

ORACLE®

Strategies for Maintenance and Online Patching for Oracle E-Business Suite 12.2

Elke Phelps, Product Management Director
Applications Technology
E-Business Suite Development
Oracle

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- 1 ➤ Define Your Preventive Maintenance Strategy
- 2 ➤ Understand the Architecture, Tools and Options
- 3 ➤ Define Your Deployment Strategy

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Define Your Preventive Maintenance Strategy

- A** ➤ Keep Your Environment Up-To-Date
- B** ➤ Keep Your Environment Healthy

Define Your Preventive Maintenance Strategy

A ➤ Keep Your Environment Up-To-Date

B ➤ Keep Your Environment Healthy

Keep Your Environment Up-To-Date

Oracle E-Business Suite

- Release Upgrade
- Release Upd
- Family Pack
- Recommend
- Recommend patches
- Minimum prerequisites for support, MOS Doc ID **1195034.1**

Technology Stack

- Desktop client
- Java Runtime Environment (JRE)
- Java Development Kit (JDK)
- Oracle Developer
- Oracle HTTP Server (OHS)
- Oracle WebLogic Server (WLS)
- Database
- Daylight Savings Time (DST) - all technology stack components

CRITICAL PATCH UPDATES

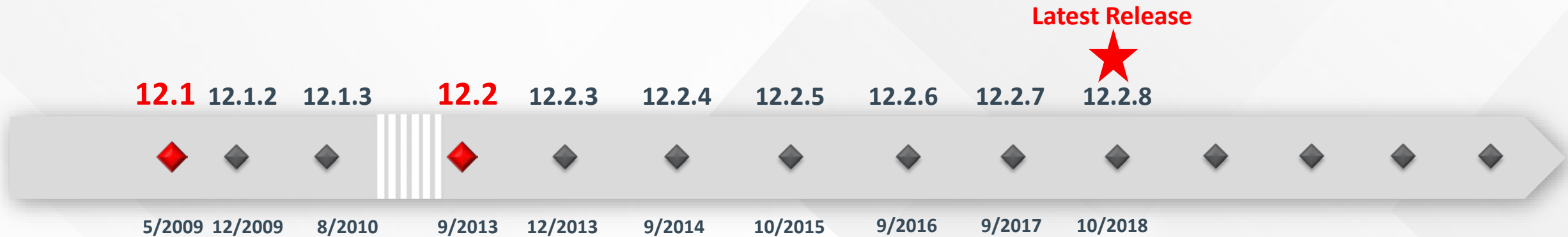
CONTINUOUS INNOVATION ON EBS 12.2 WITH PREMIER SUPPORT THROUGH AT LEAST 2030

Delivering Ongoing Innovation and
Underlying Technology Stack Updates
without Major Upgrade

[Announcing Continuous Innovation on Oracle E-Business Suite 12.2 \(PDF\)](#)

EBS Release Roadmap: Continuous Innovation on EBS 12.2

Continued Investment and Support for Years to Come without Major Upgrade

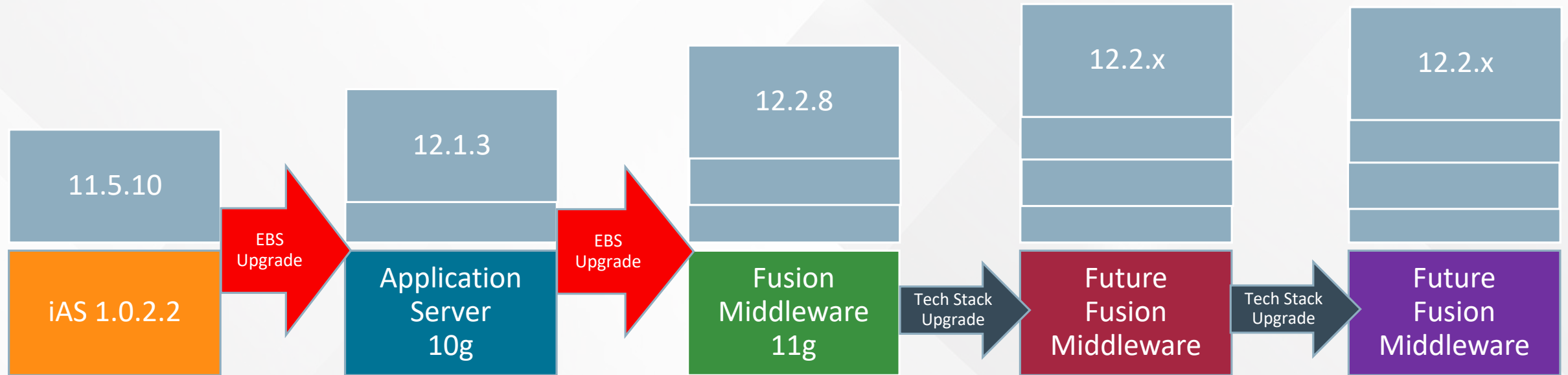


PREMIER SUPPORT THROUGH:

- **Release 12.1:** Dec. 2021
- **Release 12.2:** At least 2030

Continuous Innovation on EBS 12.2

Update Underlying Technology while Keeping the Same Level of EBS Code



- Uptake new middleware without major EBS upgrade
- No need to rewrite customizations

EBS Support timelines...

... do not override Oracle Database timelines for releases or options:

- 12gR2, 11gR2
- Real Application Clusters
- Advanced Compression, etc...

... do not override Fusion Middleware timelines for external components:

- SOA Suite
- Single Sign-On (OAM/OID/ODU)
- Portal, etc...

... override Fusion Middleware timelines for internal EBS components:

- Oracle HTTP Server
- Forms & Reports 10g
- Oracle Containers for Java (OC4J)
- Java JDK

Where Can You Find Authoritative Dates?

Understand Where You Are with Regards to Support Policies

▲ ORACLE LIFETIME SUPPORT BROCHURES

- ➔ [Lifetime Support Policy: Oracle Technology Products \(PDF\)](#)
- ➔ [Lifetime Support Policy: Oracle Fusion Middleware Products \(PDF\)](#)
- ➔ [Lifetime Support Policy: Oracle Applications \(PDF\)](#)
- ➔ [Lifetime Support Policy: Oracle Retail Applications \(PDF\)](#)
- ➔ [Lifetime Support Policy: Oracle Financial Service Products \(PDF\)](#)

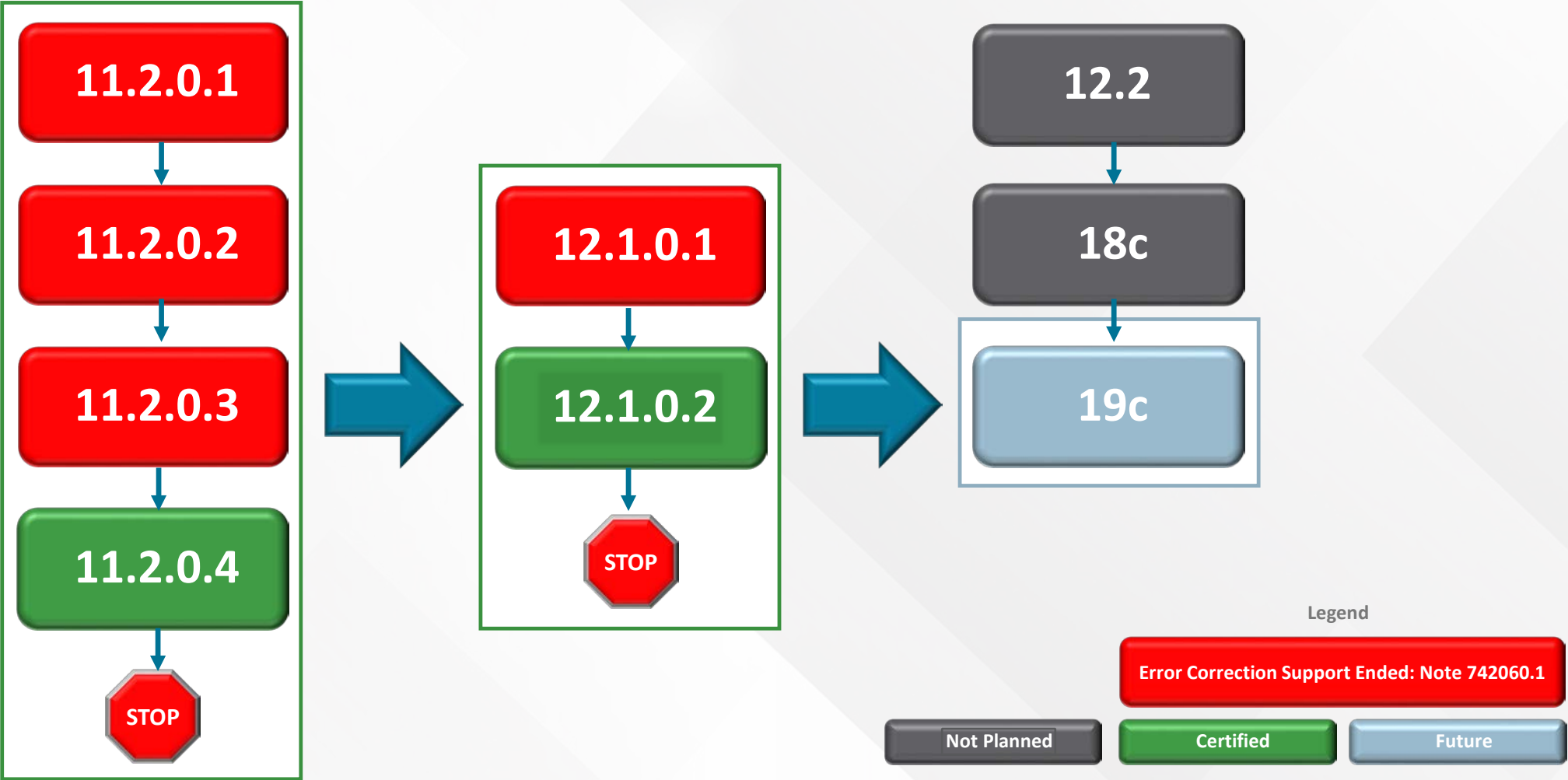
www.oracle.com/us/support/lifetime-support

Extended Support Fee Waiver

Oracle Database 12.1 and 11.2 for Oracle E-Business Suite

- Extended Support fees waived for Oracle Database licenses through December 2020
 - Applicable to licenses used for Oracle E-Business Suite
 - [Extended Support Fee Waiver for Oracle Database 12.1 and 11.2 for Oracle E-Business Suite](#) (Doc ID 2522948.1)
- Customers that have already paid Oracle Database Extended Support fees may be eligible to receive a credit
- Contacting Oracle regarding eligibility for waiver or credit:
 - Access your Oracle Premier Support Renewal information and log a service request via [My Support Renewals](#)
 - Contact Oracle Support Renewals using the [Oracle Global Contacts page](#)

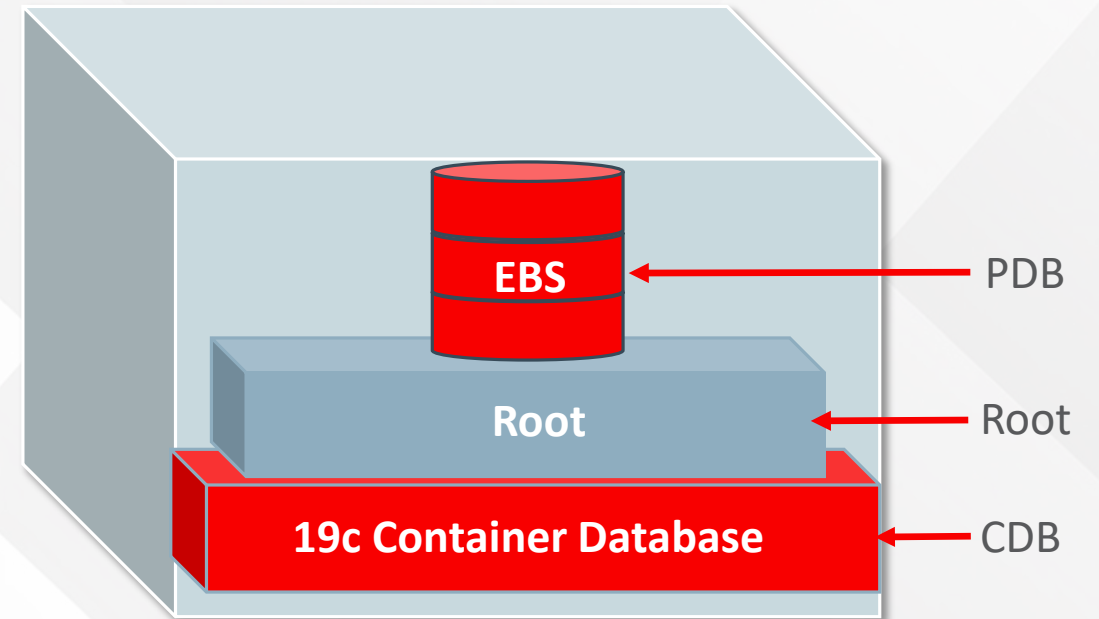
EBS 12.2 and 12.1 Database Certifications



EBS Database Certifications

What is Changing with Database 19c?

- EBS with Database 19c will be converted to the Container Database (CDB) Architecture
- The EBS 19c Database will consist of a Container Database (CDB) with a **single** Pluggable Database (PDB)



EBS Database Certifications

What You Can Do Now to Prepare for the Planned Certification with Database 19c

- Learn about differences in database administration with an Oracle Database with Multitenant Architecture
 - Take an Oracle Database Administration training course
 - Read Oracle Database online documentation
 - Create a sandbox environment (minimum requirement: Database 12cR1)
 - Install an Oracle Database with Multitenant Architecture
 - Use the sandbox environment to apply what you have learned

EBS Database Certifications

What is Changing with Database 19c?

- UTL_FILE_DIR is an init.ora database parameter currently used by EBS when products or custom code requires access to the filesystem to write output files or read input files
- UTL_FILE_DIR is desupported with Database 19c
- Oracle Database Directory Objects replace the use of UTL_FILE_DIR
- With the EBS database upgrade to Database 19c, an equivalent Directory Object will be created for each UTL_FILE_DIR entry
- Preexisting EBS product code and custom code will continue to function

EBS Database Certifications

What You Can Do Now to Prepare for the Planned Certification with Database 19c

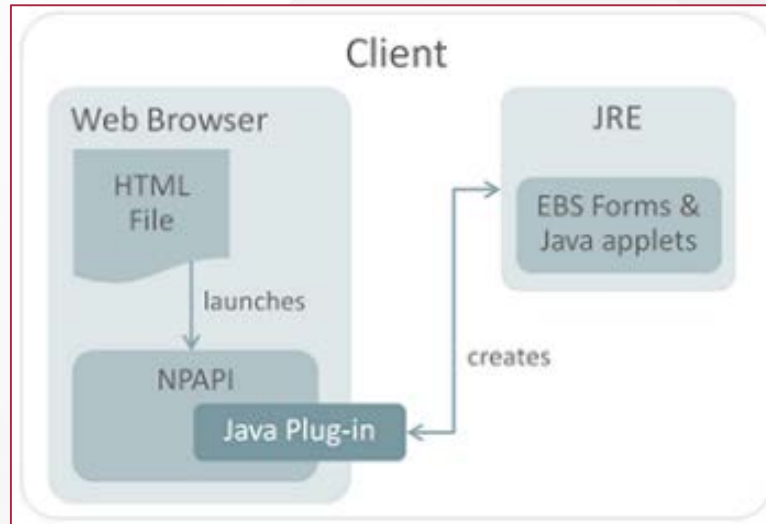
- Learn about Oracle Database Directory Objects
 - [Oracle Database Online Documentation Library, 12c Release 1 \(12.1.0.2\)](#),
 - Database SQL Language Reference, **CREATE DIRECTORY**
- When deploying **new custom code**, use Oracle Database Directory Objects in place of UTL_FILE_DIR
- When updating directory paths in **existing custom code**, convert to use Oracle Database Directory Objects

