

IBM PureApplication System

Maintenance - System and workload



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This presentation will cover IBM PureApplication™ System maintenance.

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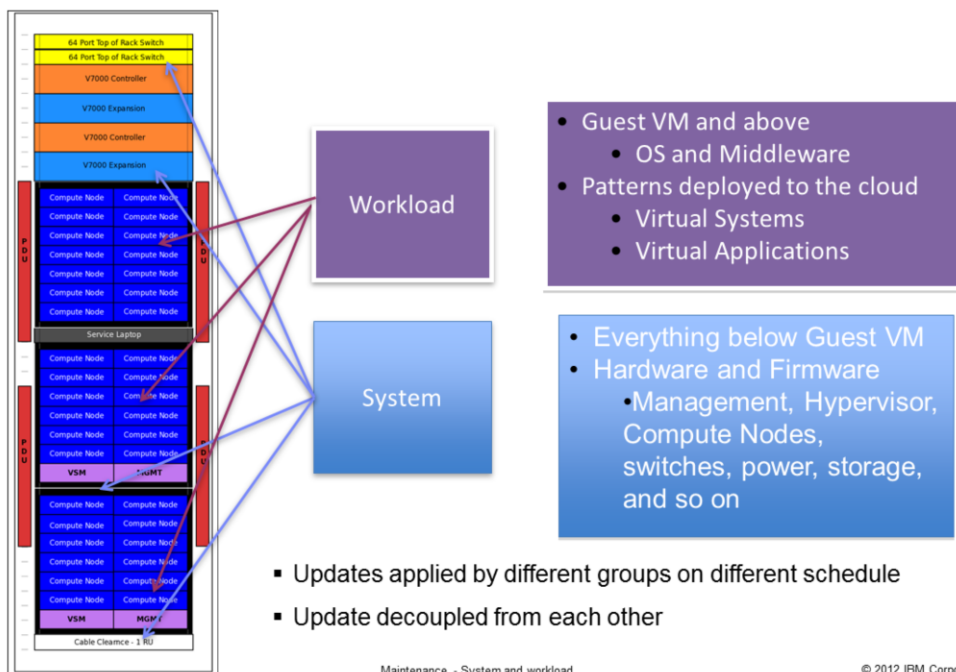
- Maintenance overview
- System maintenance
- Adding emergency fixes to the catalog
- Workload and Middleware maintenance
 - Virtual applications
 - Virtual systems (includes custom image)
- Apply vendor provided patches
- Summary

This presentation will cover applying maintenance to the system firmware, applying virtual application and virtual system maintenance, and upgrading pattern types.

Overview

This section will provide an overview of maintenance on IBM PureApplication System.

IBM PureApplication System - Maintenance breakdown

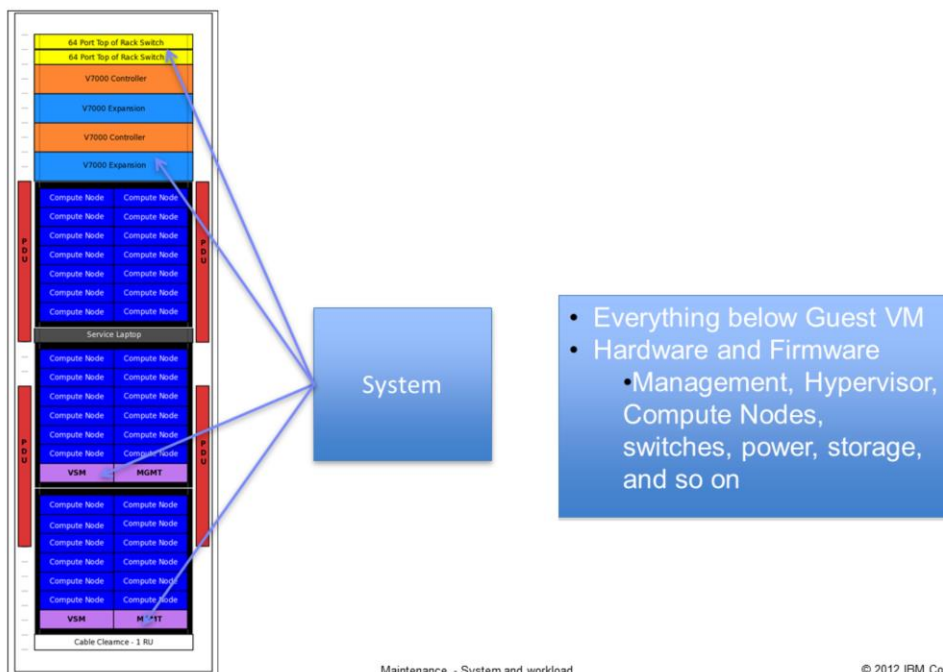


There are three types of maintenance available in IBM PureApplication System. Emergency fixes which you apply to upgrade the operating system and middleware running within virtual machines; Pattern type upgrades which you apply to the pattern type; System upgrades apply maintenance to hypervisors and the firmware controlling the hardware components.

System maintenance

This section will provide a brief overview of system maintenance.

PureApplication System – System maintenance



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System maintenance is used to update everything below guest virtual machines. This includes hardware firmware and controller software for the management nodes, compute nodes, switches, power, storage, and other hardware components. It can also provide upgrades to the hypervisors running on the compute nodes.

