WebSphere Application Server: Configuration and Use of the Job Manager Component

Mike Loos
IBM
mikeloos@us.ibm.com

Monday, February 28, 2011

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WebSphere Application Server Sessions

Room	Day	Time	Title	Speaker
208B	Monday	11:00	Lab	Multi
201A	Monday	11:00	The Value of the WebSphere Application Server Job Manager	Loos
205A	Monday	4:30	WebSphere Application Server for z/OS -- I am No Longer a Dummy but...	Loos
205B	Tuesday	9:30	Performance Tuning for WebSphere Application Server for z/OS - Practical Advice	Everett
205A	Wednesday	4:30	WebSphere Application Server for z/OS: Tools and Tricks (Potpourri)	Loos and Co.
205A	Wednesday	6:00	WebSphere Application Server for z/OS: Helping Customers Help Themselves	Stephen
206B	Thursday	8:00	Securing WebSphere Application Server for z/OS	Kearney
206B	Thursday	9:30	Application Improvement and Savings Through Simplification	McCorkle
206B	Thursday	11:00	WebSphere Application Server for z/OS: Batch	Bagwell
206A	Thursday	12:15	WebSphere Application Server 101	Stephen
206B	Thursday	1:30	WebSphere Application Server for z/OS: Availability Considerations	Bagwell
206B	Thursday	3:00	WebSphere Application Server: z/OS Exploitation/Differentiation	Follis
206B	Thursday	4:30	Performance Tuning for WebSphere Application Server for z/OS - WAS and WLM Interactions and Concepts	Follis

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Slide 2

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- **How to Configure the Job Manager Server.**

- Using the Job Manager.

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3

Slide 3

We'll be doing this in two parts. First we'll run through the steps to configure the Job Manager, as well as some of the options available, and then we'll go through a couple of usage scenerios.

Let's start with configuration...

3

Starting (as usual) with the spreadsheet. You can either do this as and additional part of an existing cell (this allows you to reuse the existing security infrastructure) or you could do the Job Manager as a totally separate configuration. No matter which way you decide, the Job Manager is actually as separate cell, with its own daemon. Basically it is a specialized standalone server.

Once you've filled out the spreadsheet, you can select the Job Manager "tab".

Value of the WebSphere Application Server Job Manager

WebSphere Configuration Excel Workbook

Generated responseFile to configure:

Job Manager
In Cell - S1JMGRC

To be imported into the z Profile Management Tool that is part of Application Server Toolkit (AST).

1. Copy contents of this column by clicking on the column 'A' header above, then press CTRL-C to copy to clipboard.

2. Open a new file with notepad/wordpad and paste this in (CTRL-V).

3. Save the newly created file as   S1JMGRC.responseFile

4. Load into z Profile Management Tool

create
adminPassword=

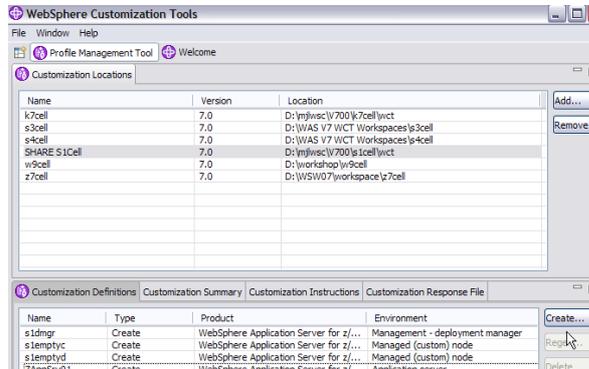Copy the entire contents of Column "A", then paste the results into a text file.

Next step is to use "edit copy" to get the entire first column into the clipboard. Then paste it into a text file for use as a response file that will be the input to the zPMT.

