WebSphere Application Server – Being the Backup Administrator

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SHARE in Anaheim 2012

WebSphere Application Server on z/OS

Session	Day	Time	Room	Title	Speaker
11377	Monday	11:00	Grand Ballroom Salon B	What Can I Do With the SMF 120s?	David Follis
11371	Monday	3:00	Orange County Salon 2/3	Administrator Hands On Lab	David Follis / Michael Stephen / Ken Irwin
11378	Tuesday	12:15	Grand Ballroom Salon B	Spelunking the Admin Console	John Hutchinson
11375	Tuesday	4:30	Grand Ballroom Salon B	Being the Back-Up Administrator	Mike Loos
11374	Wednesday	11:00	Grand Ballroom Salon B	Liberty Profile – Rumors Dispelled	David Follis
11373	Thursday	4:30	Grand Ballroom Salon B	What's New?	David Follis / John Hutchinson / Michael Stephen
11376	Friday	8:00	Platinum Ballrom Salon 10	zWAS – In Real Life	David Follis / Rod Feak

The Backup Administrator

- Needs to know:
  - Something about Unix.
    - Simple set of commands.
    - Filesystem layout and setup.
  - Something about Websphere.
    - Basic architecture.
    - Your naming convention.
    - Your port numbering convention.
    - Navigation of the adminconsole.
    - Any local "procedures"

The Backup Administrator

- Needs to know:
  - Some systems programming topics.
    - PROCLIB location.
    - WLM stuff.
    - RMF stuff.
  - Security Topics.
    - Unix stuff.
    - z/OS stuff.
    - Hybrid stuff.
      - *FACILITY class.*
      - *UNIXPRIV class*
      - *WebSphere stuff.*

Something about UNIX

- Shells...

  - ISHELL   Unix tricycle.

  - OMVS   Unix on training wheels

  - Telnet   Unix.

  - 3.14   Interesting...

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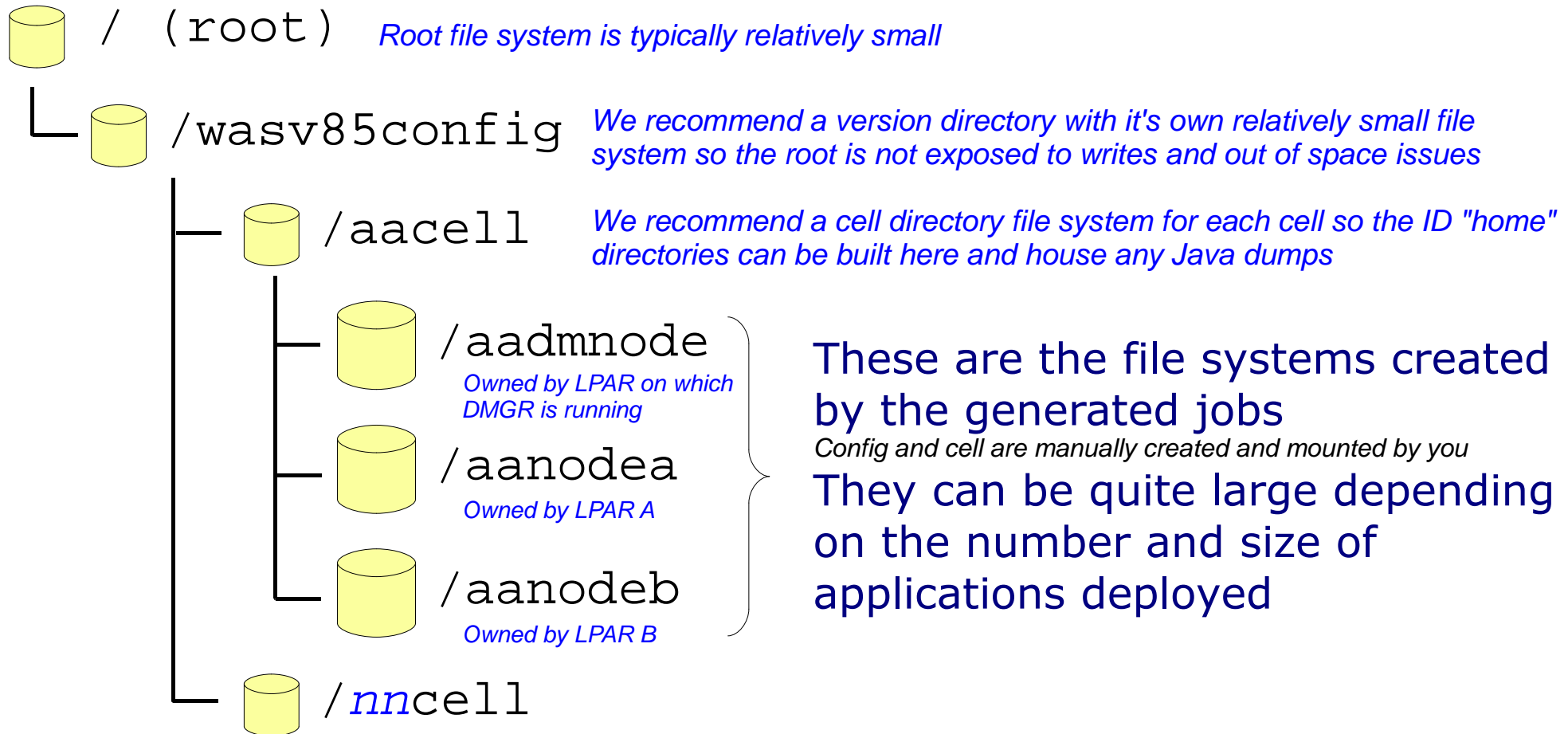# Something about UNIX

