

Common Problems and Other Things You Should Know about WAS on z/OS

Session 16382

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IBM



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WebSphere Application Server



Session	Title	Time	Room	Speaker
16379	WebSphere Liberty Profile, Windows and z/OS, Hands-on Lab	Monday 4:30	Redwood	Follis/Stephen
16380	z/OS Connect: Opening up z/OS Assets to the Cloud and Mobile Worlds	Tuesday 1:45	Virginia	David Follis
16381	WebSphere Liberty Profile and Traditional WebSphere Application Server – What's New?	Tuesday 3:15	University	Follis/Stephen
16509	Debug 101-Using ISA Tools for Apps in WebSphere Application Server z/OS	Wednesday 3:15	Virginia	Mike Stephen, Joran Siu
16383	IBM Installation Manager for z/OS System Programmers: Web-based Installs, Fix Packs, and How iFixes Really Work.	Thursday 8:30	University	Don Bagwell, Bryant Panyarachun
16384	JSR 352 - The Future of Java Batch and WebSphere Compute Grid	Thursday 10:00	University	David Follis
16382	Common Problems and Other Things You Should Know about WAS on z/OS	Thursday 4:30	Virginia	Mike Stephen
16385	Configuring Timeouts for WebSphere Application Server on z/OS	Friday 10:00	Virginia	Follis/Stephen



Security / Integrity

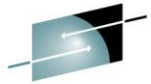
Security Vulnerabilities

- Yes.....vulnerabilities get reported
 - News media
 - Network of friends / co-workers
 - CVE – Common Vulnerabilities and Exposures
- No... WebSphere App Server z/OS Level 2 cannot discuss them
 - So where do you get the information ?
 - System z Security Portal
 - contains all pertinent information regarding security vulnerabilities for products on the z/OS platform, and how to resolve them

System z Security Portal

- **z/OS and z/VM customers access security and Integrity PTFs via the System z Security Portal.**
 - IBM recommends that you promptly install security and integrity PTFs
 - SECINT PTFs are included in RSUs periodically
 - The System z Security Portal can help you stay more current with SECINT PTFs by providing SMP/E HOLDDATA you can use to identify these fixes before they are marked RSU
 - The System z Security Portal also provides associated Common Vulnerability Scoring System (CVSS) V2 ratings for new APARs*
 - To get this information, you must register!
 - Because widespread specifics about a vulnerability could increase the likelihood that an attacker could successfully exploit it
 - In response to customer requests to maintain the confidentiality
 - Other requirements on the website
 - IBM recommends that you visit the System z Security Portal site: http://www.ibm.com/systems/z/advantages/security/integrity_zos.html to get the information you need to register
 - Questions can be directed to: syszsec@us.ibm.com
- Note: According to the Forum of Incident Response and Security Teams (FIRST), the Common Vulnerability Scoring System (CVSS) is an "industry open standard designed to convey vulnerability severity and help to determine urgency and priority of response." IBM PROVIDES THE CVSS SCORES "AS IS" WITHOUT WARRANTY OF ANY KIND, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. CUSTOMERS ARE RESPONSIBLE FOR ASSESSING THE IMPACT OF ANY ACTUAL OR POTENTIAL SECURITY VULNERABILITY IN THEIR SPECIFIC ENVIRONMENT. IBM DOES NOT PROVIDE A CVSS ENVIRONMENT SCORE. THE CVSS ENVIRONMENT SCORE IS CUSTOMER ENVIRONMENT SPECIFIC AND WILL IMPACT THE OVERALL CVSS SCORE. CUSTOMERS SHOULD EVALUATE THE IMPACT OF ANY ACTUAL OR POTENTIAL SECURITY VULNERABILITY IN THEIR SPECIFIC ENVIRONMENT.
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WebSphere App Server z/OS

- PROVIDE TLSV1.1 AND TLSV1.2 PROTOCOL SUPPORT FOR DAEMON SYSTEM SSL
- Customers wanting to implement TLS1.1 and TLS1.2 protocol communications between clients and the z/OS Location Server Daemon can not.
 - PI19036 V7 – 7.0.0.33
 - PM99397 V7.x - 7.0.0.33
 - V8.x – 8.0.0.9
 - V8.5.x – 8.5.5.3

Note: If you are changing DAEMON protocols, the variable "com_ibm_DAEMON_protocol_xxx_xxx_xxx=y" will *only surface in the Daemon* job output.

