



IBM Software Group

# WebSphere Application Server

## Planning for Version To Version Migration

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# Agenda

- Migration overview
- Migration roadmap
- Improving migration story
- Runtime migration support
- Version specific highlights
- Additional resources



# Introduction

- This presentation is intended to educate and assist in performing WebSphere® Application Server Migrations
- It contains overall planning guidelines as well as detailed migration concerns for your awareness
- It does not prescribe one Migration path
  - ▶ Varies with customer policies
  - ▶ Varies with versions involved
  - ▶ Varies with customer procedures
- Use this information as a guide to build your own plan
- Get assistance if needed



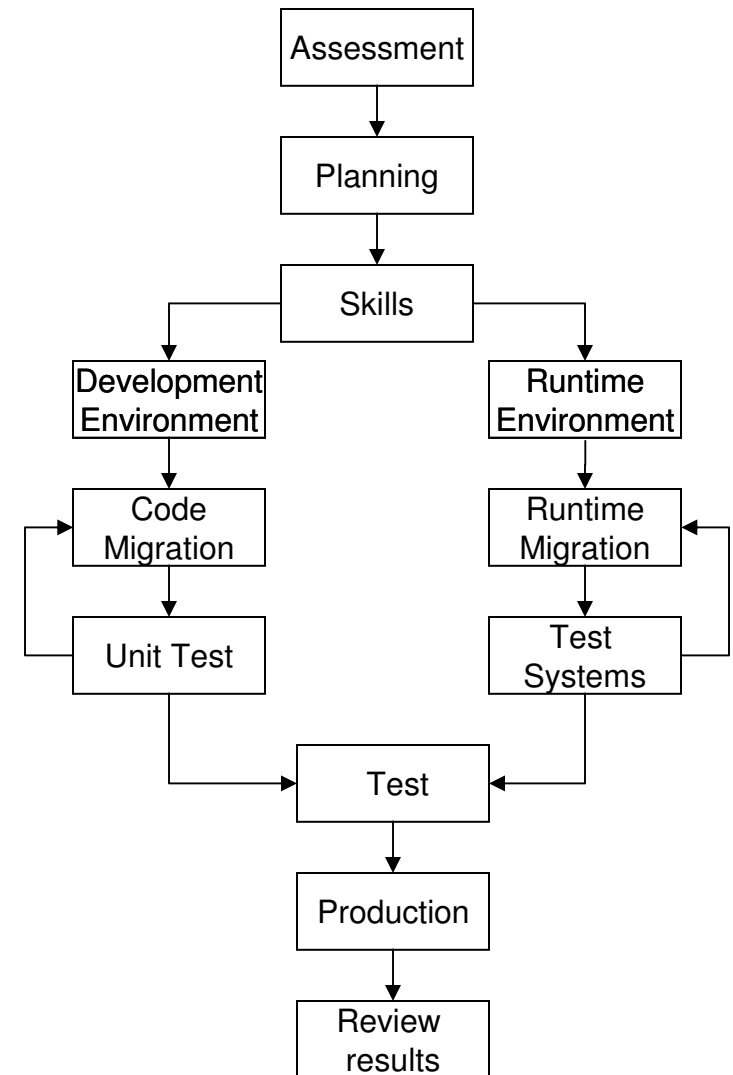
# Overview

- Migration considerations
  - ▶ More than just software development
  - ▶ Must consider the applications, infrastructure, education and culture
  - ▶ Migration process should not compromise day-to-day business
  - ▶ Manage complexity, expectations, expense and risk
- Careful planning is required
  - ▶ Each situation is unique
  - ▶ There is no one standard plan



