

IBM WebSphere Application Server Migration: Benefits, Planning and Best Practices

Including WebSphere v9.0



WAS V7 & V8 EOS

WAS Release	WAS EOM	WAS EOS	WAS EOES
7.0 - all editions	Dec 16, 2016 ⁽²⁾	Apr 30, 2018	Apr 30, 2021 ⁽¹⁾
8.0 - all editions	Dec 16, 2016 ⁽²⁾	Apr 30, 2018	Apr 30, 2021 ⁽¹⁾
RFA 71777 on Sept 13, 2016 (Distributed) RFA 71843 on Sept 13, 2016 (z/OS)			

WAS Release	Java 6 EOS in WAS	Java 7 EOS in WAS	Java 8 EOS in WAS
7.0	April 2018	n/a	n/a
8.0	April 2018	n/a	n/a
8.5	April 2018 ⁽¹⁾⁽³⁾	Sept 2019	March 2025

Migration Links

WebSphere Migration Strategy - <https://www-01.ibm.com/support/docview.wss?uid=swg27008724>

Migration Decision Support Tool - <http://whichwas.mybluemix.net>

WebSphere Application Server Migration Discovery Tool - https://www-01.ibm.com/marketing/iwm/dre/signup?source=mrs-form-3089&S_PKG=ov50193

WAS Migration Toolkit overview: <http://www.ibm.com/developerworks/websphere/downloads/migtoolkit/>

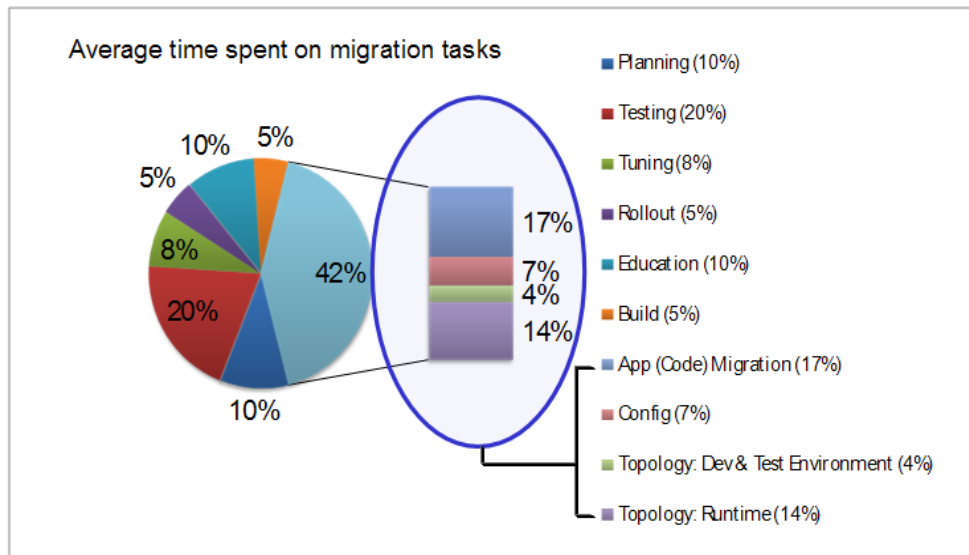
WAS 8.5 WebSphere Migration Guide - <http://www.redbooks.ibm.com/redpieces/abstracts/sg248048.html>

(1) After December 2018, Java SDK 6 support is limited to 'usage & known defects'

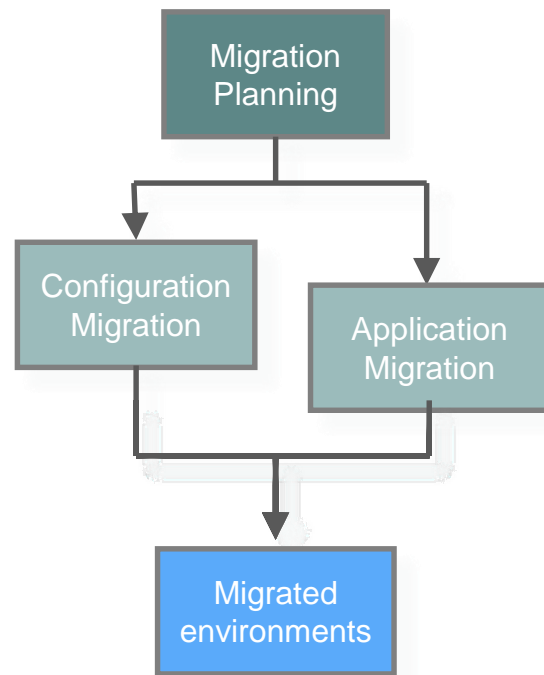
(2) WAS on z/OS EOM will be Feb 2017. Announcement occurred in June 2016.

(3) WebSphere Application Server Liberty has a single support stream for all product versions. Support for Java SE 6 with Liberty will end in September 2017 to allow the Liberty code and included open source packages to move forward.

Migration Overview



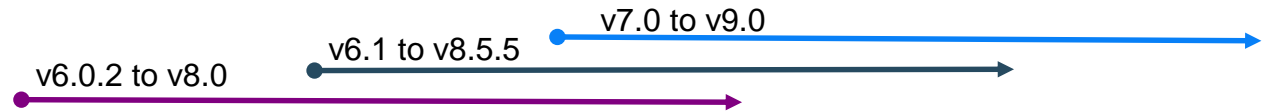
- The whole migration process involves a variety of steps
- Application changes and testing is 37%
- Migrating configuration is 25%
- What if you could make this easier?



Migration impacts overview

Migration impact is gated by two overarching factors

1. The versions involved in the customer Migration scenario
 - Moving from v7.0 to v9.0 is different than moving from v6.0.2 to v9.0
2. The amount of change introduced in and between these versions
 - Moving from v7.0 to v9.0 involves changes introduced by v8.0, v8.5 and v9.0.
 - Moving from v6.1 to v9.0 involves changes introduced by v7.0, v8.0, v8.5 and v9.0 and would require a double migration, since the migration tools only support n-3.



	v6.0.2	v6.1	v7.0	v8.0	v8.5	V9.0
Configuration	Port assignment	Security	None	None	Port assignments	Core group wire protocol
Application	JSP and Servlet	Java SE	Some	Minimal	None*	Java EE 7 Java SE 8

None means no required code changes with default of JRE6 when using traditional WAS runtime*

Best practices, offers, incentives

- **PVU Waiver offer:** IBM will now grant customers no charge, temporary use Software Subscription & Support (S&S) rights to continue using their current licenses in production while also using up to 2x those license entitlements for migration to a later WAS Version.
- **Migration Assist:** is available for customers on Support and Maintenance. Customers can call Support with migration questions
- **ISSW Assessments:** are available to assist customers with their migration planning and execution activities
- **IBM Software Accelerated Value Program:** provides expertise in custom version to version migrations.
- **Website Knowledge Center**

Migration Planning Roadmap

Migration overview

Migration planning roadmap

Application Migration options

Configuration Migration options

Migration Assist Program

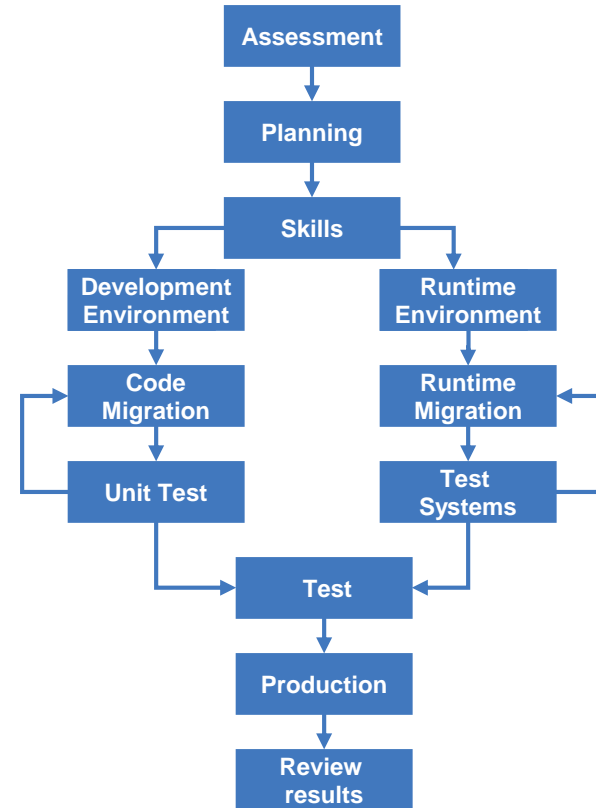
Summary

References



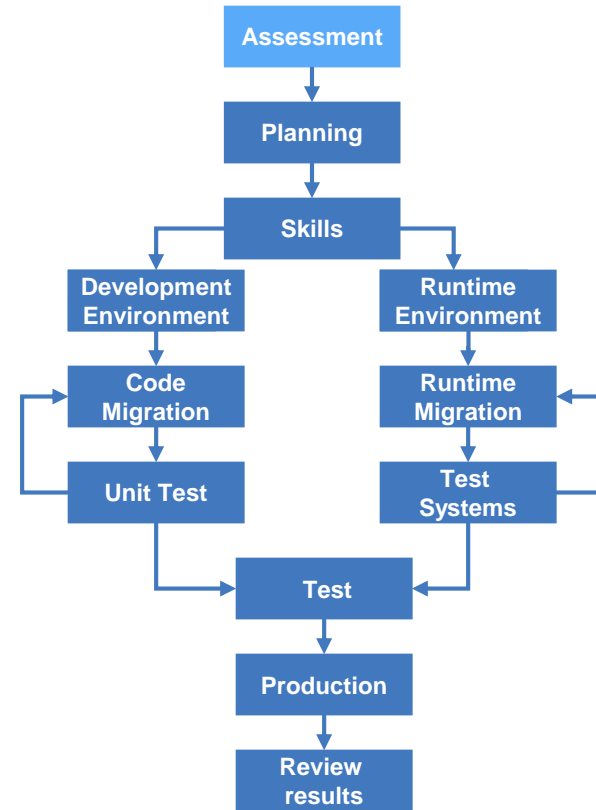
Migration Plan Roadmap

- Assessment
- Planning
- Skills
- Development Environment
- Application Code Migration
- Runtime Environment Migration
- Test
- Production
- Review the results



Assessment

- Gather the stakeholders
 - Communications with clients, peers, and leadership
 - Consider a core Migration team for larger scale
- Identify education requirements
 - Developer, Administrator...
- Hardware requirements
 - Possible Upgrades, 64 bit versus 32 bit
- Topology assessment
 - Downtime tolerance, Failover support
- Application architecture
 - Tightened JEE specifications
 - Dependencies between apps
 - API removal, JRE changes
- Review Testing practices
 - Standard practices and automation
- Vendor apps and WebSphere products
 - J2EE/JDK/WebSphere version requirements



Planning - Questionnaires

- Runtime Environment

- Overall Infrastructure questions
- Hardware and Software prereqs
- HTTP Server, Network Edge
- Availability requirements
- Rollout plans
- Administration
- Security
- Test Practices and tools

- Development Environment

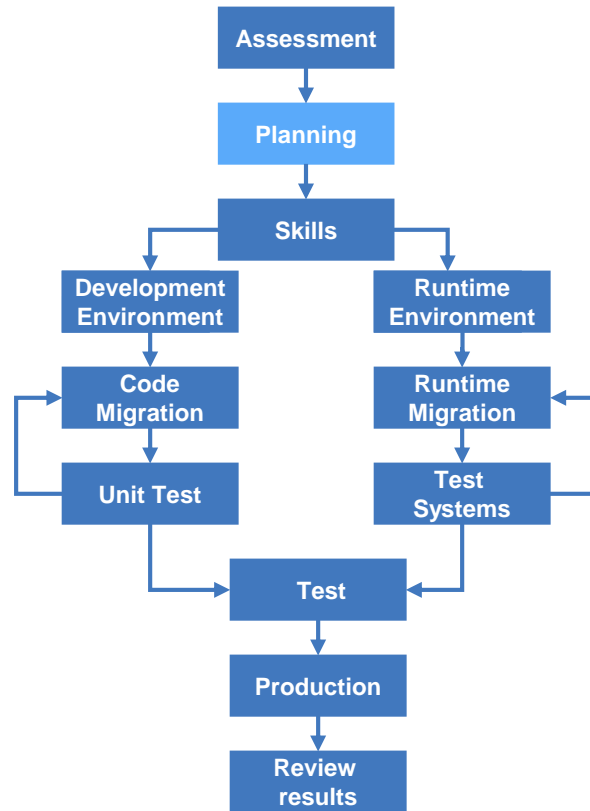
- Workstations and IDEs
- Test configurations
- Software development skills
- Development methodology
- Build, Packaging Tooling and Process