Value of the WebSphere Application Server Job Manager

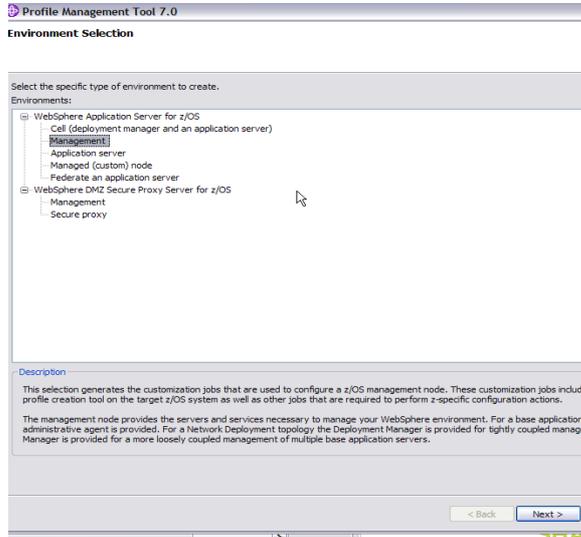While not necessary, I'm bulding within an existing cell location.

Slide 6

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For this presentation, we'll be using an existing cell, the s1cell which I've been using for SHARE presentations since the GA of WAS V7. We'll basically be adding what looks like another component, the Job Manager, but which really only shares security profiles and therefore some long and short names with the rest of the cell. It truly is a separate standalone server that just happens to share enough of the naming to make the security still work.

Once you've clicked on Create, you can select the Management option...

Then select "Job Manager"...

Give the customization definition a name, s1jmgrc, and indicate that you want to use the response file which we just created.

Value of the WebSphere Application Server Job Manager

While the normal progression at this point would be to just click Next all the way through, accepting the values provided by the response file, we're going to make a couple of exceptions to make setup a little easier and to minimize the changes to the security configuration.

The first one is we'll change the mountpoint so that the zfs for the job manager configuration is mounted in the same directory as the other zfs files for the rest of the s1cell configuration (again, understanding that we're not really part of the cell, just "sharing space".

The next exception is to use the same keyring name as the rest of the cell so that we don't have to define any new ones and so that ssl handshakes will work for us when we start testing.

Value of the WebSphere Application Server Job Manager

Security Managed by the z/OS Product
Management - job manager

SAF profile prefix (optional):
S1JMGRC

WebSphere Application Server unauthenticated user

User ID: S1GUEST

UID
○ Allow OS security to assign UID
● Assign user-specified UID: 40002

☐ Enable Writable SAF Keyring support

SAF profile prefix (optional):
S1CELL

WebSphere Application Server unauthenticated user

User ID: S1GUEST

UID
○ Allow OS security to assign UID
● Assign user-specified UID: 40002

Slide 12   © 2011, IBM Corporation   12

Last, we'll reuse the SAF profile prefix that the
s1cell already uses so that we can use the same
EJBROLE, APPL, and some other profiles.

Value of the WebSphere Application Server Job Manager

After we've finished CREATing the customization definition and PROCESSed it (uploading the CNTL and DATA datasets), we can begin processing.

If we hadn't caused reuse of the SAF profiles and mountpoints earlier, we would have to run the BBOSBRAK, BBODBRAK, and BBOSBRAM jobs.

Since we did reuse most of the SAF profiles, the only additional profiles we need are the STARTED class profiles for the daemon and controller started tasks.

"RDEFINE STARTED XXDMNJ*.* STDATA(USER(XXACRU) GROUP(XXCFG) TRACE(YES))"

"RDEFINE STARTED XXJCR*.* STDATA(USER(XXACRU) GROUP(XXCFG) TRACE(YES))"

In every case, we do have to run the BBODCPY1, BBODCFS, BBODHFSA, and BBOWWPFD jobs.

We then would be ready to start the Job Manager server using the start command shown at the bottom of the screen.

Value of the WebSphere Application Server Job Manager

You must create some additional directories...

In the Job Manager configuration
file system...