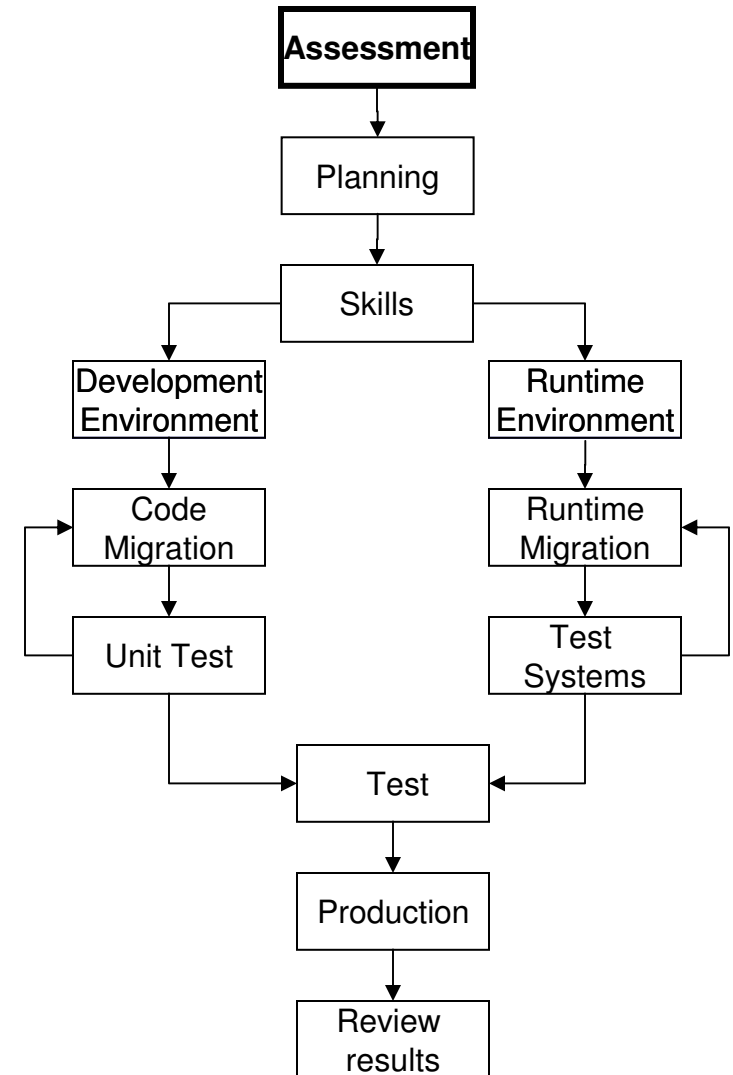
# Migration Plan Roadmap

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



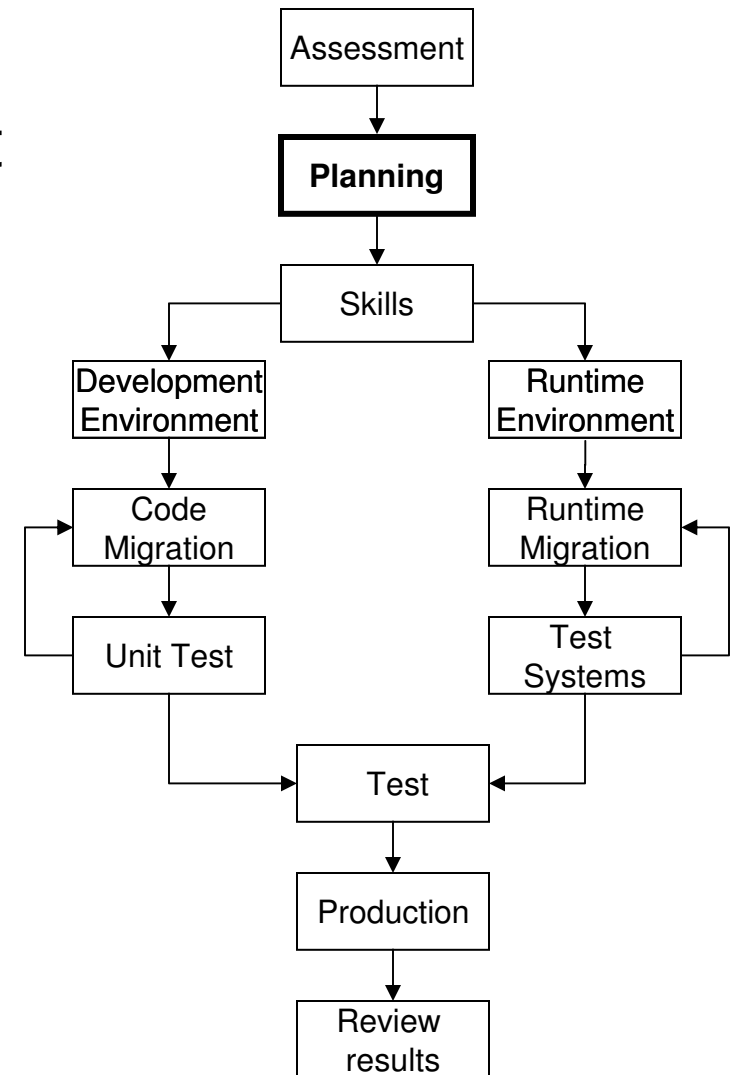
# Assessment

- Gather the people
  - ▶ Consider a core Migration team
- Identify education requirements
  - ▶ Developer, Administrator...
- Hardware requirements
  - ▶ Possible Upgrades, All levels
- Topology assessment
  - ▶ Downtime tolerance, Failover support
- Application architecture
  - ▶ Tightened specifications
  - ▶ Dependencies between apps
  - ▶ API removal, JDK changes
- Review Testing practices
  - ▶ Standard practices and automation
- Vendor apps and WebSphere products
  - ▶ J2EE/JDK/WebSphere version requirements