- V7 Release to Release Migration Guide

<http://www.redbooks.ibm.com/redpieces/abstracts/redp4635.html>

- Many Detailed Questions: WAS 8.5 WebSphere Migration Guide (Appendix A)

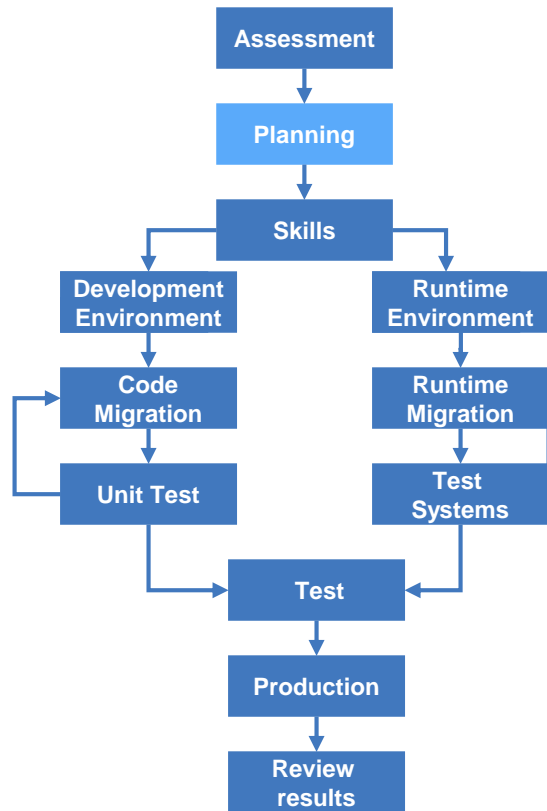
<http://www.redbooks.ibm.com/redpieces/abstracts/sg248048.html>



Planning

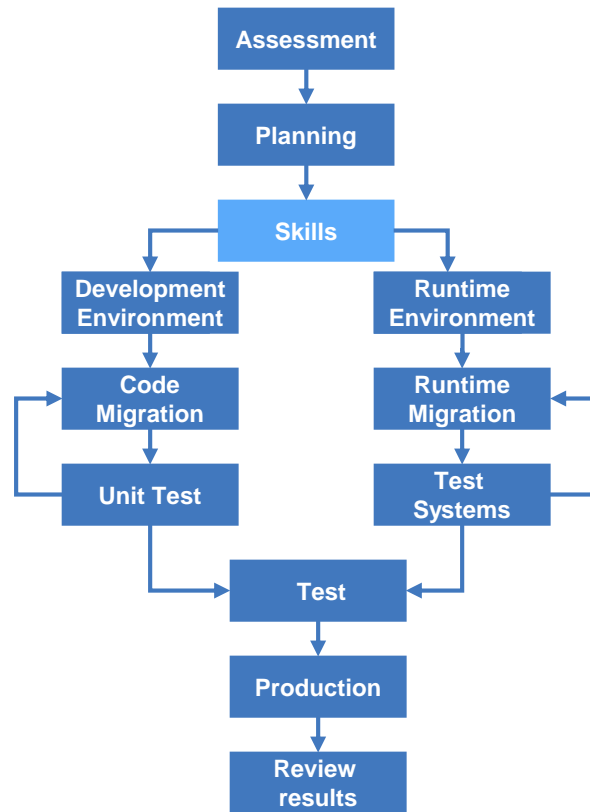
Build a plan based on assessment

- Hardware and license requirements
- Prerequisite and requisite software
 - Check with “Clarity” website
- Education
 - IBM Education Assistant, IBM Education, ...
- Account for many applications and multiple development teams?
 - Identify early adopters
 - Identify Pilot projects
 - Migration as an initiative or project?
- Application rollout strategies
 - “Stealth”, “Train”, Voluntary, Continuous...
- Consider timeline factors
 - Availability, maintenance windows, lockdowns
- Plan for High Availability
 - Mixed version clusters requires dual app compatibility
- Create an execution timeline
- Include a rollback plan



Skills

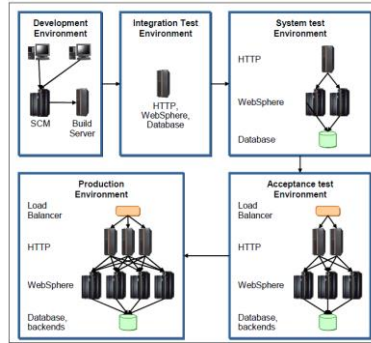
- Plan for education
 - New development tooling
 - Enhancements in WebSphere administration model
 - Changes in the latest WebSphere version
 - New standards



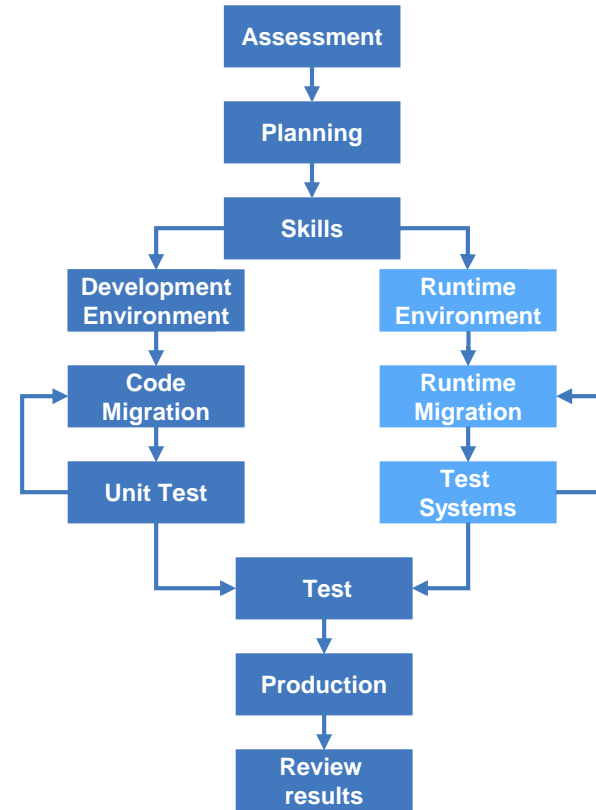
Runtime Environment

- Most likely will need to support parallel development
- Migrate test systems iteratively

- Integration
- System test
- Performance
- Pre-Production
- Production

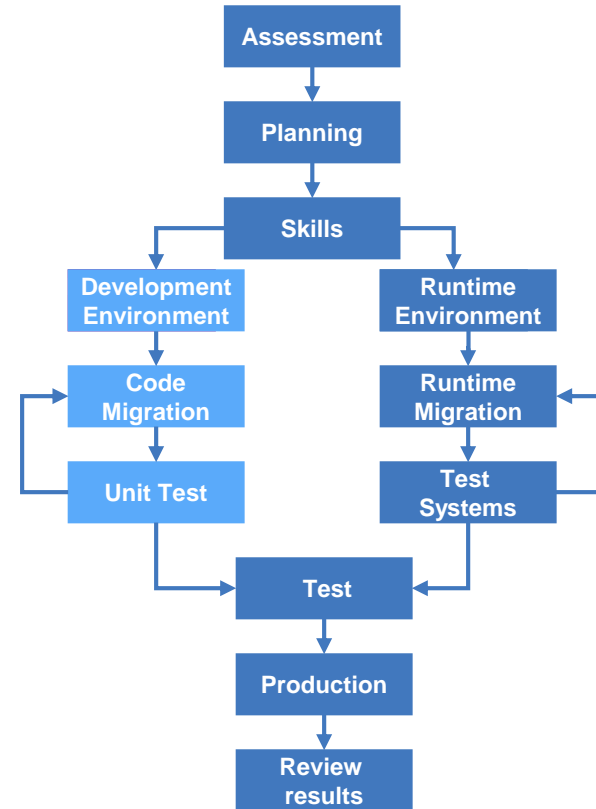


- Use the same migration process throughout if possible
 - Or at least before you do production migration...



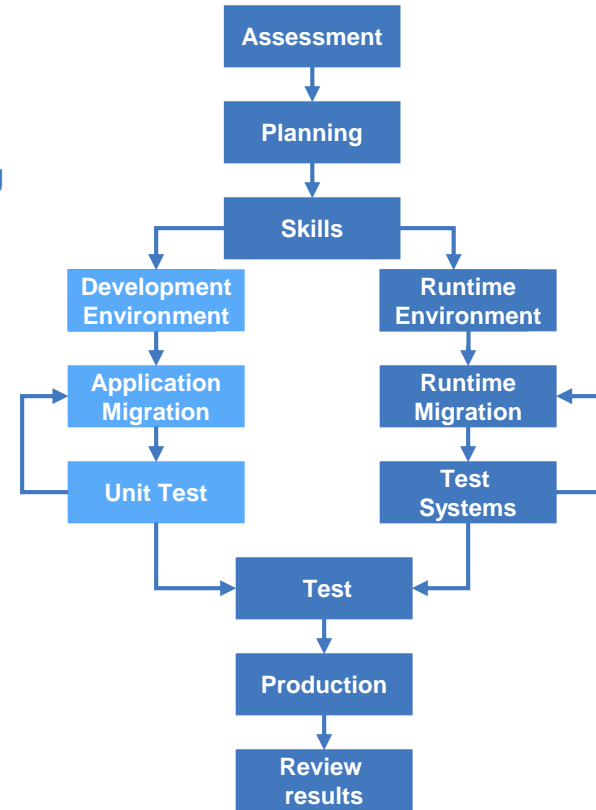
Development Environment

- Upgrades needed for IDEs
 - Progress iteratively, expand outward
 - Can migrate the WAS configuration using WAS configuration migration tools
- Assume good but not complete application compatibility
 - Assess apps, based on known issues
 - If no changes required, perform standard regression



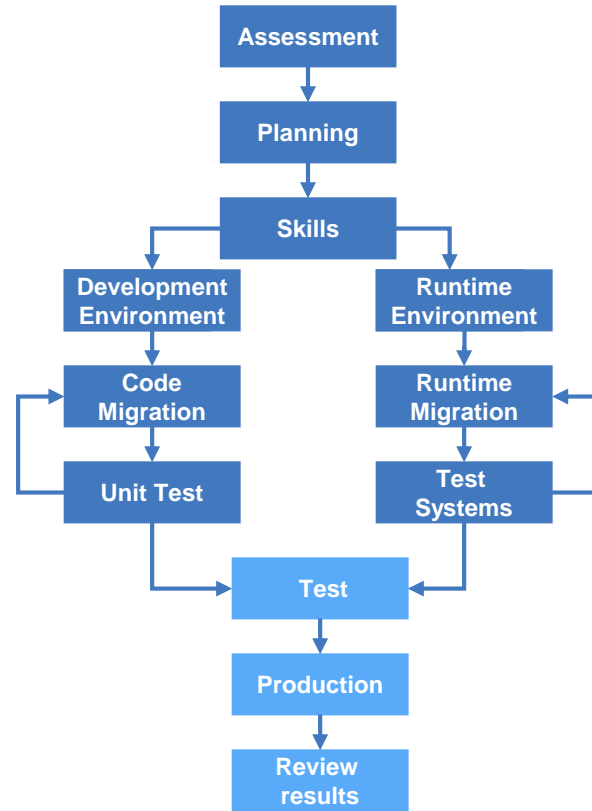
Application Migration (Iterative)

- Minimize change
 - Only make changes required to support version migration
 - Reduces complexity of planning, diagnosis and debug - **“Keep it Simple”**
 - Require application code to be dual-compatible to support mixed version clusters
 - Test to the depth of test environment that fits your comfort level
- Then Optimize and Enhance
 - Java EE Spec migration
 - New programming models
 - Application upgrades
 - Depreciations
- Iterate following your standard practices



Test/Production/Review

- Run your standard test processes
 - Progress applications normally through the test environments
- Ensure Performance is measured
 - Differences exist between versions
 - JDK changes may have occurred
- Have a rollback plan for production
 - Practice on another system earlier in the cycle
- Review the results of the Migration
 - Update the plan for next time



Application Migration options

Migration overview

Migration planning roadmap

Application Migration options

Configuration Migration options

Summary

References

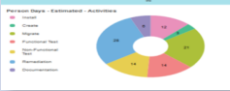
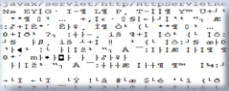
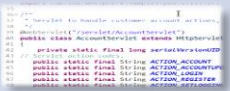
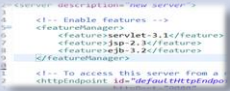


An Overview of WebSphere Migration Tools

A set of tools that help you:



- Migrate between versions of WebSphere Application Server
- Migrate from traditional WebSphere to Liberty
- Move your applications to cloud platforms
- Migrate from third-party application servers to WebSphere

Migration discovery and planning	Binary analysis	Source analysis	Configuration migration
			
<p>WebSphere Migration Strategy Tool – online tool that helps you</p> <ul style="list-style-type: none"> • Learn the options for migration including Liberty, on-premises, Docker, and cloud options <p>WebSphere Migration Discovery Tool - on-line tool that helps you</p> <ul style="list-style-type: none"> • Estimate the effort required to migrate your application to WebSphere Application Server from third-party application servers • Select the IBM cloud platform suited to host your application and estimate migration to that platform. 	<p>Command-line binary scanner that provides</p> <ul style="list-style-type: none"> • High level evaluation report • Inventory report that provides content and structure of your application and potential deployment problems • Detailed analysis for migration between versions of traditional WebSphere, Liberty, and Liberty Core • Cloud migration for instant runtimes differences • Cloud connectivity analysis • Generate Liberty server configuration files with application required features 	<p>WAMT - Eclipse plugins that scans application source to provide</p> <ul style="list-style-type: none"> • High level evaluation report showing the Java EE technologies your application uses • A line-by-line analysis of code changes required • Detailed analysis from third-party applications servers • Detailed analysis for migration between versions of traditional WebSphere, Liberty, and Liberty Core • Cloud migration for instant runtimes differences • Cloud connectivity analysis 	<p>WASPreUpgrade and WASPostUpgrade commands to move WebSphere traditional configuration between profiles.</p> <p>WCMT – Eclipse plugin that helps migrate server configuration</p> <ul style="list-style-type: none"> • From third-party application servers to WebSphere Application Server. • Between versions of WebSphere Application Server including traditional WebSphere to Liberty <p>UrbanCode to move configuration.</p>

How do I use the application migration tools?