Desktop Java Client for Oracle E-Business Suite

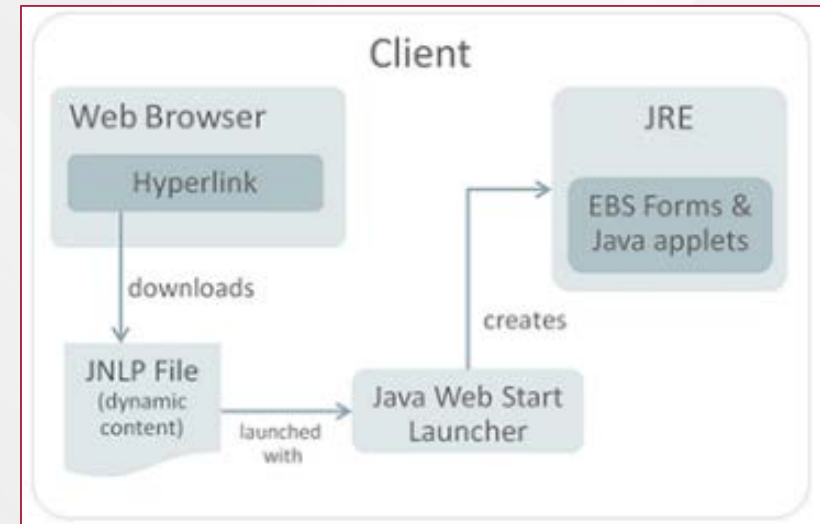
Required for E-Business Suite Modules that Use Oracle Forms or Other Applets

- Browsers have been phasing out the ability to launch plugins, including Java Plug-in
- E-Business Suite customers should deploy Java Web Start now as a replacement for Java Plug-in

Java Plug-In



Java Web Start

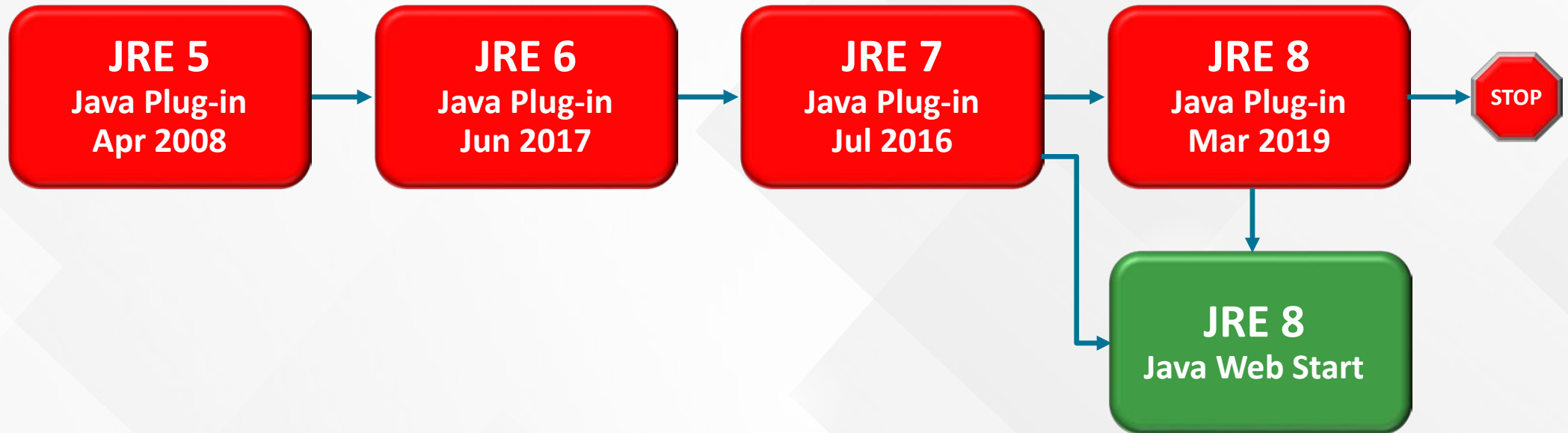


EBS Desktop Java Client – What’s Supported?

	Java Plug-In	Java Web Start
Oracle E-Business Suite Release		
12.2 and 12.1	X	✓
11i	X	X
Browser		
Microsoft Internet Explorer (IE)	✓	✓
Microsoft Edge	X	✓
Firefox 60.x Extended Support Release	X	✓
Google Chrome 45 and higher	X	✓
Feature		
Multiple Session Support	✓	✓
One-time Login with Multiple Session Support	X	✓

EBS Desktop Java Client

Recommendation: Migrate to Java Web Start Now



EBS 12.2 & 12.1: MOS Note 2188898.1

Legend

Error Correction Support Ended: Note 1640397.1

Certified

Future

EBS 12.1 Application Tier Java

Recommendation: Upgrade to JDK 7



EBS 12.1: MOS Note 1467892.1

Legend

Error Correction Support Ended: Note 1640397.1

Certified

Future

EBS 12.2 Application Tier Java

Recommendation: Upgrade to JDK 7



EBS 12.2: MOS Note 1530033.1

Legend

Error Correction Support Ended: Note 1640397.1

Certified

Future

FAQ for Java Usage in Oracle E-Business Suite

- Describes important recommended actions for Java in your EBS environment
- Answers commonly asked questions about Java usage in EBS

★ FAQ: Essentials of Java Usage in Oracle E-Business Suite (Doc ID 2510500.1)

This knowledge document answers frequently asked questions about Java usage in Oracle E-Business Suite.

The most current version of this document can be obtained in My Oracle Support Knowledge [Document 2510500.1](#). All updates are noted in the [change log](#).

Note: To receive automatic notifications of updates, subscribe to the Hot Topics Notification feature in My Oracle Support, as described in [Document 793436.2](#), *How to use Hot Topics Email notification to subscribe to Support Product News, SRs, Bugs, etc. and events*, so that you never miss an important update to this document.

In This Document


This document is divided into the following sections:

- [Section 1: Overview](#)
- [Section 2: Recommended Actions for Oracle E-Business Suite Releases 12.2 and 12.1](#)
 1. [Upgrade client tier to JRE 8 and use Java Web Start with Oracle E-Business Suite](#)
 2. [Upgrade application tier to JDK 7](#)
 3. [Upgrade \[ORACLE_HOME\]/appsutil/jre on database tier to JRE 7](#)
- [Section 3: Frequently Asked Questions about Java Usage in Oracle E-Business Suite](#)
 1. [What is the nature and extent of Java dependencies in Oracle E-Business Suite runtime systems?](#)
 2. [Will Oracle E-Business Suite depend upon Java in the future?](#)

MOS Note 2510500.1

How to Deploy Oracle E-Business Suite Securely

Stay Current with Patching

- Apply Critical Patch Updates (CPUs) + Security Alerts
 - Critical Patch Advisory Page
<http://www.oracle.com/technetwork/topics/security/alerts-086861.htm>
 - Oracle E-Business Suite CPU MOS Note [2484000.1](#) 
- Apply latest maintenance pack or release update pack
 - Yes, Oracle E-Business Suite maintenance packs release update packs improve security as well
- Deploy the latest Oracle E-Business Suite security features

Oracle EBS 12.2 AD and TXK

Stay Current with the Latest Release Update Packs (RUPs)

- AD and TXK are the infrastructure components that provide the 12.2 Online Patching technology
- Oracle strongly recommends that you apply the latest release update patches, consolidated patches and critical fixes for AD and TXK at your earliest convenience
- Latest RUPs available
 - AD Delta 11 [Patch 25820806](#)
 - TXK Delta 11 [Patch 25828573](#)



Description	MOS Doc ID
Applying the Latest AD and TXK Release Update Packs to Oracle E-Business Suite Release 12.2	1617461.1
Oracle E-Business Suite Applications DBA and Technology Stack Release Notes for R12.AD.C.Delta.10 and R12.TXK.C.Delta.10	2295390.1

Blog: Oracle E-Business Suite Technology Blog

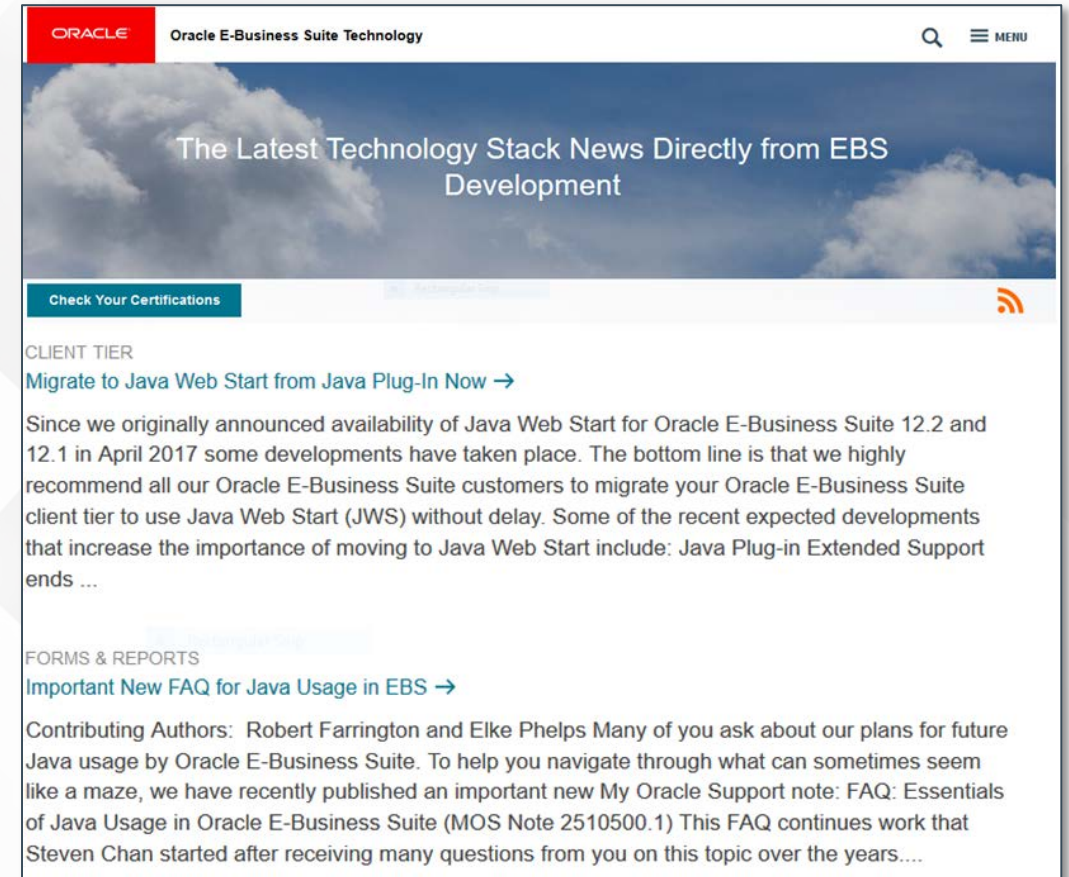
New URL <https://blogs.oracle.com/ebstech> (previously blogs.oracle.com/stevenchan)

- Same blog, new URL

Note: blogs.oracle.com/stevenchan will automatically redirect to blogs.oracle.com/ebstech

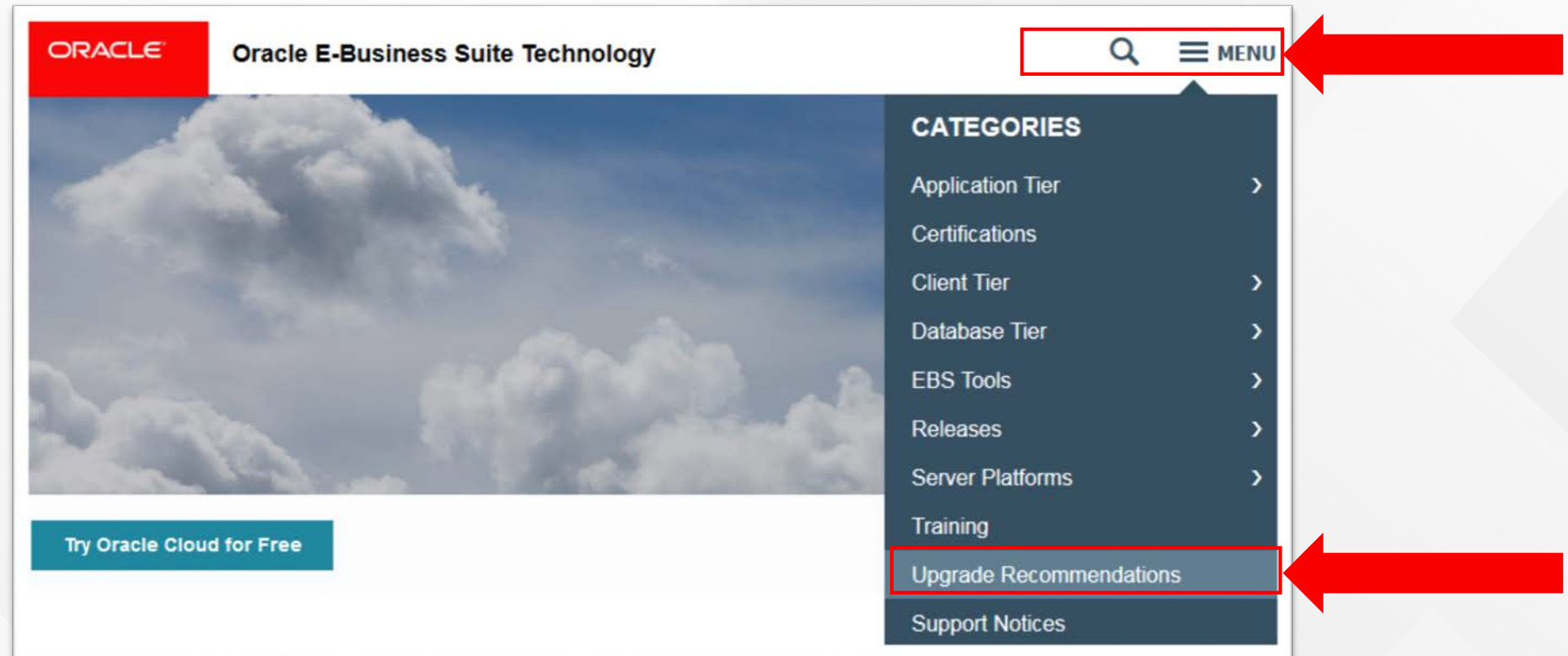
- News about EBS Technology
- Certification announcements
- Quarterly upgrade recommendations
- Primers, FAQs, tips
- Statements of Direction
- Desupport reminders

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Where Can You Find Authoritative Dates?

Understand Where You Are with Regards to Support Policies



<http://blogs.oracle.com/ebstech>

Where Can You Find Authoritative Dates?

Understand Where You Are with Regards to Support Policies

May 21, 2019

Quarterly EBS Upgrade Recommendations: May 2019 Edition



Elke Phelps

PRODUCT MANAGEMENT DIRECTOR

We've previously provided advice on the [general priorities for applying EBS updates](#) and creating a [comprehensive maintenance strategy](#).

Here are our latest upgrade recommendations for Oracle E-Business Suite updates and technology stack components. These quarterly recommendations are based upon the latest updates to Oracle's product strategies, [latest support timelines](#), and [newly-certified releases](#).

You can research these yourself using this MOS Note:

- [How to Find E-Business Suite Patches & E-Business Suite Technology Stack](#)

<http://blogs.oracle.com/ebstech>

Finding the Updates you Need

EBS Technology Code level Checker (ETCC)

Ensures that required database and application tier bug fixes have been applied to your Oracle E-Business Suite Release 12.2 environment

Database Code Level Checker

Identifies database tier technology stack patches required by EBS 12.2



Application Tier Code Level Checker

Identifies application tier technology stack patches required by EBS 12.2

Application Tier	
Application TOPs	Application TOPs
Forms 10.1.2 ✓	Forms 10.1.2 ✓
OHS ✓	OHS ✓
Oracle Common ✓	Oracle Common ✓
WebLogic ✓	WebLogic ✓
fs1	fs2

EBS Technology Code Level Checker (ETCC)

- ETCC can be downloaded via [Patch 17537119](#) from My Oracle Support
- Oracle strongly recommends the use of this utility to ensure that all required database and middle tier bugfixes have been installed
- Database EBS Technology Codelevel Checker (DB-ETCC)
 - `checkDBpatch.sh`
- Middle Tier EBS Technology Codelevel Checker (MT-ETCC)
 - `checkMTpatch.sh`

MOS Doc ID 1594274.1

Where Can I Find Updates?