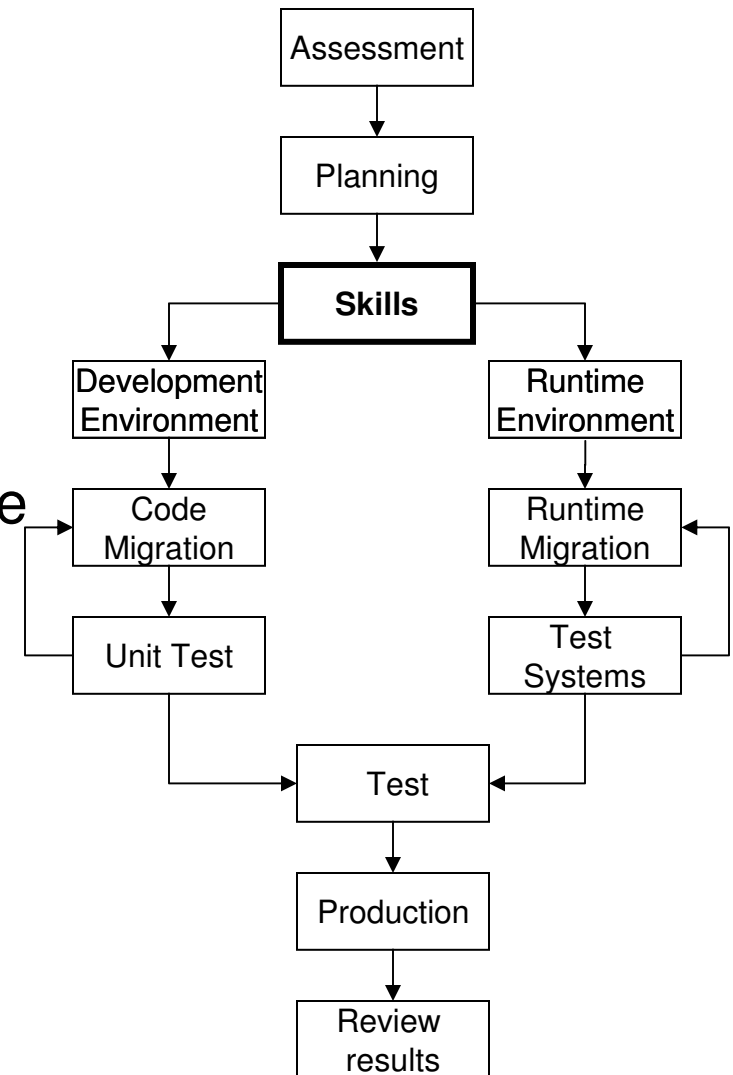
# Planning

- Build a plan based on assessment
  - ▶ Hardware requirements
  - ▶ Prerequisite software upgrades
  - ▶ Educational needs
  - ▶ Identify early adopters
  - ▶ Identify Pilot projects
  - ▶ Consider risk factors
  - ▶ Create an execution timeline
  - ▶ Include a rollback plan



# Skills

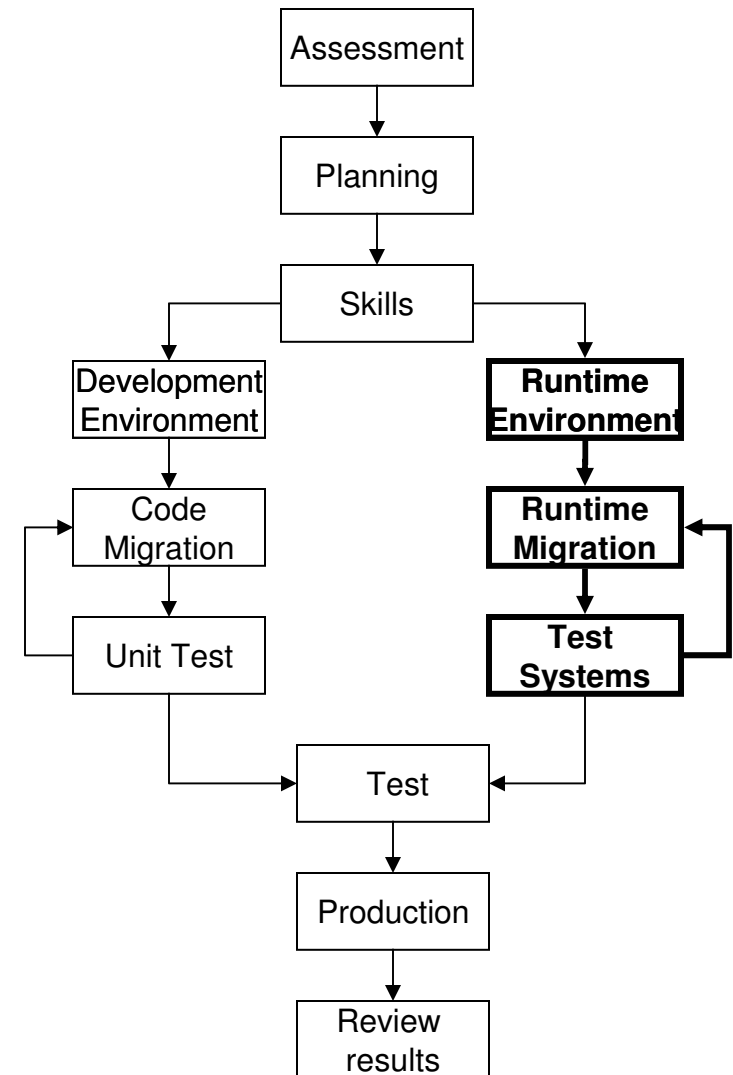
- Plan for education
  - ▶ New development tooling
  - ▶ Changes in WebSphere administration model
  - ▶ Changes in the latest WebSphere version
  - ▶ New standards





