IBM WebSphere Software

WebSphere Application Server for z/OS and OS/390

WebSphere V5 for zOS - **Operations**

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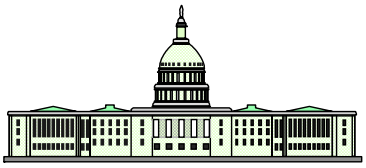
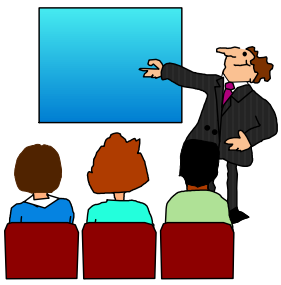


Agenda:

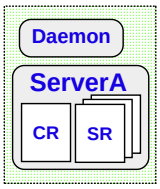
- **WebSphere V5 Configurations**
  - Basic Application Server & Network Deployment (single & multi-system)
    - Terminology & Names (cells, nodes, servers, clusters, managers, agents)
    - Procs, Parms, Profiles & WLM Application Environments
- **Operational Interfaces**
  - MVS Commands
  - Admin Console (a WebSphere application)
  - other (wsadmin $AdminControl, Command Line tools)
- **Base Application Server Scenarios**
  - Starting & Stopping, Displaying, Modifying Servers
- **ND Scenarios**
  - Starting & Stopping Managers, Nodes, Servers, Clusters
- **When things go wrong...**
  - Problem Determination & Tracing
- **Summary, references, etc.**



WebSphere V5 Configurations

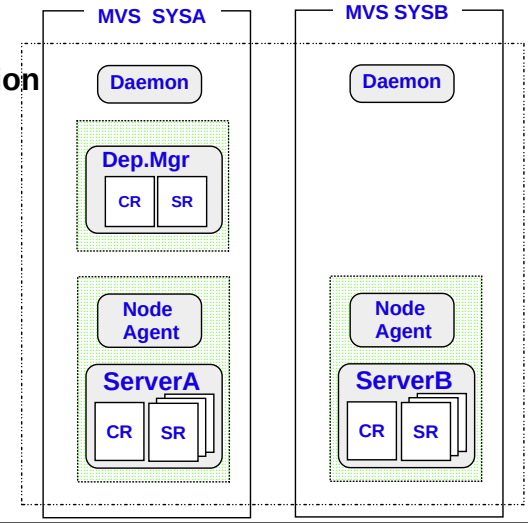
- **Base Application Server** (Simple stand-alone Cell on a single system)
  - Daemon
  - Application Server
    - Controller Region
    - Servant Regions (1 or more per WLM)

  Recommended for testing



- **Network Deployment (ND) Configuration** (Single or multi-system Cell)
  - Daemon (1 per system)
  - Deployment Manager (1 per cell)
    - Controller & Servant Region
  - Node (1 or more per system) *(Recommend 1 AppNode/system/cell)*
    - Node Agent (1 per node per cell)
    - Application Server (1 or more per node)
      - Controller Region (1 per)
      - Servant Regions (1 or more)

  Recommended for Production Servers

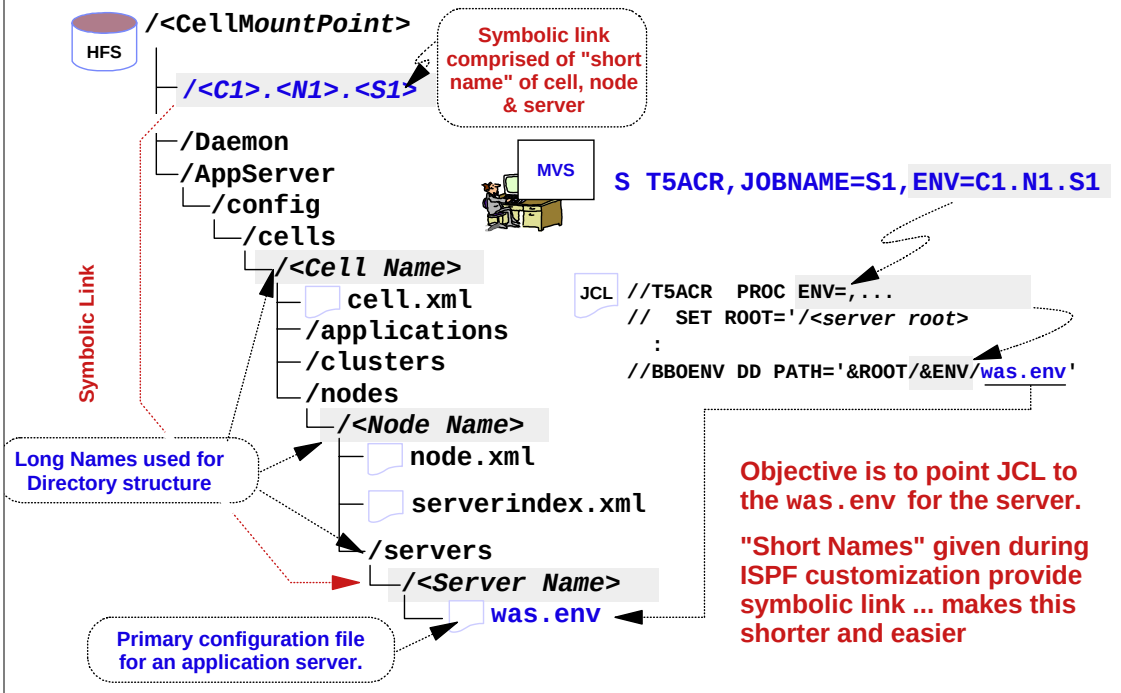


Terminology & Names

Version 5	Version 4
Cell	Node
Cluster	Server
Cluster Member	Server Instance
Node Agent & Deployment Manager	System Management Server (sort of)
Controller Process	Control Region
Servant Process	Server Region
server_generic_short_name (also "Cluster Transition Name" and "Application Environment name")	Server name ("Application Environment name")
server_specific_name	Server Instance name (sort of)
server_specific_short_name	Server Instance name

- **Names (Cells, Nodes, Servers, Clusters)**
  - "Long" name used for HFS directories
    - Mixed case, 60 chars or less
    - Platform independent name (WebSphere "family")
  - "Short" names used for MVS parms
    - Upper case, 8 chars or less
    - Platform-specific aliases for the "long names"

Starting an Application Server - Long & Short Names



Procs, Parms, & Commands:

- **3 Procs used:**
  - T5ACR - Controller
  - T5ASR - Servant
  - T5DMN - Daemon
- **Parms used to start the server** (Controller region)**:**
  - **JOBNAME=_____**
    - Set to suit installation standards
    - Can have an effect on RACF STARTED profiles (not necessary with generics)
  - **ENV=** `<Cell_shortname>.<Node_shortname>.<Server_shortname>`

Servant Proc (for all servers):

```
//T5ASR PROC ENV=CELL1.NODEA.SRV1,Z=T5ASRZ
//  SET ROOT='/wasv5config/twas'
//BBOSR   EXEC PGM=BBOSR,REGION=0M, ....
// PARM='TRAP(ON,NOSPIE),ENVAR("_EDC_UMASK
//BBOENV DD PATH='&ROOT/&ENV/was.env'
//  INCLUDE MEMBER=&Z
```

- **Start Commands for SRV1 on NodeA and SRV2 on NodeB:**
  - `start t5acr,jobname=srv1,env=cell1.nodea.srv1`
  - `start t5acr,jobname=srv2,env=cell1.nodeb.srv2`

Decision: Common or Unique Procs for each server?

A. **Same Procs for all servers (in the cell) assuming common HFS:**
- T5ACR - Controller Proc name
- T5ASR - Servant Proc name
- T5DMN - Daemon Proc name

+ Don't have to add procs for each new server
- Have to specify JOBNAME & ENV on Start command
  `start t5acr,jobname=srv1,env=cell1.nodea.srv1`
- (Good for test/development environment - more dynamic)

B. **Unique Procs for each server:**
+ Don't have to specify Jobname or ENV parms when starting up,
  `start t5acr1a` but ....
- Have a lot more procs in proclib, and have to add one for each new server
  - Hard-code ENV= in each proc
- (Good for production/QA environment - more stable)

```
//T5ACR1A  PROC ENV=C1.NA.SRV1A,PARMS=' ',Z=T5ACRZ
//  SET ROOT='/wasv5cfg/twas'
//BBOCTL EXEC PGM=BBOCTL,REGION=0M,
// PARM='ENVAR("_EDC_UMASK_DFLT=007") / &PARMS.''
//BBOENV DD PATH='&ROOT/&ENV/was.env'
//  INCLUDE MEMBER=&Z
```

Controller start-up Procedure with WAS V.5.0.1:

