




Business Process Management (BPM) Version To Version (V2V) Migration: An Overview

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Agenda

- **Why Migrate your BPM (WPS) Environment?** 
- To Which Version?
- Version-to-Version (V2V) Migration
- Migration Patterns: An Overview
- A Customer's Success Story
- Essential Steps for Successful Migration

Why Migrate?

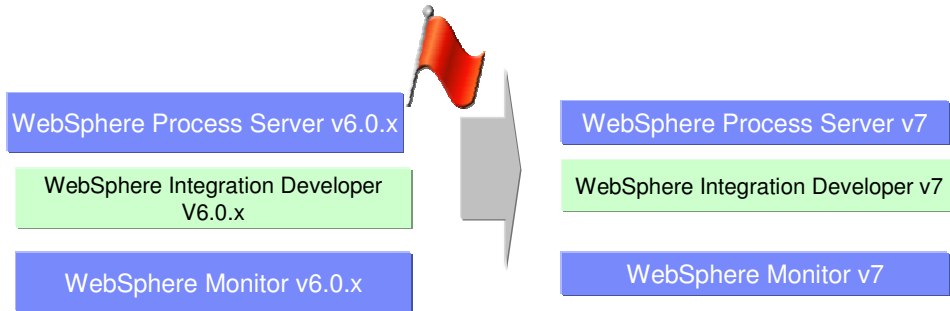
- End of Support
 - The official EOS dates are posted at <http://www-01.ibm.com/software/websphere/support/lifecycle/>
- Hardware/OS change
 - More horsepower
 - More suitable O/S
- Movement from 32-bit to 64-bit
 - More heap space for business data
- Topology Change
 - Better load handling, high availability
- New functionalities
 - Can be exploited by applications
 - ...
- Newer middleware
 - Better performance
 - Improved runtime
 - Latest specification (SCA, JEE) compliance
 - More recent focus on serviceability
 - ...

Besides EOS both improved 'runtime' and 'artifact (code)' handling are considerations to move to more recent versions

Some may change their BPM topologies from silver to gold or from gold to multiple gold.


MIGRATE, Migrate, migrate, -- Upcoming Deadline

V6.0.x out of service Sept 2010



EOS may be a big determining factor in some environments.

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Which Version?

- BPM 7 is strongly **recommended**
 - Wealth of new and improved features
 - Better performing and more stable middleware
 - Ready to take advantage of latest specifications and technologies

Migration is a planned activity. Migration is often disruptive to existing business. You may not want to go through the migration exercise that often. There is no reason to go from BPM 6.0 to BPM 6.2 and then again to BPM 7. You are strongly encouraged to migrate to BPM 7.

Use of BPM 7 may result in receiving better quality service from IBM – more service focus on latest release

A Few Important BPM 7 Features

- Run time Improvement
 - Based on WebSphere 7
 - Java 6
 - **Native SCA Container**
 - Better performance
 - Improved Serviceability
 - Cross Component Trace (XCT)
 - Simpler Install
 - More Comprehensive Migration Tool
 - ...
- New Features
 - Process Instance Migration
 - **Advanced Human tasks**
 - **Improved Business Space support**
 - Integration with ILog, Cognos
 - ...
- Improved Development Support
 - Logging and Tracing for WID
 - ...
- Significantly Improved
 - **WebSphere Business Monitor**
 - Functionality, usability and performance
 - WebSphere Registry and Repository
 - Functionality, usability and improved integration with WPS/WESB/WiD

For SCA, no more wrapping around EJB. This also generates shorter and perhaps easier to understand exception and warning messages

New features can be exploited by application developers.

Refer to

http://publib.boulder.ibm.com/infocenter/dmndhelp/v7r0mx/topic/com.ibm.websphere.bpc.doc/doc/bpc/cprocversioning_migration.html and

<http://publib.boulder.ibm.com/infocenter/dmndhelp/v7r0mx/topic/com.ibm.wbit.help.bpel.doc/topics/cversion.html>

for process instance migration


BPM V7 Improvements



Role	7.0 Improvements	7.0 Features Added	Products delivering
Business Leader	<ul style="list-style-type: none"> i. Easier access to participation ii. Broader set of techniques to capture business intent iii. more content to expedite modeling 	<ul style="list-style-type: none"> i. Web based tool ii. Collaboration, Service, Strategy and Capability editors iii. Industry capability and process maps 	<ul style="list-style-type: none"> i. Compass ii. Compass iii. Industry Content Packs (ICP)
Process Owner and Business Analyst	<ul style="list-style-type: none"> i. More support to capture processes that require less downstream refinement ii. Faster turnaround on interactive process design iii. More content to expedite process modeling iv. Improved collaboration and team support means better quality process models 	<ul style="list-style-type: none"> i. More BPMN shapes (eg.. Compensation) ii. Classic Native SCA Container iii. Industry processes, service definitions and KPIs iv. "Review Space" and "Design Space" and Process walk-through 	<ul style="list-style-type: none"> i. Modeler ii. WPS iii. ICP iv. Compass
IT Architect and IT Developer	<ul style="list-style-type: none"> i. Reduce user-interface development costs – less custom code ii. Improved build performance iii. Simplified capture of human-centric flows iv. More techniques to capture infrastructure logic v. Less coding to integrate with EJBs vi. Ability to migration instances to new versions without coding vii. Faster solution development 	<ul style="list-style-type: none"> i. More business space widgets delivered for key patterns ii. Classic Native SCA Container iii. Parallel routing support iv. New mediation primitives v. EJB Binding vi. Process Instance Migration vii. Industry services and common components 	<ul style="list-style-type: none"> i. All ii. WPS, WID iii. WPS, WID iv. WESB, WID v. WPS, WID vi. WPS vii. ICP
IT Operations and Administration	<ul style="list-style-type: none"> i. Less migration planning time and migration execution time ii. Simplified product install iii. Faster setup for departmental configurations iv. Faster configuration for multi-product production environments v. Lower cost of applying database standards to BPM schemas vi. Easier Service Monitoring vii. Faster recovery from 'service down' viii. Faster configuration of BAM 	<ul style="list-style-type: none"> i. Enhanced migration framework, tools and documentation ii. Unified install across tools and runtimes iii. Single cluster topology iv. BPM topology creation wizard and template v. DbDesign generator vi. Service Monitoring Widgets vii. Store and Forward viii. Security and Alphablox config improvements 	<ul style="list-style-type: none"> i. All ii. All iii. WPS iv. All v. All vi. WPS vii. WPS viii. Monitor
Business User	<ul style="list-style-type: none"> i. More consistent user interface ii. Work management to better match work patterns 	<ul style="list-style-type: none"> i. More business space widgets ii. Escalations List and Processes List widget 	<ul style="list-style-type: none"> i. All ii. WPS iii. WPS

A complete listing of major BPM 7 improvements.

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Version To Version (V2V) Migration

Everybody should have a fair set of expectations

1. There's **not just one** set of instructions for V2V migration
2. V2V migration requires additional focus and skill
3. V2V migration can **not** be started and completed in a week.
4. BPM (WPS) V2V migration is **not** exactly like WAS V2V migration, just with a few extra applications

There's not just one set of instructions for V2V migration - You must choose the migration pattern that best suits your company's requirements.