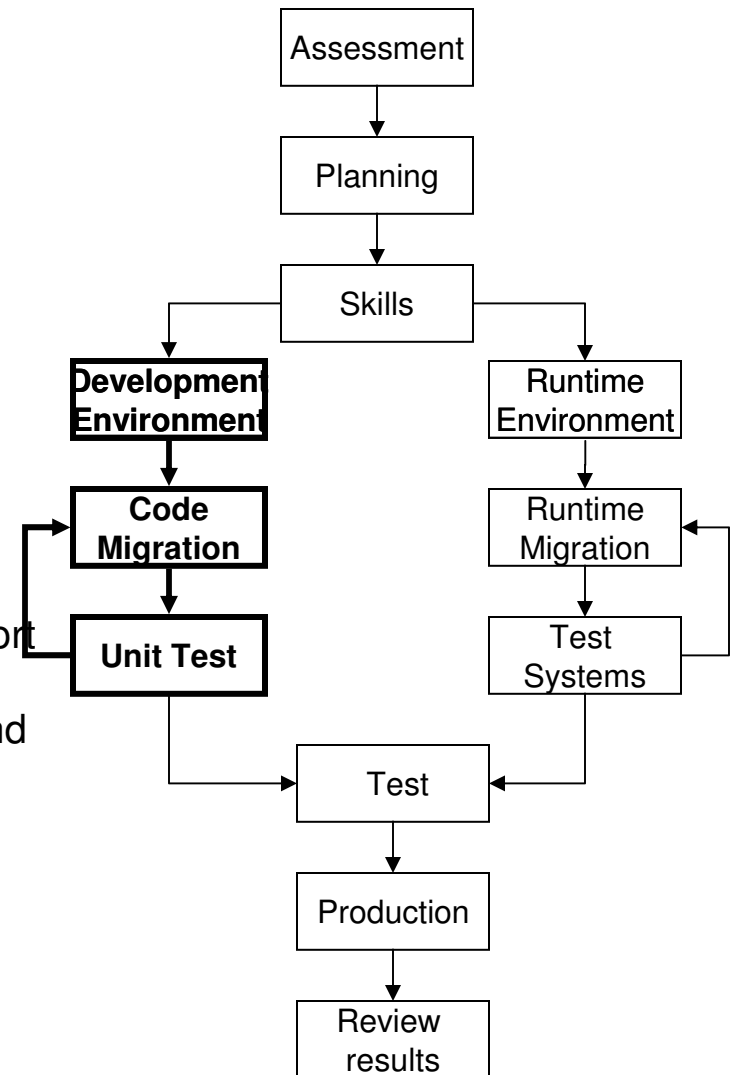
# Runtime Environment

- Most likely will need to support parallel development
- Migrate some test systems iteratively
  - ▶ Integration
  - ▶ System test
  - ▶ Performance
  - ▶ Pre-Production
  - ▶ Production
- Based on your environment



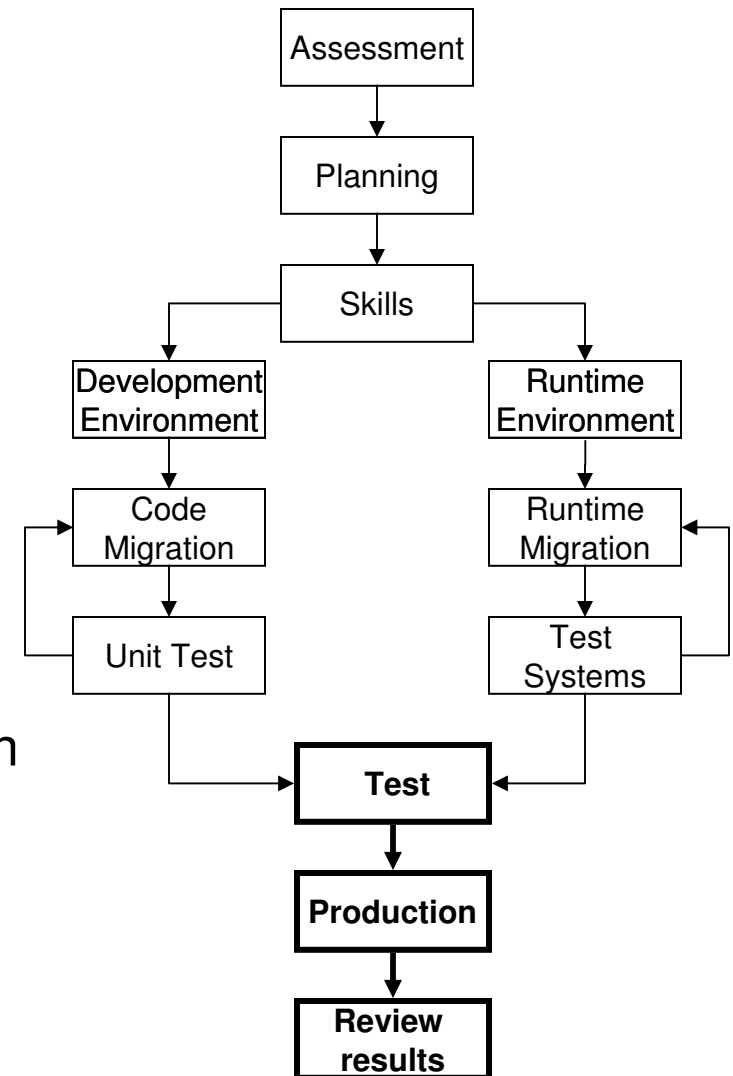
# Development Environment

- Likely require a change in IDE
  - ▶ Progress iteratively, expand outward
- Assume application compatibility
  - ▶ Assess apps, based on known issues
  - ▶ If no changes required, perform standard regression
- If development is required do it iteratively
  - ▶ Initially make changes that are required to support version migration
    - Reduces complexity of planning, diagnosis and debug - “Keep it Simple”
  - ▶ Test to the depth of test environment that fits your comfort level
  - ▶ Then do any necessary new code development and iterate following your standard practices
- Address Deprecations at some point
  - ▶ Ideally later as part of application updates



