WebSphere Expert Call Series
WebSphere Application Server V7.0 Migration Best Practices – Part 1

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Agenda

- Identify your goals
- Planning
- Case studies
- Migration map
- Summary

Identify your goals

- Why migrate?
  - Define goals (i.e., why do we need to migrate)
  - Understand the important details
  - Examine your timeframe and budget
  - Identify wanted and needed changes in your environment
- Some reasons to migrate:
  - Move to current release (i.e., a supported version)
  - Leverage new features, improvements in tools, improve performance, etc.
  - Reconfigure to adapt for growth or changing needs
  - Satisfy requirements of new applications
  - Move to new hardware
- Identify goals early to create a solid foundation for a successful migration

Planning

- A migration is a project
- Identify important details
- Create assessment questionnaire
- Implement best practices
- Address skill gaps
- Review benchmark performance of products, if available
- Leverage incremental improvement strategy
- Identify relevant IBM documents
- Avoid known issues

Planning: A migration is a project

- A migration is a project and should be treated as such:
  - Assign a migration team team or at least a migration lead
  - All tasks should go through and be reviewed by this team
- Create a project plan with clearly stated goals
- Include all tasks, requirements and a timeline
- Organize regular team meetings that include representatives of all necessary areas (e.g., development, operations, management)
- Include your IBM AVP team and IBM WebSphere representative. They can provide:
  - Information on software
  - Suggestions based on real life experiences
  - Best practices
  - Training and education

Planning: Identify important details

- Assess your overall configuration and each applications
  - Hardware requirements
  - Software requirements (e.g., co-requisites and prerequisites)
  - Changes to load (e.g., increase in user base)
  - Topology
  - Application architecture
  - Environment availability
  - Testing practices
- Identify gaps between current and planned environments
- Identify gaps between planned environment and goals for planned use

Planning: Create assessment questionnaire

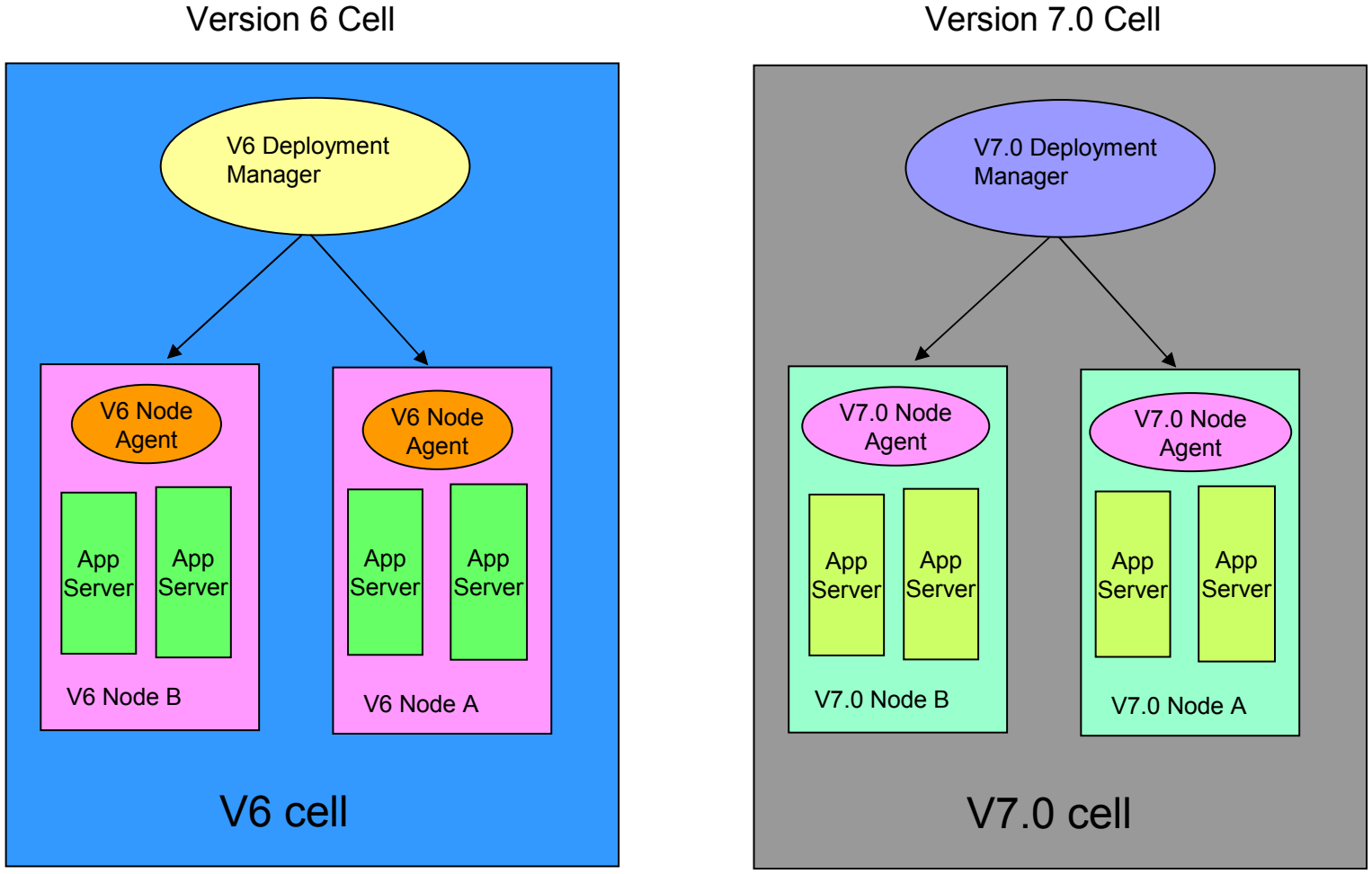
- Create an Assessment Questionnaire
  - Capture information about applications
- Use new WebSphere Application Server V7.0 deploy wizard feature: “Show all”
  - Prompts you for all information needed in a deploy
  - These are questions to include in your Assessment Questionnaire
- Build a plan that includes the results from each Assessment Questionnaire
- Advice for Project Assessment:
  - Identify challenges and known issues in your current environment
  - Leverage new and existing features in your new environment. In addition to addressing any past issues such stability, best practices, and processes including inefficiencies:
    - This is a good time to increase use of automation, such as jython and wsadmin
    - This is also a good time to consider implementing High Availability