V2V migration requires additional focus and skill – There can be many moving parts. Not only must you be aware of what things might be changing between versions like JDK versions, but you also must have the knowledge and skill to execute the runtime migration tooling.

V2V migration can NOT be started and completed in a week – Planning for a V2V migration should start months before the migration will actually occur. Acquiring skills and resources may take some time. Testing may take several weeks. After an environment that looks exactly like the production environment has been successfully migrated and applications run cleanly (including resolution of any PMRs), then the actual production migration may occur relatively quickly.

- In the case of 'Runtime Migration' (Pattern 3), the length of the downtime depends on the number of nodes, number of applications and the amount of data stored in WPS databases
- In the case of other two migration patterns (Pattern 1 or 2), a new cell is created, configured, and tested in parallel. Therefore, to get the new cell to go live, it may simply be a matter of routing the clients to the new cell.

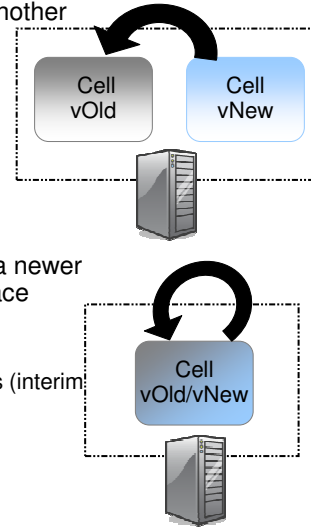
WPS V2V migration is NOT exactly like WAS V2V migration, just with a few extra applications – Several aspects of WPS V2V migration are similar to WAS V2V migration: WPS V2V migration is based on WAS V2V migration, and many WAS considerations also apply to WPS (such as change in JDK, any deprecations in WAS classes, etc.). However, there are additional key considerations that differentiate WPS migration from WAS. The most obvious of these is the stateful data (such as BPEL long running process instances). The point is, even people who are familiar with a WAS V2V migration will have additional considerations to learn.

Acronyms and Terminology

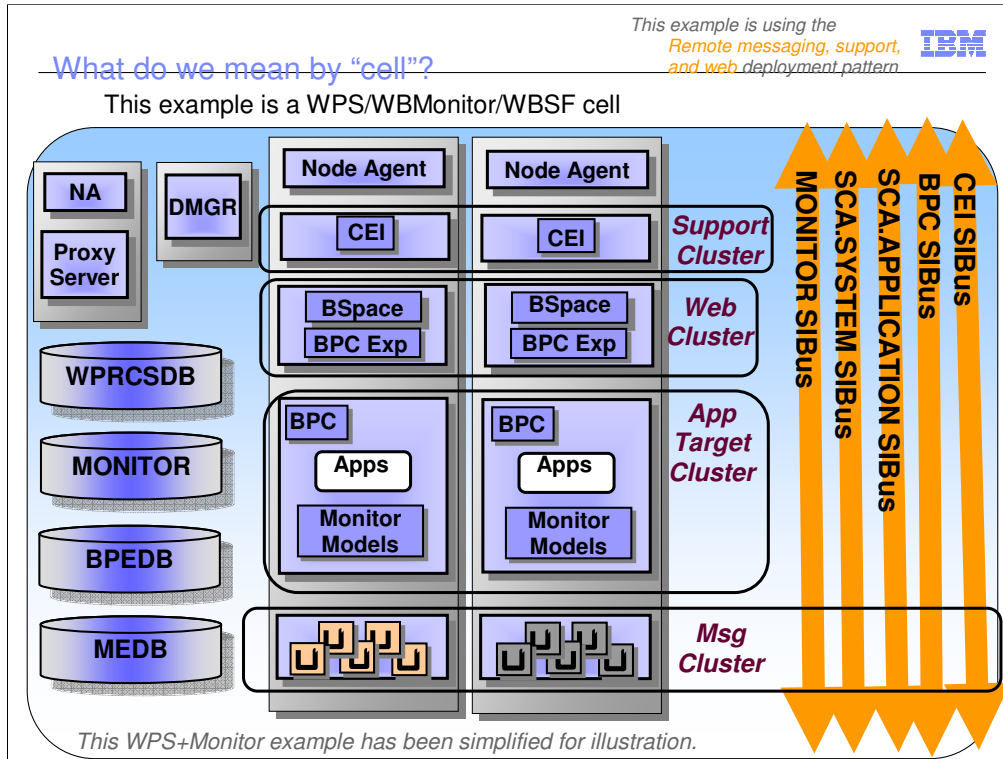
V2V	Version-to-Version
BPM	WebSphere Business Process Management
WPS	WebSphere Process Server
WID	WebSphere Integration Developer
WBMonitor	WebSphere Business Monitor
WBModeler	WebSphere Business Modeler
WBSF	WebSphere Business Services Fabric
vOld	Version of product migrating from (aka source)
vNew	Version of product migrating to (aka target)
DMGR	Deployment Manager

Migration vs. Upgrade

- **'Migration'** refers to movement of configuration settings and applications from one installation environment to another
 - Required when delivering major new features, profile updates, and enhancements
 - Applies to 1st and 2nd digit release number changes
 - Sample Versions: vOld = **6.1.x**, vNew = **6.2.x**
 - In a runtime migration, the new version must be installed side-by-side the old version of the product
- **'Upgrade'** refers to replacement of a product with a newer version of that same product (also known as 'in-place upgrade')
 - Delivers updates or fixes to the existing components
 - Applies to 3rd and 4th digit release number changes (interim fixes, refresh packs, fix packs)
 - Example: version **6.2.0.2**
 - The new version is installed on top of the existing installation of the previous release



The “migration” and “upgrade” terminology is consistent between WebSphere Application Server (WAS), WebSphere Enterprise Service Bus (WESB), WebSphere Process Server (WPS), and more of the WebSphere stack.




This is an example of a typical BPM cell.
 The “Remote messaging, support, and web) deployment pattern is a common 4-cluster WPS and WBMonitor cell.

A WPS cell will be simpler – the web cluster, the monitor database, and the monitor SIBus will not be there. Also in a WPS golden topology, the BPC Explorer can reside in the support cluster.

Note: single server environments are great for development and function test environments. However, a single server does not provide High Availability, etc.

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V2V Migration Patterns

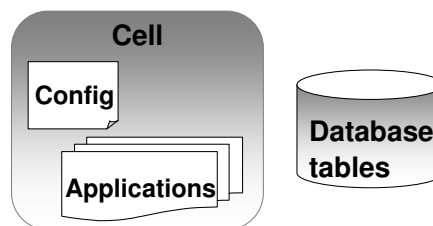
1 Manual migration
Redeploy with unmigrated artifacts

2 Artifact migration
Redeploy with migrated artifacts

3 Runtime migration
Using migration tools to migrate the runtime

*WebSphere BPM
V2V migration tools
are used for the
runtime migration pattern*

*For each pattern, take note of the
version of the binaries, configuration,
applications, and database info*



The detail here is in terms of WPS, as that is commonly the core of the BPM migration.

There are 3 common patterns for WPS V2V migration.

Each pattern has different considerations for the databases tables, your deployed artifacts/applications, and your configuration/cluster topology.