Let's walk through using the migration tools to gain insights of your applications and details on your migration concerns.

Migration strategy and discovery



Binary analysis

```
sjavax/servlet/http/HttpServletRe
Nw EXIG I-1 L4 P, T-111 Ym 0+1
L **E 0* ... +, I- 0S1-111** v4 E
E:2+IE* E14, 11 0* (1 +*E 0* ...
:0+IO* 7, :11- 18 9+1 IO* (1 IO:
:1S 14, 18 1+1 !! * (1 IO:1S m10
114* 11 1112* v4 A -:111E 1111 1
0** m1+111 11214
L 1112* v4 A -:111E 1111 14:J
-11 11 14 11A 11a 116 11 (10
L 1 1 1 1 - 1 1 1 1 1 1 1 1 1 1 1 1
```

Source Migration

```
20 import com.ibm.websphere.samples.jee.util.Util
21
22 /**
23  * Servlet to handle customer account actions.
24  */
25 @WebServlet("/servlet/AccountServlet")
26 public class AccountServlet extends HttpServlet
27 {
28     private static final long serialVersionUID =
29     // Servlet action codes.
30     public static final String ACTION_ACCOUNT
31     public static final String ACTION_ACCOUNTUPD
32     public static final String ACTION_LOGIN
33     public static final String ACTION_REGISTER
34     public static final String ACTION_SEYLOGGING
```

Config Migration

```
2=<server description="new server">
3
4 <!-- Enable features -->
5 <featureManager>
6 <feature>server-3.1.</feature>
7 <feature>jsp-2.3.</feature>
8 <feature>ejb-3.2.</feature>
9 </featureManager>
10
11 <!-- To access this server from a r
12 <httpEndpoint id="defaultHttpEndpo
13 httpPort="509090"
```

Step 1: Strategy planning and sizing tools

Migration discovery and planning



Binary analysis

```
<code>-javax/servlet/http/HttpServletRequest
N> EYIG I-E LE P, T-IIE ym D+J
++E E* ... +,I< -ES|-I I* N, E
E:Z+IE* S|, EIQ* (I **E S* ...
0+IO* ?y :+|- - IS ?+I IO* (I IO:
JS |B, IS I+I B * (I IO: S 0)0
I* * |I |I|2* N, A *-:IIE IIE E
0* * mI*|Q| |I|E|
-IIE* N, A -+IIE I+I E I4:J
+I2 -I -IY IIA #Iam QI6 *I (IO
t a i -1 i -a -a -a -a -a -a -a -a</code>
```

Source Migration

```
<code>20 import java.util.logging.Logger;
21
22 /**
23  * Servlet to handle customer account actions.
24  */
25 @WebServlet("/servlet/AccountServlet")
26 public class AccountServlet extends HttpServlet
27 {
28     private static final long serialVersionUID =
29     // Servlet action code
30     public static final String ACTION_ACCOUNT
31     public static final String ACTION_ACCOUNTUPD
32     public static final String ACTION_LOGIN
33     public static final String ACTION_REGISTER
34     public static final String ACTION_SEFLOGGING
35</code>
```

Config Migration

```
<code>2<server description="new server">
3
4     <!-- Enable features -->
5     <featureManager>
6         <feature>servlet-3.1</feature>
7         <feature>jsp-2.3</feature>
8         <feature>ejb-3.2</feature>
9     </featureManager>
10
11     <!-- To access this server from a
12     <httpEndpoint id="defaultHttpEndpoint"
13         httpPort="9090">
14</code>
```

WebSphere Migration Strategy Tool:

<http://whichwas.mybluemix.net>

Evaluate options for your WebSphere applications

WebSphere Application Server Migration Discovery Tool

<http://ibm.biz/MigrationDiscovery>

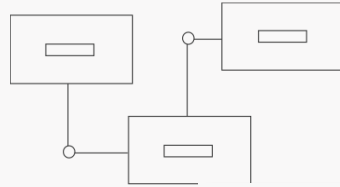
Size your effort and learn about WebSphere cloud migration

WebSphere Migration Strategy Tool

<http://whichwas.mybluemix.net>

WebSphere Migration Strategy

As you consider the future of your WebSphere applications, how will you innovate to support **social, mobile, analytics, and cloud technologies** to better serve your customers?



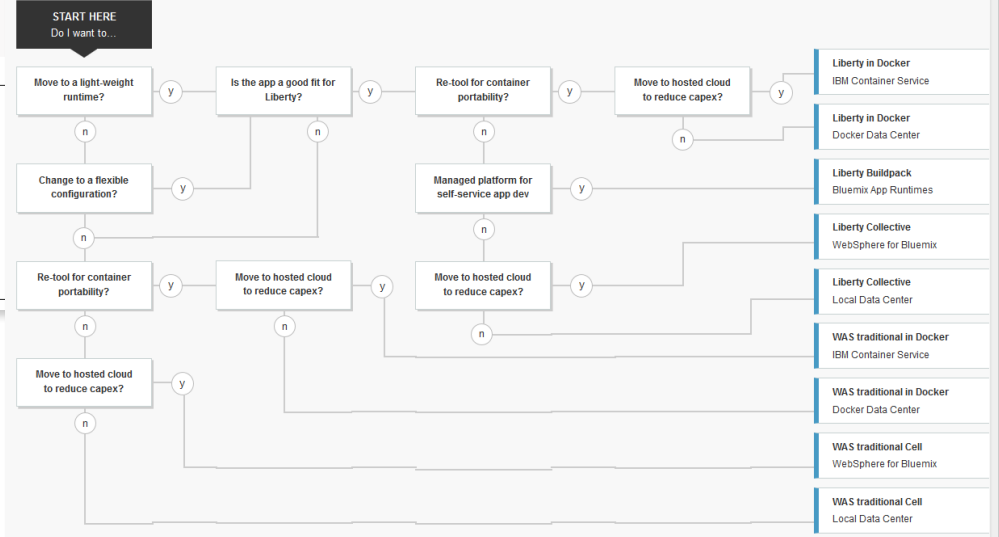
Choose your environment

Show me the simplest migration

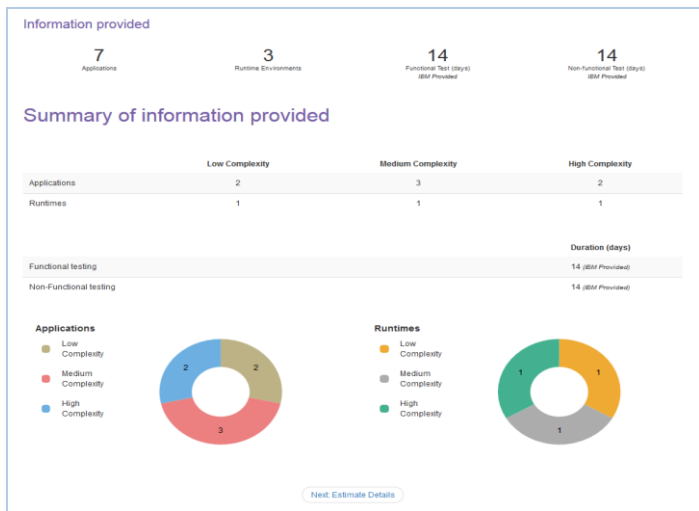
→

Show me the choices to transform and modernize

→



Summary and Estimate Details

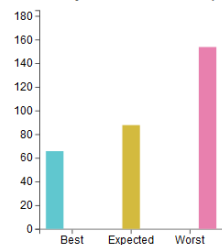


Discovery "Rough Order of Magnitude" Estimates

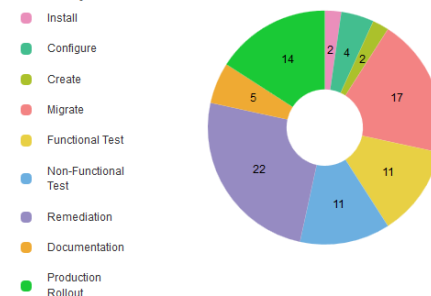
Estimated values: 88 person days (rounded to nearest day)
Estimated range: 66 - 154 person days (rounded to nearest day)
Degree of accuracy: From -25% to +75%

Migration Activity	Total Effort in person days (rounded up to the next full day)
Install Runtimes	2
Configure Runtimes	4
Create Java EE Resources in WAS	2
Migrate and Smoke Test Applications	17
Functional Test Applications	11
Non-Functional Test Applications	11
Remediation During Testing	22
Documentation During Migration	5
Production Rollout	14
Total	88

Person Days - Estimated Values(Range)



Person Days - Estimated - Activities



Migration Discovery - Gather Installation/Application/Test Info

WebSphere Application Server

Migration Discovery Tool

The purpose of this questionnaire is to gather basic information on your current JEE applications, JEE installations, and testing stages so we can better estimate the effort required to migrate them to WebSphere. These questions help us to identify all of the artifacts that need to be migrated, the degree to which those migrations can be automated, and the overall effort for doing the migration.

It is expected that you will be able to respond to most of the questions based on your knowledge of your environment. Some of the metrics may require a limited amount of research. If you find that a question is not appropriate to your environment, please skip that question and move onto the next.

All answers will be kept confidential by IBM.

[IBM Online Privacy Statement Highlights](#)

Discovery progress (2 of 4)

5%

Installation Questions

Please answer these questions in the context of the Application Server installations that you want to migrate. This should include all Application Server installations that are required by application development teams, testing teams, and production. For example, if you are migrating from JBoss then count all of your JBoss configurations, or if you are migrating from WebLogic then count all of your WebLogic domains.

How many installations are you going to migrate?

Classify them as low, medium, or high complexity:

Low 1

This is a local installation. This means the same host. Other components such as it might be used for development or integrat

Medium 1

This is a distributed installation. This mea on multiple hosts, but there is no horizo testing, or production where horizo

High 1

This is a fully clustered installation. This can be horizontal and vertical clustering. High availability are required.

Discovery progress (1 of 4)

37%

Cloud Questions

Please select the Cloud Platform you will be migrating to. Use the "HELP ME" section if you need assistance with selecting a Platform. Click the "Compare" button to see side-by-side detailed comparisons of up to 3 Cloud Platforms.

HELP ME choose a Cloud platform

Tell us what you are looking for:

Cloud Deployment Model

- Public - Off-Premise
- Dedicated - Off-Premise
- Local - On-Premise
- Undecided

Cloud Management Model

- Customer Managed
- Pattern Managed
- Platform Managed
- Undecided

Cloud Migration Strategy

- Cloud Native Application
- Traditional Tiered Application
- Undecided

Choose a Cloud Platform to migrate to:

50% match WAS on Cloud for Bluemix Public Matched factors: Public - Off-Premise; Platform Managed, Traditional Tiered Application.

33% match Bluemix Instant Runtimes (Public) Matched factors: Public - Off-Premise; Platform Managed.

