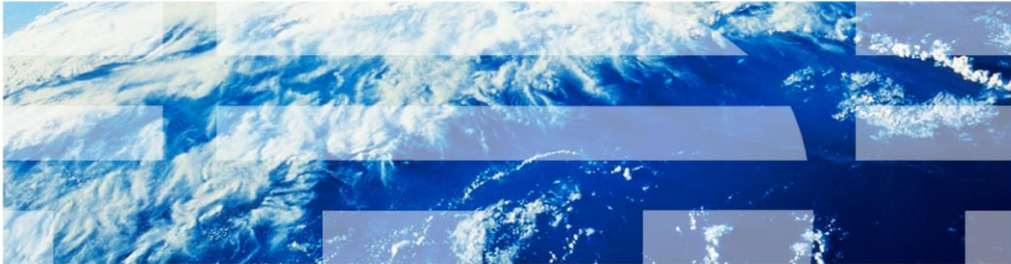


IBM Workload Deployer V3.1

IBM Image Construction and Composition Tool



This presentation covers the IBM Image Construction and Composition Tool shipped with V3.1 of the IBM Workload Deployer product.

Agenda

- Overview
- Installation
- Configure new cloud provider
- Working with images
- Creating software bundles
- Logs

This presentation will present an overview of the Image Construction and Composition product, show the process of creating a virtual machine using the IBM Workload Deployer Image for x86 Systems, installing the Image Construction and Composition tool onto the virtual machine, adding software bundles, synchronizing, capturing, and completing the image. You will also see a high level overview of creating software bundles. Finally, there will be a slide about viewing logs.

Overview

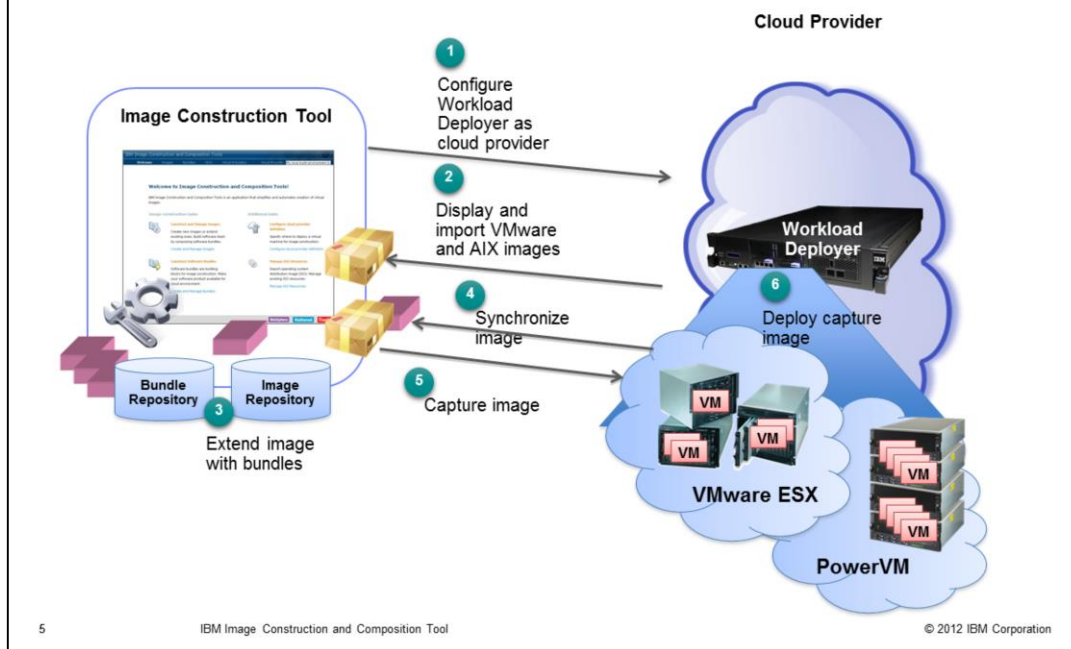
This next section provides an overview of the Image Construction and Composition tool and new product features in IBM Workload Deployer V3.1.

Purpose of IBM Image Construction and Composition Tool

- Workload Deployer provides a defined set of Hypervisor Edition images
- Combine operating system and bundled middleware
- Possible that the specific OS and middleware combinations will not meet every users' needs
- Image Construction and Composition allows users to create custom operating system content, custom middleware, or deploy non-IBM software into their private cloud.
- New with IBM Workload Deployer V3.1, you can configure Workload Deployer as cloud provider
 - Can import VMWare and AIX images from Workload Deployer catalog
 - Extend the Workload Deployer images with software bundles and
 - synchronize/capture those images back into Workload Deployer
 - Deploy images to either a VMWare or PowerVM hypervisor

The IBM Workload Deployer provides a defined set of Hypervisor Edition images that combine operating system and bundled middleware. However, it is possible that the specific operating system and middleware combinations will not meet your needs. The Image Construction and Composition Tool provides the capabilities to combine your own operating system definition along with custom software bundles to compose virtual images that can be provisioned into the cloud. In Workload Deployer version 3.1, you can configure the Workload Deployer as the cloud provider for the Image Construction and Composition Tool. This allows you to import VMware and AIX images from the catalog, extend those images with software bundles, then capture the new image back into Workload Deployer. You can then deploy the new image to a VMWare or PowerVM hypervisor.

IBM Image Construction and Composition Tool with IBM Workload Deployer



This diagram shows the interaction of the Image Construction Tool with the Workload Deployer. In step 1, you log into the Image Construction Tool and configure Workload Deployer as a cloud provider. In step 2, you display and import the VMware and AIX images that are extended. In step 3, you will extend the image by adding software bundles. Step 4 is to synchronize the image, which will create a temporary virtual system and install the software bundles on that system. The last step is to capture the new image with software bundles installed back into the Workload Deployer catalog.

Virtual machine to host Image Construction and Composition


- Requirements for Image Construction and Composition virtual machine:
 - SuSE Linux Enterprise Server 11 SP1 32-bit or 64-bit
 - RedHat Enterprise Server 5.6 32-bit or 64-bit
- Hardware requirements
 - Minimum requirements
 - 1 CPU - physical or virtual
 - 1 GB memory - physical or virtual
 - Suggested requirements
 - 2 CPUs - physical or virtual
 - 2 GB memory - physical or virtual
- Storage
 - 100 GB of disk space for building Native VMWare images
 - 60 GB of disk space if only building IBM Cloud or IBM Workload Deployer
- Software requirements
 - IBM JDK SR9 FP1 bundled with Image Construction and Composition product
 - Supported browsers
 - Firefox 4, Firefox 3.x
 - IE 7, IE 8

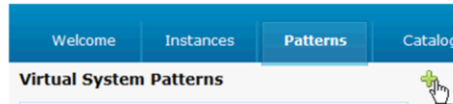
This slide lists the minimum requirements for the virtual machine that will host the Image Construction Tool.

Install Image Construction and Composition

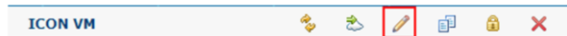
This section covers creating a virtual machine and installing Image Construction and Composition.

Create a virtual machine using IBM Workload Deployer (1 of 2)

- Navigate to **Patterns > Virtual Systems** to create a new pattern 



- Click the pencil Image Construction and Composition to edit the pattern



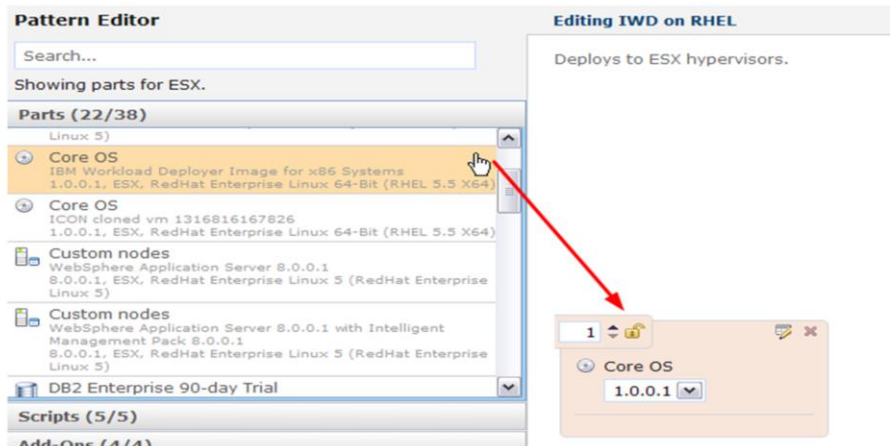
The first step is to create a virtual machine to host the Image Construction Tool. In Workload Deployer, navigate to **Patterns > Virtual Systems** and click the plus sign to create a new pattern. This creates a blank pattern.