`/wasv7config/s1cell/s1jmgrc/JobManager/profiles/default`

```
    /config
        /temp
            /JobManager
```
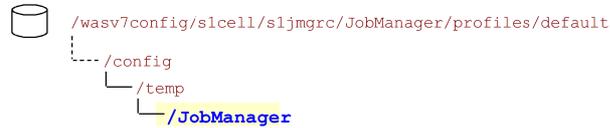
In the Deployment Manager configuration
file system...

`/wasv7config/s1cell/s1dmnode/DeploymentManager/profiles/default`

```
    /downloadedContent
```

Slide 14

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14

We also need to make a change to the configuration file system for the Job Mangager configuration to add the directory where scripts will be found.

Also, any "target" configuration will need a place for the scripts to be downloaded.

These directory names and locations are non-negotiable.

Value of the WebSphere Application Server Job Manager

Slide 15

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At this point the configuration work is basically complete.

A comparison of the adminconsole for the network deployment cell (s1cell) and the Job Manager cell shows the difference (and more importantly the similarities) between the two.

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- **Using the Job Manager.**

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16

We're ready to begin using the Job Manager to make changes to the target (ND s1cell).

Value of the WebSphere Application Server Job Manager

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The first thing that has to happen, is we must "register" the s1cell with the Job Manager.

This is done from the adminconsole for the cell (not the Job Manager) by opening up System administration, clicking on Deployment manager, and then on Job managers.

Value of the WebSphere Application Server Job Manager

Slide 18

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A particular node may be registered to multiple Job managers.

To start the registration process for a node, click on the Register with Job manager button.

On the next screen, the managed node name should be pre-filled with the name of the node with which you are working. You must fill in the hostname and port (WC_adminhost_secure) for the Job manager with which you wish to register, as well as the security credentials you will use for the process.

When you click on OK, the process will start.

Value of the WebSphere Application Server Job Manager

Once registration is complete you will return to the screen listing the Job managers for which the node is registered. If you click on the UUID of the Job Manager, you'll get a screen showing the details.

Value of the WebSphere Application Server Job Manager

Now that we've completed registration, we can actually do something with the Job manager.

To begin, we'll get a list of application servers using the adminconsole for the cell. As you can see, there has yet to be a server named s1sr05c created.

Value of the WebSphere Application Server Job Manager

To create a new server, one way would be to use the Job Manager.

To start, in the adminconsole for the Job manager, open up the Jobs section, and click on Submit. On the pane which that opens, select Create application server from the dropdown selection list. Click Next.

On the next panel, select the target node (the deployment manager node for an ND cell), and provide the proper credentials. Click Next.

Value of the WebSphere Application Server Job Manager

On the next panel you'll need to specify the new server long name (s1sr05c) and the actual appserver node long name (s1nodec).

If you open up the Additional job parameters, you'll be given the opportunity to specify the new server short names (specific and generic), and the bit mode (64bit is the default). Click Next.

Value of the WebSphere Application Server Job Manager

The next screen is all about scheduling. You have great flexibility for when the job will run, when it will no longer be available to run, and how often and on what interval it will be run. Since we're just creating a server on a one time basis, taking the default of run once, now, is fine. Click Next.

23

Value of the WebSphere Application Server Job Manager

Submit a job to the job manager

Review the options that you entered. If you are satisfied with the options, click Finish to submit the job. Otherwise, click Previous to make further changes to the job options.

Step 1: Choose a job type

Step 2: Choose job targets

Step 3: Specify job parameters

Step 4: Schedule the job

→ **Step 5: Review the summary and submit the job**

Review the summary and submit the job

Summary of actions:

Options	Values
Job type	Create application server
Description	createApplicationServer
Node names	s1dmnode
Notification	mikeloos@us.ibm.com
Initial Availability	Make the job available now.
Expiration	Use the default expiration.
User name	s1admin
Server name	s1sr05c
Node name	s1nodec
Specific short name	S1SR05C
Generic short name	S1SR05

Previous   Finish   Cancel

Slide 24

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24

The next screen is a job summary panel, and if everything looks OK, simply click on Finish and the job will be submitted.

The next screen, the Job status screen will start out with a Status summary of Incomplete (grey in color) and when the job completes will change to Succeeded (green) or one of the less happy colors and statuses.