33% match Bluemix IBM Containers (Public) Matched factors: Public - Off-Premise; Platform Managed.

16% match Bluemix Instant Runtimes (Dedicated) Matched factors: Platform Managed.

16% match Bluemix Instant Runtimes (Local) Matched factors: Platform Managed.

Discovery progress (3 of 4)

76%

Application Questions

Please answer these questions for all deployable archives that are to be migrated. Note that for the purposes of this questionnaire a deployable archive is any WEB Archive, EJB-JAR, Application Client JAR, or Resource Adaptor Archive that you deploy separately or as part of an Enterprise Application Archive (EAR) to the application server.

How many WARs and EJB JARs are you going to migrate?

Classify them as low, medium, or high complexity:

Low Complexity:

WAR 1

App Client JAR 0

Medium Complexity:

WAR 1

EJB JAR 1

RAR 0

High Complexity:

WAR 0

EJB JAR 0

Total number of WAR:

2

Total number of EJB JAR:

1

Total number of App Client JAR:

0

Total number of RAR:

0

[Previous: Installation Questions](#)

[Next: Testing Questions](#)

WebSphere Application Server

Migration Discovery Tool

The purpose of this questionnaire is to gather basic information on your current JEE applications, JEE installations, and testing stages so we can better estimate the effort required to migrate them to WebSphere. These questions help us to identify all of the artifacts that need to be migrated, the degree to which those migrations can be automated, and the overall effort for doing the migration.

It is expected that you will be able to respond to most of the questions based on your knowledge of your environment. Some of the metrics may require a limited amount of research. If you find that a question is not appropriate to your environment, please skip that question and move onto the next.

All answers will be kept confidential by IBM.

[IBM Online Privacy Statement Highlights](#)

Discovery progress (4 of 4)

100%

Testing Questions

Please answer these questions based on your own historical data for testing the Java EE Applications that are to be migrated. Include the time to prepare the test, execute the tests and report the results. Do not include the time to resolve the defects.

Use IBM historical data (uncheck if you will be providing testing effort information)

[Previous](#) [Submit](#)

Step 2: Application assessment using the binary scanner

Migration Toolkit for Application Binaries

https://developer.ibm.com/wasdev/downloads/#asset/tools-Migration_Toolkit_for_Application_Binaries

Migration discovery



Binary analysis

```
$javac/servlet/http/HttpServletRe
Nw EYIG· I-1L E P, T-111 YM O+1
L **E O' ... +,I<· 0S|+111' 'N, E
E:2+IE*? E14, 12 O' (L **E O' ...
:0+IO* 2, :+1- is 4+1 IO' (L IO:
:4S 14 12 1+1 11 A {L IO:2S 210
1'14 1 1 112' 'N, A -:111E 111E 1
:0* m'·1112' 1 1249
L 1112' 'N, A -:111E 111E 14:J
-12 -12 12 1A #1m 12 12 12 12
L * 1 1 -1 * 1 1 -1 * 1 1 -1 * 1 1
```

Source Migration

```
10 import com.ibm.webSphere.samples.jps.v111.v111
11 /**
12  * Servlet to handle customer account actions.
13  */
14 @WebServlet("/servlet/AccountServlet")
15 public class AccountServlet extends HttpServlet
16 {
17     private static final long serialVersionUID =
18     // Servlet action code
19     public static final String ACTION_ACCOUNT
20     public static final String ACTION_ACCOUNTUPD
21     public static final String ACTION_LOGIN
22     public static final String ACTION_REGISTER
23 }
```

Config Migration

```
2<server description="new server">
3
4  <!-- Enable features -->
5  <featureManager>
6    <feature>servlet-3.1</feature>
7    <feature>jsp-2.3</feature>
8    <feature>ejb-3.2</feature>
9  </featureManager>
10
11  <!-- To access this server from a
12  <httpEndpoint id="defaultHttpEndpoi
13    httpPort="5050">
```

- Evaluates the binaries – EAR, WAR, JAR, RAR
- Command line convenience
- HTML or JSON output

Step 3: Make application changes

- **WebSphere Application Server Migration Toolkit**

- https://developer.ibm.com/wasdev/downloads/#asset/tools-WebSphere_Application_Server_Migration_Toolkit

Migration discovery



Binary analysis

```
<?xml version="1.0" encoding="UTF-8" standalone="no" ?>
<code>
</code>
</pre>
```

Source Migration

```
16 // **
17 * Servlet to handle customer account actions.
18 */
19 @WebServlet("/servlet/AccountServlet")
20 public class AccountServlet extends HttpServlet
21 {
22     private static final long serialVersionUID =
23         1L;
24     // Servlet action codes.
25     public static final String ACTION_ACCOUNT
26         = "account";
27     public static final String ACTION_LOGIN
28         = "login";
29     public static final String ACTION_REGISTER
30         = "register";
31     public static final String ACTION_SETLOGGING
32         = "setlogging";
33 }
```

Config Migration

```
<?xml version="1.0" encoding="UTF-8" standalone="no" ?>
<code>
</code>
</pre>
```

- Evaluates Java, JSP, XML, and other files
- Eclipse IDE

Analyze application source code in Eclipse

Source server

Liberty

WAS traditional 5.1+

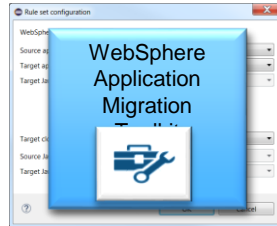
JBoss

WebLogic

Tomcat

Oracle

- Java EE 1.4, 5 or 6
- Java SE 1.4, 5, 6 or 7



Target server

Liberty 

WAS traditional 

- Java EE 6 or 7
- Java SE 7 or 8
- On premises, instant runtime, WAS on Cloud, Docker

Step 4: How do I migrate configuration?

- WebSphere Version to Version Migration
 - WASPreUpgrade / WASPostUpgrade
- Traditional WebSphere to Liberty or third-party app servers
 - WebSphere Configuration Migration Tool
 - https://developer.ibm.com/wasdev/downloads/#asset/tools-WebSphere_Configuration_Migration_Tool

Migration discovery



Binary analysis

```
javax.servlet.http.HttpServletRe
N> EVIG- I-3 LE P, T-112 Y= 0+
...
private static final long serialVersionUID
private static final String ACTION_ACCOUNT
private static final String ACTION_ACCOUNTUPD
private static final String ACTION_LOGIN
private static final String ACTION_REGISTER
private static final String ACTION_RESETLOGGING
```

Source Migration

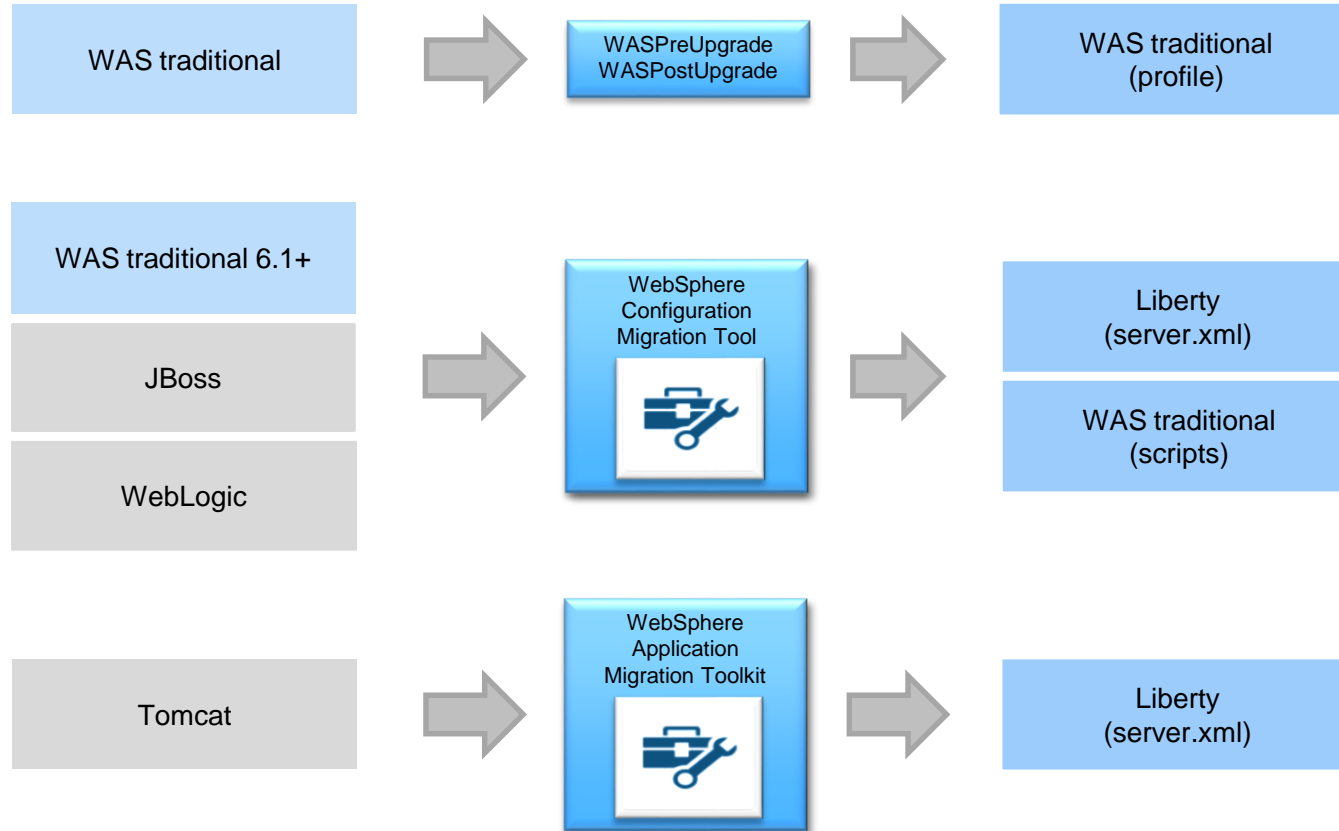
```
import com.ibm.webSphere.samples.pilot.its.its
...
public class AccountServlet extends HttpServlet
{
    private static final long serialVersionUID
    // Servlet to handle customer account actions.
    public static final String ACTION_ACCOUNT
    public static final String ACTION_ACCOUNTUPD
    public static final String ACTION_LOGIN
    public static final String ACTION_REGISTER
    public static final String ACTION_RESETLOGGING
}
```

Config Migration

```
<!-- Enable features -->
<featureManager>
  <feature>servlet-3.1</feature>
  <feature>jsp-2.3</feature>
  <feature>ejb-3.2</feature>
</featureManager>

<!-- To access this server from a
<httpEndpoint id="defaultHttpEndpoint"
  httpPort="9080"
```

Analyze configuration



WCMT in Eclipse

- Lists resources, allows edit of properties
- Preview and save liberty server.xml content
- Creates Jython scripts for traditional WebSphere
- Input for traditional WebSphere is config properties file
 - `wsadmin -lang jython -c "AdminTask.extractConfigProperties(['-propertiesFileName my.props'])"`

The screenshot displays the WebSphere Configuration Migration Tool interface. The left pane, titled "Review Resources Found", lists several configuration resources with checkboxes for selection. The right pane shows the details for the selected "jdbc_DerbyDS" resource, including its type, name, jndiName, and helper class name. A third pane on the right shows the generated Liberty server.xml XML content, which includes configuration for the Derby database driver and connection pool.

Review Resources Found

Below are the resources the tool has found. Select the resources you want to migrate. Any resource with a red X has an invalid or unknown value and must be fixed or deselected to continue.

Select All

- SIBus: BUS1
- SIBus Member
- Authentication Aliases:
- JDBCProvider: jdbc_DerbyDS(Cell)
 - DataSource: jdbc_DerbyDS
- WebSphere Variables: Modify Existing
 - VariableSubstitutionEntry: DERBY_JDBC_DRIVER_PATH(C

Configuration Resources

Resource type : DataSource

name : jdbc_DerbyDS

jndiName : jdbc/DerbyDS

datasourceHelperClassName : com.ibm.websphere.rsadapter.l

Messages : []

WebSphere Configuration Migration Toolkit

Migrate your runtime configuration to WebSphere Application Server v8.5.

Step 4: Preview and save the Liberty server.xml

Preview the generated server.xml with the migrated configurations to apply to your WebSphere Application Server Liberty profile environment.