Click the pencil icon to edit the pattern.

Drag and drop the IBM Workload Deployer Image for x86 Systems RedHat Enterprise Linux, 64 bit onto the canvas. Click **Done editing** and deploy to the cloud.

Create a virtual machine using IBM Workload Deployer (2 of 2)

- Drag and drop the Core OS part from the IBM Workload Deployer Image for x86 Systems onto the canvas



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IBM Image Construction and Composition Tool

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Drag and drop the IBM Workload Deployer Image for x86 Systems RedHat Enterprise Linux, 64 bit onto the canvas. Click **Done editing** and deploy to the cloud.

Install Image Construction and Composition on the virtual machine

- In Workload Deployer, go to **Instances > Virtual Systems**
- Once the virtual system based on Image Construction and Composition shows a status of "Virtual system is ready", expand the "Virtual machines" section and note the "Network interface." This is the host name and IP address of the virtual machine where you will install Image Construction and Composition

The screenshot displays the 'Virtual System Instances' section of the IBM Workload Deployer. On the left, a list of instances is shown, with 'ICON Redhat' selected. On the right, the details for 'ICON Redhat' are displayed under the 'Hardware and network' section. The 'Network interface 0' field is highlighted with a red box, showing the host name 'aimcp138.austin.ibm.com' and the IP address '9.3.75.138'. Below this, the 'Operating system' section shows the name as 'Linux', the type as 'RedHat Linux', and the version as '2.6.18-274.3.1.el5'.

Virtual System Instances	
Exported_Virtual_Image01-1.0	[Status]
ICON Redhat	[Status]
ICON cloned vm 1316816167826-1.0.0.1	[Status]
ICON on RHEL	[Status]
ND_DayTrader_ESX_SUSE_D82E5E_V5	[Status]
SJS single server	[Status]

ICON Redhat (5725-D64)	
Hardware and network	
Virtual CPU count:	2 (You must stop this virtual machine in order to change this value.)
CPU shares on host:	2000
CPU shares consumed on host:	0.0
Virtual memory (MB):	2048 (You must stop this virtual machine in order to change this value.)
SSH public key:	id_rsa.pub
Network interface 0:	aimcp138.austin.ibm.com (9.3.75.138)
MAC address 0:	00:50:56:95:00:3e
Operating system	
Name:	Linux
Type:	RedHat Linux
Version:	2.6.18-274.3.1.el5

Now you are ready to install the Image Construction Tool. In the Workload Deployer, determine the IP address of the virtual machine you just deployed by navigating to Instances > Virtual Systems. Expand the Virtual machines section and you will see that the Network interface field shows the host name and IP address.

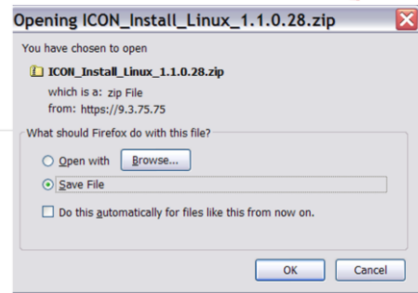
Install Image Construction and Composition (continued)

- Download the Image Construction and Composition zip file by clicking on the link on the welcome page of Workload Deployer. The file is named ICON_Install_Linux_1.1.0.x.zip, where x is the build level.



IBM Workload Deployer

Setting up your private cloud



Download IBM Image Construction and Composition Tool

Download IBM Workload Plugin Development Kit

Download command line tool

Download the Image Construction Tool zip file by clicking on the link in the upper right corner on the welcome page of Workload Deployer.

Install Image Construction and Composition (continued)

- Installation instructions for Image Construction and Composition are in the Workload Deployer InfoCenter:
http://worklodepid.raleigh.ibm.com/help/topic/com.ibm.worlodep.doc/pc/cicn_installation.html
- Core OS images (Linux and AIX) do not ship with any window managers, so customers extending these images must use the **silent install** instructions
- Need to **uninstall** any previously existing ICON tool and Installation Manager before installing the new Image Construction and Composition.
 - /opt/IBM/InstallationManager/eclipse/tools/ ./imcl uninstallAll
 - /var/ibm/InstallationManager/uninstall/.uninstallc
 - Remove /drouter if it exists: `rm -fr /drouter`
 - Removing /drouter will delete any existing images
 - Remove “icon” folder from /opt/IBM (or whatever the previous installation folder was)
 - Ensure nothing is running on port 443
 - To check this: `fuser -vn tcp 443`

Instructions are given for both GUI installation and silent installation. If you are extending a Core OS image(Linux or AIX) from Workload Deployer, you need to use the silent installation instructions. The Core OS images do not ship with any window managers.

Any previous existing Image Construction Tool installations need to be uninstalled along with the Installation Manager before installing the new Image Construction and Composition tool.

Installation and uninstall instructions are in the Workload Deployer InfoCenter at the link shown here, but slides 12 through15 also list the uninstall and silent installation steps.

Install Image Construction and Composition (continued)

- Move ICON_Install_Linux_1.1.0.x.zip to the virtual machine, and extract it into a folder. In this example, /temp is used.
- To continue with silent installation:
 - Go into the /temp folder and edit install.xml by removing these lines:
 - <repository location='icon'/>
 - <offering id ='com.ibm.cloud.Image icon'/>
 - Save the file
 - From /temp, install the Installation Manager by running `./installc -acceptLicense`
 - You should see this:

```
-bash-3.2# ./installc -acceptLicense
Installed com.ibm.cic.agent_1.5.0.20110909_1200 to the /opt/IBM/InstallationManager/eclipse directory.
-bash-3.2#
```

This slide shows installation of the Installation manager.

Install Image Construction and Composition (continued)

- Continuing with silent installation:
 - Go into the “icon” folder under the folder where you extracted the Image Construction and Composition file. In the example, this would be /temp/icon/
 - Edit icon_silent_install_response_file.xml as follows:
 - Edit the file so that the repository location points to the “Image Construction and Composition” folder
 - <repository location='/path/to/icon_im_repository'/>
 - In the example this would become <repository location='/temp/icon'/>
 - Set the username and password for the Image Construction and Composition console if required. By default they are set to admin/password
 - <data key='user.username,com.ibm.cloud.icon' value='admin'/>
 - <data key='user.password,com.ibm.cloud.icon' value='fufgZbY47EfxLYarBAIxeQ=='/>
 - <data key='user.confirmPassword,com.ibm.cloud.icon' value='fufgZbY47EfxLYarBAIxeQ=='/>
 - To encrypt a string for use in the password field execute:
 - /opt/IBM/InstallationManager/eclipse/tools/./imcl encryptString <password>
 - Save the file

This slide shows the xml files that need to be modified for silent installation of the Image Construction Tool. You can leave the username and password as the default values and change them after installation. The default values are “admin” and “password.”

Install Image Construction and Composition (continued)

- Continuing with silent installation:
 - Go to this directory: `/opt/IBM/InstallationManager/eclipse/tools`
 - Run this command:

```
./imcl input <path to response  
file>/icon_silent_install_response_file.xml -acceptLicense
```

 - In this example, the command would be `./imcl input /temp/icon/icon_silent_install_response_file.xml -acceptLicense`
 - You should see this message:

```
Installed com.ibm.cloud.icon_1.1.0.836 to the /opt/IBM/icon directory.  
-bash-3.2#
```

This slide covers the commands for a silent install of the Image Construction Tool.

Install Image Construction and Composition (continued)

- Installation automatically starts Image Construction and Composition for you
- Access Image Construction and Composition GUI at <https://<hostname or IP>/icn/ui/>
- Log into this instance using the credentials that were used in the response file
- Port 443 must be open to access Image Construction and Composition GUI
- Unique to Core OS images: it blocks all ports by default except SSH
- To open port 443 on Core OS virtual machines:
 - Go to `opt/IBM/icon` folder
 - Issue the command `service iptables stop`
- Stop and start Image Construction and Composition with the `stop.sh` and `start.sh` scripts in `opt/IBM/icon`
- Image Construction and Composition must be restarted if the virtual machine is restarted
- Installation logs are located at `/var/ibm/InstallationManager/logs`

The Image Construction Tool is automatically started by the installation process. Access the GUI by opening a browser and typing in the URL shown. You will use the credentials supplied in the response file to login. Note that port 443 must be open to access the GUI. If you have installed the tool on a Core OS image, you will need to unblock port 443. Core OS images block all ports by default except for SSH. Instructions are shown here and are also in the InfoCenter.