System maintenance - Overview

- Single cumulative system update
 - All system patches needed in single package
 - Current workloads continue to run during update
 - Must have extra capacity for mobility in each cloud group
 - Update will fail if the system has no room for mobility
 - No new workloads will be allowed during this time
 - System tasks are blocked and will queue until complete
- For V1, IBM CE will apply the single patch
 - Downloads the maintenance package from IBM to their Https or SCP server
 - Enables access for IBMer to log in the rack and apply maintenance
 - IBMer gets time-limited password to log in the rack

Rather than updating individual components, IBM will provide cumulative system updates which includes all system patches needed in a single package. Current workloads will continue to run during the update as long as the system has enough extra capacity for mobility in each cloud group. The update will check to ensure the system has room for mobility before it starts. Before a compute node is upgraded the system will migrate work off of that compute node. No new workloads will be allowed during this time, and all system tasks are blocked and will queue until the upgrade is complete.

For the initial release, IBM support personnel will apply the system upgrade. First you must download the maintenance package from IBM to a local HTTPS or SCP server, then you provide the IBM Customer Engineer temporary access to log in the system and apply the maintenance.

IBM access for maintenance and troubleshooting

- Enable access to IBM CE
 - To apply maintenance or troubleshoot
 - Troubleshooting panel (System Console → System → Troubleshooting)
 - Click "**Enable customer engineer account**"
- Generates a key for IBM CE who uses that to get the time-limited password

Troubleshooting on 172.18.120.32 Expand All Collapse All

Enable IBM customer engineer (IBM CE) account access

The IBM CE account is used by IBM to service the system. The account must be enabled before the IBM CE can log in to take corrective actions. The account remains enabled for 36 hours. It becomes disabled after 36 hours has passed.

Secret key:
Send this key to IBM Service Center and get a time-limited password.

```

IGMvdGwkMRXjBqS1xjaTLGcN6viHP2ogGDCU9cE
kC1FC73b/PdINV5XWV4Int+uUQCKjST1zVO
//uGB/p45j1tj3+494RKu7X3crn
/vEFQTKyUgMjBBOFY3Tr+3gaor6AnaWSOpV4mEmH
DTbaakgbtnY
/Ypny7kXj2PFRumC1j7pbxnCDUwCo42DzLHxc9
wzDEq1OuHRCCGYU6OYDnPyh1k
/yuzAtanOCZpWxejCa17B33JHMcuaNSI+mMXhGv
PVkypyIaupK/SENEdbKngNYX1y5cvcTa
/PeeBGy5xDteLYUg2aWwe9kgxIYttFRXx3bt17e9
/SL7TTOa2oig==

```

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You must provide explicit permission for the IBM Customer Engineer log in the system to apply maintenance or help troubleshoot system problems. The System console's troubleshooting panel will generate a one-time, time-limited password that allows the IBM Customer Engineer to log in the system. This password is automatically invalidated after 36 hours.

System maintenance report

- Get System Maintenance report from System Console → System → Settings

System settings Expand All

- Mail Delivery
- Date and Time
- Event Forwarding
- Domain Name Service
- Backup and Restore
- System Maintenance Report**

[Download CSV file](#)
 [Install Fix pack](#)
 [Download SGEN Logs](#)

Name	Model	Type	Firmware level	FRU serial	Serial Number	Version	Unified extensible firmware interface level	Vendor
8283/Rack17	8283-3C2	racks			Rack17			IBM
SN#100124/	Not Available	power_supplies		ZK105119RC	Not Available			IBM (DELT)
SN#100126/	92X	compute_node_ch 0		Y030BG224C	100126A			IBM (BG)
Cluster 1	1	cluster			1			IBM
11S49Y7471	HUSML4040ASS60	disk_drive			11S49Y7471			IBM-207>
SN#100124/	IBM Flex System EN4093 10Gb Virt	chassis_network_	5.0	Y250VT1BW:		7.2.5.11 (FLASH image2)^ active configurator		IBM (Not Available)
SN#100125/	92X	compute_node_ch 0		Y030BG224C	100125A			IBM (BG)

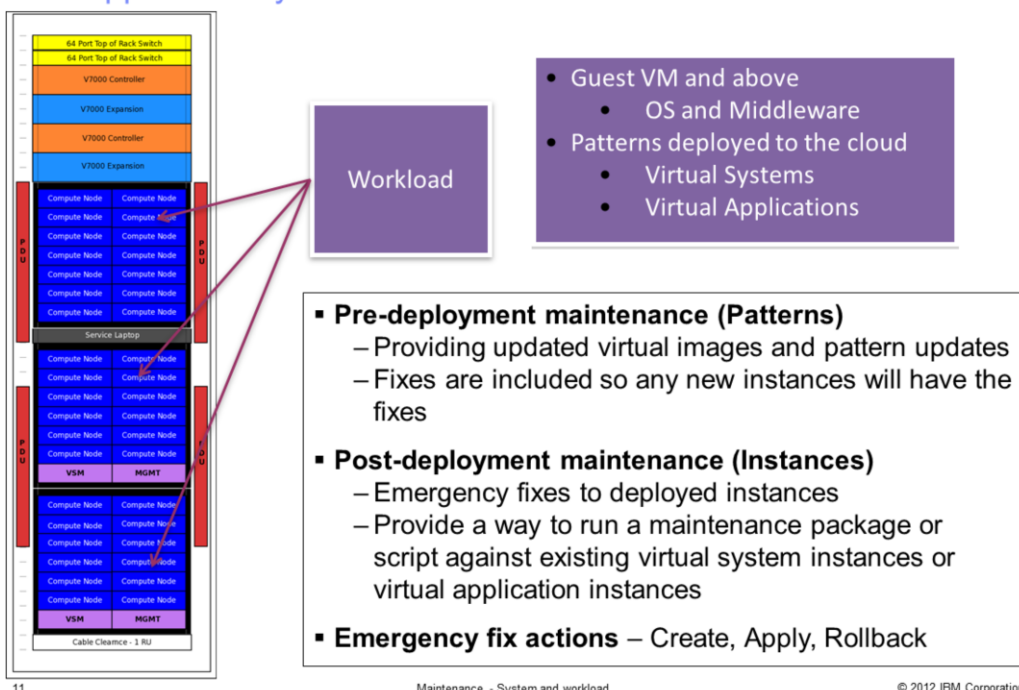
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The system console also allows the system administrator to view and download a maintenance report which included detailed information on hardware and firmware components for all hardware in the system.