- Some commands
    - pwd
    - chmod
    - chown
    - ls
    - mkdir
    - rm
    - cat
    - vim (and avim)
    - mount
    - unmount

    - chmount
    - df
    - zfsadm
    - netstat
    - man
    - bpxmtext

How We Generally See the File Systems Deployed

Here's a picture that shows how the file system would be created and mounted based on the jobs generated using the PRS4686* planning spreadsheets:

/ (root) *Root file system is typically relatively small*

/wasv85config *We recommend a version directory with it's own relatively small file system so the root is not exposed to writes and out of space issues*

/aacell *We recommend a cell directory file system for each cell so the ID "home" directories can be built here and house any Java dumps*

/aadmnode
Owned by LPAR on which DMGR is running

/aanodea
Owned by LPAR A

/aanodeb
Owned by LPAR B

These are the file systems created by the generated jobs
Config and cell are manually created and mounted by you

They can be quite large depending on the number and size of applications deployed

/nncell

DMGR file system …

The Essential Structure of DMGR Configuration Tree

Here's a snapshot of some of the key elements of the configuration structure:

```
/wasv85config/aacell/aadmnode/DeploymentManager
  /bin ◄┄┄┄┄┄┄┄┄┄┄┄┄┄┄
  /installableApps
  /java
  /java64
  /lib ◄┄┄┄┄┄┄┄┄┄┄┄┄┄┄
  /profiles
     /default
        /bin
        /config
        /cells
           /<cell_long_name>
              XML Files
           /nodes
              /<node_long_name>
                 XML Files
              /servers
                 /<server_long_name>
                    XML Files
        /logs
        /properties
        /wstemp
```

Deployment Manager's mount point and root

Shell scripts, JAR files and shared object modules

Java symlinked from here

Other platforms use "profiles" to allow multiple cell configurations in the same install root. But on z/OS we separate configuration from install so one profile is sufficient

This is the heart of it

All the nodes and all the servers and their properties for the whole cell represented here

Identical to distributed in basic structure; different in certain ways we'll show

`logs` -- where things like WSADMIN logging goes
`properties` -- key properties files for functions and activities
`wstemp` -- temporary directory that you can clean periodically
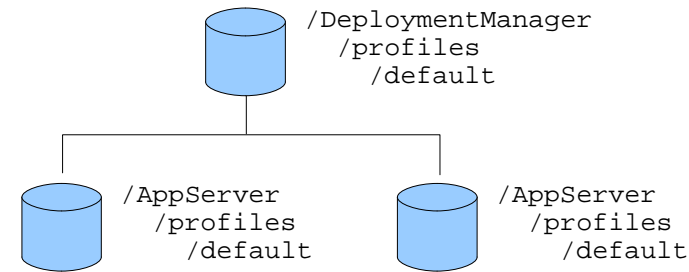
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Node file system ...

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Each Managed Node Has Similar Configuration