HTTP Server 5.3 / WASOEM

- HTTP Server 5.3
- PK53555
 - R53B UK29919; R530 UK29918; R531 UK29920 UP07/10/11
- UNABLE TO TURN OFF SSLVx WITHOUT TURNING OFF TLSV1
- APAR and latest Planning, Installing, and Using doc has documented
 - turn off SSLv2 / 3 and force TLSv1
- <http://pic.dhe.ibm.com/infocenter/zos/v2r1/index.jsp?topic=%2Fcom.ibm.zos.v2r1.dgw%2Fdgw.htm>
 - **Appendix B** under **Security directives**. The SSLCipherSpec section starts on page 594.
- WASOEM
 - information can be found in the System z Security Portal.

Traditional WAS / Liberty

Collecting HFS Configuration Files

Save time and help expedite problem resolution by sending in all configuration files in once.

Traditional WebSphere Profile

Run the collector shell script to obtain files with extensions xml, xmi, props, properties, ffdc logs, and others.

```
export IBM_JAVA_OPTIONS=-Dfile.encoding=ISO8859-1  
/WAS_HOME/AppServer/profiles/default/bin/collector.sh
```

Ignore messages about deprecation.

This will create a jar labeled [hostname.cellname.nodename.default-WASenv.jar](#) in the directory that you ran the command from.

Liberty Profile

Run the [server dump](#) command to create a zip file containing server.xml, server.env, ffdc logs.

Ensure you have your JAVA_HOME set to the JVM location and WLP_USER_DIR set to the Liberty Profile directory.

```
export JAVA_HOME=/usr/lpp/zWebSphere/Liberty/V8R5/java/java_1.7_64  
export WLP_USER_DIR=/WebSphere/Liberty  
/usr/lpp/zWebSphere/Liberty/V8R5/bin:>server dump <servername>
```

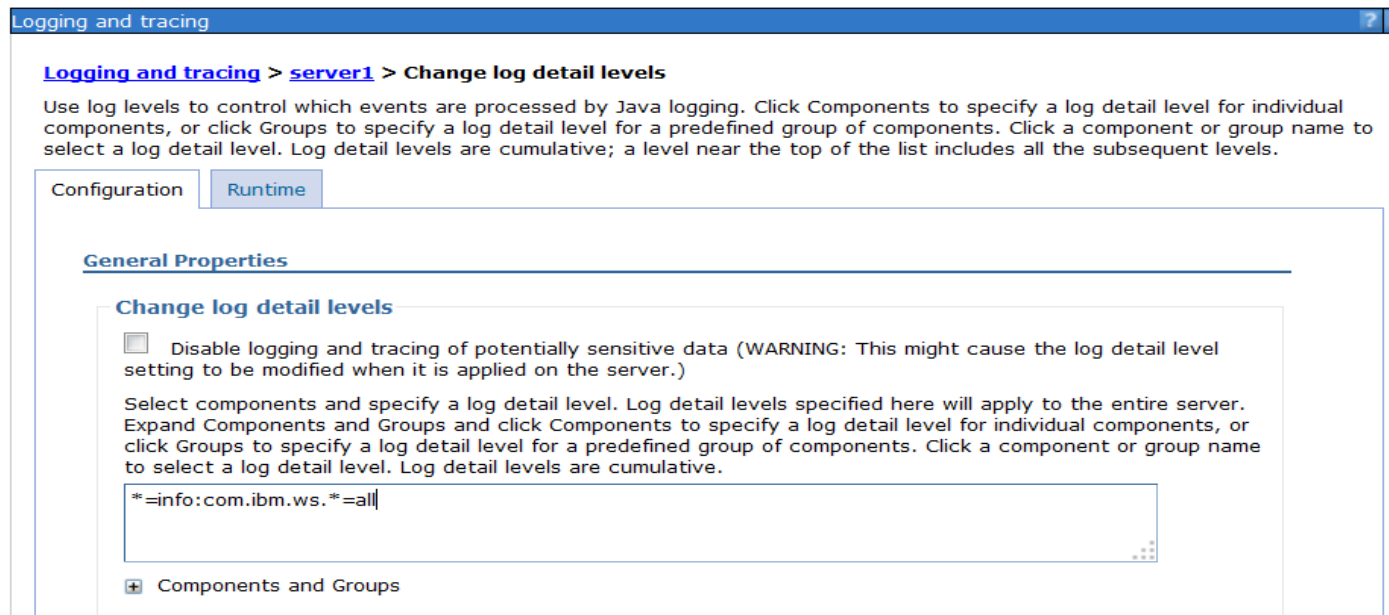
This will create a zip file called [servername.dump-year.month.day_hour.minute.second.zip](#) in the WLP_USER_DIR/severs/servername directory.