- **Additional step added to Contol Region Proc:**
  - APPLY step - applyPTF.sh checks to see if service has been applied to WebSphere and run the "update files" for the new service.
  - Output written to .../properties/service/logs/applyPTF.out'
  - Classify server jobnames with WLM OMVS Classification rules - see Flash10243

```
//T5ACR  PROC ENV=,PARMS=' ',Z=T5ACRZ
// SET ROOT='/wasv5config/t5was'
// SET FOUT='properties/service/logs/applyPTF.out'
//APPLY   EXEC PGM=BPXBATCH,REGION=0M,
// PARM='SH &ROOT./&ENV..HOME/bin/applyPTF.sh inline'
//STDOUT   DD PATH='&ROOT./&ENV..HOME/&FOUT.',
// PATHOPTS=(OWRONLY,OCREAT,OAPPEND),PATHMODE=(SIRWXU,SIRWXG)
//STDERR   DD PATH='&ROOT./&ENV..HOME/&FOUT.',
// PATHOPTS=(OWRONLY,OCREAT,OAPPEND),PATHMODE=(SIRWXU,SIRWXG)
//*
//BBOCTL  EXEC PGM=BBOCTL,COND=(8,EQ),REGION=0M,TIME=MAXIMUM,
// PARM='TRAP(ON,NOSPIE),ENVAR("_EDC_UMASK_DFLT=007") / &PARMS.'
//BBOENV DD PATH='&ROOT/&ENV/was.env'
// INCLUDE MEMBER=&Z
```

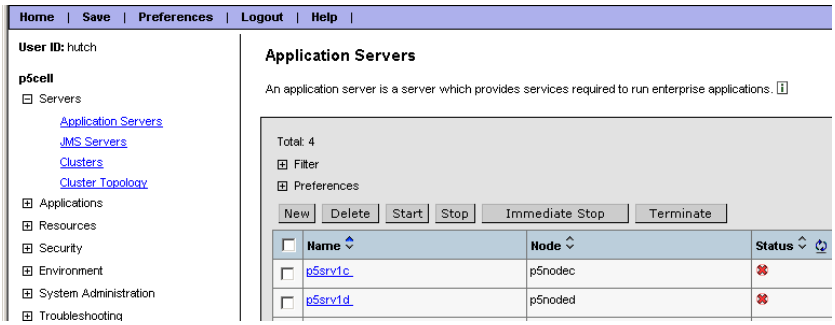
- **Other Procs unchanged:**
  - T5ASR - Servant
  - T5DMN - Daemon

WLM Application Environments - Static & Dynamic - Operational Considerations

- **WAS automatically checks WLM to see if Dynamic APPLENVs are supported**
  - Provided with fix for APAR OW54622 (SUP F305)
    - See cover letter for doc.
  - If so, dynamically creates one (static APPLENVs are not used)
  - If not, they must be defined with the WLM ISPF Panels
- **MVS Commands - Dynamic ApplEnvs:**
  - D WLM,DYNAPPL=appl_env_name
  - D WLM,DYNAPPL=*
    - Use this command to see if you have the maintenance on.
  - V WLM,DYNAPPL=appl_env_name,RESUME
- **MVS Commands - Static ApplEnvs:**
  - D WLM,APPLENV=appl_env_name
  - D WLM,APPLENV=*
  - V WLM,APPLENV=appl_env_name,RESUME

WebSphere Operational Interfaces:

- **MVS Commands**
  - Start Servers, Nodes (Agents), Managers (Deployment)
  - Stop Servers, Nodes, Managers, Daemons
  - Modify Servers, Display Servers, Sessions, etc.
- **wsadmin** (BSF based on JMX - JACL)
  - ./wsadmin.sh in {WAS_ROOT}/AppServer/bin
  - e.g., >$`AdminControl startServer t5srv1`
- **Command Line tools** in {WAS_ROOT}/AppServer/bin
  - startServer.sh, stopServer.sh
- **AdminConsole** (ND only)
  - Start
  - Stop
  - Terminate
  - Ripple Start (Clusters)



UNIX system services (telnet) Commands:

- **command line shell commands** (must be on the same system)

  :/wasv5config/twas/AppServer/bin-> ./**startServer.sh t5srv1**
  ADMU0116I: Tool information is being logged in file /wasv5config/twas/AppServer/logs/...
  ADMU3100I: Reading configuration for server: t5srv1
  ADMU3200I: Server launched. Waiting for initialization status.
  ADMU3000I: Server t5srv1 open for e-business; process id is BA023E0C9B ...

  :/wasv5config/twas/AppServer/bin-> ./**stopServer.sh t5srv1**
  ADMU0116I: Tool information is being logged in file /wasv5config/twas/AppServer/logs/...
  ADMU3100I: Reading configuration for server: t5srv1
  ADMU3201I: Server stop request issued. Waiting for stop status.
  ADMU4000I: Server t5srv1 stop completed.

- **WSADMIN scripting** (can be on another system)

  :/wasv5config/twas/AppServer/bin-> **./wsadmin.sh**
  WASX7209I: Connected to process "t5srv1" on node t5noded using SOAP connector;
  The type of process is: UnManagedProcess
  wsadmin>**$AdminControl stopServer t5srv1**
  WASX7337I: Invoked stop for server "t5srv1" Waiting for stop completion.
  WASX7264I: Stop completed for server "t5srv1" on node "t5noded"
  wsadmin>$AdminControl startServer t5srv1

Starting a ND server using batch JCL

- **Deployment Manager must be up and accessible**

```
//START EXEC PGM=IKJEFT01,REGION=0M
//SYSTSPRT DD SYSOUT=*
//SYSTSIN DD *
BPXBATCH SH +
/wasv5config/g5cell+
/DeploymentManager+
/bin/wsadmin.sh +
-conntype SOAP +
-host wsc3.washington.ibm.com +
-port 15510 +
-c '$AdminControl startServer g5sr01c g5nodec' +
1> /tmp/StSvrG5.out +
2> /tmp/StSvrG5.err
/*
//*************************************************
//* STEP 2 - Copy script output back to joblog
//COPY  EXEC PGM=IKJEFT01,REGION=0M
//SYSEXEC DD DISP=SHR,DSN=WAS502.WAS.SBBOEXEC
//SYSTSIN DD *
BBOHFSWR '/tmp/StSvrG5.out'
BBOHFSWR '/tmp/StSvrG5.err'
//SYSTSPRT DD SYSOUT=*
//
```

Starting up a Base AppServer:

▸ back to MVS operator commands . . .

- **Operator issues 'start server' command**
  - S T5ACR,JOBNAME=T5SRV1,ENV=C1.NA.T5SRV1
  - ► Daemon is started automatically with command;
    - S T5DMN,JOBNAME=T5DMNA,ENV=C1.C1.T5DMNA
  - ► Servant regions started by WLM with command:
    - S T5ASR,JOBNAME=T5SRV1S,ENV=C1.NA.T5SRV1
- **Results in 3 address spaces running:**
  - T5DMNA
  - T5SRV1
  - T5SRV1S

► SDSF DA panel:

JOBNAME	ProcStep	Owner	ASIDX	JobID	Real	CPU-Time
T5DMNA	BBODAEMN	T5DMNU	0300	STC19834	114	0.87
T5SRV1	BBOCTL	T5ACRU	034C	STC19833	16T	29.85
T5SRV1S	BBOSR	T5ASRU	0316	STC19835	24T	33.49

Stopping Base Application Servers

MVS Commands:

- **The "proper way" - Stop command**
  - ► "P <servant_jobname>"
  - ► If this fails, then . . .
- **The "brute force way" - Cancel & Force**
  - ► "C <servant_jobname>"
  - ► "FORCE <servant_jobname>"
  - ► "P <daemon_jobname>" stops all servers immediately
    - (Usually no reason to stop or restart the Daemon)
- **Recycling servers** (Required to change some parms)
  - ► Controller regions: Stop & Start
  - ► Servant regions: Cancel <servant_ jobname>
    - WLM will restart them

SDSF Action chars - Stopping Application Servers:

- ► K = SysCancel (MVS Cancel command)
- ► Z = SysForce (MVS FORCE command)
- ► Y = SysStop (MVS Stop command - z/OS R5)

Operations & Availablity Monitoring (SDSF or (E)JES):

- **Customize the DA panel to display most relevant info**
  - Filter to display WebSphere server regions
  - Arrange and Sort fields for max. visibility
  - Use Action Characters "k" to cancel, "z" to force.

```
SDSF DA SYSA  SYSA     PAG    0 SIO    81 CPU  11/ 11  LINE 1-7
COMMAND INPUT ===>                                    SCROLL==>CSR
PREFIX=WS*  DEST=(ALL) OWNER=* SORT=JOBNAME/A FILTERS=5 SYSNAME=SYSD
ACTION=//-Block,=-Repeat,+-Extend,?-JDS,A-Release,C-Cancel,D-Display,E-Restart,
ACTION=H-Hold,K-SysCancel,L-List,P-Purge,Q-Outdesc,R-Reset,S-Browse,W-Spin,
ACTION=X-Print,Z-SysForce
NP   JOBNAME  JobID      CPU%  ECPU%    SIO Real  ECPU-Time   Tran-Act
     T5DMNA   STC18268   0.01   0.00   0.00  337      37.21  219:33:04
     T5SRV1   STC18266   1.21   0.00   0.00  136       0.97    2:25:41
     T5SRV1S  STC18270   0.31   0.01   0.00  54T      48.03    2:25:30
```

- **ENClave Panel:** (Check out your WLM classification rules)