The key difference is in that it maintains only partial awareness of *other* nodes but *full awareness of itself:*
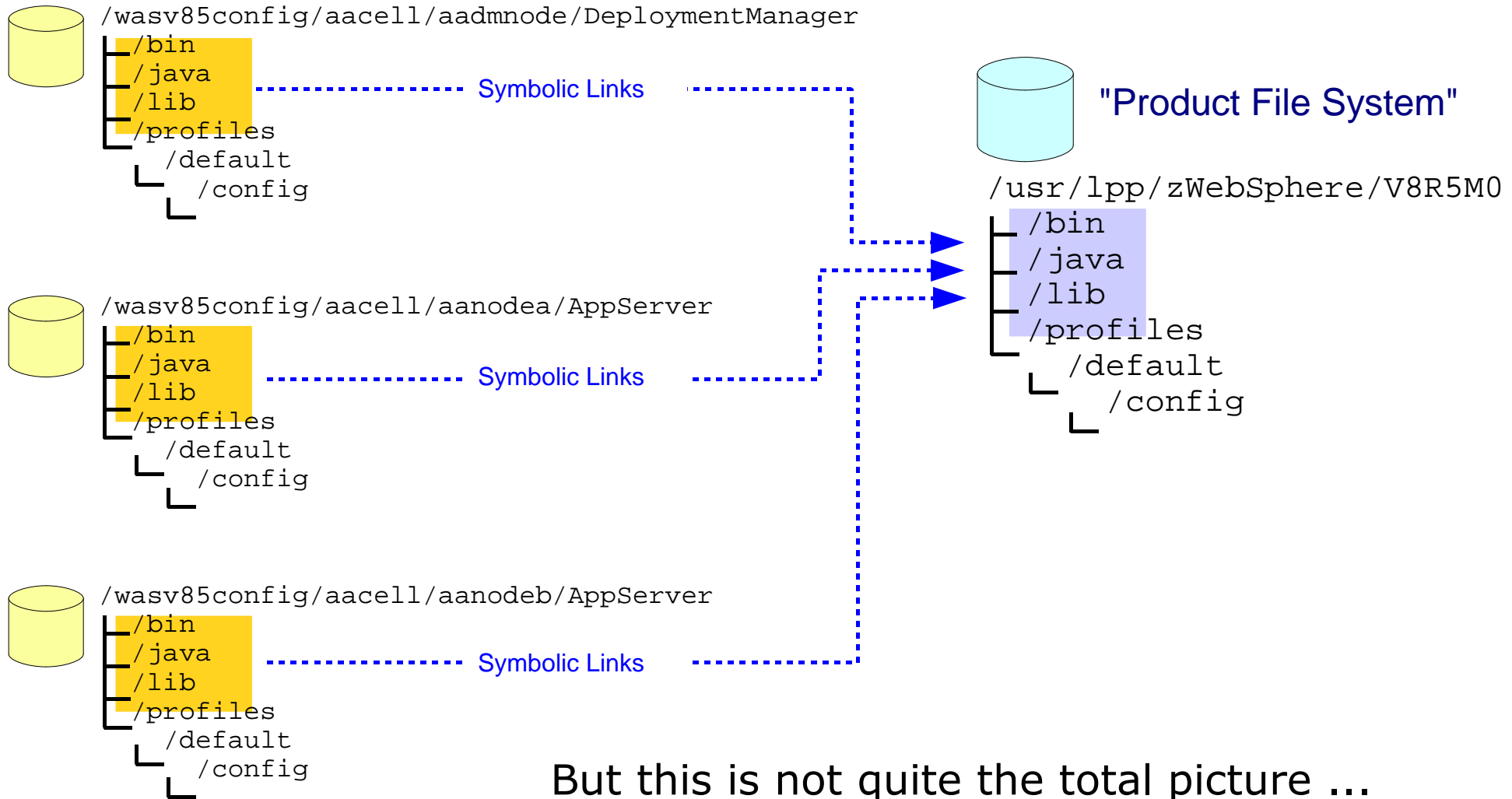
```
/wasv85config/aacell/aanodea/AppServer
   /bin
   /installableApps
   /java
   /java64
   /lib
   /profiles
      /default
         /bin
         /config
            /cells
               /<cell_long_name>
                  XML Files
                  /nodes
                     /<node_long_name>
                        XML Files
                        /servers
                           /<server_long_name>
                              XML Files
         /logs
         /properties
         /wstemp
```
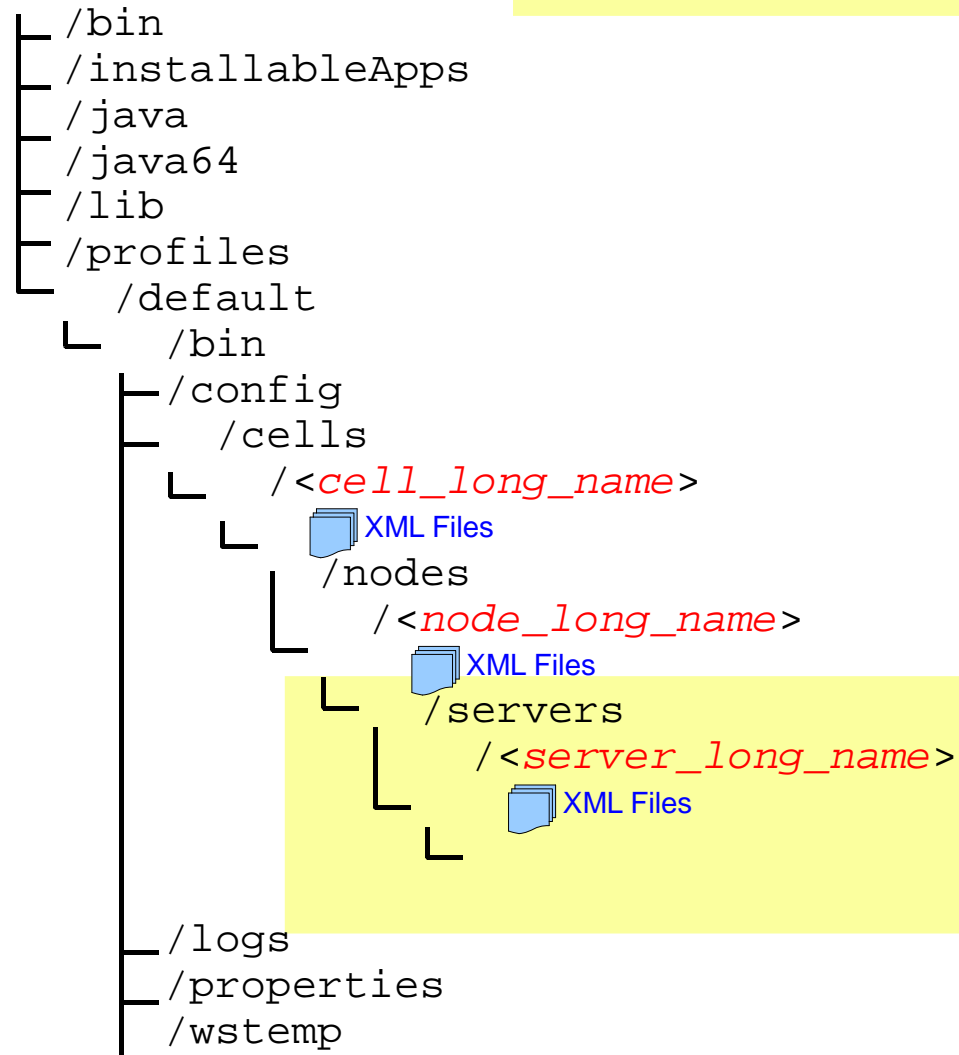
The mount point and the node root are different because this is a different node from the Deployment Manager node

```
                    /DeploymentManager
                         /profiles
                            /default


      /AppServer              /AppServer
       /profiles               /profiles
          /default                /default
```