Enabling Trace for Traditional WebSphere

Traditional WebSphere Profile

Using the administrative console

Logging and tracing > servername > Change log detail levels



The screenshot shows the 'Logging and tracing' administrative console window. The breadcrumb path is 'Logging and tracing > server1 > Change log detail levels'. Below the breadcrumb is a paragraph explaining log levels. There are two tabs: 'Configuration' and 'Runtime'. Under 'General Properties', there is a section 'Change log detail levels' with a checkbox for 'Disable logging and tracing of potentially sensitive data'. Below this is a text area containing the log level pattern '*=info:com.ibm.ws.*=all'. At the bottom, there is a '+ Components and Groups' link.

Trace output will typically go to [SYSPRINT](#) in the job output or if High Performance Extensible Logging (HPEL) is enabled, trace output will go to the file system in [WAS_HOME/profiles/default/logs/servername/tracedata](#) directory

Enabling Trace for Liberty Profile

Add the logging XML tag with your traceSpecification to server.xml

Edit ASCII file server.xml

/WebSphere/Liberty/servers/server1/server.xml

```
<server description="new server">
  <!-- Enable features -->
  <featureManager>
    <feature>jsp-2.2</feature>
  </featureManager>

  <httpEndpoint id="defaultHttpEndpoint"
    host="localhost"
    httpPort="9080"
    httpsPort="9443" />

  <logging traceSpecification="*=info:com.ibm.ws.*=all"/>
</server>
```

Trace will be written to ASCII file [WLP_USER_DIR/servers/servername/logs/trace.log](#)

Dynamic Tracing for WebSphere and Liberty



Traditional WebSphere Profile

Enabling a trace using the modify command

```
F BBOS1,TRACEJAVA='com.ibm.ws.*=all'  
BBOO0211I MODIFY COMMAND TRACEJAVA='com.ibm.ws.*=all' COMPLETED SUCCESSFULLY
```

Resetting a trace using the modify command

```
F BBOS1,TRACEINIT  
BBOO0211I MODIFY COMMAND TRACEINIT COMPLETED SUCCESSFULLY
```

Liberty Profile (requires servers to be started using angel BBZANGL and server BBGZSRV procs)

Enabling a trace using the modify command

```
F BBGZSRV,LOGGING='com.ibm.ws.*=all'  
+CWWKB0005I: COMMAND RESPONSES COMPLETED SUCCESSFULLY FROM Logging  
+CWWKB0002I: MODIFY COMMAND LOGGING='com.ibm.ws.*=all' COMPLETED SUCCESSFULLY.
```

Resetting a trace using the modify command

```
F BBGZSRV,LOGGING=RESET  
+CWWKB0005I: COMMAND RESPONSES COMPLETED SUCCESSFULLY FROM Logging  
+CWWKB0002I: MODIFY COMMAND LOGGING=RESET COMPLETED SUCCESSFULLY.
```

Obtaining a Javacore



Traditional WebSphere Profile

`wsadmin.sh/Jython`

```
wsadmin.sh [-host host_name] [-port port_number] [-user userid[-password password]]
jvm = AdminControl.completeObjectName('type=JVM,process=SERVER_NAME,*')
AdminControl.invoke(jvm, 'dumpThreads')
```