Value of the WebSphere Application Server Job Manager

Application servers

Application servers

Use this page to view a list of the application servers in your environment and the status of each of these servers. You can also use this page to change the status of a specific application server.

⊞ Preferences

| New | Delete | Templates... | Start | Stop | Restart | ImmediateStop | Terminate |

Select	Name ◇	Node ◇	Host Name ◇	Version ◇	Cluster Name ◇	Status ⟳
	You can administer the following resources:					
☐	s1sr01c	s1nodec	wsc3.washington.ibm.com	ND 7.0.0.13		✖
☐	s1sr02c	s1nodec	wsc3.washington.ibm.com	ND 7.0.0.13		✖
☐	s1sr03c	s1nodec	wsc3.washington.ibm.com	ND 7.0.0.13	s1sr03	✖
☐	s1sr03d	s1noded	wsc4.washington.ibm.com	ND 7.0.0.13	s1sr03	✖
☐	s1sr04d	s1noded	wsc4.washington.ibm.com	ND 7.0.0.13		✖
☐	s1sr05c	s1nodec	wsc3.washington.ibm.com	ND 7.0.0.13		✖

Total 6

26

If we return to the cells adminconsole and look at the list of application servers, we see that s1sr05c is now there.

If we were to check, the port assignments are all "default" values which don't do us much good on most z/OS systems. Also, nothing has been done to add the http/https ports to the virtual host list for the cell. So, we either have a choice of hand modifying the ports, running a script to modify them, or for purposes of this presentation, we're going to (behind the scenes) delete the server and re-define it using a custom wsadmin script.

26

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```
:/wasv7config/s1cell/s1jmgrc/JobManager/profiles/default/config/temp/JobManager
-> cp /u/mjloos/tb/v7/createNewServerv7.py .
:/wasv7config/s1cell/s1jmgrc/JobManager/profiles/default/config/temp/JobManager
-> ll
total 52
drwxrwxr-x   2 MJLOOS   S1CFG         416 Jan 20 12:16 .
-rwxr-xr-x   1 MJLOOS   S1CFG       11895 Jan 20 12:16 createNewServerv7.py
-rwxrwxr-x   1 MJLOOS   S1CFG        2215 Jan 12 17:00 applist.py
-rwxrwxr-x   1 MJLOOS   S1CFG        1949 Jan 12 16:31 appoptlist.py
-rwxrwxr-x   1 S1ADMIN  S1CFG        2960 Jan 12 15:41 appinfov2.py
drwxrwx---   6 S1ADMIN  S1CFG         384 Jan 12 11:40 ..
:/wasv7config/s1cell/s1jmgrc/JobManager/profiles/default/config/temp/JobManager
```

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27

The first thing that needs to happen is that the script needs to be pre-
positioned into the proper directory of the Job manager file system. As
show, we have added a jython script, createNewServerv7.py. This script will
create the server and set all values properly (in line with the naming
standards we've adopted), set the ports accordingly, and add the proper
ports to the virtual host alias list.

Value of the WebSphere Application Server Job Manager

Now that the script is properly pre-positioned we can "distribute" it. This puts a copy of it into a pre-defined directory in the deployment manager file system.

To start, we go into the submit job dialog and select Distribute file from the dropdown selection list. Click Next.

On the next panel we select the target node and provide credentials. Click Next.

Value of the WebSphere Application Server Job Manager

On the next screen we have to specify the URL of the file in the Job manager file system, and give it a name to be used at the destination.

On the next screen we can do scheduling. Same as before. Default is right now.

Value of the WebSphere Application Server Job Manager

Summary screen, click Finish.

Status screen, wait for successful completion.

Value of the WebSphere Application Server Job Manager