The start and stop scripts for the Image Construction Tool are in `opt/IBM/icon` by default.

Create new cloud provider

This next sections covers creating a cloud provider.

Create new cloud provider in Image Construction and Composition

- Access the GUI for Image Construction and Composition at https://<ip_address>:443, and login. By default the userid/password is admin/password
- Wizard will start automatically. Or start the wizard manually by clicking on **Administer > Manage cloud providers** then clicking on the plus sign to add a new cloud provider
- Choose a name and select Workload Deployer as the cloud provider type

Create new cloud provider

Welcome > General > Credentials > Cloud details > Summary

Please specify a name and description of the connection

Name: IWD Cloud Provider

Description:

Cloud Provider Type: IBM Cloud, VMware ESX, IBM Cloud, IBM Workload Deployer

Previous Next Cancel

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IBM Image Construction and Composition Tool

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Login to the GUI for the Image Construction tool. A “create new cloud provider” wizard will start automatically if no cloud providers are defined.

Choose a name and select Workload Deployer as the cloud provider type.

Create new cloud provider (continued)

- Enter the IP address or hostname of the Workload Deployer machine and the credentials to access it. Save this cloud provider

IWD Cloud Provider

General

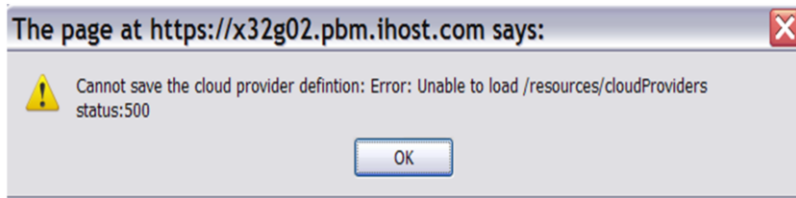
General Properties

Name:	<input type="text" value="IWD Cloud Provider"/>
Description:	<input type="text" value="IWD 254"/>
Host name:	<input type="text" value="9.3.75.254"/>
Type:	<input type="text" value="IBM Workload Deployer"/>
User Name:	<input type="text" value="cbadmin"/>
Password:	<input type="password" value="•••••"/>

Enter the IP address or hostname of the Workload Deployer machine and the credentials to access it. Save this cloud provider.

Create new cloud provider (continued)



- Incorrect credentials do not save. You'll see this error:



Entering incorrect credentials for Workload Deployer will result in an error.

Create new cloud provider (continued)

- The userid for the cloud provider does not need to be an administrator. It can be any ID with these permissions:

ICON  

Permissions:

- Deploy patterns in the cloud
- Create new patterns
- Create new environment profiles
- Create new catalog content
- Cloud administration
 - Read-only view
 - Full permissions
- Appliance administration
 - Read-only view
 - Full permissions
- Auditing
 - Read-only view
 - Full permissions
- IBM License Metric Tool (ILMT)

The user ID for the cloud provider does not need to be an administrator. It can be any ID with permission to deploy patterns in the cloud, create new patterns, and create new catalog content.

Section

Working with images

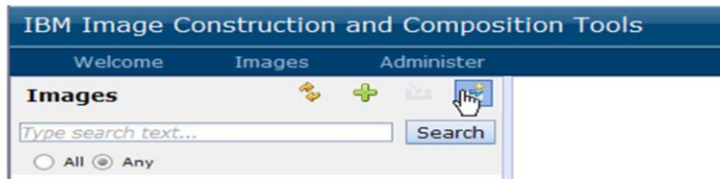
This next sections covers working with images.

Import images from cloud provider (Workload Deployer)

- Choose **Images > Build images**. Be sure to select the appropriate cloud provider in the upper right corner



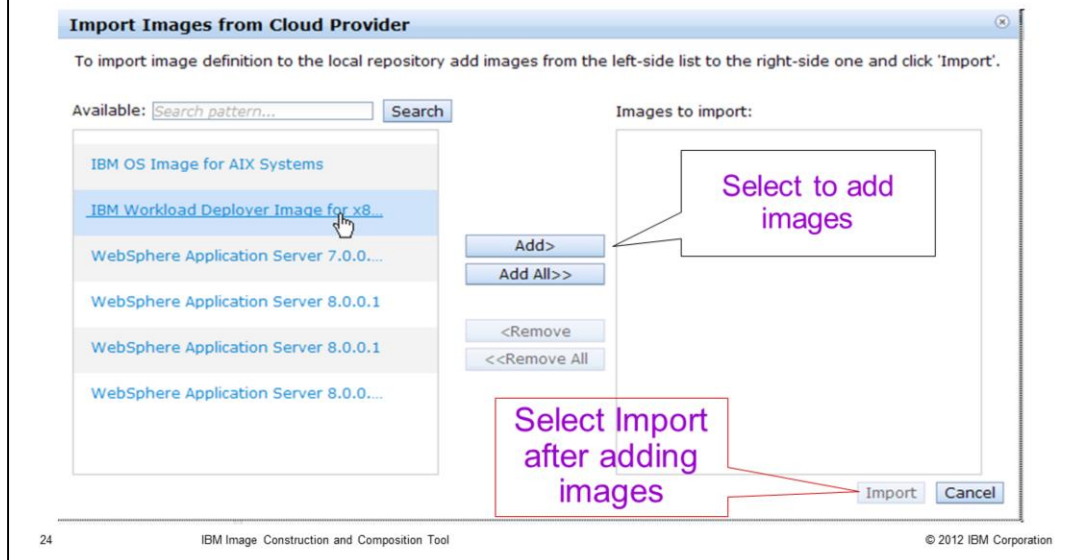
- Click the import icon to import images from the Workload Deployer appliance



In the Image Construction Tool, choose **Images > Build images**. Be sure to select the appropriate cloud provider in the upper right corner. Click the import icon to import images from the Workload Deployer appliance.

Import image (continued)

- Search for and select the image you want and add it to the box on the right. In the example below, the Workload Deployer Image for x86 Systems is added



Search for and select the image you want and add it to the box on the right. In the example shown, the Workload Deployer Image for x86 Systems is added.

Import image (continued)

- Wait until the image has a status of “Completed”. The actual image content does not transfer to the Image Construction and Composition Tool, only a copy of the metadata is saved

The screenshot displays the IBM Image Construction and Composition Tools interface. The main window title is "IBM Image Construction and Composition Tools". The interface is divided into a left sidebar and a main content area. The sidebar, titled "Images", contains a search bar and a list of images. The main content area displays the details for the selected image, "IBM Workload Deployer Image for x86 Systems". The image status is "Completed", which is highlighted with a red box. The details include:

Description:	IBM Workload Deployer Image for x86 Systems
Universal ID:	icon.image.ibm_workload_deployer_image_for_x86_systems
Version:	1.0.0
Extends Image:	3
Image Status:	Completed
Created on:	Fri Sep 23 2011 13:31:21 GMT-0500 (Central Daylight Time)
Updated date:	Fri Sep 23 2011 13:31:33 GMT-0500 (Central Daylight Time)
Operating System:	RedHat Enterprise Linux 64-Bit RHEL RHEL 5.5 X64 Activation Framework: Not found.
Cloud Provider:	IWD cloud provider
Software Bundles:	
Products:	
Validation Status:	Valid (0 errors, 0 warnings, 0 infos, 0 unknowns)

At the bottom of the interface, the page number "25" is visible on the left, "IBM Image Construction and Composition Tool" is in the center, and "© 2012 IBM Corporation" is on the right.

Wait a few seconds until the image shows a status of “Completed.” The actual image content does not transfer to the Image Construction and Composition Tool, only a copy of the metadata is saved.

Extend the image

- Now you will extend the completed image by clicking on the extend icon. The tool does not copy or modify the base OS image during this step

IBM Workload Deployer Image for x86 Systems		Completed		
Description:	IBM Workload Deployer Image for x86 Systems			
Universal ID:	icon.image.ibm_workload_deployer_image_for_x86_systems			
Version:	1.0.0			
Extends Image:	3			
Image Status:	 Completed			
Created on:	Fri Sep 23 2011 13:31:21 GMT-0500 (Central Daylight Time)			
Updated date:	Fri Sep 23 2011 13:31:33 GMT-0500 (Central Daylight Time)			
Operating System:	RedHat Enterprise Linux 64-Bit RHEL RHEL 5.5 X64 Activation Framework: Not found.			
Cloud Provider:	IWD cloud provider			

Now you will extend the completed image by clicking on the extend icon. The tool does not copy or modify the base OS image during this step.

