



WebSphere Application Server for z/OS and OS/390

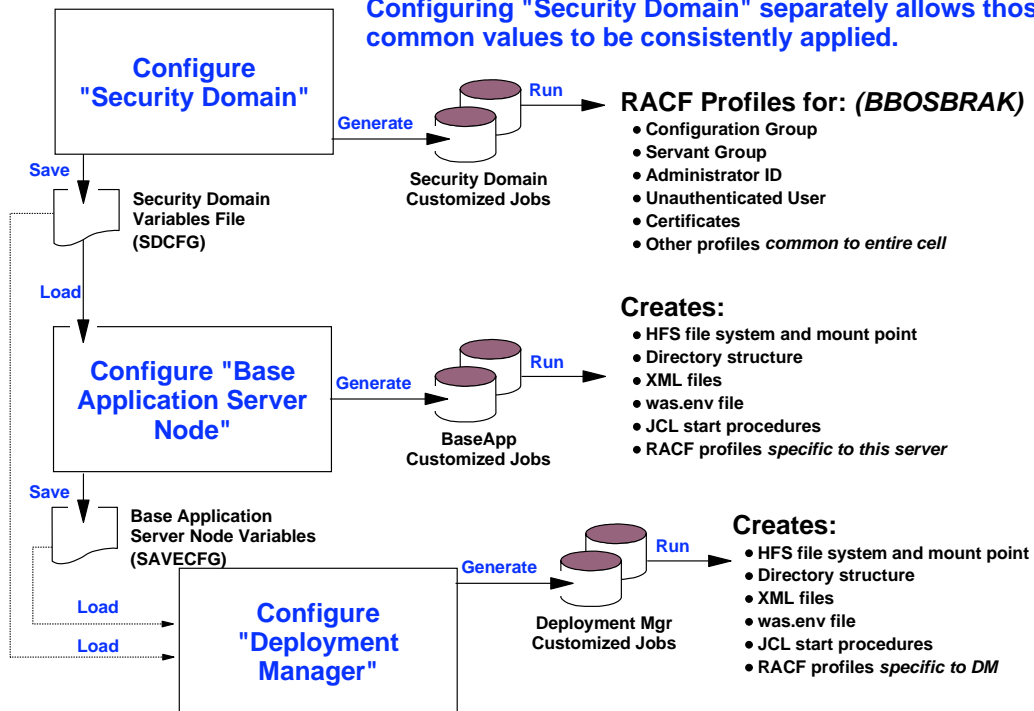
WebSphere for z/OS ISPF Dialog Mysteries Uncovered

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 Gaithersburg, MD, USA

High-Level of Configuration Process



Configuring "Security Domain" separately allows those common values to be consistently applied.



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Things to Watch Out For



ISPF saved variables

Automatically saved by ISPF

Saved by you in the dialogs

Loading Sequence

Default variables

Saved variables

Security Domain

Base Appserver

Deployment Manager

Target data set in job creation

After loading saved variables

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Notes About the Variables

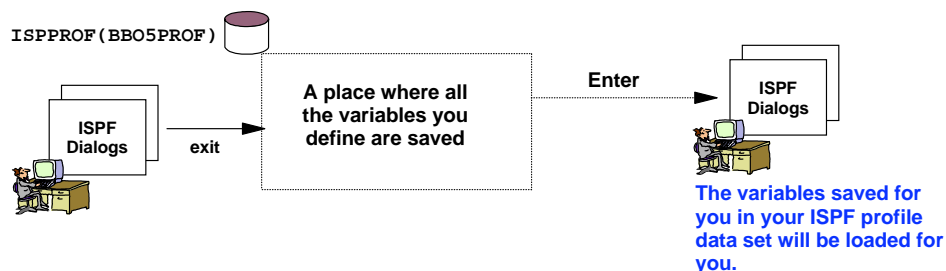


ISPF

Variables saved on your behalf

Member BBO5PROF is used | created when the dialog is entered.

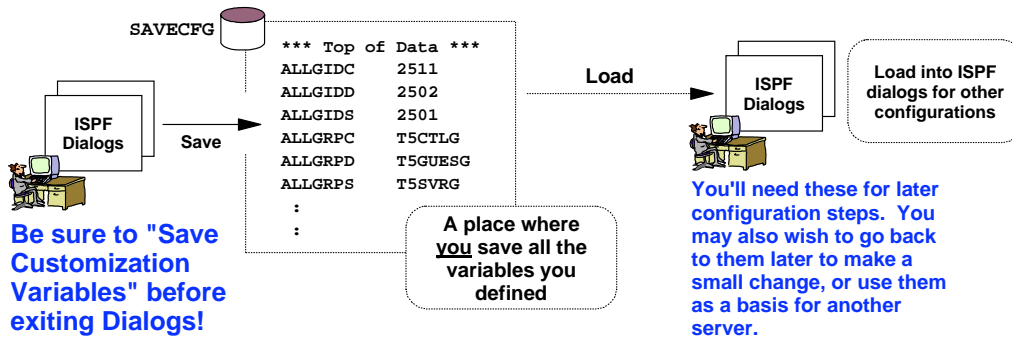
Variables are saved when dialog is exited



You should always save your variables using the dialog option.

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Notes About the SAVECFG Data Set

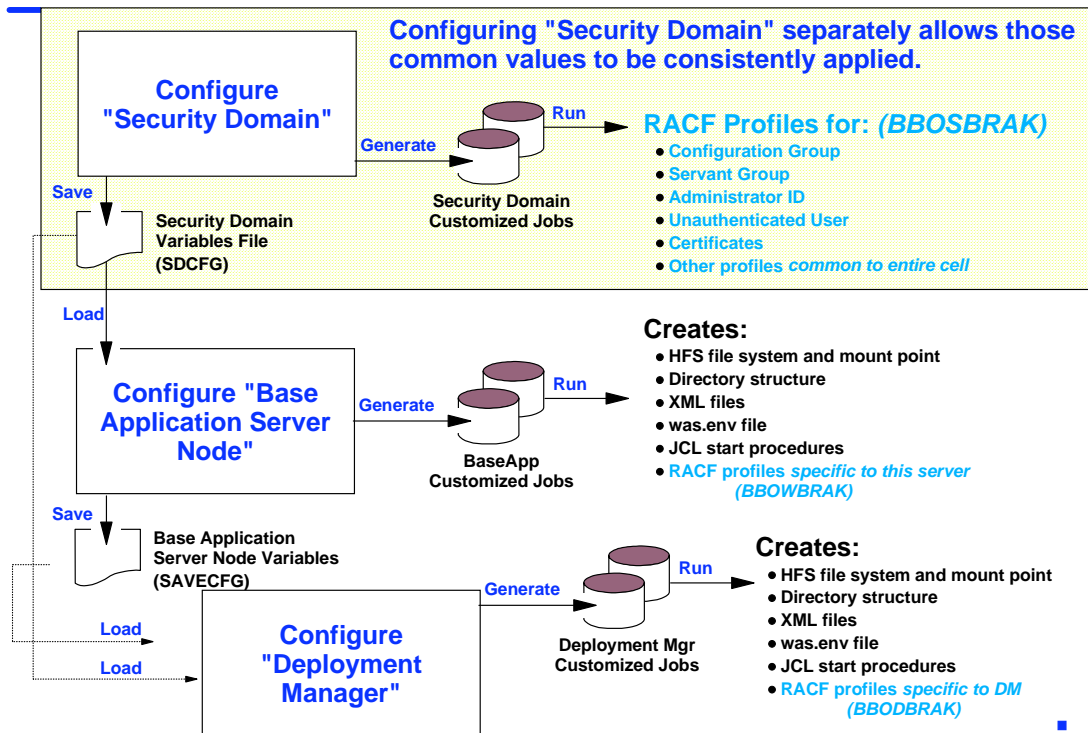


For different configurations, save into separate SAVECFG data sets:



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Configuring the Security Domain



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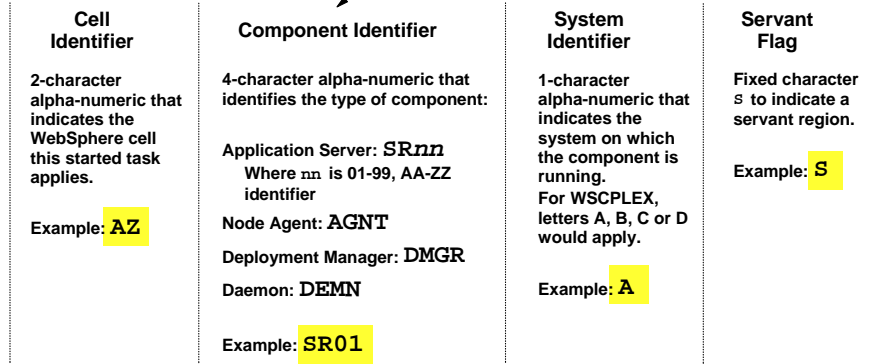
Naming Convention



Assume Server Short = JOBNAME for controller, then plan JOBNAMEs. Here's an example in use at the Washington Systems Center:

Key! Make first characters common for all JOBNAMEs in cell!

a a b b b b c d



AZSR01AS

"Server 01 servant in Cell AZ, running on SYSA"

Note: this naming convention, and the actual configuration that's based on it, is described in full detail:
<http://www.ibm.com/support/techdocs/atmastr.nsf/WebIndex/WP100367>

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Creating the Security Domain



Configure Security Domain

Use this dialog to define variables and generate customization jobs for your installation. Specify an option and press Enter.