Similar terminology for the 3 patterns is utilized in the WPS v7 InfoCenter
http://publib.boulder.ibm.com/infocenter/dmndhelp/v7r0mx/topic/com.ibm.websphere.wps.doc/doc/cmig_vtv_migtypes.html

The terminology used in the InfoCenter is:

- *Manual migration (parallel production environment)*
- *Artifact migration (parallel production environment with development tool migration)*
- *Runtime migration (production environment)*

V2V Migration Pattern 1: Manual Migration

Description:

- A parallel environment
- Unmigrated artifacts (applications)
- New database tables

Steps include:

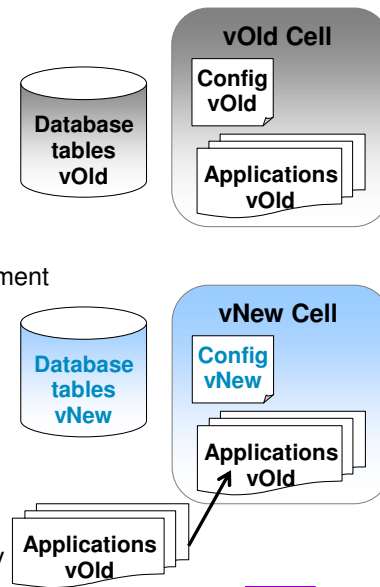
1. Install vNew product binaries
2. Create and configure vNew environment
3. Deploy vOld applications to the vNew environment

Benefits include:

- ✓ Opportunity for configuration change
- ✓ Downtime completely avoided

Costs include:

- ✗ Existing application data not utilized
- ✗ Historical monitor data not utilized
- ✗ Applications don't exploit vNew functionality



16

WebSphere software

Basic Steps

1. Install the latest version of WPS/WESB (separately from the existing installation)
 - If the original cell was configured with scripts, they can be reused in the new cell
2. Set up a new production environment
3. Manually deploy the existing applications (Enterprise apps, etc), as is, to new environment
4. Update your client applications, as needed
5. As an option, you can run both environments in parallel so that old instances finish their work in the old environment (a.k.a. 'Dry out') and new instances are started in the new environment (requires federation on the client)

Test Focus:

- Includes regression testing, binary compatibility
- Includes performance testing of new environment
- Not focused on testing runtime migration activities (no use of runtime migration tools)
- Not focused on testing utilization of new functions

Benefits

- Opportunity for config/topology changes
- If not a lot of config changes, can reuse configuration scripts
- Parallel production environment support
- Selective application migration
- No downtime
- Because this is a parallel environment, it enables extensive testing of the environment before going live

Costs

- Existing **data not moved**, new database tables used
- Stateful data from old cell not available to new cell (e.g., LRP instances)
- No exploitation of new functions
- Manual/scripted deployment of applications
- May require updates to client applications (e.g., different hostnames, ports)

V2V Migration Pattern 2: Artifact Migration

Description:

- A parallel environment
- Migrated artifacts (applications)
- New database tables

Steps include:

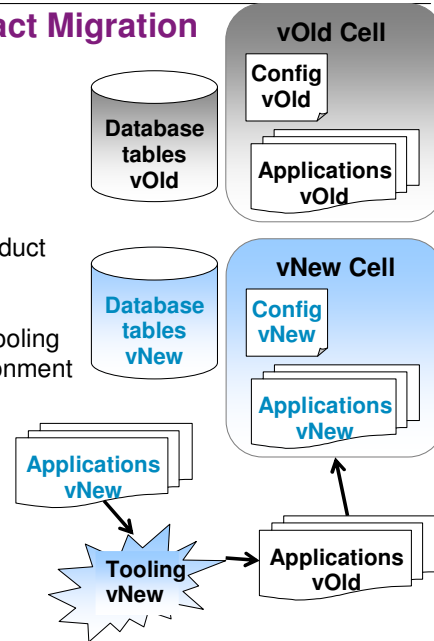
1. Migrate applications via vNew tooling product
2. Install vNew runtime product binaries
3. Create and configure vNew environment
4. Update vOld applications to vNew using tooling
5. Deploy vNew applications to vNew environment

Benefits include:

- ✓ Opportunity for configuration change
- ✓ Downtime completely avoided
- ✓ Applications can exploit new functionality

Costs include:

- ✗ Existing application data not utilized
- ✗ Historical monitor data not utilized



Basic Steps:

1. Import the existing PI or workspace into the latest version of WID
2. Update the source code, exploit new features (add, remove, etc)
3. Build and test successfully with WID/WTE
4. Install the corresponding version of the runtime product
5. Set up a new production environment (again scripting from old environment can be reused)
6. Export modules from WID and deploy to new runtime environment
7. As an option similar to previous pattern, you can update client and 'Drain out' old environment

Test Focus:

- Includes regression testing of the artifacts
- Includes testing migrated app in vNew runtime, may include utilization of new functions
- Includes performance testing of new environment
- Not focused on testing binary compatibility
- Not focused on testing runtime migration activities

Benefits

- Ability to exploit new features
- Opportunity for config/topology changes
- If not a lot of config changes, can reuse configuration scripts
- Parallel production environment support
- Selective application migration
- No downtime
- Because this is a parallel environment, it enables extensive testing of the environment before going live

Costs

- New development environment is required
- Existing **data not moved**, new database tables used
- Stateful data from old cell not available to new cell (e.g., LRP instances)
- Manual/scripted deployment of applications
- Requires updates to client applications

V2V Migration Pattern 3: Runtime Migration

Description:

- Utilize old level configuration and application data in the new runtime
- Single active cell * (**Both cells not concurrently active**)
- Unmigrated artifacts (applications)
- Upgraded database tables

Steps include:

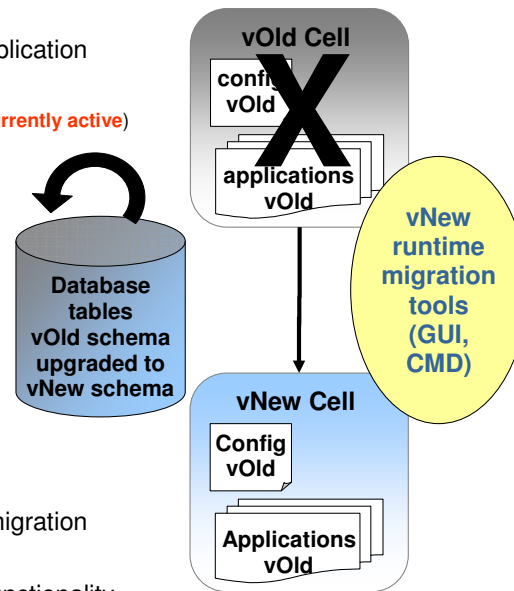
1. Install vNew runtime product
2. Utilize runtime migration tools, including db upgrade scripts

Benefits include:

- Migrated cell can access and use
- ✓ stateful application data of old cell
 - ✓ historical monitor data

Costs include:

- ✗ No configuration change during migration
- ✗ Some downtime is unavoidable
- ✗ Applications don't exploit vNew functionality



(*) Note “single active cell” means that both cells are not active at a single time.

