Updating ESX Server 3

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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 roll up 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 Vmnix

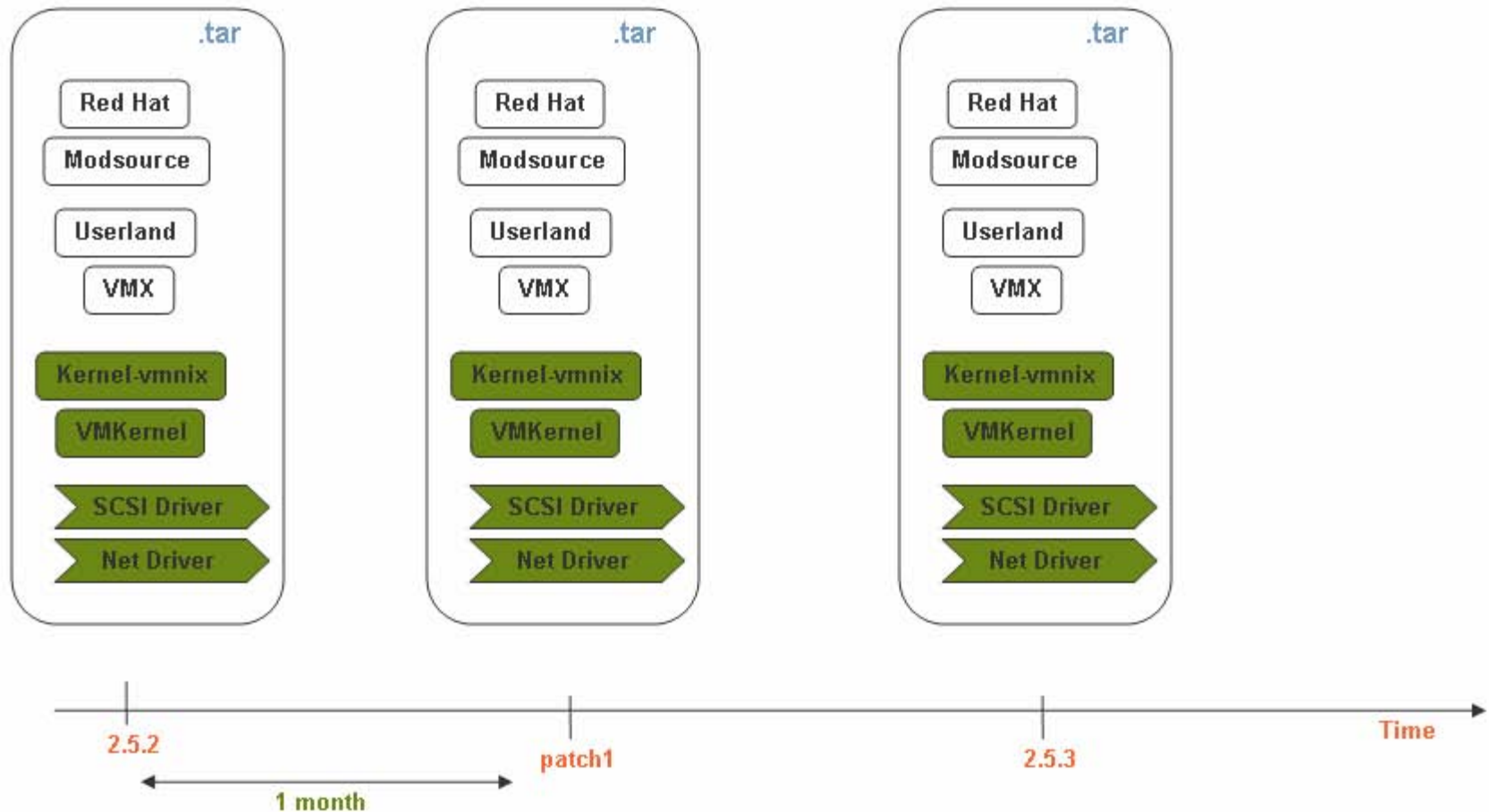# ESX Server 2.x Patch Updates

- 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]$
[govindarajan@phoenix misc]$ ls -lh es
esx-2.5.3-22981-upgrade/        esx-2.5.3-22981-upgrade.tar.gz
[govindarajan@phoenix misc]$ ls -lh esx-2.5.3-22981-upgrade
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
-rwxr-xr-x  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 es
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