The screenshot shows a web page with a navigation bar at the top containing the following tabs: Overview of EBS Patches, EBS Patches, EBS Technology Stack Patches, Critical Patch Updates, Oracle Standalone/Edge Applications, Support Policy & Minimum Patch Levels, and EBS Patching Resources. Below the navigation bar are two buttons: 'Print Document' and 'Search This Document'. The main heading is 'Welcome to Finding E-Business Suite Patches & E-Business Suite Technology Stack Patches'. The content is divided into two columns. The left column is titled '1. How to use this document?' and contains two bullet points: 'Purpose of document:' (with a sub-bullet explaining the document's purpose for EBS customers) and 'Navigation of document:' (with a sub-bullet to click on the navigation tabs). The right column is titled '2. Make sure your E-Business Suite is Up-To-Date!' and contains a bullet point to click on 'Creating a Maintenance Strategy for Oracle E-Business Suite' (with a note about the May 2014 presentation). Below this is a 'Sample Slide:' section showing a slide titled 'Keeping all E-Business Suite Components Up-To-Date' with five numbered items: 1. EBS Updates, 2. Technology Stack, 3. Security Patches, 4. Interim Patches, and 5. R11i Minimum Extended Support Baseline / R12 Minimum Prerequisites.

Overview of EBS Patches | EBS Patches | EBS Technology Stack Patches | Critical Patch Updates | Oracle Standalone/Edge Applications | Support Policy & Minimum Patch Levels | EBS Patching Resources

Print Document | Search This Document

Welcome to Finding E-Business Suite Patches & E-Business Suite Technology Stack Patches

1. How to use this document?

- Purpose of document:
 - This document is meant to assist an E-Business Suite customer in finding all Patches necessary to maintain a healthy system. This includes Recommended patches, Technology Stack patches, Performance patches, etc...
- Navigation of document:
 - Click on the above tabs to navigate through the document

2. Make sure your E-Business Suite is Up-To-Date!

- Click here **Creating a Maintenance Strategy for Oracle E-Business Suite**
(May 2014 Oracle E-Business Suite Development Presentation)

Sample Slide:

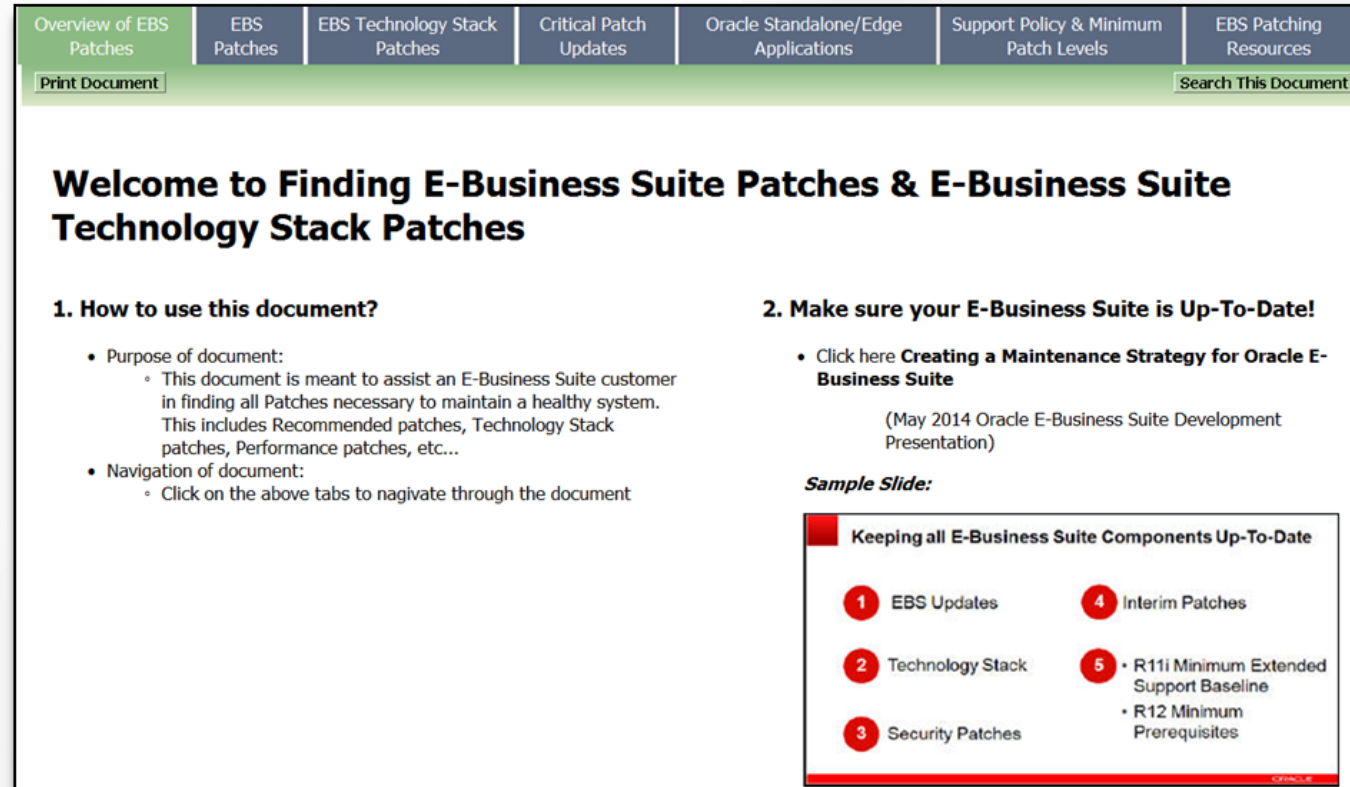
Keeping all E-Business Suite Components Up-To-Date

1 EBS Updates	4 Interim Patches
2 Technology Stack	5 R11i Minimum Extended Support Baseline
3 Security Patches	R12 Minimum Prerequisites

MOS Doc ID 1633974.2

Where Can I Find Updates?

 **Navigation
Tabs**



The screenshot shows a document page with a navigation bar at the top. The navigation bar includes tabs for 'Overview of EBS Patches', 'EBS Patches', 'EBS Technology Stack Patches', 'Critical Patch Updates', 'Oracle Standalone/Edge Applications', 'Support Policy & Minimum Patch Levels', and 'EBS Patching Resources'. Below the navigation bar, there is a 'Print Document' button on the left and a 'Search This Document' button on the right. The main content area has a title 'Welcome to Finding E-Business Suite Patches & E-Business Suite Technology Stack Patches'. Below the title, there are two main sections: '1. How to use this document?' and '2. Make sure your E-Business Suite is Up-To-Date!'. Section 1 includes a list of bullet points: 'Purpose of document:' (This document is meant to assist an E-Business Suite customer in finding all Patches necessary to maintain a healthy system. This includes Recommended patches, Technology Stack patches, Performance patches, etc...) and 'Navigation of document:' (Click on the above tabs to navigate through the document). Section 2 includes a bullet point: 'Click here **Creating a Maintenance Strategy for Oracle E-Business Suite**' (May 2014 Oracle E-Business Suite Development Presentation). Below section 2, there is a 'Sample Slide:' section with a slide titled 'Keeping all E-Business Suite Components Up-To-Date'. The slide contains five numbered items: 1. EBS Updates, 2. Technology Stack, 3. Security Patches, 4. Interim Patches, and 5. R11i Minimum Extended Support Baseline, R12 Minimum Prerequisites.

Overview of EBS Patches | EBS Patches | EBS Technology Stack Patches | Critical Patch Updates | Oracle Standalone/Edge Applications | Support Policy & Minimum Patch Levels | EBS Patching Resources

Print Document | Search This Document

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(May 2014 Oracle E-Business Suite Development Presentation)

Sample Slide:








Keeping all E-Business Suite Components Up-To-Date

- 1 EBS Updates
- 2 Technology Stack
- 3 Security Patches
- 4 Interim Patches
- 5 R11i Minimum Extended Support Baseline
R12 Minimum Prerequisites

MOS Doc ID 1633974.2

Where Can I Find Updates?

Oracle Applications Manager → Patch Wizard

Patch Wizard Tasks			
Task Name	Description	Tasks	Job Status
Patch Wizard Preferences	Set download, merge, and stage area preferences		
Define Patch Filters	Create custom patch filters		
▶ Recommend/Analyze Patches	Submit requests for patch advice or analysis	▶ 	
Download Patches	Submit requests to download patches		
Aggregate Patch Impact	Aggregate Patch Impact		

MOS Doc ID 1400757.1

Define Your Preventive Maintenance Strategy

- A Keep Your Environment Up-To-Date
- B Keep Your Environment Healthy

Keep Your Environment Healthy

Database

- Generate Statistics
- Recompile Invalids
- Rebuild Indexes
- Reorganize Tables

Filesystem

- Log file cleanup
- Patching cleanup
- Pre-upgrade binary removal
- Space watcher

Keeping Your Environment Healthy

Archive and Purge

- Define retention requirements
- Deploy archive/purge routines
 - Use the Purge Portal
 - System Administrator Responsibility → Oracle Applications Manager → Purging/Critical Activities
 - Purge system data
 - Examples: Concurrent Requests, Workflow
 - Purge transactional data

- 1 Define Your Preventive Maintenance Strategy
- 2 Understand the Architecture, Tools and Options
- 3 Define Your Deployment Strategy

12.2 Patching Overview

Why Online Patching?

- Critical business operations are **not interrupted** by maintenance operations
- Revenue generating activities **stay online**
 - Web Orders
 - Booking Orders
 - Service Requests
- Business users **stay online**
 - Pay Suppliers
 - Pay Employees
 - Uninterrupted manufacturing operations
- Downtime required by any patch is **predictable**
 - Measured in minutes not days or hours
- Global Single Instances **remain operational 24*7**
 - Maintenance window easier to allocate as shorter time required

Maintenance with Oracle E-Business Suite 12.2

Changing the Patching Paradigm

- Downtime Patches
 - **No** online users
 - Wall clock time **very important**
 - Consumes **all resources**
 - Upgrade designed to run as **fast as possible**
- Online Patches
 - User remain **online**
 - Wall clock time is **no longer an overriding concern**
 - Online users **share resources**
 - Data upgrades designed to **not affect** the running application

Online Patching

E-Business Suite 12.2 Remains Online During Patching

- In 12.2 all patching operations are online
 - EBS will remain available to users during patching operations
- Different lines of Business are no longer affected by patching
 - Run Financials while applying an HR legislative updates
 - Run Manufacturing while applying Financials updates

Copy the Code, NOT the Data

- EBS uses both the file system and the database to store the code and data that make up the application
 - Code
 - Stored both on the File system & In the Database
 - Any code object changed in a patch is copied
 - Data
 - Stored both on the File system & In the Database
 - Application data is NOT copied by a patch

Patching Occurs on a Copy

- File system Patching
 - All patches are applied to a secondary file system
 - Synchronization of the file systems is managed by the patching tools
- Database Patching
 - A separate copy is maintained of all database code objects that are changed by a patch
 - Utilizes Edition-Based Redefinition feature of the Database

Downtime Redefined as “Cutover”

Changing the Unit of Measure for Downtime

- Cutover is the time taken to switch users from the production system to the newly patched copy
- Cutover changes the unit of measure for downtime
 - Measured in minutes **NOT** hours or days
- Cutover time is very predictable
 - The time taken to bounce the Middle Tiers

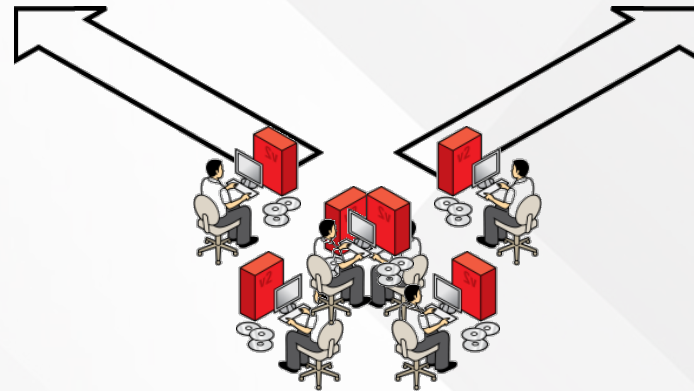
Downtime Limited to Short Cutover

Production

E-Business Suite
12.2.7

Patched Production

E-Business Suite
12.2.8



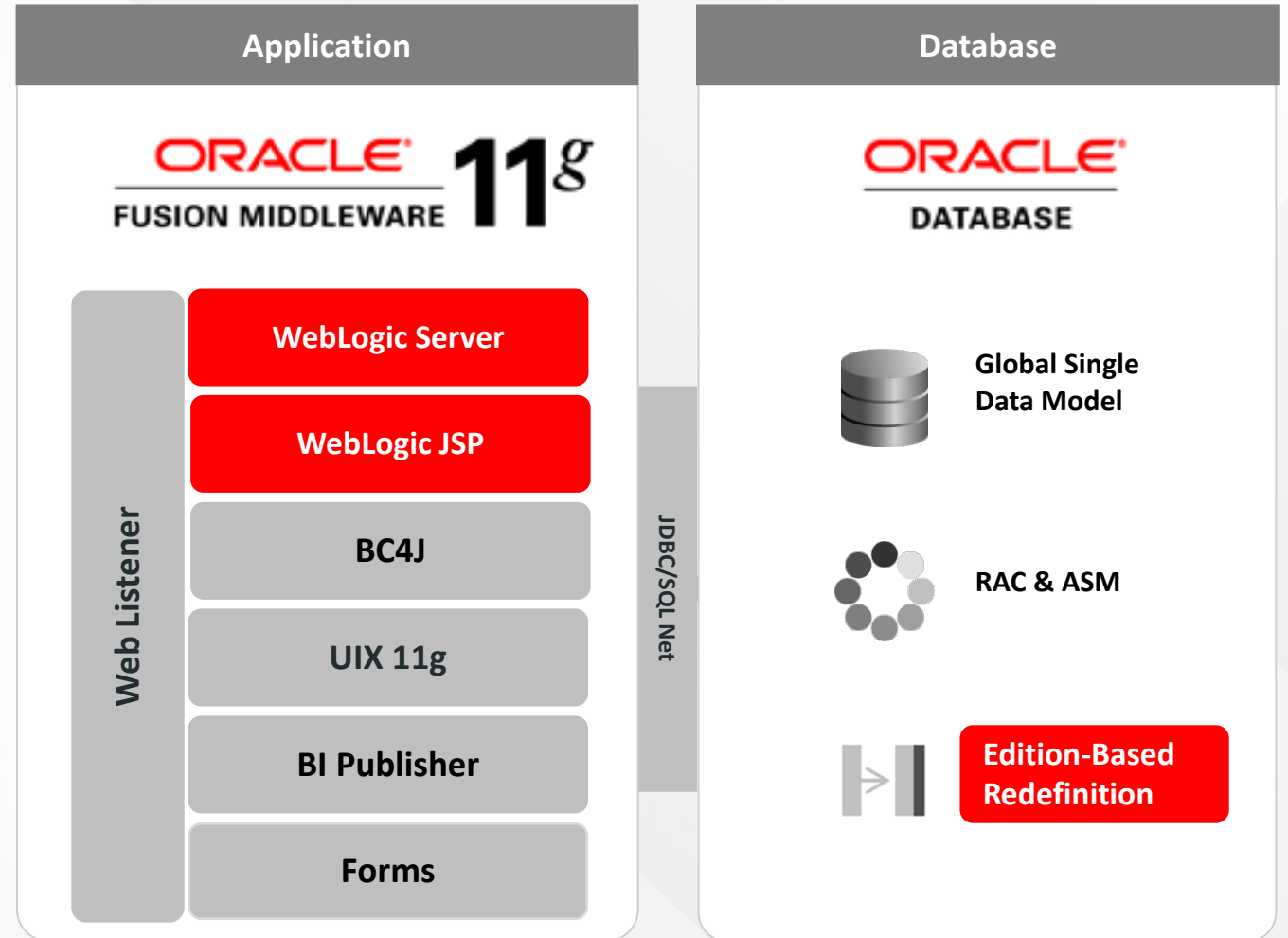
- Users are logged off the production Instance
- When users reconnect they are directed to the newly patched system

Oracle E-Business Suite 12.2 Architecture

Oracle E-Business Suite 12.2 Architecture

Latest Technology Stack Features

- Fusion Middleware
 - WebLogic Server
- Database
 - Edition-Based Redefinition(EBR)