It will have a directory for each node. Other nodes have some meta-data files that provides the partial information.
But the node directory for itself and the servers under it are fully populated with detailed XML
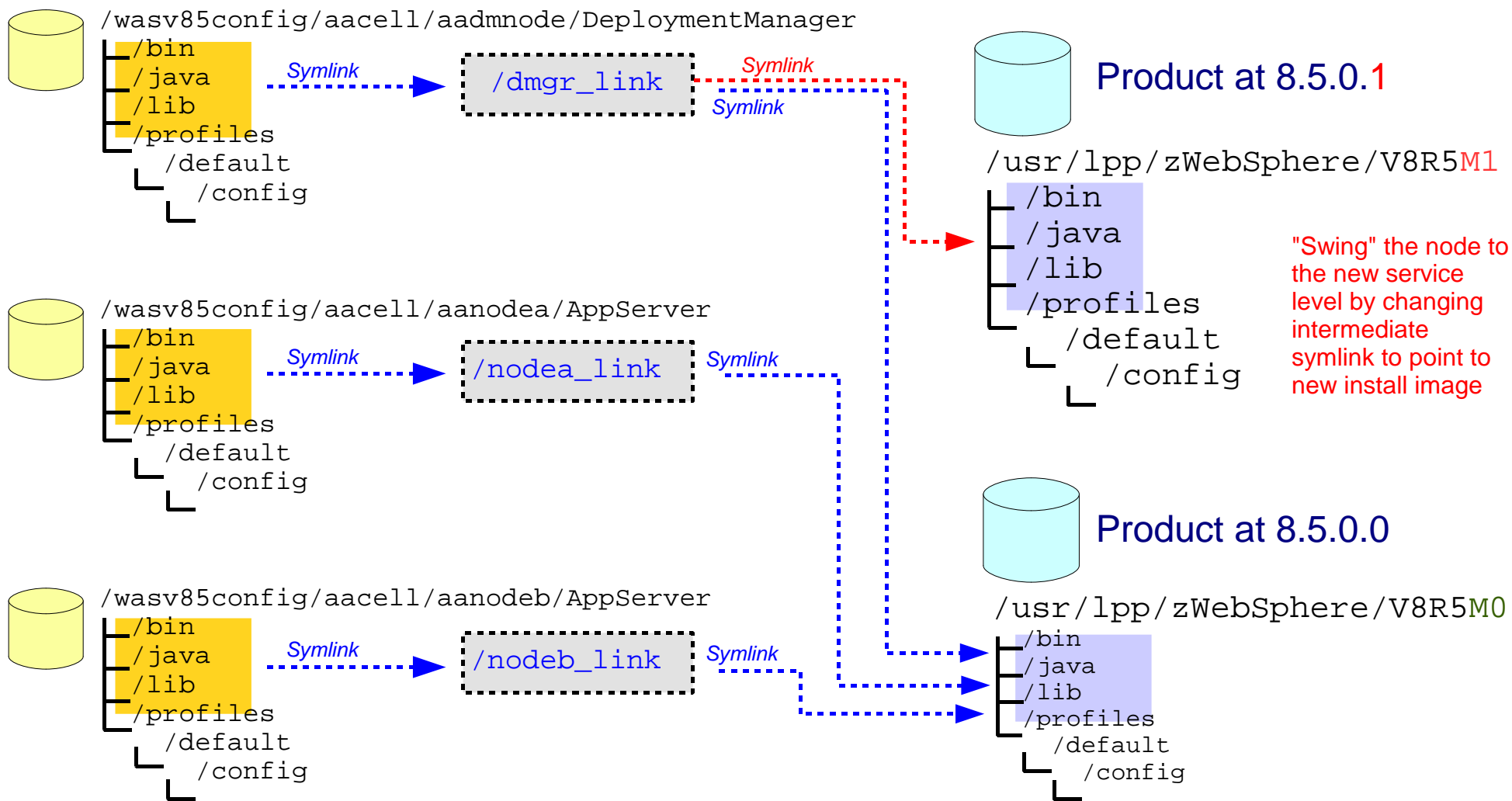
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Relationship to install image …