Planning: Implement best practices

- Basic migration options:
  - Build from scratch (best practice)
    - Engage an architect to assist with migration, if possible
    - Keep old configuration intact and build new configuration in new OS
  - Mixed cell
    - Migrate V6 node into V7.0 cell
    - Use migration tooling to copy applications and profiles from old to new in same OS
  - Migrate in place, change a V6 cell into a V7.0 cell
    - Migrate V6 node into V7.0 cell (i.e., shared configuration with V7.0 node manager)
    - Use migration tooling to copy applications from V6 cell to V7.0 cell within one config
- Benefits of using best practices:
  - Save time reading and repeating steps
  - Reduce risk of unusable configuration and unplanned downtime

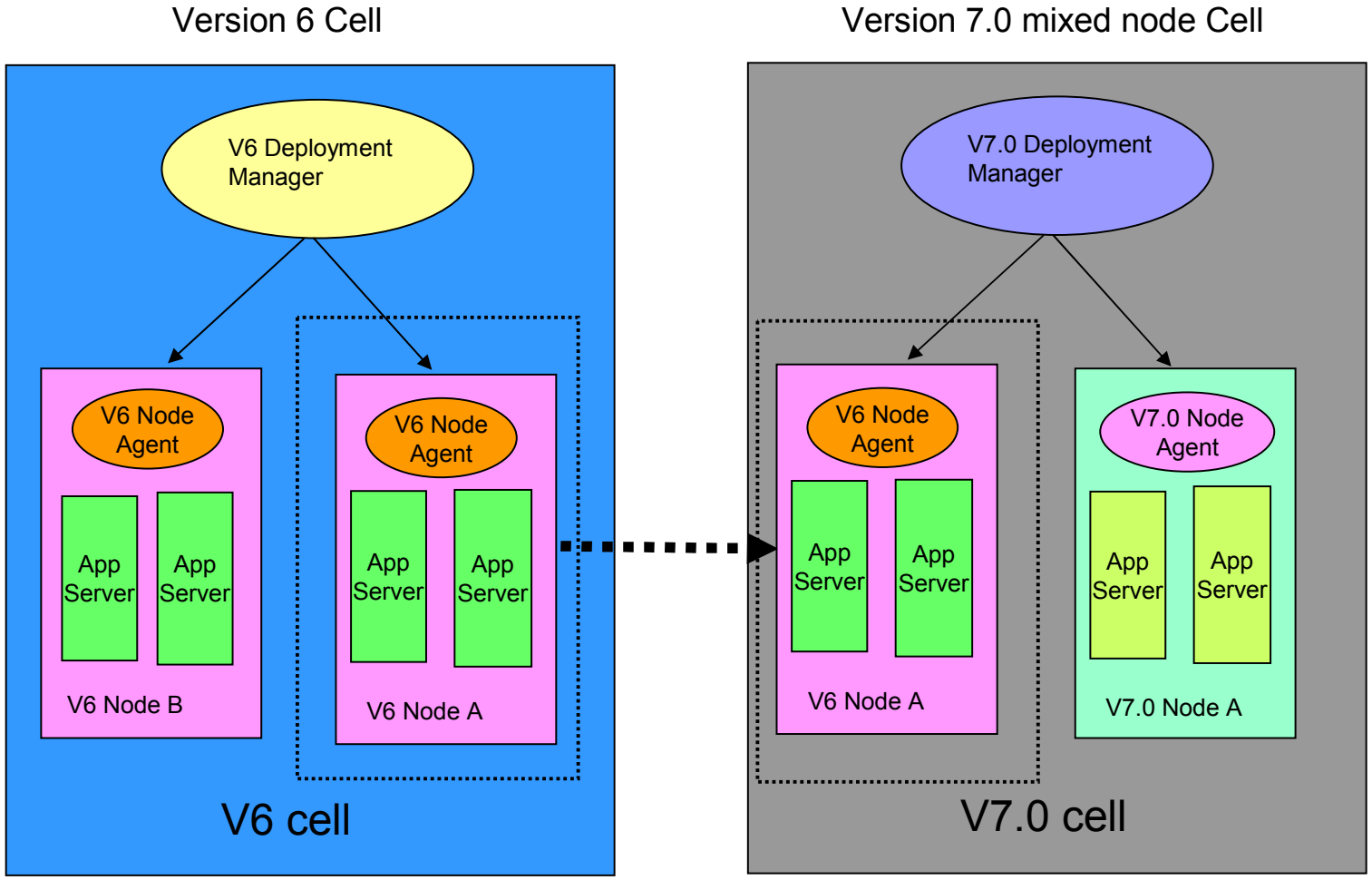
Planning: Best practices - Migrate from Scratch

New environment is built from scratch.
No settings or parameters are passed over to new environment.