Extend the image (continued)

- Choose a name for the new image and a universal identifier. The universal ID is a means to identify an Image Construction and Composition Tool asset across different repositories, and is a required field
- Typically you use any dotted notation to create a universal identifier, such as the one shown below

Extend an Image

The new image will be created by extending this one.

Name:

Universal ID:

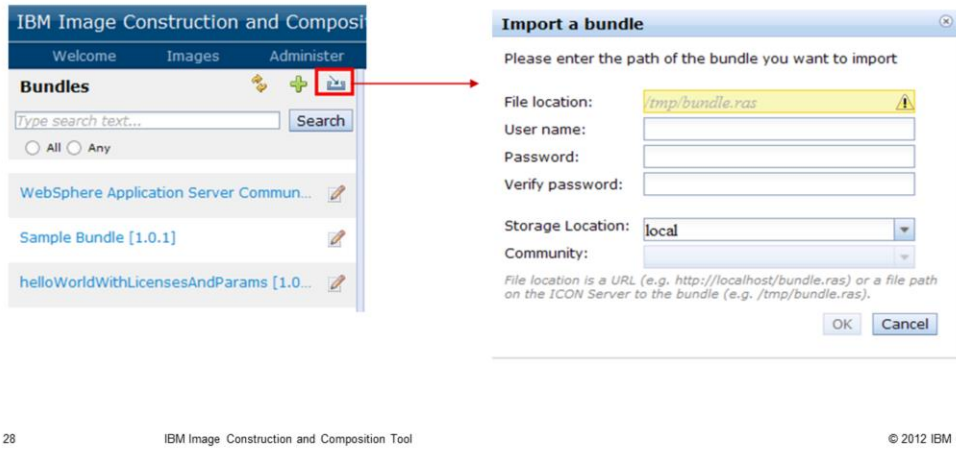
Version:

Description:

Choose a name for the new image and a universal identifier. The universal ID allows the Image Construction and Composition Tool to look up bundles independently from the repository where they are stored. Typically you use any dotted notation to create a universal identifier.

Import software bundles

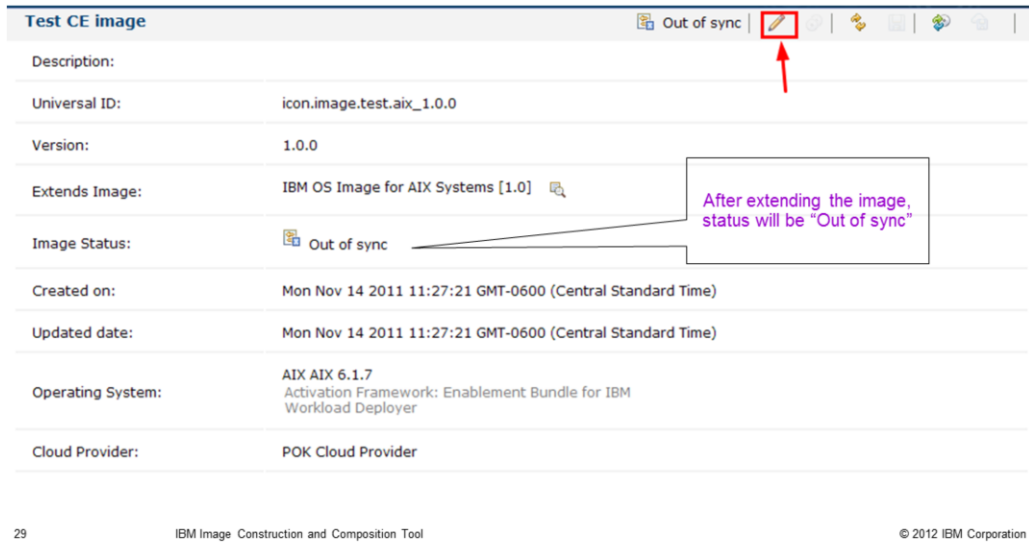
- The next step is to add software bundles to the new image. Before you can do this, you need to import your bundles. Go to **Images > Build software bundles**. Click the import icon.
- File location can be local or a URL (e.g. `http://hostname/bundle.ras`)
- There is more on software bundles later in this presentation



The next step is to add software bundles to the new image. Before you can do this, you need to import your bundles. Go to **Images > Build software bundles**. Click the import icon. File location can be local or a URL (e.g. `http://hostname/bundle.ras`). There is more on software bundles later in this presentation.

Add bundle to the image

- To add a bundle to the extended image, navigate to **Images > Build images**. Click the pencil icon to edit the image



The screenshot displays the 'Test CE image' details in the IBM Image Construction and Composition Tool. The image status is 'Out of sync', and a pencil icon is highlighted with a red box and an arrow. A callout box explains that after extending the image, the status will be 'Out of sync'.

Test CE image	
Description:	
Universal ID:	icon.image.test.aix_1.0.0
Version:	1.0.0
Extends Image:	IBM OS Image for AIX Systems [1.0]
Image Status:	Out of sync
Created on:	Mon Nov 14 2011 11:27:21 GMT-0600 (Central Standard Time)
Updated date:	Mon Nov 14 2011 11:27:21 GMT-0600 (Central Standard Time)
Operating System:	AIX AIX 6.1.7 Activation Framework: Enablement Bundle for IBM Workload Deployer
Cloud Provider:	POK Cloud Provider

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To add a bundle to the extended image, navigate to **Images > Build images**. Click the pencil icon to edit the image.

After extending the image, the Image Status will read “Out of sync” until a synchronization is performed. This is because under the covers an enablement bundle has been added to the image to allow Image Construction and Composition to perform silent installation tasks on software.

Add bundle to the image (continued)

- Expand Software Bundles, click the Add bundle button. You are given a list of previously imported bundles to choose from. In the example below, the WebSphere Application Server Community Edition bundle is being added to Test CE Image

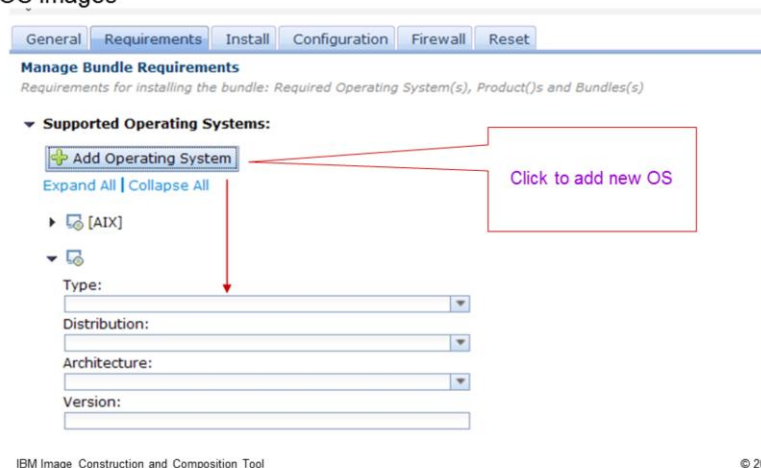
The screenshot displays the 'Test CE image' interface with the 'Add bundle to image' dialog box open. The main interface shows the image status as 'Out of sync' and lists various details including creation and update dates, operating system (AIX AIX 6.1.7), and cloud provider (POK Cloud Provider). Under 'Software Bundles', there is an 'Add bundle' button and a list containing 'AIX [6.1.7]'. The dialog box, titled 'Add bundle to image', prompts the user to 'Select a bundle to install in the image'. It features a search bar, radio buttons for 'All' and 'Any', and a checked checkbox for 'Show only bundles compatible with the image'. A list of bundles is shown, with 'WebSphere Application Server Community Edition - ...' selected. A callout box points to this list with the text: 'Compatible bundles are determined by OS. See next slide.' Red arrows highlight the 'Add bundle' button and the selected bundle in the dialog.

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Expand Software Bundles, click the Add bundle button. You are given a list of previously imported bundles to choose from. In the example shown, the WebSphere Application Server Community Edition bundle is being added to Test CE Image. The tool does not copy or modify the actual software during this step.

Add bundle to the image (continued)

- To see if a bundle is compatible with the image, go to **Images > Build software bundles**, and select the bundle. Click the Requirements tab and expand **Supported Operating Systems**
- Example: the bundle below is compatible with AIX images. Click the button to add other compatible OS images



To see if a bundle is compatible with the image, go to **Images > Build software bundles**, and select the bundle. Click the Requirements tab and expand Supported Operating Systems. You specify other operating systems to be compatible by clicking the **Add Operating System** button.