# Test/Production/Review

- Run your standard test processes
  - ▶ Progress applications normally through the test environments
- Ensure Performance is measured
  - ▶ Differences exist between WebSphere 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



## Section

# Improving migration story




# Administration

- Administration model changed starting in v5.0
  - ▶ Transition from DB repository to file based
  - ▶ Administration scripting tools changed
- Scripting model changed starting in v5.0
  - ▶ Stable scripting strategy starting v5.0
  - ▶ No changes moving from v5.0 to v5.1
  - ▶ Small number of changes when moving to v6.0 and v6.1
- Used to differ in migration tooling and support between Distributed, iSeries and zOS platforms
  - ▶ Improvement starting in v5.0, with same underlying migration tooling, support and experiences



# Administration impacts

From\To	3.02	3.5	4.0	5.0	5.1	6.0	6.1
6.0							Easier
5.1						Easier	Easier
5.0					Easier	Easier	Easier
4.0					Difficult	Difficult	Difficult
3.5			Easier		Difficult	Difficult	Difficult
3.02		Easier	Easier		Difficult	Difficult	Difficult
2.03	Difficult	Difficult	Difficult		Difficult	Difficult	Difficult

# Administration scripting choices

- JACL or Jython?
- JACL is currently used more often
- Jython is the preferred direction
  - ▶ More industry support
  - ▶ Better performance
  - ▶ Priority in future deliverables
- No immediate need to convert from JACL
  - ▶ Deprecated in v6.1 but is still fully supported
  - ▶ Conversion tool included in v6.1 and available in Application Server Toolkit (AST) or via download (see speaker notes)
- Suggest an evolution
  - ▶ Create new scripts using Jython



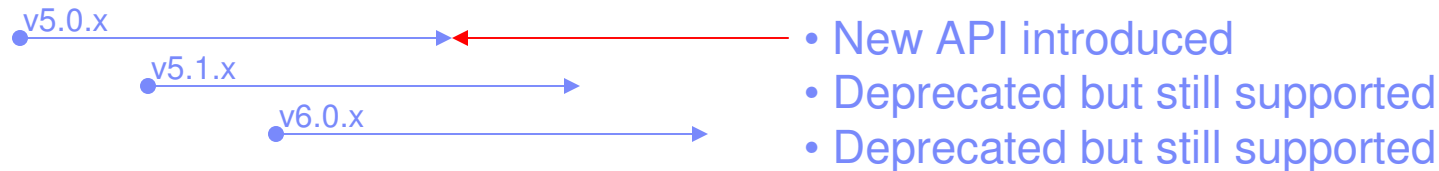
# Application Migration

- J2EE compatibility
  - ▶ J2EE 1.3 Implicitly supports J2EE 1.2
  - ▶ J2EE 1.4 Implicitly supports J2EE 1.2 and J2EE 1.3
- J2EE supports incremental upgrade
  - ▶ Modules within an application can be earlier versions
- In general WebSphere APIs very compatible
  - ▶ Many v4.x Applications run unchanged (except for zOS)
  - ▶ Most v5.0/v5.1 Applications run unchanged





# Deprecation policy



- Deprecation policy in place for all WebSphere Application Server APIs
- API supported for 2 full releases from the point of deprecation or 3 full years whichever is longer
- API may be removed at such point
- Deprecations and Removals are documented in InfoCenter
- 5+3 support statement as of March 2007
  - ▶ Five for free, three for fee.
  - ▶ Updated April 2008 to include selected products within the Information Management, IBM Lotus, IBM Rational, IBM Tivoli and WebSphere
  - ▶ See for specifics: <http://www-1.ibm.com/support/docview.wss?uid=swg21256700>

# Development impacts

From\To	3.02	3.5	4.0*	5.0	5.1	6.0*	6.1*
6.0							Easier
5.1						Easier	Easier
5.0					Easier	Easier	Easier
4.0 <sub>z</sub>				Varies	Varies	Varies	Varies
3.5				Difficult	Difficult	Difficult	Difficult
3.02		Easier		Difficult	Difficult	Difficult	Difficult
2.03	Difficult	Difficult		Difficult	Difficult	Difficult	Difficult

\* z/OS scenarios are difficult for this row; Easier for all other platforms

# Impacts summary

	<b>v3.5</b>	<b>v4.0</b>	<b>v5.x</b>	<b>v6.0</b>	<b>v6.1</b>
<b>Development</b>	VisualAge for Java™ WebSphere Studio “Classic”	WebSphere Studio 5.0	WebSphere Studio 5.1	Rational Application Developer v6.0	Rational Application Developer v7.0
<b>Code</b>	Pre-J2EE JDK 1.2	J2EE 1.2 JDK 1.3	J2EE 1.3 JDK 1.3 (v5.0) JDK 1.4 (v5.1)	J2EE 1.4 JDK 1.4	J2EE 1.4 JDK 5
<b>Packaging and Deployment</b>	Ad hoc Manual or scripted	J2EE packaging EAR deploy	J2EE packaging EAR deploy	J2EE packaging EAR deploy Configuration in the EAR	J2EE packaging EAR deploy Configuration in the EAR
<b>Administrati on and Operations</b>	Plug-in OSE Administration db WSCP, XMLConfig	Plug-in HTTPx Admin db for AE WSCP, XMLConfig	Plug-in HTTPx XML configuration JMX/TCL	Plug-in HTTPx XML configuration JMX/TCL	Plug-in HTTPx XML configuration JMX/TCL