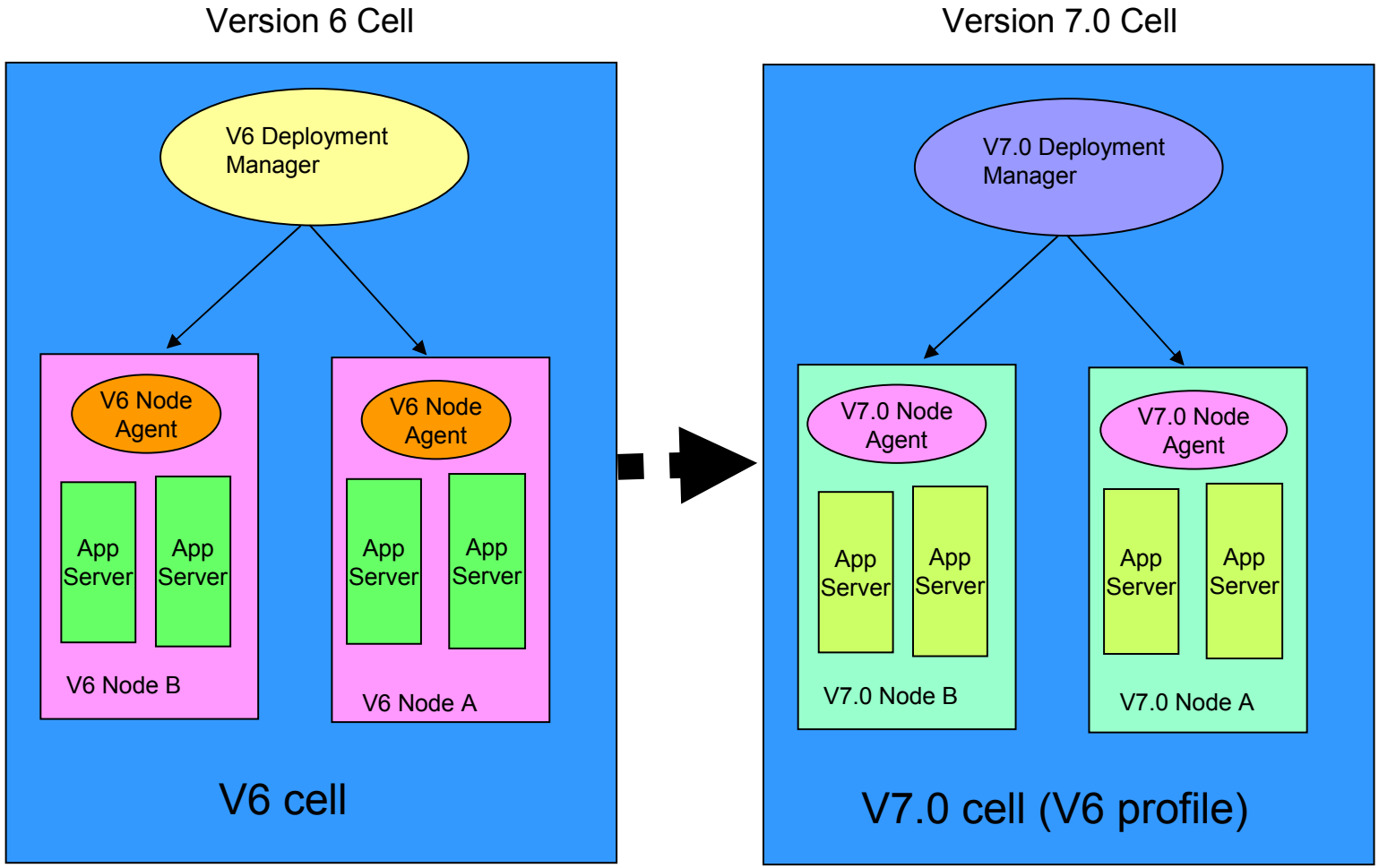
Planning: best practices - Mixed Cell Migration

Federate a node of the old environment into the node of new environment, creating a mixed node cell. This is an intermediate step.



Planning: best practices - Migrate In Place

V6 cell is upgraded to V7.0 in place, using V6 profiles.
Migration is completed with runtime migration tools.



Planning: Implement best practices

Process	Pros	Cons
Build from scratch	• No dependencies on tooling • Least risk of computability issues • Can easily migrate applications one at a time	• Any tuning of old environment is not carried over • Manual process (unless scripts are utilized)
Mixed cell	• All configuration information is carried forward • Does not require comprehensive set of scripts • Cell is accessible by V6.1 nodes	• Dependency on runtime migration tools • Does not enable some upgraded features. Features can be enabled once migration is complete • Limited value when refactoring topology • Defaults may change
Migrate in place	• All configuration information is carried forward • Does not require a comprehensive set of scripts	• Dependency on runtime migration tools • Requires all applications be migration ready • Limited value when refactoring topology • Does not enable some upgraded features. Features can be enabled once migration is complete • Defaults may change

Planning: Leverage incremental improvement strategy

- Improve your automation when managing a configuration
  - Scripting:
    - If you currently use the admin console to manage production, invest in using scripting:
      - Scripts eliminate mistakes because they can be tested, then reused
      - Scripts save time and help maintain a record of actions taken
    - Suggested scripting practice:
      - Use admin console in test environment
      - Turn on “capture commands” to record steps that can be automated
    - Write jython scripts that invoke wsadmin
    - Test scripts in your pre-production/staging environment, then reuse in production
  - Simplified configuration management using property files in V7.0:
    - New AdminTask tool enables save (export) and update (import) of key configuration elements using property files
    - Make several related changes to a human-readable property file (e.g., update JDBC driver settings) and update with one command
    - Fewer steps than writing jython script to execute multiple wsadmin commands for each setting

