

ORACLE®

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

*Great Lakes Oracle Conference*

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Oracle

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# Safe Harbor Statement

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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**



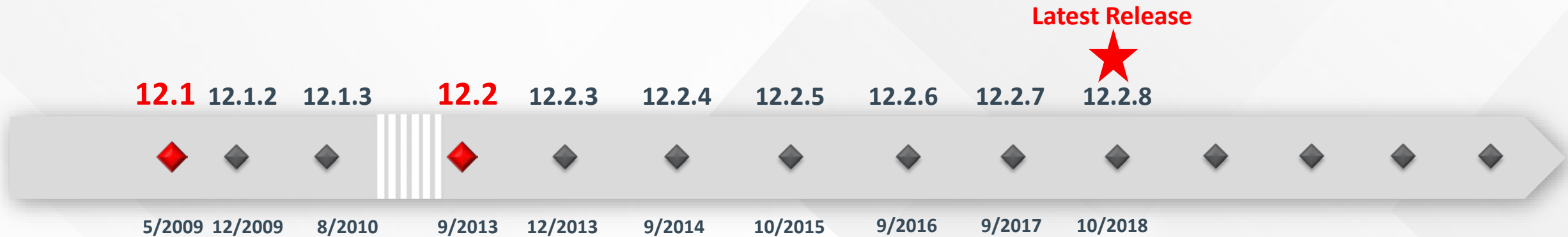
# CONTINUOUS INNOVATION ON EBS 12.2 WITH PREMIER SUPPORT THROUGH AT LEAST 2030

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

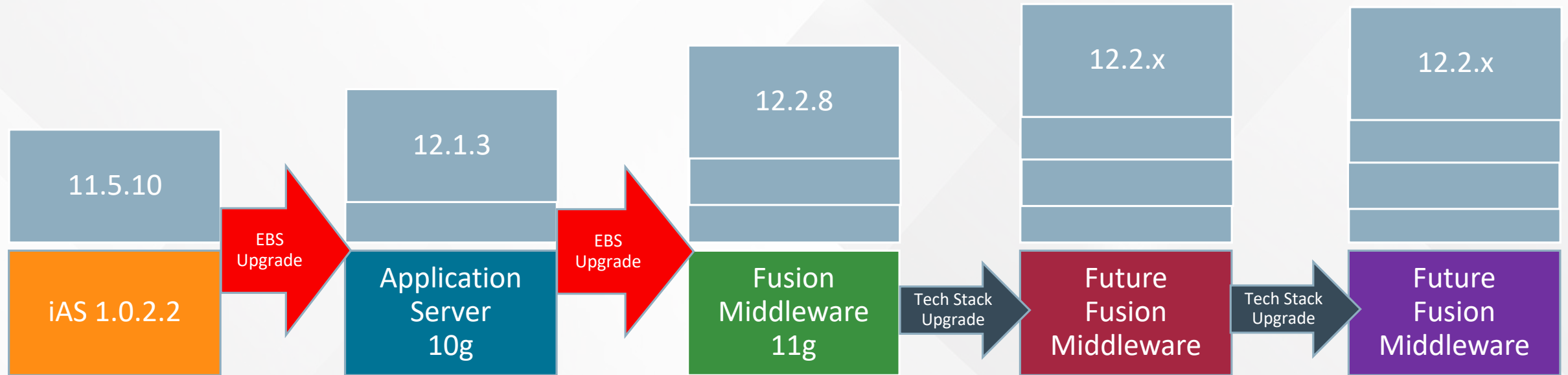


## PREMIER SUPPORT THROUGH:

- **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:

- Discoverer
- Single Sign-On
- 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](http://www.oracle.com/us/support/lifetime-support)

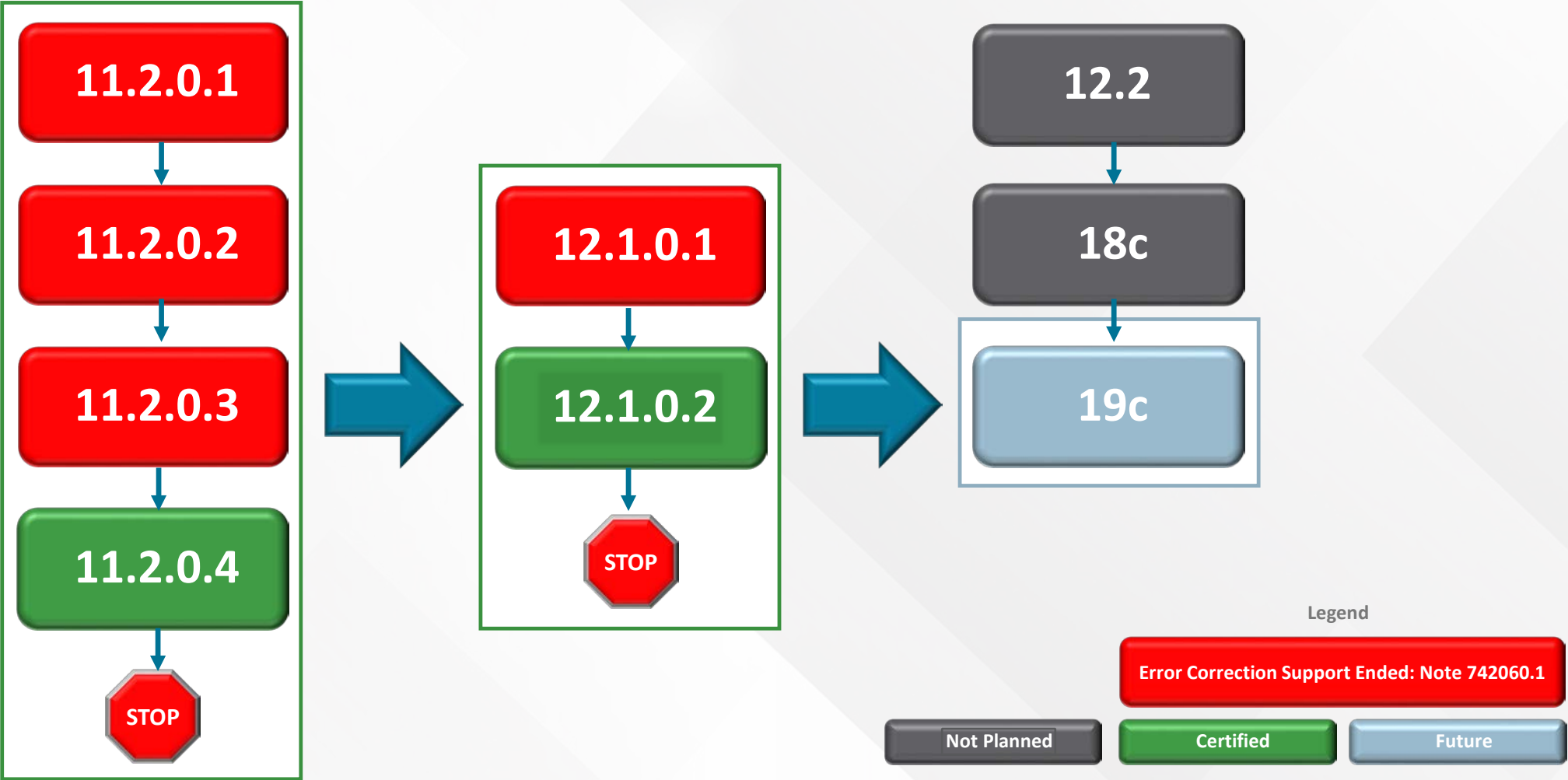


# Extended Support Fee Waiver

## 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



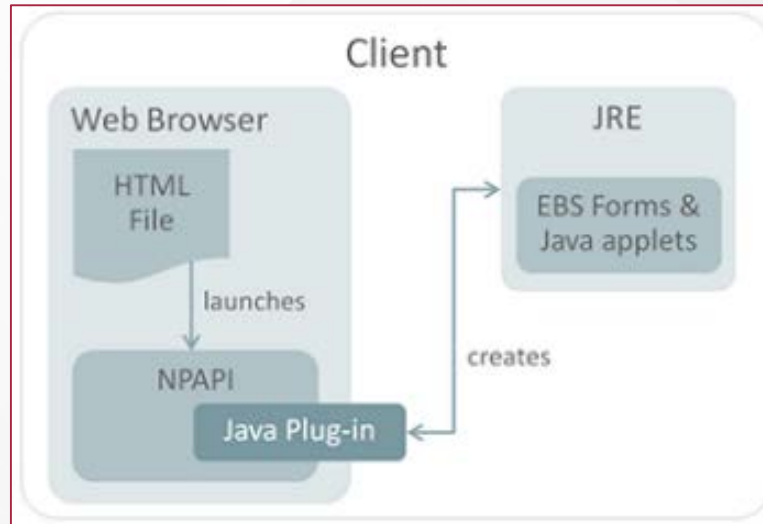


# Desktop Java Client for Oracle E-Business Suite

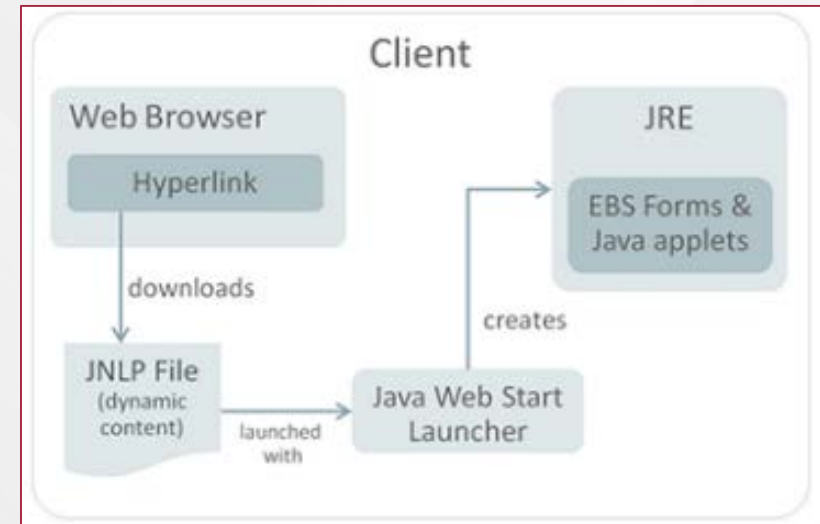
## Required for E-Business Suite Modules that Use Oracle Forms or Other Applets

- 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 support ended March 2019, MOS Note 1640397.1
  - EBS Java FAQ, MOS Note 2510500.1