Database Edition-Based Redefinition

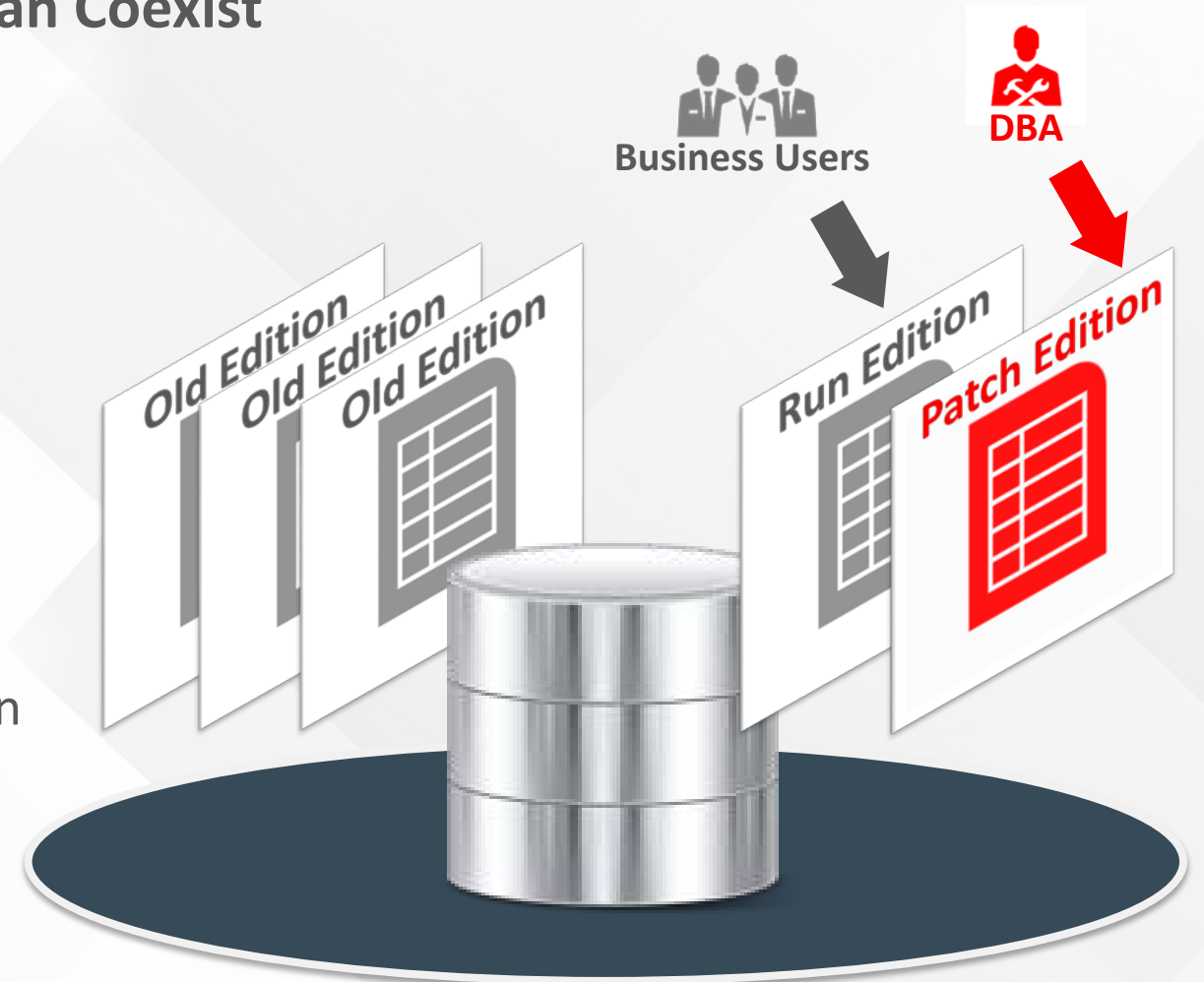
Oracle Database 11gR2 Edition-Based Redefinition (EBR)

- Key enabling technology for Online Patching
 - Enables the online upgrade of the application definition
 - Allows an application to efficiently store multiple copies of its code and schema in the same database
- Provides an isolation mechanism that allows pre-upgrade and post-upgrade schemas to co-exist
 - Changes to database objects are made in the isolation of an “**Edition**”
 - Changes to database objects do not affect the running application

Online Patching is Enabled by Oracle Database 11gR2 Edition-Based Redefinition

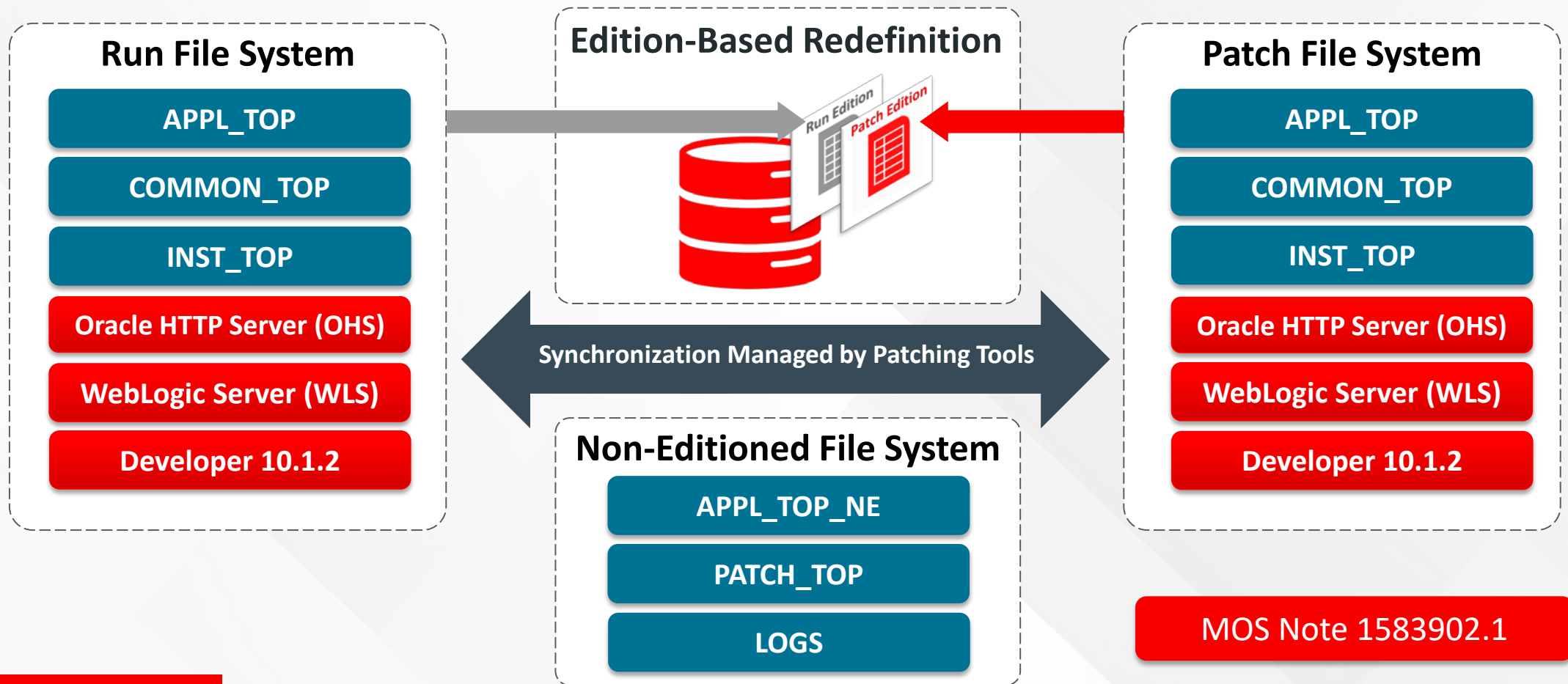
Multiple Copies of Database Code Objects Can Coexist

- Client code connects to an “edition” of the database
 - **Run Edition**
 - Used by online users
 - Never changed by a patch
 - **Patch Edition**
 - Used by patching tools
 - Changes do not affect the running application
- Patch Edition becomes the Run Edition at Cutover



Oracle E-Business Suite 12.2 Architecture

Dual File System and Edition-Based Redefinition



Dual File System

Online Patching Uses a Dual File System

- **Run file system**

- Used by online users
- Stores a complete copy of all Applications and Middle Tier code
- Logically mapped to either fs1 or fs2

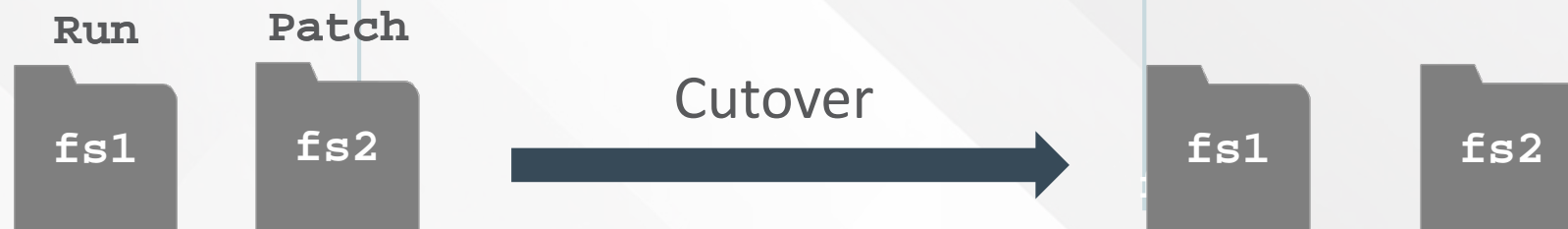
- **Patch file system**

- Used by patching tools
- Stores a complete copy of all Applications and Middle Tier code
- Logically mapped to either fs1 or fs2

- **Non-Editioned file system**

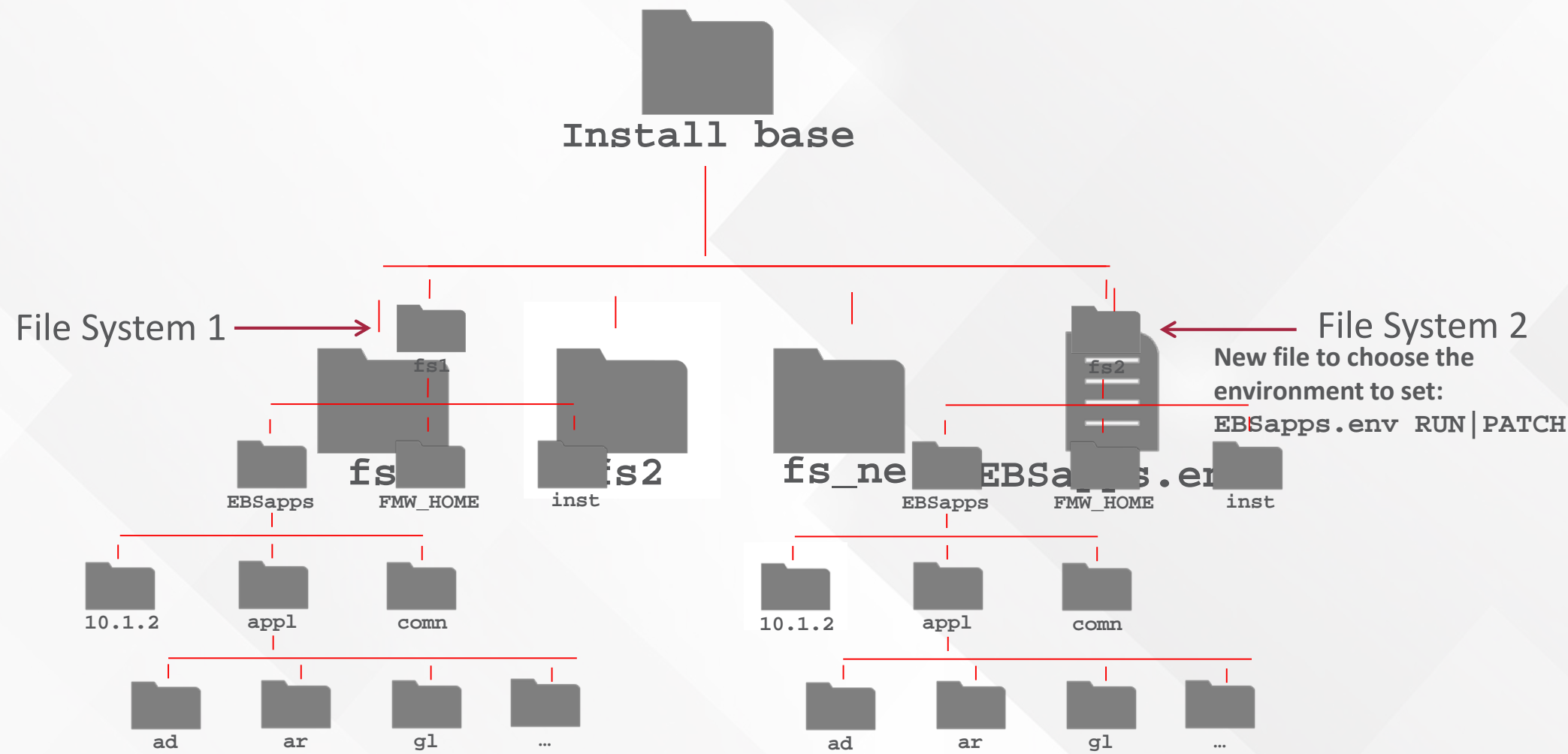
- Used for data files
e.g.: data import/export files, log files, report output files
- Only stores data files

fs1 and **fs2** switch **Run** and **Patch** designation during the cutover phase of an Online Patching cycle



E-Business Suite 12.2 File System Layout

Post Rapid Install Execution



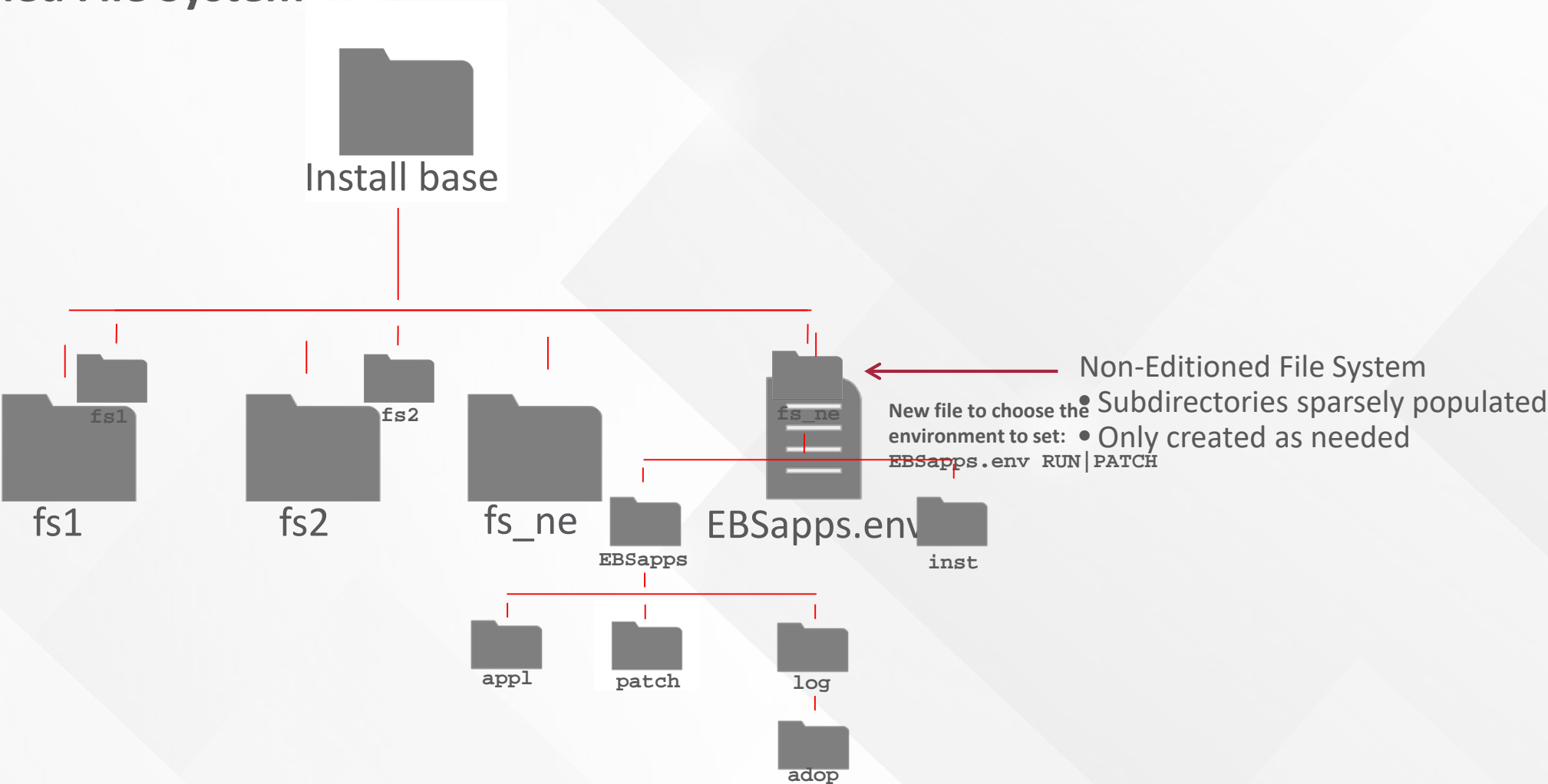
E-Business Suite 12.2 File System Layout