High level qualifier for product data sets: WAS510.WAS

- 1 **Allocate target data sets.** The data sets will contain the customization jobs and data generated by the dialog.
- 2 **Define variables.** Define your installation-specific information for customization.
- 3 **Save security domain variables.** Save your security domain configuration variables in a data set for later use.
- 4 **Generate customization jobs.** Validate your customization variables and generate jobs and instructions.
- 5 **View instructions.** View the generated customization instructions.

Options for WebSphere Application Server for z/OS Customization Variables

- L **Load security domain variables.** Load your security domain configuration variables from a data set.

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Creating the Security Domain



Panel 2 of 2
(Servant Group and SSL configuration)

Panel 1 of 2

```

Use Security Domain Identifier in RACF Definitions: Y
Security Domain Identifier.....: T5CELL

Sysplex Name: WSLPLEX

Generate default RACF realm name: N
Default RACF realm name ....: WSLPLEX

WebSphere Configuration Group Information
Group...: WSCFG1          GID...: 2500

WebSphere Administrator Information
User ID..: WSADMIN       UID...: 2403
Password.: WSADMIN

Unauthenticated User Definitions for Base Servers
User ID..: WSGUEST      UID...: 2402
Group....: WSLGFP       GID...: 2502

WebSphere Asynchronous Administration Task
User ID..: WSADMSH      UID...: 2504

Configure for local OS security registry.....: Y
    
```

Used inEJBROLE and CBIND definitions in this domain (cell)

Owens the HFS and has read/write permissions. All WAS address spaces must be connected to this group.

CAUTION!
Password is stored in the clear in the saved variables data set. Change this later through your security system.

This userID is used to run processes on behalf of unauthenticated clients

Two panels that capture information about the security definitions common to the planned cell, not just the Base AppServer.

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Define Common Group & User IDs



ADDGROUP WSSR1 OMVS(GID(2501))

ADDGROUP WSCFG1 OMVS(GID(2500))

ADDGROUP WSLGFP OMVS(GID(2502))

Administrator

```

ADDUSER WSADMIN DFLTGRP(WSCFG1) OMVS(UID(2403) HOME(/tmp)
PROGRAM(/bin/sh)) NAME("WAS ADMINISTRATOR")
PW USER(WADMIN) NOINTERVAL
ALU WSADMIN PASSWORD(WADMIN) NOEXPIRED
ADDUSER WSADMSH DFLTGRP(WSCFG1) OMVS(UID(2504) HOME(/tmp)
PROGRAM(/bin/sh)) NAME("WAS Asynch Admin Task") NOPASSWORD
NOIDCARD
    
```

Unauthenticated client

```

ADDUSER WSGUEST RESTRICTED DFLTGRP(WSLGFP) OMVS(UID(2402) HOME(/)
PROGRAM(/bin/sh)) NAME("WAS DEFAULT USER")
    
```

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EJBROLES



Prefix for role definitions specified in security domain

```

/*Define roles used to access Administrator functions */
RDEFINE EJBROLE T5CELL.administrator UACC(NONE)

RDEFINE EJBROLE T5CELL.monitor UACC(NONE)

RDEFINE EJBROLE T5CELL.configurator UACC(NONE)

RDEFINE EJBROLE T5CELL.operator UACC(NONE)

/*Set up access to EJBROLES for administrator and CR */
PERMIT T5CELL.administrator CLASS(EJBROLE) ID(WSCFG1) ACCESS(READ)

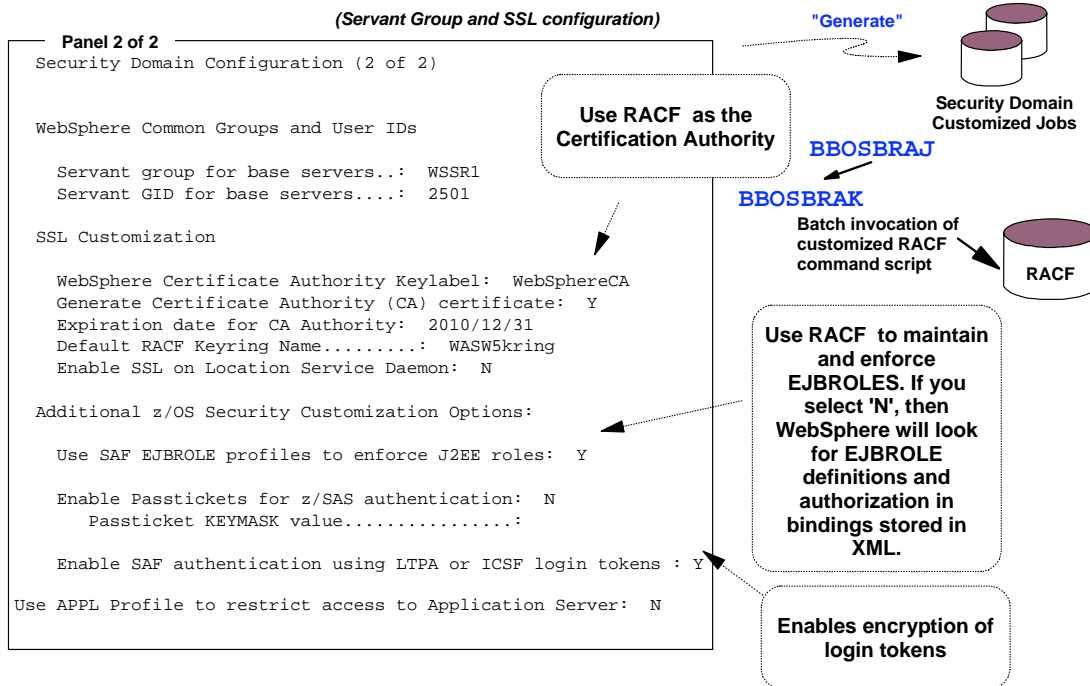
PERMIT T5CELL.monitor CLASS(EJBROLE) ID(WSCFG1) ACCESS(READ)

PERMIT T5CELL.configurator CLASS(EJBROLE) ID(WSCFG1) ACCESS(READ)

PERMIT T5CELL.operator CLASS(EJBROLE) ID(WSCFG1) ACCESS(READ)
    
```

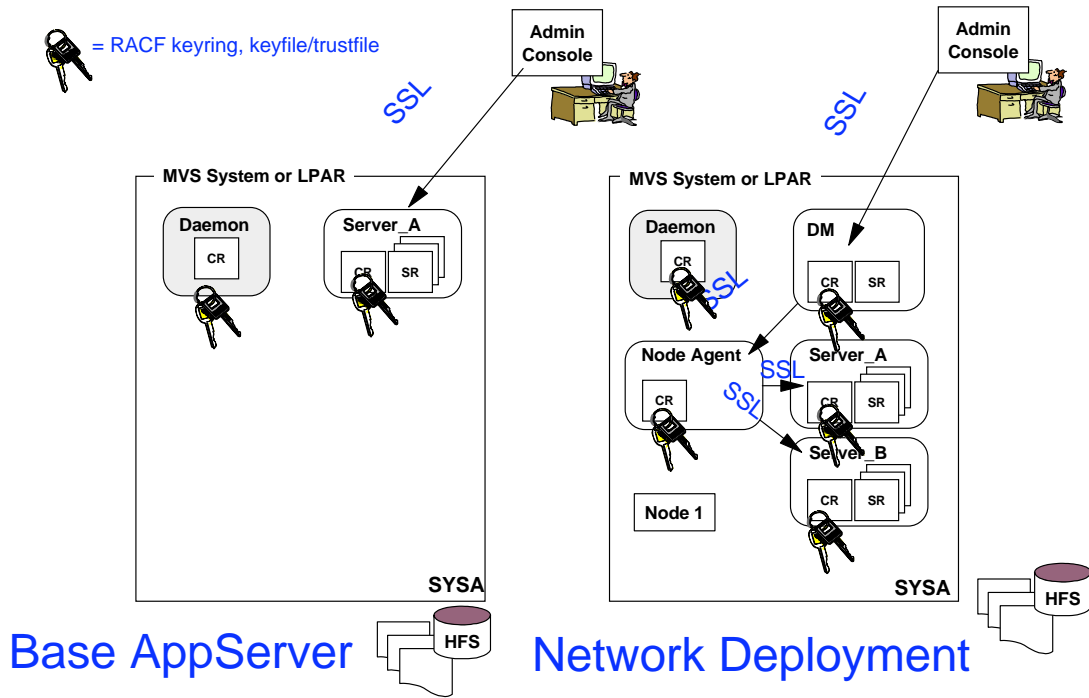
If 'N' was specified for Security Domain, then roles will simply be monitor, administrator, configurator and operator.