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<server>
  <featureManager>
    <feature>jsp-2.2</feature>
    <feature>jdbc-4.0</feature>
  </featureManager>
  <jdbcDriver id="jdbc_DerbyDS" javax.sql.DataSource="org.apache.derby.jdbc.ClientConnectionPoolDataSource">
    <library>
      <file name="${DERBY_JDBC_DRIVER_PATH}/derbyclient.jar"/>
    </library>
  </jdbcDriver>
  <dataSource id="jdbc_DerbyDS" jndiName="jdbc/DerbyDS" jdbcDriverRef="jdbc_DerbyDS">
    <properties.derby.client.databaseName="sampledb" minPoolSize="5" driver="org.apache.derby.jdbc.ClientDriver" driverClass="org
  </dataSource>
  <variable name="DERBY_JDBC_DRIVER_PATH" value="" />
</server>
```

Save File

What can you migrate to Liberty using WCMT?

- JDBC providers
- Data sources
- JMS destination
- JMS topic
- JMS queue
- JMS connection
- JMS topic connection factory
- Foreign JMS connection factory
- Activation specification
- Queue activation specification
- Topic activation specification
- MQ topic
- MQ queue
- MQ activation specification
- MQ connection factory
- MQ queue connection factory
- JCA authentication alias
- Service integration bus
- Global security
- LDAP user registry
- WebSphere variables

Tomcat migration

Tomcat Configuration Migration Tool

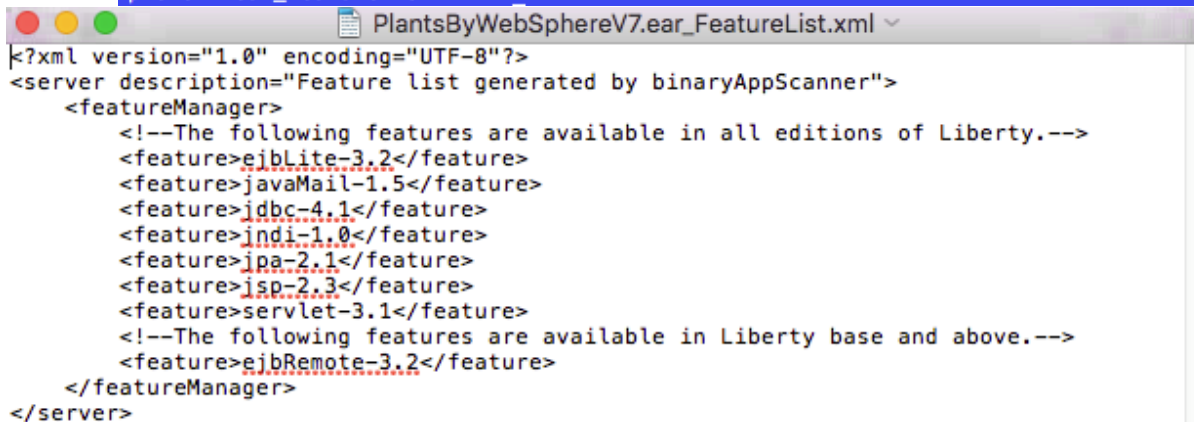
Included with WAMT

- Migrates common Tomcat configuration elements to Liberty profile
- Simplifies developer experience – Integrated experience in Eclipse for both app and configuration migration to Liberty
- Uses WDT for server definitions and deploy

Binary Scanner - Liberty server configuration

- Scans the application binaries and generates a Liberty server configuration file that contains the features required by the application
- Simplifies developer experience – assists with configuring the Liberty server

```
cheryls-mbp:wamt cherylking$ java -jar binaryAppScanner.jar /apps/PlantsByWebSphereV7.ear --featureList
Processing the PlantsByWebSphereV7.ear application.
Scanning files.....
.....
The report was saved to the following file: /binaryScannerNext/wamt/PlantsByWebSphereV7.ear_FeatureList.xml
```