- During a “full downtime migration” procedure, the v.Old cell is completely stopped before the v.New cell is started
- During a “minimal downtime migration” procedure, it is possible that parts of the v.Old cell continue to run for a short time while parts of the v.New cell are being migrated. Be aware there are heavy restrictions during such time, including administrative restrictions, and including that both cells cannot access the same tables at the same time.

BPEL Long Running Process (LRP) instances that were started in the v.Old cell will automatically continue to run in the v.New cell

Basic Steps:

1. Install the latest version of the runtime product, on the same machines
2. Use the **V2V Runtime Migration tools** to migrate existing Profiles, applications, and data to the new runtime environment

Test Focus:

- Includes regression testing of the artifacts, test binary compatibility, runtime migration activities (including End-to-end testing to validate migration process), and performance testing
- Not focused on testing utilization of new functions

Benefits

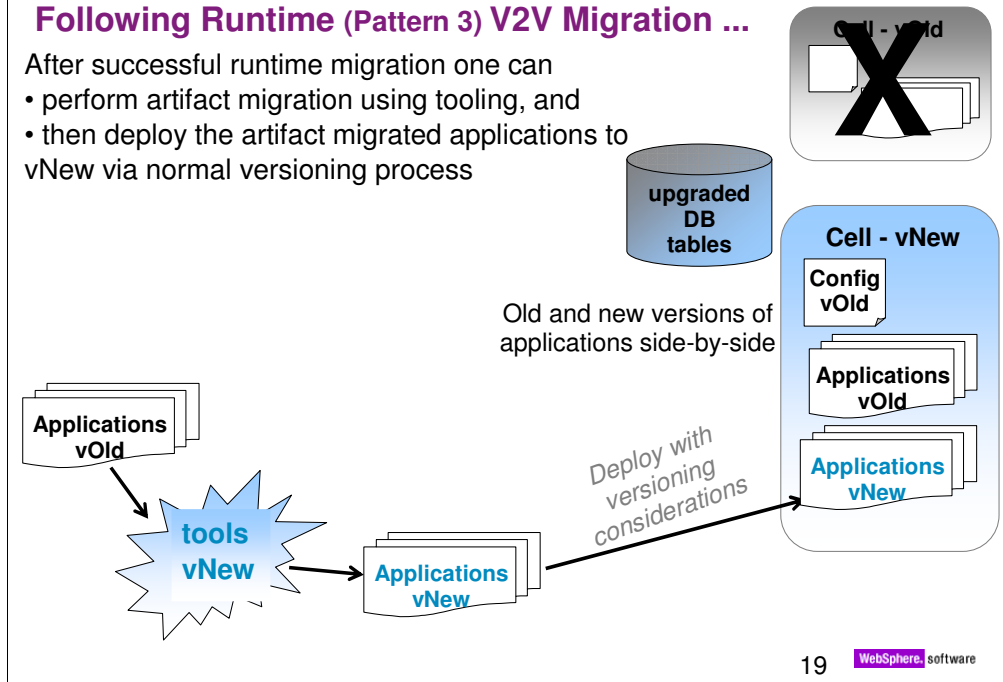
- Existing configuration/tuning moved
- Existing applications moved, as is
- Existing data moved, utilization of existing database tables
- Stateful data from old cell is available to new cell (e.g., BPEL Long Running Process instances)
- Does not require comprehensive set of scripts since migration tooling is used

Costs

- Requires downtime
- Dependency on using the runtime migration tools
- Requires all applications on node be ready to migrate at the same time
- New features are not enabled automatically
- Migration tools do NOT provide opportunity for config/topology change
- Any config/topology changes would have to occur post-migration
- Parallel production environment cannot be set up

Following Runtime (Pattern 3) V2V Migration ...

- After successful runtime migration one can
- perform artifact migration using tooling, and
 - then deploy the artifact migrated applications to vNew via normal versioning process



After the cell has been migrated via the runtime migration tooling, ensure that the migration has completed successfully and that applications are running cleanly.

Then one can migrate the applications via WID (tooling), export the migrated apps (vNew), and finally deploy them to the vNew cell via the normal versioning process.

In a sense, this can be thought of a combination of 'Runtime' and 'Artifact' migration patterns.

Downtime and Rollback

- **“Downtime”** refers to the period of time where the services provided by the cell are unavailable.
 - Downtime can be avoided via Patterns 1 and 2
 - Downtime is unavoidable in Pattern 3. There are 2 methods to handle:
 1. **“All at once downtime”** (*always available & recommended*)
 2. **“Minimum downtime”** (*not available for all version combinations*)
- **“Rollback”** refers to reverting back to a prior state. A full rollback includes the binaries, cell configuration, database state, and application state
 - **Patterns 1 and 2 utilize parallel cells, therefore “rollback” is not required**
 - Rollback is critical in Pattern 3.
 - New data (such as new process instance data in database) will be lost
 - Must roll back to a synchronized point

Downtime

Migration Pattern 3: Runtime migration requires downtime

Two methods for dealing with downtime

•All downtime at once

The entire cell will be shut down

Length of the Downtime depends on the number of nodes, number of applications & amount of data stored in WPS databases

•Minimum Downtime

Half of the cluster members (for each cluster) are stopped and migrated first

A minimum downtime is needed to complete the migration of each cluster

Rollback

Migration Pattern 3: Runtime migration may incur rollback

Retain a synchronized set of all data (profile configuration db data, transaction logs, applications)

Profile configuration

Always backup the configuration of the DMGR and each node before migration (e.g. use backupConfig)

Restore the old nodes using a restore tool on the DMGR and each node (e.g. use restoreConfig)

Database structure

Before migration make a backup of all databases at the same time

Restore if need to rollback

Limitation: New data will be lost

Applications

Use the old applications as is


Which Migration Pattern to Choose?

- Answer: It depends
 - On business requirements
 - Presence of long running processes
 - Allowed downtime
 - Nature of deployed applications
 - Hardware, O/S, Topology change
 - ...
 - On environments
 - Availability of hardware, software
 - Availability of skilled resources
 - ...
 - If possible, for simplicity and the use of latest runtime and other features our preferred approach:
 - **Artifact Migration**

Manual migration is the simplest but it does not use the latest runtime or development features.

If runtime migration is selected for valid reasons, one should try to deploy the migrated artifacts at an early opportunity.

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“Customer I” Overview

- Large international private bank
- Approximately 16 million customers
- About 24 million accounts
- Over 20,000 employees
- More than 1000 domestic branches
- More than 3,000 ATMs,
- About 4M Credit Cards
- About 100 Kiosks



Production Process Server Usage at “Customer I” before Migration



- More than 10 business applications deployed
- More than 100 process templates deployed
- More than 15,000 process instances per day
- About 5 different development teams

Note that customer I was having 10 large sets of EARs not simply 10 EARs.