Creating the Security Domain



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SSL Configurations



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Keyring



Stored in RACF

Identified by UserID (owner)

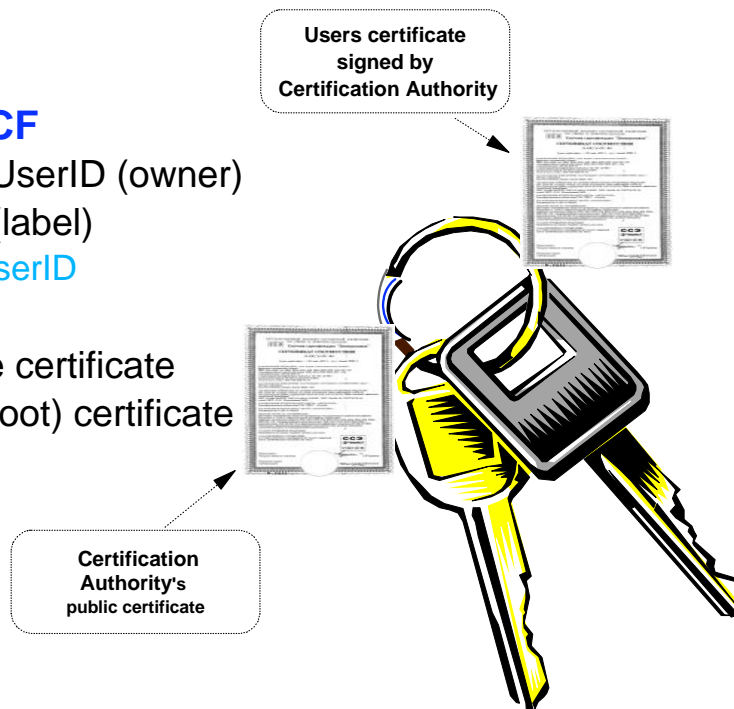
Has a name (label)

unique by UserID

Contains

User's private certificate

CA's public (root) certificate



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CA Certificate



```
Panel 2 of 2
Security Domain Configuration (2 of 2)

SSL Customization

WebSphere Certificate Authority Keylabel: WebSphereCA
Generate Certificate Authority (CA) certificate: Y
Expiration date for CA Authority: 2010/12/31
Default RACF Keyring Name.....: WASW5kring
Enable SSL on Location Service Daemon: N

Additional z/OS Security Customization Options:

Use SAF EJBROLE profiles to enforce J2EE roles: Y

Enable Passtickets for z/SAS authentication: N
Passticket KEYMASK value.....:

Enable SAF authentication using LTPA or ICSF login tokens : Y
```

Only created if you specified 'Y'



/* Create CA Certificate for WebSphere Security Domain

```
RACDCERT CERTAUTH GENCERT
SUBJECTSDN(CN('WAS CertAuth for Security Domain') OU('T5Cell.WebSphere for zOS'))
WITHLABEL('WebSphereCA')
TRUST NOTAFTER(2010/12/31)
```

Key Ring Access

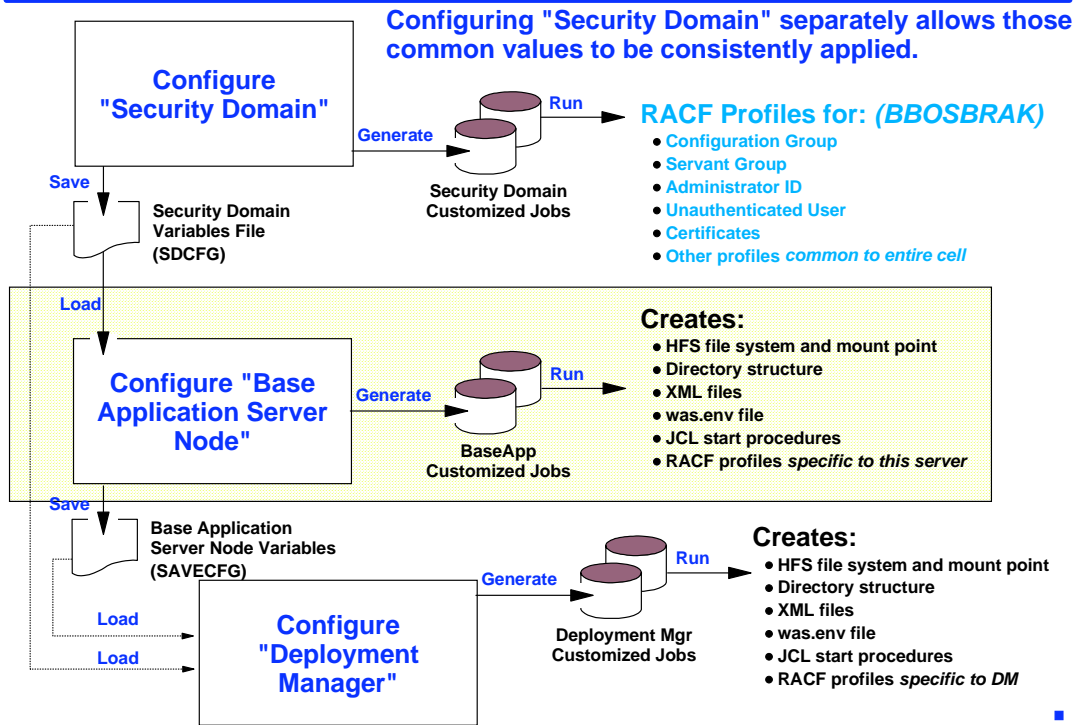


/* Protect access to keyrings */
/* Permit server access to keyrings */

```
RDEFINE FACILITY IRR.DIGTCERT.LIST UACC(NONE)
RDEFINE FACILITY IRR.DIGTCERT.LISTRING UACC(NONE)
PERMIT IRR.DIGTCERT.LIST CLASS(FACILITY) ID(WSCFG1) ACC(READ)
PERMIT IRR.DIGTCERT.LISTRING CLASS(FACILITY) ID(WSCFG1) ACC(READ)
```

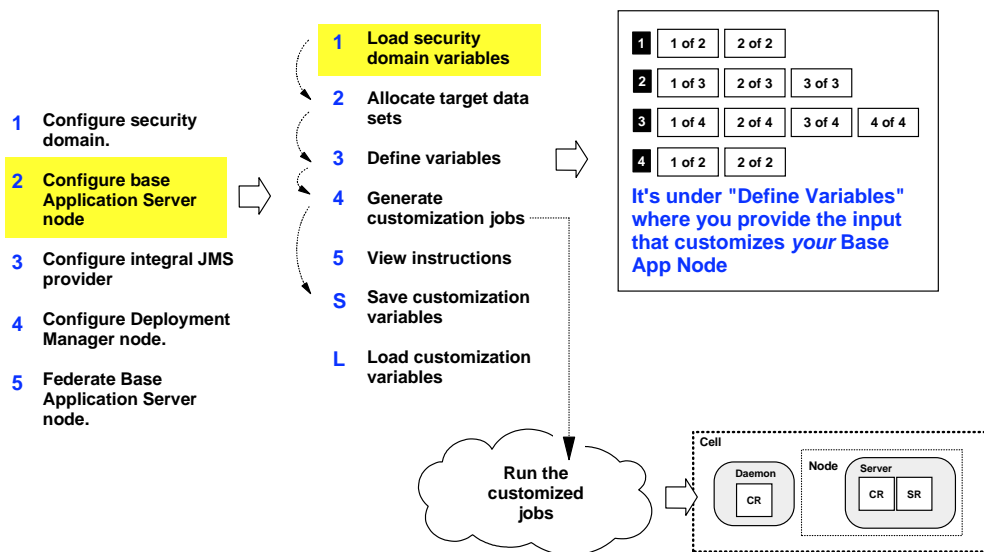


High-Level of Configuration Process



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The Flow of the ISPF Panels



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Inside "Define Variables"



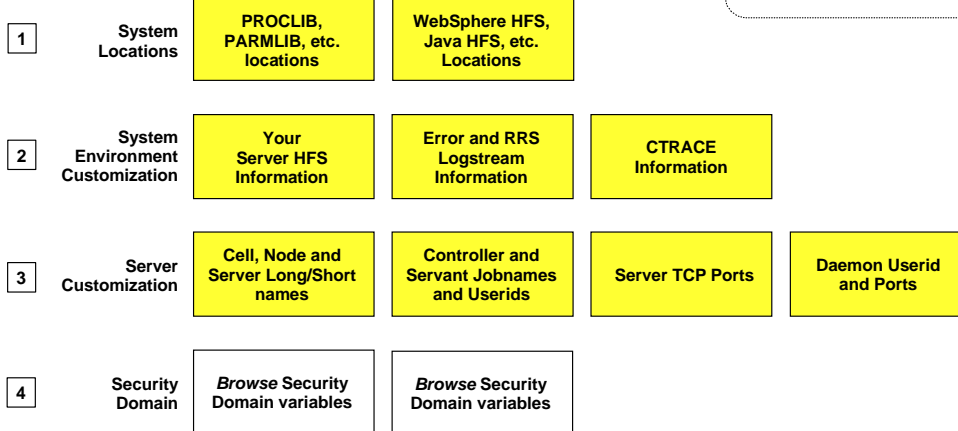
ISPF
Customization
Dialogs

- 1 - System Locations (directories, HLQs, etc)
- 2 - System Environment Customization
- 3 - Server Customization
- 4 - Security Customization

Completed?