### Java Plug-In



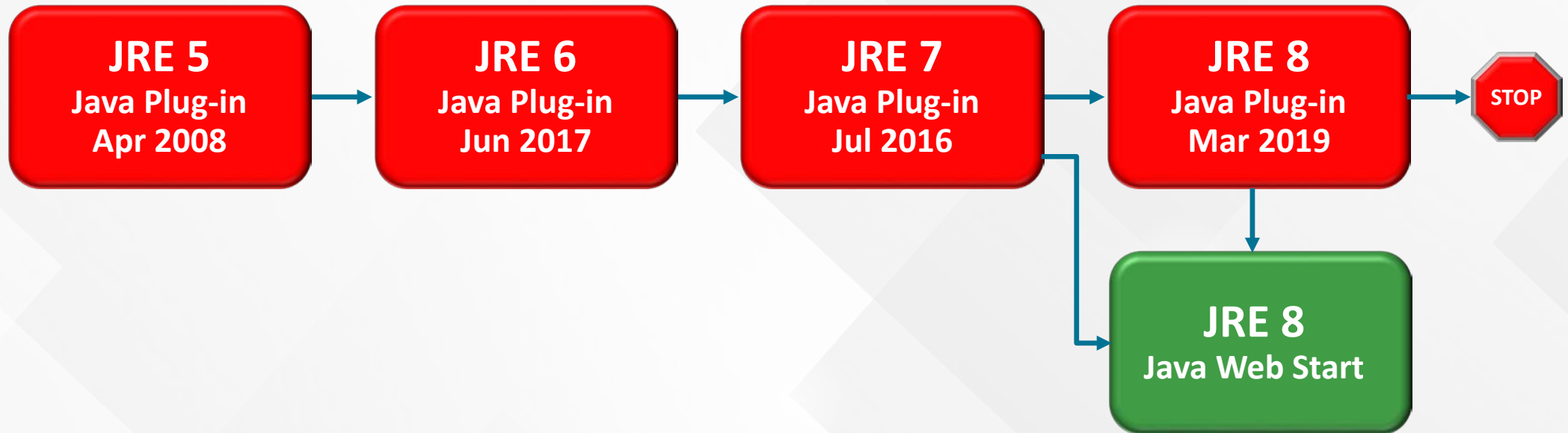
### Java Web Start





# EBS Desktop Java Client

Recommendation: Migrate to Java Web Start Now



EBS 12.2 & 12.1: MOS Note 2188898.1

Legend

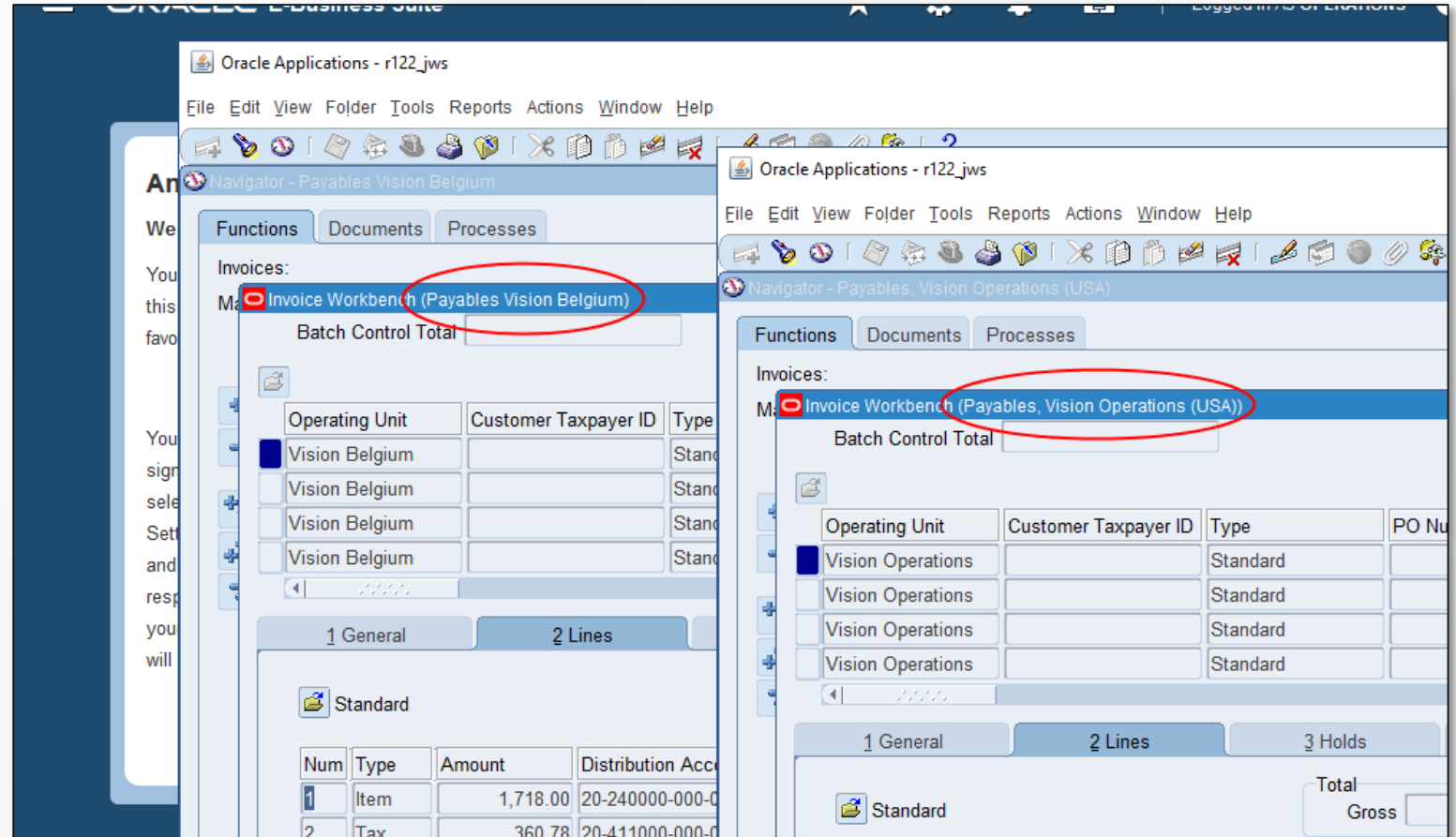
Error Correction Support Ended: Note 1640397.1

Certified

Future

# Additional Improvements with Java Web Start

- Use additional browsers
- Launch multiple Forms-based modules from a single browser session
- Log in only once when working with multiple Oracle Forms Sessions



# EBS Desktop Java Client – What’s Supported?

|  | Java Plug-In | Java Web Start |
|--|--------------|----------------|
| <b>Oracle E-Business Suite Release</b>       |              |                |
| 12.2 and 12.1                                | X            | ✓              |
| 11i  | X            | X              |
| <b>Browser</b>                               |              |                |
| Microsoft Internet Explorer (IE)             | ✓            | ✓              |
| Microsoft Edge                               | X            | ✓              |
| Firefox 60.x Extended Support Release        | X            | ✓              |
| Google Chrome 45 and higher                  | X            | ✓              |
| Safari 12                                    | X            | X              |
| <b>Feature</b>                               |              |                |
| Multiple Session Support                     | ✓            | ✓              |
| One-time Login with Multiple Session Support | X            | ✓              |

# 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 are AD Delta 10 [Patch 25820806](#) and TXK Delta 10 [Patch 25828573](#)
- Consolidated Patch II for AD Delta 10, [Patch 29273993](#)



| 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

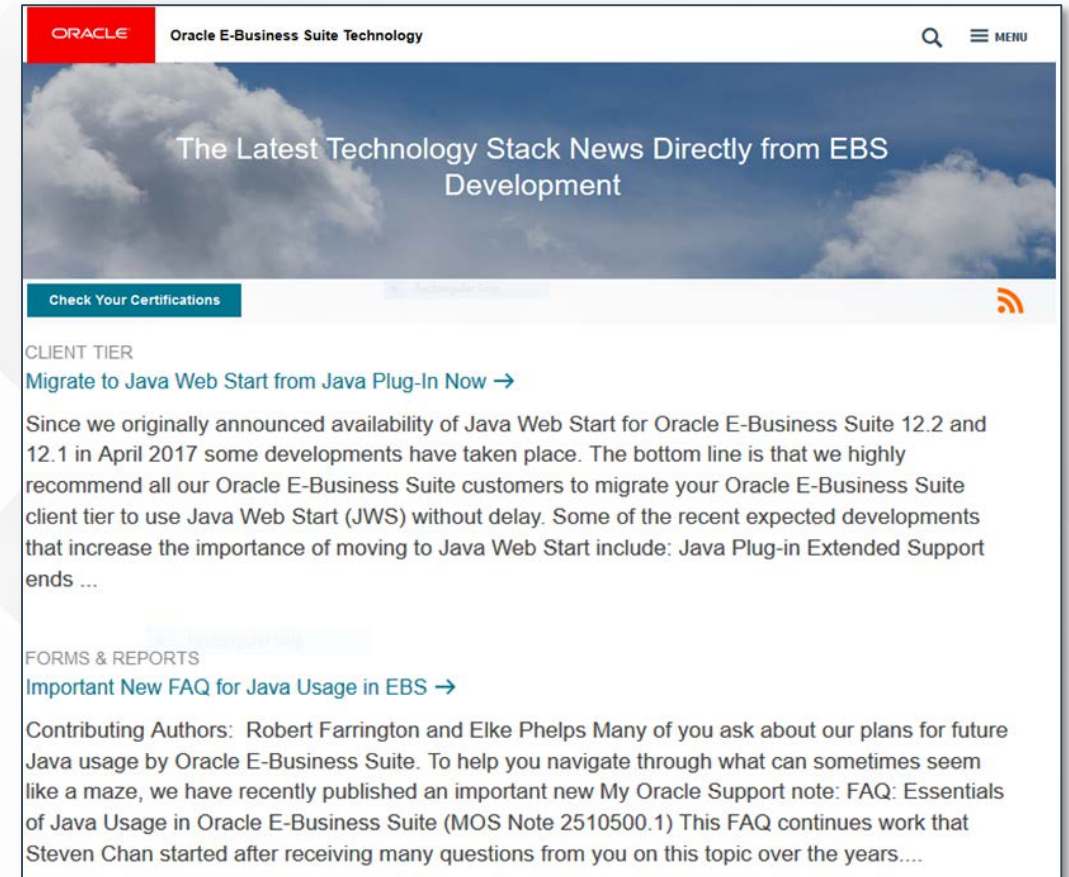
**New URL** <https://blogs.oracle.com/ebstech> (previously [blogs.oracle.com/stevenchan](https://blogs.oracle.com/stevenchan))

- Same blog, new URL

Note: [blogs.oracle.com/stevenchan](https://blogs.oracle.com/stevenchan) will automatically redirect to [blogs.oracle.com/ebstech](https://blogs.oracle.com/ebstech)

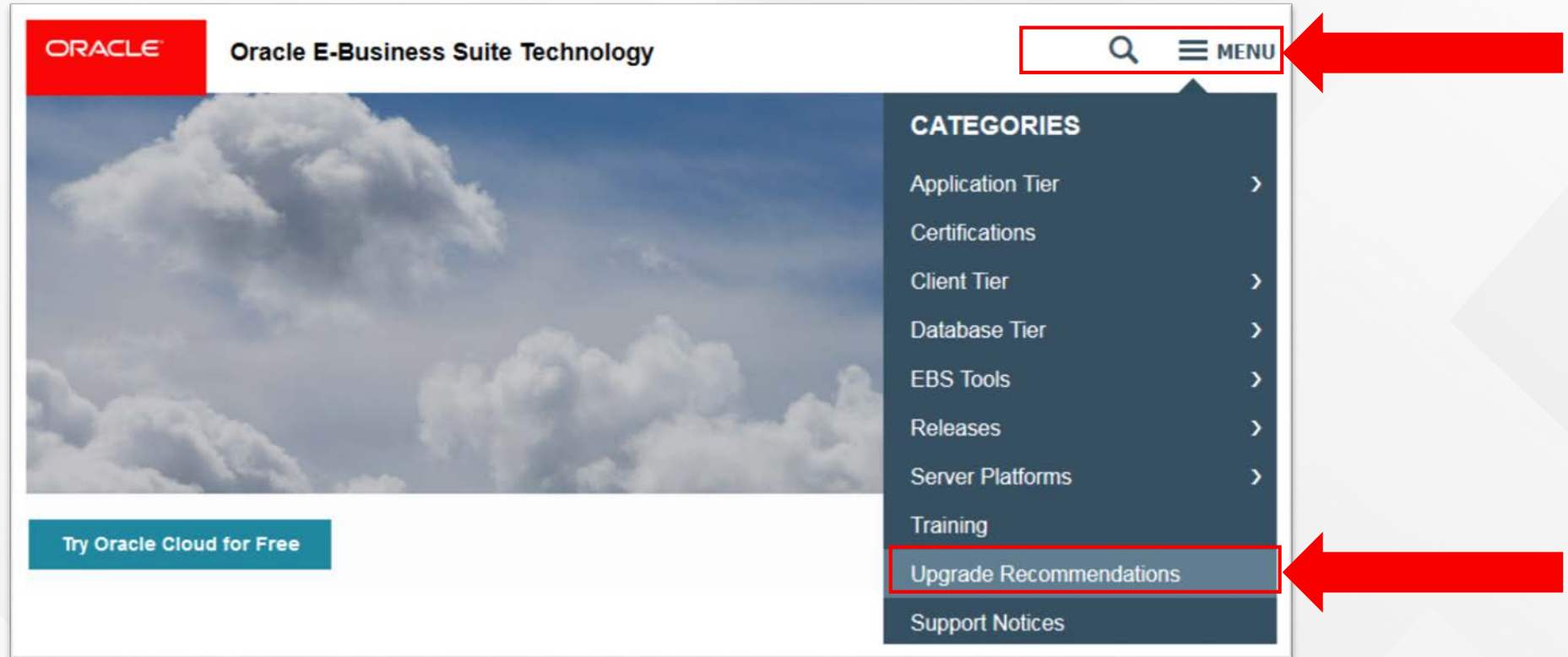
- News about EBS Technology
- Certification announcements
- Quarterly upgrade recommendations
- Primers, FAQs, tips
- Statements of Direction
- Desupport reminders

