ORACLE

Oracle Enterprise Manager 13.4

Enterprise Manager Upgrade Best Practices and Transitioning to HA Level4 DR

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Product Management

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Safe harbor statement

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Agenda

1 **What's New in EM 13.4 LCM**

2 Why Upgrade to EM 13.4

3 Enterprise Manager Upgrade PUMA Program

4 Upgrade Overview, Strategies, and Best Practices

5 Upgrade and Transitioning to Level4 DR Readiness

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What's New in EM 13.4 Lifecycle Management

- Oracle Enterprise Manager 13.4 shipped with
  - Weblogic – 12.2.1.3.0
  - JDK 1.8 u231 - Default shipped version
  - BI Publisher – 12.2.1.3
  - JDK 1.8 u251 : Updated as part of RU2
- Oracle Enterprise Manager 13.4 release will allow you
  - Fresh Install – EM 13.4
  - Upgrade to EM 13.4
- Repository Database Versions and Type Supported – Single Instance, RAC, PDB
  - DB 12.1.0.2, 12.2
  - DB 18c (18.3/4/5/6/7/8)
  - DB 19c (19.3/5/6)

Oracle Enterprise Manager

What's New in EM 13.4 Lifecycle Management

- Upgrade optimization
  - Additional OMS's Parallel Upgrade

- Repository Data Extraction Through REST
  - SQL Execution via REST API

- Mass Agent Decommission

- DB 18.6 and 19.5 Templates available for Install

Oracle Enterprise Manager

Ease of EM 13.4 Lifecycle Management
Software and Add-on Plug-ins Download

- Oracle Enterprise Manager software binaries for all platforms are available on oracle.com and edelivery.oracle.com

- Download the binaries from:
    - www.oracle.com/enterprise-manager/downloads/cloud-control-downloads.html (or)
    - https://edelivery.oracle.com/osdc/faces/SoftwareDelivery

- Add-on Plug-ins like Golden Gate, ODA, EBS, etc.

- Download for Install/Upgrade from:
    - https://www.oracle.com/enterprise-manager/downloads/oem-v134-update-plugins-downloads.html

Agenda

Enterprise Manager Support Policy

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
EM 12c - Platform (GA: Oct 2011)		EM 12c OCT 2016					OCT 2020									
EM 12.1.0.5 (GA: June 2015)	*Terminal Release*				OCT 16	OCT 17	OCT 2020									
EM 13c - Platform (GA: Dec 2015)					EM 13c DEC 2023									DEC 2026		
EM 13.2.0.0 (GA: Oct 2016)						JULY 2019			DEC 2026							
EM 13.3.0.0 (GA: July 2018)								JAN 2021								
EM 13.4.0.0 (GA: January 2020)										JAN 2022		DEC 2026				