***Workload maintenance -
Middleware and deployment
virtual system, virtual application upgrades***

This section will cover workload maintenance, including virtual system and virtual application upgrades.

PureApplication System – Workload maintenance



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Maintenance - System and workload

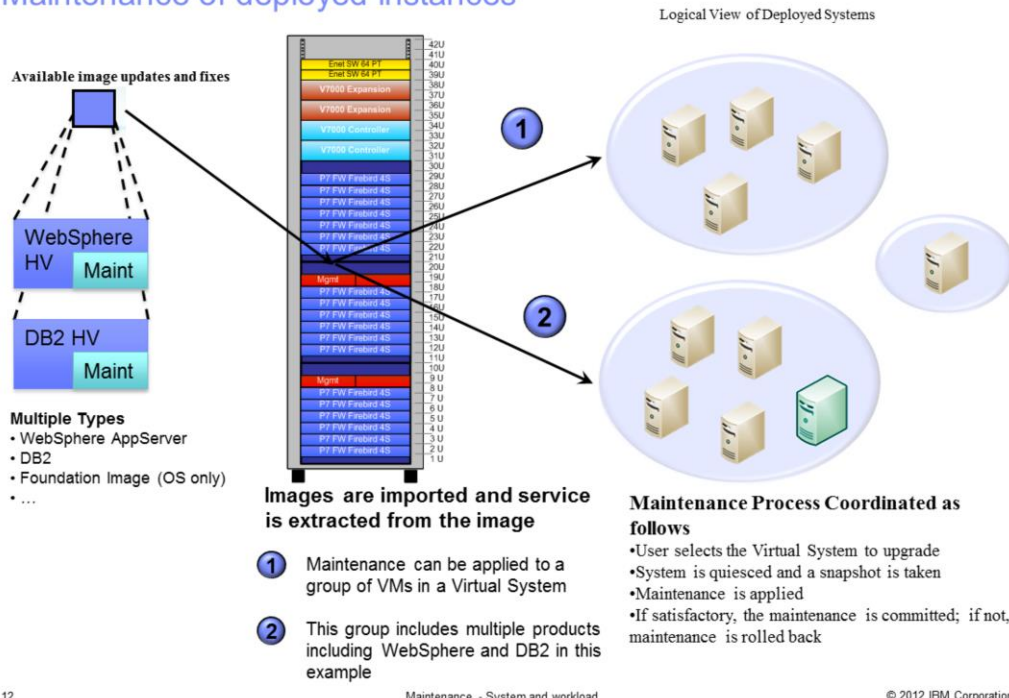
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There are two types of workloads in IBM PureApplication System: virtual applications and virtual systems. You have several options for applying maintenance to both types of workloads. You can apply maintenance before deploying the workload or to an already deployed, running workload.

To upgrade a workload before it is deployed you install updated virtual images and updated system plug-ins and pattern types. You can acquire updated images from IBM or other image providers; or you can use the extend and capture feature to add a set of fixes to an existing virtual image.

To upgrade a workload after it has been deployed, you use the emergency fix capability of PureApplication System. Emergency fixes can be made available to both virtual applications and virtual systems and are easily applied to the existing system.

Maintenance of deployed instances



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IBM will deliver updated images and updated patterns that can be applied to future instances Maintenance of Deployed.

There are two ways to apply maintenance. One, apply it to the pattern and two, apply it against the instance. Each approach has its own benefits which you will see.

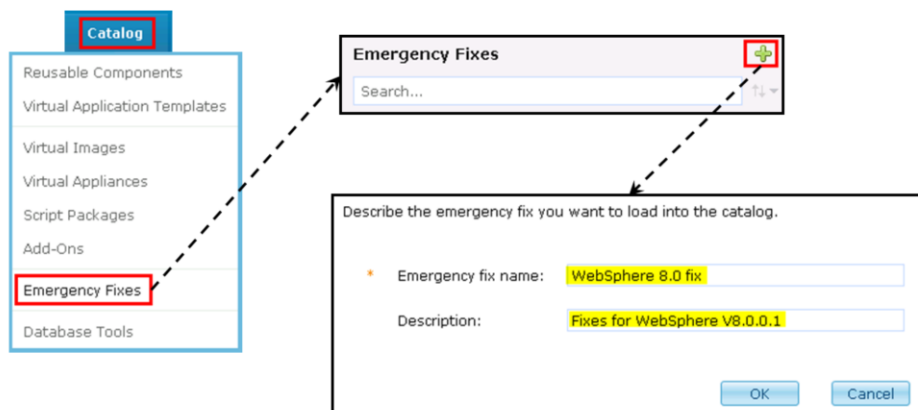
The process of applying maintenance is that once the user has selected the instance to be upgraded, the instance VMs are quiesced, snapshot is taken, maintenance is applied and if there were any errors in applying maintenance, the instance is rolled back.

Adding emergency fixes to catalog

Before you apply maintenance you must create an emergency fix in IBM PureApplication System. You must be assigned the Create new catalog content permission or the Appliance administration role to create an emergency fix.