**Subscribe via RSS or email**



# Where Can You Find Authoritative Dates?

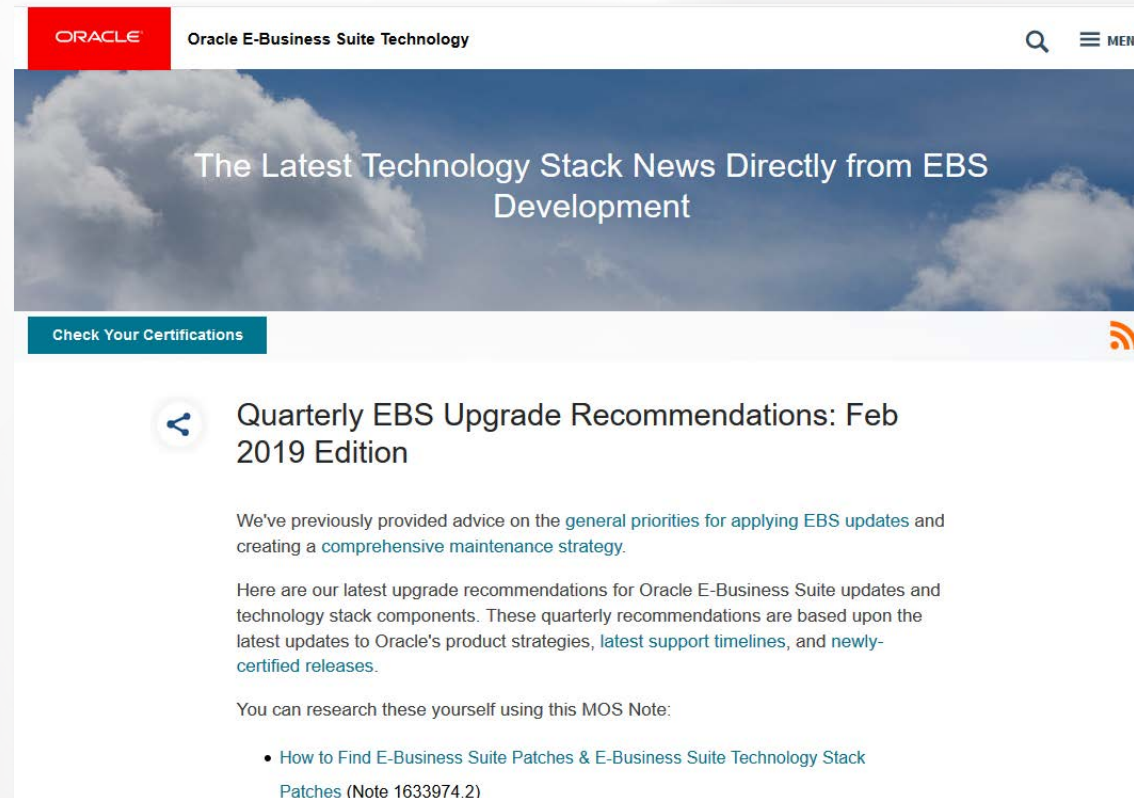
Understand Where You Are with Regards to Support Policies



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

# Where Can You Find Authoritative Dates?

## Understand Where You Are with Regards to Support Policies



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

# 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

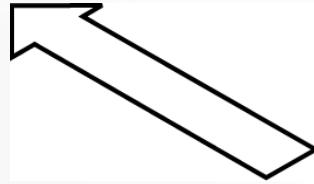
## Changing the Patching Paradigm

- 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

# Patches are Applied to a Copy of Production

## Production

E-Business Suite  
12.2.7



## Copy of Production

E-Business Suite  
- 12.2.7  
- 12.2.x  
- ...

- Copy the production code
- Apply patches to the copy

# 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 MOS document page with a navigation bar at the top containing 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 buttons for 'Print Document' and 'Search This Document'. The main content area has a title 'Welcome to Finding E-Business Suite Patches & E-Business Suite Technology Stack Patches' and two numbered sections. Section 1, 'How to use this document?', lists the purpose and navigation instructions. Section 2, 'Make sure your E-Business Suite is Up-To-Date!', includes a link to 'Creating a Maintenance Strategy for Oracle E-Business Suite' and a reference to a May 2014 presentation. A 'Sample Slide:' is shown at the bottom right, titled 'Keeping all E-Business Suite Components Up-To-Date', which lists five items: EBS Updates, Technology Stack, Security Patches, Interim Patches, and R11i/R12 Minimum Extended Support Baseline/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:**

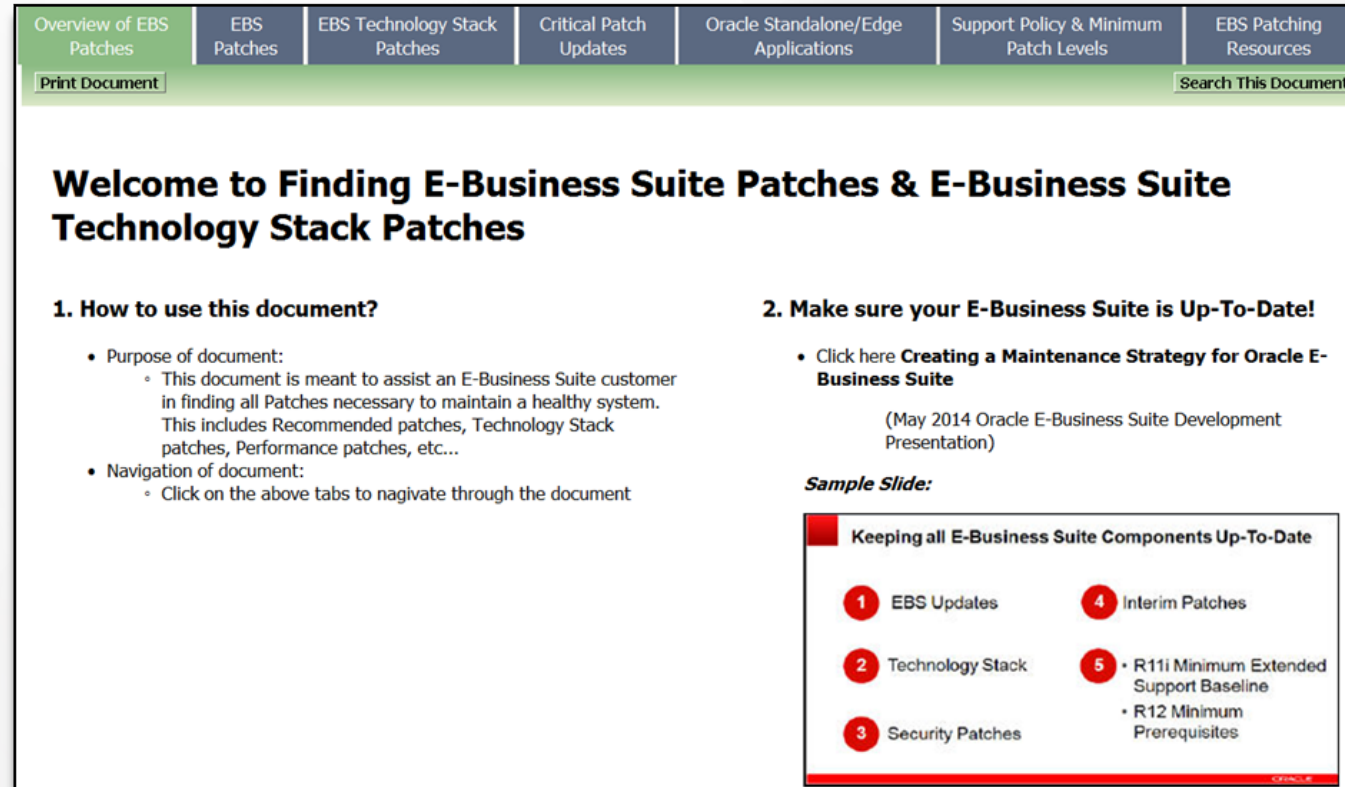
**Keeping all E-Business Suite Components Up-To-Date**

- 1 EBS Updates
- 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?

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 is a 'Print Document' button and a 'Search This Document' button. The main content area has a title 'Welcome to Finding E-Business Suite Patches & E-Business Suite Technology Stack Patches'. It contains 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 about the document's purpose and navigation. Section 2 includes a bullet point about creating a maintenance strategy and a 'Sample Slide' titled 'Keeping all E-Business Suite Components Up-To-Date'. The sample slide lists five items: 1. EBS Updates, 2. Technology Stack, 3. Security Patches, 4. Interim Patches, and 5. R11i Minimum Extended Support Baseline and 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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**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