```
PlantsByWebSphereV7.ear_FeatureList.xml
<?xml version="1.0" encoding="UTF-8"?>
<server description="Feature list generated by binaryAppScanner">
  <featureManager>
    <!--The following features are available in all editions of Liberty.-->
    <feature>ejbLite-3.2</feature>
    <feature>javaMail-1.5</feature>
    <feature>jdbc-4.1</feature>
    <feature>jndi-1.0</feature>
    <feature>jpa-2.1</feature>
    <feature>jsp-2.3</feature>
    <feature>servlet-3.1</feature>
    <!--The following features are available in Liberty base and above.-->
    <feature>ejbRemote-3.2</feature>
  </featureManager>
</server>
```

Configuration Migration Options

Migration overview

Migration planning roadmap

Application Migration options

Configuration Migration options

Migration Assist Program

Summary

References



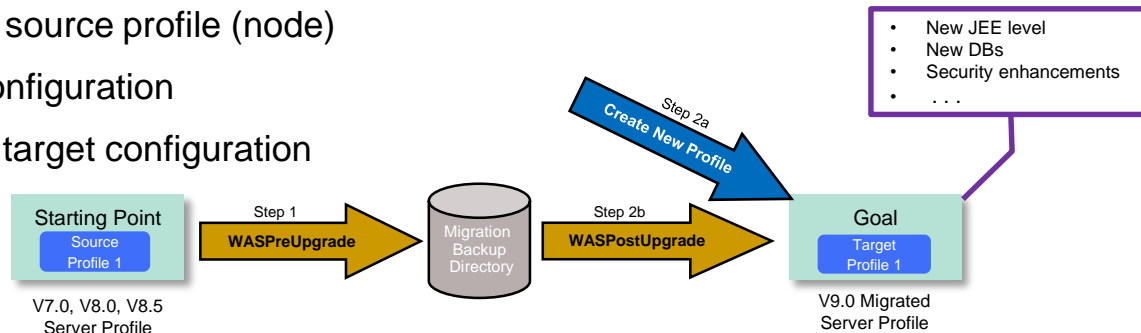
Traditional WebSphere Configuration Migration

Configuration migration goals:

- ❑ Upgrade to new release – new features, functions and the latest technologies (Java, JEE, WebSphere)
- ❑ Maintain a stable environment – new environment behaves as close as possible to old environment
- ❑ Install applications “as-is” – no code changes, deployed using same options (must be fully tested)

Configuration migration overview:

- ❑ Capture configuration data from source profile (node)
- ❑ Create target profile with new configuration
- ❑ Merge source configuration into target configuration
 - ❑ merge, purge, add, adjust



Traditional WebSphere Configuration Migration

WebSphere migration strategies:

- ❑ Remote versus Local – Source and target profiles are on different machines
- ❑ Standard(replace) versus clone – Source is replaced by target, thus the source servers are stopped and disabled. Clone allows for the old environment to continue to run during and after migration
- ❑ Other – Script based, Property-File Based Configuration

WebSphere migration tools:

- ❑ WASPreUpgrade and WASPostUpgrade – Capture and merge the source and target profile configuration
- ❑ createRemoteMigrJar – Captures the WASPreUpgrade command from a V9.0 install. Used for remote migration when you do not want to install the new WebSphere release on the old source machine
- ❑ WASMigrationAppInstaller – Tool to run the application install scripts generated by the WASPostUpgrade command
 - ❑ By default WASPostUpgrade will install the applications, but the application installs can be deferred and controlled by this command line tool
 - ❑ The CMMT wizard also supports splitting-out the application installs into a separate process
- ❑ Configuration Migration Management Tool (CMMT wizard) – Runs WASPreUpgrade, manageprofiles, WASPostUpgrade and optionally the WASMigrationAppInstaller
- ❑ z/OS Migration Management Tool (zMMT wizard) – Creates the jobs and instructions for running a WebSphere migration on zSeries. This tool is part of the WebSphere Configuration Toolset (WCT) and runs on linux and windows

WASMigrationAppInstaller Tool

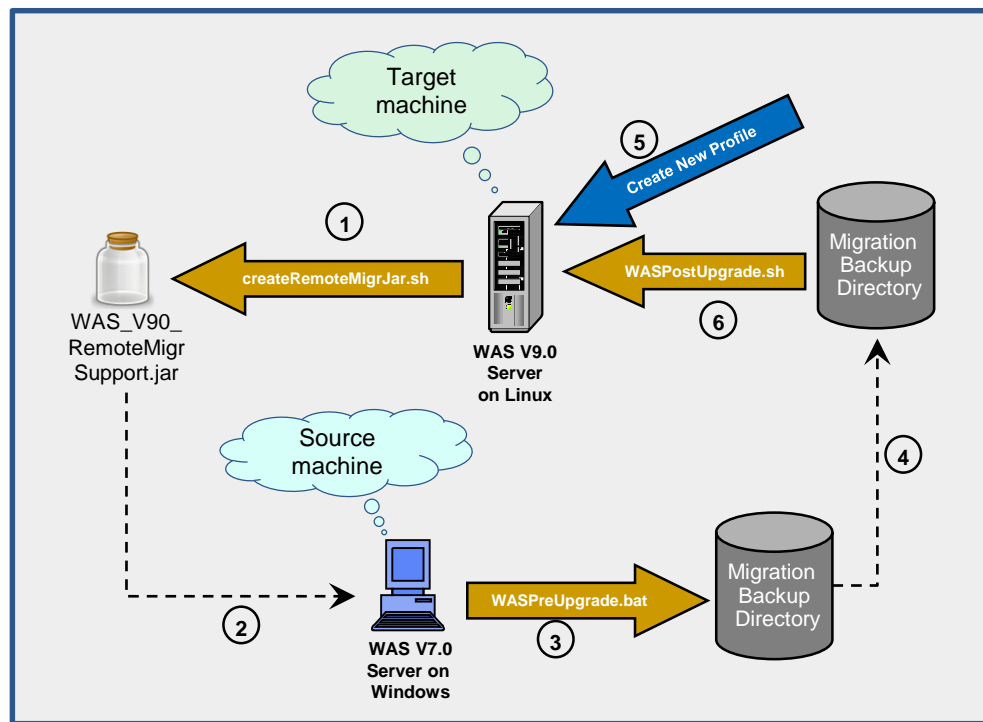
- Replaces the old *install_all_apps.jy* script
- Relies on WASPostUpgrade `–includeApps` options
 - `true` – create install scripts for each app, then runs WASMigrationAppInstaller to install them
 - `script` – create install scripts only
 - `false` – do neither
- Run manually after WASPostUpgrade
 - By default runs all install scripts found in migration backup directory
 - Includes option to select the applications to install to migrated server
 - Checks if app is already installed
 - Tries at new JEE level and if fails at old JEE level
- Reminder – Applications are installed “as-is” to the new release.
 - Use WebSphere Application Migration Toolkit to determine if application needs to be migrated to new JEE, java or WebSphere level

createRemoteMigrJar Tool

Remote migration overview

1. Run createRemoteMigrJar on target machine
 - Gathers from v9.0 WASPreUpgrade support files
 - No need to install v9.0 on source
2. Send jar to source machine and unzip
3. Run WASPreUpgrade command
4. Zip migration backup directory and send to target machine
5. Create target profile
6. Run WASPostUpgrade command

Note: -includeJava option packages the jre shipped with WebSphere v9.0 into the remote jar.



Use createRemoteMigrJar command to avoid having to install WebSphere V9.0 on your source machine just to run the WASPreUpgrade command!

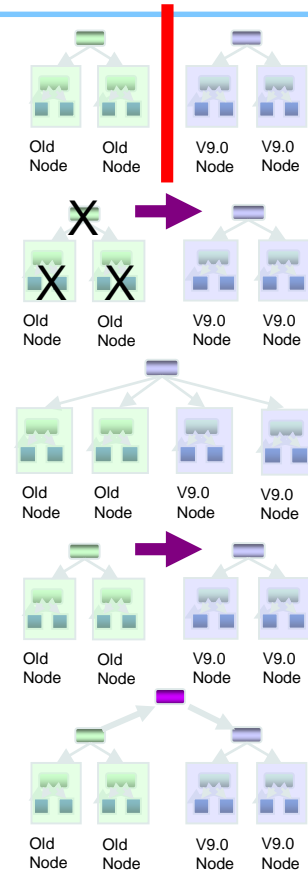
Migration Tools for Administrators

WebSphere Application Server configuration migration tools

- Configuration Migration Tool (CMT) for distributed
 - Move existing configurations between versions on same machine
- z/OS Migration Management Tool (zMMT) – for z/OS
 - Creates jobs to perform the migration (WCT product)
- Command line tools for configuration migration
 - For distributed and iSeries (WASPreUpgrade, WASPostUpgrade)
 - Local and cross-platform version migration support (createRemoteMigrJar)
 - Delayed application deployment (WASMigrationAppInstaller)

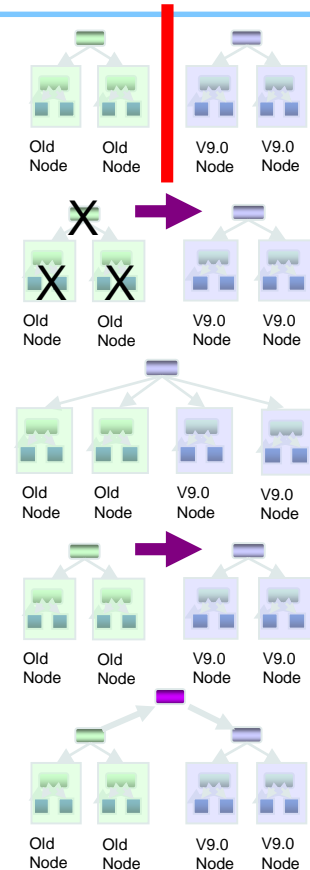
Five Strategies for Migrating Network Deployment

1. Manual Side by Side (**Scripted**)
 - Create a new cell and populate with tools or manually
 - No runtime migration tools
2. In Place - Copy and replace the cell (**Standard**)
 - Recreates the **exact** existing configuration in new cell
 - The old dMgr and nodes are disabled when migrated.
3. In Place - Copy and replace the DMgr (**Hybrid**)
 - Recreates the **exact** existing configuration in new cell
 - Add new nodes and move incrementally
4. In Place - Copy and coexist (**Clone – new for v9**)
 - Recreates the **exact** existing configuration in new cell
 - All ports in the new cell will be changes.
 - New cell can coexist with the old cell.
5. Side by Side - Fine Grained (**Fine Grained**)
 - Create a new cell and incrementally copy configuration
 - Uses an intermediate profile, runtime migration and wsadmin tools

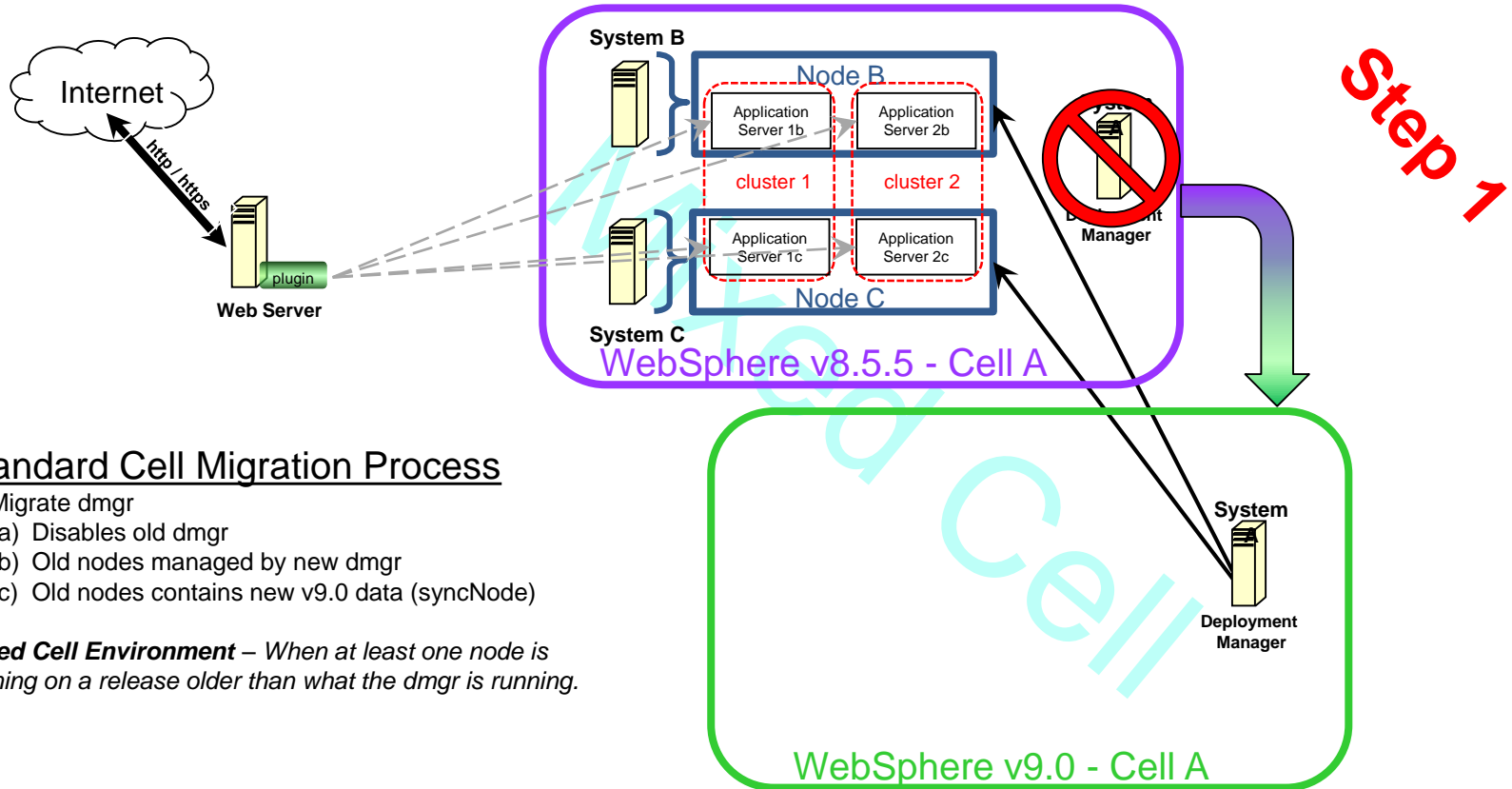


Five Strategies for Migrating Network Deployment

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Standard Migration Strategy (In Place - Copy and replace the cell)

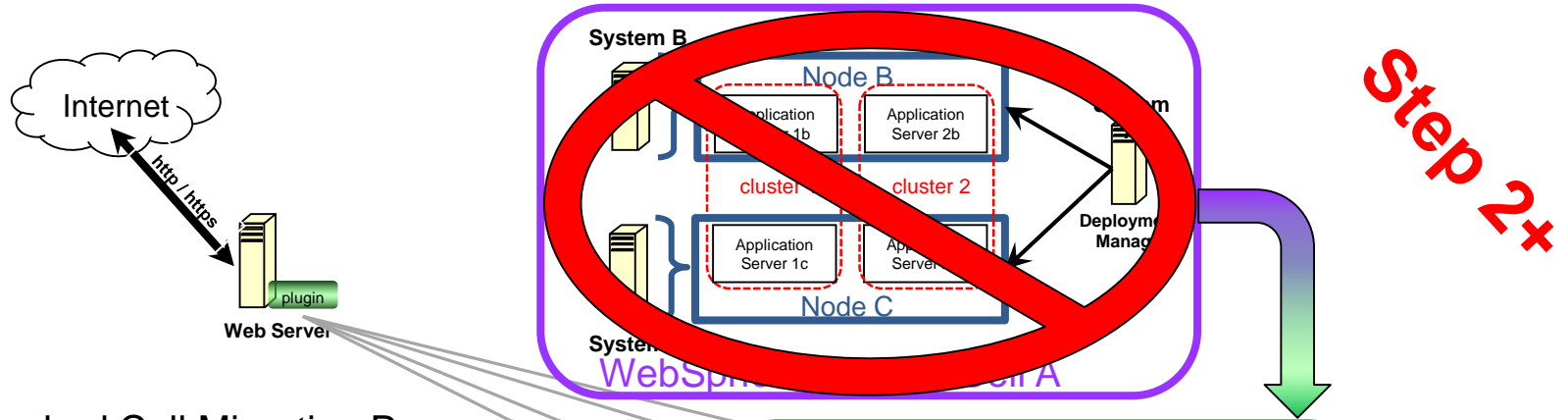


Standard Cell Migration Process

1. Migrate dmgr
 - a) Disables old dmgr
 - b) Old nodes managed by new dmgr
 - c) Old nodes contains new v9.0 data (syncNode)

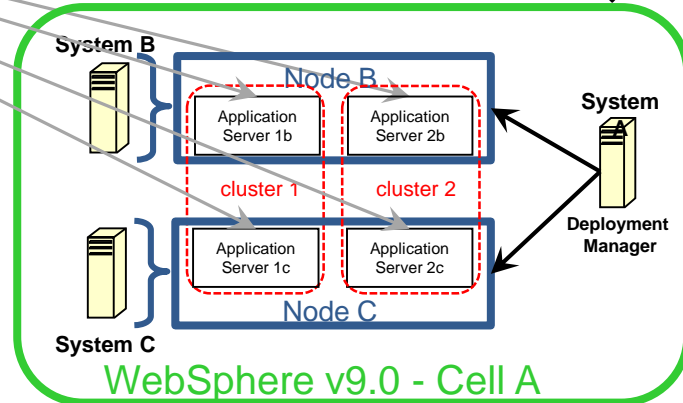
Mixed Cell Environment – When at least one node is running on a release older than what the dmgr is running.

Standard Migration Strategy (In Place - Copy and replace the cell)

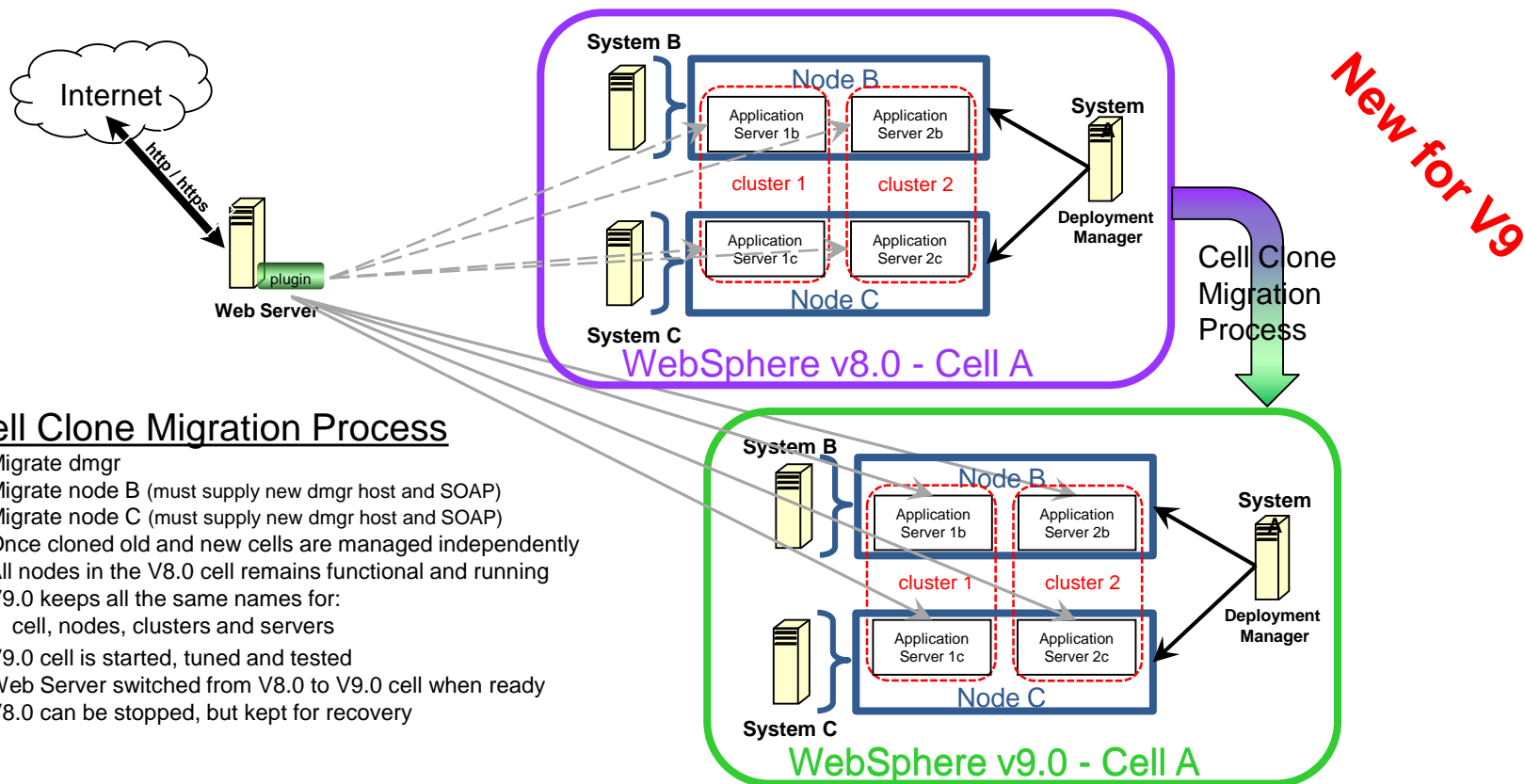


Standard Cell Migration Process

1. Migrate dmgr
2. Migrate node B (disables old node)
3. Migrate node C (disables old node)
4. V8.5.5 cell becomes obsolete
5. V9.0 keeps all the same names for:
cell, nodes, clusters and servers
6. V9.0 cell is started, tuned and tested
7. V8.5.5 recovery become difficult



Clone Migration Strategy (In Place - Copy and coexist)



Cell Clone Migration Process

1. Migrate dmgr
2. Migrate node B (must supply new dmgr host and SOAP)
3. Migrate node C (must supply new dmgr host and SOAP)
4. Once cloned old and new cells are managed independently
5. All nodes in the V8.0 cell remains functional and running
6. V9.0 keeps all the same names for:
cell, nodes, clusters and servers
7. V9.0 cell is started, tuned and tested
8. Web Server switched from V8.0 to V9.0 cell when ready
9. V8.0 can be stopped, but kept for recovery

Advantages of using the Clone Migration Strategy

- Practice and throw away. Flesh out the issues.
- No scheduling of weekend or weeknight outages in order to migrate.
- Zero down time for old release.
- Concurrent functional environments at both the old and new release levels.
- Verify and test newly migrated cell before bringing it online.
- Quick fall back strategy to old release.
- Reduce cost in planning and carrying out a migration.

Clone Migrations – other notes

- Does not support a mixed cell environment.
 - If Dmgr is cloned then all nodes in the cell must also be cloned!
 - A node may not be cloned unless its DMgr is cloned!
- All endpoint ports in new cell are completely independent of old cell.
- Supports the remote migration option. (-machineChange true)
- Currently not supported on iSeries
- Supports all profile types except:
 Job Manager and Managed App Servers.
- For a federated node migration, the host and SOAP
 or RMI port of the new deployment manager must be provided.

V9 Clone Migration Demo Overview



IBM UrbanCode Deploy speeds WAS applications to Hybrid Cloud

including
Bluemix

UrbanCode automates your application deployment process

UrbanCode deploys all the application components so you can set up environments painlessly in minutes versus hours.

Use Cloud Blueprints to deploy the entire application environment to hybrid cloud

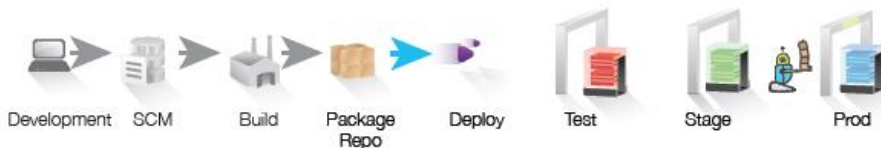
With the blueprinting capability of UrbanCode Deploy you can blueprint your target environments and quickly reuse them for any cloud.

Benefits: *Automated, Fast, Repeatable*

- **Reduced Risk:** Automated, consistent deployments and rollbacks of applications
- **Repeatable Process:** Orchestration of changes across servers, tiers and components
- **Consistent:** Configuration and security differences across environments
- **Traceable:** Clear visibility: what is deployed where and who changed what