Emergency fixes – adding to the catalog

- Hot fixes to be applied to Virtual system and Virtual applications patterns and instances
- Go to Workload Console → Catalog → Emergency Fixes
- Add a Emergency Fix
- Configure to be applicable to the Virtual images it can be applied



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To create an emergency fix in the workload console, select Emergency Fixes from the Catalog menu. Give the emergency fix a name and optional description. At this point the emergency fix has no content.

Configuring emergency fixes (1 of 2)

The screenshot displays the 'Emergency Fixes' management interface. A search bar is at the top left. Below it, a list shows 'WebSphere 8.0 fix' selected. The main panel shows details for this fix:

- Description:** Fixes for WebSphere 8.0.0.3
- Created on:** Aug 2, 2012 2:57:41 PM
- Updated on:** Aug 2, 2012 5:31:32 PM
- Emergency fix files:** Includes an 'Upload' button and a 'Download' button for the file 'WAS8003_Fix_1.zip'.
- Access granted to:** 'deploy18 [owner]' with an 'Add more...' link.
- Severity:** A dropdown menu set to 'Normal'.
- Applicable to:** Fields for 'Images' and 'Plugins', each with an 'Add more...' link.
- Comments:** A section indicating 'There are no comments yet'.

Yellow callout boxes provide additional context:

- 'WebSphere 8.0 fix' (points to the list item)
- 'Browse and upload fix file' (points to the Upload button)
- 'Can download file once in the system' (points to the Download button)
- 'Modify Access rights' (points to the Access granted to field)
- 'Severity for info purpose' (points to the Severity dropdown)
- 'Select virtual images or pattern plug-ins where this fix applies' (points to the Applicable to fields)

Emergency fixes are normally packaged as interim fixes for WebSphere® Application Server or related products. Upload your interim fix and mark which virtual images or system plug-ins it is applicable to.

The severity level for your fix is for informational purpose to provide a quantitative description to represent the urgency for applying this emergency fix.

Configuring emergency fixes (2 of 2)

WebSphere 8.0 fix
Refresh Delete

Description: Fixes for WebSphere 8.0.0.3

Created on: Aug 2, 2012 2:57:41 PM

Updated on: Aug 2, 2012 5:31:32 PM

Emergency fix files:

 The script package is in WAS8003_Fix_1.zip.

Access granted to: deploy18 [owner]

Severity:

Applicable to:

Images:

Plugins:

Comments There are no comments yet

List of virtual images

WebSphere Application Server 8.0.0.3, RedHat Enterprise Linux 64-Bit (RedHat Enterprise Linux 6), 6 WebSphere Application Server 8.5.0.0 32-bit RHEL 6 x86-64 (VMWare), RedHat Enterprise Linux 64-Bit (RedHat Enterprise Linux Server), 6 WebSphere Application Server 8.5.0.0 64-bit RHEL 6 x86-64 (VMWare), RedHat Enterprise Linux 64-Bit (RedHat Enterprise Linux Server), 6 IBM WebSphere Application Server Hypervisor Edition 8.0.0.3 with IMP (no fixes) 8.0.0.3.1, RedHat Enterprise Linux 64-Bit (RedHat Enterprise Linux 6), 6
 Type to find more...

List of plug-ins

itcamwas.age...0.0.0
 itcamwas/1.0.0.0
 was/1.0.0.5
 was/2.0.0.2
 wasctg/1.0.0.5
 wasctg/2.0.0.2
 wasdb/1.0.0.5
 wasdb/2.0.0.2
 wasdb2/1.0.0.5
 wasdb2/2.0.0.2
 Type to find more...

Emergency fixes may be applicable to multiple images or plug-ins in your catalog. Click the appropriate “Add more...” entry field and begin typing to see a list of matching entries. The emergency fix will be listed as available for installation on all deployed workloads based on the images and plug-ins you specify here.

Packaging custom fixes

- Create your own archives
 - Upload and use as an emergency fix to apply maintenance to existing virtual system instances
 - Allows you to create fixes for your custom image
- Create a bundle (archive) that contains
 - Script or module to run on your Virtual System instance
 - *service.xml* file (in root directory of the archive)
 - Specifies the details of the fix, script to run, images to apply, and so on
- Can only be run once on any eligible Virtual System instance
- See example of custom fix in the Information Center
 - <http://pic.dhe.ibm.com/infocenter/psappsys/v1r0m0/index.jsp>

In addition to IBM provided emergency fixes, you can create your own archives to upload and use as emergency fixes to apply maintenance to your custom images.

To do this you create a bundle that contains a script or module to run on your virtual system instance. A *service.xml* file, located in the root directory of the bundle, specifies the details of the fix, script to run, images to apply, and so on. Each emergency fix must be less than 512 MB and can only be run once on any eligible virtual system instance. The PureApplication System information center shows an example of a custom emergency fix package.

Virtual systems patterns and instances upgrades and maintenance

This section will cover maintenance to virtual systems.