Add bundle to the image (continued)

- When you finish adding the bundles , click the Save icon

Test CE image Out of sync Save Refresh Undo Redo Close

Image Status: Out of sync

Created on: Mon Nov 14 2011 11:27:21 GMT-0600 (Central Standard Time)

Updated date: Mon Nov 14 2011 11:27:21 GMT-0600 (Central Standard Time)

Operating System: AIX AIX 6.1.7
Activation Framework: Enablement Bundle for IBM Workload Deployer

Cloud Provider: POK Cloud Provider

▼ Software Bundles:

+ Add bundle

- ▶ ✓ AIX [6.1.7]
- ▶ ⚠ WebSphere Application Server Community Edition - PowerVM [1.0.2.a]

Sort: **Alphabetically**, By instal

The new bundle shows in the list as "planned"

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IBM Image Construction and Composition Tool

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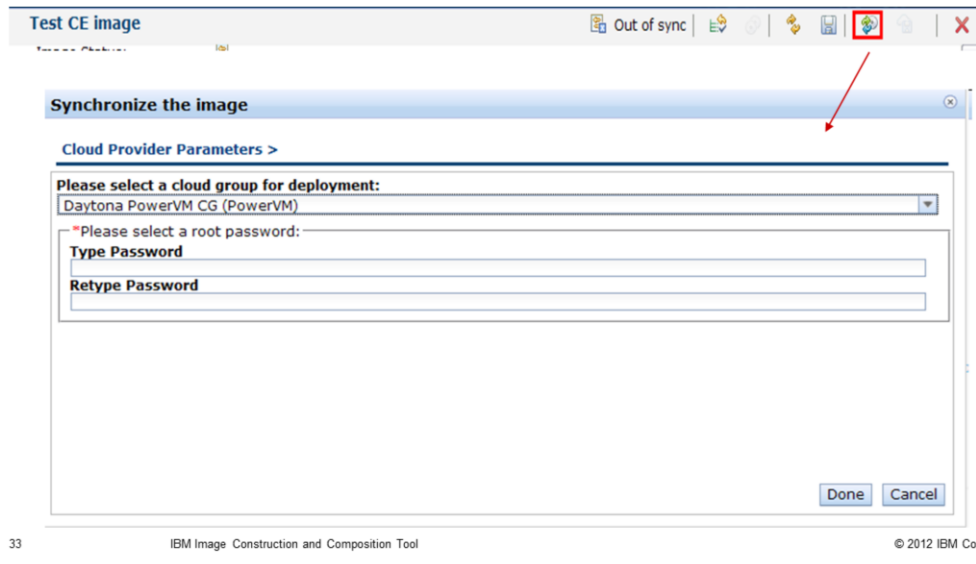
When you finish adding the bundles , click the Save icon. As you edit the image, the Image Construction and Composition Tool identifies any missing or not valid input by highlighting any invalid entry or by including a message in the validation status section. When you save, the Image Construction and Composition Tool completes semantic validation to ensure that the image definition is consistent. For example, it validates that the specified bundle order satisfies any dependency requirements.

The validation is performed by the server and is ran only when you save changes.

The validation report entries have three severities, either info, warning, or error. If your image has any **error** severity validation entries, any synchronize or capture action for the image is likely to fail. Even if the synchronize or capture action succeeds, the resulting image might not usable.

Synchronizing images

- Click Synchronize. The Deployment Parameters wizard is displayed if you have installed bundles in the image.



Click the Synchronize icon to synchronize.

The deployment parameters wizard is displayed, prompting you to enter values for the deployment parameters, such as passwords. Default deployment values that were specified during bundle creation are displayed. Make changes to the deployment parameters, as required. You are also asked to choose a cloud provider for the image from the drop down box.

Synchronizing images (continued)

- Image Construction and Composition starts a VM, copies files and runs installation tasks
- Refresh the image in the Image Construction and Composition tool to monitor synchronization progress
- View the Workload Deployer console and note that a cloned VM is being created in Workload Deployer during this process
- Sync takes about 40 minutes to complete

The screenshot displays the IBM Workload Deployer web interface. At the top, there's a navigation bar with 'Welcome', 'Instances', 'Patterns', 'Catalog', 'Reports', 'Cloud', and 'System'. The 'Instances' tab is active. Below the navigation, there's a search bar and a list of virtual system instances. One instance, 'ICON cloned vm 1318981218128-1.0.0.1', is highlighted in blue, and a red arrow points to it. To the right of the list, a details panel for this instance is visible, showing fields like 'Created on', 'From pattern', 'Using Environment profile', 'Current status', 'Updated on', and 'Access granted to'. The 'Current status' field indicates 'Transferring files to hypervisor cache (2 of 2 ICON cloned vm 1318981218128)'. At the bottom of the page, there's a footer with '34', 'IBM Image Construction and Composition Tool', and '© 2012 IBM Corporation'.

The synchronization process starts your base image in the build environment, performs the software bundle installations, and then performs any additional configuration specified in the software bundles. This step is when the Image Construction and Composition Tool starts a virtual machine from the base OS image, and during this step files are copied and installation tasks run. Synchronization takes about 40 minutes to complete.

You can perform the synchronize step multiple times. If you synchronize an image more than once, each synchronization executes any additional planned bundles. After executing a bundle, the tool moves that bundle to the Installed section under the Software tab for the image. If the synchronization process fails, you can edit the list of planned bundles and resynchronize by clicking Synchronize again.

Sync results

- Once synchronization completes, the Image Construction and Composition console displays the new bundle information

▼ Software Bundles:

Sort: **Alphabetically**, By install order

- ✔ WebSphere Application Server Community Edition - PowerVM [1.0.2.a]
- ✔ AIX [6.1.7]

▼ Products:

Name	Version	Publisher	Bundle
IBM Virtual System Activation Engine	2.1.1	IBM	Enablement Bundle for IBM Workload Deployer
ConfigIcon	1.0.0	IBM	Enablement Bundle for IBM Workload Deployer
WebSphere Application Server Community	1.0.2.a	IBM	WebSphere Application Server Community Edition - PowerVM

▼ Virtual System:

Virtual System ID: 1
 Virtual System Status: RM01006
 Hostname: 9.3.75.137
 IP Address: 9.3.75.137

[Download logs](#)

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Once synchronization completes, the Image Construction and Composition console displays the new bundle information. The new bundle will show up with a green check mark, and it will also display in the product listing. Note the IP address of the new virtual system.

Sync results (continued)

- On the Workload Deployer appliance, view the new temporary “placeholder” virtual system under **Instances > Virtual Systems**

The screenshot displays the 'Virtual System Instances' section of the IBM Workload Deployer GUI. On the left, a list of instances is shown, with 'ICON cloned vm 1318981218128-1.0.0.1' selected. On the right, the details for this instance are displayed under the heading 'ICON cloned vm 1318981218128-1.0.0.1'. The details include system information, hardware and network settings, and a table of network interfaces. A red box highlights the 'Network interface 0' entry, which shows the IP address 'aimcp137.austin.ibm.com (9.3.75.137)'. A callout box points to this entry with the text: 'Expand "Virtual machines" to see the IP address of the virtual system'.

Virtual System Instances	
Search...	↑↓
ICON ESX VM	▶
ICON cloned vm 1318981218128-1.0.0.1	▶
ICON cloned vm 1318990323286-1.0	▶
Sandy ICON	▶

ICON cloned vm 1318981218128-1.0.0.1	
IBM WORKLOAD DEPLOYER	50 PVU
IMAGE FOR X86 SYSTEMS	
PROCESSOR VALUE UNIT	
PROCESSOR VALUE UNIT (PVU)	
LICENSE + SW SUBSCRIPTION & SUPPORT 12 MONTHS (5725-D64):	
Hardware and network	
Virtual CPU count:	1 (You must stop this virtual machine in order to change this value.)
CPU shares on host:	1000
CPU shares consumed on host:	0.0
Virtual memory (MB):	2048 (You must stop this virtual machine in order to change this value.)
SSH public key:	id_rsa.pub
Network interface 0:	aimcp137.austin.ibm.com (9.3.75.137)
MAC address 0:	00:50:56:95:00:50

Go back to the Workload Deployer GUI, and login. View the new temporary “placeholder” virtual system under **Instances > Virtual Systems**. It is in the format of “ICON cloned vm” with a numerical string attached. The numerical string represents a timestamp.