- **Integrated:** With middleware, provisioning and service virtualization

UrbanCode also automatically configures the environment to support the application

Eliminate the manual configuration steps to reduce risk and speed applications from Dev to QA to Prod consistently and in a repeatable fashion. UrbanCode deploys, tracks and versions WAS configurations.

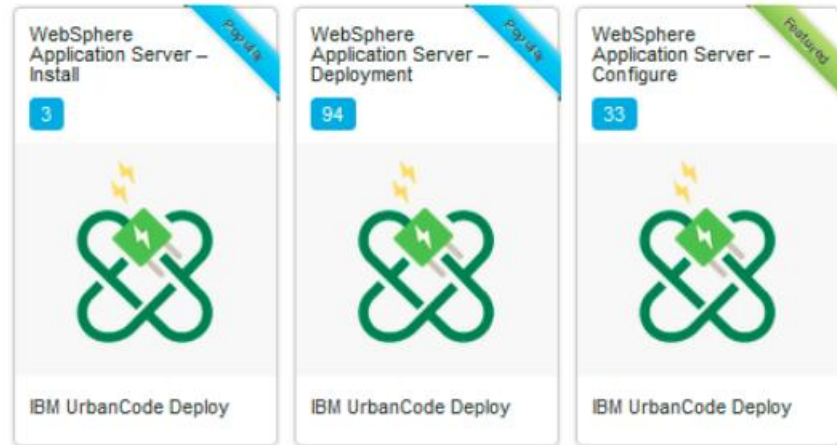


UCD WebSphere Automation

<https://developer.ibm.com/urancode/products/urancode-deploy/features/managing-ibm-websphere-application-server/>

Why choose UrbanCode to manage WebSphere?

- **Reduced Risk**
- **Repeatable Process**
- **Consistent**
- **Visible & traceable**
- **Portable**
- **Integrated with cloud**



Summary

Migration overview

Migration planning roadmap

Application Migration options

Configuration Migration options

Migration Assist Program

Summary

References





Summary

- Migration needs to be a pragmatic, well designed and repeatable process
- WebSphere Application Server migration is becoming easier!
 - More tools
 - More techniques
 - Minimizing Application changes

Enablement: IBM Migration Knowledge collection

- This information and more is available online!
- General planning with detailed notes and WebSphere AppServer version specific information
- Updated with timely information
- Google: “websphere application server migration”

Knowledge Collection: Why Migrate?

 Be the first to ask a question  Chat with our new IBM Support Agent Tool (Beta)

Product documentation


Abstract

Wondering why you should migrate your apps to a newer version of WebSphere? Here are resources to help you understand the associated benefits and the value of migrating.

Content

Why Migrate?	Migration Planning and Resources	Migration Offers and Support	9.0.x	8.5.x	8.0.x, 7.0.x and 6.1x	z/OS	Additional Resources
---------------------	----------------------------------	------------------------------	-------	-------	-----------------------	------	----------------------

Why upgrade to WebSphere Application Server Version 9.0
Learn more about the key reasons for upgrading to WAS version 9.0.

 Migration - Why Upgrade to WAS v9.pdf

WebSphere Application Server V9 Update: On Premise and in the cloud
For a more in-depth understanding about the technical capabilities of WebSphere Application Server V9 -- Watch this video.

<http://www.ibm.com/support/docview.wss?uid=swg27008728>

Questions ?

IBM

References



Reference Information

- Migration Information
- Planning
- Migrating from competitors application servers
- Moving to the cloud
- Training
- Configuration
- Development
- Operations
- 5 Runtime migration strategies
- Differences between versions
- Application planning example

Migration information

- IBM Migration Assist from WebSphere Level 2 Support Team
 - http://www-01.ibm.com/support/docview.wss?uid=swg21570083&acss=was_sp#5
- IBM WebSphere Migration Services
 - <http://www.ibm.com/developerworks/websphere/services/findbykeyword.html?q1=gwap005>
- IBM Software Accelerated Value program
 - <http://www-01.ibm.com/software/support/acceleratedvalue/index.html>
- WAS Migration Toolkit overview:
 - <http://www.ibm.com/developerworks/websphere/downloads/migtoolkit/>
- WAS 8.5 WebSphere Migration Guide
 - <http://www.redbooks.ibm.com/redpieces/abstracts/sg248048.html>
- Talk with your IBM representative !

References - Planning

- Supported hardware and software information
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 - <http://publib.boulder.ibm.com/infocenter/prodguid/v1r0/clarity/index.html>
- IBM Support Policies
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- Installation Manager and Managing Repositories
 - http://www.ibm.com/developerworks/websphere/library/techarticles/1201_seelemann/1201_seelemann.html
 - <http://www.ibm.com/support/docview.wss?uid=swg27023967&aid=1>
 - http://www.ibm.com/developerworks/websphere/techjournal/1301_seelemann/1301_seelemann.html?ca=drs-
- The Ideal WebSphere Development Environment
 - http://www.ibm.com/developerworks/websphere/techjournal/0312_beaton/beaton.html
- Web Server plug-in technotes and Merge tool
 - <http://www-1.ibm.com/support/docview.wss?uid=swg21160581>
 - <http://www-01.ibm.com/support/docview.wss?uid=swg21139573>
 - http://www14.software.ibm.com/webapp/wsbroker/redirect?version=phil&product=was-base-dist&topic=twsv_configsimplelb

References - Planning

- WebSphere supported Specification levels and pointers to JEE specifications
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 - http://www14.software.ibm.com/webapp/wsbroker/redirect?version=cord&product=was-nd-mp&topic=rovr_specs_javaee7
- WebSphere App Server API Deprecations, removals and stabilizations
 - http://www14.software.ibm.com/webapp/wsbroker/redirect?version=cord&product=was-nd-mp&topic=rmig_deprecationlist
- Changes in Default behavior
 - http://www14.software.ibm.com/webapp/wsbroker/redirect?version=cord&product=was-nd-mp&topic=rmig_defaultvalue
- WebSphere Application Server V8.5 Concepts, Planning, and Design Guide
 - <http://www.redbooks.ibm.com/Redbooks.nsf/RedbookAbstracts/sg248022.html?Open>
- Migrating WebSphere Compute Grid or Feature Pack for Modern Batch
 - http://www14.software.ibm.com/webapp/wsbroker/redirect?version=phil&product=was-nd-zos&topic=container_computegrid_migrating_cg
- Webcast replay: WebSphere Application Server V61 for z/OS Exit Plan
 - <http://www.ibm.com/support/docview.wss?uid=swg27035994&myns=swgws&mynp=OCSS7K4U&mync=E>
- IBM Media Center – WAS and Liberty Channel
 - <https://mediacenter.ibm.com/channel/t/33964822>

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 - <https://developer.ibm.com/wasdev/docs/was-classic-or-was-liberty-how-to-choose/>
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 - http://www.ibm.com/developerworks/websphere/techjournal/1506_webcon/1506_webcon-trs.html
- Configuring and Deploying Open Source with IBM WebSphere Application Server Liberty Profile
 - <http://www.redbooks.ibm.com/abstracts/sg248194.html?Open>
- IBM WebSphere Application Server V8.5 Administration and Configuration Guide for Liberty Profile
 - <http://www.redbooks.ibm.com/abstracts/sg248170.html?Open>
- WASdev YouTube Channel
 - <https://www.youtube.com/c/wasdevnet>
- WASdev Documentation
 - <https://developer.ibm.com/wasdev/docs/>

Migrating from a Competitive Application Server?

- Certain migrations could include free services available
 - Migration Assessment Report
 - Workshops
 - Proof of Concept
- Contact your IBM rep

IBM WebSphere Application Server

Why Pay More And Get Less?

The business case for the value, robustness, scalability, and enterprise grade attributes of WebSphere is compelling.

Consider The Facts:

With IBM WebSphere, you can improve your overall total cost of ownership taking into account licenses and support, performance, availability and usability, administrative and development tools.

- With IBM WebSphere, you only pay for software on the server cores you use.
- You can realize savings of 57% on first year licensing and support, compared to Oracle WebLogic.
- Since 2010 over 400 Oracle WebLogic clients have chosen IBM WebSphere.
- Hands-on analysis of capabilities reveal that over 5 years, JBoss is 49% more expensive than WebSphere.
- WebSphere beats Tomcat hands down on features that are important to any sized business.

Get Started Now:

- I would like an IBM migration expert to give me, at no charge, a high level estimate of to what it will take to migrate (requires 2-3 hours.)
- I would like an IBM migration expert to come on-site for a free deep evaluation of my environment and applications and provide a full migration assessment report at no charge.
- I am interested in a Proof of Concept (PoC) where an IBM migration expert comes on-site to migrate 1 or 2 of my applications to WAS on our test environment using their proven methodology and automation tools – all at no charge.
- I would like several of my company's technical personnel or management to attend a free 1, 2, or 3 day Migration Workshop to get an introduction WAS v8.5 and do hands-on labs to learn about the business value and migration process.

If you said YES to any of these options, our migration experts would like to talk to you. They can help you save money now!

Contact your local IBM representative, or send an e-mail to wascmt@us.ibm.com.



References – Planning your move from other servers

- Comparing IBM WebSphere and Oracle WebLogic
 - https://www-01.ibm.com/marketing/iwm/iwm/web/signup.do?source=sw-app&S_PKG=ov1115&S_TACT=109KA5IW&dynform=4522&lang=en_US
- IBM WebSphere Application Server V8.5 vs. JBoss Enterprise Application Platform V6
 - https://www-01.ibm.com/marketing/iwm/iwm/web/signup.do?source=sw-app&S_PKG=ov9787&S_TACT=109KA5IW&dynform=4526&lang=en_US
- WebSphere Application Server Migration Discovery Tool
 - <http://ibm.biz/MigrationDiscovery>

References – Planning for the cloud with V9

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 - <http://www.ibm.com/developerworks/learn/cloud/bluemix/quick-start/index.html>
- WebSphere Application Server V9 Update: On Premise and In the Cloud
 - https://mediacenter.ibm.com/media/WebSphere+Application+Server+V9+technical+update/0_ttxciunh
- Why choose when you can have it all with WebSphere V9?