Relationship to "Install Image"

The "install image" is the file system that contains the product binaries. The configuration file systems link to that via symbolic links:

```
/wasv85config/aacell/aadmnode/DeploymentManager
  /bin
  /java
  /lib
  /profiles
     /default
        /config
```

Symbolic Links

"Product File System"

```
/usr/lpp/zWebSphere/V8R5M0
  /bin
  /java
  /lib
  /profiles
     /default
        /config
```

```
/wasv85config/aacell/aanodea/AppServer
  /bin
  /java
  /lib
  /profiles
     /default
        /config
```

Symbolic Links

```
/wasv85config/aacell/aanodeb/AppServer
  /bin
  /java
  /lib
  /profiles
     /default
        /config
```

Symbolic Links

But this is not quite the total picture ...

Intermediate symlinks …

Intermediate Symbolic Links

We've taken this symlink structure one step further by introducing an "intermediate symbolic link" for each node between the node and the install image:

```
/wasv85config/aacell/aadmnode/DeploymentManager
  /bin
  /java           Symlink                    /dmgr_link              Symlink
  /lib
  /profiles                                                  Symlink
     /default
        /config
```

Product at 8.5.0.1

```
/usr/lpp/zWebSphere/V8R5M1
  /bin
  /java
  /lib
  /profiles
     /default
        /config
```

"Swing" the node to the new service level by changing intermediate symlink to point to new install image

```
/wasv85config/aacell/aanodea/AppServer
  /bin
  /java           Symlink                    /nodea_link             Symlink
  /lib
  /profiles
     /default
        /config
```

Product at 8.5.0.0

```
/usr/lpp/zWebSphere/V8R5M0
  /bin
  /java
  /lib
  /profiles
     /default
        /config
```

```
/wasv85config/aacell/aanodeb/AppServer
  /bin
  /java           Symlink                    /nodeb_link             Symlink
  /lib
  /profiles
     /default
        /config
```

WebSphere Basic Architecture

- WebSphere configuration consists of:
  - Cells
    - Nodes
      - *Servers*
      - *Nodeagents*
    - Multinode config is appropriate for:
      - *Clusters of servers*

