WebSphere Application Server for z/OS
Version 8.5
Overview & Demo

(for BPM:Process Server V8 Workshop ZBPM8)

The WebSphere Application Server on z/OS

WebSphere on z/OS is basically a set of MVS address spaces (Started Tasks)

- Two Configuration Options:
  - Base (stand-alone) AppServer
  - Network Deployment (ND)

Controller Regions are started manually, with an MVS start command, or using the Integrated Solutions Console (ISC)

WLM starts servants based on workload seen
Parameters provide control over this:
- Minimum number of regions
- Maximum number of regions

WLM starts CRA if MEs defined

Each Server has several Started tasks:
- Controller Region (CR) - protocol entry point: HTTP, HTTPS, IIOP or JMS
- Servant Regions (SR) - this is where the application components run (One or more)
- Control Region Adjunct (CRA) - if SI Buses with Messaging Engines are defined.

Servers can be replicated for workload balancing and high availability
You'll Need to Do Some Planning

There's no avoiding it ... these things require a lot of names, values, ports and such.

Deployment Manager Definitions

WebSphere Application Server home directory: /wasv8config/b8cell/b8nodea/AppServer

- Cell name (short)......: B8CELL
- Cell name (long).......: b8cell

- Node name (short)......: B8NODEA
- Node name (long).......: b8nodea

- Server name (short)....: B8SR01A
- Server name (long).....: b8sr01a

- Cluster transition name: B8SR01

All components have two names

<table>
<thead>
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<th>Defined using the ISPF dialogs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long Name</td>
</tr>
<tr>
<td>Name used as directory names</td>
</tr>
<tr>
<td>used in Admin Console</td>
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</tbody>
</table>

| Short Name                    |
| Name used as jobname for controllers |
| used in symbolic links        |
| limited to 7 characters       |

Naming Scheme: cc|type|n|s

- cc = Cell ID
- type= sr01 (server #01)
- demn (daemon)
- dmgr (Deployment mgr)
- agnt (Node Agent)
- n = System ID (SYSA)
- s = Servant or Adjunct

HFS Config root: OMVS.B8CELL.B8NODEA.CONFIG.HFS
mounted at /wasv85config/b8cell/b8nodea

Start Command to Start WebSphere Application Server:
s b8acra, jobname=b8sr01a,
  env=b8cell.b8nodea.b8sr01a

Reviewing BPM Product History

WAS V.5:
WBISF (WebSphere Business Integration Server Foundation) V. 5.1

WAS V.6.1: WebSphere Business Process Management for V.6.1.2
Included WPS, WESB, WBSF/Fabric, and Bus. Monitor
These products pre-req'd the Feature Packs for XML, SCA, & SDO.

WAS V.7: BPM V7, but many still called it WPS V.7
+ WLE (WebSphere Lombardi Edition) V. 7.1 & 7.2

BPM:PS V7.5
("IBM Business Process Manager Advanced: Process Server") V. 7.5
- Still pre-req'd the Feature Packs for XML, SCA, & SDO.
- Dropped the "WebSphere" name. Included WLE - WebSphere Lombardi Edition

WAS V8: BPM:PS V. 8

WAS V8.5: BPM: V. 8.5 (April, 2013)
- Added "Advanced-Only" Configuration.
Reviewing HFS Directories, Roots & Homes

All directory names are user-defined...
here are examples of our servers:

**SMP/E installed Product HFS – Read/Only:**

```
wasmpe = /shared/zWebSphere/V8R5
```

**Configuration HFSes for each node – Read/Write:**

**Mount Points (WAS_HOME directories):**

- **Dmgr:** /wasv8config/b8cell/b8dmnode/DeploymentManager
- **NodeA:** /wasv8config/b8cell/b8nodea/AppServer

- **profile_roots:**
  
  `<WAS_HOME>/profiles/default`

- **server_home:**
  
  `<profile_home>/config/<cell>/nodes/<node>/servers/<server>`

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The Profile Management Configuration Tool (zPMT)

Is a workstation graphical tool that captures key names, values and input from you and consistently imbeds those values in customized batch jobs.

- **Hmmm, I’ll supply the following values …**

  - **Customized Batch JCL jobs**
    
    These get uploaded to z/OS where they’re submitted, one after another, to create the configuration runtime.
    
    Uploading and running the jobs is the easy part.