“Customer I’s” Motivation and Challenges



- Motivational factors:
 - New features coming with WPS 6.1.2 and WAS 6.1
 - Business Activity Monitoring integration
 - Performance enhancements
- Challenges
 - Production downtime limited to a weekend maximum
 - Time between production and pre-production environment must be minimized
 - Existing process instances may live for weeks after migration
 - BPEL development and testing processes cannot be interrupted
 - Many dependent external applications and their development activities also should not be impacted by the migration



What “Customer I” Advises as Critical for a Successful Migration

- Get professional assistance from IBM Lab
 - If IBM is with you, life is much more easier.
- Coordinate and work as a team with your developers
 - Working shoulder to shoulder with your developers is essential
 - Migration includes migration of development environments
- Perform work in a tidy and organized fashion
 - Assure error-free start-up of all JVMs prior a migration
 - Clean up unused/erroneous process templates/applications
 - Clean up leftover messages in SI-Bus queues
 - Apply (record) migration instructions (the steps followed) in a “Step by Step” fashion and rollback to backup if “any” thing fails
 - Check migration logs in every step
 - Never loose your focus during migration
 - Use (German) Discipline wherever possible !!!

SI-Bus: Service Integration Bus



What “Customer I” advises as Critical for a Successful Migration (cont.)

- Test your applications thoroughly in every phase of the migration
 - Plan and document your tests prior to migration, use checklists
 - Create “lots” of testing instances for long running processes
 - Keeping developers close to you makes testing easier
- Use silent migration procedures
 - Easy to document and minimize human error possibility
 - Essential if you need to migrate 4 cells (maybe more than one)
- Make migrations switchable in early phases
 - In early phases of migration you may want to switch back and forth quickly between versions in development environments
- Keep your Test Environments similar to Production as much as possible
 - Migration procedure used for Production is developed on Test

If ‘Customer I’ does it again, there will be no wrong steps which can be avoided by sound planning and execution.

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A Few Suggestions for a Successful Migration

- Follow the proven roadmap
 - See Appendix 1
- Download and carefully complete the migration checklist available at IBM support site: <http://www-01.ibm.com/support/docview.wss?rs=2307&uid=swg27015595>
- Develop a 'Migration Assessment Document' involving all the stakeholders as appropriate
 - Managers
 - Project manager
 - System architects
 - Application architects and developers
 - Test Architect and application testers
 - Data base administrators
 - System administrators
 - ...
 - IBM Lab Services (suggested)
- Conduct an early POC

The **Migration_Planning_Checklist.doc** is presently getting updated for Version 7 migration and will be available very soon. It should be noted the contents of the updated document will not be greatly different from the present one.

Read relevant reference materials especially

•WAS migration planning containing WAS deprecated features, security, etc; <http://www-01.ibm.com/support/docview.wss?rs=180&uid=swg27008724>

•WPS pre-migration checklist.

http://publib.boulder.ibm.com/infocenter/dmndhelp/v7r0mx/index.jsp?topic=/com.ibm.websphere.wps.doc/doc/cmig_vtv_premigchecklist.html

•WPS

deprecations.http://publib.boulder.ibm.com/infocenter/dmndhelp/v7r0mx/index.jsp?topic=/com.ibm.websphere.wps.doc/doc/gmig_deprecationlist.html

The Migration Assessment Document should clearly document

- the present environment topology and configuration (production, test, DR), testing plans and code promotion path, migration requirement and considerations
- recommended migration pattern, recommended product version, target environment topology, artifact migration, source code management during migration, suggested testing effort
- resource and training plan
- a strawman project plan
- risk analysis and mitigation strategy
- next steps to follow

The Migration Assessment Document will continue to evolve as migration proceeds from plan to reality

Best Practices: General Recommendations

- **Skills and education** will be needed
 - Get trained or
 - Hire skilled resource
- **Involve IBM Services**
 - Ideally in all phases but at least in the planning and production migration phase
 - To ensure a quick problem resolution
 - For rapid skill transfer
- **Execute the actual migration steps yourself**
 - While IBM guides you
- **Document** migration procedure and problems!
- Always save migration logs!
- For runtime migrations, plan **application migration** as a **separate** project
- Don't overlook performance testing and tuning
 - As part of the migrations old defaults are applied to new versions
- Keep migration backups until the production migration is done
 - For Manual (Pattern 1) and Artifact (Pattern 2) migrations you should not immediately dismantle the vOld environments.

The **Migration_Planning_Checklist.doc** is often the starting point to understand the complexity of such a project. **Download** and fill out the **migration planning worksheet** (<http://www-01.ibm.com/support/docview.wss?rs=23>)

Identify a person with **overall migration responsibility**.

This is required to have an overall view on the project. Customer often operate their environment

Skills and Training will be needed

BPM (WPS) migration can be somewhat involved. Often it is the first time that customers are pe

involve IBM Services ideally in all phases but at least in the assessment, planning and production migration phase

- To ensure a quick problem resolution

- To keep the focus on the migration

Document migration procedure and problems

To ensure a smooth production migration, this final migration should be an execution of a check

For the runtime migration approach plan **application migration** as a **separate** project

To reduce dependencies between teams.

And of course applications have to be tested thoroughly!

If you perform a version to version runtime migration using the IBM tooling you have to be aware of the fact, that

Always save migration logs and **Keep migration backups** until the production migration is done!

You never know when an error occurs. Support will want to see them as soon as they hear that a

Acknowledgements

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- **Eric Herness**, IBM DE, BPM Chief Architect, IBM USA
- **Johanna Ang'ani**, ISSW Migration Lead, IBM, Germany
- **Michele Chilanti**, WW BPM Tech Sales

References

General

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- WPS pre-migration checklist
http://publib.boulder.ibm.com/infocenter/dmndhelp/v7r0mx/index.jsp?topic=/com.ibm.websphere.wps.doc/doc/cmig_vtv_premigchecklist.html
- WPS deprecated features
http://publib.boulder.ibm.com/infocenter/dmndhelp/v7r0mx/index.jsp?topic=/com.ibm.websphere.wps.doc/doc/gmig_deprecationlist.html
- Data Migration for the Business Process Choreographer
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- Troubleshooting: WebSphere Process Server migration
<http://www-01.ibm.com/support/docview.wss?rs=2307&uid=swg21320119>
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<http://www-01.ibm.com/support/docview.wss?rs=2307&uid=swg27006649>
- MustGather for troubleshooting: Version to Version Migration for WebSphere Process Server
<http://www-01.ibm.com/support/docview.wss?rs=2307&uid=swg21320189>
- WebSphere Process Server Version-to-Version Migration Patterns and Best Practices.
<http://www.ibm.com/developerworks/library/ws-wpsmigration/index.html>

Version 7.x

- WPS 7.0 Migration – Information Center
http://publib.boulder.ibm.com/infocenter/dmndhelp/v7r0mx/index.jsp?topic=/com.ibm.websphere.wps.doc/doc/cmig_vtv_bpmmig_ovw.html
- Migrating to WebSphere Process Server V7 – Tutorial
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Version 6.2.x

- WPS 6.2 Migration - Information Center
http://publib.boulder.ibm.com/infocenter/dmndhelp/v6r2mx/index.jsp?topic=/com.ibm.websphere.wps.620.doc/doc/cmig_vtv_intro.html
- Migration to WebSphere Process Server 6.2 – Mandatory reading
<http://www-01.ibm.com/support/docview.wss?rs=2307&uid=swg21329733>
- Migrating to WebSphere Process Server for z/OS V6.2
<http://www-01.ibm.com/support/docview.wss?rs=2307&uid=swg21367181>
- Migration of WPS 6.1.2 to WPS 6.2 – Step by step instructions
<http://www-03.ibm.com/support/techdocs/atsmastr.nsf/WebIndex/TD105118>
- Migrating to WebSphere Process Server V6.2 – Tutorial
http://www.ibm.com/developerworks/websphere/tutorials/0911_madgula/
- Obtaining up to date 6.2 migration technical documents
<http://www-01.ibm.com/support/search.wss?rs=2307&q1=Migration+6.2&sort=desc&tc=SSQH9M&dc=DB560+DB520+D800+D900+DA900+DA800&dtm>