`F BBOS1, JAVACORE`

`BBOO0211I MODIFY COMMAND JAVACORE COMPLETED SUCCESSFULLY`

`JVMDUMP034I User requested Java dump using`

`'/SY1/var/WebSphere/home/WSCFG1/javacore.20150227.190936.67008.0001.txt'` through JVMRI

`BBOO0211I MODIFY COMMAND JAVACORE COMPLETED SUCCESSFULLY`

`JVMDUMP034I User requested Java dump using`

`'/SY1/var/WebSphere/home/WSSR1/javacore.20150227.190937.67012.0001.txt'` through JVMRI

Liberty Profile

`server javadump servername`

`/usr/lpp/zWebSphere/Liberty/V8R5/bin:>server javadump server1`

`Dumping server server1.`

`Server server1 dump complete in`

`/WebSphere/Liberty/servers/server1/javacore.20150224.102206.83952322.0001.txt.`

`F BBGZSRV, JAVACORE`

`JVMDUMP034I User requested Java dump using`

`'/WebSphere/Liberty/servers/defaultServer/javacore.20150224.162944.66238.0002.txt'`

`through com.ibm.jvm.Dump.JavaDump`

`+CWWKB0005I: COMMAND RESPONSES COMPLETED SUCCESSFULLY FROM Javacore Command Handler.`

`+CWWKB0002I: MODIFY COMMAND JAVACORE COMPLETED SUCCESSFULLY.`

Obtaining a Portable Heapdump PHD

Traditional WebSphere Profile

```
wsadmin.sh/Jython
```

```
wsadmin.sh [-host host_name] [-port port_number] [-user userid[-password password]]  
jvm = AdminControl.completeObjectName('type=JVM,process=SERVER_NAME,*')  
AdminControl.invoke(jvm, 'generateHeapDump')
```

```
F BBOS1,HEAPDUMP
```

```
JVMDUMP034I User requested Heap dump using '/SY1/var/WebSphere/home/WS  
SR1/heapdump.20150227.211036.67012.0002.phd' through JVMRI
```

Liberty Profile

```
server javadump servername --include=heap
```

```
/usr/lpp/zWebSphere/Liberty/V8R5/bin:>server javadump server1 --include=heap
```

```
Dumping server server1.
```

```
Server server1 dump complete in
```

```
/WebSphere/Liberty/servers/server1/javacore.20150224.102223.83952322.0002.txt.
```

```
Server server1 dump complete in
```

```
/WebSphere/Liberty/servers/server1/heapdump.20150224.102223.83952322.0003.phd.
```

```
F BBGZSRV,HEAPDUMP
```

```
JVMDUMP034I User requested Heap dump using
```

```
'/WebSphere/Liberty/servers/defaultServer/heapdump.20150224.163149.66238.0003.phd'
```

```
through com.ibm.jvm.Dump.HeapDump
```

```
+CWWKB0005I: COMMAND RESPONSES COMPLETED SUCCESSFULLY FROM Heapdump Command Handler.
```

```
CWWKB0002I: MODIFY COMMAND HEAPDUMP COMPLETED SUCCESSFULLY.
```


WAS z/OS is getting 'Social'

WebSphere Application Server for z/OS



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- We're BLOGGING
- Link from the main WebSphere Support Portal

WebSphere BLOGs

Support Portal > WebSphere Application Server for z/OS >


Forums, blogs and social media for WebSphere Application Server for z/OS

- ⇒ Facebook: WebSphere and CICS Support
- ⇒ Twitter: WebSphere Application Server
- ⇒ Twitter: All WebSphere and CICS Twitter groups
- ⇒ Twitter, Facebook, and Blog information for WebSphere and CICS Support
- ⇒ **Blog: WebSphere and CICS Support**
- ⇒ WebSphere Support Technical Exchanges



Filter results





Twitter

 AppServer Support @IBM_AppServer Feb 26,, 04:00 PM
#wasserv Why am I getting the CRIMC1029E error when I try to update my WAS installation to 8.5.5.0? [http://bit.ly/14FY1QeQ](#)

Forums & user groups

 jebinjohanson Feb 26,, 01:05 PM
WADL - Add extended information
 Savio Barros Feb 26,, 01:00 PM
Custom Login Module - How to config on WAS

Blogs & wikis

 Shawfu Feb 25,, 05:54 PM
WebSphere Application Server for z/OS: Your first cup of Java is included!
 Slava S. Feb 25,, 05:18 PM


Tags: websphere_application_server; was; websphere

Tags are “and’d”, not “or’d”

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WebSphere Application Server for z/OS: Your first cup of Java is included!