.tar

Red Hat

Modsource

Userland

VMX

Kernel-vmnix

VMKernel

SCSI Driver

Net Driver

.tar

Red Hat

Modsource

Userland

VMX

Kernel-vmnix

VMKernel

SCSI Driver

Net Driver

.tar

Red Hat

Modsource

Userland

VMX

Kernel-vmnix

VMKernel

SCSI Driver

Net Driver

2.5.2

patch1

2.5.3

Time

1 month

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+

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2.5.3 Solution

- **Smaller tarball (~80MB) with less RPMs**

Addressing Update Pain Points – VI3

Current Pain Points	VI3 Solution

> Monolithic ESX RPMs. Huge tarballs are getting bigger.

■ **Replace tarball with small patch _bundles_; patch only as needed**

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**

Addressing Update Pain Points – VI3

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- Graceful esxupdate tool

Addressing Update Pain Points – VI3

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- Requires at most one reboot

Addressing Update Pain Points – VI3

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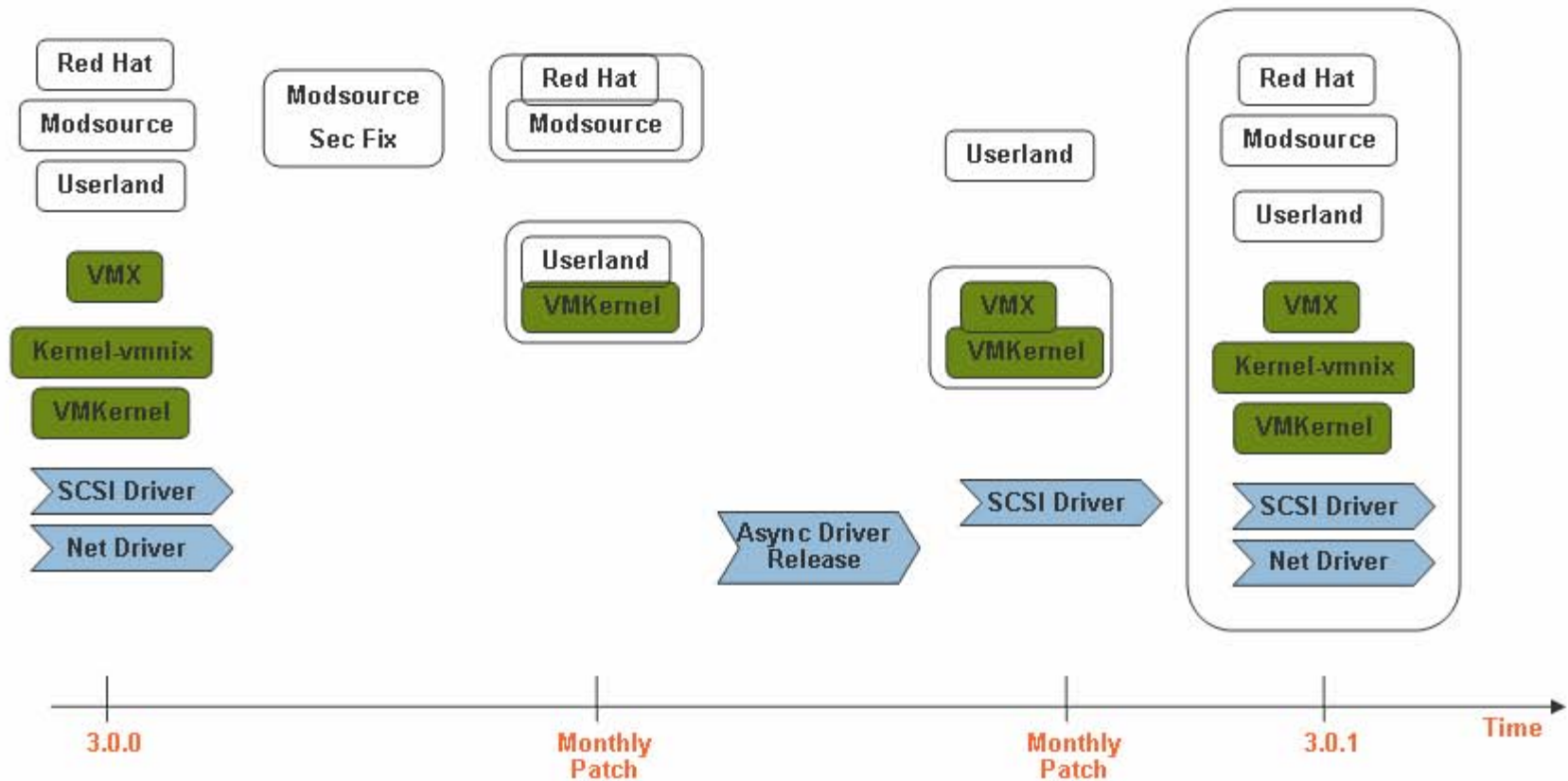> Upgrade.pl force-installs everything