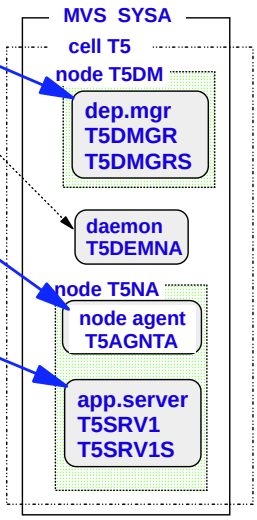
```
 SDSF ENCLAVE DISPLAY  SYSD     ALL           LINE 1-32 (100)
 NP   TOKEN           Status   SrvClass RptClass   CPU-Time
      11000004BFF     ACTIVE   CBFAST   RT5IVEJB       0.02
      13000004C04     ACTIVE   CBFAST   RT5IVSER       0.01
      15C00004C05     ACTIVE   CBFAST   RT5IVSER       0.09
      3400004C3C      INACTIVE CBFAST   RT5IVEJB       0.00
      3800004C50      INACTIVE CBSLOW   RT5IVT         0.00
```

ND Operational Scenarios

Starting up an ND Configuration:

1. **Operator starts the Deployment Manager**
   - **S T5ACR,JOBNAME=T5DMGR,ENV=T5.T5DM.T5DMGR**
   - **Daemon started automatically by DMgr (or Nagent)**
     - **S T5DMN,JOBNAME=T5DEMNA,ENV=T5.T5NA.T5DEMNA**
2. **Operator starts Node Agent for each node**
   - S T5ACR,JOBNAME=T5AGNTA,ENV=T5.T5NA.T5AGNTA
3. **Server (Controller region) started (MVS cmd)**
   - S T5ACR,JOBNAME=T5SRV1,ENV=T5.T5NA.T5SRV1

   . . . or by the Admin Console:
   - Servers > check 't5srv1' and hit the 'Start' button
4. **Servant regions started by WLM with command:**
   - for the Application Server:
     - S T5ASR,JOBNAME=T5SRV1S,ENV=T5.T5NA.T5SRV1
   - and the Deployment manager:
     - S T5ASR,JOBNAME=T5DMGRS,ENV=T5.T5NA.T5DMGR



ND Configuration (operator's view):

- **Results in minimum of 6 address spaces running:**
  - SDSF DA panel:

JOBNAME	ProcStep	Owner	ASIDX	JobID	Real	CPU-Time
T5AGNTA	BBOCTL	T5ACRU	0088	STC19712	13T	112.30
T5DEMNA	BBODAEMN	T5DMNU	0300	STC19714	114	0.94
T5DMGR	BBOCTL	T5ACRU	0089	STC19715	19T	133.36
T5DMGRS	BBOSR	T5ASRDMU	006D	STC19723	33T	119.86
T5AS01A	BBOCTL	T5ACRU	034C	STC19833	15T	42.40
T5AS01AS	BBOSR	T5ASRU	0316	STC19834	857	40.73

- **Need Good Naming Standards**

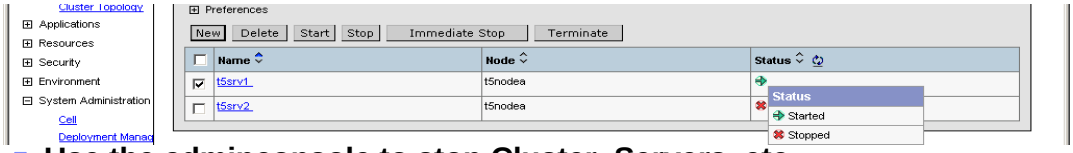
  Another Template for STC Job Names: (round 5)
  - First 2 characters indicate a WebSphere "Cell" identifier (T5)
  - Next 4 chars indicate Application Server (AS+ 01 - 99, or AA - ZZ identifier), Node Agent (AGNT), Daemon (DEMN), Deployment Manager (DMGR)
  - Next char for System identifier
  - Servant regions have an "S" on the end

Multi-System ND Configuration Example

- **2-System 'P5' Cell**
  - with 2 servers on each system

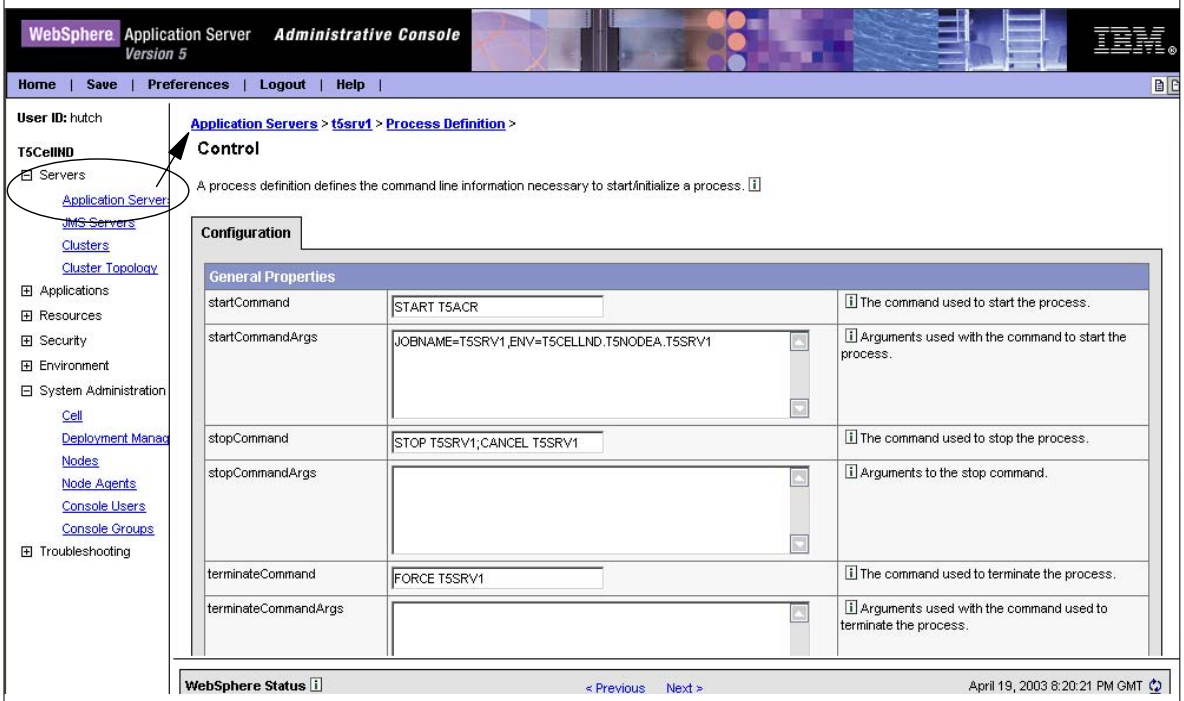
```
PREFIX=* SORT=SysName/A JOBNAME/A  FILTERS=6  SYSNAME=SYS%
NP  JOBNAME   SysN JobID    Real ASIDX CPU-Ti ProcStep
    P5NAGTC   SYSC STC32526  30T  0053  70.47 BBOCTL
    P5DEMNC   SYSC STC32527 5918  0054   0.53 BBODAEMN
    P5AS01C   SYSC STC32651  29T  02F9  43.80 BBOCTL
    P5AS01CS SYSC STC32652  32T  02FC  52.52 BBOSR
    P5AS03C   SYSC STC32657  28T  02F7  37.98 BBOCTL
    P5AS03CS SYSC STC32659  30T  02F6  41.12 BBOSR
    P5NAGTD   SYSD STC32525  20T  02FE  77.97 BBOCTL
    P5DMGR    SYSD STC32523  21T  005F 138.52 BBOCTL
    P5DMGRS   SYSD STC32658  31T  0076  57.16 BBOSR
    P5DEMND   SYSD STC32524  174  005C   0.54 BBODAEMN
    P5AS01D   SYSD STC32648  29T  006C  44.09 BBOCTL
    P5AS01DS SYSD STC32650  32T  030A  52.65 BBOSR
    P5AS02D   SYSD STC32653  28T  0073  37.68 BBOCTL
    P5AS02DS SYSD STC32656  29T  030B  36.78 BBOSR
```

Stopping Servers, Nodes, Cells, etc. (ND Configuration)