# 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

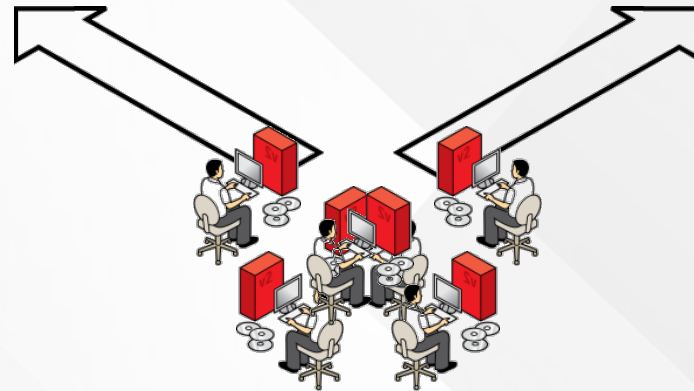
# Downtime Limited to Short Cutover

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

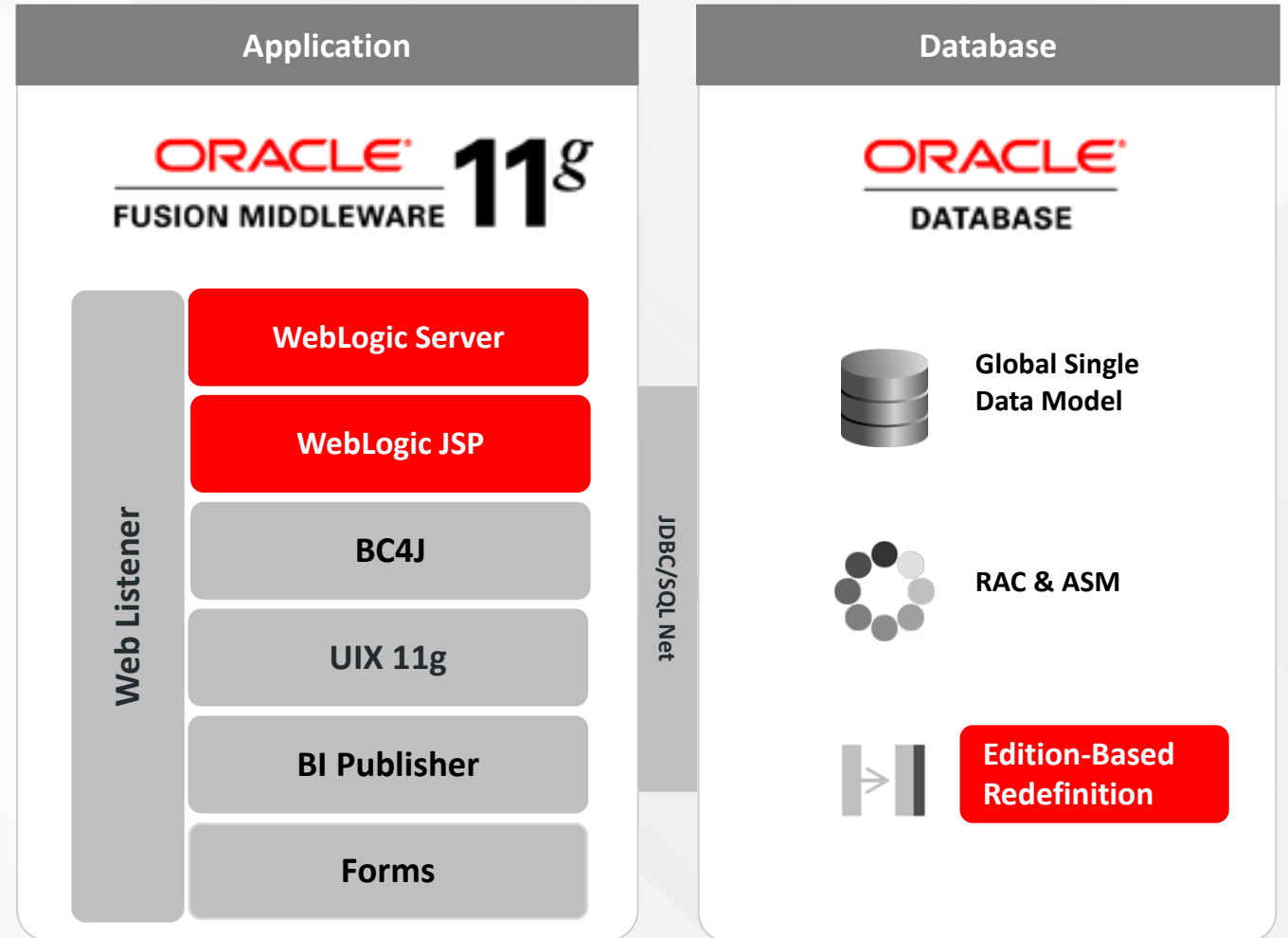


# Oracle E-Business Suite 12.2 Architecture

# Oracle E-Business Suite 12.2 Architecture

## Latest Technology Stack Features

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



# Database Edition-Based Redefinition

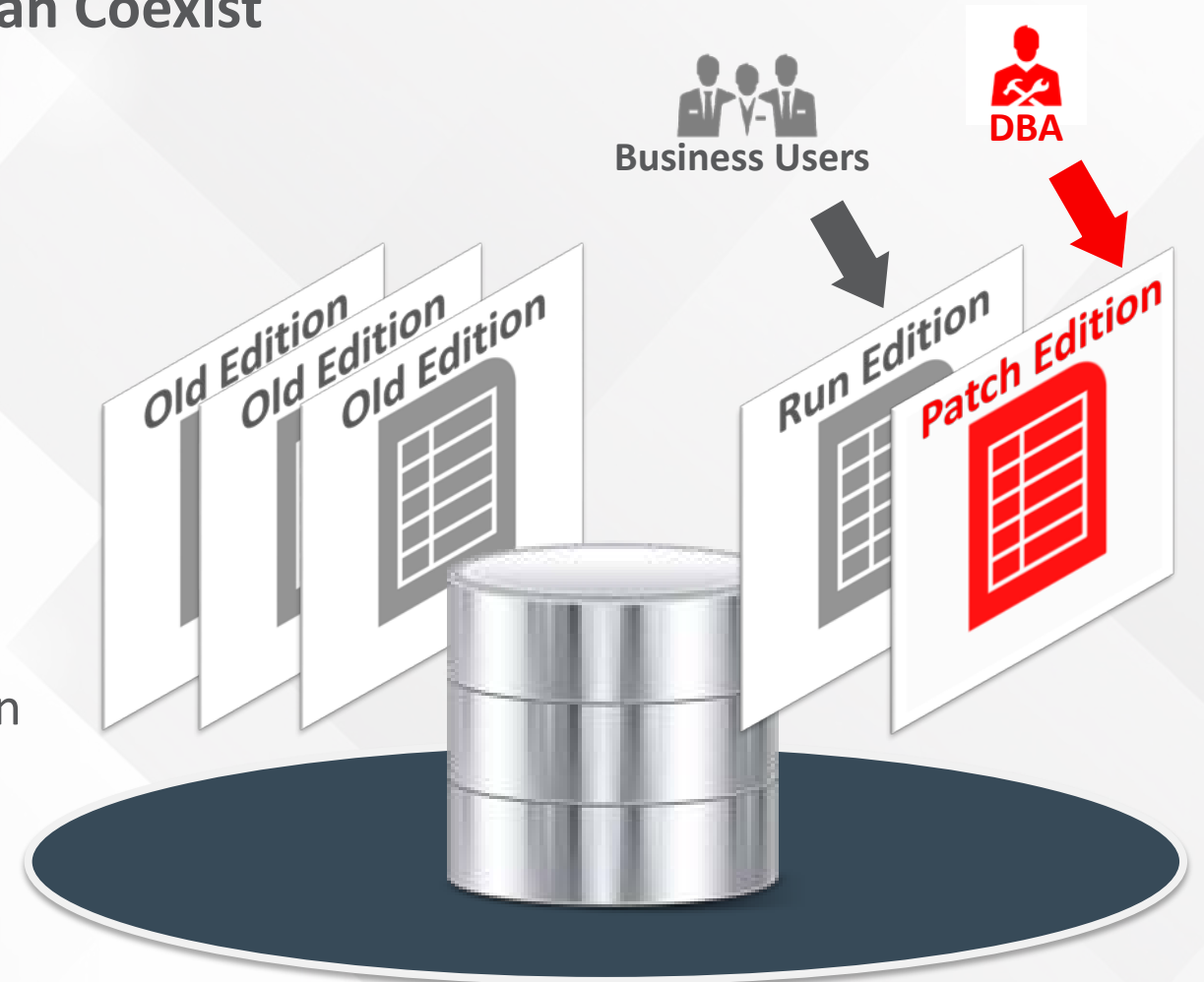
# Oracle Database 11gR2 Edition-Based Redefinition (EBR)

- 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

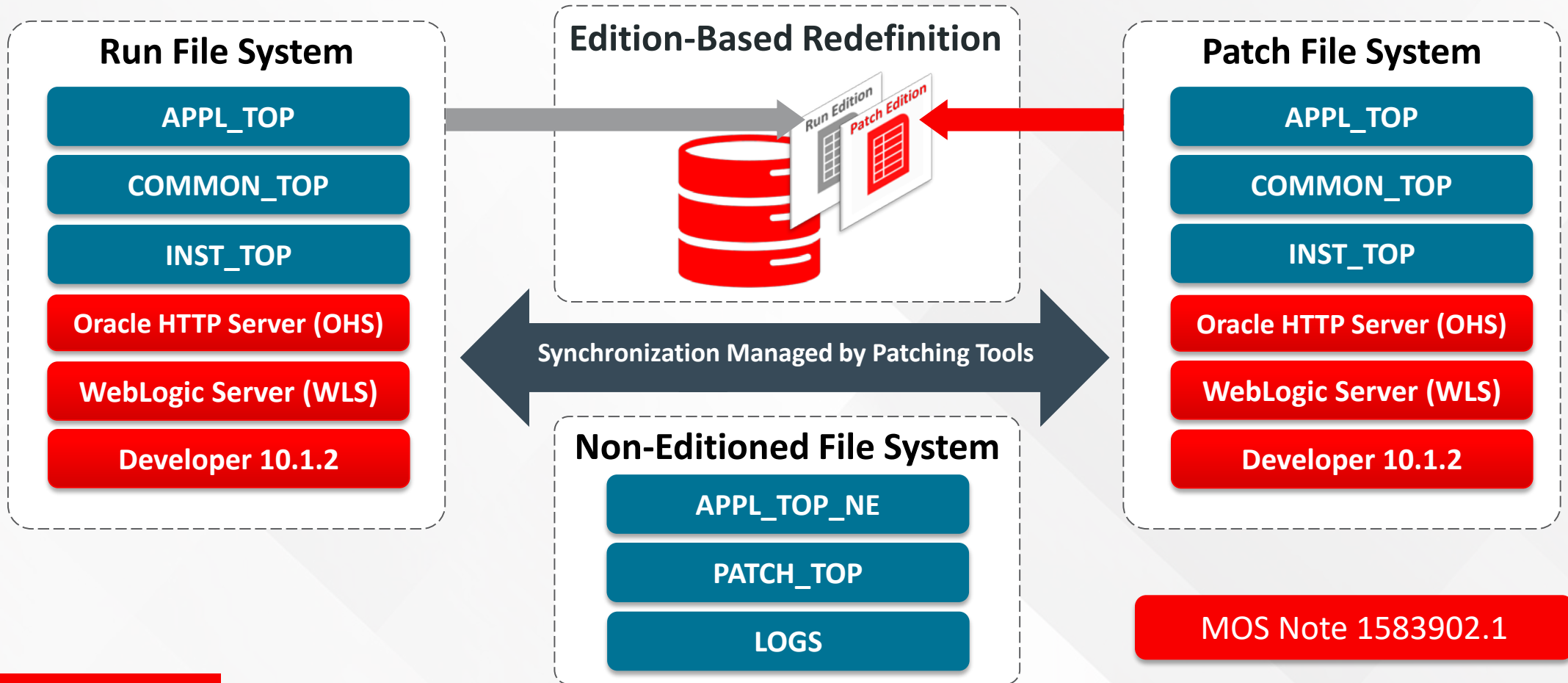
## Multiple Copies of Database Code Objects Can Coexist

- 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

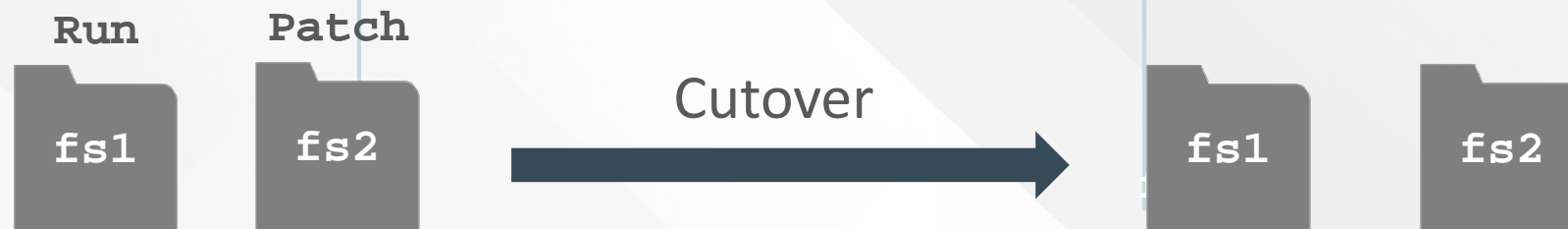
- **Patch file system**

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

- **Non-Editted file system**

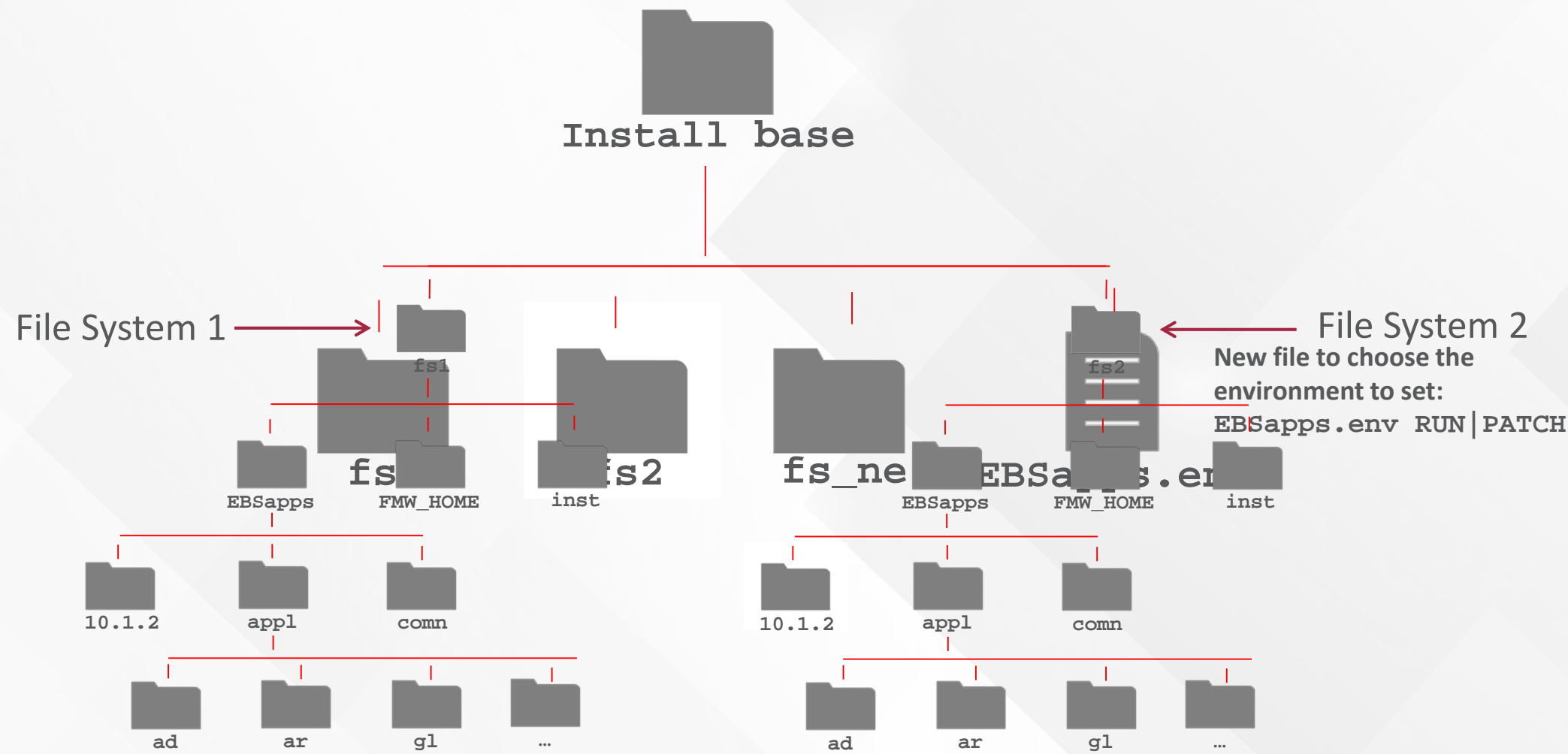
- Used for data files  
e.g.: data import/export files, log files, report output files
- Only stores data files