## Choosing the “right” version

- Question: “Which WebSphere Application Server version should I migrate to?”
- Answer: “It depends”
  - ▶ End of Service date for your current version
    - For example WebSphere Application Server v5.1 is September 2008
  - ▶ End of Service date for the targeted version
  - ▶ Stability in lifecycle of targeted version
  - ▶ J2EE/JDK levels relative to targeted version
  - ▶ New WebSphere Application Server features you want
  - ▶ Version requirements of vendor or other WebSphere products that you have or want
  - ▶ The Version your Enterprise has committed towards
  - ▶ What about fixpack level? – do what makes the most sense...

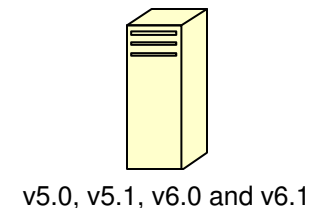
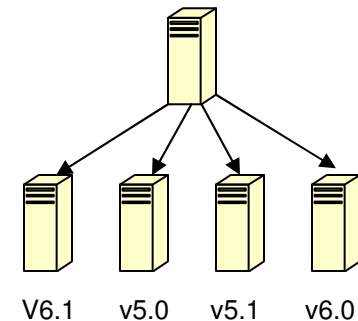
## Section

# Runtime migration support



# Tools and techniques

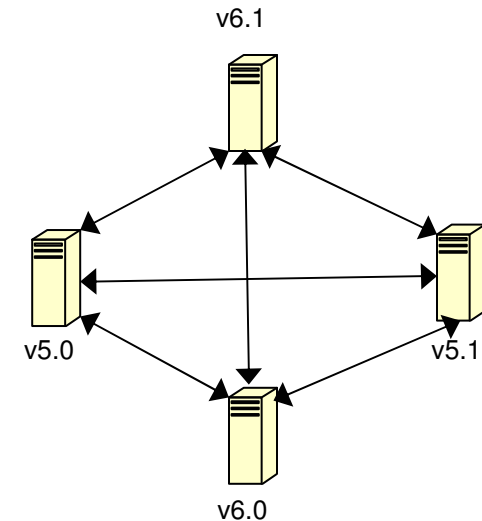
- Cross version plug-in support
  - ▶ Web Server plug-in can work to multiple WebSphere versions
    - The URI for a machine must be unique in the routing rules for the plug-in
    - E.g. v6.1 supports v5.0, v5.1, v6.0 and v6.1
- Coexistence
  - ▶ Running different versions of WebSphere on a machine at the same time
    - Requires port conflict resolution of concurrently running servers
    - Requires hardware capable of running all images
    - E.g. v6.1 supports v5.0, v5.1, v6.0 and v6.1



# Tools and techniques...

## ■ Interoperability

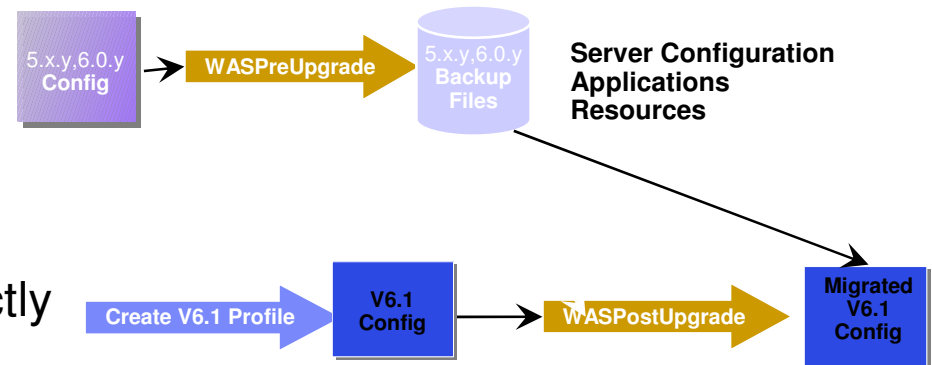
- ▶ Different versions of WebSphere can communicate
  - Support for applications that are Secure, Transactional, EJB WLMable
  - E.g. v6.1 supports v5.0, v5.1, v6.0 and v6.1