> Downtime of ESX hosts with 2 reboots

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**
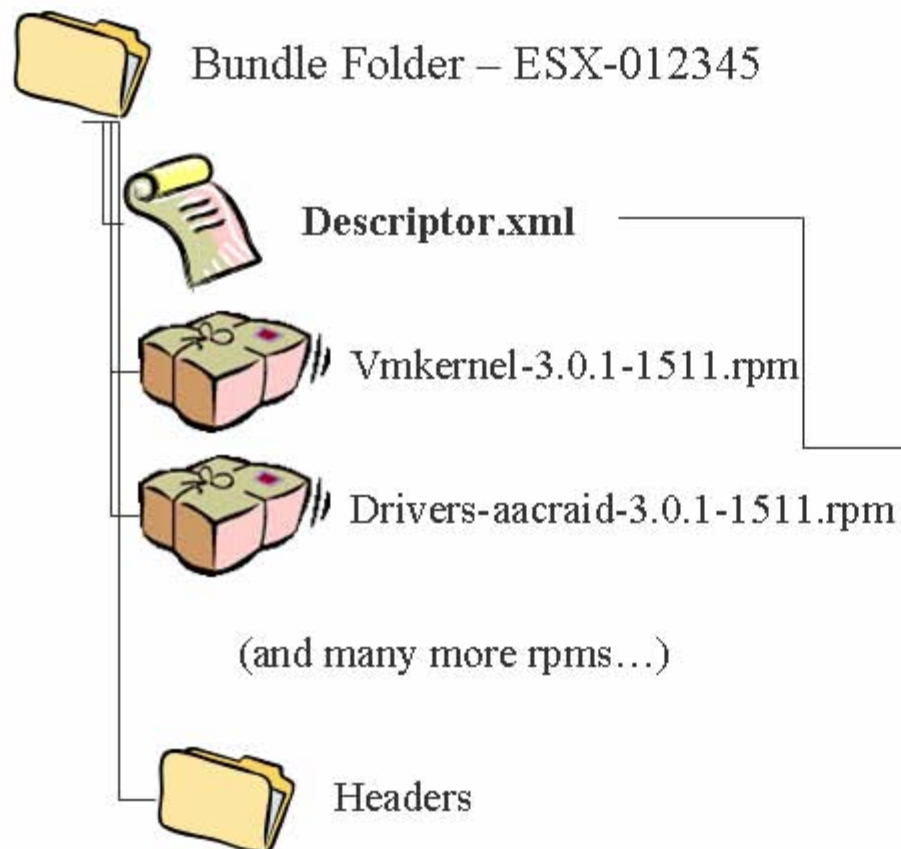
Everything is a Bundle

- Everything is a bundle
  - > Maintenance (3.0.0 to 3.0.1) upgrades
  - > Security patch
  - > Hardware support, ie 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

Pick and Choose Your Updates with VI3

3.0.0   Monthly Patch   Monthly Patch   **3.0.1**   Time

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

```
<descriptor version="1.0">
  <product>Vmware-ESX-Server
  <version>3.0.0
  <release>16953
  <description>The complete..
  <contact>support@vmware.co
  <upgradepaths>
    <path>3.0.0</path>
    <path>3.0.0-patch1</path>
    <noreboot>
  </upgradepaths>
  <rpmlist>
:
```

How about this for a Non-Intrusive Update?