```
:/wasv7config/s1cell/s1dmnode/DeploymentManager/profiles/default/downloadedContent
-> ll
total 54
drwxrwxr-x   3 S1ADMIN  S1CFG         448 Jan 20 15:45 .
-rw-rw-rw-   1 S1ASRU   S1CFG       11895 Jan 20 12:1  createNewServerv7.py
-rw-rw-rw-   1 S1ASRU   S1CFG        2215 Jan 12 17:00 applist.py
-rw-rw-rw-   1 S1ASRU   S1CFG        1949 Jan 12 16:31 appoptlist.py
-rw-rw-rw-   1 S1ASRU   S1CFG        2960 Jan 12 15:41 appinfov2.py
drwxrwxr-x   2 S1ADMIN  S1CFG         256 Jan 12 15:21 appl
drwxrwxr-x  20 S1ADMIN  S1CFG         928 Jan 12 15:20 ..
:/wasv7config/s1cell/s1dmnode/DeploymentManager/profiles/default/downloadedContent
->
```

Slide 31

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31

As you can see, the script has now been downloaded to the deployment managers node file system. We're ready to run...

Value of the WebSphere Application Server Job Manager

Slide 32

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This time when we get to the Job submit dialog, we select Run wsadmin script. Click Next.

On the next panel we specify the name of the script (as it was downloaded) and any parameters necessary to run it. For this script the parameters are: new server long name, target node long name, and low port number for the server. Click Next.

You'll see the same panels as before and fill them out in the same fashion and eventually you'll get to the successful completion Job status panel.

Where did the output go?

Value of the WebSphere Application Server Job Manager
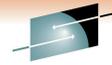
From the Deployment Manager Servant SYSPRINT:

```
Trace: 2011/01/20 15:58:40.641 01 t=8C9CF0 c=UNK key=P8 (13007002)
   ThreadId: 000000c6
   FunctionName: com.ibm.ws.scripting.AbstractShell
   SourceId: com.ibm.ws.scripting.AbstractShell
   Category: AUDIT
   ExtendedMessage: BBOO0222I: WASX7091I: Executing script: "/wasv7config/s1cell/s1dmnode/DeploymentManager/profiles/default/download
edContent/createNewServerv7.py"
Server name is  s1sr05c
Server short name will be:   S1SR05C
Cluster Transition name will be:   S1SR05
Node name  is  s1nodec
First port number is  15540
BOOTSTRAP_ADDRESS  values before modification: host =  wsc3.washington.ibm.com port =  2809
BOOTSTRAP_ADDRESS  values after modification: host =  wsc3.washington.ibm.com port =  15543

SOAP_CONNECTOR_ADDRESS  values before modification: host =  wsc3.washington.ibm.com port =  8880
SOAP_CONNECTOR_ADDRESS  values after modification: host =  wsc3.washington.ibm.com port =  15542

ORB_LISTENER_ADDRESS  values before modification: host =  * port =  2809
ORB_LISTENER_ADDRESS  values after modification: host =  * port =  15543

WC_adminhost  values before modification: host =  * port =  9060
WC_adminhost  values after modification: host =  * port =  15545

WC_defaulthost  values before modification: host =  * port =  9080
WC_defaulthost  values after modification: host =  * port =  15547

DCS_UNICAST_ADDRESS  values before modification: host =  * port =  9353
DCS_UNICAST_ADDRESS  values after modification: host =  * port =  15550

ORB_SSL_LISTENER_ADDRESS  values before modification: host =  * port =  15407
ORB_SSL_LISTENER_ADDRESS  values after modification: host =  * port =  15544

WC_adminhost_secure  values before modification: host =  * port =  9043
WC_adminhost_secure  values after modification: host =  * port =  15546

WC_defaulthost_secure  values before modification: host =  * port =  9443
WC_defaulthost_secure  values after modification: host =  * port =  15548
```

Slide 34

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Since we didn't specify anything different, anything which would have been directed to STDOUT will go to the deployment manager servant SYSPRINT and STDERR to SYSOUT ddnames.

Value of the WebSphere Application Server Job Manager

```
SIP_DEFAULTHOST   values before modification: host =  * port =   5060
SIP_DEFAULTHOST   values after modification: host =  * port =   15555