Non-Editioned File System

- Stores external data files
 - Human readable
 - Have a structure that is mostly independent of the application code level
 - Not directly patched by EBS Development and they should not be editioned
- Examples
 - Concurrent report output
 - Log files
 - Data import/export files
 - SSL certificates
 - File-based system integration
 - Patch downloads

E-Business Suite 12.2 File System Layout

Non-Edited File System



E-Business Suite 12.2 Environment Overview

Working with the E-Business Suite 12.2 Environment

- New script to setup the environment: **EBSapps.env RUN | PATCH**
- New environment variables for R12.2 to help you navigate the system
 - \$FILE_EDITION - Current fs edition type sourced, values: **run** or **patch**
 - \$RUN_BASE - RUN file system base directory
 - \$PATCH_BASE - PATCH file system base directory
 - \$NE_BASE - Non-edition file system base directory
 - \$APPL_TOP_NE - Application top that stores product files considered data
 - \$PATCH_TOP – Directory where the patch files are unzipped
 - On a **multi-node system** with **non-shared file** systems, you must copy the patch files to each separate \$PATCH_TOP directory, so that the patch files are available from the same location on all nodes

EBS 12.2 Environment Overview

Setting the E-Business Suite 12.2 Environment

- Source the Run environment

```
$ source EBSapps.env RUN  
  
E-Business Suite Environment Information  
-----  
  
RUN File System           : /scratch/orauser/im4kevin/fs2/EBSapps/appl  
PATCH File System        : /scratch/orauser/im4kevin/fs1/EBSapps/appl  
Non-Edited File System    : /scratch/orauser/im4kevin/fs_ne  
DB Host: rws3270749.us.oracle.com  Service/SID: im4kevin  
Sourcing the RUN File System ...
```

← **Note:** fs2 is the RUN file system

- Echo environment variables

```
$ echo $FILE_EDITION      : run  
$ echo $RUN_BASE          : /scratch/orauser/im4kevin/fs2  
$ echo $PATCH_BASE       : /scratch/orauser/im4kevin/fs1  
$ echo $NE_BASE           : /scratch/orauser/im4kevin/fs_ne  
$ echo $APPL_TOP_NE       : /scratch/orauser/im4kevin/fs_ne/EBSapps/appl  
$ echo $PATCH_TOP        : /scratch/orauser/im4kevin/fs_ne/EBSapps/patch
```

← **Note:** RUN file system is sourced

← **Note:** fs2 is the RUN file system

E-Business Suite 12.2 File System Layout

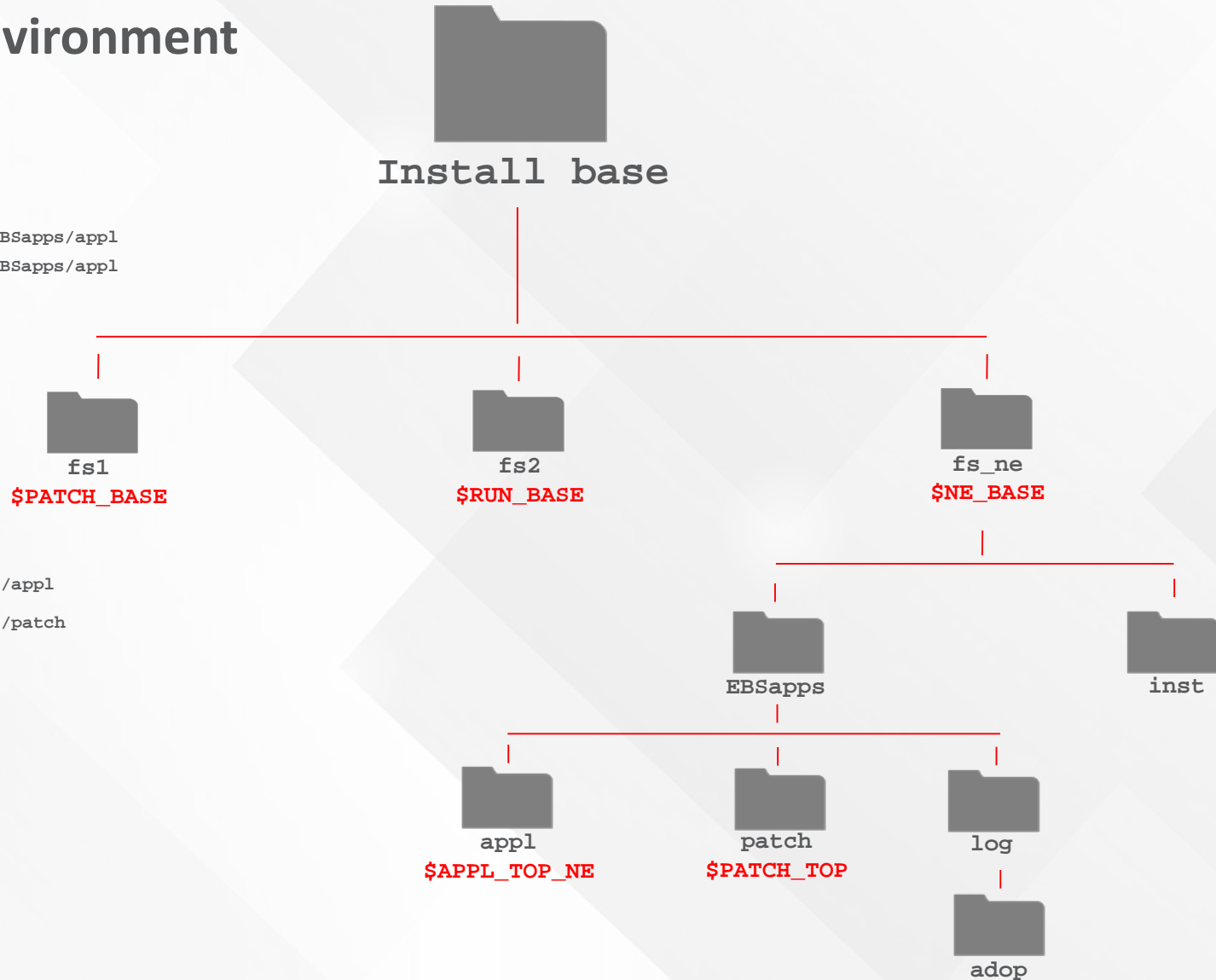
Working with the EBS 12.2 Environment

- Source the Run environment

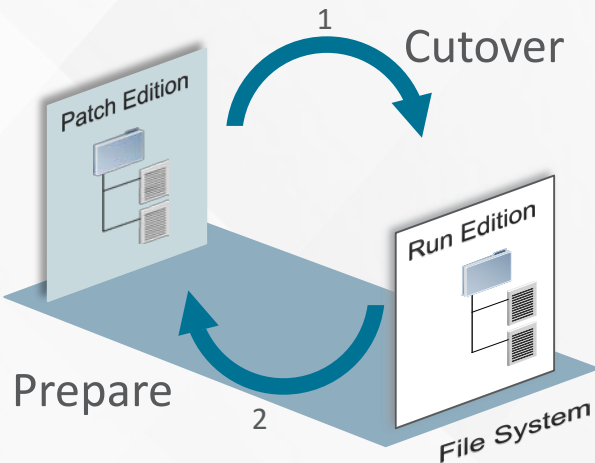
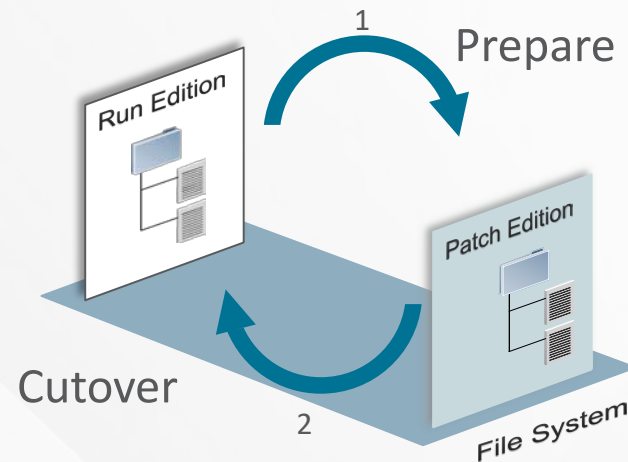
```
$ source EBSapps.env RUN
E-Business Suite Environment Information
-----
RUN File System          : /scratch/orauser/im4kevin/fs2/EBSapps/appl
PATCH File System       : /scratch/orauser/im4kevin/fs1/EBSapps/appl
Non-Edited File System   : /scratch/orauser/im4kevin/fs_ne
DB Host: rws3270749.us.oracle.com  Service/SID: im4kevin
Sourcing the RUN File System ...
```

- Echo environment variables

```
$ echo $FILE_EDITION : run
$ echo $RUN_BASE      : /scratch/orauser/im4kevin/fs2
$ echo $PATCH_BASE   : /scratch/orauser/im4kevin/fs1
$ echo $NE_BASE       : /scratch/orauser/im4kevin/fs_ne
$ echo $APPL_TOP_NE   : /scratch/orauser/im4kevin/fs_ne/EBSapps/appl
$ echo $PATCH_TOP    : /scratch/orauser/im4kevin/fs_ne/EBSapps/patch
```

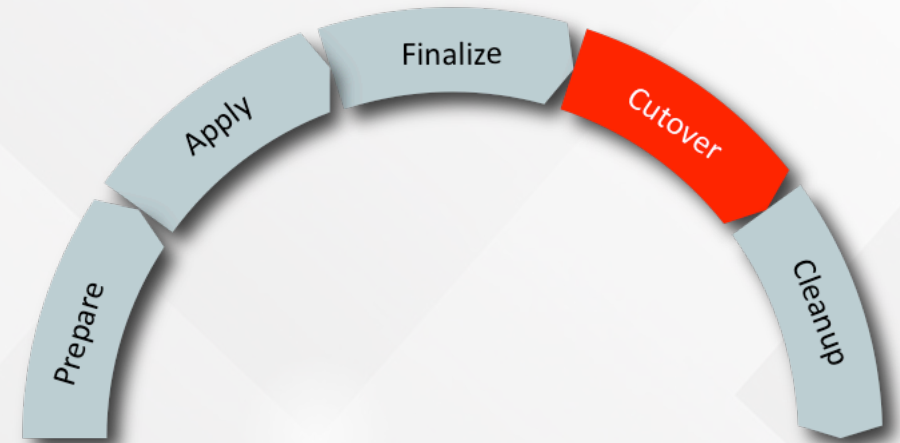


E-Business Suite 12.2 File Systems Patching Cycle



- Two complete file systems are always present
 - Run Edition - Used by the running Application
 - Patch Edition - Either:
 - Currently being patched
 - or
 - Waiting for the next patching cycle
- The two files systems are rotated between Run and Patch during every patch cycle

E-Business Suite 12.2 Online Patching Cycle



Online Patching Cycle Orchestration

- Formalized Patching Cycle
 - New utility to orchestrate the Online Patching cycle
 - **adop** replaces **adpatch** as the EBS 12.2 patching tool
 - Supports single and multi-node environments
 - Dual file systems are synchronized automatically
 - Database Editions are managed automatically
- Users remain **online** during patching
 - Patching CANNOT affect the running application
 - Data model changes (tables, indexes...)
 - Code changes (pl/sql, views, c code, java code...)
 - Running application CANNOT affect the patch

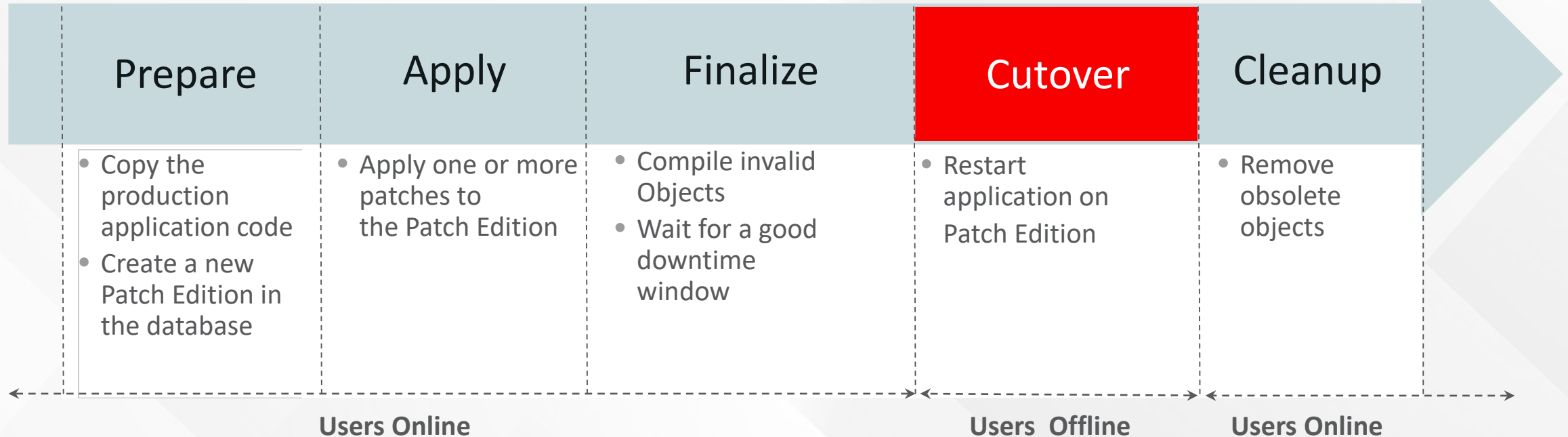
Understanding the Online Patching Cycle



- Online Patching is used to apply all EBS patches in EBS 12.2
- Online Patching cycle includes 5 major phases
- New patching tool “adop” orchestrates the patching cycle

Understanding the Online Patching Cycle

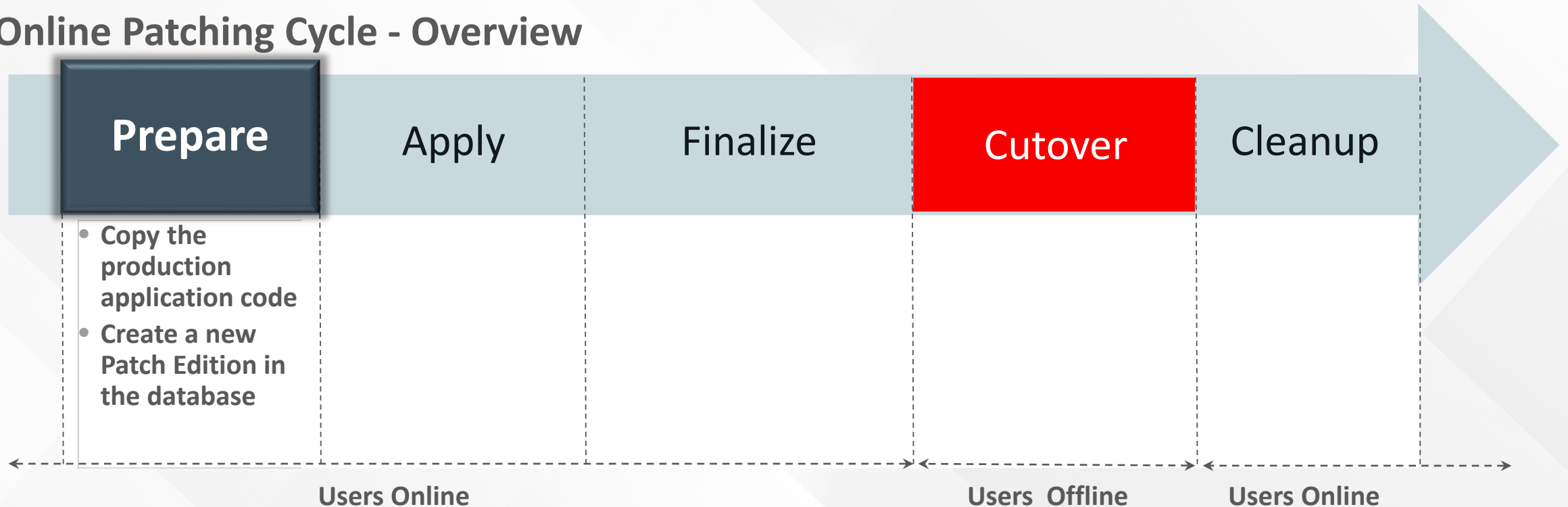
Online Patching Cycle - Overview



- Online Patching is used to apply all EBS patches in EBS 12.2
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- New patching tool “adop” orchestrates the patching cycle