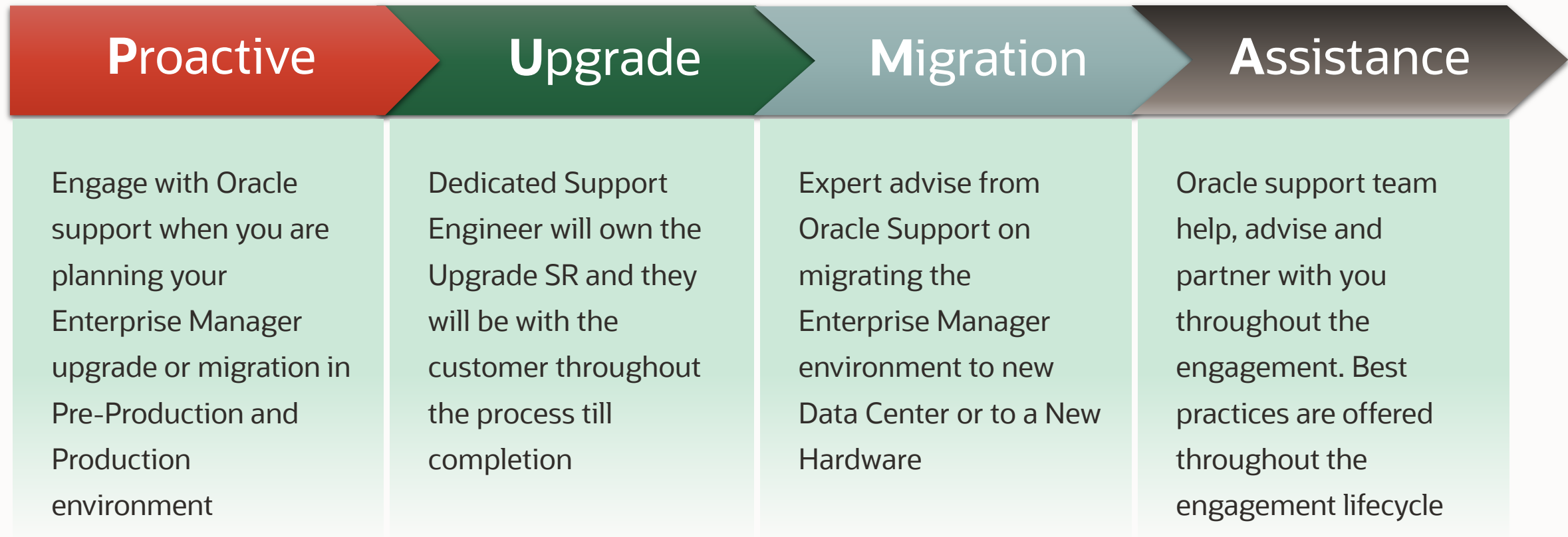|	PREMIER SUPPORT		ERROR CORRECTION		EXTENDED

Support Policy Details

- EM12c platform 'Family' premier support is ended. No more PSUs or One-off provided for EM12c platform

- EM13.x platform 'Family' Premier support ends in Dec 2023 but Extended support exist till Dec 2026

- EM 13.2 Premier support ended in July 2019 and last PSU rolled out is April 2020. EM 13.2 customers should plan to upgrade to 13.4 version from supportability perspective

- EM 13.3 support exist till January 2021 and post that it will be in Extended support

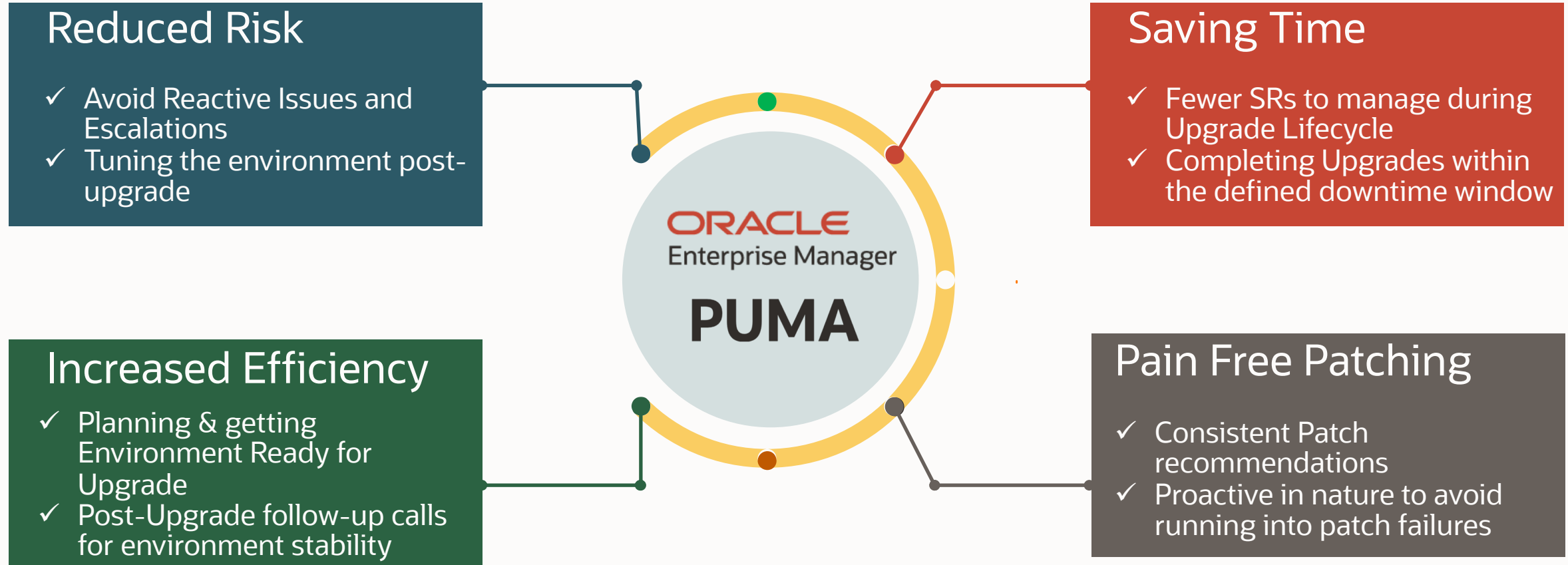- EM 13.4 Premier support exist till January 2022 and post that it will be in Extended support