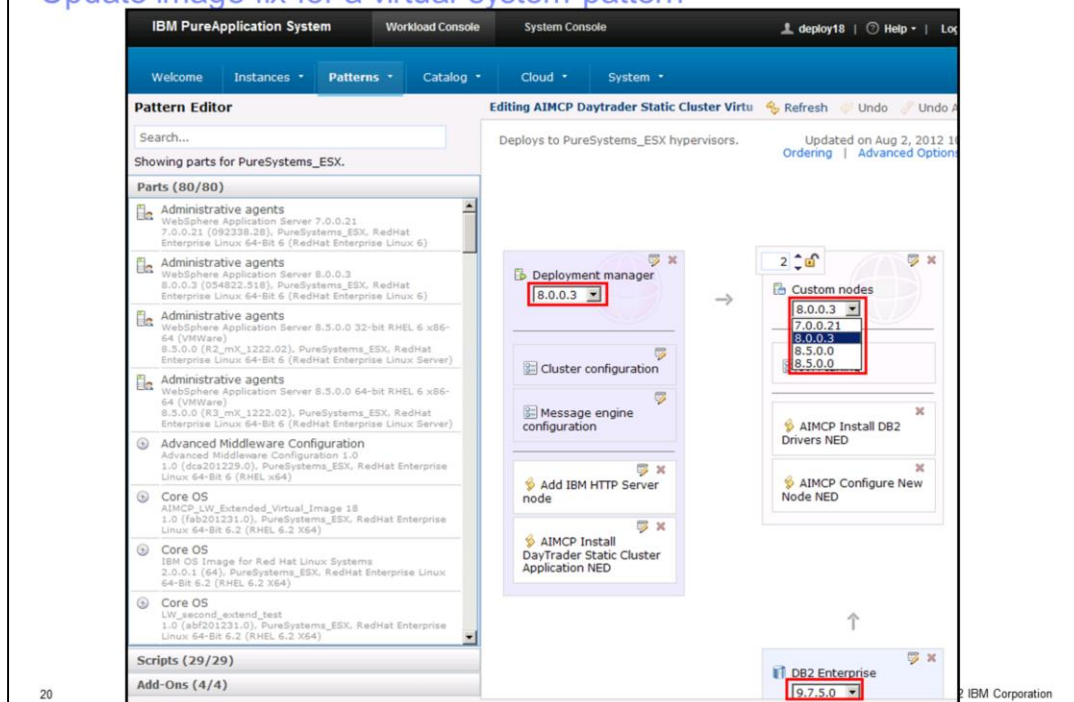
Virtual system

- Emergency fixes
 - Covers existing deployments
 - Batch update of fix (apply to all image instances at a single time)
 - LIMIT: Can not be associated during deployment
- Update images fixes
 - IBM provided or client extend/captures updated images
 - Planned fixes for new patterns
 - As new service levels are installed, virtual system patterns can be edited to use them

You can apply maintenance to the virtual systems either before or after deployment. After deployment, you normally apply fixes through the emergency fixes described earlier. The primary limitation of emergency fixes is they cannot be installed during virtual system deployment; they must be applied after the virtual system is successfully deployed and started. Some fixes may be required to fix problems with product initialization, or may be difficult to package in an emergency fix bundle. For these situations you can use the PureApplication System extend and capture feature to extend an existing image and install your fixes. Then specify the captured image in your virtual system pattern.

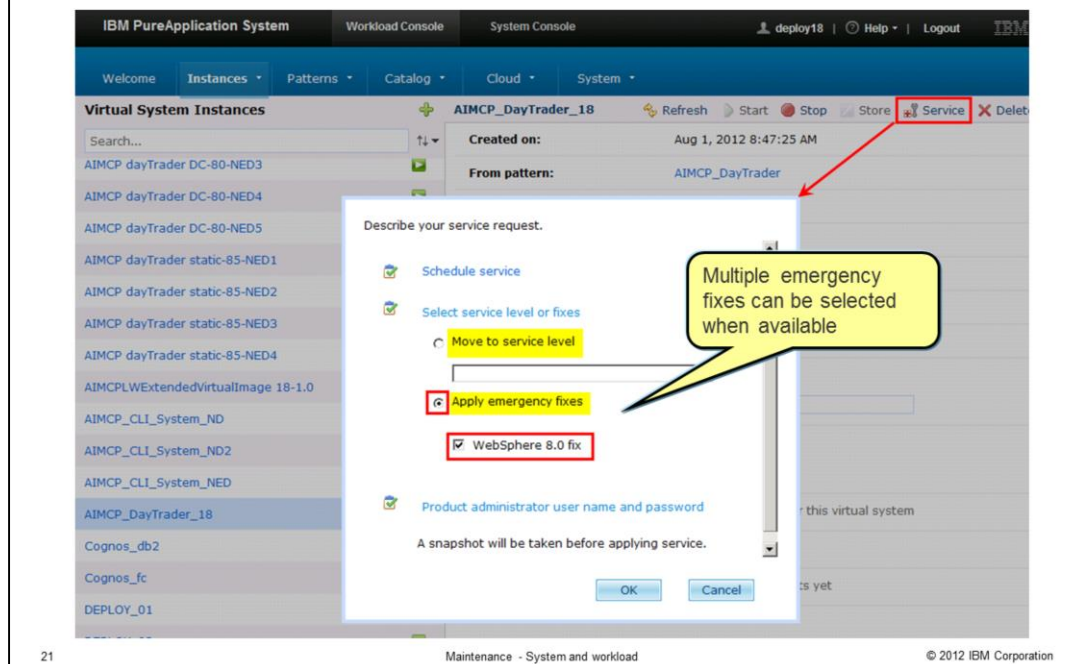
IBM will periodically provide new virtual image versions with updated middleware and other fixes. You can easily import these images to your PureApplication System catalog.

Update image fix for a virtual system pattern



Updated virtual system images also have updated version numbers. You must update your virtual system patterns to use the new version. This is easily accomplished in the virtual system editor by clicking the version on each component and selecting the updated version. If you hover the mouse pointer over a version number in the list more details on the image will pop up.

Virtual system instance - Applying an emergency fix



When you apply an emergency fix or service level to a deployed virtual system, the maintenance is applied to all the virtual machines in the instance for which it applies.

Before maintenance is applied the system will create a snapshot image of the virtual system instance. Only one snapshot image is stored for each virtual system instance. The snapshot can be used to restore your virtual system instance if a problem arises after the maintenance is applied.