Understanding the Online Patching Cycle

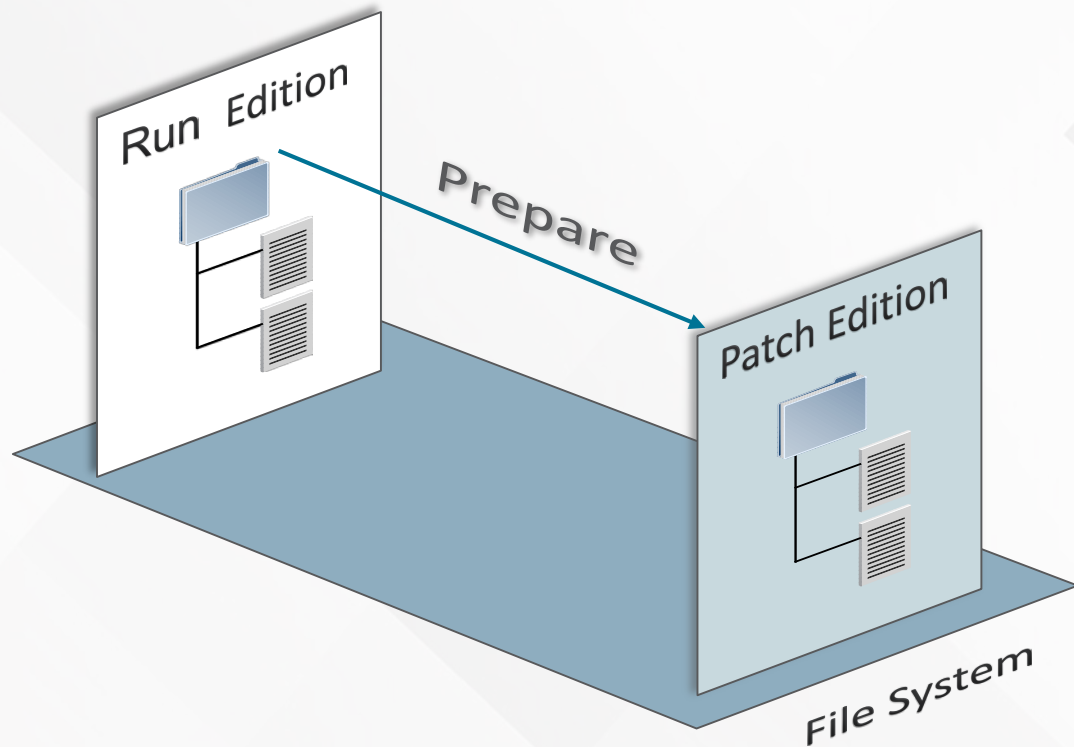
Online Patching Cycle - Overview



- Synchronizes Patch Edition and Run Edition on the file system
- Create a new Patch Edition in the database

Online Patching Cycle – Prepare Phase

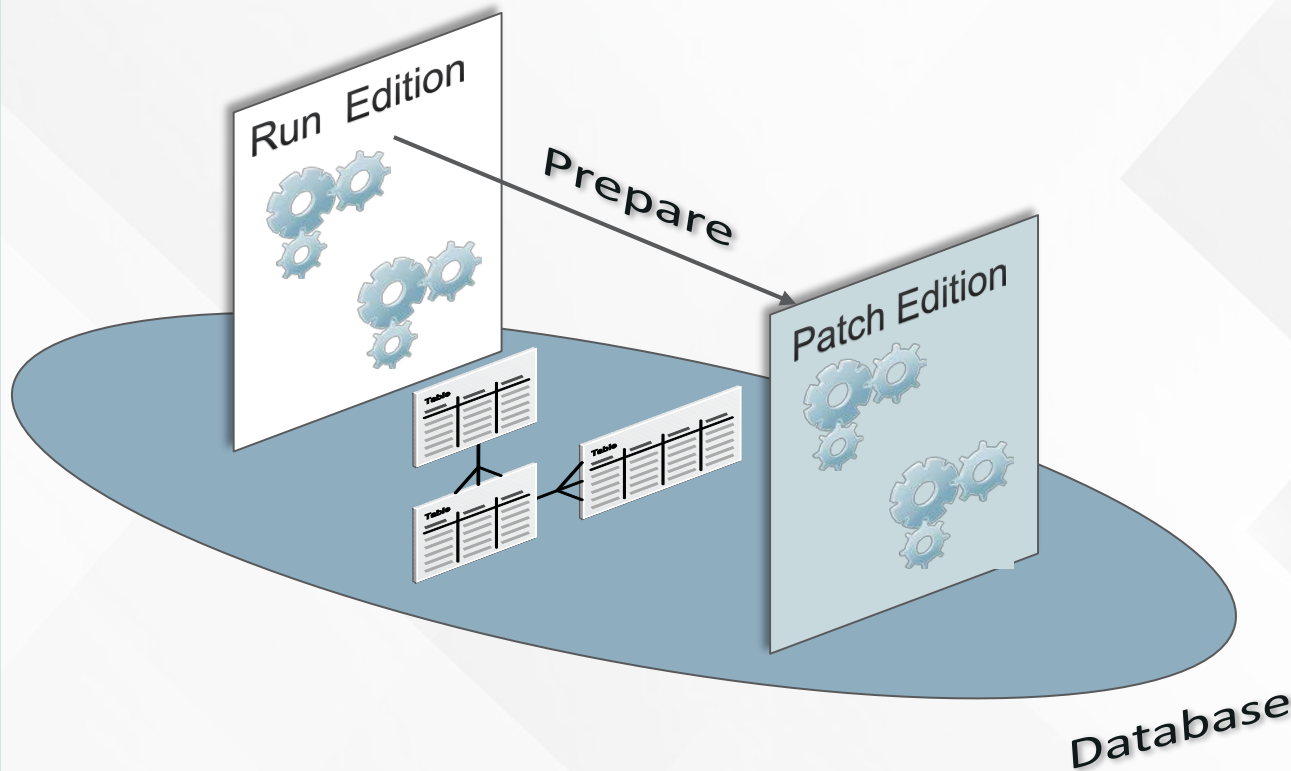
Preparing the File System



- Patch Edition & Run Edition of the file systems are synchronized
- All files on the Patch Edition are an exact copy of the files on the Run Edition
- Efficient synchronization
 - Incremental synchronization is the default
 - Only files changed in the last patch application are copied
 - Full synchronization available if necessary

Online Patching Cycle – Prepare Phase

Preparing the Database



- Patch Edition is created in the database
- All code objects in the Patch Edition begin as pointers to code objects in the Run Edition
- Efficient use of space
 - Objects are only “Actualized” into the Patch Edition when a new revision of the code is applied
- Storage objects such as tables are not copied
- New patching standards are followed for upgrading storage objects

Online Patching Cycle – Prepare Phase

What to Know

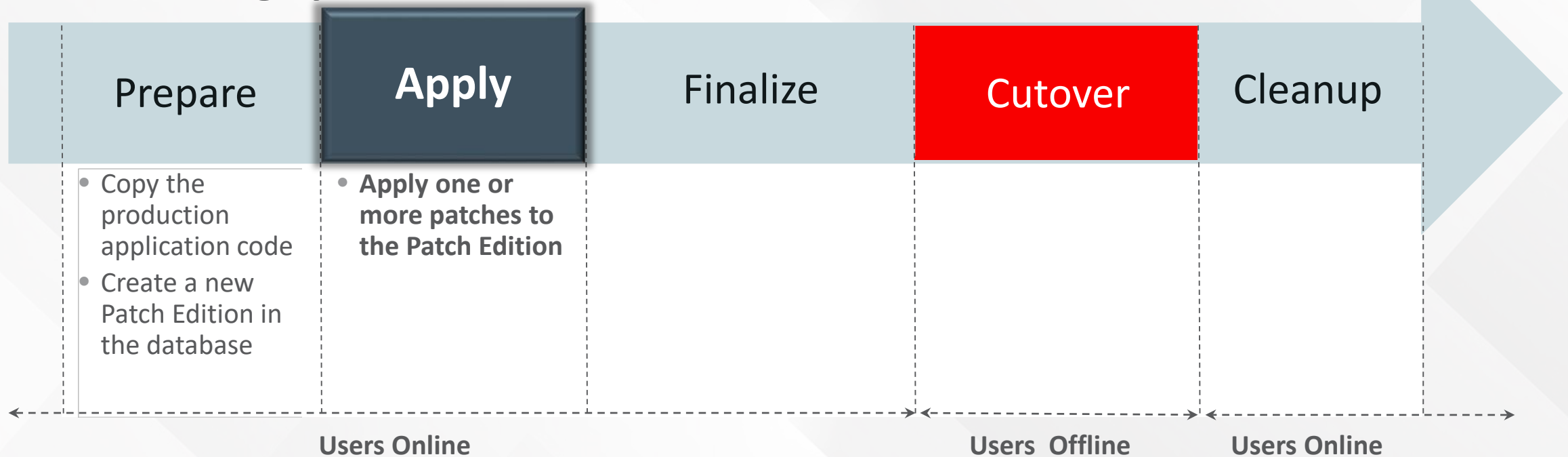
- ADOP controls preparing the system for patching
- Validates system configuration to ensure that the system is ready to start an Online Patching cycle.
- Prepare is run on all nodes in a multi-node configuration
- Synchronizes the Run and Patch File System
- Creates the Database Patch Edition

What to Do

- Execute prepare on the primary node
`$ adop phase=prepare`

Understanding the Online Patching Cycle

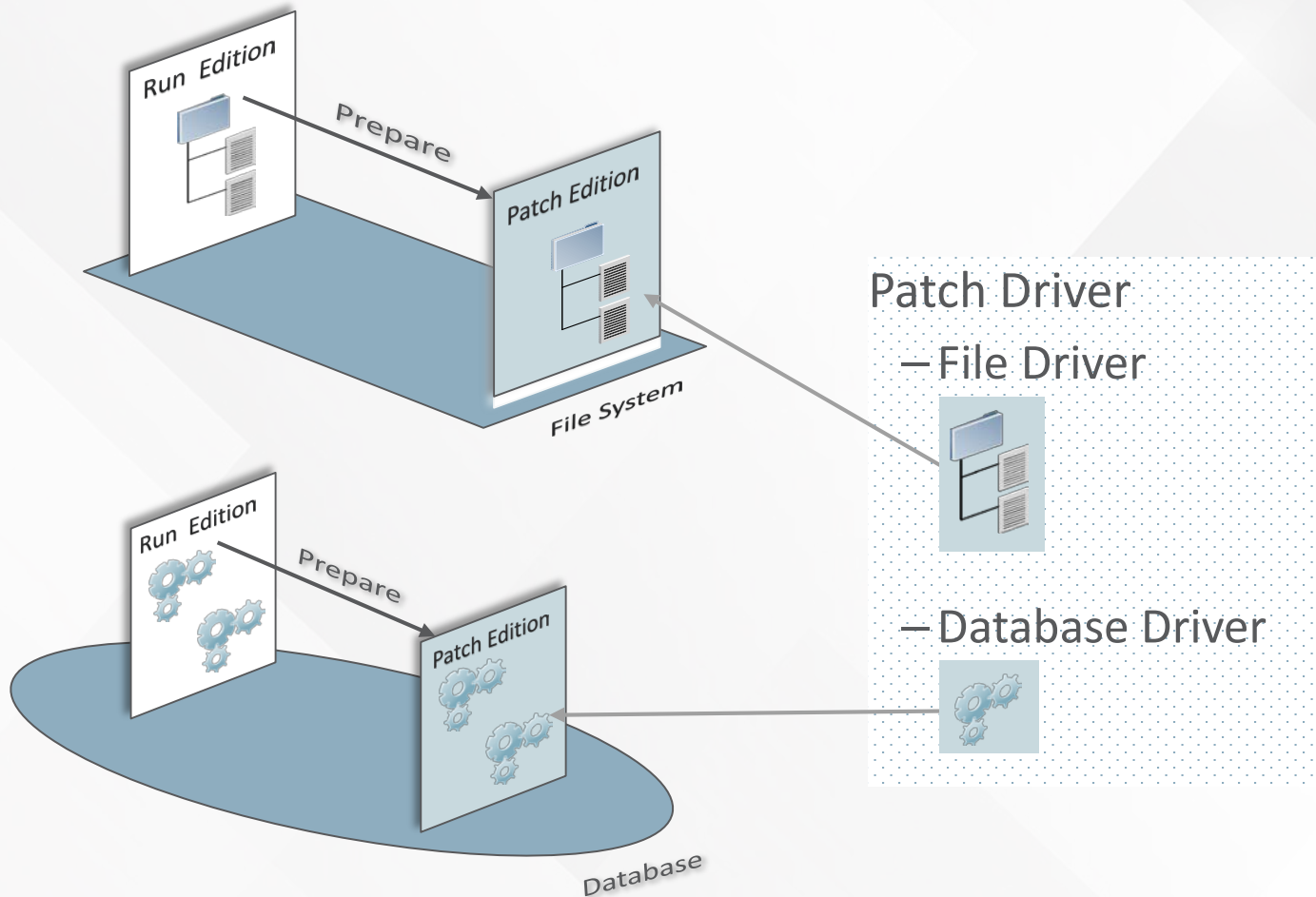
Online Patching Cycle - Overview



- Execute patch drivers to update Patch Edition
- Multiple patches can be applied, **including customizations**

Online Patching Cycle - Apply

Applying Patches



- Patches are applied to the copy (Patch Edition)
- The production application is unaffected by the changes
 - Users are connected to the Application and can perform their work unaffected by the patch
- Changes are made in the isolation of an Edition
 - The running application is unaffected by these changes

Online Patching Cycle - Apply

What to Know

- ADOP controls application of patches to the file system and database
- Multiple patches can be applied in the same patching cycle
- Supports all options previously supported by adpatch
- Supports fully automated execution via inputs files

What to Do

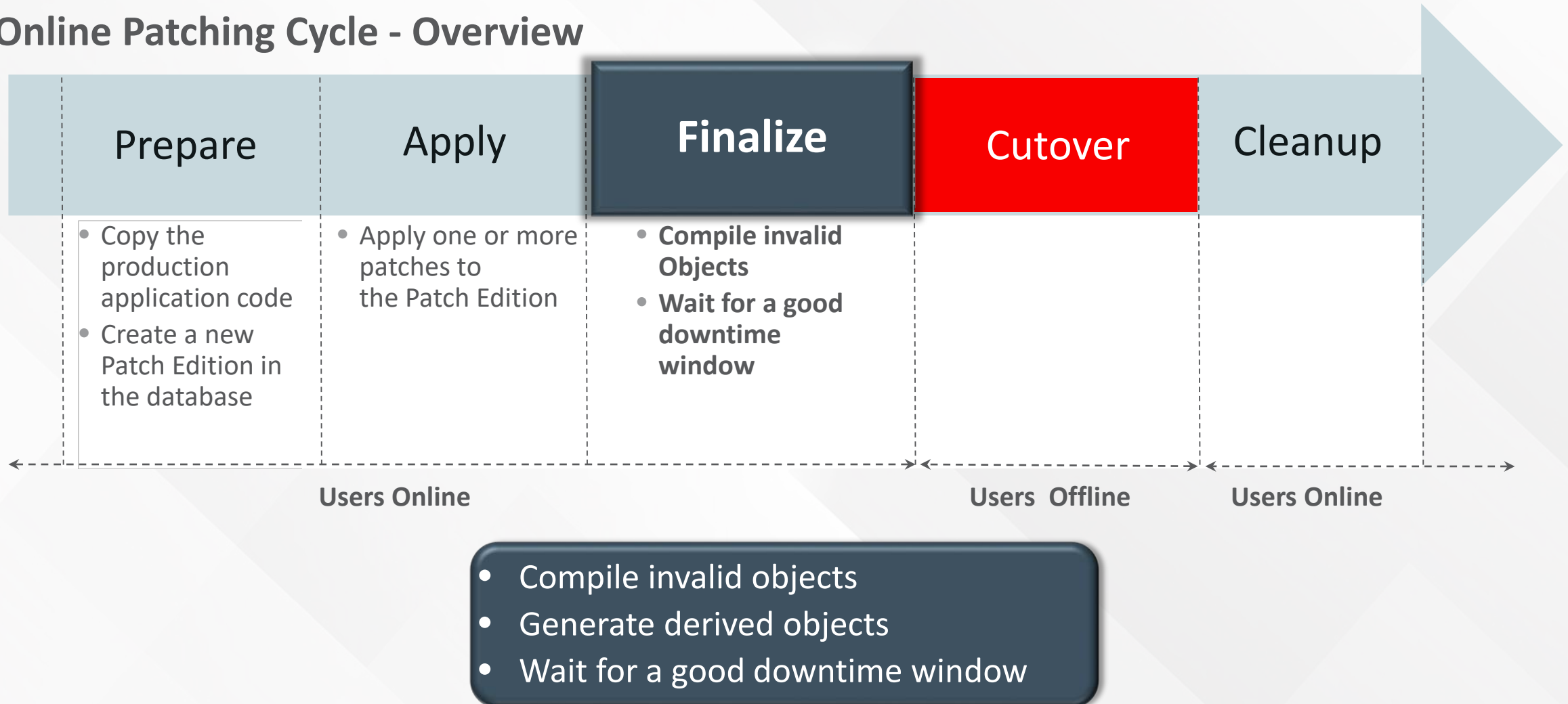
- Execute adop apply on the primary node

```
$ adop phase=apply patches=12345  
$ adop phase=apply patches=1234,5678,9876  
$ adop phase=apply patches=1234,5678 workers=4  
$ adop input_file=April2016.txt
```

```
April2016.txt  
phase=prepare,apply,finalize  
patches=1234,5678,9876  
workers=4
```