- **The real challenge is coming up with all the names and values and ports the PMT is going to ask for.**

  - **Without a plan for those names you’ll very quickly get confused.**
Techdoc PRS4944: WAS V8.5 Planning Spreadsheet

An Excel spreadsheet that makes planning values and using the PMT much easier … it helps enforce a disciplined “top down” design:

Provide key variables in the “Variables” sheet

Copy the generated variables from the appropriate worksheet and paste into Notepad to create a file

Then point to the file in the “Response File” field of the window where you gave the definition a name

Then just tab through the PMT windows and generate the jobs

Creating the target Servers

For WAS V8.5, you must use the Profile Management Tool (zPMT)
- part of WebSphere Customization Toolbox (WCT)
  - Select Version 8.5,
  - Create Management, Managed (Custom) node
Using SDSF

Monitoring WAS Address Spaces (Started Tasks):
Use the DA (display active) command to get a good view of your server address spaces.
- Use SDSF commands to 'set display on/off' and 'set action on/off'
- Use the 'PREfix' or Filters to limit the rows (Jobnames) displayed.
- Use the 'ARRange' command or pull-down to put interesting columns on the first panel.
- Sort on JobName (instead of JobID or CPU%) to keep the rows from jumping around.
Working in the HFS on z/OS

Telnet Clients
- Putty
- TeraTerm Pro

ISPF
- OMVS or =0.4
- IShell or =0.3

z/OS UNIX Directory List Utility =3.17

FTP client - WS-FTP

Editing files (in EBCDIC):
- vi or vim (in telnet sessions)
- oedit (in OMVS environment)

Editing ascii files:
- viascii (in telnet sessions)
- oeascii (in OMVS environment)

Converting files to/from ascii or ebcidic:
- `iconv -f IBM-1047 -t ISO8859-1 SIBAPP.ddl > SIBAPP_ascii.ddl`
- or use my `cvtA2E.sh` & `cvtE2A.sh` scripts in `/u/user1/wpswork/`
  - Works with OMVS also!

Looking at logs created in ascii:

Use viascii or a2e (or vi with z/OS 1.13):
- `viascii wsadmin.traceout`
- `cat wsadmin.traceout | a2e | pg`

ISPF 3.17 (with z/OS 1.9)

Convert to EBCDIC:
- `iconv -f ISO8859-1 -t IBM-1047 wsadmin.traceout > wsadmin.traceout.ebc`

Use FTP Client:
Download to your workstation or 'View' in 'Binary' mode.
UNIX Commands you should know...

cat - Concatenate or display text files
cd - Change the working directory
chgrp - Change the group owner of a file or directory
chmod - Change the mode of a file or directory
chmount - Change the mount attributes of a file system
chown - Change the owner or group of a file or directory
cp - Copy a file
date - Display the date and time
df - Display the amount of free space in the file system
diff - Compare two text files and show the differences
.dot - Run a shell file in the current environment
echo - Write arguments to standard output
exit - Return to the shell’s parent process or to TSO/E
export - Set a variable for export
extattr - Set, reset & display extended attributes for files
find - Find a file meeting specified criteria
grep - Search a file for a specified pattern
head - Display the first part of a file
history - Display a command history list
iconv - Convert characters from one code set to another
id - Return the user identity
kill - End a process or job, or send it a signal
link - Create a hard link to a file
ln - Create a link to a file
ls - List file and directory names and attributes
man - Display online reference manual
mkdir - Make a directory
more - Display files on a page-by-page basis
mount - Logically mount a file system
mv - Rename or move a file or directory
nohup - Start a process that is immune to hang ups
pax - Interchange portable archives
ps - Return the status of a process
pwd - Return the working directory name
rm - Remove a file or directory entry
r - Process a command history list
set - Set or unset command options and positional params
sh - Invoke a shell
su - Change the user ID associated with a session
tail - Display the last part of a file
touch - Change the file access and modification times
unmount - Remove a file system from the file hierarchy
vi - Use the display-oriented interactive text editor
whence - Tell how the shell interprets a command name
who - Display information about current users
whoami - Display your effective user name
zfsadm - manage zFS file systems and aggregataes
Skills for these Labs (we can help you)

MVS TSO Skills:
- ISPF - Edit, Submit jobs, Search, PFKeys, Screen size format (=0)
- SDSF - Control jobs, STCs, Browse Output, Syslog
- MVS Commands
- RACF, WLM, RMF, MXI panels/commands
- WAS Modify (f) command
- SHELL (o.3) & OSHELL = OMVS (o.4)
- PCOM terminal emulator - Keyboard, translate tables, Screen size (50x133)

UNIX skills:
- basic shell commands
- vi, viasii, awk, grep, a2e, iconv
- shell scripts, jacl, ant scripts

WebSphere skills:
- InfoCenter
- Administrative Console = Integrated Solutions Console (ISC)
- wadmin.sh

Other tools:
- telnet clients: TeraTerm, putty (watch out for backspace key!)
- FTP
- DB2 utility - ADBL, SPUFI

Arrange your teams so you have a good mix of skills!

