw-r--r--  1 govindarajan  mts    39K  Apr  1 08:35 upgrade.pl*
-drwxr-xr-x  3 govindarajan  mts    72  Apr  1 08:35 VMware/
[govindarajan@phoenix misc]$ ls esx-2.5.3-22981-upgrade
esx-2.5.3-22981-upgrade/ esx-2.5.3-22981-upgrade.tar.gz
[govindarajan@phoenix misc]$ ls esx-2.5.3-22981-upgrade/VMware/RPMS/ | wc -l
181
[govindarajan@phoenix misc]$ 
```
Update Model – ESX 1.0 to 2.x

Red Hat
Modsourse
Userland
VMX
Kernel-vmnix
VMKernel
SCSI Driver
Net Driver

Red Hat
Modsourse
Userland
VMX
Kernel-vmnix
VMKernel
SCSI Driver
Net Driver

Red Hat
Modsourse
Userland
VMX
Kernel-vmnix
VMKernel
SCSI Driver
Net Driver

2.5.2
patch1
2.5.3

1 month
Time
Current Pain Points in ESX 2.x

Current Pain Points

- Monolithic ESX RPMs. Huge tarballs are getting bigger.
- No choice of individual fixes - All or nothing
- Upgrade.pl force-installs everything
- Downtime of ESX hosts with 2 reboots
Addressing Update Pain Points – ESX 2.5.3+

Current Pain Points

- Monolithic ESX RPMs. Huge tarballs are getting bigger.
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2.5.3 Solution

- Smaller tarball (~80MB) with less RPMs
Addressing Update Pain Points – VI3

Current Pain Points

- Monolithic ESX RPMs. Huge tarballs are getting bigger.

VI3 Solution

- Replace tarball with small patch bundles; patch only as needed.
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- Graceful esxupdate tool
## Addressing Update Pain Points – VI3

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VI3 Solution

- Replace tarball with small patch bundles; patch only as needed
- Pick and choose smaller patches; Freedom to pick and choose security patches
- Graceful esxupdate tool
- Requires at most one reboot
- Single update mechanism for both upgrades and patches
Everything is a Bundle

- Everything is a bundle
  - Maintenance (3.0.0 to 3.0.1) upgrades
  - Security patch
  - Hardware support, i.e., new drivers
  - Hotfix for specific customers
- Each bundle consists of one or more RPMs
  - Giant ESX 2.x RPMs are broken down into 50+ component RPMs
  - Each driver gets its own RPM
  - RPM dependencies used to enforce component relationships
  - Bundle can contain one package or the entire distribution
- A Bundle is classified as security, critical, and general
- ESX Server software state can be described as the base x.y.z version plus the installed bundles
What a VI3 Bundle Looks Like

- **Bundle Folder – ESX-012345**
  - **Descriptor.xml**
  - **Vmkernel-3.0.1-1511.rpm**
  - **Drivers-aacraid-3.0.1-1511.rpm**
    (and many more rpms…)
  - **Headers**