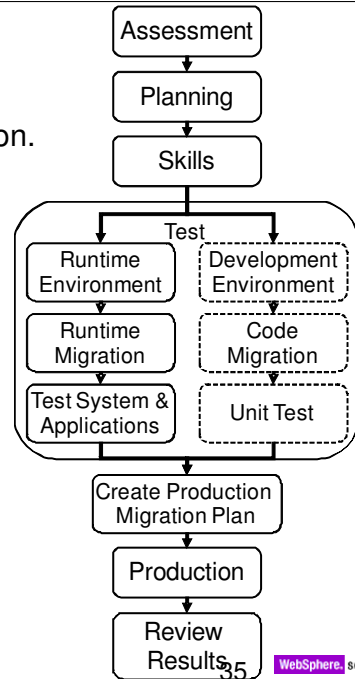
WebSphere Application Server

- A quick guide for migrating to WebSphere Application Server V6.1
http://www.ibm.com/developerworks/websphere/library/techarticles/0608_chalmers/0608_chalmers.html
- WebSphere Application Server migration planning and best practices (attached in PDF (WebSphereApplicationServerMigration.pdf) at this link:
<http://www-01.ibm.com/support/docview.wss?rs=180&uid=swg27008724>
- WebSphere Application Server V6 Migration Guide
<http://www.redbooks.ibm.com/abstracts/SG246369.html?Open>
- Security changes for v6.1
http://www-128.ibm.com/developerworks/websphere/techjournal/0612_birk/0612_birk.html
- Migrating servers from multi-broker replication domains to data replication domains
http://publib.boulder.ibm.com/infocenter/wasinfo/v6r0/index.jsp?topic=/com.ibm.websphere.nd.doc/info/ae/trun_drs_migrate.html
- JACL to Jython conversion assistant
<http://www-1.ibm.com/support/docview.wss?rs=180&uid=swg24012144>
- IBM Migration Knowledge collection for WAS
<http://www-1.ibm.com/support/docview.wss?rs=180&uid=swg27008724>
- Planning an iterative migration of a high availability environment to WebSphere Application Server V6.1 http://www-128.ibm.com/developerworks/websphere/library/techarticles/0702_luchini/0702_luchini.html

Appendix 1: Roadmap

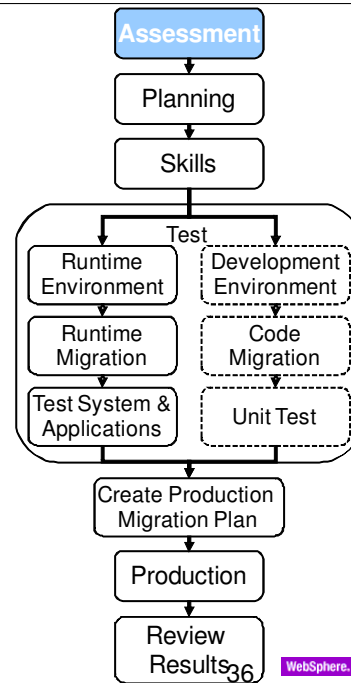
Best Practices: Roadmap

This diagram illustrates the proven roadmap for successful a migration.



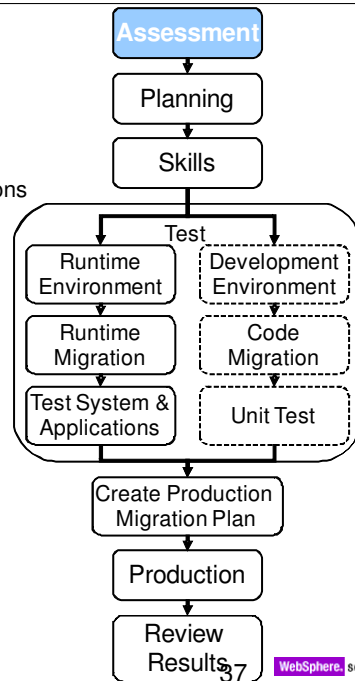
Roadmap: Assessment

- What are your migration drivers?
 - Functionality
 - Configuration
 - Compatibility
 - Performance
 - End of Support (e.g., v6.0.x)
 - Business reasons (e.g., company directive for specific version)
 - ...
- What are migration constraints?
 - Do not affect the operability of currently deployed applications
 - Do not affect the availability of the production environment
- What are the priorities of each?



Roadmap: Assessment

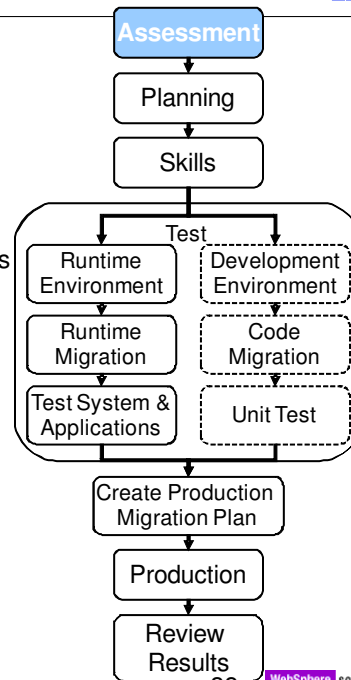
- Requirements analysis
 - **Hardware requirements**
 - What systems are currently in use?
Are there any (non-WebSphere) reasons why those are no longer sufficient?
 - Is existing H/W sufficient
 - **Software requirements**
 - Changed specifications
 - API deprecation or removal, JDK changes
 - Vendor applications and WebSphere products
 - **Functional migration requirements?**
 - **Non-functional migration requirements**



Description of functional and non-functional requirements

Roadmap: Assessment

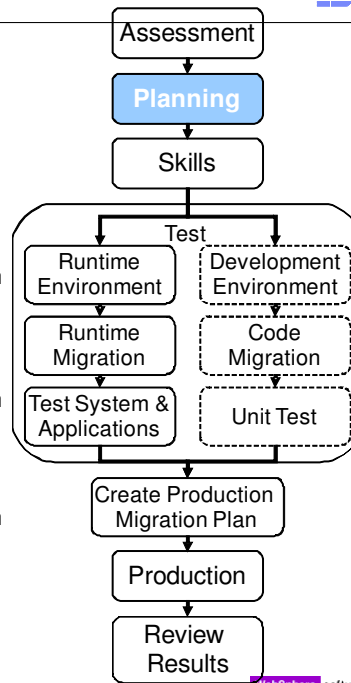
- Which topologies /environments have to be migrated?
 - Are they documented?
 - Are they equally configured?
 - Is their configuration scripted?
 - Are custom libraries, custom directories (e.g., db driver directory) etc. used?
- Is the **Security** mechanism affected?
- How many applications are running?
- What are the **application dependencies**?
- **Download** and fill out the **migration planning worksheet** from IBM support site (see References)