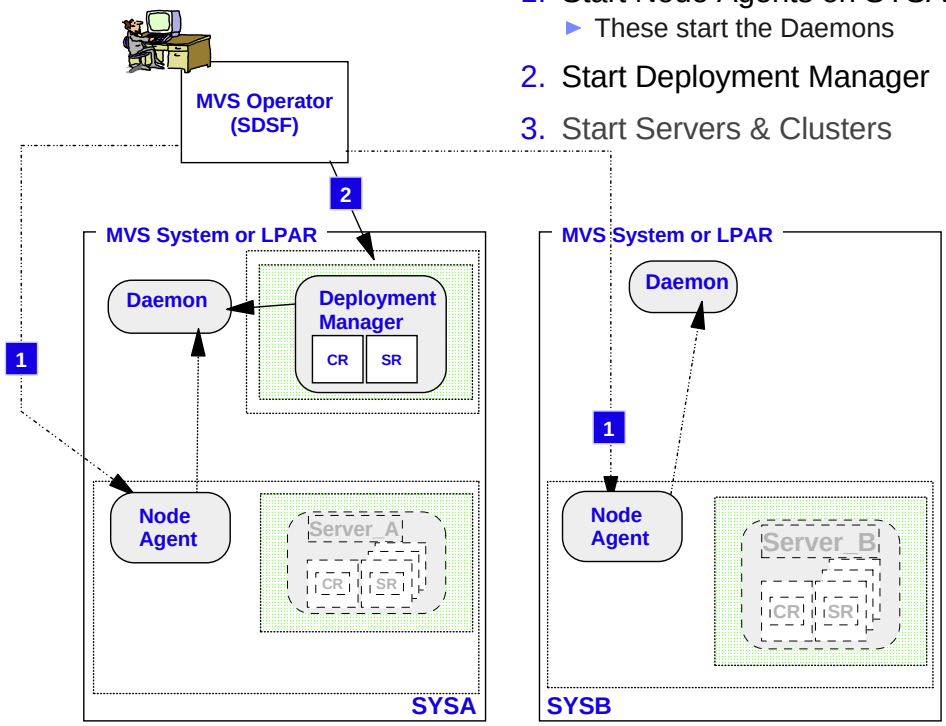
- **Use the adminconsole to stop Cluster, Servers, etc.**
  - Clusters: Servers >> Clusters >> "Stop" button
    - "RippleStart" to Stop and Restart
  - Servers: Servers >> Appl. servers >> "Stop" button
  - Node Agent: System Administration >> Node Agents >> "Stop" button
  - Deployment Mgr: System Administration >> Deployment Manager "Stop" button (This will log you out of the adminconsole.)
  - Daemons: Must use MVS Stop command
    - (Usually no reason to stop or restart the Daemon)
- **MVS Commands:**
  - Use the MVS Stop command (or SDSF 'Y' action char.) to bring down STCs in the reverse order that you started them.
  - If this fails (or if you are in a hurry), then use the "brute force way"
    - "C <jobname>"
    - "FORCE <jobname>" (you must first issue Cancel)
  - Recycling servers (Required to change some parms)
    - Controller regions: Stop & Start
    - Servant regions: Cancel <servant_ jobname>
      - WLM will restart them

Editing the commands issued by the AdminConsole:



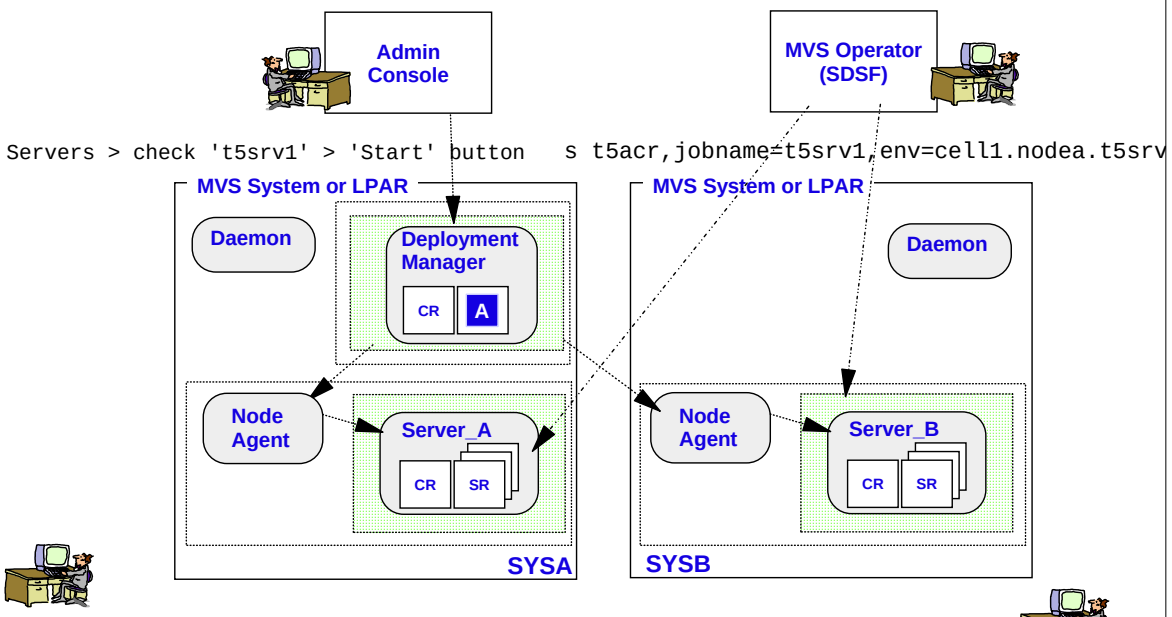
Multi-System Operations - MVS Commands to bring up the infrastructure:

1. Start Node Agents on SYSA & SYSB
   - These start the Daemons
2. Start Deployment Manager
3. Start Servers & Clusters



Starting servers - 4 ways to do it (at least)...
(once the Deployment Manager & Node Agents are started)

- Admin Console thru Node Agents
- MVS Start Command



- Command line tool (USS):

```
AppServer/bin> ./startServer.sh  t5srv1
```

- wsadmin script:

```
AppServer/bin> ./wsadmin.sh
wsadmin> $AdminControl startServer t5srv1
```

Operations using command line tools, or wsadmin scripts (if you are a UNIX geek)

telnet:

```
./startNode.sh
./startManager.sh
./startServer.sh
```

Start the Node Agent:

```
====================
:/wasv5config/twas/AppServer/bin-> ./startNode.sh
ADMU0116I: Tool information is being logged in file
        /wasv5config/twas/AppServer/logs/nodeagent/startServer.log
ADMU3100I: Reading configuration for server: nodeagent
ADMU3200I: Server launched. Waiting for initialization status.
ADMU3000I: Server nodeagent open for e-business; process id is ..
```

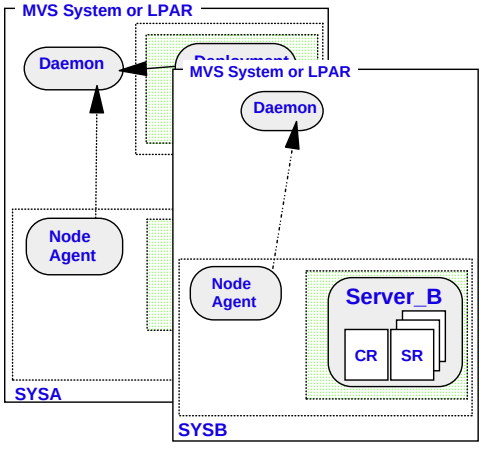
Start the Deployment Manager:

```
============================
/wasv5config/twas/DeploymentManager/bin-> ./startManager.sh
ADMU0116I: Tool information is being logged in file
    /wasv5config/twas/DeploymentManager/logs/dmgr/startServer.log
ADMU3100I: Reading configuration for server: dmgr
ADMU3200I: Server launched. Waiting for initialization status.
ADMU3000I: Server dmgr open for e-business; process id is BA1744...
```

Start the Server:

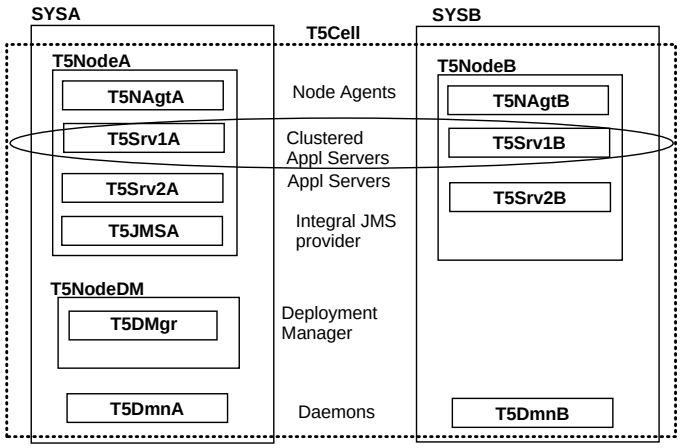
```
============================
/wasv5config/twas/AppServer/bin-> ./startServer.sh t5srv1
ADMU0116I: Tool information is being logged in file
        /wasv5config/twas/AppServer/logs/t5srv1/startServer.log
ADMU3100I: Reading configuration for server: t5srv1
ADMU3200I: Server launched. Waiting for initialization status.
ADMU3000I: Server t5srv1 open for e-business; process id is  BA...
```

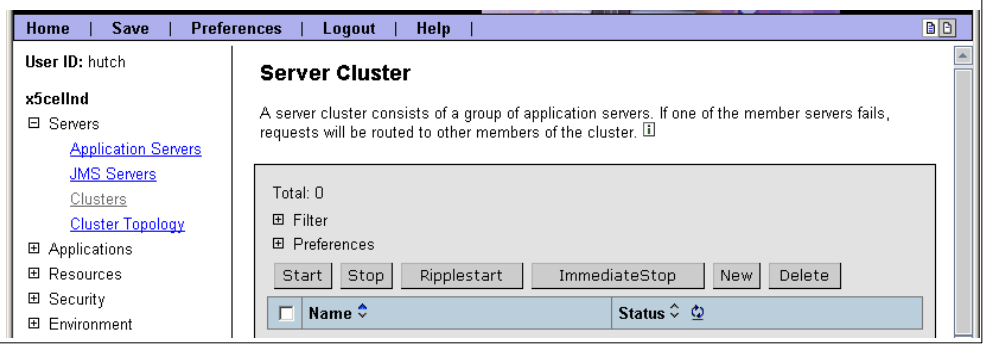
1. Start Node Agents ...
   - These start the Daemons
2. Start Deployment Manager
3. Start Servers & Clusters



Server Clusters

- **Groups of servers . . .**
  - running the same applications
  - provide high availability, and load balancing across a sysplex.
  - must be in the same cell
  - on the same or different systems
  - can be started and stopped as a group, or individually
  - use "Ripplestart" button in the adminconsole to re-cycle.