Agenda

Enterprise Manager PUMA Program

Proactive	**U**pgrade	**M**igration	**A**ssistance
Engage with Oracle support when you are planning your Enterprise Manager upgrade or migration in Pre-Production and Production environment	Dedicated Support Engineer will own the Upgrade SR and they will be with the customer throughout the process till completion	Expert advise from Oracle Support on migrating the Enterprise Manager environment to new Data Center or to a New Hardware	Oracle support team help, advise and partner with you throughout the engagement. Best practices are offered throughout the engagement lifecycle

Enterprise Manager PUMA Program - Value Addition

Reduced Risk

- ✓ Avoid Reactive Issues and Escalations
- ✓ Tuning the environment post-upgrade

Saving Time

- ✓ Fewer SRs to manage during Upgrade Lifecycle
- ✓ Completing Upgrades within the defined downtime window

ORACLE
Enterprise Manager

PUMA

Increased Efficiency

- ✓ Planning & getting Environment Ready for Upgrade
- ✓ Post-Upgrade follow-up calls for environment stability

Pain Free Patching

- ✓ Consistent Patch recommendations
- ✓ Proactive in nature to avoid running into patch failures

- ▪ PUMA = **P**roactive **U**pgrade **M**igration **A**ssistance
- ▪ Engage into PUMA program for better Upgrade experience

Enterprise Manager PUMA Program - Work Flow

1. Customer Success Manager(CSM)/Product Manager(PM) contacts PUMA Engagement Coordinator (EC) in regards to an upcoming customer upgrade/migration

2. Pre-engagement doc is sent to CSM/PM for customer completion

3. EC receives the pre-engage doc, it is reviewed. If all looks ok, EC will open PUMA SR, select an available support engineer to be involved and work with CSM/PM on the scheduling of a "Kick-off call"

4. Support engineers add introduction texts in the PUMA SR. The support engineer starts capturing specific info regarding customer environment . Support engineer primarily works with the customer via SR