**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



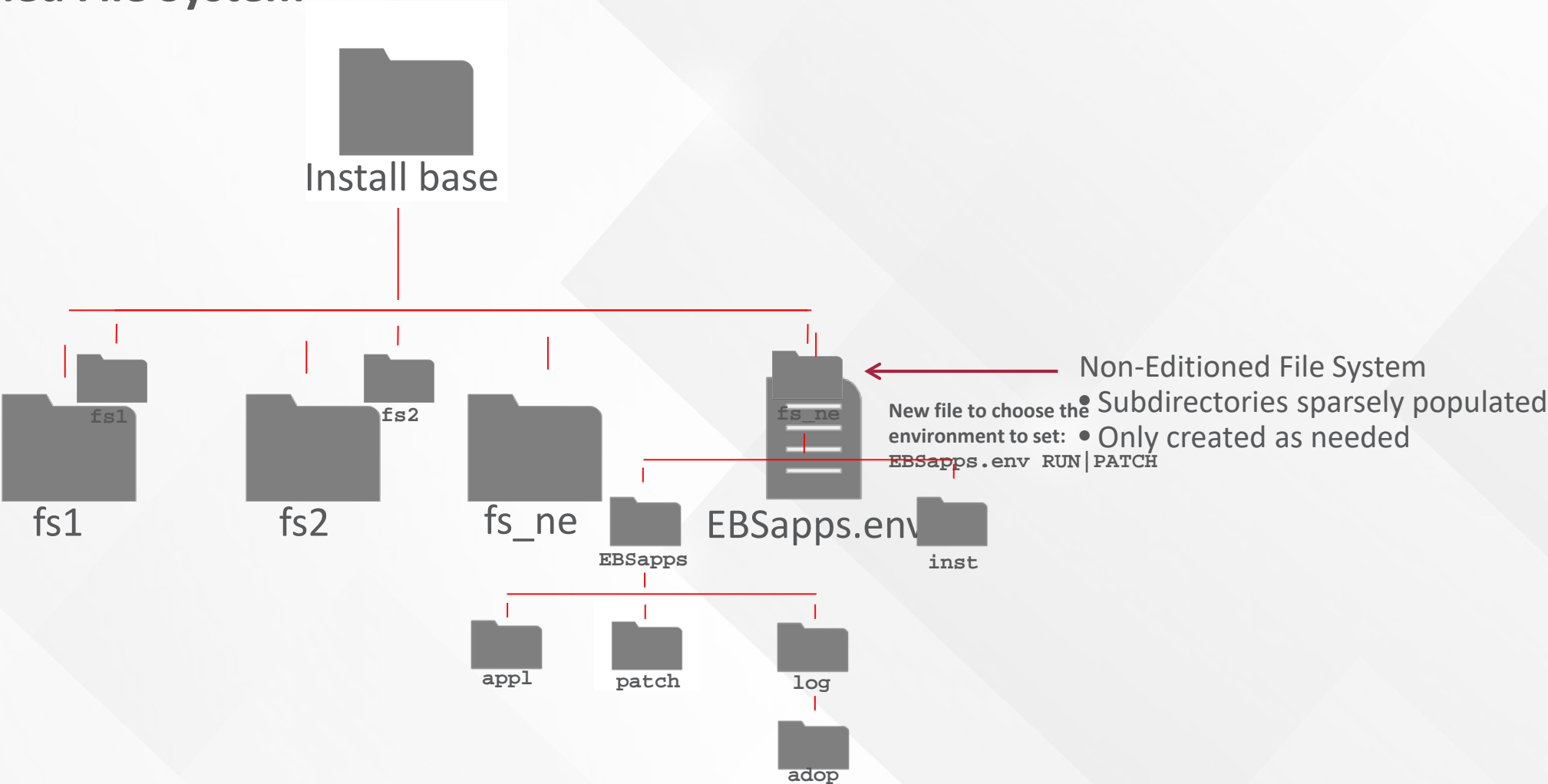
# E-Business Suite 12.2 File System Layout

## 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

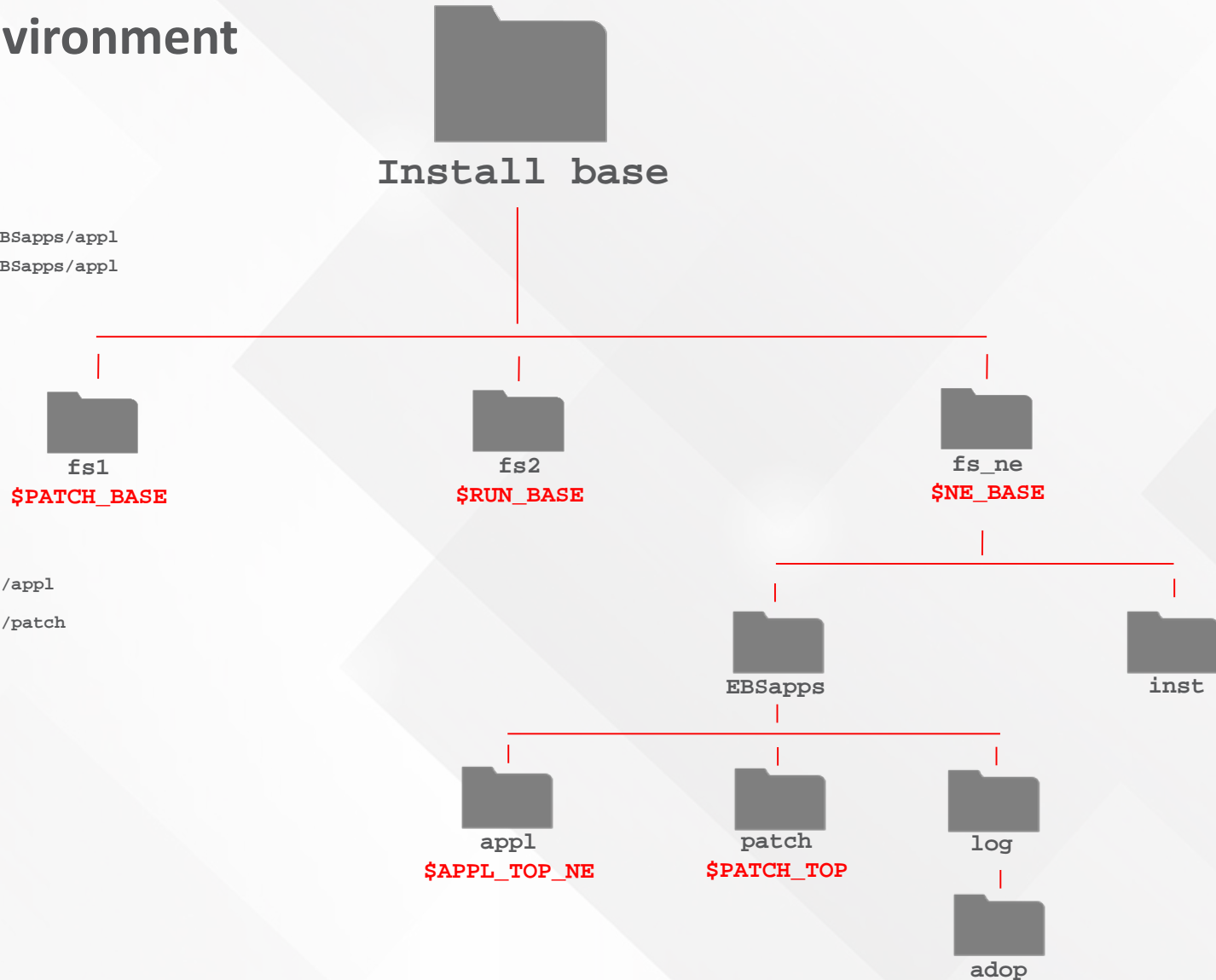
## Working with the EBS 12.2 Environment