Security Considerations

- **OPERCMDS profiles**
  - MVS Operator, Daemon, and Controller regions need access to the appropriate OPERCMDS profiles. Examples:
    - MVS.START.STC.** ACC(UPDATE)
    - MVS.STOP.STC.** ACC(UPDATE)
    - MVS.MODIFY.STC.** ACC(UPDATE)
    - MVS.CANCEL.STC.** ACC(UPDATE)
    - MVS.FORCE.STC.** ACC(CONTROL)
  - Access to startServer.sh shell script, etc.
  - Sample Profiles No longer generated by the installation dialog (as of WAS 5.0.2)
- **EJBROLE profiles**
  - If Global Security is on, the adminconsole application uses EJBROLE Classes in RACF to control various functions:
    - <cellname>.administrator ACC(READ)
    - <cellname>.monitor ACC(READ)
    - <cellname>.configurator ACC(READ)
    - <cellname>.operator ACC(READ)

Practice Your Recovery Scenarios

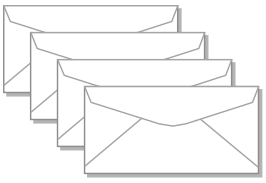
- **Server failures (Controller region)**
  - Restart with ARM (or your automation system)
- **NodeAgent, DeploymentManager**
  - Restart also with ARM
  - Should not impact application servers
- **System failures**
  - Cross-system ARM restart to release locks
  - Configure multi-system server clusters
  - Moving the Deployment Manager
- **Servers, Node Agents, DMgrs won't start**
  - Check the spelling of Start command parameters
    - Use SDSF 'SJ' command on old STC output
  - Verify RRS, TCP/IP, other subsystems are up
  - Check WLM Application Environment - active

Misc. Operational Tips

Where do all the messages go?

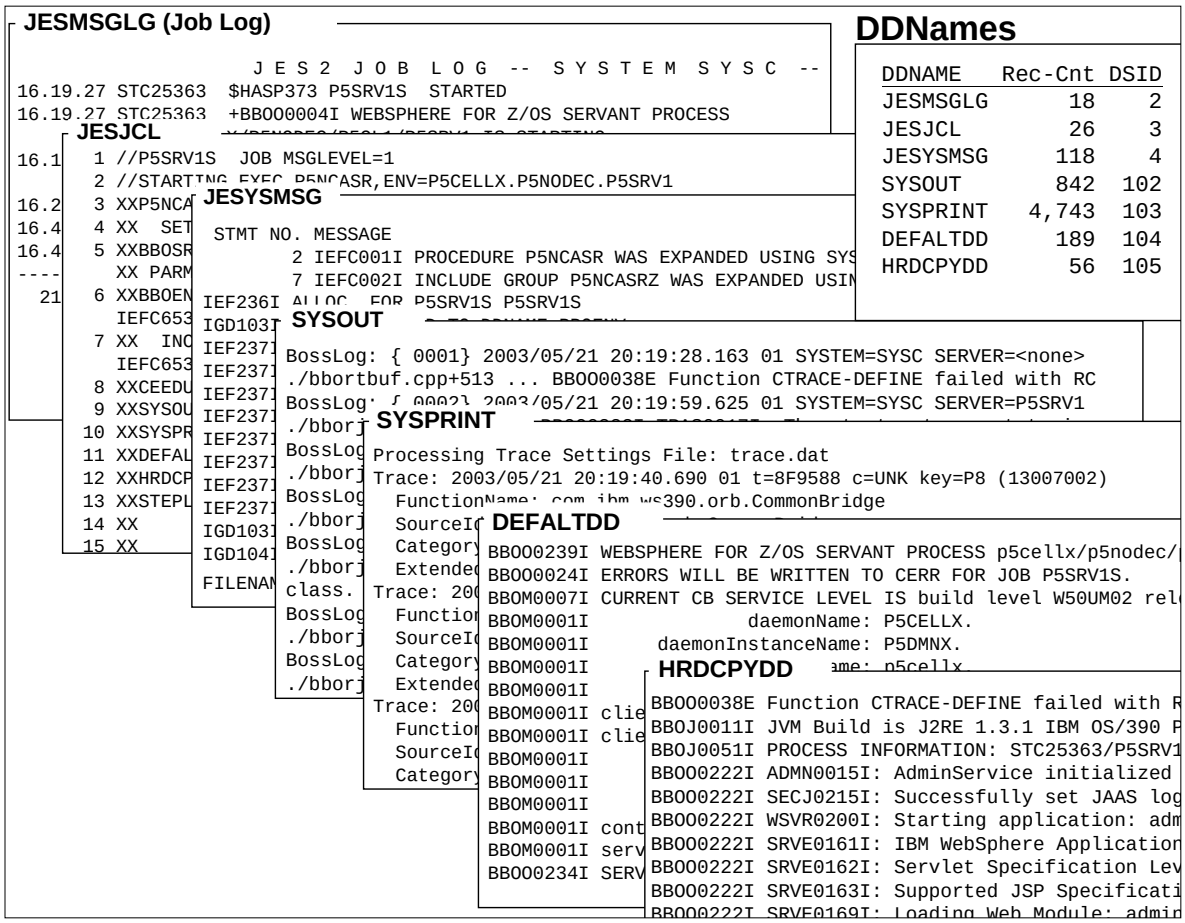
(or "how to clean all those messages off of SYSLOG...")

- **Configuration msgs at start-up** (before connecting to cerr), WTOs & Trace Error msgs, & Native code
  - **ras_hardcopy_msg_dd**=
  - default is JESMSGLG (JOBLOG) and SYSLOG
- **WTOs, Trace Audit msgs from distributed Java code**
  - **ras_default_msg_dd**=
  - default is hardcopy (JESMSGLG & SYSLOG)
- **Error Log Msgs, System.out.printerr**
  - **ras_log_logstreamName**=<log_stream_name>
  - default is STDERR (JESMSGLG & SYSOUT if no logstream?)
- **Traces, System.out.println**
  - **ras_trace_outputLocation**=BUFFER | SYSPRINT | TRCFILE
  - default is BUFFER for servers, SYSPRINT for clients



See Techdocs article TD101116

"How to manage operator message routing in WebSphere for z/OS V5"



Sending the output to HFS files

- **For the UNIX geeks (no green screens required):**
  - STDOUT and STDERR streams directed to SYSPRINT, SYSOUT (or other DDs) can be redirected to files in the HFS:
  - Modify the included &Z members in Proclib:

&Z member (partial view)

```
//* Output DDs
//*
//CEEDUMP   DD SYSOUT=*,SPIN=UNALLOC,FREE=CLOSE
//SYSOUT    DD SYSOUT=*,SPIN=UNALLOC,FREE=CLOSE
//SYSPRINT DD PATHMODE=(SIRWXU,SIRWXG,SIROTH),        <<< 775
//            PATHOPTS=(OWRONLY,OCREAT),              <<<
//            PATH='/tmp/wasv5log.&ENV..d&LYYMMDD..t&LHHMMSS'
```

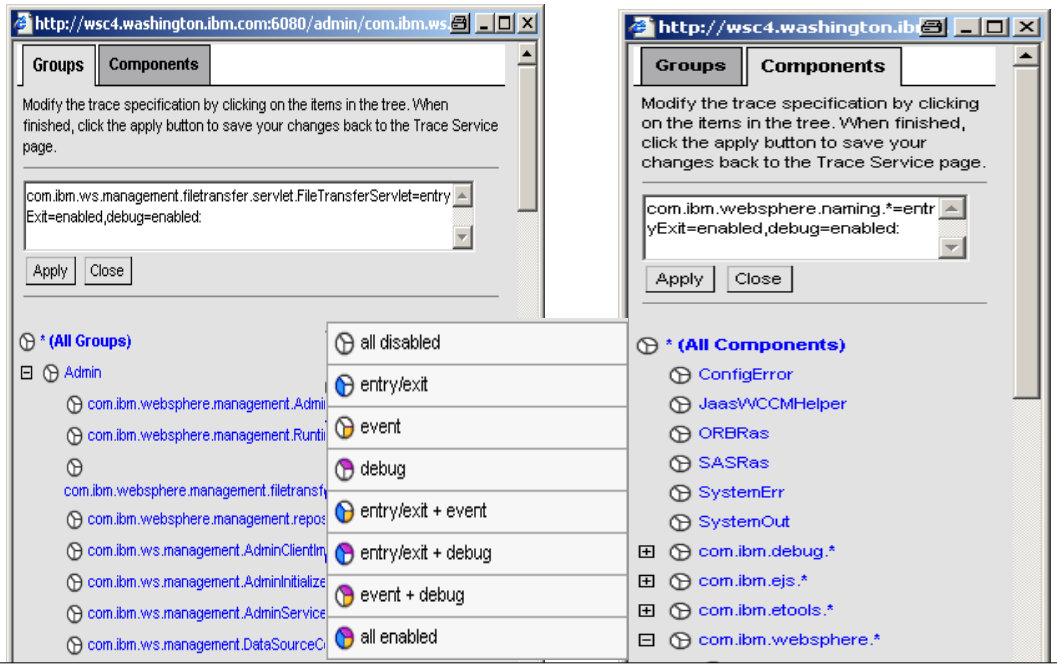
- **filename on May 29, 2003 at 1:30:35 PM resolves to wasv5log.<cell>.<node>.<server>.d030529.t133035**
- **Note: Cannot assign two DDs to the same HFS file.**