5. Production date is reached and we assist the customer with production upgrade /migration

6. Customer informs us that all is ok in Production. EC will close engagement. PUMA survey is sent to customer

Agenda

Small Strategies – Big Difference

1 Step-by-Step Strategy
- Upgrade/Migration Planning
- Fallback Strategy

2 Least Critical First
- Development system
- UAT/Non-Prod system
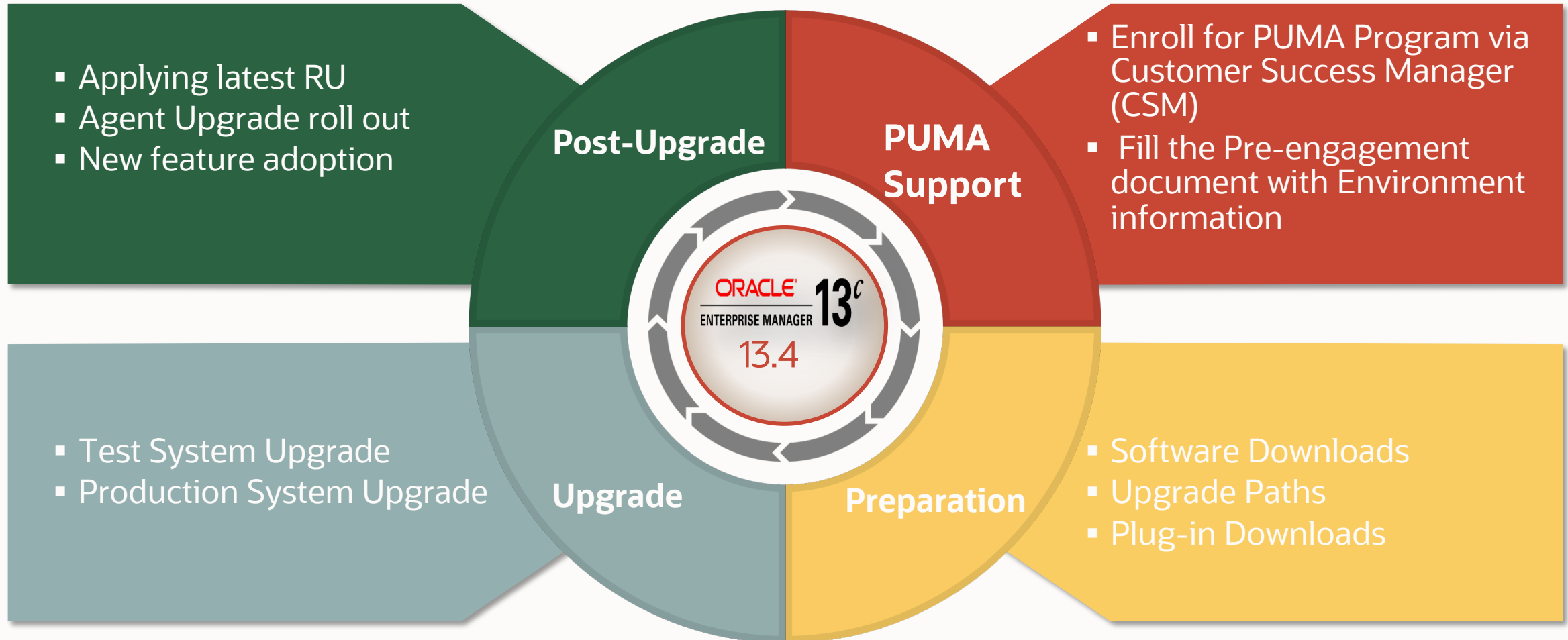- Production System