Sync results (continued)

- View the temporary “placeholder” pattern that was created under **Patterns > Virtual systems**

The screenshot displays the 'Virtual System Patterns' interface. On the left is a list of patterns, with 'ICON cloned vm 1318981218128_1.0.0.1' selected. On the right, the details for this pattern are shown:

Virtual System Patterns	
Description:	None provided
Created on:	Oct 18, 2011 6:40:26 PM
Current status:	Read-only
Updated on:	Oct 18, 2011 6:40:26 PM
In the cloud now:	ICON cloned vm 1318981218128-1.0.0.1
Access granted to:	Administrator [owner] <input type="text" value="Add more..."/>
Topology for this pattern:	Deploys to ESX hypervisors.

At the bottom of the screenshot, the page number '37' is visible on the left, 'IBM Image Construction and Composition Tool' is in the center, and '© 2012 IBM Corporation' is on the right.

Still in the Workload Deployer GUI, view the temporary “placeholder” pattern that was created under **Patterns > Virtual systems**. It is in the format of “ICON cloned vm” with a numerical string attached.

Sync results (continued)

- View the temporary catalog image that was created under **Catalog > Virtual images**

The screenshot displays the 'Virtual Images' section of the IBM Workload Deployer GUI. On the left, a list of virtual images is shown, with 'ICON cloned vm 1318981218128' selected. On the right, the details for this image are displayed in a table-like format.

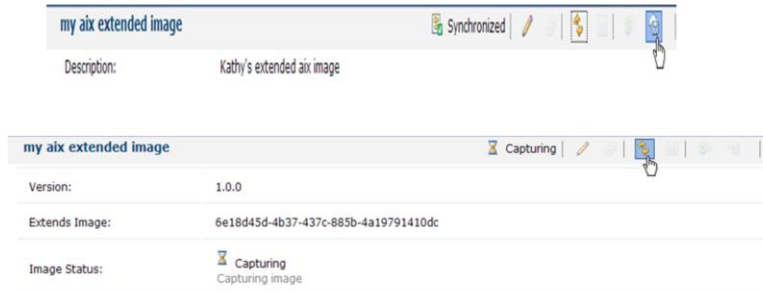
Virtual Images		ICON cloned vm 1318981218128	
Search...	↑↓	Updated on:	Oct 18, 2011 7:29:56 PM
DB2 Enterprise 9.7.3.1	📄	License agreement:	📄 Accepted
DB2 Enterprise 9.7.3.1 (PowerVM)	📄	Hypervisor type:	ESX
DB2 Express 9.7.3.1	📄	Operating system:	RedHat Enterprise Linux 64-Bit, version 5.7 (RHEL 5.7 X64)
IBM OS Image for AIX Systems	📄	Version:	<u>1.0.0.1</u>
IBM Workload Deployer Image for x86 Systems	📄	Image reference number:	aca201143.0
ICON cloned vm 1318981218128	📄	Product IDs (e.g., 5724-X89):	5725-D64 (PVU license)
ICON cloned vm 1318990323286	📄	Contains parts:	Core OS [part product IDs...] 5725-D64 (PVU license)
WebSphere Application Server 7.0.0.17	📄	Included in patterns:	ICON cloned vm 1318981218128 1.0.0.1
WebSphere Application Server 7.0.0.17 (PowerVM)	📄	In the cloud now:	ICON cloned vm 1318981218128-1.0.0.1
WebSphere Application Server 8.0.0.1	📄		
WebSphere Application Server 8.0.0.1	📄		

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Still in the Workload Deployer GUI, view the temporary catalog image that was created under **Catalog > Virtual images**.

Capture to complete the image

- The last step is to perform a capture operation which will complete the image
- Return to the Image Construction and Composition tool and select the extended image in **Images > Build Images**. Click the capture icon to start the capture process
- Monitor the process using the refresh icon. This will take about 40 minutes to complete



The last step is to perform a capture operation which will complete the image. Return to the Image Construction and Composition tool and select the extended image in **Images > Build Images**. Click the capture icon to start the capture process. Monitor the process using the refresh icon. This will take about 40 minutes to complete.

Capture to complete the image (continued)

- When finished, the image status will show "Completed: Capture complete"

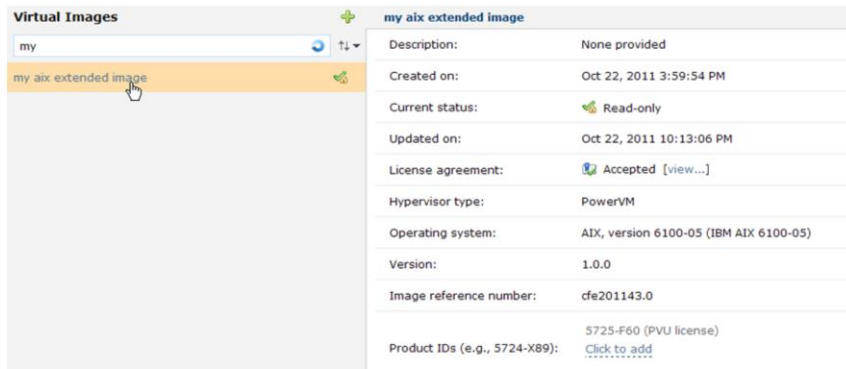
The screenshot displays the IBM Image Construction and Composition Tool interface. On the left, a list of images is shown under the heading 'Images'. The selected image, 'my aix extended image [1.0.0]', is highlighted. On the right, the details for this image are shown, including its version (1.0.0), the image it extends (6e18d45d-4b37-437c-885b-4a19791410dc), and its status. The status is 'Completed' with a green checkmark, and the text 'Capture complete' is displayed below it, both enclosed in a red rectangular box. Other details include the creation and update dates (Sat Oct 22 2011) and the operating system (AIX AIX 6.1.7).

my aix extended image Completed	
Version:	1.0.0
Extends Image:	6e18d45d-4b37-437c-885b-4a19791410dc
Image Status:	Completed Capture complete
Created on:	Sat Oct 22 2011 15:14:51 GMT-0500 (Central Daylight Time)
Updated date:	Sat Oct 22 2011 21:38:10 GMT-0500 (Central Daylight Time)
Operating System:	AIX AIX 6.1.7

When finished, the image status will show "Completed: Capture complete".

Capture results

- In the Workload Deployer appliance, the temporary placeholders in **Instances > Virtual Systems** and in **Patterns > Virtual Systems** are deleted.
- The image in **Catalog > Virtual Images** will remain, and the name will be changed to match the name in the Image Construction and Composition tool

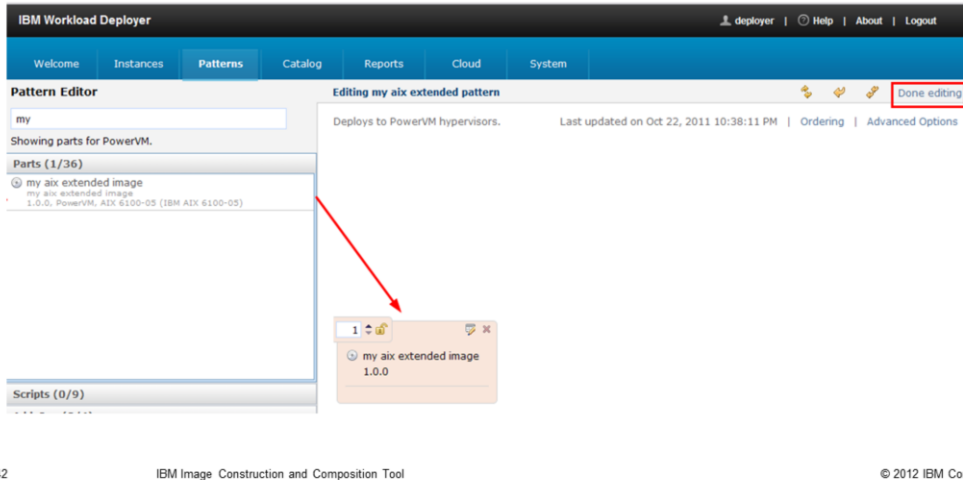


In the Workload Deployer appliance, the temporary placeholders in **Instances > Virtual Systems** and in **Patterns > Virtual Systems** are deleted.

The image in **Catalog > Virtual Images** will remain, and the name will be changed to match the name in the Image Construction and Composition tool.

Capture results (continued)

- The part from the new catalog image now shows up in the Workload Deployer Pattern Editor when creating a new pattern.
- You can add this image part to a pattern and deploy it to the cloud



The part from the new catalog image now shows up in the Workload Deployer Pattern Editor when creating a new pattern. You can add this image part to a pattern and deploy it to the cloud.

Capture results (continued)

- When you deploy the new pattern to the cloud, you are prompted for any parameters required by the software bundles you added. The example below shows the prompt when WAS CE bundle is part of the image.
- If the software bundles do not have any required parameters, you are not prompted.