Planning: Leverage incremental improvement strategy

- Change your use of High Availability features:
  - Have your availability requirements changed?
  - Carry out a topology Assessment:
    - Downtime tolerated
    - Failover requirements
    - Clustering
    - Replication domains
  - Manage Core Groups:
    - Requirement for at least one Node Agent and DMgr in a core group is removed in V7.0
    - Place all members in the same cluster in the same core group
  - Core group size limit increases:
    - Maximum of 50 for V6.0
    - Maximum of 100 for V6.1 and V7.0

Planning: Identify relevant IBM documents

- Prerequisite V7.0 concepts:
  http://www.redbooks.ibm.com/redpieces/abstracts/sg247708.html?Open
- Migration topics in V7.0 Information Center (official product documentation):
  - Distributed:
    http://publib.boulder.ibm.com/infocenter/wasinfo/v7r0/index.jsp?topic=/com.ibm.websphere.base.doc/info/aes/ae/welc6topmigrating.html
  - z/OS:
    http://publib.boulder.ibm.com/infocenter/wasinfo/v7r0/index.jsp?topic=/com.ibm.websphere.zseries.doc/info/zseries/ae/welc6topmigrating.html
- Migration redpiece (100 pages of best advice from development):
  http://www.redbooks.ibm.com/abstracts/redp4635.html?Open
- IBM Education Center (z/OS presentation with audio):
  http://publib.boulder.ibm.com/infocenter/ieduasst/v1r1m0/index.jsp
- Migration tooling:
  http://www.ibm.com/developerworks/websphere/downloads/migration_toolkit.html
- Latest V7.0 migration news and technotes (knowledge collection):
  http://www.ibm.com/support/docview.wss?uid=swg27013842

Planning: Avoid known issues

- WebSphere Application Server V7.0 64 bit performance improved:
  - For many applications, V7.0 will perform better than V6.1
  - Performance testing and heap usage analysis is required
  - More detail: http://www.ibm.com/software/webservers/appserv/was/performance.html
  - Java Health Center with ISA 4.1 http://www.ibm.com/software/support/isa/
- Changes to packaging of JDBC drivers:
  - Not all drivers are packaged with WebSphere Application Server V7.0
  - System Requirements identifies download sites: http://www.ibm.com/support/docview.wss?uid=swg27012414
  - System requirements include pointer to details in information center
- More ports used:
  - More application ports used in V6.1/V7.0 compared to V6.0
  - More detail in information center: http://publib.boulder.ibm.com/infocenter/wasinfo/v7r0/topic/com.ibm.websphere.migration.nd.doc/info/ae/ae/rmig_portnumber.html

Planning: Avoid known issues (continued)

- Security default changes:
  - LTPA V1 disabled by default
  - WebSeal TAI interceptor deprecated
  - Cipher strength changes
- Migrating when feature packs are installed increase complexity:
  - Some features in V6 and V6.1 are now part of V7, while other remain feature packs
  - V6 configuration issue with any feature pack corrected in V7
- WSAdmin changes:
  - JACL no longer deprecated, recognizing significant investment of some clients
  - Some WebSphere Application Server objects used in jython scripts have changed

Planning: Avoid known issues (continued)

- Behavior changes between WebSphere MQ V6 and V7.0:
  - Among several WebSphere MQ V7 changes, a new JMS data conversion behavior deployed in WebSphere MQ V7 that may cause failures
  - APAR IC72897 opened to provide fix that restores the V6 data conversion behavior
- Behavior changes between older versions of DB2 and V9.5/V9.7:
  - Locking timeout turned off by default
  - More detail in information center: http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/topic/com.ibm.db2.luw.admin.perf.doc/doc/c0021311.html