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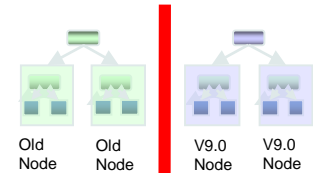
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Five Runtime Migration Strategies For Network Deployment

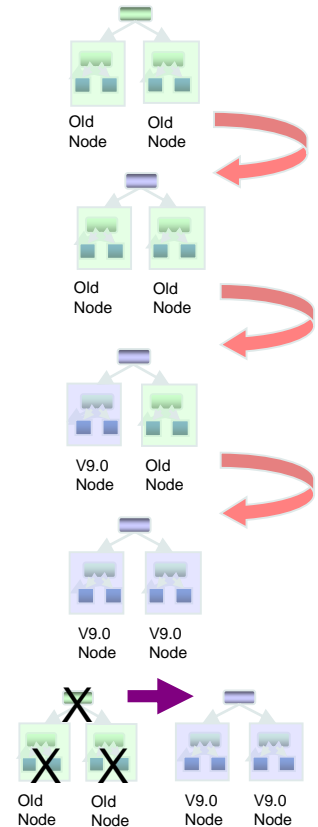
Side by Side

- Ignores the existing configuration
- Create a new cell and populate with administration scripts or manually
- Best results with a comprehensive set of scripts or tools for configuration automation
- Pros
 - No dependencies on tooling
 - Least risk assuming existing scripts are comprehensive
 - Can easily migrate applications singly
- Cons
 - Comprehensive set of scripts and ongoing maintenance of those scripts can be expensive
 - Any required changes to these scripts must be done before migrating
 - Tuning of the old configuration is not carried forward



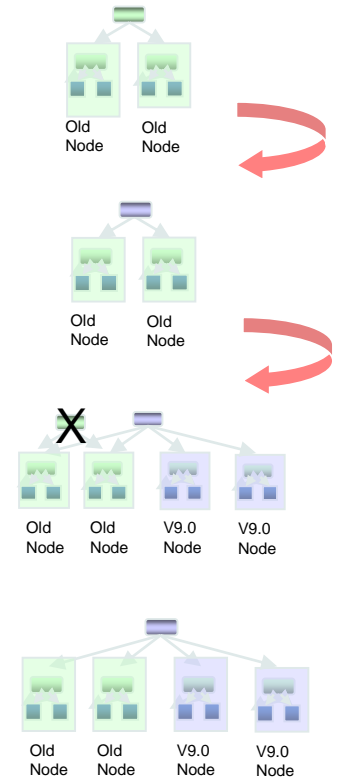
In Place - Copy and replace Cell (Standard)

- Use Runtime migration tools on DMgr
 - Recreates the **exact** existing configuration in the new cell
- Later migrate the existing nodes using the runtime migration tools
 - All applications on a managed node are migrated at the same time
- Pros
 - Does not require comprehensive set of scripts
 - All configuration is moved forward
- Cons
 - Dependency on using the runtime migration tools
 - Requires all applications on a node be ready to migrate at the same time
 - Limited value if you are refactoring your topology
 - Carries default values forward from the old cell



In Place - Copy and replace DMgr

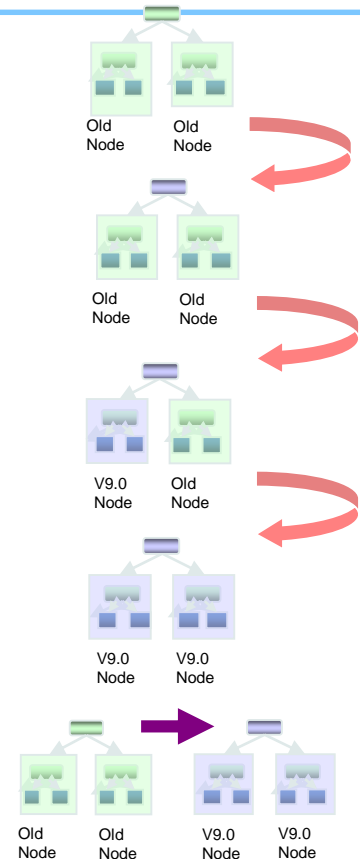
- Use Runtime migration tools on DMgr
 - Recreates the **exact** existing configuration in the new cell
- Add new nodes
 - Applications can be migrated singly when ready
 - Remove old nodes when no longer needed
- Pros
 - Does not require comprehensive set of scripts
 - All configuration is moved forward
 - Cell and cluster level configuration accessible by older nodes
- Cons
 - Dependency on using the runtime migration tools
 - Limited value if you are refactoring your topology
 - Carries default values forward from the old cell



In Place - Copy and coexist (Clone)

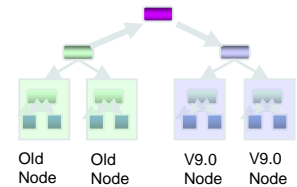
- Same steps as “Copy and replace Cell” except:
 - Use the ***NEW*** `-clone` option of the runtime migration `WASPostUpgrade` tool to migrate the Dmgr.
 - No need to stop or disable the old Dmgr – leave it running.
 - Start new DMgr
 - Migrate all the nodes using the `-clone` option and provide the new Dmgr’s host name and RMI or SOAP port.
 - Migration will resolve all port conflicts.
 - Start each node in the new cell as it is migrated.
 - See Migration redpiece for example

<http://www.redbooks.ibm.com/redpieces/abstracts/redp4635.html?Open>



Side by Side - Fine Grained

- Uses a combination of tools
 - An intermediate profile
 - The runtime migration tools
 - Properties based configuration tool (PBC)
- Approach
 - Migrate the existing data to an intermediate profile
 - Extract portions of the configuration from that profile
 - Import them into the final DMgr profile using PBC
- See Migration redpiece for example
 - <http://www.redbooks.ibm.com/redpieces/abstracts/redp4635.html?Open>



Overview changes by version

Migration impacts (worst case scenario)

Potential Impact areas	v6.0	v6.1	v7.0	v8.0	v8.5.x	v9.0
Java Runtime (v8.5 has JRE6 and 7)	n/a	6	2	n/a	0/20/19 ^{note}	19
JEE - JSP	8	n/a	1	1	0	0
JEE - Servlet	5	n/a	0	2	0	9
JEE - Other	3	n/a	5	7	1	50
WAS Specific	1	6	0	4	0	3
3 rd party packages	2	0	1	0	0	3
Development total	19	12	9	13	0/20/19	64
Administrative script	4	3	2	0	0	1
WAS directory structure	1	1	0	0	0	1
Other administrative	5	2	6	7	0	1
Total administrative	10	6	8	7	0	3
Total potential impact areas	29	18	17	20	0/20/19	67

Note: V8.5 supports Java 6, 7 and 8. Java7 and Java 8 introduces a number of behavior changes. "0" represents Java6 and "20" is for Java7. Not all breaking changes will impact all applications

Migration impacts - Liberty

Potential Impact areas	Java SE	Traditional to Liberty	Liberty Core	Java EE 7
Java Runtime – Java SE 7	16			
Java Runtime – Java SE 8	14			
Third-party APIs		14		
WebSphere API differences		3		
WebSphere API unavailable		55		
JEE – behavior difference		15		
JEE / Java technology – unavailable		13	12	
JEE – CDI				11
JEE – EL				1
JEE – JAX-RS				11
JEE – JMS				2
JEE – JPA				25*
JEE – JSF				1
JEE - Servlet				9
Development total		102	12	60

* JPA 2.0 can be used with other Java EE 7 features.

http://www14.software.ibm.com/webapp/wsbroker/redirect?version=phil&product=was-nd-dist&topic=rwlp_prog_model_jee7behaviors

Changes in v9.0

- Administration changes
 - Default Jython version
 - New default coregroup wiring protocol
 - New java extensions directory - `$WAS_HOME/javaext`
 - Other miscellaneous changes
- Development changes
 - Development tool changes
 - Java SE 8 upgrade
 - Java EE 7 upgrade
 - [CDI, JAX-RS, JPA implementation change](#)
 - [Servlet, EL, JMS behavior changes](#)
 - API removals
 - API deprecations

Changes in v8.5.5

- WAS traditional
 - No change in product configuration!
 - No need to install in a new directory!
 - No need to migrate configuration!
- Liberty
 - Now Java EE 6 Web Profile Compliant
 - Updating v8.5.0 installed images that have Liberty
 - v8.5.0 image that has just Liberty
 - Must install the new standalone Liberty offering
 - Can then continue using the user data and server configurations currently used by this original install
 - v8.5.0 image that has combined WAS traditional and Liberty
 - User is advised that Liberty will be backed up.
 - To obtain v8.5.5 Liberty and future service, install the standalone offering.
 - Can then continue using the user data and server configurations currently used by this original install.
 - WAS traditional updates as normal.

Changes in v8.5.0

- Administration changes
 - Some new ports defined
 - A number of minor default setting changes
 - [Information provided in the v8.5 InfoCenter](#)
- Development changes
 - Development tool changes
 - Java7 upgrade – Java6 is the default
 - [Breaking changes: \(AWT, Internationalization, IO, JAXP, Language, Networking, Text and Utilities\)](#)
 - JPA (2)
 - [Custom settings are provided to provide compatibility](#)
- Liberty introduced
 - Simplified configuration
 - Programming model subset (webapp focused)

Changes in v8.0

- Administration changes
 - Installation changes
 - Centralized Install Manager
 - Install Factory alternative
 - WebServer Plug-in installation and configuration
 - Java Garbage collection and dump format changes
 - Security default changes
 - Other miscellaneous changes
- Development changes
 - Development tool changes
 - JEE 1.6
 - WebSphere API changes

Changes in v7.0

- Administration changes
 - SessionInitiationProtocol(SIP) Migration Considerations
 - zOS Migration tool
 - Administration script required changes
 - Port usage
 - Security Migration considerations
 - Mixed version considerations
- Development changes
 - Development tool change
 - JRE 6 impacts
 - JEE 5 impacts
 - WebSphere removed features
 - Support for WebServices included in WAS
 - Embedded WebServices implementation and conflicts with existing applications

Changes in v6.1

- Administration changes
 - Migration and Feature Packs
 - zOS Migration tool
 - Administration script required changes
 - Install response file format changes
 - Port usage
 - Profile directory structure
 - New administrative tool IDE
 - Migration tools and v6.1 Security model
- Development changes
 - Development tool change
 - JRE 5 impacts
 - WebSphere changes and removed features

Application planning example

Migration Project

App Owners - Develop a Wave Formula

▪ Create Application Rating System

- Least Complex →→→ to Most Complex
- Least Critical →→→ to Most Critical

▪ Separate Tracks

- Validated VS. Non-Validated
- Custom Built VS. Vendor Application

▪ Factor in

- Core Technology Requirements (JSF, EJBs, JSP, Servlets, JAX-WS, Spring, Hibernate, etc...)
- Dependencies - Applications that Must Migrate together
- Business Benefit (Application Enhancements Requested)
- Group into Tier3, Tier2 and Tier1 Type Applications

Migration Project

Expectations

- Many Applications will be easy (little or no changes)
- Some Applications will be difficult (moderate to large amount of changes)
- Some will be in-between

Consider these factors

- Identify Candidates for “Decommissioning” - save yourself some work
- Enhance the Application Features
- Correct Flaws
- Port “As-Is” doing only what is required for migration

Migration Project – Rank Your Applications

“Hypothetical” Ranking – Developing a Formula

Complexity			Mission Critical			Total Score
Low (1)	Medium (3)	High (5)	Low (1)	Medium (5)	High (10)	
1			1			2
	3		1			4
1				5		6
		5	1			6
	3			5		8
		5		5		10
1					10	11
	3				10	13
		5			10	15

Migration Project

	Complexity			Mission Critical			Total Score	JSF Used?	EJB Used?	JSP Used?	Servlet Used?	JAX-WS Used?	Total Score	Overall Score
	Low	Med	High	Low	Med	High								
App A	1			1			2			1	1		2	6
App B		3		1			4	3					3	10
App C	1				5		6		3				3	12
App D			5	1			6			1		3	4	14
App E		3			5		8		3		1	3	7	22
App F			5		5		10	3	3			3	9	28
App G	1					10	11	3		1	1	3	8	27
App H		3				10	13	3	3		1		7	27
App I			5			10	15	3	3	1	1	3	11	37

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