- Source the Run environment

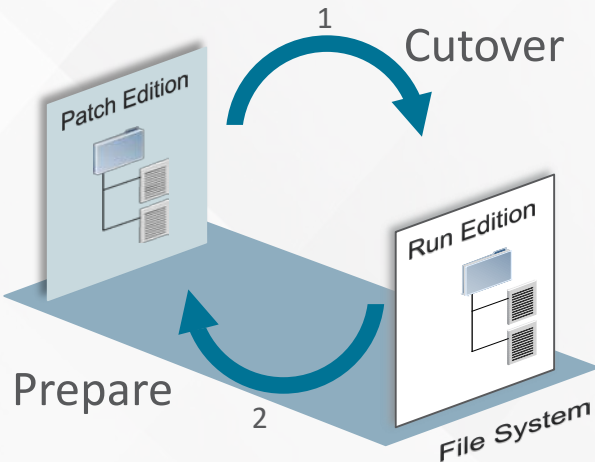
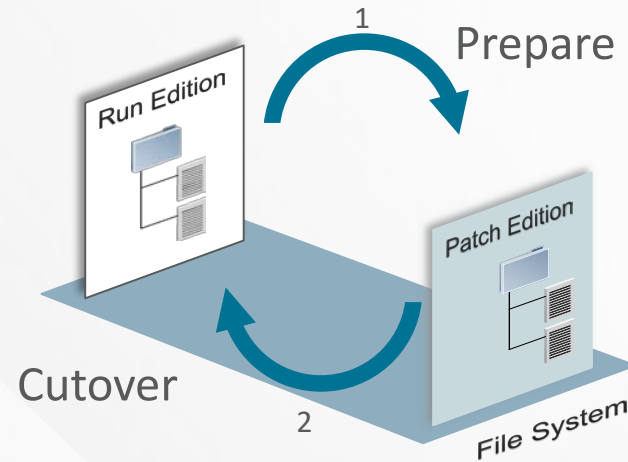
```
$ source EBSapps.env RUN
E-Business Suite Environment Information
-----
RUN File System      : /scratch/orauser/im4kevin/fs2/EBSapps/appl
PATCH File System   : /scratch/orauser/im4kevin/fs1/EBSapps/appl
Non-Edited File System : /scratch/orauser/im4kevin/fs_ne
DB Host: rws3270749.us.oracle.com  Service/SID: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

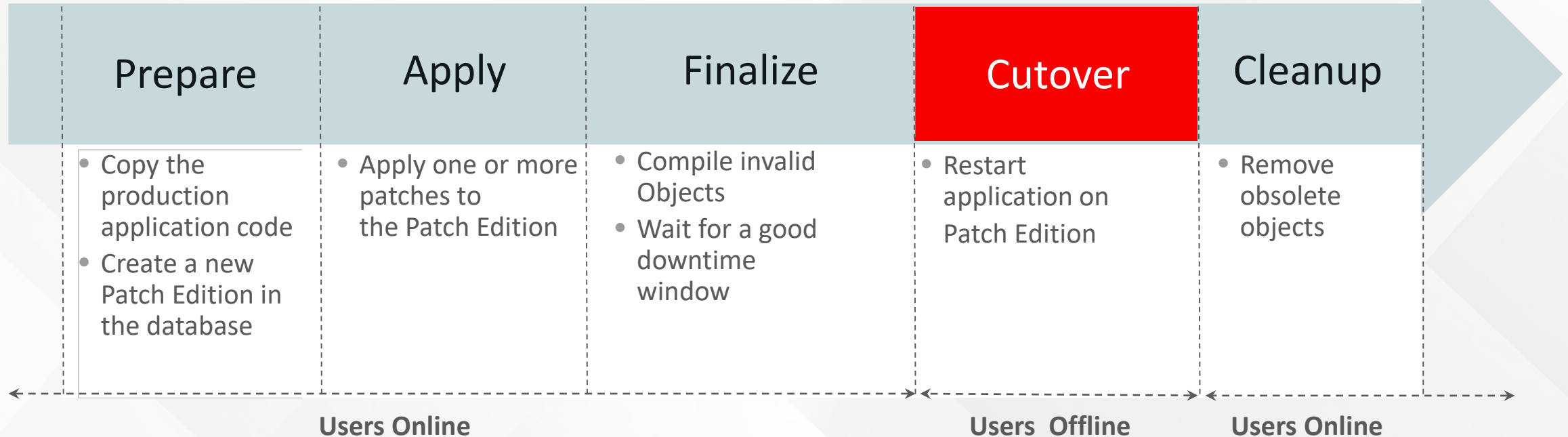


- Online Patching is used to apply all EBS patches in EBS 12.2
- Online Patching cycle includes 5 major phases
- New patching tool “adop” orchestrates the patching cycle



# Understanding the Online Patching Cycle

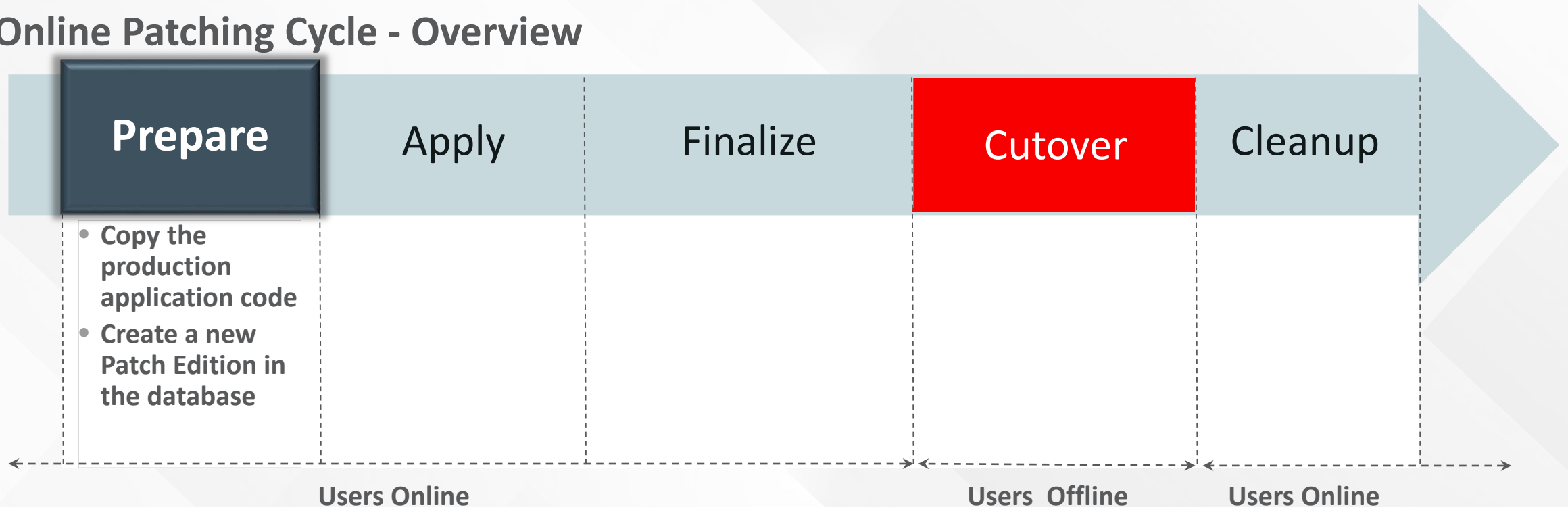
## Online Patching Cycle - Overview



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

# Understanding the Online Patching Cycle

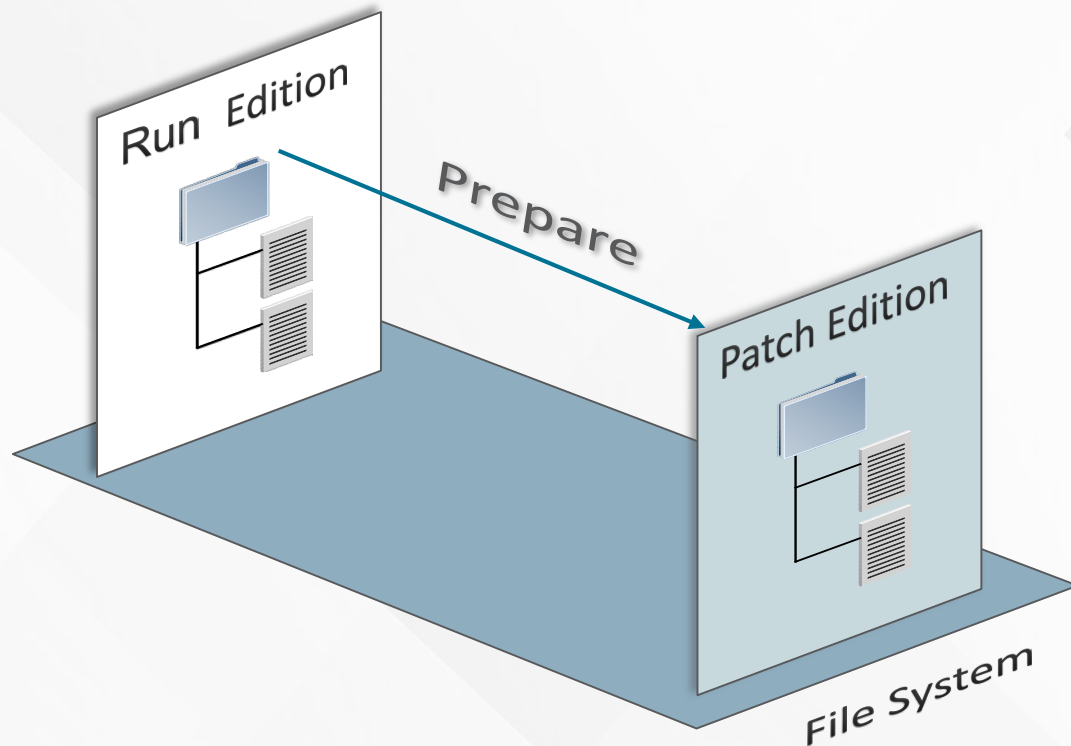
## Online Patching Cycle - Overview



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

# Online Patching Cycle – Prepare Phase

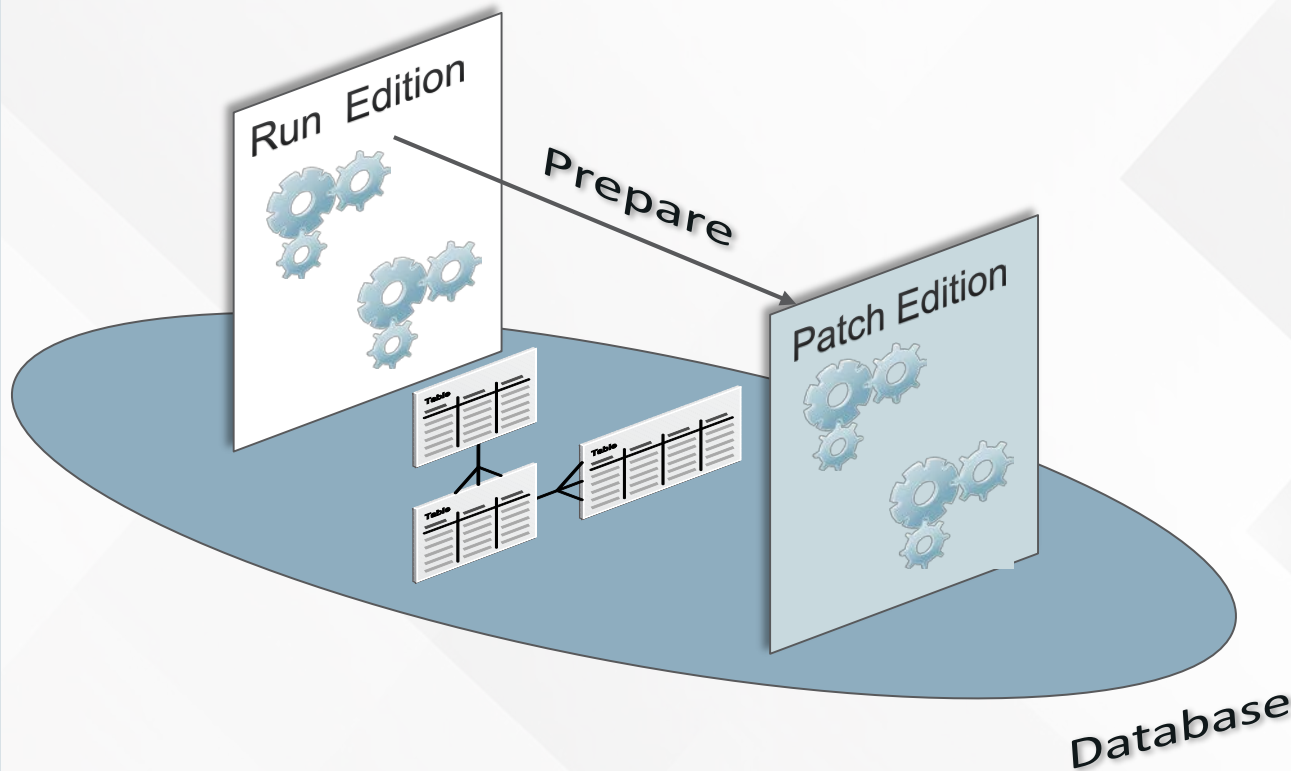
## Preparing the File System



- 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

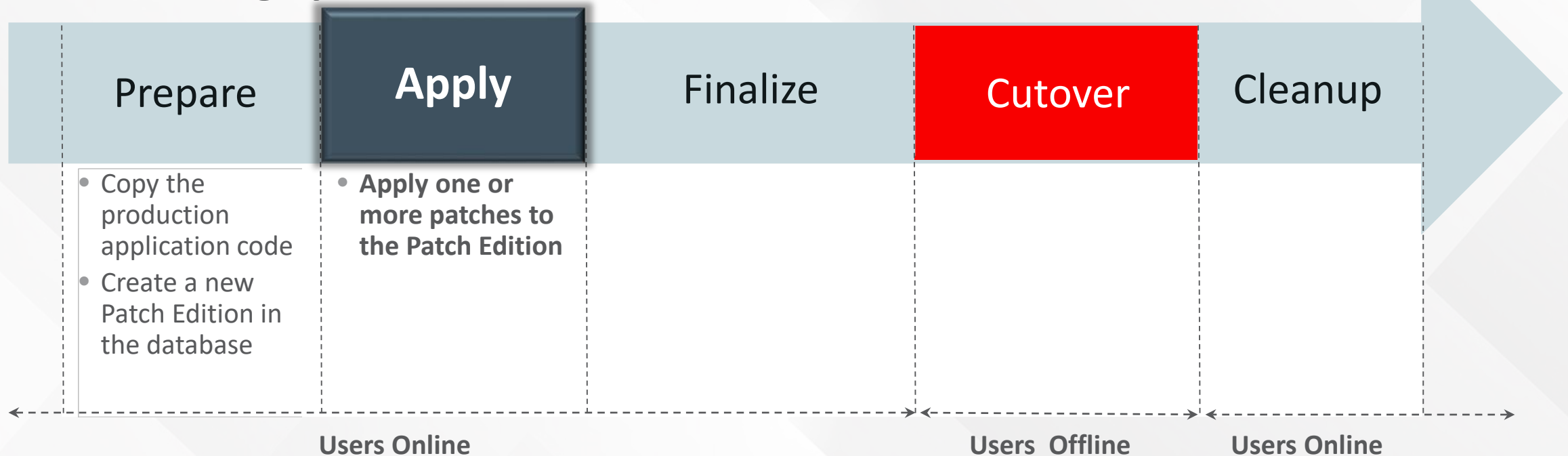
- ADOP controls preparing the system for patching
- Validates system configuration to ensure that the system is ready to start an Online Patching cycle.
- Prepare is run on all nodes in a multi-node configuration
- Synchronizes the Run and Patch File System
- Creates the Database Patch Edition

## What to Do

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

# Understanding the Online Patching Cycle

## Online Patching Cycle - Overview

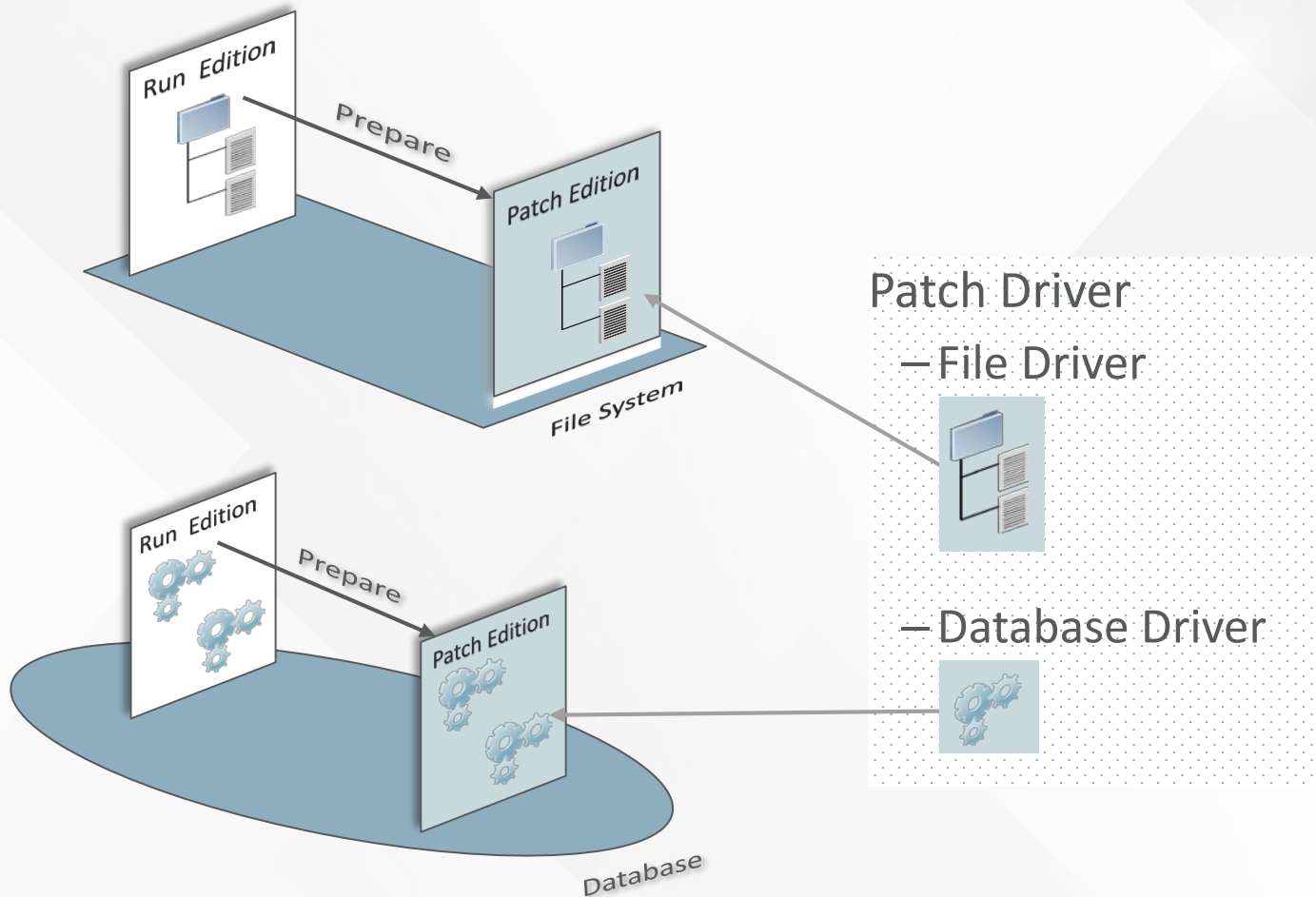


- Execute patch drivers to update Patch Edition
- Multiple patches can be applied, **including customizations**



# 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

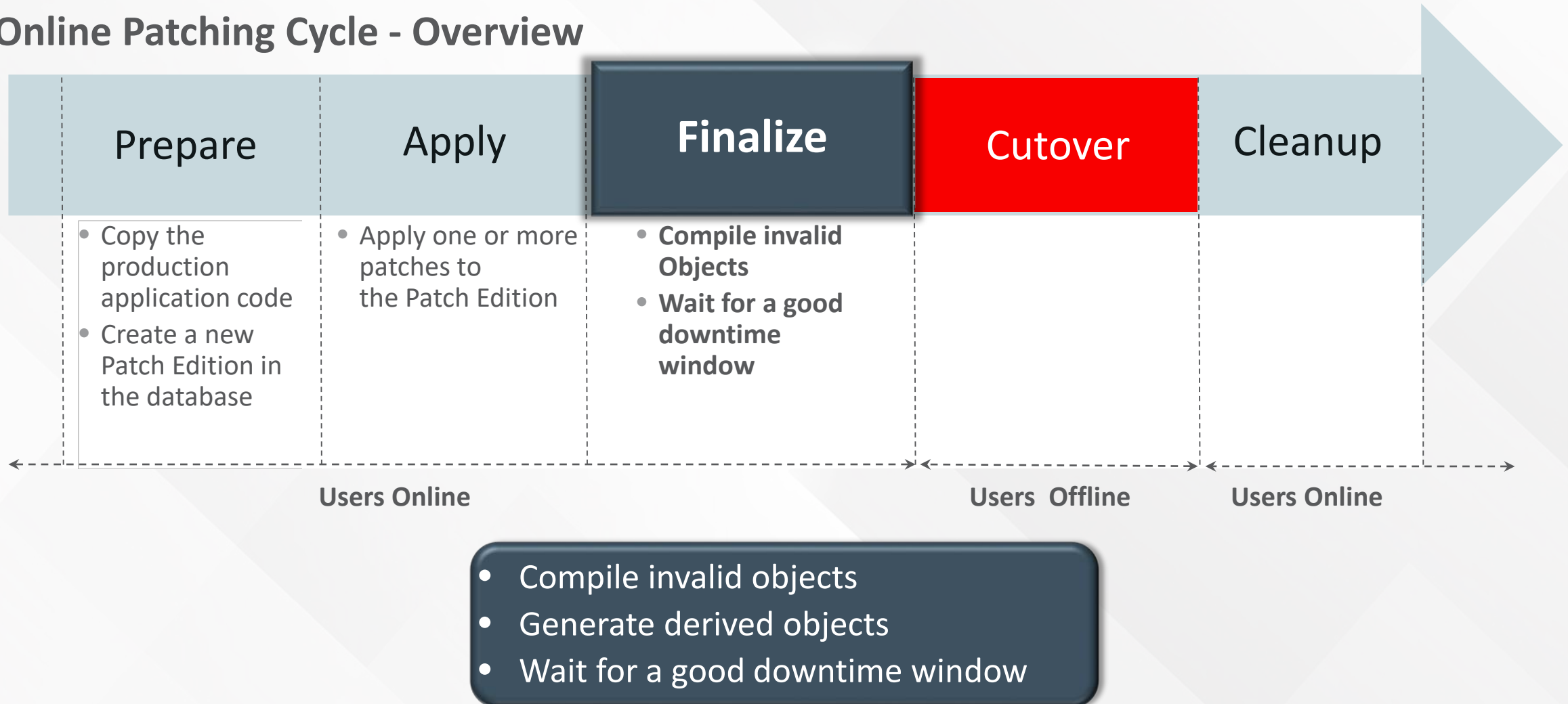
- Execute adop apply on the primary node