Roadmap: Planning

Plan to use a migration pattern that best fulfills your requirements

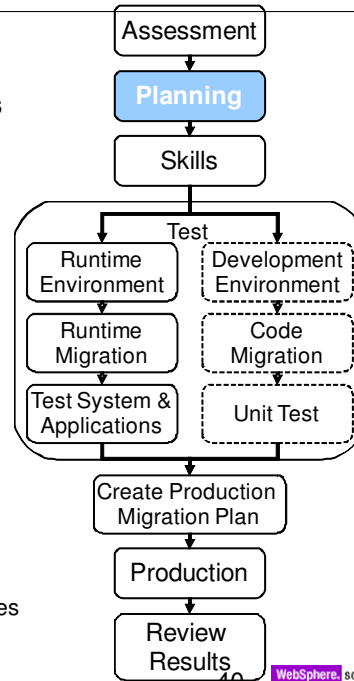
- Use 'Manual Migration' if
 - You want to use new hardware/OS
 - No databases or process instances migration
 - No profile configuration migration
- Use 'Application Migration' if:
 - You want to use new hardware/OS
 - No databases or process instances migration
 - No profile configuration migration. You want to exploit new features right away
- Use 'Runtime Migration' if:
 - Use hardware/OS used with previous version
 - Want to migrate configuration and applications. *(note that versioning of applications is a post-migration step)*
 - Want to migrate running process instances and Human Tasks



Roadmap: Planning

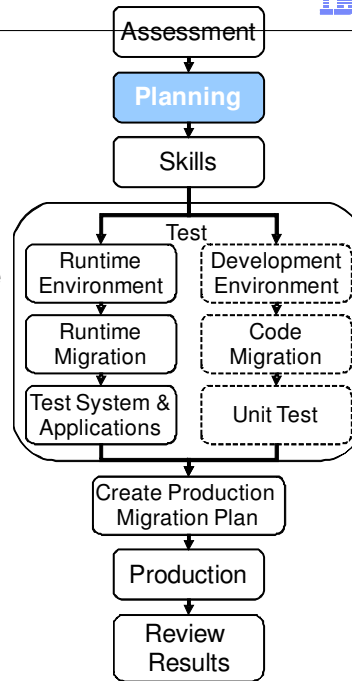
Plan to have the necessary resources available at the right times

- Human Resources
 - **Assemble** a core **migration team**
 - Administrator, development, maintenance
 - Define a migration manager
- IT Resources
 - Hardware
 - Software
 - Prerequisite software upgrades
 - Identify latest WPS/WESB/WBMonitor/WBSF fixes
- Identify **resource dependencies**
- Create an **execution timeline**
 - Include dependencies, resource availabilities
 - Identify pilot projects



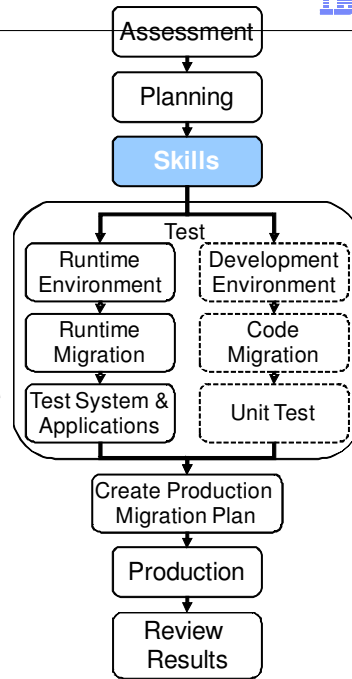
Roadmap: Planning

- **Identify gaps in expertise**
 - Installation and configuration
 - Migration methodologies
 - Changes in the latest runtime functions
 - ...
 - Expertise must exist, or be grown, or be hired!
- **Identify Risks**
 - Business factors
 - Environmental dependencies
 - Functional dependencies
 - Scheduling
- **Include the rollback plan**



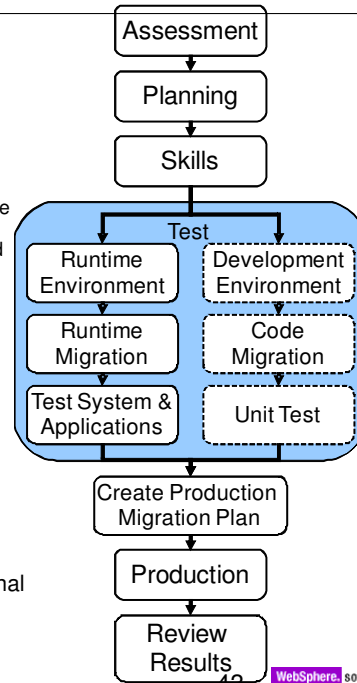
Roadmap: Skills

- **Grow or obtain expertise**
 - Runtime installation, configuration, administration
 - Migration methodologies
 - Changes in the latest runtime functions
 - Utilizing latest tooling (WID, WBModeler)
 - ...
 - Expertise must exist, or be grown, or be hired!
 - Execute on getting education



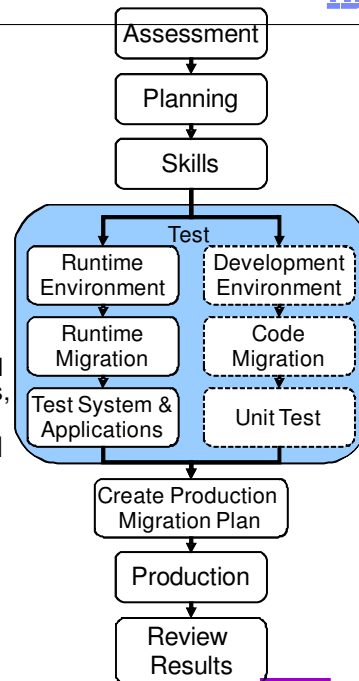
Roadmap: Test

- **Test thoroughly!**
- **If possible: Test applications first on a target version* standalone server**
 - To ensure that old applications run properly on the new version
 - To be able to distinguish between application and migration problems
- **Migrate some test environments iteratively**
 - Integration
 - System test
 - Performance
 - Pre-Production
 - Production
- **Test your migration procedure in production-like environments**
 - Test environments are often less complex, thus migrating them successfully is not a final proof for a production migration



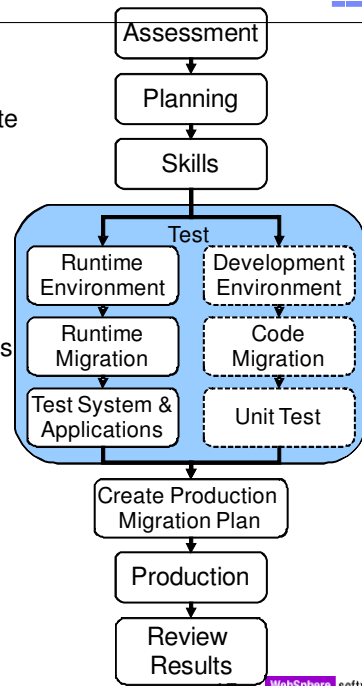
Roadmap: Test

- Consider risk factors
 - **Test the rollback procedure** on a test system
- Don't overlook performance testing/tuning
- Document your tests
- Test
 - ALL your applications
 - ALL products / applications interacting with WPS/WBMonitor/WBSF
- There will likely be a need for some parallel development and support (versions of apps, versions of tools, versions of runtimes)
- Keep time between pre-production and production migration short
 - As soon as pre-production is migrated there is potentially no test environment in the old version available
- If possible plan application migration in a separate project than runtime migration.