3 Big Bang Strategy
- Stage the new Software
- All in one downtime window
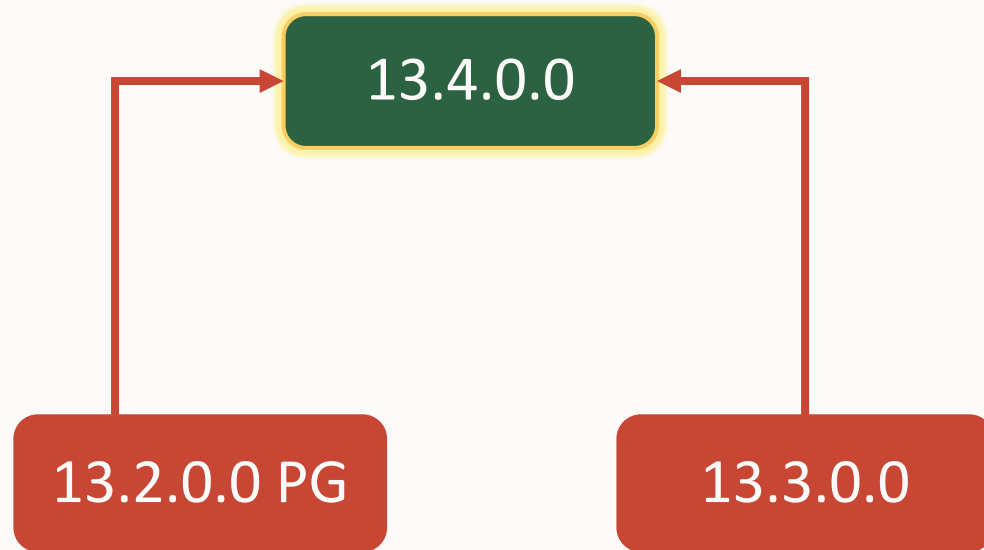
4 Most Critical First
- Performance Monitoring
- Patching
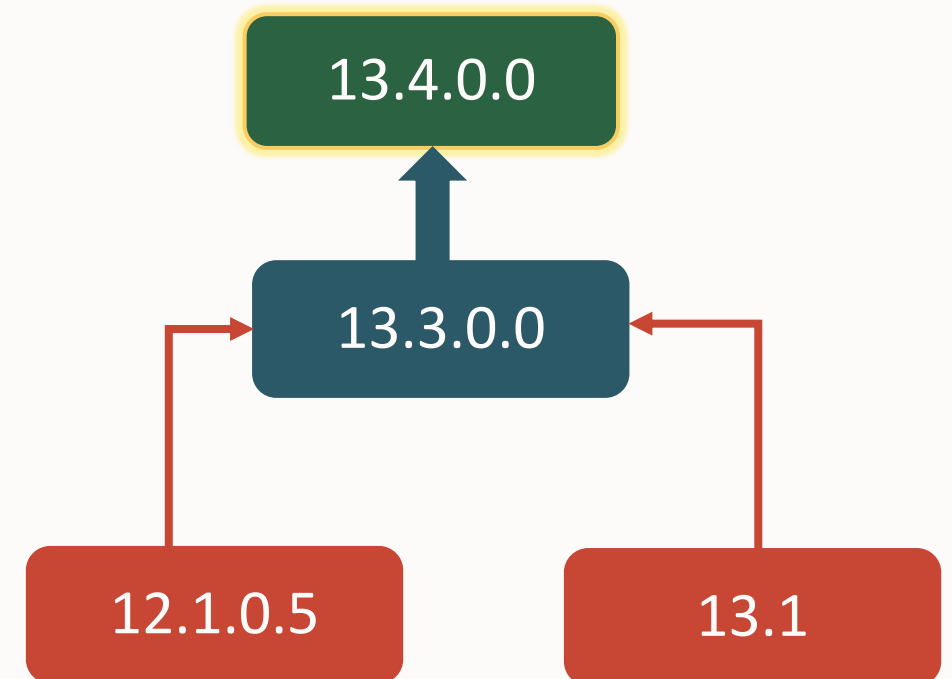- New Features

Enterprise Manager Upgrade Process – A 360º View

Post-Upgrade
- Applying latest RU
- Agent Upgrade roll out
- New feature adoption

PUMA Support
- Enroll for PUMA Program via Customer Success Manager (CSM)
- Fill the Pre-engagement document with Environment information

Upgrade
- Test System Upgrade
- Production System Upgrade

Preparation
- Software Downloads
- Upgrade Paths
- Plug-in Downloads

ORACLE ENTERPRISE MANAGER 13ᶜ 13.4

Upgrade Paths to Enterprise Manager 13.4

- Direct Upgrade Paths to 13.4 from 13.2 or 13.3

- EM 12.1.0.5 or 13.1 Upgrade Paths to 13.4

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Enterprise Manager Upgrade - Best Practices Checklist

- Checklist for Upgrading EM 13.2/13.3 to 13.4 - MOS ID **2625646.1**

- Ensure that the host on which the OMS is being upgraded meets the OS requirements.
    - Minimum supported OS is OL/RHEL 6.6

- Undeploy obsolete plug-ins from OMS and Agent
    - Oracle Engineered System Healthchecks (oracle.em.sehc)
    - Oracle Virtual Networking (oracle.em.sovn)
    - Oracle Audit Vault (oracle.em.soav)
    - Oracle Ops Center (oracle.em.sooc)
    - Microsoft .Net Framework (oracle.em.smdn)

- EM 13.4 upgrade will be blocked if older agents like 13.1, 12.1.0.5, 12.1.0.4 are present in pre-upgrade env.