Case study 1: Large healthcare provider

- Background on an easy migration:
  - Migrated multiple IBM products simultaneously (Application Server, MQ and DB2)
  - Skipped versions (Migrated from V6 to V7.0)
  - Installed on new hardware
  - Only minor application changes
  - IBM Services engaged during architecture and planning
  - AVP not engaged until solution was in production
- Issues:
  - DB2 behavior change in new V9.5 resulted in locking problems
    - DB2 code disabled lock timeout, so locks occurred w/no errors logged
    - To resolve, client changed configuration
  - WebSphere MQ behavior changes in V7.0 triggered “Listener errors”
    - Clients received error messages, but no errors logged
    - Problem not seen until code in production due to inadequate performance testing
    - Config change to disable V7.0 behavior resolved issue
  - AIX issues required fix pack updates and interim fixes (APARs)

Case study 1: Large healthcare provider (continued)

- Best practices used:
  - Built new production environment from scratch:
    - Built a test environment that mirrors production
    - Tested early and often
  - Leveraged experience of IBM Services
  - When possible, limited scope of changes:
    - Limited changes to applications because IBM software versions changed
    - Did not change everything at once
  - Wrote scripts to automate deploy:
    - Tested scripts then reuse in production to avoid mistakes and reduce complexity
- Lessons learned:
  - Research co-requisites and prerequisites for all software during planning
  - Testing needs to include performance testing:
    - Even if there are no new functions or additional users, performance testing is needed
    - Performance testing needs to simulate real-world use

Case study 2: Large retail client

- Background on a difficult migration:
  - Migrated complex IBM software stack, including WebSphere Application Server
  - Skipping versions (migrating from V6 to V7.0)
  - Installing on new hardware
  - Upgrading client applications
  - Used IBM Services for some of the work
  - AVP was engaged prior to deploy, but after planning
- Issues:
  - Complexity of changes caused compressed test schedule:
    - Limited and late user acceptance and performance testing
  - Test environment was significantly smaller than production (not representative)
  - No planning for changes to IBM software caused delays:
    - For example, deprecated APIs, changes to behavior, leveraging new features
  - No agreement on project management strategy between client and vendors:
    - Difficult to raise and address issues
    - Challenges adjusting plans to mitigate risk

Case study 2: Large retail client (continued)

- Best practices used:
  - Built new production environment from scratch (best practice):
    - Did not use migration software
- Lessons Learned:
  - Build a test environment that mirrors production
  - Deploy changes incrementally:
    - Separate application changes from upgrading versions of IBM software
    - Test after every incremental change (e.g., performance and user acceptance)
  - Research changes to IBM software and add to project plan:
    - Leverage new features to improve overall solution
    - Plan for removing deprecated functions
  - When leveraging IBM Services:
    - Agree on project plan up front
    - Plan for addressing issues/changes and steps to mitigate risk

Migration Map

- Migration level of effort
- Migration dependencies
- Mixed Version Support
- Port Usage

Migration Map: Migration level of effort

Administration Impacts

From\To	3.02	3.5	4.0	5.0	5.1	6.0	6.1	7.0
6.1								Easier
6.0							Easier	Easier
5.1						Easier	Easier	Easier
5.0*					Easier	Easier	Easier	Easier
4.0				Difficult	Difficult	Difficult	Difficult	Difficult
3.5			Easier	Easier	Difficult	Difficult	Difficult	Difficult
3.02		Easier	Easier	Difficult	Difficult	Difficult	Difficult	Difficult
2.03	Difficult	Difficult	Difficult	Difficult	Difficult	Difficult	Difficult	Difficult

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 between V6.0, V6.1 and V7.0

Migration tooling and support differs between Distributed, System i and System z platforms:
- Improvement starting in V5.0, with same underlying migration tooling, support and experiences

Development Impact notes:
"*" Does require a change to use different Development IDE
"z" Scenarios are difficult for this row, "easier" for all other platforms

Development Impacts

From\To	3.02	3.5	4.0*	5.0	5.1	6.0*	6.1*	7.0*
6.1								Easier
6.0							Easier	Easier
5.1						Easier	Easier	Easier
5.0					Easier	Easier	Easier	Easier
4.0_z				Varies	Varies	Varies	Varies	Varies
3.5			Difficult	Difficult	Difficult	Difficult	Difficult	Difficult
3.02		Easier	Difficult	Difficult	Difficult	Difficult	Difficult	Difficult
2.03	Difficult	Difficult	Difficult	Difficult	Difficult	Difficult	Difficult	Difficult