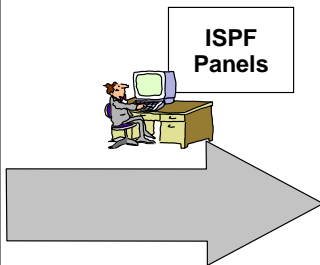
Y
Y

Provides status of what
you've done so far



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STEPLIBS



ISPF
Panels

System Locations (1 of 2)

```
PROCLIB.: SYS1.PROCLIB
PARMLIB.: SYS1.PARMLIB
SYSEXEC.: SYSS.SYSEXEC

SCEERUN.: CEE.SCEERUN
SCEERUN2.: CEE.SCEERUN2
SBBLOAD.: WAS51.WAS.SBBLOAD
SBBOLD2.: WAS51.WAS.SBBOLD2
SBBOMIG.: WAS51.WAS.SBBOMIG
SBBOLPA.: WAS51.WAS.SBBOLPA
SGSKLOAD.: SYS1.GSK.SGSKLOAD
```

In LNKLIST or
LPA (Y or N)?

Y
Y
N
N
N
N
Y

answer "Y", then ...

```
:
/** Output DDs
/**
//CEEDUMP DD SYSOUT=*,SPIN=UNALLOC,FREE=CLOSE
//SYSOUT DD SYSOUT=*,SPIN=UNALLOC,FREE=CLOSE
//SYSPRINT DD SYSOUT=*,SPIN=UNALLOC,FREE=CLOSE
/**
/**Steplib Setup
/**
```

answer "N", then ...

```
:
/** Output DDs
/**
//CEEDUMP DD SYSOUT=*,SPIN=UNALLOC,FREE=CLOSE
//SYSOUT DD SYSOUT=*,SPIN=UNALLOC,FREE=CLOSE
//SYSPRINT DD SYSOUT=*,SPIN=UNALLOC,FREE=CLOSE
/**
/**Steplib Setup
/**
//STEPLIB DD DISP=SHR,DSN=WAS500T.WAS.SBBOLD2
// DD DISP=SHR,DSN=WAS500T.WAS.SBBLOAD
```

STEPLIB statements are built when you answer "N" to the "In LNKLIST or LPA?" question. Left out of JCL if "Y" is what you provide.

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WebSphere V5 Install Directory



System Locations (2 of 2)

Specify the following for your WebSphere customization.
Press Enter to continue.

Locations of HFS Resident Components

WebSphere SMP/E home directory.:

`/usr/lpp/zWebSphere/V5R1M0`

WebSphere JMS Client Java Feature SMP/E home directory.:

`/usr/lpp/mqm/V5R3M1`

java home directory.:

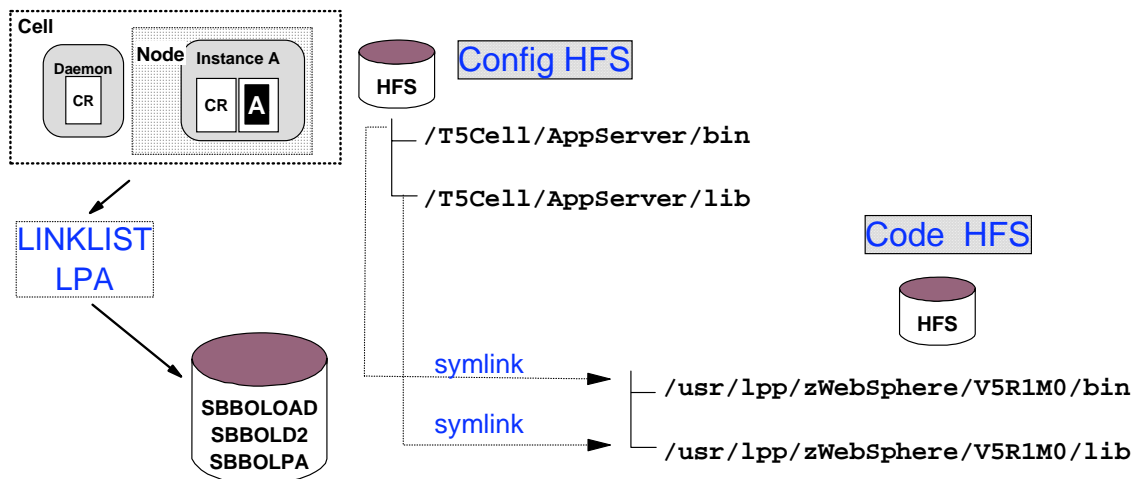
`/usr/lpp/java/J1.4`

specified mountpoint is used to create symbolic links to code HFS

Becomes the JAVA_HOME environment variable

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Library and HFS Structure



Paths to jar files and other executables are specified as symbolic links from directories in the configuration HFS.

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Server Customization, Panel 1 of 4



Server Customization

Server Customization (1 of 4)

Specify the following to customize your WebSphere
Press Enter to continue.

Application Server definitions

WAS home directory.....:
/WebSphere/V5/T5Cell
/ AppServer

Cell name (short).....: T5CT
Cell name (long).....: t5_cell_test

Node name (short).....: T5N1
Node name (long).....: t5_node_1

Server name (short)....: T5SRV1
Server name (long).....: t5_server_1

Cluster transition name: t5clul1

Admin asynch operations procedure name: T5WASSH

Provides quick pointer to was.env file:

```

/<mount point>
|
+-- /T5CT.T5N1.T5SRV1
|
+-- /T5CT.T5CT.T5DMN
|
+-- /Daemon S V5ACR,JOBNAME=T5SRV1, ENV=T5CT.T5N1.T5SRV1
|
+-- /AppServer
|
+-- /config
|
+-- /cells
|
+-- /t5_cell_test
|
+-- cell.xml
|
+-- /applications
|
+-- /clusters
|
+-- /nodes
|
+-- /t5_node_1
|
+-- node.xml
|
+-- serverindex.xml
|
+-- /servers
|
+-- /t5_server_1
|
+-- was.env

```

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Server Customization, Panel 1 of 4



Server Customization

Application Server definitions

WAS home directory.....:
/WebSphere/V5/T5Cell
/ AppServer

Cell name (short).....: T5CT
Cell name (long).....: t5_cell_test

Node name (short).....: T5N1
Node name (long).....: t5_node_1

Server name (short)....: T5SRV1
Server name (long).....: t5_server_1

Cluster transition name: t5clul1

S T5ACR,JOBNAME=T5SRV1,ENV=T5CT.T5N1.T5SRV1

Application Environment Name . . : **T5CLUL1**

Description WAS V5 on SYSD

Subsystem Type CB

Procedure Name T5ASR

Start Parameters

JOBNAME=&IWSSNM.S,ENV=T5CT.T5N1.&IWSSNM

...and WLM starts servant region(s)

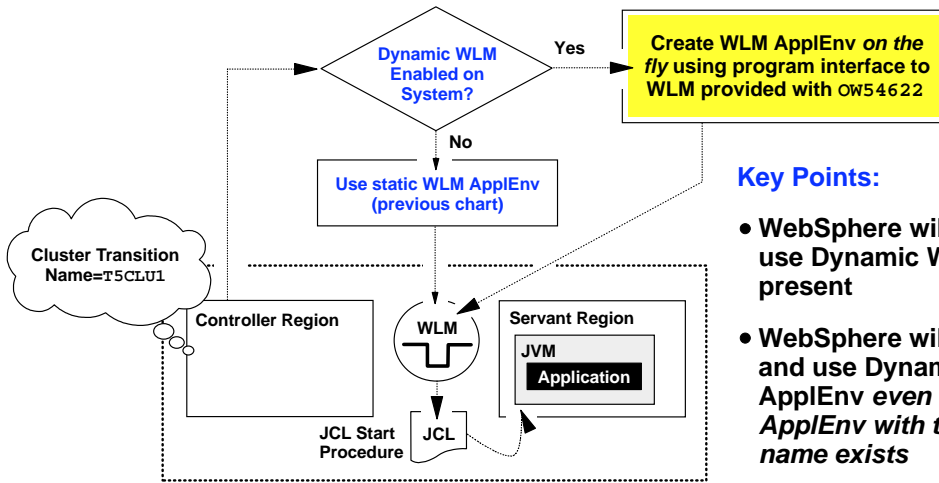
- Limit on starting server address spaces for a subsystem instance:
1. No limit
 2. Single address space per system
 3. Single address space per sysplex

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Dynamic WLM Appl. Environments



New function of WLM in z/OS V1.2 and above that permits subsystems like WebSphere to create Application Environments dynamically:



Key Points:

- WebSphere will *always* use Dynamic WLM if it's present
- WebSphere will create and use Dynamic ApplEnv *even if static ApplEnv with the same name exists*

New commands:

```
D WLM, DYNAPPL=<name>
V WLM, DYNAPPL=<name>, RESUME
```

Static WLM ApplEnv Commands

```
D WLM, APPLENV=<name>
V WLM, APPLENV=<name>, RESUME
```

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Clusters



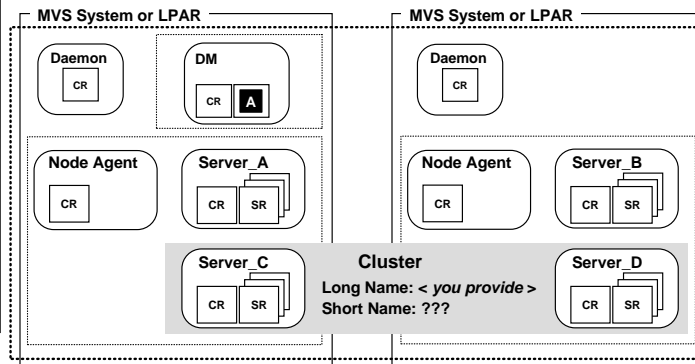
Server Customization

```
Application Server definitions
WAS home directory.....:
/WebSphere/V5/T5Cell
 / AppServer

Cell name (short).....: T5CT
Cell name (long).....: t5_cell_test

Node name (short).....: T5N1
Node name (long).....: t5_node_1
Server name (short)....: T5SRV1
Server name (long).....: t5_server_1

Cluster transition name: t5clu1
```



WebSphere uses "**Cluster Transition Name**" (WLM application environment name) of existing server as cluster short name



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Server Customization, Panel 2 of 4



Jobname values filled in for you, based on server short name on previous panel.

Server Customization

Server Customization

Specify the following to customize your WebSphere for z/OS server
Press Enter to continue.

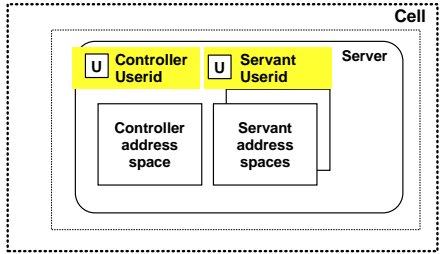
Application Server definitions

Controller information

Jobname.....: T5SRV1
Procedure name.: T5ACR
User ID.....: T5SRV1C
UID.....: 2431

Servant information

Jobname.....: T5SRV1S
Procedure name.: T5ASR
User ID.....: T5SRV1S
UID.....: 2432



JCL Procedure S T5ACR, JOBNAME=T5SRV1, ENV=...

STARTED Profile

STARTED profile based on PROC name. <procname>.*
* represents the JOBNAME

JCL Procedure S T5ASR, JOBNAME=T5SRV1S, ENV=...

STARTED Profile

STARTED profile based on JOBNAME value.

Creating the Base AppServer



Daemon Customization

Server Customization (4 of 4)

Specify the following to customize your WebSphere for z/OS server.
Press Enter to continue.

Location Service Daemon definitions

Daemon Home Directory:
/WebSphere/V5/T5Cell/Daemon

Daemon Job Name: T5DEMN

Procedure Name.: T5DEMN
User ID.....: T5DEM1
UID.....: 2411

IP Name.....: wg31.washington.ibm.com
Port.....: 5655
SSL Port.....: 5656

Register Daemon with WLM DNS: N

JCL Procedure S T5DEMN, JOBNAME=T5DEMN, ENV=...

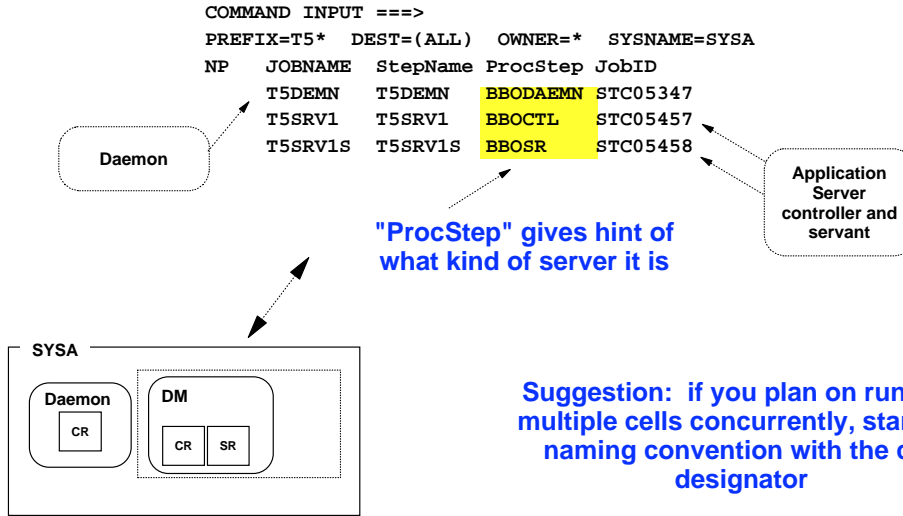
STARTED Profile

STARTED profile based on PROC name. <procname>.*
* represents the JOBNAME

Benefit of Common First Characters

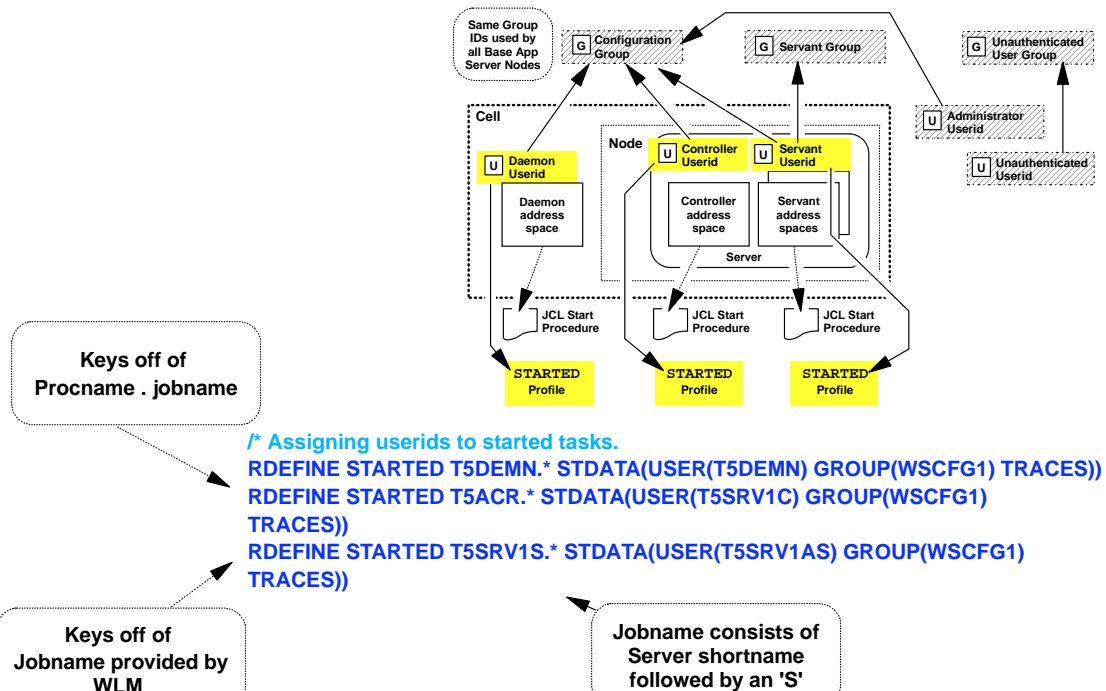


As your configuration grows, you may want to see all the running tasks on one screen:



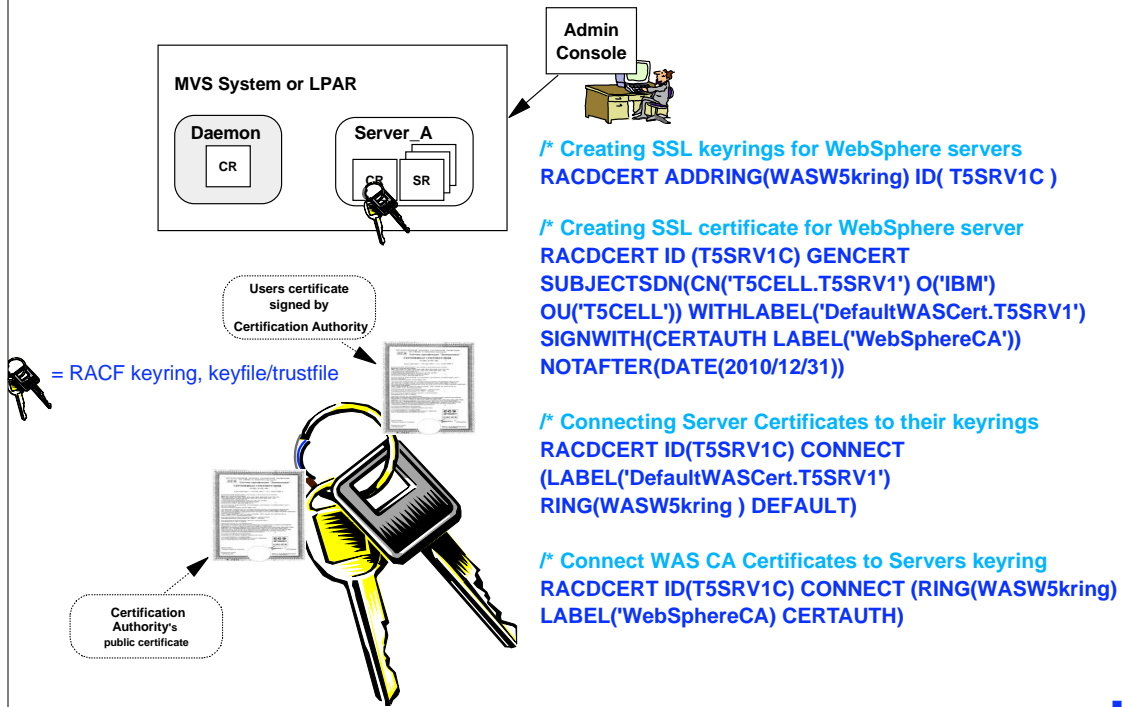
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Assigning User IDs to Started Tasks



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SSL in Base Configuration



```
/* Creating SSL keyrings for WebSphere servers
RACDCERT ADDRING(WASW5kring) ID( T5SRV1C )
```

```
/* Creating SSL certificate for WebSphere server
RACDCERT ID( T5SRV1C) GENCERT
SUBJECTSDN(CN('T5CELL.T5SRV1') O('IBM')
OU('T5CELL')) WITHLABEL('DefaultWASCert.T5SRV1')
SIGNWITH(CERTAUTH LABEL('WebSphereCA'))
NOTAFTER( DATE(2010/12/31))
```

```
/* Connecting Server Certificates to their keyrings
RACDCERT ID(T5SRV1C) CONNECT
(LABEL('DefaultWASCert.T5SRV1')
RING(WASW5kring ) DEFAULT)
```

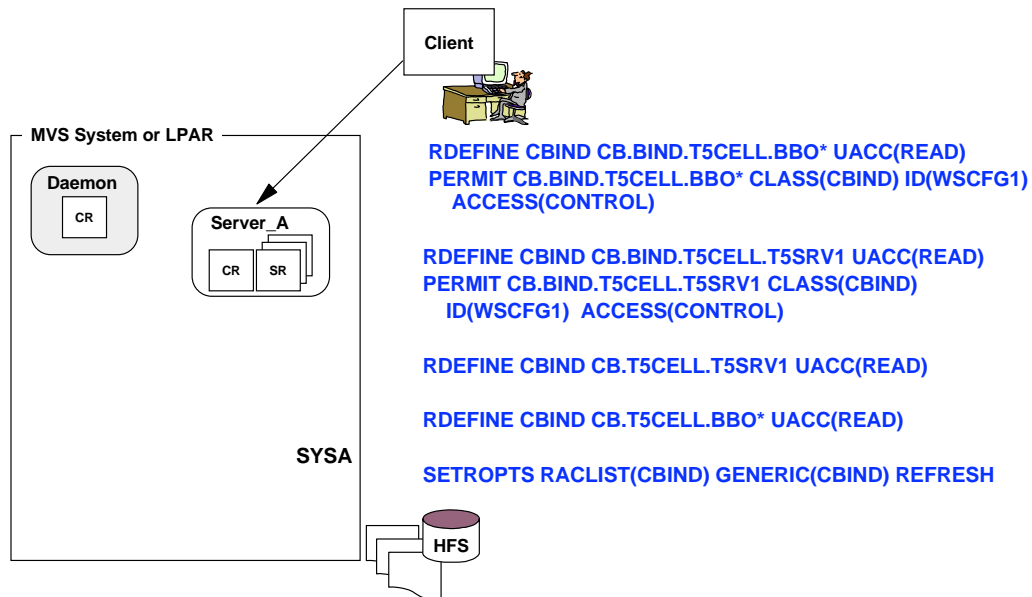
```
/* Connect WAS CA Certificates to Servers keyring
RACDCERT ID(T5SRV1C) CONNECT (RING(WASW5kring)
LABEL('WebSphereCA) CERTAUTH)
```

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Access to Server



Profiles in the *CBIND* class are used to authorize access to servers (clusters) by clients.



```
RDEFINE CBIND CB.BIND.T5CELL.BBO* UACC(READ)
PERMIT CB.BIND.T5CELL.BBO* CLASS(CBIND) ID(WSCFG1)
ACCESS(CONTROL)
```

```
RDEFINE CBIND CB.BIND.T5CELL.T5SRV1 UACC(READ)
PERMIT CB.BIND.T5CELL.T5SRV1 CLASS(CBIND)
ID(WSCFG1) ACCESS(CONTROL)
```

```
RDEFINE CBIND CB.T5CELL.T5SRV1 UACC(READ)
```

```
RDEFINE CBIND CB.T5CELL.BBO* UACC(READ)
```

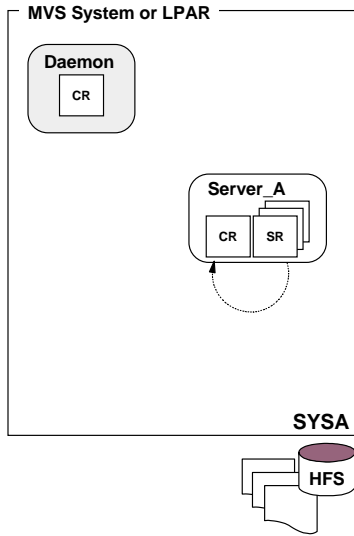
```
SETROPTS RACLIST(CBIND) GENERIC(CBIND) REFRESH
```

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Access to Controller



Profiles in the *SERVER* class control what servants may access the controller.



```

Defining SERVER CB.cluster.generic_server.
RDEFINE SERVER CB.* UACC(NONE)

RDEFINE SERVER CB.*.BBO* UACC(NONE)

RDEFINE SERVER CB.*.BBO*.* UACC(NONE)

RDEFINE SERVER CB.*.T5SRV1 UACC(NONE)
PERMIT CB.*.T5SRV1 CLASS(SERVER)
ID(T5SRV1AS) ACC(READ)

RDEFINE SERVER CB.*.T5SRV1.* UACC(NONE)
PERMIT CB.*.T5SRV1.* CLASS(SERVER)
ID(T5SRV1AS) ACC(READ)

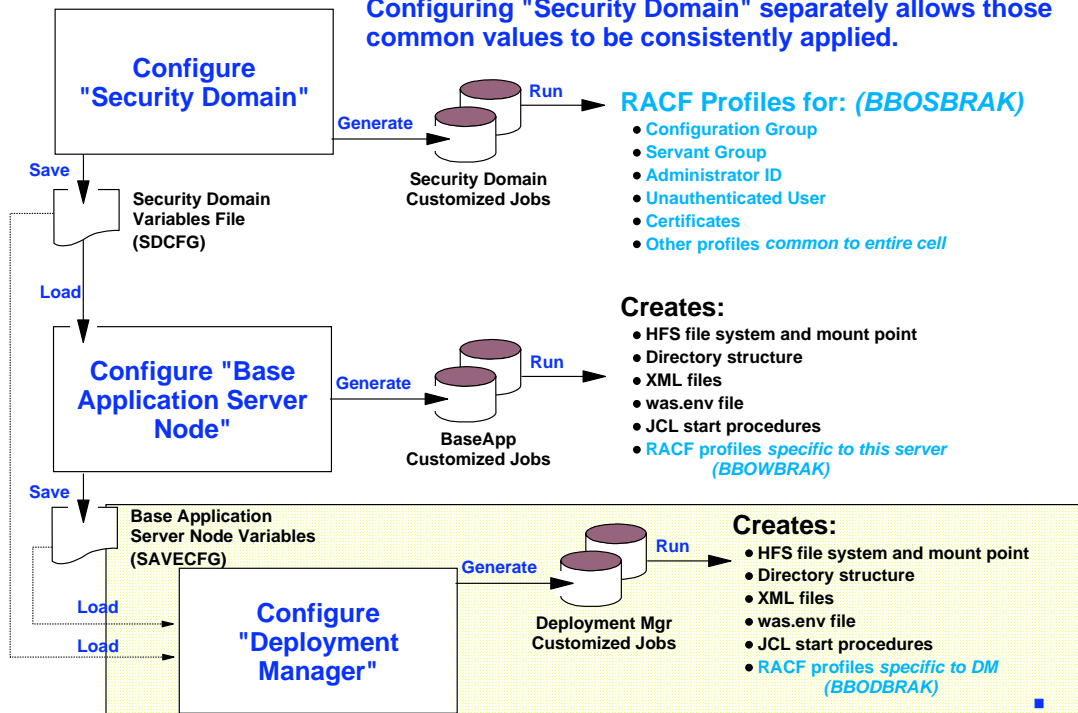
SETROPTS RACLIST(SERVER) GENERIC(SERVER) REFRESH
    
```