By the time you exit test...

- Any necessary artifact migration is complete
- All applications have been tested and verified to run on the target version
- Migration procedures have been tested in an environment that looks just like the production environment. Those procedures have been documented and scripted.
- Rollback procedures have been tested



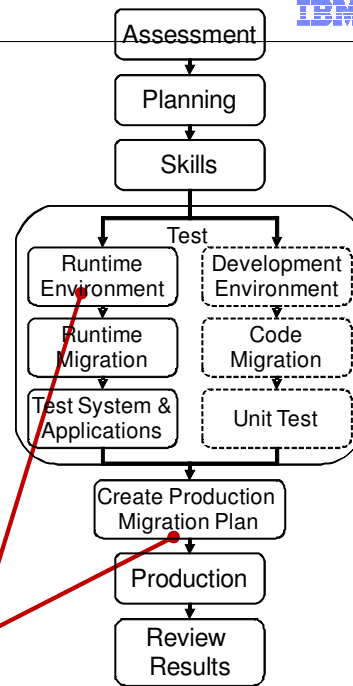
Risk Mitigation!

Migration Preparation

- Clean up your environment to
 - **Make** the migration as **uncomplex** as possible
 - Not move problem on to new versions
 - Use this as a point to verify your system health

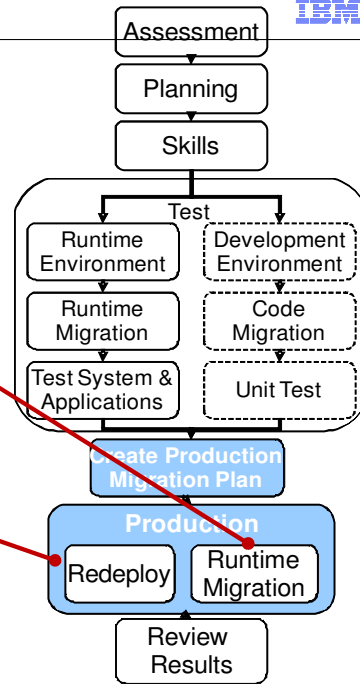
- Perform a clean restart to **identify existing errors** in logs **prior the migration**
 - Resolve them as possible
 - Use them to distinguish between old and newly introduced problems

* Applies to test environments and production environment



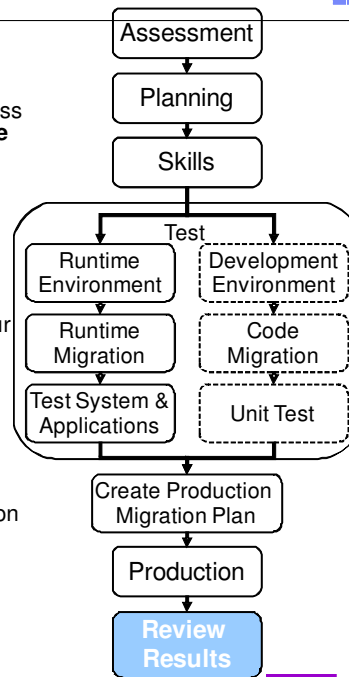
Roadmap: Production Migration

- Based on results from testing define a Production Migration Plan including
 - Tasks
 - Resources
 - Duration
- True runtime migration pattern (Pattern #3)
 - Following full downtime procedures, production is down until the migration is completed or rolled back.
- Redeploy pattern (Pattern #1 or #2)
 - Old version production cell may continue to run while new version production cell is installed, configured, tested.



Roadmap: Review Results

- At this stage, you are done with migration process and **need some verification before getting the production up and running**
 - **Review the results** of the Migration (Pattern #3)
 - Check migration logs
 - Update the plan for next time
 - Runtime execution **tuning**
 - (Pattern #1 or #2), ensure applying your required (and tested!) tuning
 - **Run your standard test processes**
 - Progress applications normally through the test environments
- Rollback if necessary
 - Note that any new data stored after migration will be lost (e.g. newly created business processes)
- “Open the floodgates”



Appendix 2: Miscellaneous Data

WAS and JDK versions for WPS

WPS version	WAS version	Java
WPS 6.0.2.0	WAS 6.0.2.17	SDK 1.4.2
WPS 6.1.0.0	WAS 6.1.0.13	SDK 1.5
WPS 6.1.2.0	WAS 6.1.0.17	SDK 1.5
WPS 6.2.0.0	WAS 6.1.0.21	SDK 1.5
WPS 7.0.0.0	WAS 7.0.0.7	SDK 1.6

Verify Java SDK version shipped with IBM WebSphere Application Server Fix Packs

<http://www-01.ibm.com/support/docview.wss?rs=180&uid=swg27005002>

End of Support dates

Product	End of Support
WebSphere Process Server v601, v602	30 Sept 2010
WebSphere Business Modeler v601, v602	30 Sept 2010
WBM Publishing Server v601, v602	30 Sept 2010
WebSphere Business Monitor v601, v602	30 Sept 2010
WebSphere Business Services Fabric v602	30 Sept 2010

WebSphere product lifecycle dates

<http://www-01.ibm.com/software/websphere/support/lifecycle/>

Additional products of note:

- WebSphere Enterprise Service Bus v601, v602 --- EOS 30 Sept 2010
- WebSphere Service Registry and Repository v602 --- EOS 30 Sept 2010

WPS from/to versions for V2V migration

	To	6.0.2.x*	6.1.0.x*	6.1.2.x*	6.2.x*	7.0.0.x*
From						
6.2.0.x						Migrate
6.1.2.x					Migrate	Migrate
6.1.0.x			Upgrade		Migrate	Migrate
6.0.2.x			Migrate	Migrate	Migrate	Migrate
6.0.1.x	Upgrade	Migrate	Migrate		**	**

(*) It is recommended to use the latest versions (fix packs) of WPS/WESB for migration purposes. At the time these charts were created, 6.1.2.3, 6.2.0.2, 7.0.0.1 are the latest published versions. For example, to target v6.2.0.1, you will need to install v6.2.0, apply fixpack 6.2.0.1 then perform migration

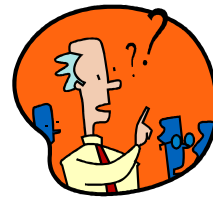
(**) Recommended to upgrade from 6.0.1.x to 6.0.2.x then migrate to v6.2.x or v7

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Questions

Questions?



धन्यवाद
Hindi

多謝
Traditional Chinese

Grazie
Italian

ขอบคุณ
Thai

Gracias
Spanish



Merci
French

Спасибо
Russian

شكراً
Arabic

Obrigado
Brazilian Portuguese

Danke
German

多谢
Simplified Chinese

நன்றி
Tamil

ありがとうございました
Japanese

감사합니다