Understanding the Online Patching Cycle

Online Patching Cycle - Overview



Online Patching Cycle - Finalize

What to Know

- Performs any remaining processing that is needed to ensure the system is ready for the fastest possible cutover
 - Object compilation
- Environment can pause at this stage for as long as required
- Default `finalize_mode` is quick
 - Full mode computes statistics on key data dictionary tables for improved performance

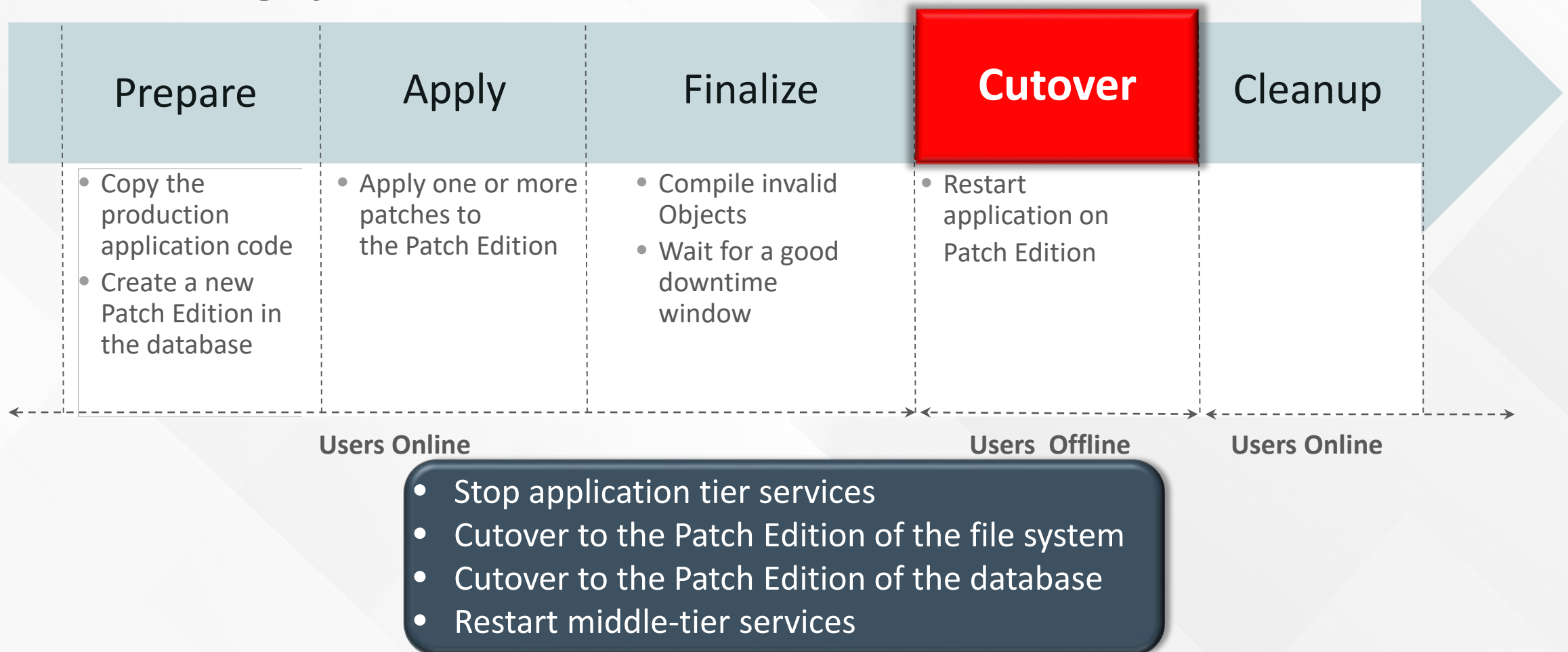
What to Do

- Execute `adop finalize` on the primary node

```
$ adop phase=finalize
$ adop phase=finalize finalize_mode=quick
$ adop phase=finalize finalize_mode=full
```

Understanding the Online Patching Cycle

Online Patching Cycle - Overview

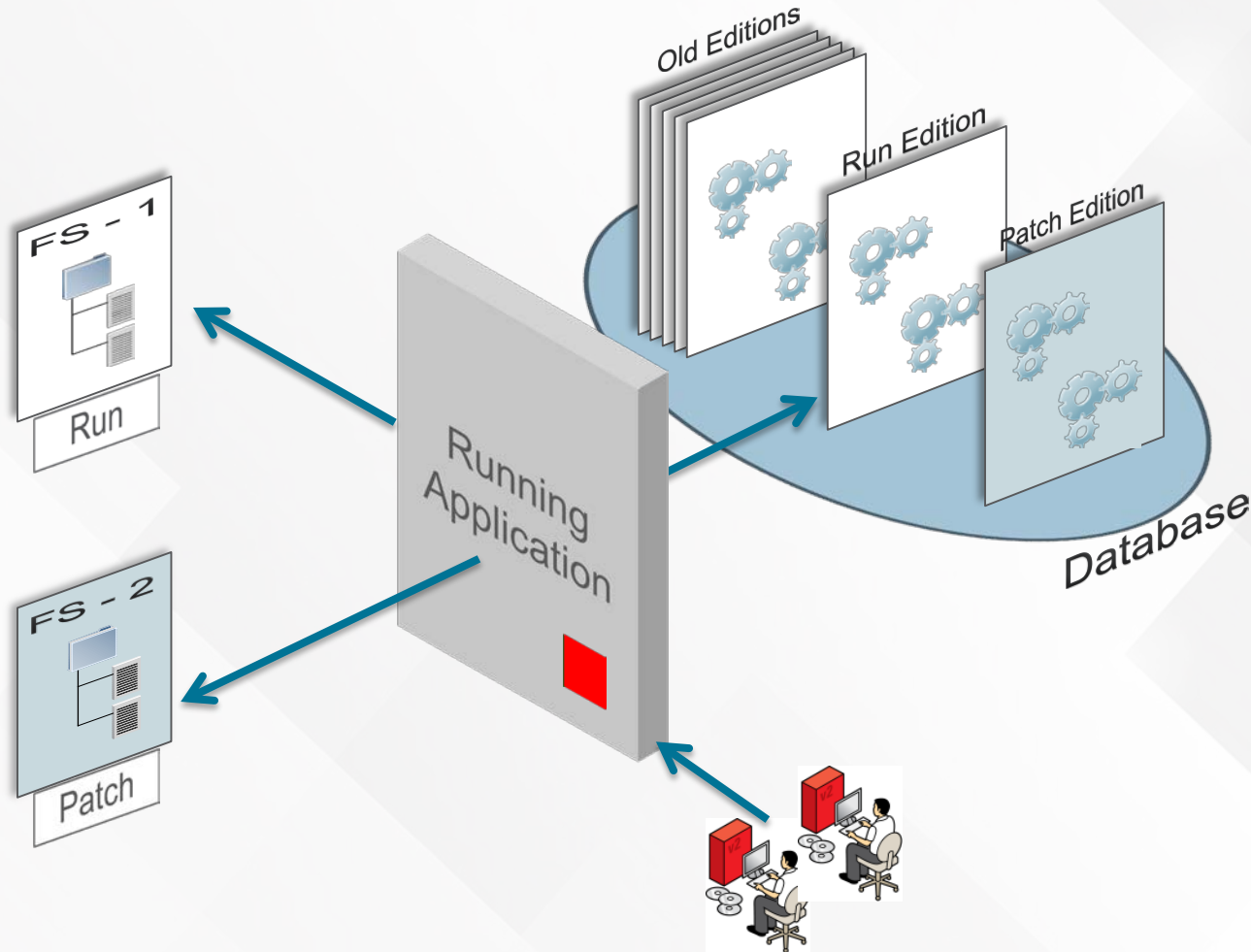


Online Patching Cycle - Cutover

- During cutover a brief downtime is taken
 - Middle tier services are stopped and users are logged off the system
 - The Patch file system is promoted to be the Run file system
 - The Patch database edition is promoted to be the Run database edition
 - Perform final maintenance operations
 - Middle tier services are restarted
 - Users are brought back online on the patched system
- The database does NOT need to be and should not be bounced during cutover

Online Patching Cycle - Cutover

Cutover Automatically Manages all Services on all Nodes



- Middle-tier processes stopped
 - Manages all nodes in the configuration via remote execution
 - End Users are disconnected
- File system roles swapped
 - Patched (FS-2) promoted to Run
 - FS-1 available for next patching cycle
- Database Patch Edition promoted to Run Edition
- Middle-tier processes restarted
 - Manages all nodes in the configuration via remote execution
 - Users reconnect

Online Patching Cycle - Cutover

What to Know

- Cutover represents the official downtime for an EBS patch
 - Application tier services are automatically shut down and restarted on all nodes
- You must ensure that no users remain on the system during cutover
 - Any third-party processes connected to the old run edition of the database should be shut down, otherwise they will be terminated automatically
- Cutover will take longer if it has to wait for long-running concurrent processes to complete
 - You can terminate the internal concurrent manager by executing the **adcmctl.sh abort** command

What to do

- Execute adop cutover on the primary node
\$ adop phase=cutover

Online Patching Cycle - Cutover

Deferring Application Tier Restart

What to Know

- In some cases, you may need to perform additional manual steps after cutover but before restarting the application tier services
 - Apply customizations
 - Patch the database tier
- You must start the application tier services manually after performing additional steps

What to do

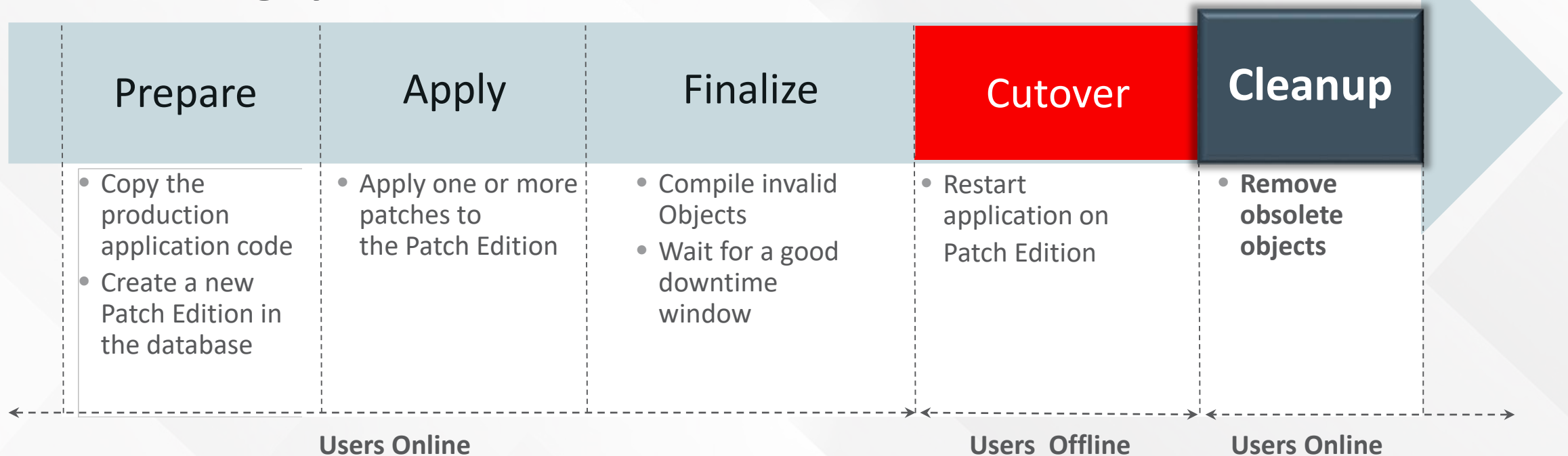
- Execute adop cutover on the primary node without starting the application services

```
$ adop phase=cutover mtrestart=no
```
- Perform manual steps
- Start application tier services manually

```
$ source EBSapps.env run
$ adstrtal.sh -mode=allnodes
```

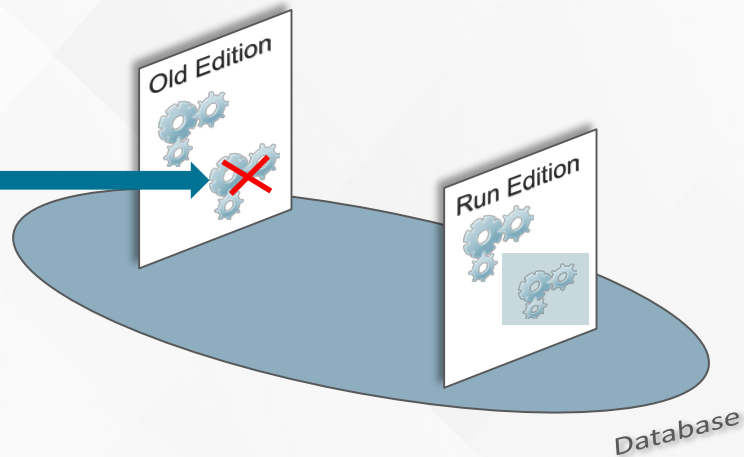
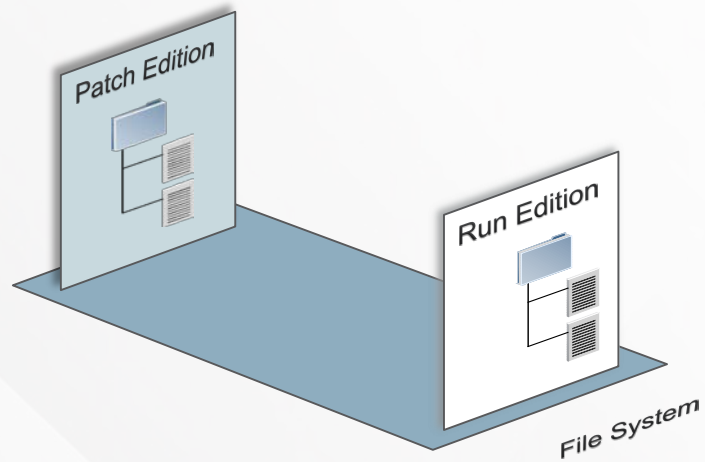
Understanding the Online Patching Cycle

Online Patching Cycle - Overview



- Cleanup old editions to recover space
- Cleanup occurs after the users have been brought back online

Online Patching Cycle - Cleanup



- Cleanup occurs after users have been brought back online to the newly patched Application
- File system
 - The pre-patch file system is now ready for the next patching cycle
 - Re-synchronized
- Database
 - Code objects patched in the latest patching cycle are deleted from Old Editions
 - Once all objects are deleted from an Old Edition it is also deleted

Online Patching Cycle - Cleanup

What to Know

- Users are online during the cleanup process
- Removes obsolete objects from the system to recover space
- If you fail to run the cleanup phase explicitly, it will be run automatically on the next prepare cycle
 - This will cause a delay in starting your next online patching cycle
- Three cleanup_modes are available
 - **quick** - Performs only essential cleanup tasks
 - **standard** (default) - Removes obsolete code objects
 - **full** - Performs maximum cleanup, which drops all obsolete code and data from earlier editions