- This patch was shipped to customers in September.

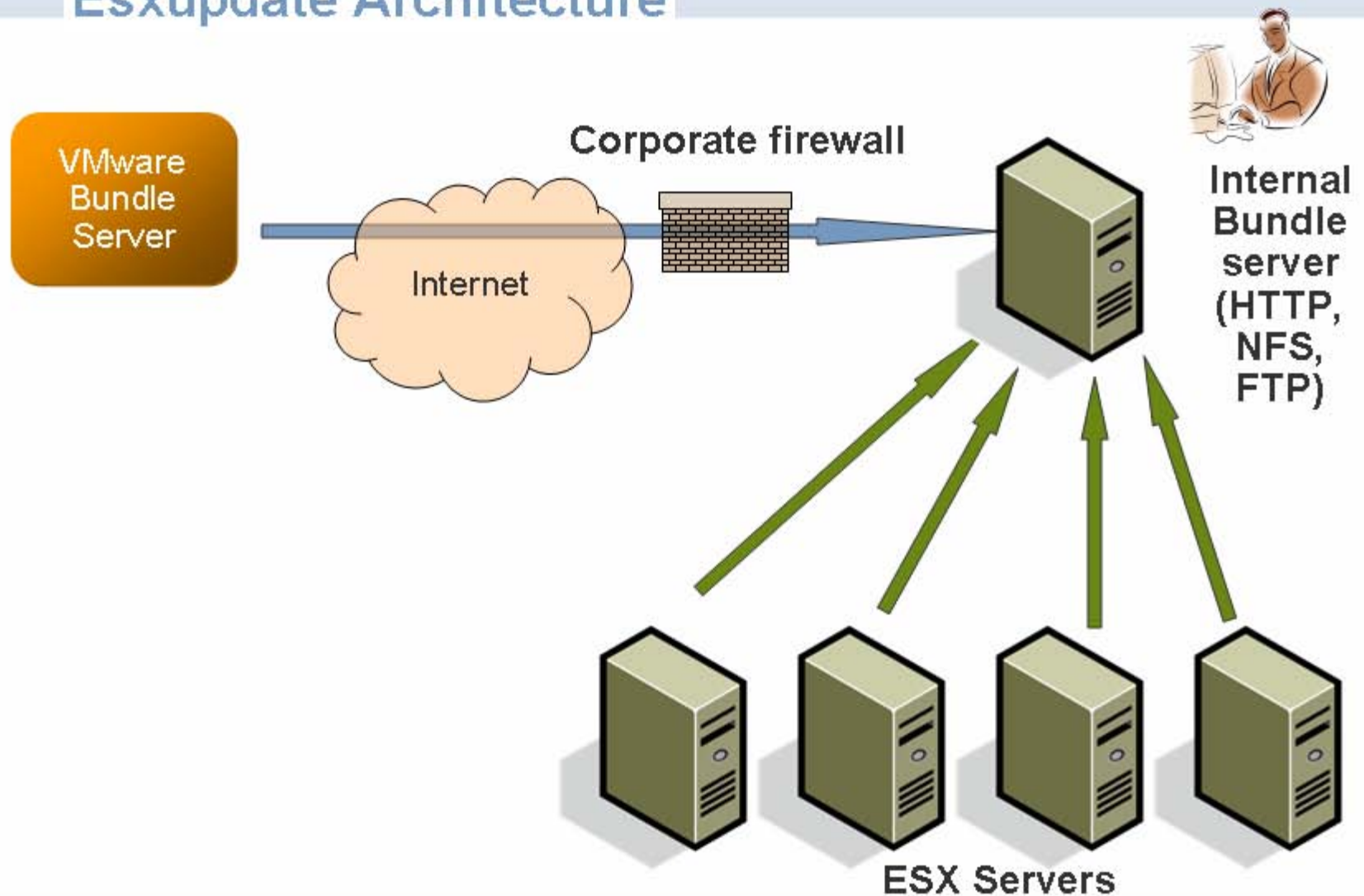| Patch Name	ESX-8005537
Release date	9/2006
Applies to	ESX 3.0.0 GA
Patch size (.tgz)	**28123 bytes**
Summary	OpenIPMI driver init scripts
Description	This update installs the init scripts for the OpenIPMI drivers. OEM Management Agents use these drivers to monitor system hardware health.
Needs reboot	**NO**
Needs VMotion	**NO**