Fill in the required values for this part of the pattern.

KERNELSERVICE_URL:

SIGNER_PRIVATE_KEY:

SSVC_TOKEN:

Number of servers:

WAS CE home:

WAS CE admin username:

WAS CE admin password:

Verify password:

OK Cancel

When you deploy the new pattern to the cloud, you are prompted for any parameters required by the software bundles you added. The example shows the prompt when WAS CE bundle is part of the image. If the software bundles do not have any required parameters, you are not prompted.

Capture results (continued)

- The required deployment parameters come from the arguments section of the Configuration tab inside the software bundle:

WebSphere Application Server Community Edition - PowerVM Draft |

General Requirements Install **Configuration** Firewall Reset

Deploy-time configuration
Define how to configure the bundle in a new instance of a virtual machine

Config Operations

ConfigWASCE

Run Command: Hide Preview
Please select an executable script to run

```
ConfigWASCE.sh -num_servers ${Number of servers} -WASCE_HOME ${WAS CE home}
-WASCE_ADMIN_USER ${WAS CE admin username} -WASCE_ADMIN_PASSWORD ${WAS CE admin
password}
```

Run As:

Arguments:

Name	Label	Value	Is Password			
WASCE_ADMIN_USER	WAS CE admin username	system	<input type="checkbox"/>			
WASCE_ADMIN_PASSV	WAS CE admin password	*****	<input checked="" type="checkbox"/>			

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The required deployment parameters can be found in the arguments section of the Configuration tab inside the software bundle. There is more on this later in the presentation.

Sync and Capture summary

- To summarize what happens during **synchronization**:
 - A copy (clone) is made of the catalog image, then extended in Workload Deployer
 - A virtual system is created in Workload Deployer
 - Updates are made to the virtual system in the form of installing and configuring software bundles
- To summarize what happens during **capture**:
 - A copy of the updated virtual system is made
 - A Workload Deployer catalog image is created
 - The catalog image can now be used to create new patterns in Workload Deployer
- This is similar to the extend and capture operations you can perform manually in Workload Deployer. Image Construction and Composition tool performs those tasks for you

To summarize what happens during synchronization and capture: a clone is made of the catalog image, then extended in Workload Deployer. A virtual system is created in Workload Deployer. Updates are made to that virtual system in the form of installing and configuring software bundles.

During the capture process, a copy of the updated virtual system is made, and a Workload Deployer catalog image is created.

These processes are similar to the extend and capture operations that you can perform manually in Workload Deployer. The Image Construction Tool performs those tasks for you.

Image Construction and Composition Tool vs. extend/capture

- Extend / capture is a very simple way to add additional content to an image. Image Construction and Composition Tool actually uses extend / capture in the background
- The easiest way of thinking about Image Construction and Composition Tool is it is allowing you to make the extend / capture process automated and repeatable
- Without Image Construction and Composition Tool, the system had no record of what was added/deleted via extend/capture (which made applying to different images, upgrades, etc riskier)
- Image Construction and Composition Tool also provides additional capabilities that are not available via extend / capture such as:
 - Keeps a record of the bundles you have added
 - The same bundle can be added to multiple images
 - allows you to add deploy-time parameters for your bundles (extended content). For example, if you are adding a monitoring agent, but you wanted the server to connect to be a parameter, you can do this with a bundle. This ties the binaries and the parameterization/scripting together
 - allows you to build a base OS image to your specifications (Linux/VMware/vSys only)

Extend/capture in Workload Deployer is a very simple way to add additional content to an image. Image Construction and Composition Tool actually uses extend / capture in the background. The best way of thinking about Image Construction and Composition Tool is it is allowing you to make the extend / capture process automated and repeatable. Without the tool, the system had no record of what was added/deleted via extend/capture (which made applying to different images, upgrades, etc riskier).

Image Construction and Composition Tool also provides additional capabilities that are not available via extend / capture such as: Keeps a record of the bundles you have added, the same bundle can be added to multiple images, allows you to add deploy-time parameters for your bundles (extended content). For example, if you are adding a monitoring agent, but you wanted the server to connect to be a parameter, you can do this with a bundle. This ties the binaries and the parameterization and scripting together. And also allows you to build some base OS images to your specifications

Creating software bundles

This next section gives a high level overview of creating and viewing software bundles.

Creating software bundles

- A software bundle contains and describes the software available for use within an image..
- The software bundle specification promotes a process where a set of installation tasks is performed once, by the image builder initially creating the image. A set of configuration tasks is then performed for each image deployment.
- Along with the installation tasks, the software bundle provides for different deployment-time configurations of the software

The software bundle specification for the software includes information the tool needs. It includes how to install the software, prerequisites of the software, and parameters available for customizing the software. The recommendation is to define time intensive tasks, for example, installing large binary files, as part of the software bundle installation so the tasks run only once. The use of deployment-time configuration parameters reduces the number of images that you require by providing a means of customizing the software for each deployment.

Creating software bundles continued

- For each software bundle, you can specify this information:
 - 1. Requirements:** when you add a software bundle to an image Image Construction and Composition checks that prerequisites such as type of OS and version are met.
 - 2. Installation tasks:** you can define the files to copy and command to run to perform the installation. You can also define parameters.
 - 3. Activation tasks:** define tasks that run during the virtual image activation process and make necessary configuration updates based on data such as IP addresses, hostnames, and other deployment time variables.
 - 4. Firewall rules:** indicate network ports and port ranges that are to be open.
 - 5. Reset tasks:** include scripts to clean up and reset any files you do not want in the final image. Reset scripts are run just before the image is captured to reset the image state to ensure that any unplanned content is not captured.
 - 6. License files:** add license files to present users with a license agreement.
 - 7. Syntactic validation :** checks that all required fields have realistic values.
 - 8. Semantic validation:** performed by the server and started only when changes are saved. The validation report entries have three severities, either `info`, `warning`, or `error`.

For each software bundle, you can specify this information:

Requirements: when you add a software bundle to an image Image Construction and Composition checks that prerequisites such as type of OS and version are met.

Installation tasks: you can define the files to copy and command to run to perform the installation. You can also define parameters.

Activation tasks: define tasks that run during the virtual image activation process and make necessary configuration updates based on data such as IP addresses, hostnames, and other deployment time variables.

Firewall rules: indicate network ports and port ranges that are to be open.

Reset tasks: include scripts to clean up and reset any files you do not want in the final image. Reset scripts are run just before the image is captured to reset the image state to ensure that any unplanned content is not captured.

License files: add license files to present users with a license agreement.

Syntactic validation: checks that all required fields have realistic values.

Semantic validation: performed by the server and started only when changes are saved. The validation report entries have three severities, either `info`, `warning`, or `error`.

Creating software bundles continued

- To view the bundles in the Image Construction and Composition console, go to **Images > Build software bundles**

The screenshot displays the IBM Image Construction and Composition console interface. On the left, a 'Bundles' sidebar lists several bundles, with 'Sample Bundle [1.0.1]' highlighted. A callout box points to this bundle with the text 'Click to create new bundle'. The main panel shows the 'Sample Bundle' configuration page, with tabs for 'General', 'Requirements', 'Install', 'Configuration', 'Firewall', 'Reset', and 'License'. The 'General Properties' section includes the following fields:

Name:	Sample Bundle
Repository:	local
Description:	Simple sample bundle with image build, deploy and reset operations.
Universal ID:	com.ibm.icon.sample_bundle
Version:	1.0.1
Publisher:	IBM
Created on:	Sun Sep 04 2011 14:23:16 GMT-0500 (Central Daylight Time)

To view the bundles in the Image Construction and Composition console, go to Images > Build software bundles.

Creating software bundles

- Choose name, Universal ID, and storage location. Check if uses IBM Installation Manager. Click Create

Create a New Bundle

Please describe the new bundle

Name:

Universal ID:

Version:

Description:

Storage Location:

Community:

Uses IBM Installation Manager:

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Choose name, Universal ID, and storage location. Check if it uses the IBM Installation Manager. And click Create.

Creating software bundles

- Create a new IM Bundle

Create a New IM Bundle

Please describe the new IM-based bundle information

Installation Manager response file

Destination

Product install user

Number of password-protected repositories

Uploading the response file also fills in Destination

System user to perform the installation

Fill in the fields when prompted. When you upload the response file, the destination is also completed. The Product install user is the system user who performs the installation.