- Perform Repository and OMS Health Check using EM Diag Kit

- Ensure the VNC session timeout is set properly for upgrade because upgrade runs close to ~ 3hr
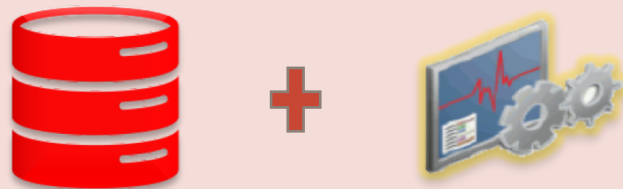
Enterprise Manager Upgrade - Best Practices Checklist

- If Weblogic is secured with Custom Certificates before upgrade remove the certificates and complete the upgrade

- Ensure the Repository DB is patched with latest PSU update

- Check for Invalid objects in repository database

- Check for custom objects Eg. Materialized views created in the repository, drop the objects prior to upgrade

- Backup Database, OMS, and Software Library before and after upgrade

- Ensure that the ulimit parameter is updated to the following values before upgrading the OMS
  - softnofiles : 30000
  - file-max : 65536

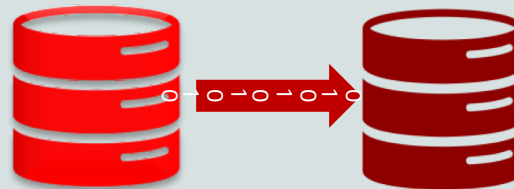# Enterprise Manager Upgrade Testing Strategies