See Techdocs article TD101116

"How to manage operator message routing in WebSphere for z/OS V5"

WebSphere Diagnostic Tracing:

- **Use the AdminConsole to tailor Tracing:**
  - Servers > Application Servers > serverX > Diagnostic Trace Service > check "Enable Trace" > Modify > Groups / Components :



WebSphere Traces

TRACEBASIC / DETAIL codes:
0 = RAS
1 = Common Utilities
3 = COMM
4 = ORB
6 = OTS
7 = Shasta
9 = OS/390 Wrappers
A = Daemon
E = Security
F = Externalization
J = JRAS
L = J2EE

- **The powerful MODIFY command:**
  - **Turn tracing to sysprint on/off**
    - MODIFY <server_name>,TRACETOSYSPRINT=YES | NO
  - **Change overall trace level** ('F' is short for 'MODIFY')
    - F <server_name>,TRACEALL=0 | 1 | 2 | 3
  - **Turn on basic or detailed tracing for specified components (Non-Java)**
    - F <server_name>,TRACEBASIC=(0,1,2...)
    - F <server_name>,TRACEDETAIL=(0,1,2..)
  - **Turn on Java Tracing for specified components**
    - F <server_name>,TRACEJAVA='com.ibm.ws.security.*=all=enabled'
  - **Reset to trace settings in configuration (was.env)**
    - F <server_name>,TRACEINIT
  - **Turn off all tracing**
    - F <server_name>,TRACENONE
  - **Help & Display facilities:**
    - F <server_name>,HELP
    - F <server_name>,DISPLAY [,SERVERS] [,SERVANTS] [,SESSIONS [,SERVER [,TCPIIOP,LIST]]] [,TRACE [,ALL]] [,JVMHEAP [,ALL]] [,HELP]

Dynamically Display WAS Info.

- **Use the Modify ('F') command against any server instance:**

```
F P5SRV1,DISPLAY,HELP
BBOO0179I SERVERS  - DISPLAY ACTIVE CONTROL PROCESSES
BBOO0179I SERVANTS - SERVANT PROCESSES OWNED BY THIS CTL PROCESS
BBOO0179I SESSIONS - INFORMATION ABOUT COMMUNICATIONS SESSIONS
BBOO0179I TRACE    - DISPLAY INFORMATION ABOUT TRACE SETTINGS
BBOO0179I JVMHEAP  - DISPLAY JVM HEAP STATISTICS

F P5DMN,DISPLAY,SERVERS
BBOO0183I P5CELL  /P5DMNY     321x  SYSD      W500102
BBOO0183I P5AGNTD /P5AGNTD    322x  SYSD      W500102
BBOO0183I P5CELL  /P5DMNX     301x  SYSC      W500102
BBOO0183I P5AGNTC /P5AGNTC    305x  SYSC      W500102
BBOO0183I P5CLDMGR/P5DMGR      50x  SYSD      W500102
BBOO0183I P5CL1   /P5SRV1D    329x  SYSD      W500102

F P5DMGR,DISPLAY,SESSIONS,SERVER,HTTP,LIST
BBOO0194I SERVER P5CLDMGR/P5DMGR HAS 2 HTTP SERVER SESSIONS AS FOLLOWS
BBOO0195I ip addr=9.82.157.209 port=1400

F P5SRV1,DISPLAY,JVMHEAP,ALL
BBOO0201I JVM HEAP INFORMATION FOR SERVER P5CL1/P5SRV1D/STC32648
BBOO0202I (STC32648) HEAP(MIDDLEWARE), COUNT(00000004),
          FREE STORAGE(40AF38), TOTAL STORAGE( 2FFFA00)
```

Display Work Commands

- **f** <server_name>,**display,work,<display_work_parameters>**
  where the <display_work_parameters> can be one of the following:
  - HELP - show these DISPLAY,WORK parameters
  - **EJB** - EJB requests driven by IIOP: total, current, dispatched & timed out
  - EJB,SRS - EJB requests driven by IIOP by servant region
  - **SERVLET** - Servlet requests driven by HTTM: total, current, dispatched & timed out
  - SERVLET,SRS - Servlet requests by each servant region
  - **MDB** - MDB requests driven by JMS: total, current, dispatched & timed out
  - MDB,SRS - MDB requests broken down by servant region
  - **ALL** - Combines the above for EJBs, servlets, and MDBs
  - ALL,SRS - EJBs, servlets, and MDBs by servant region
  - **SUMMARY** - total requests, current in progress, and in dispatch for all types
  - SUMMARY,SRS - total received by each SR, current in dispatch in each SR for all types
- **Example: f azsr01a,display,work,servlet**

```
BBOO0255I TIME OF LAST WORK DISPLAY Wed Dec 3 19:17:54 2003
BBOO0256I TOTAL SERVLET REQUESTS         150670    (DELTA 1654)
BBOO0257I CURRENT SERVLET REQUESTS       1
BBOO0258I SERVLET REQUESTS IN DISPATCH   0
BBOO0267I TOTAL SERVLET TIMEOUTS         0    (DELTA 0)
BBOO0188I END OF OUTPUT FOR COMMAND DISPLAY,WORK,SERVLET
```

Display Error Log Command

- **Shows the last 10 messages in the error log (even if you're not routing them logstream.)**
- **Example: f x5sr01b,display,errlog**

```
BBOO0266I (STC18876) BossLog: { 0001} 2003/11/25 20:08:55.120 01
SYSTEM=SYSB SERVER=X5SR01B  PID=0X010201B2 TID=0X12FB3F00 00000000
c=UNK ./bborjtr.cpp+812 ... BBOO0222I TRAS0017I: The startup trace
state is *=all=disabled.
BBOO0266I (STC18876) BossLog: { 0002} 2003/11/25 20:09:08.255 01
SYSTEM=SYSB SERVER=X5SR01B  PID=0X010201B2 TID=0X12FB3F00 00000000
c=UNK ./bborjtr.cpp+812 ... BBOO0222I SECJ0231I: The Security
component's FFDC Diagnostic Module com.ibm.ws.security.core.SecurityD
registered successfully: true.
BBOO0266I (STC18876) BossLog: { 0003} 2003/11/25 20:09:09.562 01
SYSTEM=SYSB SERVER=X5SR01B  PID=0X010201B2 TID=0X12FB3F00 00000000
c=UNK ./bborjtr.cpp+812 ... BBOO0222I SECJ0212I: WCCM JAAS
configuration information successfully pushed to login provider class
BBOO0266I (STC18876) BossLog: { 0004} 2003/11/25 20:09:09.573 01
SYSTEM=SYSB SERVER=X5SR01B  PID=0X010201B2 TID=0X12FB3F00 00000000
c=UNK ./bborjtr.cpp+812 ... BBOO0222I SECJ0240I: Security service
initialization completed successfully
```

WLM Classification of Work Requests in WAS 5.1

- **New with WAS V5.1 service level W510200 (refresh PTF)**
- **Workload Classification document: common .xml file for transaction classification (TC) of inbound work:**
  - HTTP - host, port, URI
  - IIOP - application, module, component, and method name
  - MDB - message listener port, selector attribute
- **Migration/Coexistance:**
  - New classification document supercedes old MDB classification file.
  - New classification document can coexist w/ old HTTP Transaction Class mapping file, but if it contains any HTTP classification rules, the old style document will not be used.
- **See Techdocs article WP100449**

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE Classification SYSTEM "Classification.dtd" >
<Classification schema_version="1.0">
<!--  IIOP Classification Rules  -->
   <InboundClassification type="iiop"
                          schema_version="1.0"
                          default_transaction_class="A0">
      <iiop_classification_info transaction_class="A1"
                                application_name="IIOPStatelessSampleApp"
                                module_name="StatelessSample.jar"
                                component_name="Sample20"
                                description="Sample20 EJB Classification">
         <iiop_classification_info transaction_class=""
```

Display Classification Counters: (new with W510200)

```
F X5SR02A,DISPLAY,WORK,CLINFO
BBOO0277I CLASSIFICATION COUNTERS FOR IIOP WORK
BBOO0278I CHECKED 14, MATCHED 14, USED 0, COST 0, DESC: IIOP Default
BBOO0278I CHECKED 14, MATCHED 3, USED 0, COST 0, DESC: sample
BBOO0278I CHECKED 3, MATCHED 1, USED 1, COST 3, DESC: a1a
BBOO0278I CHECKED 2, MATCHED 1, USED 1, COST 4, DESC: a1b
BBOO0278I CHECKED 1, MATCHED 1, USED 1, COST 5, DESC: a1c
BBOO0278I CHECKED 11, MATCHED 11, USED 0, COST 0, DESC: other
BBOO0278I CHECKED 11, MATCHED 1, USED 1, COST 4, DESC: a
BBOO0278I CHECKED 10, MATCHED 1, USED 1, COST 5, DESC: b
BBOO0278I CHECKED 9, MATCHED 1, USED 1, COST 6, DESC: c
BBOO0278I CHECKED 8, MATCHED 2, USED 2, COST 7, DESC: d
BBOO0278I CHECKED 6, MATCHED 1, USED 1, COST 8, DESC: e
BBOO0279I FOR IIOP WORK: TOTAL CLASSIFIED 14, WEIGHTED TOTAL COST 95