SIP_DEFAULTHOST_SECURE   values before modification: host =  * port =   5061
SIP_DEFAULTHOST_SECURE   values after modification: host =  * port =   15556

IPC_CONNECTOR_ADDRESS   values before modification: host =   localhost port =   9633
IPC_CONNECTOR_ADDRESS   values after modification: host =   localhost port =   15549

SIB_ENDPOINT_ADDRESS   values before modification: host =  * port =   7276
SIB_ENDPOINT_ADDRESS   values after modification: host =  * port =   15551

SIB_ENDPOINT_SECURE_ADDRESS   values before modification: host =  * port =   7286
SIB_ENDPOINT_SECURE_ADDRESS   values after modification: host =  * port =   15552

SIB_MQ_ENDPOINT_ADDRESS   values before modification: host =  * port =   5558
SIB_MQ_ENDPOINT_ADDRESS   values after modification: host =  * port =   15553

SIB_MQ_ENDPOINT_SECURE_ADDRESS   values before modification: host =  * port =   5578
SIB_MQ_ENDPOINT_SECURE_ADDRESS   values after modification: host =  * port =   15554

Host Alias entry for port number   15545   already exists.
Host Alias entry for port number   15546   already exists.
Host Alias entry for port number   15547   already exists.
Host Alias entry for port number   15548   already exists.
Host Alias entry for port number   15555   already exists.
Host Alias entry for port number   15556   already exists.
Skipping node s1dmnode
Done with node s1nodec
Done with node s1noded
All Done!
```

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35

Value of the WebSphere Application Server Job Manager

If you'd rather the output not go to SYSPRINT:

```
EDIT        /u/mjloos/tb/listServersToFile.py
Command ===>
****** *******************************************************
000001 import sys
000002 #
000003 #   Set up for printing to a file
000004 #
000005 listout = "/tmp/listServersToFile.out"
000006 prtout = open(listout, "w")
000007 #
000008 #   Get list of application servers in the cell
000009 #
000010 serverlist = AdminConfig.list('Server').splitlines()
000011 #
000012 #   Loop through them and print the list of servers.
000013 #
000014 for server in serverlist:
000015     print >>prtout,  server.split('(')[0],
000016     print >>prtout,  'in node: ',
000017     print >>prtout,  server.split('/')[3]
000018 print >>prtout,
****** *******************************************************
```

Slide 36

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36

What if we want the output to go elsewhere? Any option that you can use with jython/python will work. Here is one possibility that causes the print statement to redirect to file prtout, which has been opened for output, and sent to location /tmp/listServerToFile.out.

Basically this script will print out a list of servers in a cell. Let's run it.

We would do the same type of function as we just previously did for the createNewServerv7.py script. Load the script into the Job manager file system, submit a job to distribute the file to the deployment manager file system, and then submit a job to run the wsadmin script.

Note that the output file will be in ASCII.

```
VIEW          /SYSC/tmp/listServersToFile.out
Command ===> 
****** *********************************************
000001 dmgr in node:  s1dmnode
000002 nodeagent in node:  s1nodec
000003 nodeagent in node:  s1noded
000004 p7http1 in node:  s1noded
000005 s1db21c in node:  s1nodec
000006 s1sr01c in node:  s1nodec
000007 s1sr02c in node:  s1nodec
000008 s1sr03c in node:  s1nodec
000009 s1sr03d in node:  s1noded
000010 s1sr04d in node:  s1noded
000011 s1sr05c in node:  s1nodec
000012
****** *********************************************
```

Slide 37

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37

The output looks like this (it will be in ASCII).

In Summary...

- Job Manager is configured as its own cell.
  - Basically a specialized Standalone Server.
- Can be used to run jobs on both ND cells and Standalone Servers.
  - ND cells via the deployment manager node.
  - Standalone Servers via the Administrative Agent.
- Can be used to schedule jobs in a variety of ways.
- Relatively easy to configure and use.

Slide 38

38

Q and A?

Questions?

39

Q and A?