Take advantage of these labs to learn more of these!

Integrated Solutions Console (ISC)

Installs with WebSphere & Invoked from a browser, which controls:

- Configuration
- Application deployment
- Operation of servers

http://wg31:8505/ibm/console
http(s)://<host>:<port>/ibm/console

Note: ISC Security Errors with self-signed certificates
- These can be safely ignored in these labs.
- (In the real world, this error should be taken seriously)
Check option to “Synchronize changes with Nodes”

Resources defined at various Scopes
System Information for the Labs

System Information for BPM:PS z/OS Labs

This handout contains information you need for the labs to customize IBM Business Process Manager Advanced for z/OS: Process Server (BPM:PS).

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#### Basic z/OS system information:
- System name: WG31
- Sysplex name: WSLPLEX
- Operating System Level: z/OS 1.12
- System procilib: SYS1 PROCLIB
- System EXE CLibrary: SYSS.WSC SYSEXEC
- System parmlib: SYSS.PARMLIB

TCP/IP Information: (Substitute your team # for 'w')

#### Key Points:
- Each team has their own z/OS image
- You all use “wg31” as your IP host, but it resolves to the specific guest machine by the workstation “hosts” file.
- We can re-clone your guest machine … be careful but if you break something we can fix it
- Lots of virtualization going on … good environment, but we may see slowdowns.
  Please understand we’re in a test environment here

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The Lab Environment for this Workshop

Just so you have an understanding of what’s “real” behind the labs

<table>
<thead>
<tr>
<th>LPAR</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Team 01 Guest</td>
<td>Team 02 Guest</td>
<td>Team 03 Guest</td>
<td></td>
</tr>
<tr>
<td>z/OS 1.12</td>
<td>z/OS 1.12</td>
<td>z/OS 1.12</td>
<td></td>
</tr>
<tr>
<td>4.0GB storage</td>
<td>4.0GB storage</td>
<td>4.0GB storage</td>
<td></td>
</tr>
</tbody>
</table>

z/Virtual Machine Version 5 Release 3.0
40 guest images, not all running

LPAR: 16 CPs & 104 GB Storage

IBM 196
(Currently 25 LPARs)

wg31.washington.ibm.com
HOSTS = xxx.xxx.xxx.201

wg31.washington.ibm.com
HOSTS = xxx.xxx.xxx.2nn

Key Points:

- Each team has their own z/OS image
- You all use “wg31” as your IP host, but it resolves to the specific guest machine by the workstation “hosts” file.
- We can re-clone your guest machine … be careful but if you break something we can fix it
- Lots of virtualization going on … good environment, but we may see slowdowns.
  Please understand we’re in a test environment here
Your Lab Environment

Your Lab Environment

Each team has its own MVS system

You have considerable authority (UID=0, RACF Special)
--- be careful!

z/OS systems' host name = wg3n.washington.ibm.com or wg3n... which is resolved to their IP address through a "hosts" file in

c:\windows\system32\drivers\etc\hosts

Team 1: 192.168.17.201 wg31.washington.ibm.com wg31
Team 2: 192.168.17.202 wg32.washington.ibm.com wg32
... ...

NAT translation

http://wg31:8505/ibm/console

VM

TEAM 1
Host: wg31.washington.ibm.com
IP: 192.168.17.201
User: USER1
UID0: SYSADM1

TEAM 6
Host: wg31.washington.ibm.com
IP: 192.168.17.206
User: USER1
UID0: SYSADM1

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IBM Americas Advanced Technical Skills
Washington Systems Center, Gaithersburg, MD
Team up with a Lab Partner:
- Move to a workstation with a Team #
- Pair up with someone with complimentary skills.
  (3270, telnet, vi)
  (Java, RAD workbench)
- See “Basic System Info” behind Lab #2
- Logon as USER1
- 2nd team member can logon on as USER2
- 2nd team member logon to ISC as HUTCH

Note: All Lab documents are on your workstation as PDFs in: ZBPM8 Folder on your workstation desktop

¿Questions?
Always ask if it isn't clear!