Shawfu | Yesterday 5:50 PM | Visits (112)  2 Like



Co-authored by: Shawfu Chen and Steve Dittmar As of IBM WebSphere Application Server V8.5, users on most platforms can choose to run on Java SDK 6.1 or 7.0, with support for 7.1 having been added more recently. Java SDK 6.1 continues to be shipped with, and updated automatically by, the WebSphere Application Server fix packs. However, some users do not realize that Java SDK 7.x fix packs are not included in the WebSphere Application Server fix packs and thus is not automatically installed or kept up-to-date by the... [More]

Tags: [java](#) [websphere_application_ser...](#) [was](#) [z/os](#) [sdk7](#)

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Did you know you can follow your backup progress on PureApplication System version 2.0?

Slava.S. | Yesterday 5:15 PM | Visits (125)  2 Like



If you upgraded your system from version 1.n to version 2.0 you will notice that the user interface looks completely different. You will find a dedicated "Backup and Restore" page under System Console -> System. When you submit your backup and your backup configuration is in the "Running" state, it will have a twisty icon that allows you to see the current progress of the backup. In the case below, it is a "System Backup" configuration that is running, and the backup is currently at the... [More]

Tags: [pureapplicationsystem](#) [backup](#) [pureapp](#)

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BLOG entries from z/WAS Level 2

[WebSphere Application Server for z/OS: Your first cup of Java is included!](#)

[Solving EC3 timeout abends due to Mbean deadlocks](#)

[WebSphere Application Server for z/OS - Choosing a default SSL certificate](#)

[Which WebSphere Application Server fix pack levels will my iFix install on?](#)

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[Let's look at Dispatch Timeout Handling in WebSphere Application Server for z/OS](#)

[Which level of WebSphere Application Server for z/OS is compatible with the different versions of z/OS?](#)

[Time saving tips for configuring WebSphere Application Server OEM Edition for z/OS](#)

JAVA 7.0 / 7.1

- Full Profile WebSphere Application Server
 - JDK 6.1
 - Installed with full Profile WebSphere 8.5.0.0
 - Updated with WebSphere FixPack Maintenance
 - JDK 7.0
 - Delivered with WebSphere 8.5.0.0
 - Optionally installed
 - **MUST** install JDK 7.0 BASE Level FIRST, before installing JDK 7.0 FixPacks
 - JDK 7.1
 - Available at WebSphere 8.5.5.2
 - Base level JDK 7.1 (Must install base before FixPacks JDK 7.1)
- Liberty Profile
 - No JDK installed

- Recent BLOG Entry:
 - [WebSphere Application Server for z/OS: Your first cup of Java is included !](#)
 - Where to get them
 - How to Install
 - How to switch to use them
- This BLOG for Traditional WAS, Liberty Blog coming soon

LE APAR PI16681 when moving to JAVA SDK 7.1

- Performance improvement made in JAVA 7.1
 - ABEND0C7 taken to capture certain "normal" exceptions like NullPointerExceptions
 - Uses the trap instruction and handles the ABEND.
 - Most object references are against non-null objects
 - trap instructions execute normally and very quickly.
 - When some piece of Java code dereferences a null pointer, however, the trap instruction ABENDs and the JDK recovery code handles it and turns it into a NullPointerException.
 - This behavior can be disabled using generic JVM argument
 - -Xjit:noResumableTrapHandle

- In testing we have seen a Servant can take Native OOM if many of these ABEND0C7 occur.
- This is caused by a memory leak in SDWA control blocks in z/OS 2.1 Language Environment that happens during abend recovery.
- LE APAR PI16681 addresses this memory leak.
- PSP Bucket updated:

PSP Bucket Update

Upgrade WASAS850, Subset HBBO850

http://www.ibm.com/support/docview.wss?uid=isg1_WASAS850_HBBO850

1. 14/06/19 INTERDEPENDENT PRODUCT: USS / LE
PROBLEM: native storage SDWA LEAK 64-BIT 0C7

<http://www.ibm.com/support/docview.wss?uid=isg1PI16681>

USERS AFFECTED: All WAS 8.5.5.0 z/OS customers running
Java 1.7 or above

RECOMMENDATION: INSTALL PTF that includes APAR PI16681
when available

wsgridConfig.py

- WebSphere 8.5.x includes Compute Grid
- Compute Grid includes an External Scheduler Interface
- You can configure an External Scheduler Interface to control the workload for Batch Jobs
- Using the wsgridConfig.py batch script at 8.5.5.3 fails

- WASX7017E: Exception received while running file "wsgridConfig.py";
- exception information:

com.ibm.websphere.management.filetransfer.client.TransferFailedException
java.io.FileNotFoundException: java.io.FileNotFoundException:
/was85/wscell/wsdmnode/DeploymentManager/systemApps/
JobSchedulerMDI.ear
(EDC5129I No such file or directory.)

- The wsgridConfig.py script performs the following three steps required for configuring the external scheduler interface:
 1. Installs JobSchedulerMDI.ear
 2. Configures the service integration bus
 3. Configures JMS artifacts

- **APAR PI31682** created targeted for FixPack 8.5.5.6
- **Solution:**
 - The problem is the installWSGridMQ.py script needs to be updated to use -sytemApp on the AdminApp.install command so that the JobSchedulerMDILP app is processed as a system application.
- **Work Around:**
 - Add the -systemApp parameter to the install command and run the script manually.

Application Managing Resources

- **Applications** should not manage resources
 - Package connection driver jar(s) with the app
 - Load the driver directly from the application
- Application Server provides this functionality
- Causes unpredictable / difficult to diagnose problems
 - Security failure when trying to access the driver
 - Failure trying to use the connection

Security failure

Trace: 2014/12/17 15:06:13.236 01 t=AC6828 c=UNK key=P8 (13007002)

ThreadId: 0000000a

FunctionName: com.ibm.ws.security.core.SecurityManager

SourceId: com.ibm.ws.security.core.SecurityManager

Category: WARNING

ExtendedMessage: **BBOO0221W: SECJ6206W:** The current Java 2 Security policy report a potential violation of a Java 2 Security Permission.

Stack Trace:

Begin SecurityException

java.security.AccessControlException: Access denied

(java.io.FilePermission

/etc/www/WebSphere/V7R0/AppServer/home/java/lib/ext read)

Security failure

```
java.security.AccessController.throwACE  
java.security.AccessController.checkPermission  
java.lang.SecurityManager.checkPermission  
com.ibm.ws.security.core.SecurityManager.checkPermission  
java.lang.SecurityManager.checkRead  
java.io.File.list  
java.io.File.listFiles  
java.sql.DriverManager.loadDriversFromFiles  
java.sql.DriverManager.loadInitialDrivers  
java.sql.DriverManager.<clinit>  
java.lang.J9VMInternals.initializeImpl  
java.lang.J9VMInternals.initialize  
com.appliance.jdbcdriver.jdal.JDALDriver.<clinit>  
java.lang.J9VMInternals.initializeImpl  
java.lang.J9VMInternals.initialize  
java.lang.Class.forNameImpl  
java.lang.Class.forName  
com.appliance.framework.database.DBConnectionManager.initDriver  
com.appliance.framework.database.DBConnectionManager.getConnection
```

Security failure

- Remove call to `DriverManager.getConnection` from app
- Replace with a Datasource lookup for a resource reference to a WebSphere managed connection defined in WebSphere admin console
 - Let WebSphere manage the connection
 - Security
 - Connection Pool

Failure trying to use connection

BBOO0221W: NMSV0612W:

A NameNotFoundException occurred on an indirect lookup on the name "java:comp/env/DEBUG ". The name "java:comp/env/DEBUG" maps to a JNDI name in deployment descriptor bindings for the application performing the JNDI lookup. Make sure that the JNDI name mapping in the deployment descriptor binding is correct. If the JNDI name mapping is correct, make sure the target resource can be resolved with the specified name relative to the default initial context.