Migration tools available to migrate from V5.1, V6.0, and V6.1, to version V7.0

Migration Map: Migration dependencies

	V3.5	V4.0	V5.x	V6.0	V6.1	V7.0
Development	VisualAge for JAVA WebSphere eStudio "Classic"	WebSphere Studio 5.0	WebSphere Studio 5.1	Rational Application Developer V6.0	Rational Application Developer V7.0	Rational Application Developer V7.5
Code	Pre – J2EE JRE 1.2	J2EE 1.2 JRE 1.3	J2EE 1.3 JRE 1.3 (V5.0) JRE 1.4 (V5.1)	J2EE 1.4 JRE 1.4	J2EE 1.4 JRE 5	JEE 5 JRE 6
Packaging And Deployment	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	JEE packaging EAR/BLA deploy Configuration In the EAR
Admin And Operations	Plug-in OSE Admin. 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	Plug-in HTTPx XML configuration JMX/TCL

Migration Map: Mixed Version Support

Category	Supported actions	V7.0
Adding new node	V6.0.2.x and later node	Yes
	v5.1 node	No
Adding new server	V6.x servers in a v7.0 node for v6.0.2.x and later	Yes
	v5.1 servers in a v5.1 node	Yes
Adding new cluster member	v5.1 server in a v5.1-only cluster	Yes
	v5.1 server in a v7.0-only cluster	Yes
	V7.0 server in a pre-v7.0-only cluster	Yes
	V5.1 server in mixed (v5.1 and v7.0) cluster	Yes
	V7.0 server in mixed (v5.1 and v7.0) cluster	Yes

Migration Map: Port Usage

- V7.0 uses more ports than some previous versions
  - Can be an impact to those that tightly control port access
  - Can also cause more port conflicts
  - For specific port numbers, see information center: http://publib.boulder.ibm.com/infocenter/wasinfo/v7r0/index.jsp?topic=/com.ibm.websphere.migration.base.doc/info/aes/ae/rmig_portnumber.html

Server Type	V4.0	V5.x	V6.0	V6.1	V7.0
Application	8	16	19	21	21
DMgr	n/a	11	17	17	11
Node Agent	n/a	9	11	10	11

Migration Map Summary

- Assess migration level of effort for development and administrators
- Identify migration dependencies:
  - Example: JRE 6 is supported in WebSphere Application Server V7.0
- Use for mixed version support when adding a node from V5.1 to V7.0 is not supported
  - Example: Cannot include V5.1 node in V7.0 repository
- Port usage changes from version to version:
  - Example: WebSphere Application Server V7.0 uses more ports than V5.1

Additional WebSphere Product Resources

- Learn about upcoming WebSphere Support Technical Exchange webcasts, and access previously recorded presentations: http://www.ibm.com/software/websphere/support/supp_tech.html
- Discover the latest trends in WebSphere technology and implementation:
  - Participate in technically-focused briefings, webcasts and podcasts: http://www.ibm.com/developerworks/websphere/community/
- Join the Global WebSphere Community: http://www.websphereusergroup.org
- Access key product “show-me” demos and tutorials in IBM Education Assistant: http://www.ibm.com/software/info/education/assistant
- View webcast with step-by-step instructions for using Service Request (SR) to submit PMRs electronically: http://www.ibm.com/software/websphere/support/d2w.html
- Sign up to receive technical My Notifications emails (configurable for daily, weekly, etc.): http://www.ibm.com/software/support/einfo.html

Summary

- There is no such thing as a standard migration, each one is unique and there is “no one size fits all” approach!
- Take the time to:
  - Clearly identify goals of migration
  - Do an assessment of current environment
  - Identify skills gaps
  - Assign a project leader
- Plan for the new environment to be better than the last
- The more time you spend defining goals, completing an assessment questionaire and planning, the less time you will spend in implementation

Questions and Answers

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Feedback

We Want to Hear From You!

Please send your feed back and follow up questions to:
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