When a service level is applied, the affected virtual machine is restarted. When an emergency fix is applied the affected virtual machine is not restarted.

You can schedule service now or at a future time. Any time maintenance is applied, the service history for the virtual system instance is updated. This is a record of all the emergency fixes and service levels that have been applied to this virtual system instance.

Virtual application maintenance

This section will cover maintenance to virtual applications.

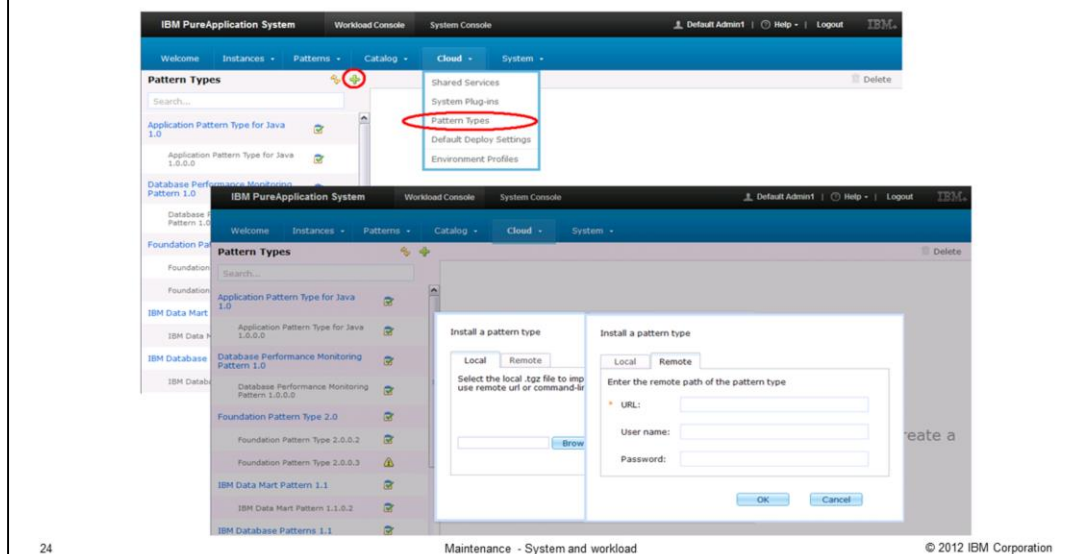
Virtual application - Maintenance options

- Pattern type update
 - Pattern type updates
 - Can update some or all plug-ins that make up the pattern-type
 - Applicable to unlocked patterns and deployment instances
- Base image update
 - Starting base image for all virtual application VM
 - Applicable to patterns
- Plug-in updates
 - Single plug-in update
 - Applicable for unlocked patterns and deployment instances
 - This will be rare – Most of the updates will come as part of pattern type updates
- Emergency fixes
 - Bring the emergency fix into PureApplication System
 - Apply imported emergency fixes to pattern and deployment instances

IBM PureApplication System provides several paths to update virtual applications. You can update the pattern type, the base image, the system plug-ins, and you can apply emergency fixes.

Pattern type update - Install

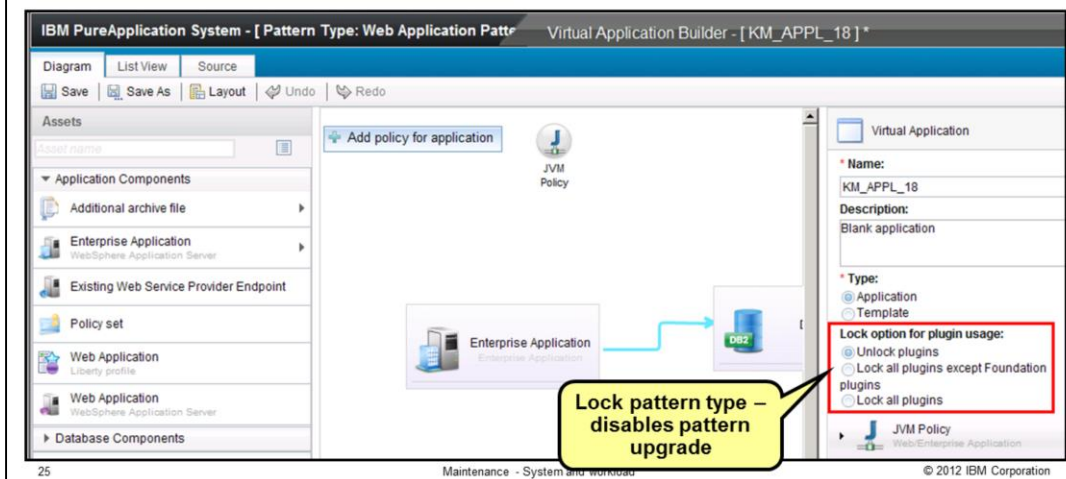
- Install the new updated pattern type
- Provided by pattern owner (IBM or non-IBM)



The easiest way to update a pattern type is to install a new version, provided by the pattern provider. You can either upload a pattern type archive from your local computer, or point to a remote URL.

Virtual application pattern – Pattern type upgrade

- Pattern type and plug-in update
 - Automatically takes the latest VRMF of pattern type and plug-ins
- Locking the pattern type will disable pattern upgrade
 - Useful when you want to control when newer version is used
- For an unlocked application pattern, new deployments pick up the latest custom plug-ins or plug-ins associated to pattern type Version/Release automatically
- Foundation pattern (containing all the core plug-ins) can be unlocked separately



When you create a virtual application pattern, you can specify how the pattern is affected by upgrades to the pattern type or to IBM Foundation Pattern.