Creating software bundles continued

▪ Add Requirements

The screenshot shows the 'Manage Bundle Requirements' interface for a 'Sample Bundle'. The interface has a top navigation bar with tabs for 'General', 'Requirements', 'Install', 'Configuration', 'Firewall', 'Reset', and 'License'. Below the tabs, there is a section titled 'Manage Bundle Requirements' with a subtitle 'Requirements for installing the bundle: Required Operating System(s), Product(s) and Bundles(s)'. There are three main sections: 'Supported Operating Systems', 'Required Software', and 'Required Bundles'. Each section has a plus sign icon and a text input field to add requirements. The 'Supported Operating Systems' section also has an 'Add Operating System' button and 'Expand All | Collapse All' links. The 'Required Software' section has a plus sign icon and a text input field, with the text 'No Required Software specified.' below it. The 'Required Bundles' section has a plus sign icon and a text input field. The bottom of the screenshot shows the page number '53', the text 'IBM Image Construction and Composition Tool', and the copyright notice '© 2012 IBM Corporation'.

Click the plus sign to add requirements for operating systems, software, or bundles. You can leave fields empty if there are no specific requirements. Complete the Required Software section to specify the software requirements for your software bundle. You can enter the name of the software and the version. Complete the Required Bundles section to specify the bundles required for the installation.

The tool checks the supported operating systems against the operating system in the base image selected by the image builder. The tool checks the software prerequisite information against other software bundles selected for or installed in the image. To use software prerequisites, ensure that the name provided for the **Name** field matches the name of the software.

Creating software bundles

- Specify how to install the software content on the **Install** tab

The screenshot displays the 'Sample Bundle' configuration window in the IBM Image Construction and Composition Tool. The 'Install' tab is active, showing the 'Install operation configuration' section. Under 'Files to Copy', a table lists 'install.sh' as an executable file. The 'Command' section shows the 'Run Command' set to 'install.sh' with a preview of the command: `install.sh -INSTALL_PARAMETER ${Install parameter}`. The 'Run As' field is set to 'root'.

Source (URI or file name)	Executable			
install.sh	<input checked="" type="checkbox"/>			

Run Command: Hide Preview
Please select an executable script to run

```
install.sh -INSTALL_PARAMETER ${Install parameter}
```

Run As:

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Specify how to install the software content on the Install tab by indicating the files to copy and commands to run.

Creating software bundles

- To define activation scripts and other artifacts necessary for deployment-time configuration, go to the **Configuration** tab

The screenshot shows the 'Configuration' tab for a 'Sample Bundle'. The interface includes a top navigation bar with tabs for 'General', 'Requirements', 'Install', 'Configuration', 'Firewall', 'Reset', and 'License'. Below this, the 'Deploy-time configuration' section is active, with a sub-section for 'Config Operations' containing a 'ConfigSample' entry. The main configuration area is titled 'Command' and contains the following fields:

- Run Command:** A dropdown menu set to 'ConfigSample.sh' with a 'Hide Preview' button.
- Preview:** A text area displaying the command: `ConfigSample.sh -config_msg ${Configuration parameter}`.
- Run As:** A text field set to 'root'.
- Arguments:** A table with columns for Name, Label, Value, and Is Password.

Name	Label	Value	Is Password
config_msg	Configuration parameter	Activation in action	<input type="checkbox"/>

At the bottom of the window, the page number '55', the text 'IBM Image Construction and Composition Tool', and the copyright notice '© 2012 IBM Corporation' are visible.

To define activation scripts and other artifacts necessary for deployment-time configuration, go to the Configuration tab.

Creating software bundles (continued)

- On the **Firewall** tab, specify port numbers that need to be open

The screenshot shows the 'Sample Bundle' configuration window with the 'Firewall' tab selected. The interface includes a title bar with 'Draft' and various icons, and a navigation bar with tabs for 'General', 'Requirements', 'Install', 'Configuration', 'Firewall', 'Reset', and 'License'. Below the tabs, the 'Set firewall configuration' section is active, with the instruction 'Specify a range of ports to open in the firewall'. A table titled 'Ports configurations (Set the port's number or select a parameter):' contains one row with the following data:

Port Range Begin	Port Range End	Protocol	
50000	50001	TCP	x

At the bottom of the window, the page number '56', the text 'IBM Image Construction and Composition Tool', and the copyright notice '© 2012 IBM Corporation' are visible.

On the Firewall tab, specify port numbers that need to be open.

Creating software bundles (continued)

- Define reset tasks

Sample Bundle Draft

General Requirements Install Configuration Firewall **Reset** License

Files to Copy

Files that should be copied to the target machine:

Source (URI or file name)	Executable			
resetSample.sh	<input checked="" type="checkbox"/>			

Command

Run Command: Hide Preview
Please select an executable script to run

```
resetSample.sh -extra ${Reset parameter}
```

Run As:

Arguments:

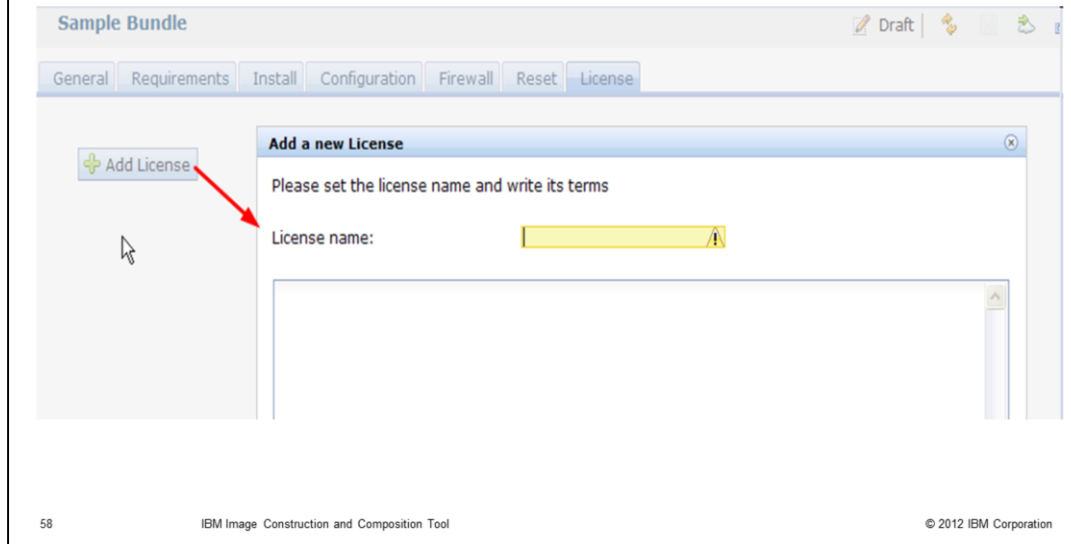
Name	Label	Value	Is Password			
extra	Reset parameter	Value of reset parameter	<input type="checkbox"/>			

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On the Reset tab, define tasks to clean up any files you do not want in the final image.



Creating software bundles (continued)


- Add a license to the software bundle




On the license tab, you can add a license for the software bundle.

Creating software bundles (continued)

- Click  to save your software bundle. When you save, the Image Construction and Composition tool completes validation to ensure that your software bundle is consistent. Review any errors, warnings, or information messages to determine if you need to make changes or take corrective action.
- If you click  to publish the software bundle, you can no longer edit the software bundle or make any changes to it but you can still clone it

Click  to save your software bundle. When you save, the Image Construction and Composition tool completes validation to ensure that your software bundle is consistent. Review any errors, warnings, or information messages to determine if you need to make changes or take corrective action.

If you click the cloud icon  to publish the software bundle, you can no longer edit the software bundle or make any changes to it but you can still clone it.

Logs

- View the Image Construction and Composition logs for any error messages. There are two places to download logs. Doing either of these gets you an archive file containing the same sets of logs. Only the name of the zip file is different
 - Select your image under **Images > Build images**. Expand the **Virtual System** section. Click the blue text that says "Download logs." This will download iconlogs.zip
 - or, you can get the same logs by clicking on **Administer > Download logs**. This will download <xxxxxxx>_iconlogs.zip
 - Unzip the file, and navigate to `drouter\ramdisk2\mnt\raid-volume\raid0\logs\error`. Open **error.log** in an editor and search for the approximate date and time of the failure
- Installation logs are located at `/var/ibm/InstallationManager/logs`

There are two locations to download Image Construction Tool logs. One place is the "Download logs" hyperlink in the virtual system section of the image.

Or you can get the same logs by clicking on Administer, then Download logs. **Extract** the file, and navigate to `drouter\ramdisk2\mnt\raid-volume\raid0\logs\error`. Open `error.log` in an editor and search for the approximate date and time of the failure. Installation logs are located at `/var/ibm/InstallationManager/logs`.

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