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High-Level of Configuration Process

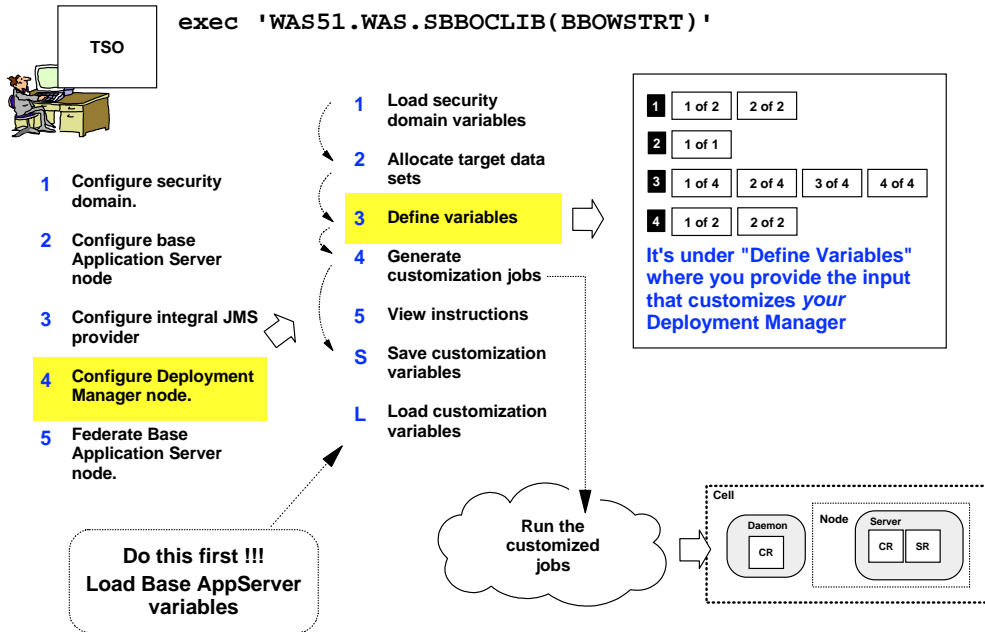


Configuring "Security Domain" separately allows those common values to be consistently applied.



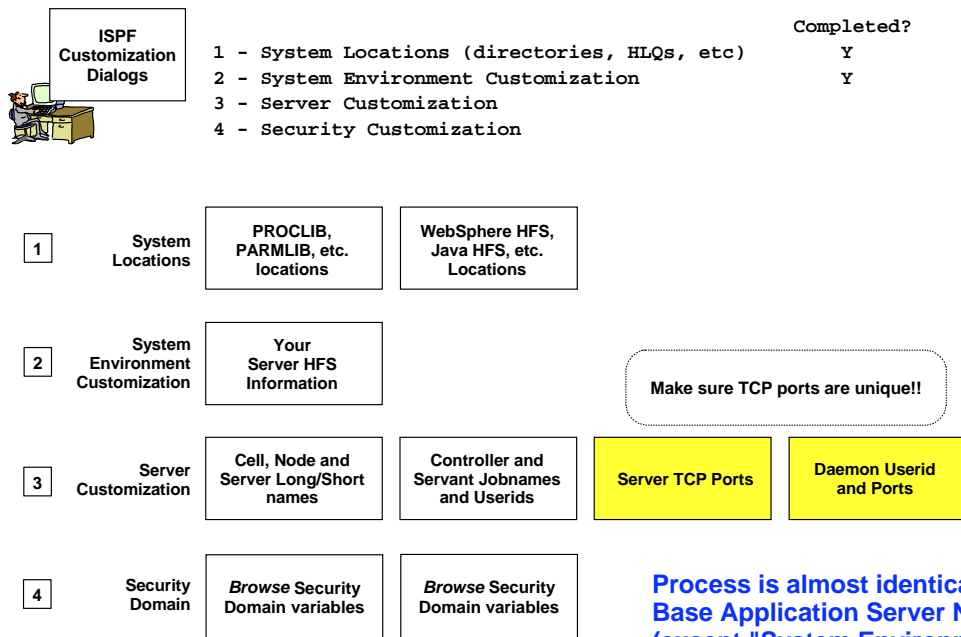
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The Flow of the ISPF Panels



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Inside "Define Variables"



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Creating the Deployment Manager



```

System
Environment

System Environment Customization (1 of 1)

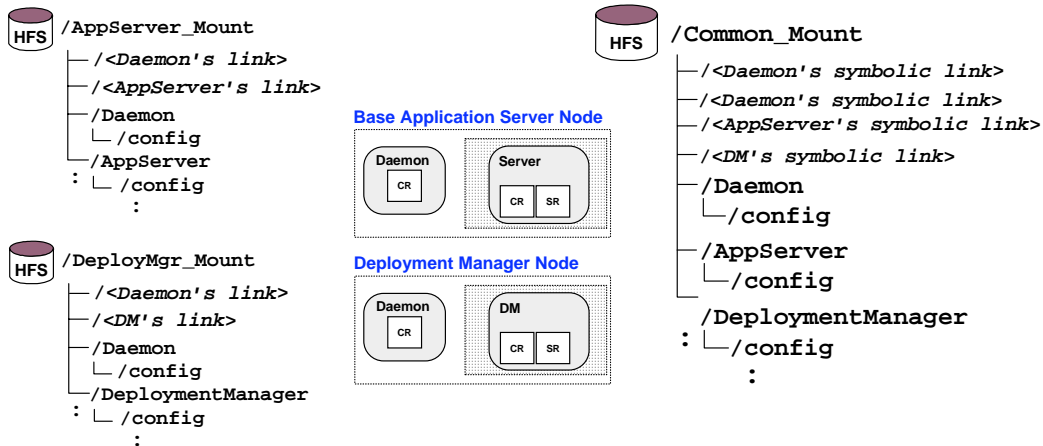
Specify the following to customize your system
environment
press Enter to continue.

WebSphere HFS Information

Mount point....: /WebSphere/V5/T5Cell
Name.....: OMVS.WAS.CONFIG.HFS
Volume, or '*' for SMS.: *
Primary allocation in cylinders...: 250
Secondary allocation in cylinders.: 100
    
```

Should this be the same as the Base Application Server's HFS?

Separate or Shared Mount Point



Separate: allows you to keep your HFS file systems from being too large
 Configuration files and application binaries maintained in separate HFS files systems. Shared would imply everything under one big HFS.

Separate: Allows for Master Configuration to be backed up separately.

Shared: allows you to use a set of "generic" JCL for all the servers
 Except for the Deployment Manager since it's PROCS are slightly different from the JCL for the application servers, so you should NOT share JCL between those two.

Deployment Manager Names



```
Server
Customization

Specify the following to customize your server, then
press Enter
to continue.

Deployment Manager Definitions

WebSphere Application Server home directory:
/WebSphere/V5/T5Cell
/DeploymentManager

Cell name (short).....: T5DMCell
Cell name (long).....: T5DMG_Cell

Node name (short).....: T5DMNODE
Node name (long).....: T5_DMGR_Node

Server name (short)....: T5DMGR
Server name (long)....: dmgr

Cluster transition name: T5DMGR
```

Make sure Cell, Node and Server names are unique!!

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Deployment Manager Procs and UserIDs



```
Server
Customization

Specify the following to customize your WebSphere for
z/OS server.
Press Enter to continue.

Deployment Manager definitions

Controller information

Jobname.....: T5DMGR
Procedure name.: T5DCR
User ID.....: T5DMGR
UID.....: 2421

Servant information

Jobname.....: T5DMGRS
Procedure name.: T5DSR
User ID.....: T5DMGRS
UID.....: 2422
```

Make sure PROC names are unique!!

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Deployment Manager's Daemon



Daemon Customization

Specify the following to customize your WebSphere for z/OS server.

Press Enter to continue.