```xml
<descriptor version="1.0">
  <product>Vmware-ESX-Server</product>
  <version>3.0.0</version>
  <release>16953</release>
  <description>The complete..</description>
  <contact>support@vmware.co</contact>
  <upgradepaths>
    <path>3.0.0</path>
    <path>3.0.0-patch1</path>
    <noreboot/>
  </upgradepaths>
  <rpmlist/>
</descriptor>
```
How about this for a Non-Intrusive Update?

- This patch was shipped to customers in September.

<table>
<thead>
<tr>
<th>Patch Name</th>
<th>ESX-8005537</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release date</td>
<td>9/2006</td>
</tr>
<tr>
<td>Applies to</td>
<td>ESX 3.0.0 GA</td>
</tr>
<tr>
<td>Patch size (.tgz)</td>
<td>28123 bytes</td>
</tr>
<tr>
<td>Summary</td>
<td>OpenIPMI driver init scripts</td>
</tr>
<tr>
<td>Description</td>
<td>This update installs the init scripts for the OpenIPMI drivers. OEM Management Agents use these drivers to monitor system hardware health.</td>
</tr>
<tr>
<td>Needs reboot</td>
<td>NO</td>
</tr>
<tr>
<td>Needs VMotion</td>
<td>NO</td>
</tr>
</tbody>
</table>
How Customers Get Patches

- Patch Notification (Monthly)
  - http://www.vmware.com/download/
- Patch Download

VMWARE 2006
Command Line Utility - esxupdate

- Primary customer interface for updating the system software with modular software bundle
- One interface for all update needs – patches, drivers, upgrades
- Smarter and more accountable
  - More graceful - only updates the needed RPMs
  - Patch maintenance and history
- Better for automation
  - Enables installing patches from centralized NFS, HTTP, or FTP repository
  - Unattended installation enables scripting and automation
- Shipping with ESX 3.0.0
Esxupdate Architecture

VMware Bundle Server

Corporate firewall

Internal Bundle server (HTTP, NFS, FTP)

ESX Servers

Internet
Command Line Utility - esxupdate

- Syntax:
  esxupdate [options] info | query | update
  options include:
  - -l/--listrpms  // to list rpms
  - -r/--repo <url>  // to find software bundle at url; default is cwd
  - -v/--verbose <level>  // to set output verbosity

- How to use it:
  - esxupdate info  // to get information about the software bundle
  - esxupdate query  // to get a list of installed releases, including
                             // base release, fixes, drivers, etc.
  - esxupdate update// to install the software bundle
[root@vmware ESX-8005537]# esxupdate info
INFO: No repository URL specified, going with file:/root/ESX-8005537
Product : VMware ESX Server
Vendor  : VMware, Inc. (support@vmware.com)
Release:  : ESX-8005537
Release Date : Fri Sep  8 07:24:50 PDT 2006
Summary  : OpenIPMI driver init scripts
Description:
This update installs the init scripts for the OpenIPMI drivers. OEM Management Agents use these drivers to monitor or system hardware health.
Upgrade paths : 3.0.0-27701
Repository URL: file:/root/ESX-8005537

For a detailed list of rpms, use the -l/--listrpms option.
[root@vmware ESX-8005537]#
Updating ESX 3.0

[root@vmware ESX-8005537]# esxupdate -r file:/root/ESX-8005537 info
Product : VMware ESX Server
Vendor  : VMware, Inc. (support@vmware.com)
Release : ESX-8005537
Release Date : Fri Sep 8 07:24:50 PDT 2006
Summary : OpenIPMI driver init scripts
Description :
This update installs the init scripts for the OpenIPMI drivers. OEM Management Agents use these drivers to monitor or system hardware health.
Upgrade paths : 3.0.0-27701
Repository URL: file:/root/ESX-8005537

For a detailed list of rpms, use the -l/--listrpms option.
[root@vmware ESX-8005537]#
Updating ESX 3.0 - install

[root@vmware ESX-8005537]# esxupdate -r file:/root/ESX-8005537 update
INFO: Configuring...
INFO: Preparing to install VMware ESX Server ESX-8005537...
INFO: Running yum install <1 packages>...
INFO: | Gathering header information file(s) from server(s)
INFO: | Server: Esxupdate-compatible repository for VMware ESX Server ESX-8005537
INFO: | Finding updated packages
INFO: | Downloading needed headers
INFO: | Resolving dependencies
INFO: | Dependencies resolved
INFO: | I will do the following:
INFO: | [update: VMware-esx-lnxcfg 3.0.0-31234.i386]
INFO: | Downloading Packages
INFO: | Getting VMware-esx-lnxcfg-3.0.0-31234.i386.rpm
INFO: | Running test transaction:
INFO: | Test transaction complete, Success!
INFO: | VMware-esx-lnxcfg 100 % done 1/2
INFO: | Completing update for VMware-esx-lnxcfg - 2/2
INFO: | Updated: VMware-esx-lnxcfg 3.0.0-31234.i386
INFO: | Transaction(s) Complete
INFO: Running esxcfg-boot to regenerate initrd...!
INFO: --- TOTALS: 1 packages installed, 0 pending or failed, 0 excluded ---
INFO: Install succeeded - please come again.
[root@vmware ESX-8005537]#
Updating ESX 3.0 - query