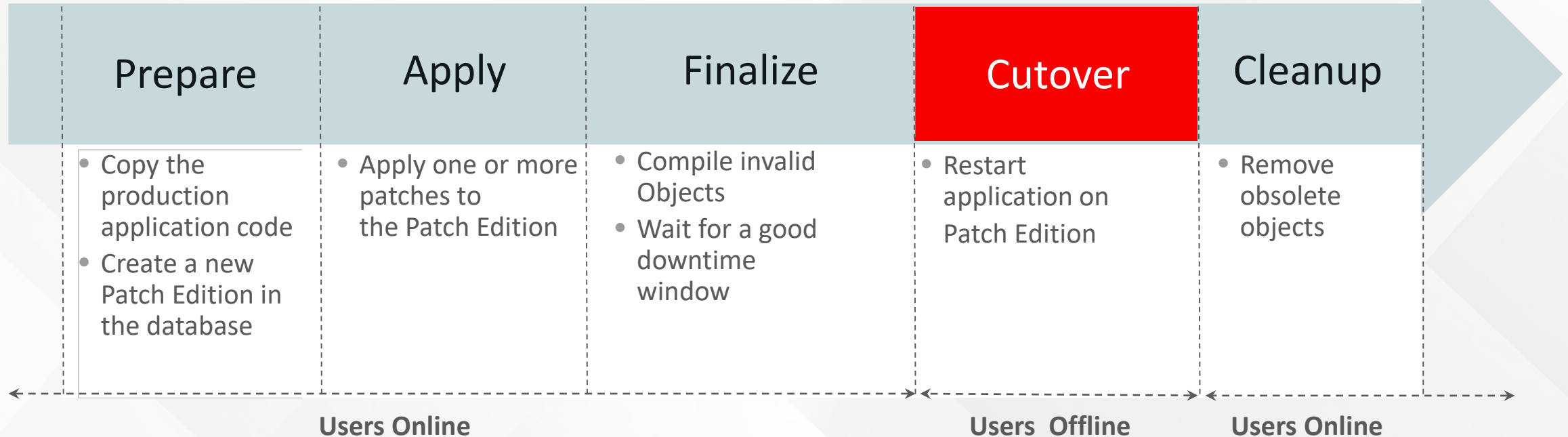
What to do

- Execute adop cutover on the primary node

```
$ adop phase=cleanup
$ adop phase=cleanup cleanup_mode=quick
$ adop phase=cleanup cleanup_mode=full
```


Understanding the Online Patching Cycle

Online Patching Cycle - Overview



- Online Patching is used to apply all EBS patches in EBS 12.2
- Online Patching cycle includes 5 major phases
- New patching tool “adop” orchestrates the patching cycle

Monitor The Online Patching Cycle

Display Status of a Single Node Online Patching Cycle

```
$ adop -status
```

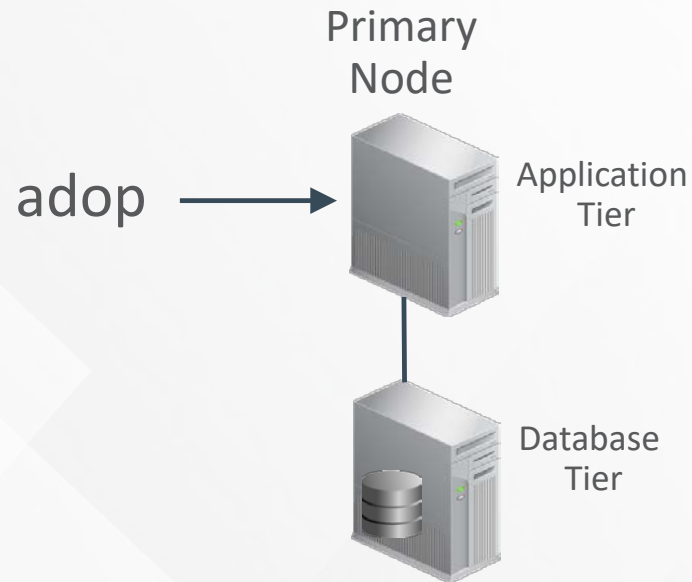
Node Name	Node Type	Phase	Status	Started			Finished			Elapsed
ebsnode01	Primary	PREPARE	COMPLETED	11-APR-15	04:10:19	-07:00	11-APR-15	04:13:55	-07:00	0:03:39
		APPLY	COMPLETED	11-APR-15	04:15:00	-07:00	11-APR-15	04:26:01	-07:00	0:11:01
		FINALIZE	COMPLETED	11-APR-15	04:27:02	-07:00	11-APR-15	04:28:40	-07:00	0:01:38
		CUTOVER	COMPLETED	11-APR-15	04:28:26	-07:00	11-APR-15	04:38:05	-07:00	0:09:39
		CLEANUP	COMPLETED	11-APR-15	04:45:02	-07:00	11-APR-15	04:46:11	-07:00	0:01:09

Online Patching Cycle – Multi-Node

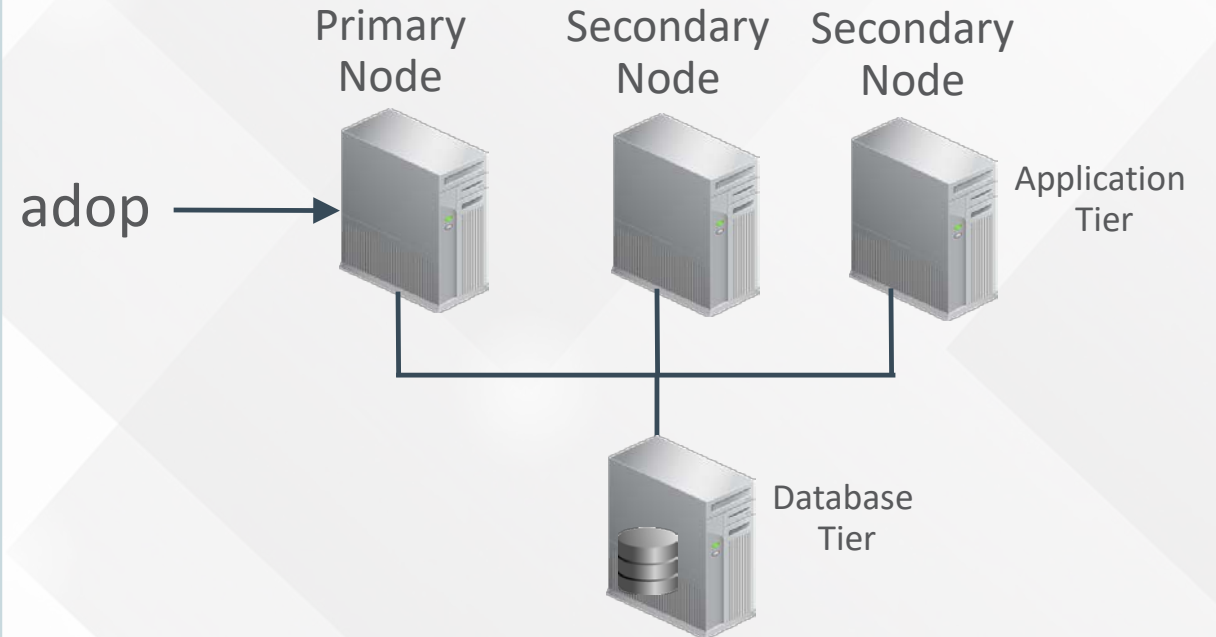
- Completely automated in multi-node deployments through adop
- No distinction between environments that are:
 - Shared file system configuration
 - Non shared file system configuration
- Primary node takes control of the patching cycle
 - Performed by remote command invocations across nodes
 - Remote command invocation setup required

Online Patching Cycle – Multi-Node

Always Execute **adop** on the Primary Node



Single Application Tier Node



Multiple Application Tier Nodes

Online Patching Cycle – Multi-Node

What to Know

- In a multi-node deployment, adop commands are only executed from the primary node.
- The primary adop node uses remote execution to automatically perform required actions on any secondary node
 - Remote command invocations from the primary node to all secondary nodes must be enabled.

What to Do

- On the primary node

```
$ adop phase=prepare
$ adop phase=apply patches=12345
$ adop phase=finalize
$ adop phase=cutover
$ adop phase=cleanup
```

Multi-Node Configuration Automatically Managed

Display Status of a Multi-Node Online Patching Cycle

```
$ adop -status
```

```
Current Patching Session ID: 75
```

Node Name	Node Type	Phase	Status	Started	Finished	Elapsed
ebsapi01d	Primary	PREPARE	COMPLETED	14-NOV-14 09:59:33 -05:00	14-NOV-14 10:14:11 -05:00	0:14:38
		APPLY	NOT STARTED			
		FINALIZE	NOT STARTED			
		CUTOVER	NOT STARTED			
		CLEANUP	NOT STARTED			
ebsape01d	Secondary	PREPARE	COMPLETED	14-NOV-14 09:59:45 -05:00	14-NOV-14 10:13:18 -05:00	0:13:33
		APPLY	NOT STARTED			
		FINALIZE	NOT STARTED			
		CUTOVER	NOT STARTED			
		CLEANUP	NOT STARTED			
ebsape02d	Secondary	PREPARE	COMPLETED	14-NOV-14 09:59:38 -05:00	14-NOV-14 10:16:32 -05:00	0:16:54
		APPLY	NOT STARTED			
		FINALIZE	NOT STARTED			
		CUTOVER	NOT STARTED			
		CLEANUP	NOT STARTED			

```
File System Synchronization Used in this Patching Cycle: Full
```

Patching Application Tier Technology Stack

Applying Application Tier Technology Stack Updates

Oracle E-Business Suite 12.2

What to Know

- Application tier technology stack updates can be
 - Applied to the PATCH file system while EBS is online
 - Applied in conjunction with an EBS Online Patching cycleor
 - Applied as a separate Online Patching exercise
- A full re-clone must be performed after applying Application tier patches to synchronize the RUN and PATCH file systems

What to Do

- Prepare the PATCH filesystem.
- Apply technology stack patches to PATCH filesystem.
- Apply EBS patches (optional).
- Coordinate time for CUTOVER and complete the online patching cycle.
- Synchronize the technology stack patches between the RUN and PATCH filesystems.

MOS Doc ID 1594274.1

EBS 12.2 FMW 11g Homes and Patch Inventory Commands

FMW Common

Set Environment (ORACLE_HOME & Path)

```
$ . $FMW_HOME/SetCommon.env
```

Patch Inventory Command

```
$ opatch lsinventory
```

Web Tier & Utilities (OHS)

Set Environment (ORACLE_HOME & Path)

```
$ . $FMW_HOME/SetWebtier.env
```

Patch Inventory Command

```
$ opatch lsinventory
```

WebLogic Server

Change Directory

```
$ cd $FMW_HOME/utils/bsu
```

Patch Inventory Report

```
$ bsu.sh -report  
-bea_home=$FMW_HOME \
```

Forms Server

Set Environment (ORACLE_HOME & Path)

```
$ source .EBSapps.env PATCH
```

Patch Inventory Command

```
$ opatch lsinventory
```

Applying Application Tier Technology Stack Updates

Oracle E-Business Suite Release 12.2

Online Patching Cycle

Prepare

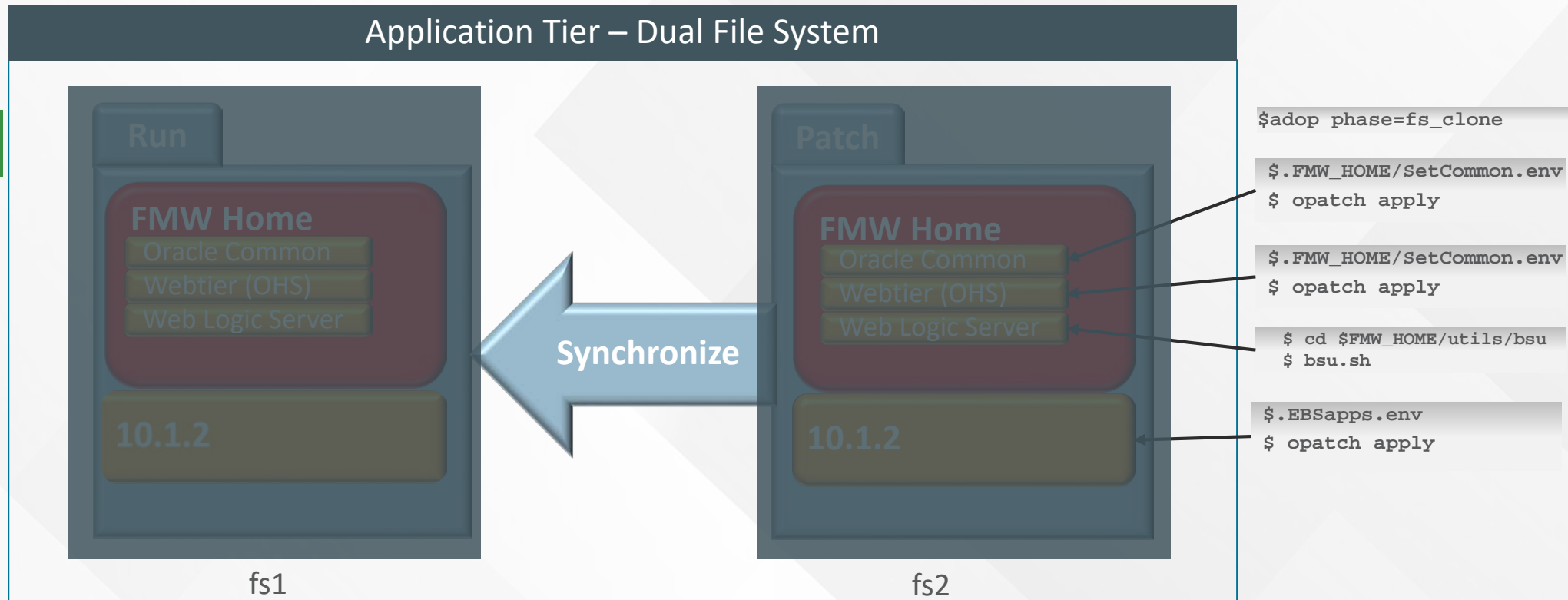
Apply

Finalize

Cutover

Cleanup

FS Clone



- 1 Define Your Preventive Maintenance Strategy
- 2 Understand the Architecture, Tools and Options
- 3 Define Your Deployment Strategy

Define Your Deployment Strategy

1 Define the Maintenance Schedule

- Document your Service Level Agreement (SLA)
 - Unplanned Downtime, Planned Downtime (maintenance)
- Define SLA for production and non-production environments
- Publish your schedule
 - Daily, Weekly, Monthly, Yearly

Define Your Deployment Strategy

2 Create Your Maintenance Plan Template

- Document your standards and processes
 - Oracle patches and updates
 - Your customization inventory and deployment process
 - *Developing and Deploying Customizations in Oracle E-Business Suite Release 12.2,*
MOS Doc ID 1577661.1
 - Test plans (functional regression, load/stress tests, customizations)
- Incorporate recommended tips, features and tools

Define Your Deployment Strategy

3 Define Your Deployment Lifecycle

- Define number of iterations and flow.
 - For example:
 - Dev → QA → Prod
 - Dev → Test → QA → Prod
- Execute Test Plan
 - Test, Test, Test

Define Your Deployment Strategy

4 ➤ Create a Deployment Plan from Your Maintenance Plan Template

- Document all steps, issues and issue resolutions/workarounds
- Optimize the plan
 - Script manual steps
 - Identify tasks that can be executed in parallel
 - Identify and perform tasks that can be performed while system is online
- Capture timing estimates for each step
- Practice, practice, practice (especially important for major upgrades)

Plan for Database Administrators and Developers

Stay Current with Documentation Updates

- Oracle® E-Business Suite Concepts Release 12.2
- Oracle® E-Business Suite Maintenance Guide Release 12.2
- Oracle® E-Business Suite Developer's Guide Release 12.2
- Oracle® E-Business Suite Release 12.2 Information Center (Doc 1583110.1)
- Developing and Deploying Customizations in Oracle E-Business Suite Release 12.2 (Doc 1577661.1)
- Guidance for Integrating Custom and Third-Party Products with Oracle E-Business Suite Release 12.2 (Doc 1916149.1)
- Oracle E-Business Suite Release 12.2: Online Patching FAQ (Doc 1583902.1)

Questions





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