How Customers Get Patches

vmware

http://www.vmware.com/download/

Patch Notification (Monthly)

Patch Download
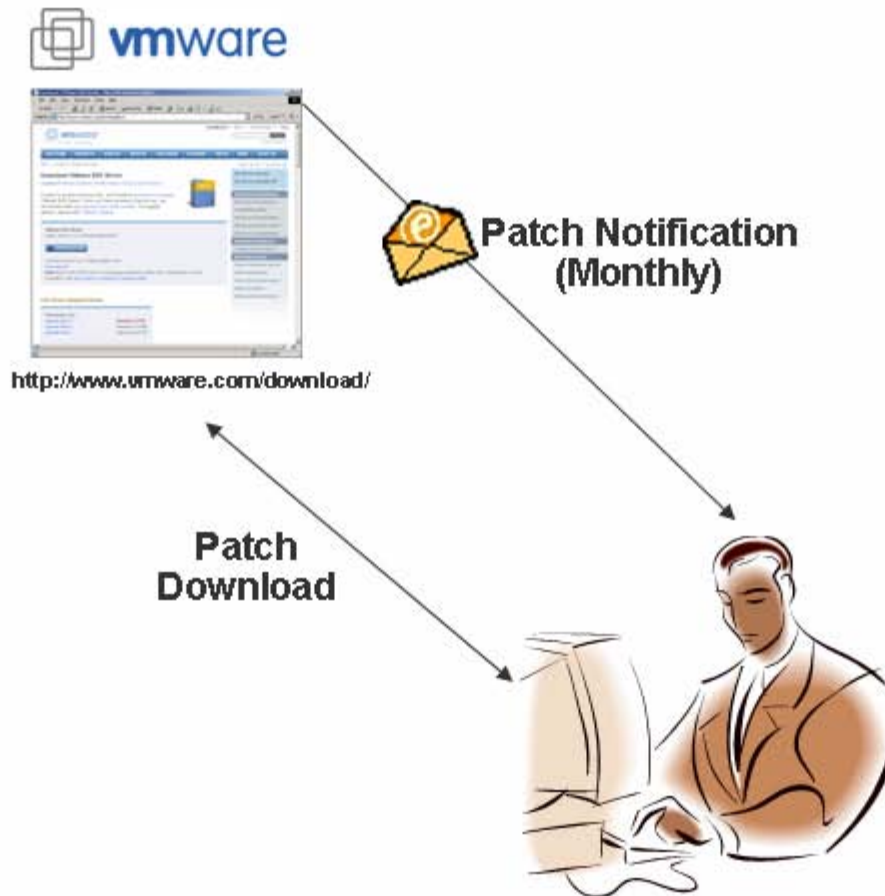
Command Line Utility - esxupdate

- 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

Internet

Internal Bundle server (HTTP, NFS, FTP)

ESX Servers

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

Updating ESX 3.0

```
[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 monit
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
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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 initrds...
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:
    ------ 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

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
[root@vmware ESX-8005537]# █
```

Evolution of Patching Capabilities

Capabilities	ESX 2.x / VC 1.x	ESX 2.5.3+	ESX 3.0 / VC 2.0
Patch granularity	entire release	subset	As small as 1 RPM
Patch Download and Central Repository	Manual		Manual (allow Central Repository)
Vulnerability (patch levels of each host) Assessment	Command line		Command line (more detail)
Reboot frequency for each update	2	2	Only when necesasary
Deployment to Multiple Hosts	Manual		Manual, scriptable
Update history	None		History database
Compliance Reporting	Manual		Manual, scriptable
New Patch Awareness and Notification	E-mail		E-mail

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

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