BBOO0277I CLASSIFICATION COUNTERS FOR HTTP WORK
BBOO0278I CHECKED 0, MATCHED 0, USED 0, COST 0, DESC: HTTP Default
BBOO0278I CHECKED 0, MATCHED 0, USED 0, COST 0, DESC: n
BBOO0278I CHECKED 0, MATCHED 0, USED 0, COST 0, DESC: o
BBOO0278I CHECKED 0, MATCHED 0, USED 0, COST 0, DESC: q
BBOO0278I CHECKED 0, MATCHED 0, USED 0, COST 0, DESC: r
BBOO0278I CHECKED 0, MATCHED 0, USED 0, COST 0, DESC: s
BBOO0279I FOR HTTP WORK: TOTAL CLASSIFIED 0, WEIGHTED TOTAL COST 0
BBOO0188I END OF OUTPUT FOR COMMAND DISPLAY,WORK,CLINFO

BBOO0277I CLASSIFICATION COUNTERS FOR MDB WORK
```

References

Handy MVS Display Commands:

```
d a,all              all jobs running on the system
d asm,page=all       page data sets & utilization of page space
d grs,c              global resource serialization - contention
d grs,res=(syszbbo,*)   grs ENQs by WAS
d iplinfo            ipl time & bootstrap parms
d logger,l           logger logstreams
d parmlib            parmlib data sets used for this IPL
d omvs,a=all         UNIX address spaces (processes)
d omvs,f | o | p     HFS file systems in use | config. | PFS
d opdata             operator command prefixes
d r,l                outstanding WTORs (Write To Operator with Replys)
d smf                SMF recording dataset status
d symbols            system symbolics
d tcpip,,n,route | home     TCP/IP routes, home
d tcpip,,n,portlist         TCP/IP Ports
d trace[,comp=cname]    trace settings
d wlm,applenv=*      what application environments are active
d wlm,dynappl=*      what dynamic application environments are active
d xcf,cpl | str      XCF parameters and couple data sets | structures
$dspl                JES2 spool utilization
```

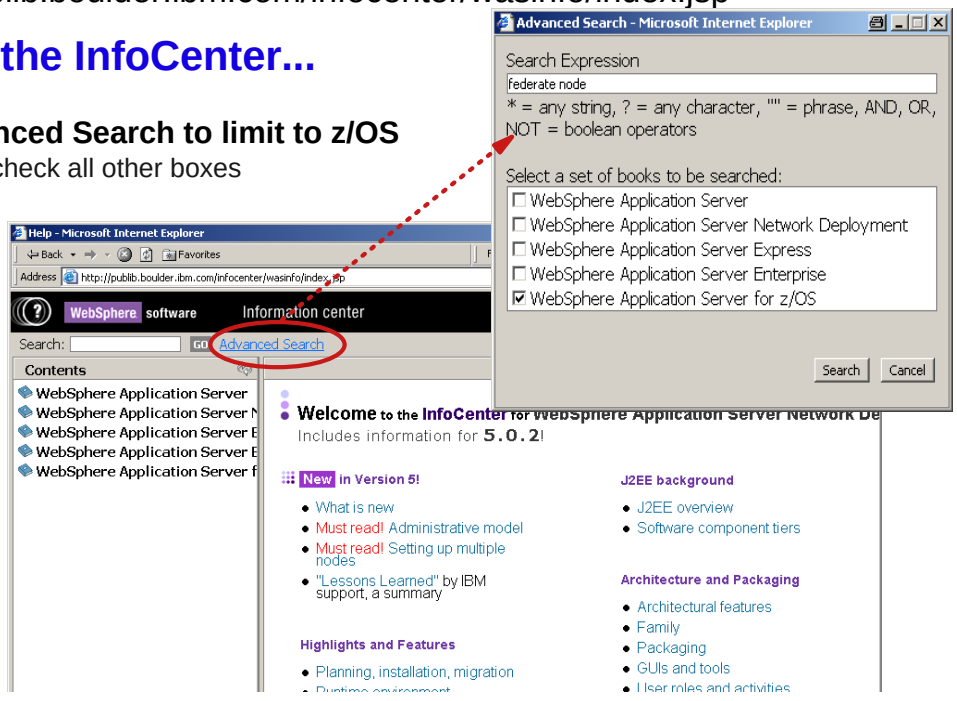
Other Handy MVS Commands:

Start RRS	start atrrrs,sub=mstr
Stop RRS	setrrs cancel
Start DB2	-dbpx start db2
Stop DB2	-dbpx stop db2
Start MQSeries	+mqsysx start qmgr parm(mqzprm)
Stop MQSeries	+mqsysx stop qmgr
Start WAS CTrace	trace ct,wtrstart=<ctwtr_procname>
Stop WAS CTRACE	trace ct,off,comp=<cell_name>
	trace ct,wtrstop=<ctwtr_procname>
Disable ARM	setxcf stop,policy,type=arm
Activate WLM Appl.Env.	v wlm,applenv=xxxx,resume
Activate Dynamic WLM Appl.Env.	v wlm,dynappl=xxxx,resume
Switch SMF datasets	i smf
Change SMF parms	setsmf <var_name>=value
Switch to new SMF parms	set smf=99
Change OMVS parms	setomvs <var_name>= value
Refresh TCP/IP Profile parms	v tcpip,,o,sys1.tcpparms(profilex)

http://publib.boulder.ibm.com/infocenter/wasinfo/index.jsp

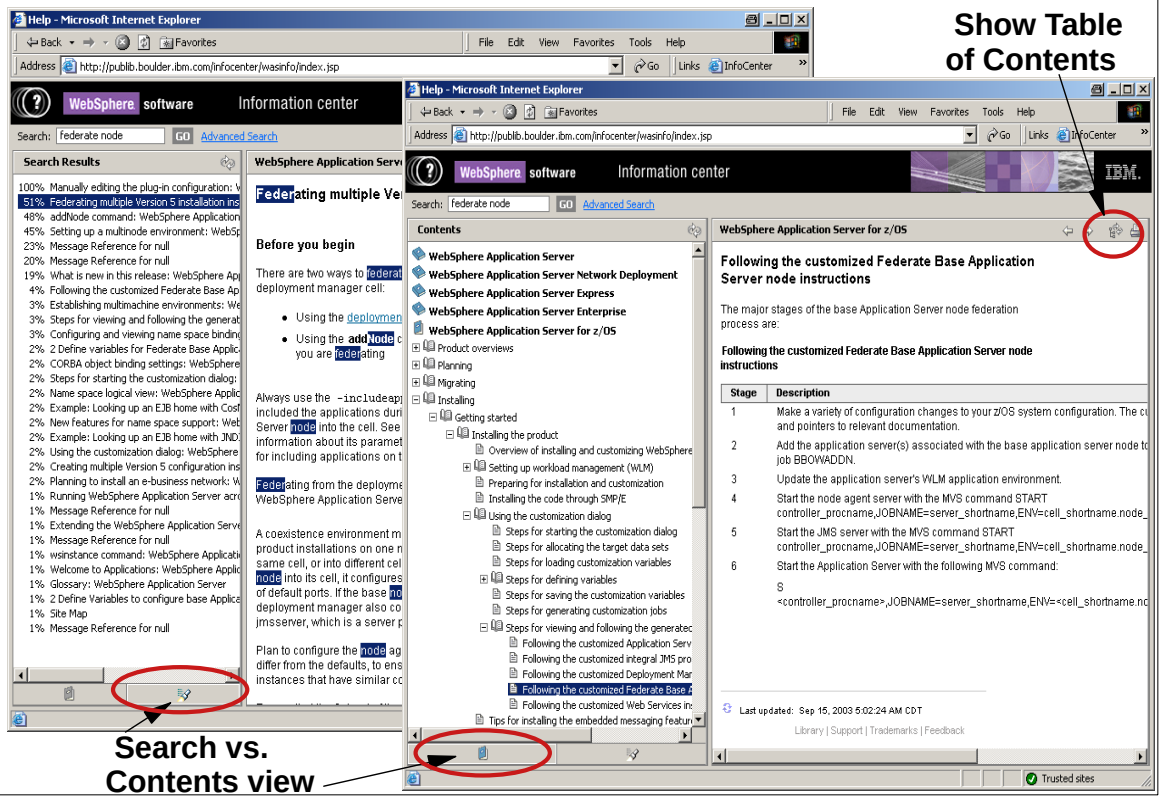
Using the InfoCenter...

- **Advanced Search to limit to z/OS**
  - Uncheck all other boxes



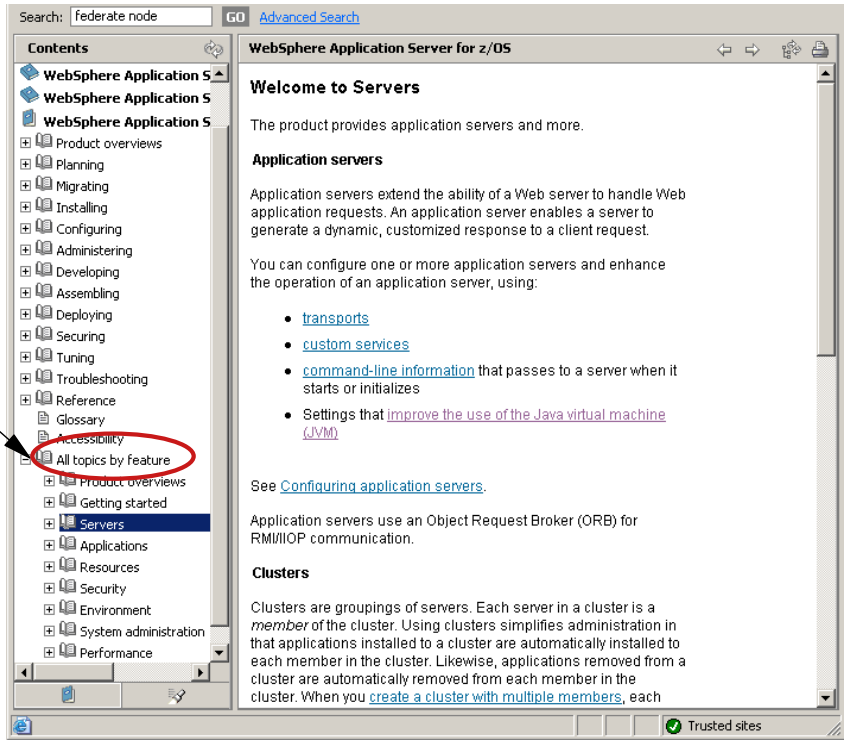
- **Download your own copy of the InfoCenter Database**
  - Go to http://www.ibm.com/software/webservers/appserv/infocenter.html
    - See Techdocs item FQ102912 "How can I put a Local copy of the WebSphere InfoCenter on my workstation? "

InfoCenter Views: Contents & Search Results



InfoCenter: All Topics by Feature

- **Display material as it is arranged in the PDFs:**
  - **All books by feature:**



Documentation - WebSphere V5.1

- **InfoCenter** (basis for the PDF books)
  - http://publib.boulder.ibm.com/infocenter/wasinfo/index.jsp
- **Books (PDFs) from WebSphere for z/OS home page**
  - http://www.ibm.com/software/webservers/appserv/zos_os390/library/
  1. **Getting Started**
  2. **Servers & Environment**
  3. **Applications**
  4. **Resources**
  5. **Security**
  6. **System Administration**
  7. **Performance Monitoring & Tuning**
  8. **Problem Determination**
  9. **Program directory**
  10. **Messages & Codes**
- **Administrative Console Help**
- **Techdocs**
  - http://www.ibm.com/support/techdocs
- **RedBooks**
  - http://www.redbooks.ibm.com/

WSC TechDocs - WebSphere V.5 for z/OS

http://www.ibm.com/support/techdocs

- WP100339 Introduction to WebSphere for z/OS Version 5 (updated 09/13/03)
- WP100367 WSC Sample WebSphere ND 502 configuration on z/OS (updated 02/16/04)
- WP100375 Connecting to CICS Transaction Server from WebSphere for z/OS Version 5
- WP100385 User MBean (z-ready) Support for Multi-Process Server on WebSphere for z/OS
- WP100386 Activating z990 Cryptographic Services for WebSphere
- WP100387 WLM Classification of Message Driven Bean Enclaves in WebSphere for zOS
- WP100392 Exploiting web services in WebSphere for z/OS
- WP100395 Using J2C Connectors under WAS V5 for z/OS to access CICS or IMS Transactions