## ■ Runtime migration tools

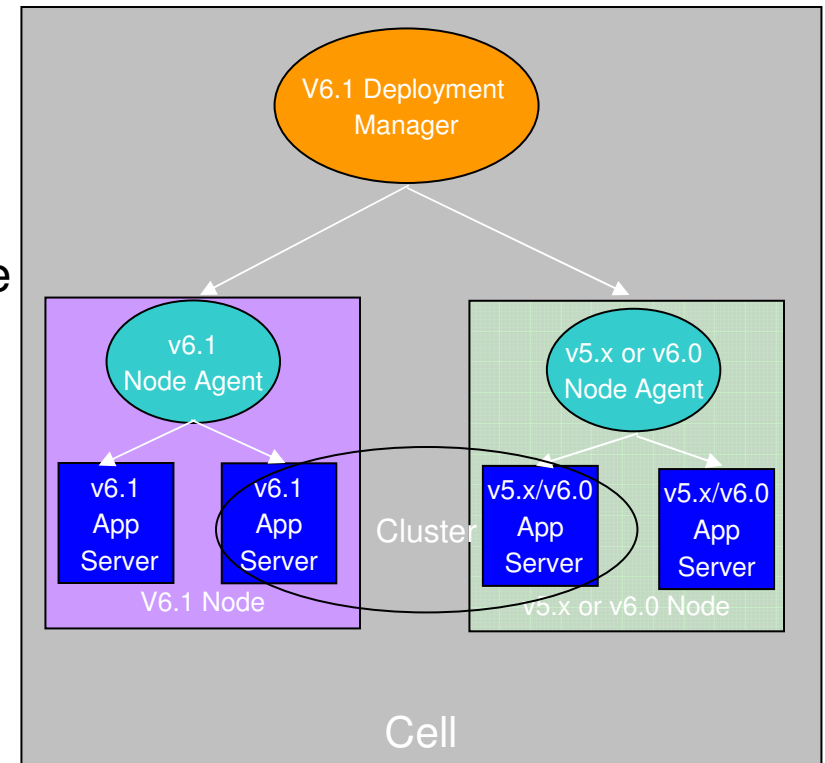
- ▶ Copy existing configurations between versions

- zOS Customization or zMMT – create customized jobs
- iSeries
  - Use commands directly
- Distributed –
  - Migration Wizard
  - Or use commands directly



# Tools and techniques...

- v6.1 Mixed cell support
  - ▶ Nodes at different versions are supported in the same cell.
  - ▶ Different OS platforms are supported in the same cell
  - ▶ Deployment Manager must always be at highest version and PTF level.
  - ▶ Must use Runtime migration tools to create mixed version cell for v5.0 and v5.1 nodes
  - ▶ v6.0.2.x nodes can be added directly
  - ▶ Supports v5.0, v5.1, v6.0 and v6.1
  - ▶ Some limitations exist
    - Cannot add v5.x nodes directly
    - Cannot use some re-deployment when installing applications

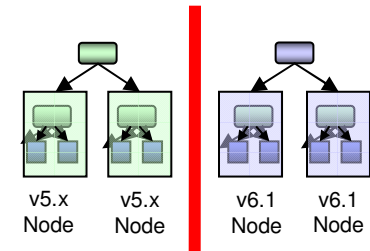




# Three Network Deployment strategies

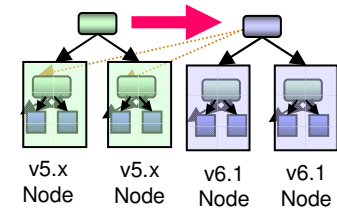
## 1. Manual

- ▶ Ignores the existing configuration
- ▶ Create a new cell and populate with administration scripts or manually



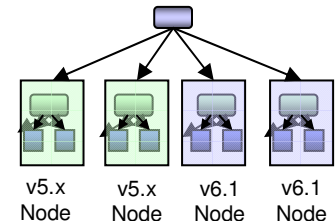
## 2. Automated with whole node upgrade

- ▶ Recreates the **exact** v5.x/v6.0 configuration in v6.1
- ▶ All applications on managed nodes are migrated at the same time



## 3. Automated with mixed version utilization

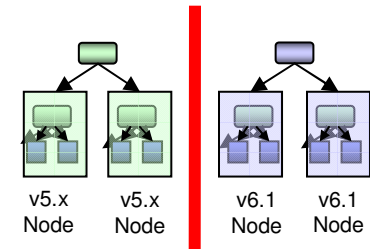
- ▶ Recreates the **exact** v5.x/v6.0 configuration in v6.1
- ▶ Add v6.1 nodes to the cell
- ▶ Applications can be moved incrementally



More details on these...

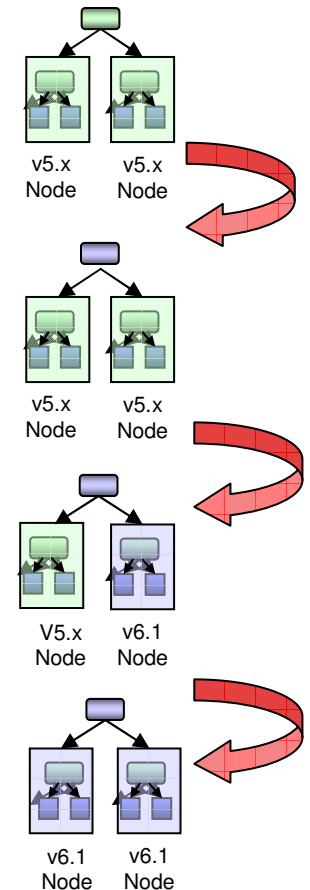
# Manual

- Ignores the existing configuration
- Create a new cell and populate with administration scripts or manually
- Best results with a comprehensive set of scripts
- 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
  - ▶ Any tuning of the old configuration is not carried forward