```
[root@vmware ESX-8005537]# esxupdate query
Installed patches / ISOs:
    ------ Name ------ --- Install Date --- --- Summary ---
    3.0.0-27701   13:46:41 09/20/06
    ESX-8005537   16:44:10 09/22/06 OpenIPMI driver init scripts
For a differential list of rpms, use the -l/--listrpms option.
[root@vmware ESX-8005537]#
```
Updating ESX 3.0 - query

```
[root@vmware ESX-8005537]# esxupdate -l query

Installed patches / ISOs:

<table>
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<tr>
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New packages:
- DirectorCimCore-5.10.3-1_RHEL3
- ITDAgent-5.10.3-1
- LGTOaama-5.1.2-1
- LGTOaamvm-5.1.2-1
- VMware-vpxa-2.0.0-27704
- xSeriesCoreServices-level1-5.10.3-1_RHEL3
```

## Evolution of Patching Capabilities

<table>
<thead>
<tr>
<th>Capabilities</th>
<th>ESX 2.x / VC 1.x</th>
<th>ESX 2.5.3+</th>
<th>ESX 3.0 / VC 2.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patch granularity</td>
<td>entire release</td>
<td>subset</td>
<td>As small as 1 RPM</td>
</tr>
<tr>
<td>Patch Download and Central Repository</td>
<td>Manual</td>
<td>Manual (allow Central Repository)</td>
<td></td>
</tr>
<tr>
<td>Vulnerability (patch levels of each host) Assessment</td>
<td>Command line</td>
<td>Command line (more detail)</td>
<td></td>
</tr>
<tr>
<td>Reboot frequency for each update</td>
<td>2</td>
<td>2</td>
<td>Only when necessary</td>
</tr>
<tr>
<td>Deployment to Multiple Hosts</td>
<td>Manual</td>
<td>Manual, scriptable</td>
<td></td>
</tr>
<tr>
<td>Update history</td>
<td>None</td>
<td>History database</td>
<td></td>
</tr>
<tr>
<td>Compliance Reporting</td>
<td>Manual</td>
<td>Manual, scriptable</td>
<td></td>
</tr>
<tr>
<td>New Patch Awareness and Notification</td>
<td>E-mail</td>
<td>E-mail</td>
<td></td>
</tr>
</tbody>
</table>
We’re Not Stopping Here

- VMware is working on more solutions:
  - To dramatically simplify the deployment of updates to multiple ESX Servers
  - To roll back undesired updates and failed installations
  - To provide a nicer UI for the selection and application of updates to ESX Servers
  - To dramatically simplify the deployment of patches to virtual machines
  - To enable integration of third-party patches and updates
Closing Remark

- esxupdate is extremely well tested since we have based it in-house for a long time and many of our internal infrastructure depends on it.
- We have successfully released patches that alleviate ESX 2.x pain-points.
  > a 28K byte patch with no reboot required.
- esxupdate can also upgrade your ESX 3.0.0 to ESX 3.0.1 - this is a unified mechanism to handle all update/upgrade needs.

- VMware understands the importance of update/upgrade management and want to continue working with our customer to provide a better service.
Please remember to complete your session evaluation form and return it to the room monitors as you exit the session.

The presentation for this session can be downloaded at http://www.vmware.com/vmtn/vmworld/sessions/

Enter the following to download (case-sensitive):

Username: cbv_rep
Password: cbvfor9v9r