```
$ 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

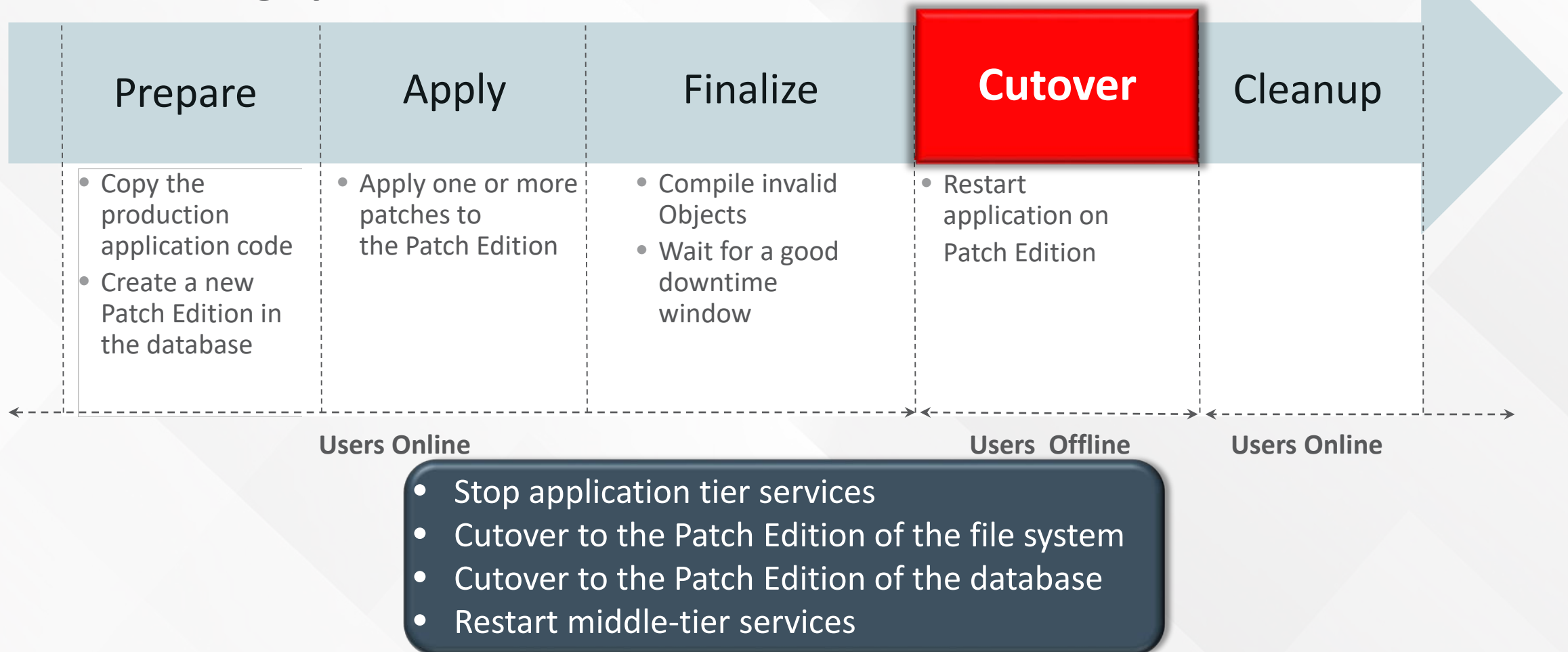
## What to Do

- 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



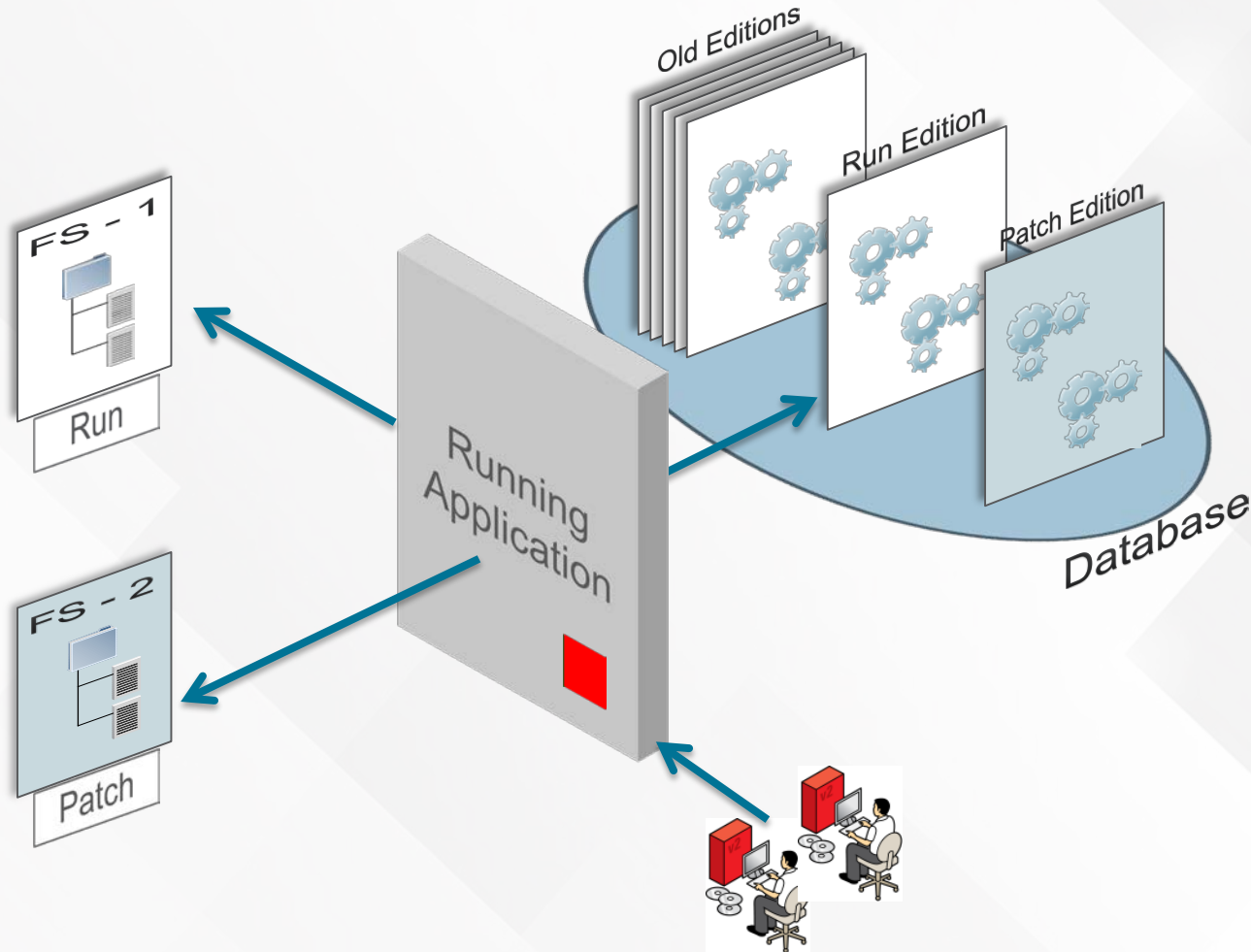
# Online Patching Cycle - Cutover

- 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

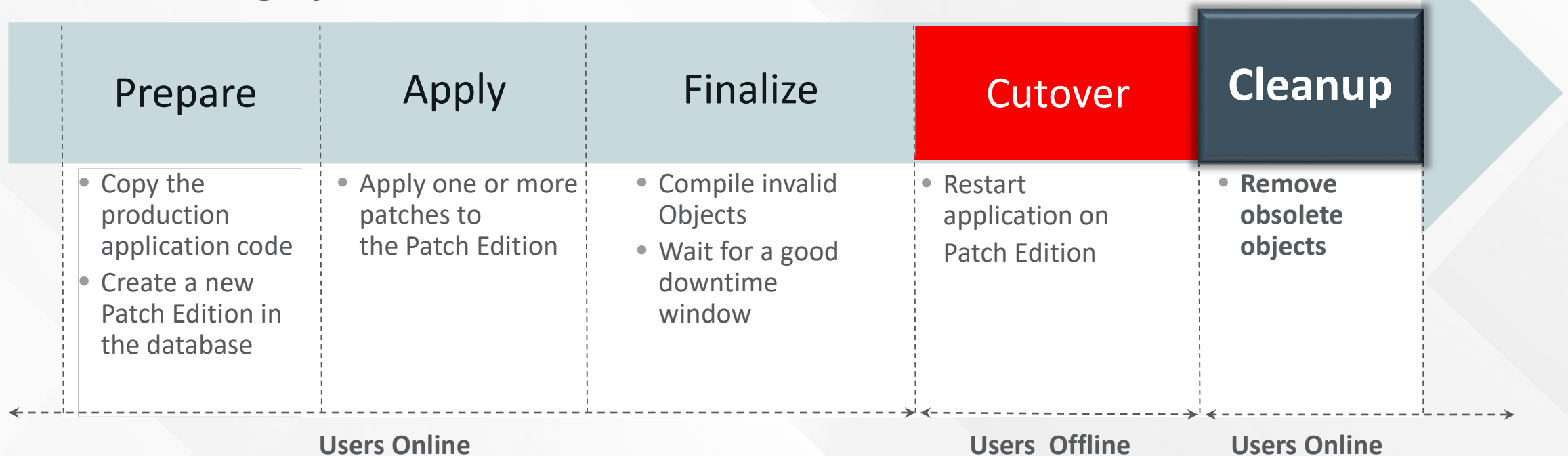
- Execute adop cutover on the primary node without starting the application services