Location Service Daemon definitions

Daemon Home Directory:
/WebSphere/V5/T5Cell/Daemon

Daemon Job Name: T5DMNA

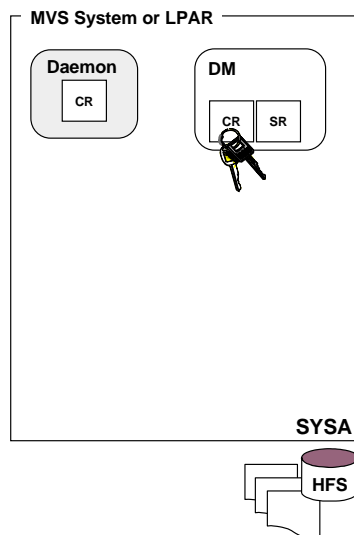
Procedure Name.: T5DMN
User ID.....: T5DMNA
UID.....: 2411

IP Name.....: wg31.washington.ibm.com
Port.....: 5755
SSL Port.....: 5756

Register Daemon with WLM DNS: N

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Certificate for the Deployment Manager



/ Generating certificates for WebSphere Deployment Manager*

```
RACDCERT ID (DMCR1) GENCERT  
SUBJECTSDN(CN('T5CellID.T5DMGR') O('IBM')  
OU('T5CellID')) WITHLABEL('DefaultWASDmgrCert')  
SIGNWITH(CERTAUTH LABEL)  
(('WebSphereCA')) NOTAFTER(DATE(2010/12/31))
```

/ Connecting Certificates to the Deployment Manager keyring*

```
RACDCERT ID(T5DMGR) CONNECT  
(LABEL('DefaultWASDmgrCert') RING(WASWkringing )  
DEFAULT)
```

/ Connect WAS CA Certificate to Deployment Manager keyring*

```
RACDCERT ID(T5DMGR) CONNECT (RING(WASW5kring)  
LABEL('WebSphereCA')  
CERTAUTH)
```

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Deployment Manager Profiles



Profiles are defined for:

- UserIDs
- Started Class
- CBIND Class
- SERVER Class

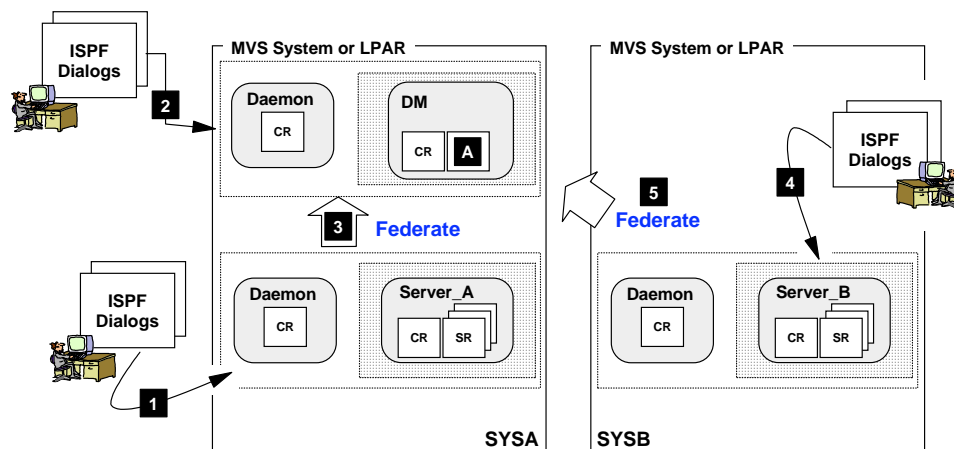
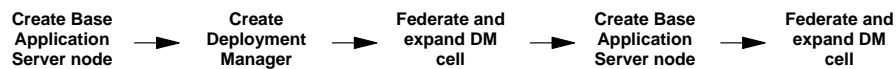
The same type of definitions are created as were in the Base AppServer.

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Federation Process



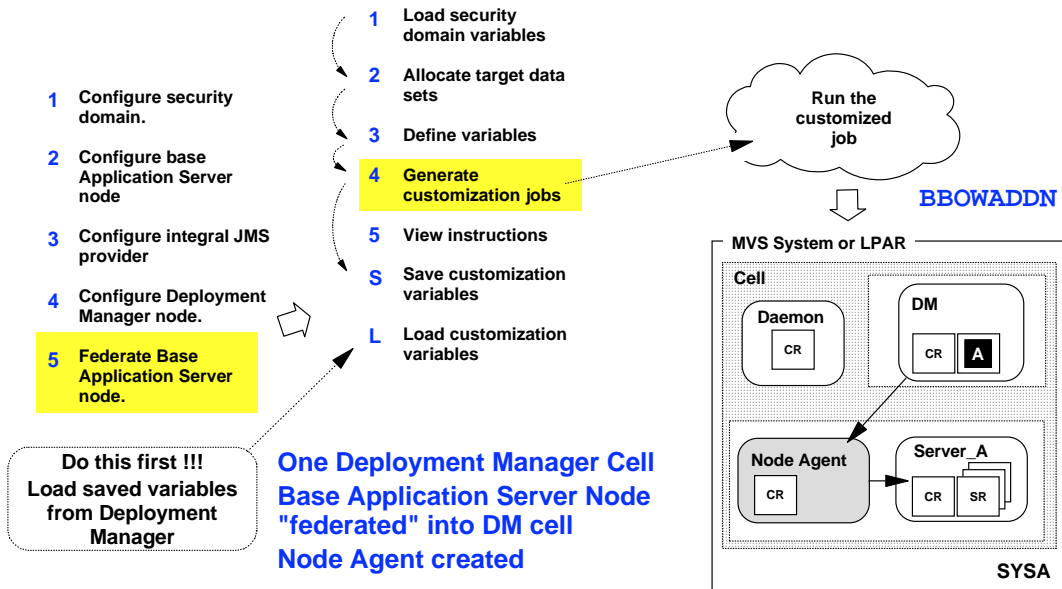
Process:



"Federating" is the act of joining a Base Application Server node into a Deployment Manager cell. In the process, a "Node Agent" is created.

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The ISPF Panel for Federation



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Define Variables for BBOWADDN Job



The "Define Variables" panel allows you to set the parameters of the BBOWADDN job:

```

WAS home directory.....:
  /WebSphere/V5/T5Cell
  / AppServer
Deployment Manager access:
Node host name.....:    wg31.washington.ibm.com
JMX Soap port.....:    8879
Deployment Manager Security is Enabled: N
  Userid.....:          T5ADMIN

Include Apps.....:      Y
Base server ORB port..: 9810

Node Agent definitions:
Server name (short)...:  T5AGNTA
Server name (long)...:  nodeagent
SOAP JMX Connector port.....:  8878
DRS Client Address port.....:  7888
Node Discovery port.....:     7272
Node Multicast Discovery port..: 5000

ORB Listener host name...: *
ORB port.....:          2809
ORB SSL port.....:      0
    
```

Mount point and home directory of the Base Application Server node being federated. This tells process which node is being federated.

Host name and listening port of Deployment Manager. This tells process what DM will be target of federation

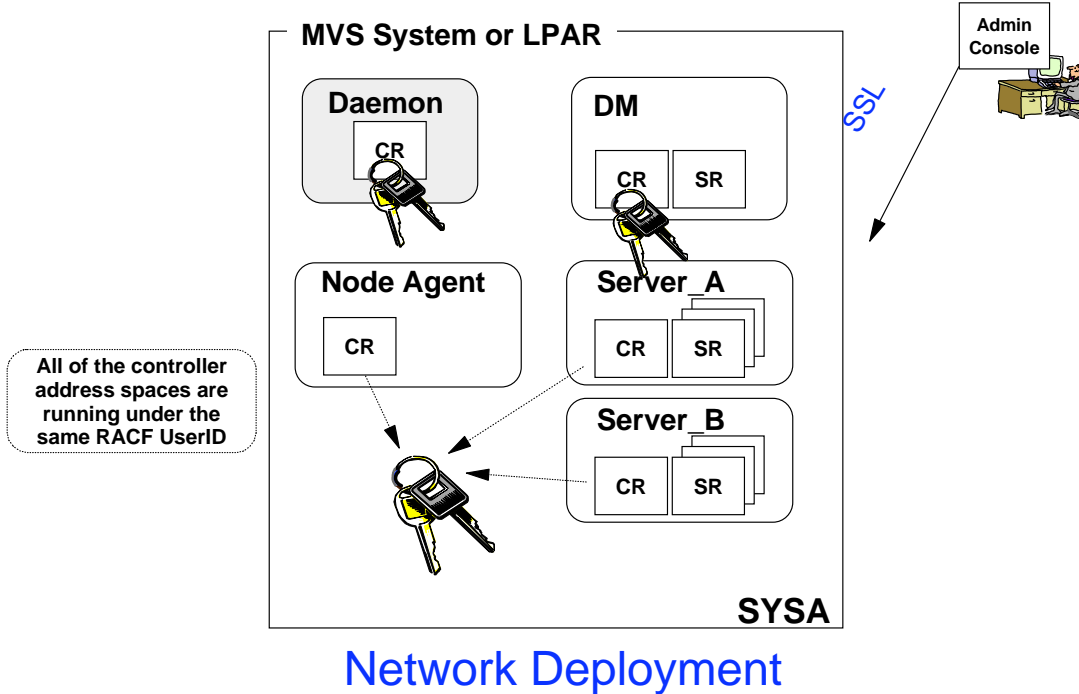
The short name of the Node Agent that will be created

Ports for Node Agent

Values supplied here become parameters to addNode.sh in the BBOWADDN job

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Shared Keyring



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Summary



- ▶ The ISPF dialogs for create jobs to generate and run RACF commands to set up your security environment.
 - Security Domain
 - Base Application Server
 - Deployment Manager
- ▶ Profiles are defined for:
 - User and Group
 - Started Class
 - CBIND Class
 - SERVER Class
- ▶ RACF keyrings and certificates are created.

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