If you select to “unlock plug-ins”, your pattern will use the latest versions of pattern type plug-ins if the base pattern type is upgraded. If the IBM Foundation Pattern is upgraded, your pattern will use the latest version.

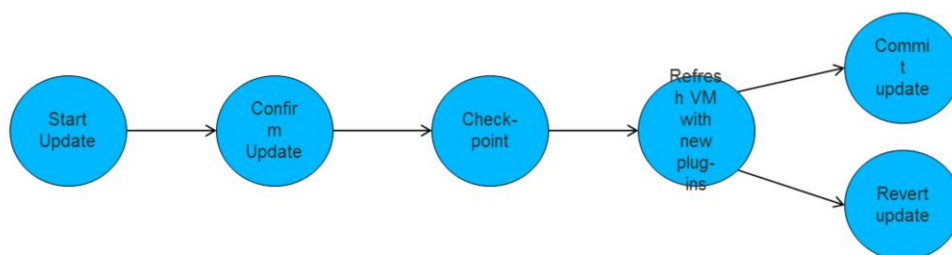
If you select “lock all plugins”, your pattern will use the version of plug-ins or the IBM Foundation Pattern associated with this virtual application pattern when it was created, even after an upgrade occurs.

You can also select “lock all plugins except Foundation plugins”, which use the version of plug-ins associated with the pattern when it was created, even if the pattern type is upgrade. If the IBM Foundation Pattern is upgraded the pattern will use the latest version.

For example, if the virtual application pattern is based on pattern type 2.0.0.1 and 2.0.0.2 was also installed, locking the pattern type will force it to continue using 2.0.0.1 when this pattern is deployed. This is useful when you want to control when a newer version is used.

Pattern type update for existing virtual application instances

- One click upgrade button
 - Update the deployment to latest pattern type Version/Release
 - If pattern was not locked
- Batch update for all VMs within the deployment
 - Plug-in can optionally checkpoint its data during the update
- Supports running, error or failed deployment status



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PureApplication System provides a one-click upgrade capability for deployed virtual application patterns. Click the Upgrade button to update the deployment to the latest pattern type Version if the pattern was not locked when it was deployed. The update process will update all virtual machines within the deployment. Plug-in can optionally checkpoint its data during the update.

If the update is successful, you can decide whether to commit or revert the update. If the update fails the workload will automatically revert the update, using previously checkpointed data.

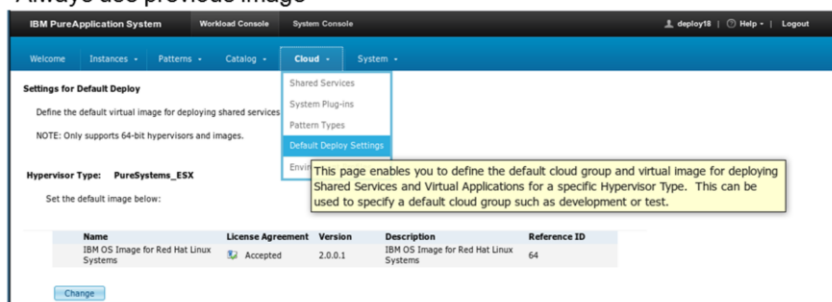
Pattern type update limitations

- Deployment can only be updated to latest within pattern type Version/Release
- Deployment will have some downtime during the update
- No rolling update within deployment to avoid downtime
- Not possible to update a deployment to the latest foundation only
- Pattern type update does not update base image to latest

This slide lists current limitation in the virtual application pattern type update process.

Virtual application pattern - Base image update

- Load new base images for virtual applications pattern deployments
 - IBM provided update
 - Extend/captured images update
- New pattern deployments
 - If cloud setting is changed to use new image, then new deployments will use updated image
- Existing pattern deployments
 - Always use previous image



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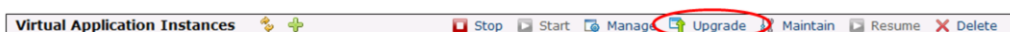
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Another way to update virtual application patterns is to update the base image used by the pattern. New deployments will use the default set on the workload console at Cloud, Default Deploy Settings. This should be changed to point to the new image. Existing deployments are not updated to use the new image.

Virtual application instance - Plug-in updates

- Update a single plug-in VRMF level only outside a pattern type update.
- Recommended only for stand-alone plug-ins
- New pattern deployments
 - if not locked,
 - Deployment will use newer custom plug-in version automatically
 - Newer plug-ins if the associated pattern type is enabled
 - No enable/disable capabilities for custom plug-ins
- Existing pattern deployment
 - can use update button for the whole pattern type update



You can update individual system plug-ins by installing a new version of the plug-in. You can upgrade the plug-in for a deployed virtual application from the application's instance console.

The version used by new deployments will depend on the virtual application pattern's "lock options for plug-in usage" setting as discussed previously in this presentation on the slide covering pattern type upgrades.

Associating emergency fixes for virtual applications

- Emergency fixes catalog allows administrators to load emergency fixes

The screenshot displays the 'Emergency Fixes' management interface. The main content area shows a 'First-Fix' entry with the following details:

- Description:** This is the first fix
- Created on:** Apr 18, 2012 4:16:57 PM
- Updated on:** Apr 18, 2012 4:18:14 PM
- Emergency fix files:** Includes a 'Browse...' button, an 'Upload' button, and a note: 'The script package is in 8.0.0.2-WASProd-IFPM53130.zip.' with a 'Download' link.
- Access granted to:** Administrator [owner] with an 'Add more...' link.
- Severity:** Normal (dropdown menu)
- Applicable to:**
 - Images:** Add more...
 - Plugins:** was/2.0.0.1 [remove], was/1.0.0.4 [remove], Add more...
- Comments:** There are no comments yet

Two yellow callout boxes highlight specific features: 'Image fixes' points to the 'Images' section, and 'Plug-in fixes' points to the 'Plugins' section.