A WebSphere 'ND' Cell
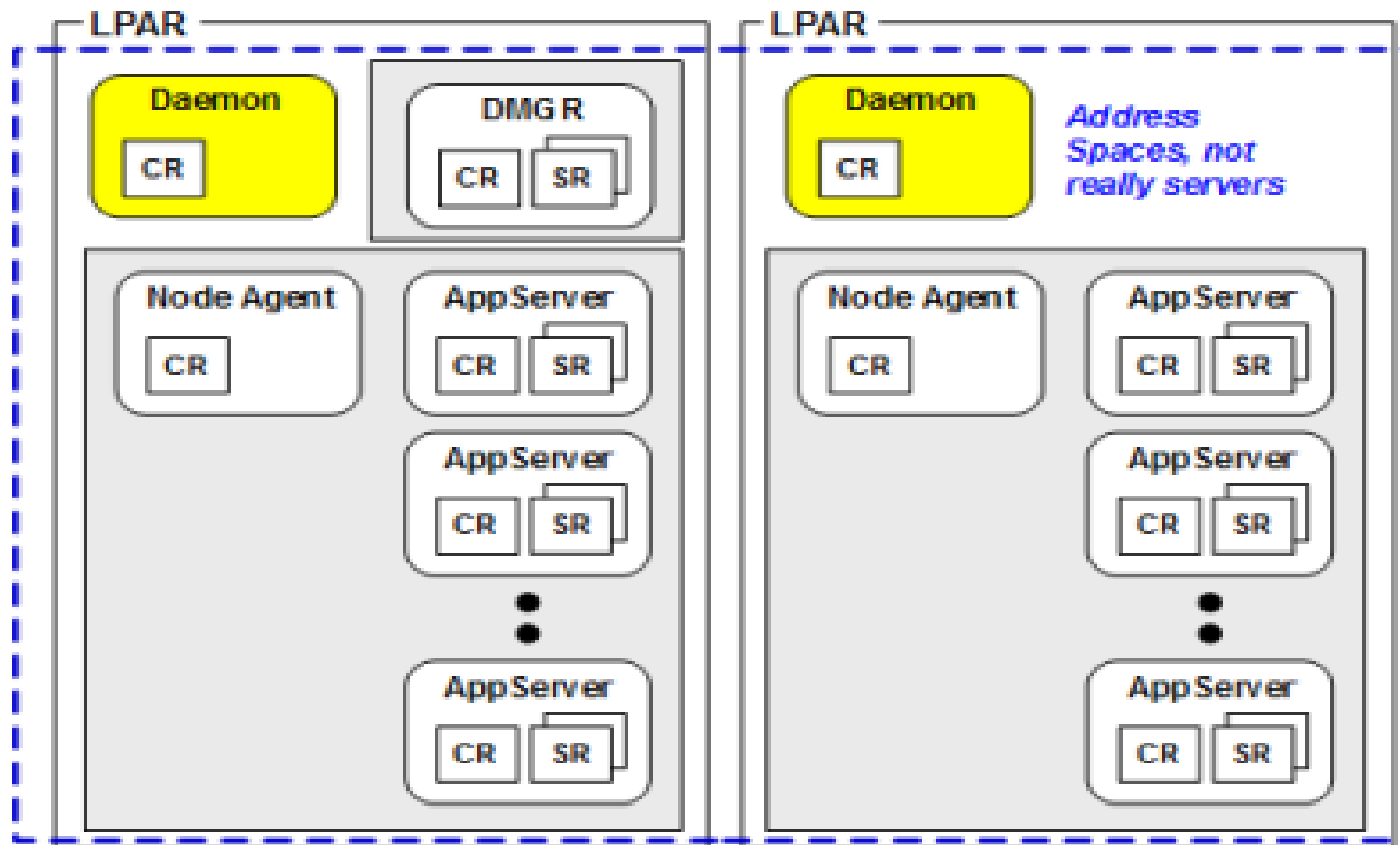
A Naming Convention...

WAS z/OS Short Names

Short names are part of WAS z/OS because of key length limitations imposed by the OS, and also as a way to associate WAS resources with lower-level z/OS resources:

z/OS has an 8 character limit for many things. WLM is going to take the last to append an "S" for servant
That leaves 7 characters to work with
How will you allocate that? The spreadsheet does this:

1	2	3	4	5	6	7	8
M	Y	S	R	0	1	A	

Must reserve the 8th for WLM

Cell Identifier   Server Identifier   System Identifier   Reserved for WLM
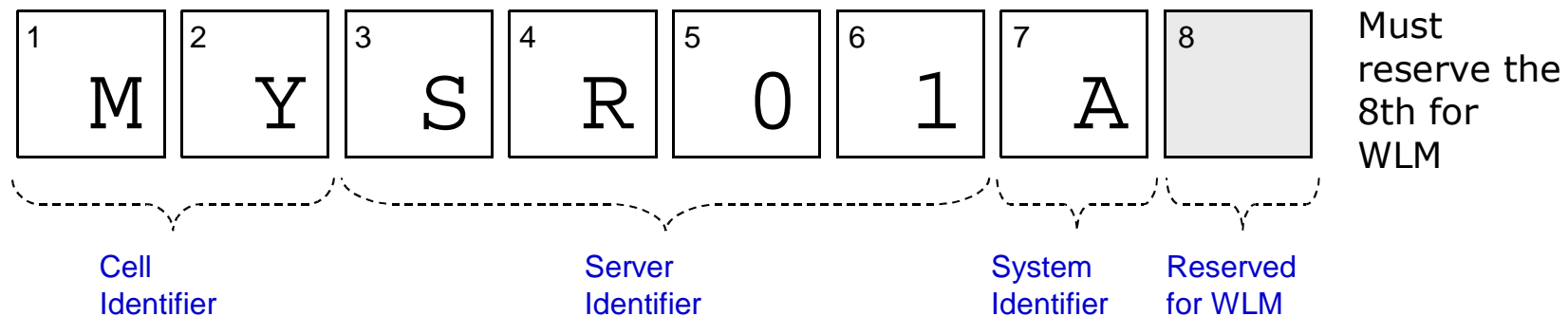
Starting every short name in a cell with the same characters is key ... it insures uniqueness between cells and allows you to quickly see everything related to a given cell

Variations exist to accommodate specific requirements
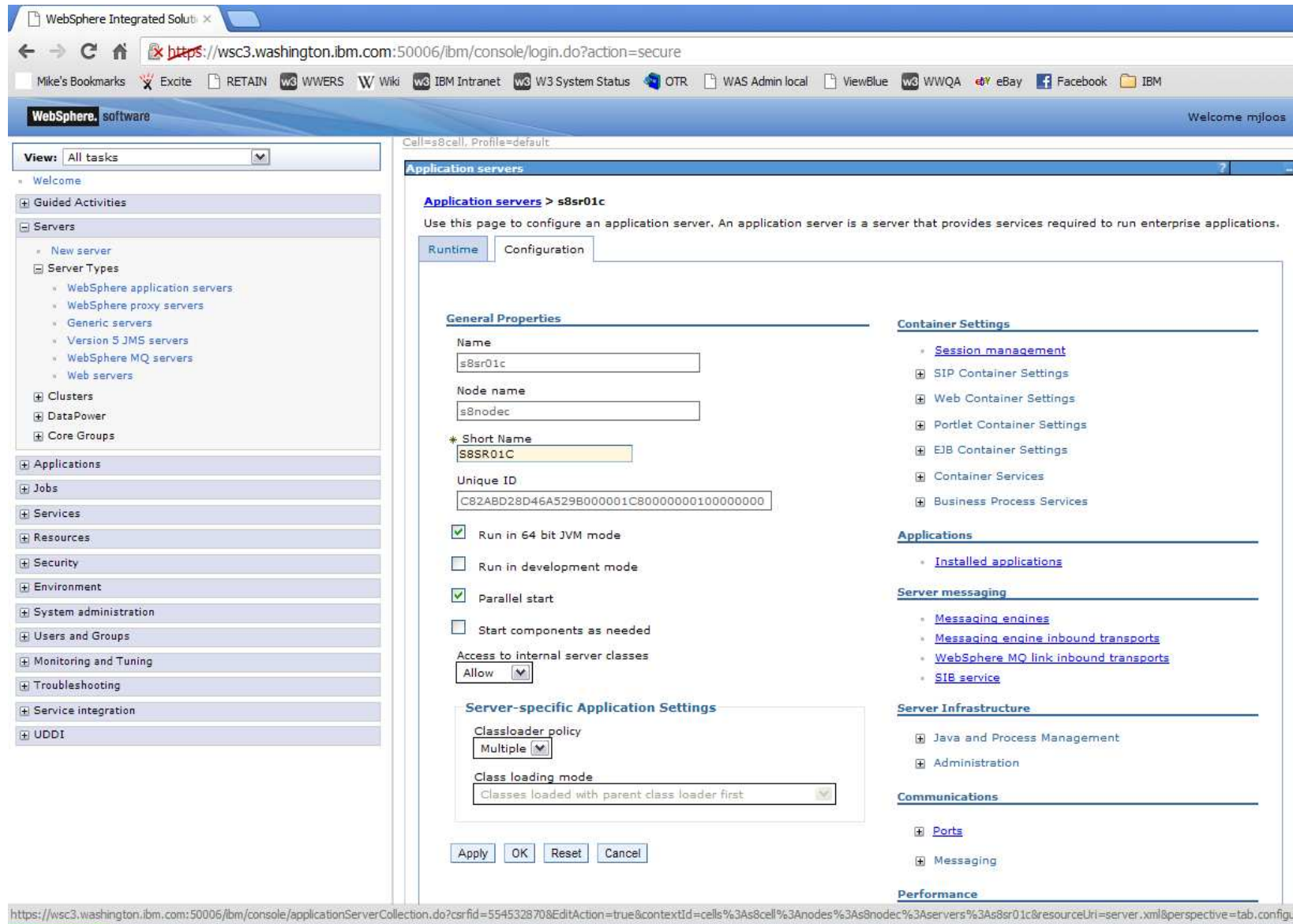
Adminconsole navigation.