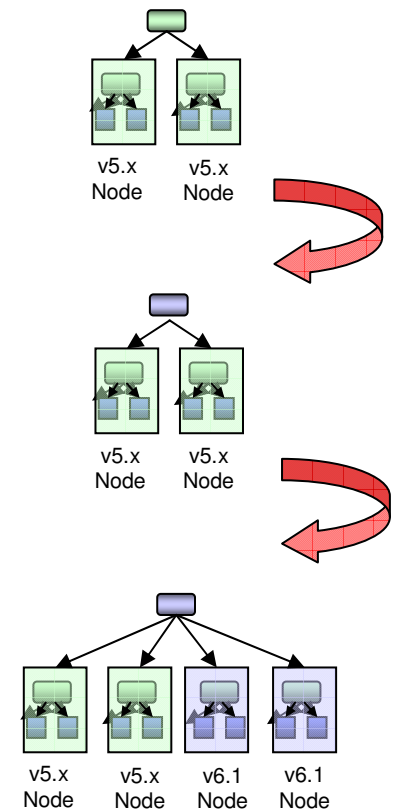
# Automated with whole node upgrade

- Use Runtime migration tools on DMgr
  - ▶ Recreates the **exact** v5.x/v6.0 configuration in v6.1
- Later migrate the existing v5.x/v6.0 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
  - ▶ Does not enable some upgraded features



# Automated with mixed version utilization

- Use Runtime migration tools on DMgr
  - ▶ Recreates the **exact** v5.x/v6.0 configuration in v6.1
- Add new v6.1 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 level accessible by v6.1 nodes
- Cons
  - ▶ Dependency on using the runtime migration tools
  - ▶ Limited value if you are refactoring your topology
  - ▶ Does not enable some upgraded features



## Section

# Version specific Highlights



## Moving to v6.1 highlights

- Unique to v6.1
  - ▶ Development tool overview
  - ▶ WebSphere removed features
  - ▶ JDK 5 impacts
  - ▶ Administration script required changes
  - ▶ Migration and Feature Packs
- Common to v6.0 and v6.1
  - ▶ Development tool overview
  - ▶ J2EE 1.4 impacts
  - ▶ V6.0 WebSphere API migration details
  - ▶ Administration script required changes
  - ▶ Profiles
  - ▶ Port usage
  - ▶ CoreGroup considerations

# Migration and Feature Packs

- **Some restrictions exist with Feature Pack usage**
  - ▶ Cannot migrate to any v6.1.x profile that has been augmented for any v6.1 feature pack
  - ▶ Can only augment a new v6.1.x standalone server or custom profile
- **Deployment Manager profiles**
  1. Migrate a v5.x or v6.0.x deployment manager to a v6.1.x deployment manager profile
  2. Migrate all the federated nodes to v6.1
  3. Augment the v6.1.x deployment manager profile with the Feature Pack that you want to use
- **Standalone server or custom profiles**
  - ▶ Can either Migrate or augment for Feature Pack usage but cannot do both
  - ▶ Alternatives if you want both:
    - Migrate as you normally would
    - Add a new cell specifically for Feature Packs
    - Add a new node in an existing cell for Feature Packs

# Enablement

- This information and more is now available online!
- Includes general planning with detailed notes and WebSphere AppServer version specific information
- Updated with timely information
- IBM Migration Knowledge collection
  - ▶ <http://www-1.ibm.com/support/docview.wss?rs=180&uid=swg27008724>

The screenshot shows a Mozilla browser window displaying the IBM Knowledge Collection page for 'Migration planning for WebSphere Application Server'. The page has a dark blue header with the IBM logo and navigation links. The main content area is divided into several sections:

- Product documentation**: Includes an abstract, content links (Overview, Education and Tutorials, Forums and Blogs, APARs and Fixes, Change history), and an overview section.
- Document information**: Lists product categories (Software, Application Servers, Distributed Application & Web Servers, WebSphere Application Server, Migration), operating systems (AIX, HP-UX, Linux, OS/400, Solaris, Windows, i5/OS, z/OS), software version (4.0, 5.0, 5.1, 6.0, 6.1), software edition (Base, Express, Network Deployment), reference number (7008724), IBM Group (Software Group), and modified date (2007-01-30).
- Related software**: Lists WebSphere Application Server for iSeries, WebSphere ESB, and WebSphere MQ.

The page also features a sidebar with links to various resources like 'Compare editions', 'Features and benefits', 'System requirements', 'Library', 'Success stories', 'News', 'Trials and demos', 'How to buy', 'Events', 'Training and certification', 'Services', and 'Support'.



# Summary

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

# Additional WebSphere Product Resources

- Discover the latest trends in WebSphere Technology and implementation, participate in technically-focused briefings, webcasts and podcasts at:  
<http://www.ibm.com/developerworks/websphere/community/>
- Learn about other upcoming webcasts, conferences and events:  
[http://www.ibm.com/software/websphere/events\\_1.html](http://www.ibm.com/software/websphere/events_1.html)
- Join the Global WebSphere User Group Community: <http://www.websphere.org>
- Access key product show-me demos and tutorials by visiting IBM Education Assistant:  
<http://www.ibm.com/software/info/education/assistant>
- View a Flash replay with step-by-step instructions for using the Electronic Service Request (ESR) tool for submitting problems electronically:  
<http://www.ibm.com/software/websphere/support/d2w.html>
- Sign up to receive weekly technical My support emails:  
<http://www.ibm.com/software/support/einfo.html>



# Questions and Answers