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You can associate an emergency fix with plug-ins as described earlier in this presentation. The emergency fix will then be available as an update from the virtual application's management console.

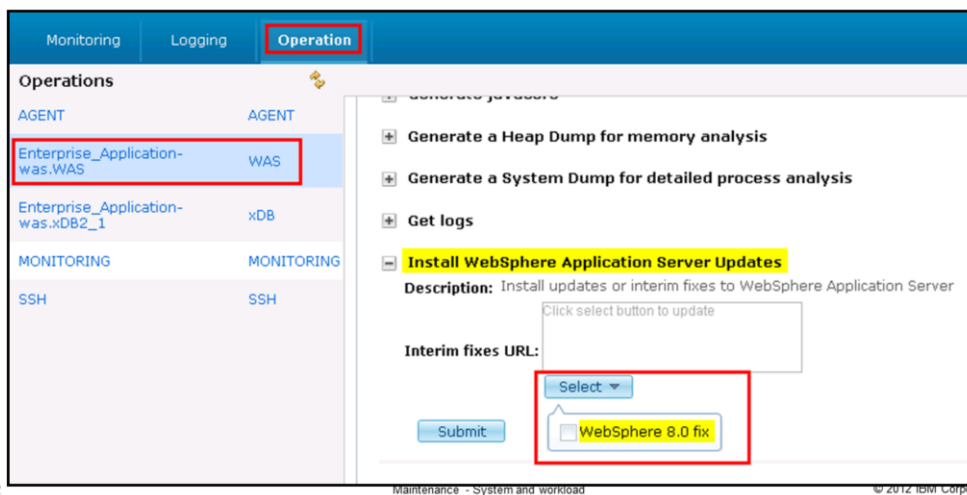
Virtual application pattern – emergency fixes

The screenshot displays the IBM WebSphere Application Server interface. On the left, the 'Assets' pane shows a tree view of components including 'Enterprise Application', 'Database Components', 'Messaging Components', 'OSGi Components', 'Transaction Processing Components', 'User Registry Components', and 'Other Components'. The main diagram area shows a 'Virtual Application' diagram with an 'Enterprise Application' component connected to a 'Database' component. A red dashed box highlights the 'Enterprise Application' component in the diagram. A yellow callout bubble points to the 'Enterprise Application' component in the diagram, containing the text: 'Apply emergency fix for certain components'. On the right, the 'Enterprise Application' configuration panel is visible, showing fields for 'Name', 'EAR File', and 'Total transaction lifetime timeout (sec)'. Below these fields, the 'Interim fixes URL' is displayed as 'https://127.0.0.1:9443/.../9/scriptArchive.zip'. A red box highlights the 'Interim fixes URL' field, and a dropdown menu is open, showing 'WebSphere 8.0 fix' selected.

You can apply an IBM WebSphere Application Server software update directly to a virtual application that is based on the IBM Web Application Pattern. The virtual application builder allows you to specify emergency fixes to install *during* the virtual application deployment.

Virtual application instance – emergency fixes

- Apply Emergency Fixes to certain Virtual Application Instance components
 - Applies to WebSphere Application Server and DB2® VMs as part of Virtual Applications
- Go to the Virtual Application Instance, click **“Manage”**, and click **“Operations”**
- Select the “Install WebSphere Application Server Updates” and select the fix to apply to the virtual machines



Post deployment, you can install emergency fixes from the virtual application management console. Navigate to the Operations tab and select the WebSphere component. The *Select* button in the “Install WebSphere Application Server Updates” section will show emergency fixes that you can apply to this virtual application instance.

Apply vendor patches

This section will cover application of vendor patches.

Need to apply vendor software patches

- For IBM provided images
 - IBM will bundle OS and other vendor fixes and patches
 - Included in regular updates for catalog images
- You may need to apply urgent vendor patch, before IBM makes them available
 - For example, RedHat critical updates
- You can create an emergency fix that includes the patch
- Ways to apply the patch
 - Virtual System pattern
 - Extend and capture the image with the patch
 - Virtual System instances
 - Log in to the VM and apply patches manually
 - Use Emergency fix mechanism
 - Virtual Application instances
 - Use emergency fix mechanism
- When patch is included in the IBM fixes, they will be either not be applied or overwritten

IBM will periodically provide updated catalog images that include OS and other vendor fixes as part of the regular image update cycle.

However, you may need to apply urgent Vendor patches before IBM makes them available. For example, critical security updates from RedHat.

You can create an emergency fix bundle that includes the patch. You then apply the patch using the same mechanisms as IBM-provided emergency fixes, as discussed in this presentation.

When the vendor patch is included in later IBM fixes, they will either be overwritten with the later copy, or not applied.

Section

Summary

This section will summarize this presentation.

Summary

- Simplified hardware and system maintenance
 - Single update ZIP archive file
 - Hides the complexity of updates to all system components internally
 - System maintenance (hardware, firmware) performed by IBM in V1 of PureApplication System
- Several mechanisms to update workloads, both patterns and instances
 - Virtual Applications
 - Virtual Systems
- Middleware and workload updates performed from Workload console

IBM PureApplication System provides simplified hardware and system maintenance through a single update file, hiding the complexity of updates to all system components. For version one, system-level updates will be installed by IBM service personnel. This includes hardware and firmware maintenance.

PureApplication System provides several mechanism to upgrade or apply maintenance to Virtual application and Virtual system patterns and deployed instances. In most cases, you can update workloads with a single click from the workload console.

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