Left-Side Navigator Bar for Admin Console

At this level the Admin Console is common across all platforms. The areas of focus for us in this workshop are indicated below:

Previous "Job Manager" function

Web Services

Focus of WSW07 workshop

With SAF in effect these roles are ignored
Performance Monitoring Tools

Configuration of the SIBus inside of WAS

Administration of servers in cell
Deploying and managing applications
Configuring access to data resources
Setting environment variables
Administration of nodes, Node Agents and the DMGR
Configuring logging and tracing

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Adminconsole navigation.

Complete your sessions evaluation online at SHARE.org/AnaheimEval

Local Procedures.

- Automation.
- Backup.
- Parmlib update serialization.
- Security.
- Basically, find out what the 'rules' are:
    - Follow them!

System Programming Topics.

- PROCLIB.
  - Where the one that is used for Started Task procedures is located.
  - Do you have access?
  - Names of the PROCs for a server.
- WLM Stuff.
  - Where the classification.xml file goes.
    - wlm_classification_file enviroment variable.
  - Which classes are available for your use.
  - Who is the local guru?

System Programming Topics.

- RMF stuff.
  - The most interesting info is in the type 72 record.
  - Run a Workload Activity Report to get the info into readable formats.
    - Keywords.
      SYSRPTS(WLMGL(SCPER(CBCLASS,CBFAST,CBSLOW)))
      SYSRPTS(WLMGL(RCPER))

Security Topics

- Unix stuff.
  - mode bits
    - drwxrwxrwx   octal representation
    - d755   directory, user can do everything (read,write,search), group member can read and search, others can read and search.
    - Each octet (111) (rwx) the corresponding bit allows access.
    - For files the low order bit allows the file to be executed, for directories it allows the directory to be searched.
  - Ownership
    - group:user

Security Topics

- z/OS stuff.
  - RACF STARTED class
  - RACF SERVER class
  - RACF FACILITY class
  - Certificate Stuff.
- Hybrid stuff.
  - FACILITY class stuff that is WebSphere specific.
  - BBO.TRUSTEDAPPS.**
  - BBO.SYNC.**
  - etc.

Security Topics

- Hybrid stuff...
  - UNIXPRIV class.
    - SUPERUSER.FILESYS
    - SUPERUSER.FILESYS.CHOWN
    - SUPERUSER.FILESYS.CHANGEPERMS
    - SUPERUSER.FILESYS.MOUNT
    - SUPERUSER.FILESYS.PFSCTL
    - etc.
  - WebSphere stuff.
    - RACF Classes.
      - *EJBROLE, CBIND, SERVER.*

Other Resources

- The WebSphere InfoCenter.
  - There is a link off of the adminconsole Welcome page.
- Techdocs website.
  - http://www.ibm.com/support/techdocs
- SHARE website for previous presentations.
  - By: Follis, Bagwell, Hutchinson, Loos, Kearney, Stephens, Boone.
- USS Manuals.
  - z/OS V1R10.0 UNIX System Services Command Reference – SA22-7802-xx
  - z/OS V1R10.0 UNIX System Services Planning – GA22-7800-xx
- My email address is: mikeloos@us.ibm.com

Summary

- Unix.
- WebSphere
- Security
- Don't be reluctant to ask for help.

System z Social Media

- System z official Twitter handle:
  - ▶ **@ibm_system_z**

- Top Facebook pages related to System z:
  - ▶ **Systemz Mainframe**
  - ▶ **IBM System z on Campus**
  - ▶ **IBM Mainframe Professionals**
  - ▶ **Millennial Mainframer**

- Top LinkedIn Groups related to System z:
  - ▶ **Mainframe Experts Network**
  - ▶ **Mainframe**
  - ▶ **IBM Mainframe**
  - ▶ **System z Advocates**
  - ▶ **Cloud Mainframe Computing**

- YouTube
  - ▶ **IBM System z**

- Leading Blogs related to System z:
  - ▶ **Evangelizing Mainframe (Destination z blog)**
  - ▶ **Mainframe Performance Topics**
  - ▶ **Common Sense**
  - ▶ **Enterprise Class Innovation: System z perspectives**
  - ▶ **Mainframe**
  - ▶ **MainframeZone**
  - ▶ **Smarter Computing Blog**
  - ▶ **Millennial Mainframer**

Questions?

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