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

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

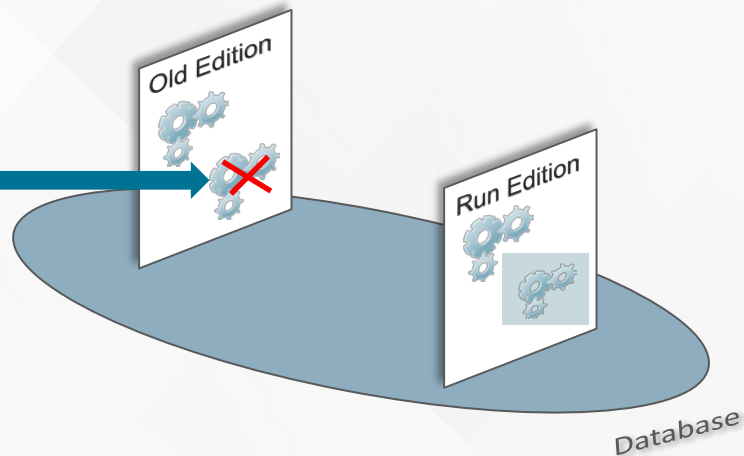
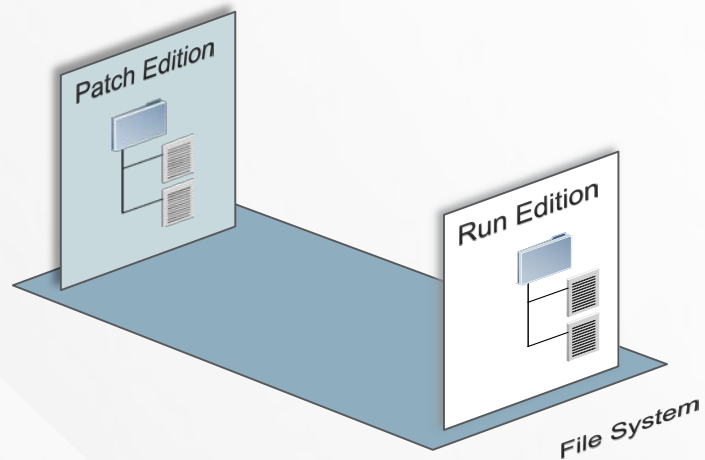
# Understanding the Online Patching Cycle

## 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

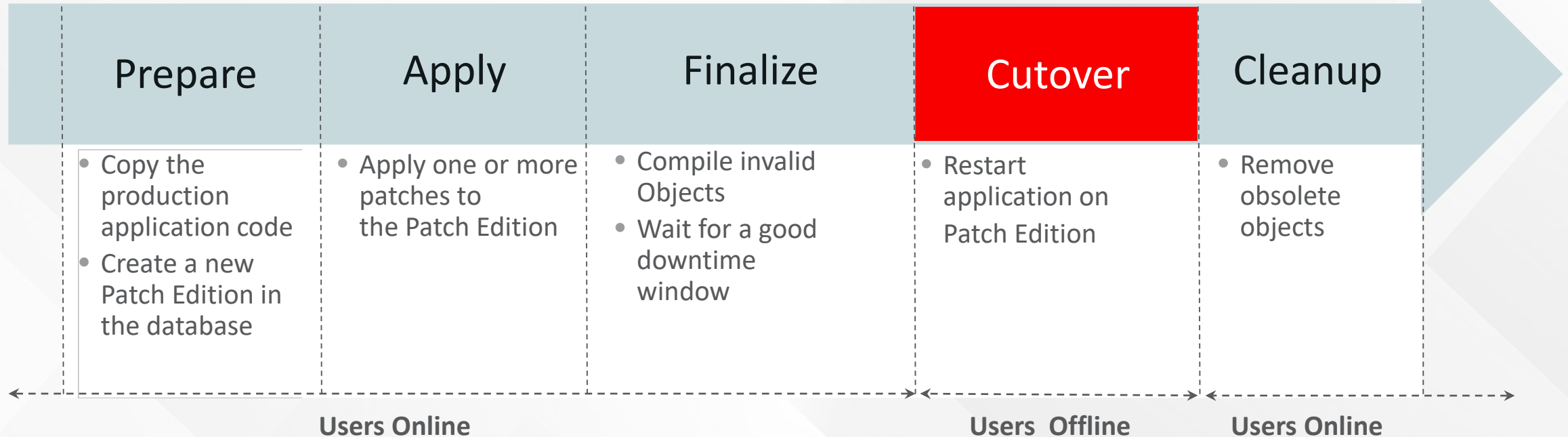
## What to do

- 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 |

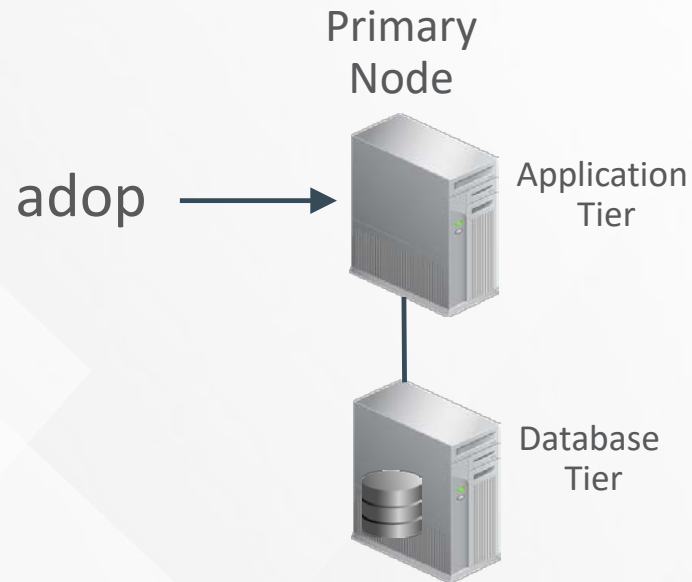


# Online Patching Cycle – Multi-Node

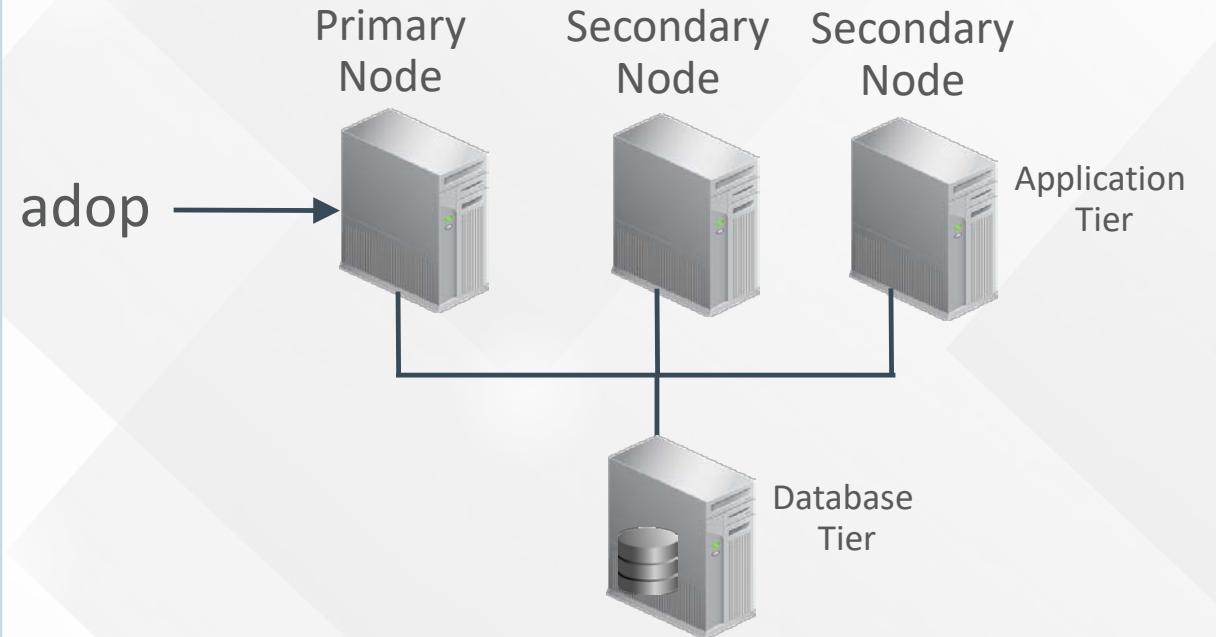
- Completely automated in multi-node deployments through adop
- No distinction between environments that are:
  - Shared file system configuration
  - Non shared file system configuration
- Primary node takes control of the patching cycle
  - Performed by remote command invocations across nodes
  - Remote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

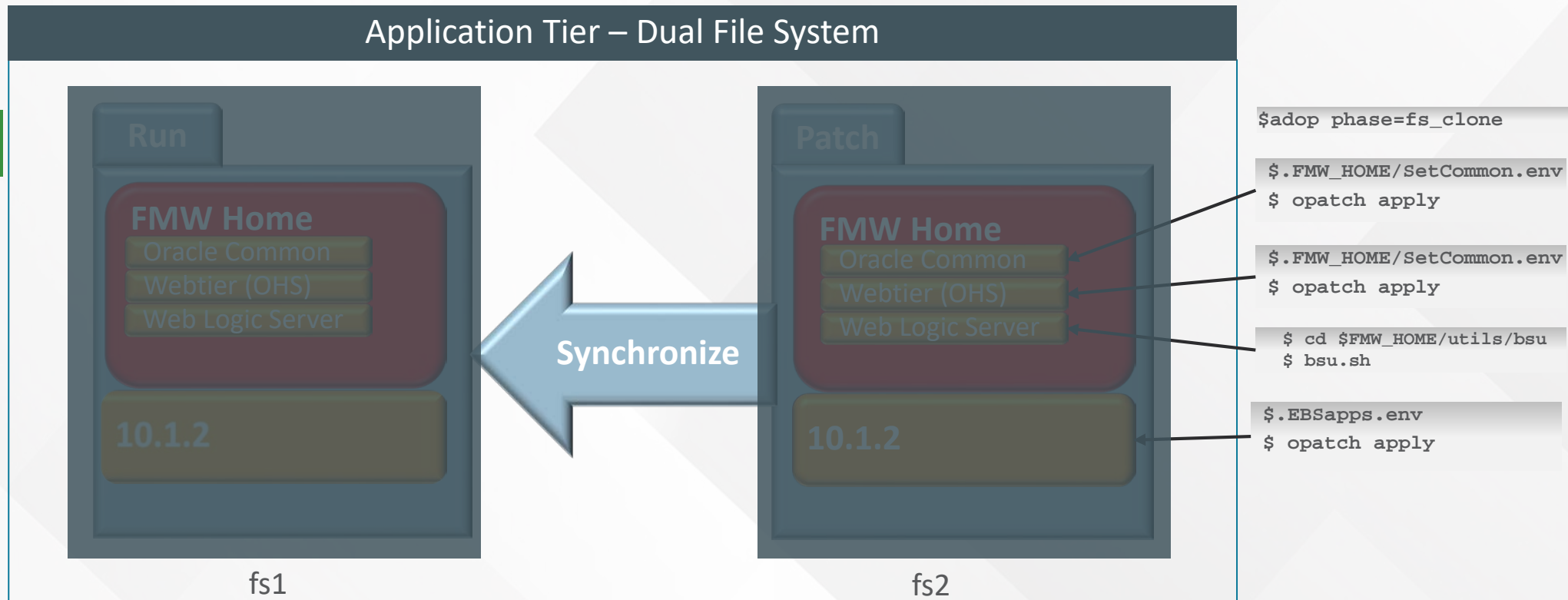
Apply

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





# Integrated Cloud

## Applications & Platform Services

ORACLE®