NameNotFoundException data follows:

Failure trying to use connection

javax.naming.NameNotFoundException: Context:

p7cell/nodes/p7nodeb/servers/p7sr01b, name: debug_value:

First component in name debug_value not found. Root exception is
org.omg.CosNaming.NamingContextPackage.NotFound: IDL:omg.org/CosNaming
/NamingContext/NotFound:1.0~

com.ibm.ws.naming.jndicos.CNContextImpl.processNotFoundException(CNCont

com.ibm.ws.naming.jndicos.CNContextImpl.doLookup(CNContextImpl.java:1911

com.ibm.ws.naming.jndicos.CNContextImpl.doLookup(CNContextImpl.java:1866

com.ibm.ws.naming.jndicos.CNContextImpl.lookupExt(CNContextImpl.java:155

com.ibm.ws.naming.util.IndirectJndiLookupObjectFactory\$1.run(IndirectJnd

com.ibm.ws.security.util.AccessController.doPrivileged(AccessController.

com.ibm.ws.naming.util.IndirectJndiLookupObjectFactory.getObjectInstance

....

Caused by: org.omg.CosNaming.NamingContextPackage.NotFound:

Failure trying to use connection

- This led us to look for what resources are defined to the Server
- Gather the config files (resources.xml)

- No JNDI names defined

- Suggest that App is doing connection mgmt.

- List all Directories and Files:

```
ls -Ral /wasvxxconfig/p7cell/p7nodeb/AppServer >  
/tmp/pmr##.b###.c###.ls.txt
```

```
/wasvxx1config/p7cell/p7nodeb/AppServer/profiles/default/installedApps/App1_v1.1.ear/  
App1.war/WEB-INF/lib:
```

```
total 3040
```

```
drwxrwx---  2 P7ADMIN P7CFG      8192 Jan 16  2011 .  
drwxrwx---  4 P7ADMIN P7CFG      8192 Jan 16  2011 ..  
-rw-rw----  1 P7ADMIN P7CFG    530825 Jun 23  2008 ctgclient.jar  
-rw-rw----  1 P7ADMIN P7CFG    286506 Jun 23  2008 ctgserver.jar  
-rw-rw----  1 P7ADMIN P7CFG    719996 Jun 23  2008 db2jcc.jar
```


- Violation of the JEE7 Specification
 - https://java.net/downloads/javaee-spec/JavaEE_Platform_Spec_PFD_candidate.pdf
 - Section EE.6.2.3.2 JDBC™ API
 - “Java EE applications should not attempt to load JDBC drivers directly. Instead, they should use the technique recommended in the JDBC specification and perform a JNDI lookup to locate a Datasource object “
- Drivers can be out of date / incorrect
- Not taking advantage of WebSphere App Server’s
 - Connection pool management
 - Security
 - Transaction management
 - Test connection support.

WebSphere Server Timeout ABENDEC3 RC=04130004

- Servant Region internal Worker thread default = 3
- Cross memory deadlock within the Servant Region
- SR threads make mbean request back to CR
 - Seen admin related requests / use SR internal worker thread
- These can then make additional mbean requests
 - Using SR internal worker thread
- With only 3, it can tie them up quickly
- XD, Portal Server, BPM seem to use this function

- Server custom property
- `private_bboo_internal_work_thread_pool_size`
- Admin console -> Environment -> WebSphere Variables ->
<Select server> <scope>
- Variable name:
`private_bboo_internal_work_thread_pool_size`
- Value: greater than 3 (the default)
10 seems to be a good number

MIGRATION

- Migrating large topology
 - Many Apps
 - You can Migrate the App Servers alone
 - Generate job to migrate applications later
 - When large number of applications
 - Break up the generated job
- Knowledge Collection: Migration planning for WebSphere Application Server

<http://www.ibm.com/support/docview.wss?rs=180&uid=swg27008724>

QUESTIONS ??

Remember Evaluations



Complete your session evaluations online at www.SHARE.org/Seattle-Eval