- WP100396 Planning for Test, Production and Maintenance
- WP100415 Starting the Deployment manager on another MVS image
- WP100417 z/OS Performance: Capacity Planning Considerations for zAAP Processors
- WP100421 WebSphere Version 5 for z/OS - WSADMIN Primer
- WP100424 WebSphere Application Server V5 for z/OS JMS and MDB IVP
- WP100431 Installing the zAAP Projection Tool Instrumented SDK in WAS for z/OS Version 5.0
- WP100441 Migrating from WebSphere for z/OS V5 to V5.1
- WP100449 WLM Classification of Work Requests in WebSphere for z/OS V5.1
- PRS708 WAS for z/OS Version 5 - "Gen 5" Wildfire Workshop Presentations (updated 5/19/04)
- PRS752 Performance Summary Report for SMF 120 records from WAS V.5 for z/OS
- PRS733 zSeries and TotalStorage Technical Update (zSTSU)
- PRS775 WebSphere V5 Security Workshop Class Materials
- PRS804 Performance Engineering & Tuning WebSphere Version 5 for z/OS
- PRS829 Configuring and Troubleshooting the WAS for z/OS Version 5 HTTP Server Plugin
- PRS929 zAAP processor capacity planning training : An Overview of the zAAP Tool
- FQ102864 How big should my /tmp directory for WebSphere V5 for z/OS?
- FQ102865 How do I turn on SMF 120 recording for WebSphere V5 for z/OS?
- FQ102895 SRVE0079E: Servlet host not found with WebSphere Version 5
- FQ102912 How can I put a Local copy of the WebSphere InfoCenter on my workstation?
- FQ102962 Where can I find good diagnostic guide for IBM Java SDK 1.3.1?
- FQ103701 Setting HTTP Output Timeout value to prevent AppServer EC3 - 04130007 ABENDs
- FQ105555 WAS v5 on z/OS - append directory to server region's libpath using adminconsole

WSC TechDocs - WebSphere V.5 for z/OS

http://www.ibm.com/support/techdocs

- TD100745 Activating S/390 and zSeries Cryptographic Services for WebSphere
- TD101072 Using DB2 for z/OS in WebSphere for z/OS Version 5
- TD101073 Using the WebSphere for z/OS V5 Customization Dialogues
- TD101074 Enabling JCE & JSSE Security in WebSphere for z/OS Ver. 5
- TD101075 WebSphere Version 5 for z/OS: 10 Steps for an Easy Installation
- TD101087 Directing SYSPRINT Output to an HFS File in WebSphere for z/OS
- TD101115 RACF Tools for WebSphere for z/OS Ver.5
- TD101116 How to manage operator message routing in WebSphere for z/OS V5
- TD101118 RACF Tips for customizing WebSphere for z/OS Ver.5
- TD101121 How to Update the CFRM Policy to include the WAS error logstream
- TD101124 How to use WLM Dynamic Application Environments with WebSphere for z/OS V5
- TD101128 RACF Backout Tool for WebSphere for z/OS Version 5
- TD101150 Enabling Global Security in WebSphere V5 for z/OS
- TD101151 How to Classify Transactions in WebSphere for z/OS V5
- TD101152 How to Manage the Number of Servant Regions with WebSphere for z/OS V5 and WLM
- TD101198 Application Problem Isolation using the WSAD Distributed Debugger with WAS for z/OS
- TD101199 Enabling the WSAD Application Profiler in a WAS 5.0 for z/OS Environment
- TD101216 Tracing and Analyzing Java Garbage Collection in WebSphere for z/OS V5
- TD101242 How-to set up the Tivoli Performance Viewer with WebSphere V.5.0.1 for z/OS
- TD101245 Important Steps in Configuring WAS V5 ND
- TD101246 Using Log4j in J2EE Applications Under WebSphere Application Server v5 for z/OS
- TD101255 Implementing Enhanced Form Based Authentication w/ Servlet Filters in WAS v5 for z/OS
- TD101338 How to Display Work in WebSphere Application Server V 5.0.2 for z/OS
- TD101339 How to find the CPU Time Usage in your WebSphere V5 for z/OS java programs
- TD101348 PolicyIVPV5 J2EE 1.3 for WebSphere for z/OS V5
- TD101529 Application Migration Perform Guide - Migrating to WAS 5.0.2 for z/OS
- TD101631 Using Wsadmin Tool Under WAS z/OS V5 Global Security Enabled Environment
- TD101645 Tivoli Performance Viewer Security for WebSphere V5 for z/OS
- TD101663 Enabling WebSphere Application Server 5.0.2 for z/OS to use the DB2 Universal JDBC Driver
- TD101703 Disabling the Deployment Manager Timeout Values in WAS for z/OS V5

Education (US) - WebSphere V5 for z/OS

- **ES685 - "WAS V5 Implementation Workshop"**
  - (4.5 days)
- **ES690 - “WebSphere for z/OS Version 5 Update”**
  - (2.0 days)
- **OZ850 - “Maximizing WebSphere Performance”**
  - (4.5 days)

Wildfire Workshops:

- **WBSR5 - WebSphere V5 for z/OS Workshop "Gen 5"**
  - (3 days)
- **WSW05 - "Security Workshop: WAS V5 for z/OS"**
  - (2.5 days)
- **WBIZ5 - "WBISF Install and Cust'n: WAS V5.1 for z/OS"**
  - (2.5 days)