1 Clone: Repository + OMS
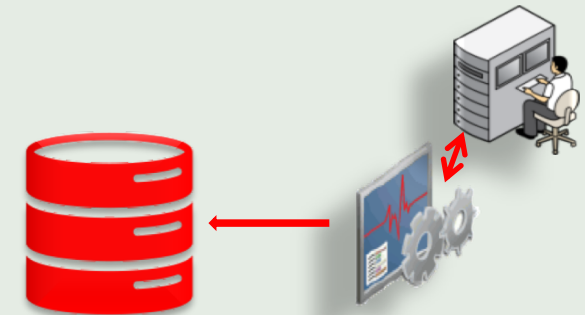
Full blown EM13.2/13.3 Production Clone Copy

2 Repository Only
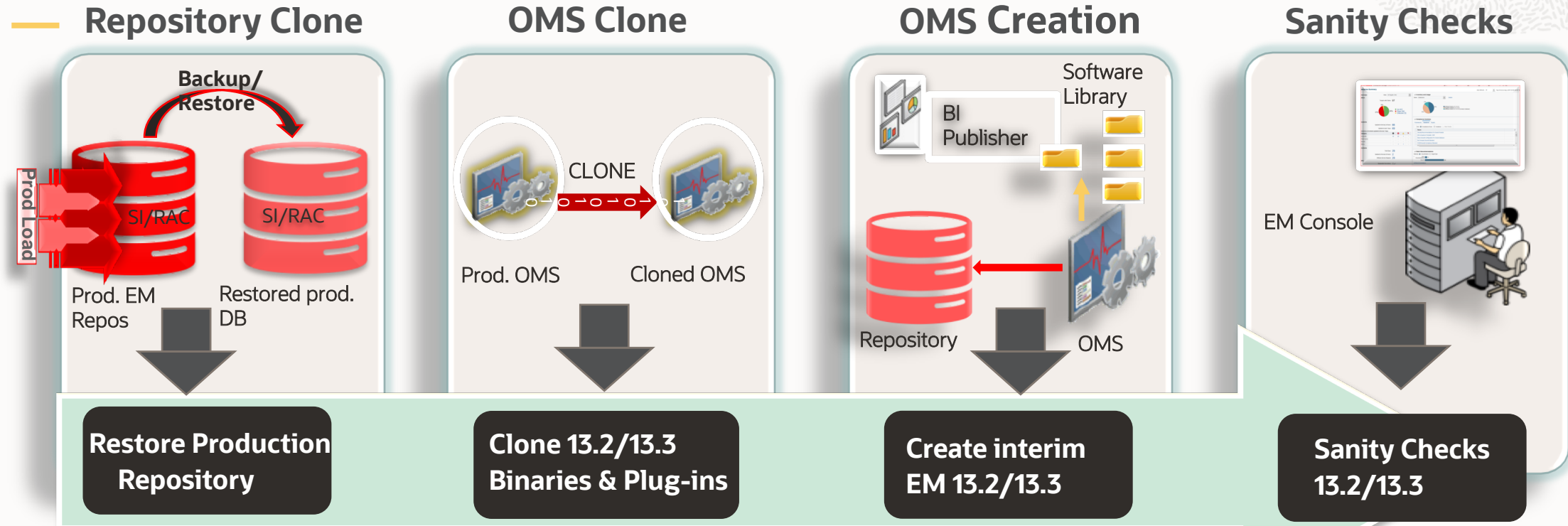
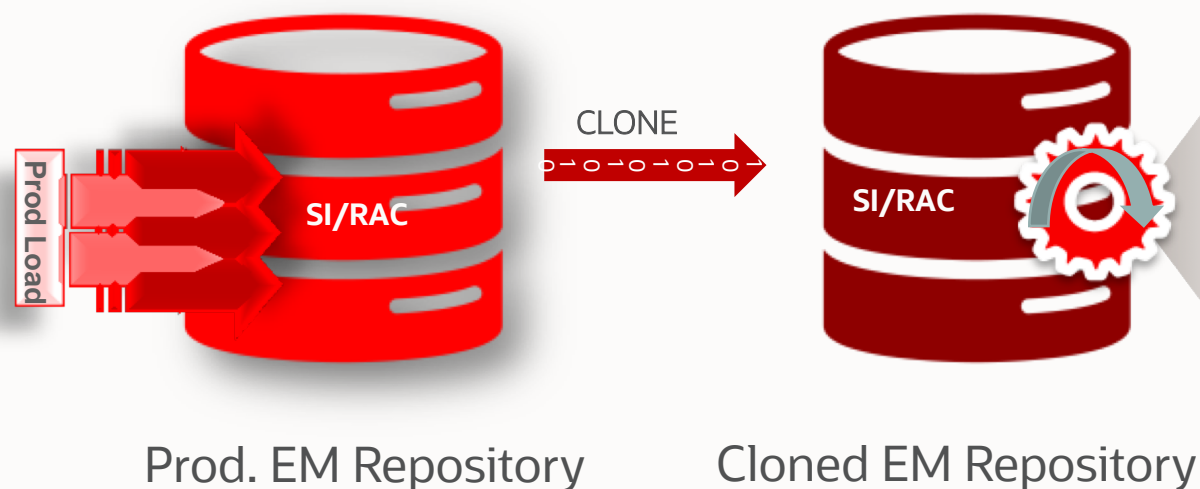Clone EM Repository Production Copy

3 Dev / Test EM System

Own Development / Test Environment

Upgrade Testing Strategies - Repository + OMS Clone

Repository Clone

Backup/Restore

Prod Load

SI/RAC   SI/RAC

Prod. EM Repos   Restored prod. DB

Restore Production Repository

OMS Clone

CLONE

Prod. OMS   Cloned OMS

Clone 13.2/13.3 Binaries & Plug-ins

OMS Creation

Software Library

BI Publisher

Repository   OMS

Create interim EM 13.2/13.3

Sanity Checks

EM Console

Sanity Checks 13.2/13.3

1. Clone the Repository Database and restore it on new host
2. Clone the OMS using the cloning scripts
3. Configure the OMS with the cloned repository
4. Perform sanity checks
5. Perform the upgrade to EM 13.4 version

Upgrade Testing Strategies - Repository Only Upgrade

Prod. EM Repository

Cloned EM Repository

- Clone or Backup/Restore Production Copy of Repository

- Run Health Checks on Production Copy – EM Prereq kit

- Repository Only Data Upgrade
  MOS Note: 2308866.1

✓ Early detection/remediate of Data issues during Repository Only Upgrade

✓ Help in Planning the Actual Downtime

Upgrade Testing Strategies - Development or Test or UAT

- Development / Test / UAT System with less targets

- Small Repository size

- Less number of Agents

- Run through the 13.4 MOS upgrade check list note. Verify the health of the system

- Perform an upgrade to 13.4

Smart Upgrade – Recommended Practice

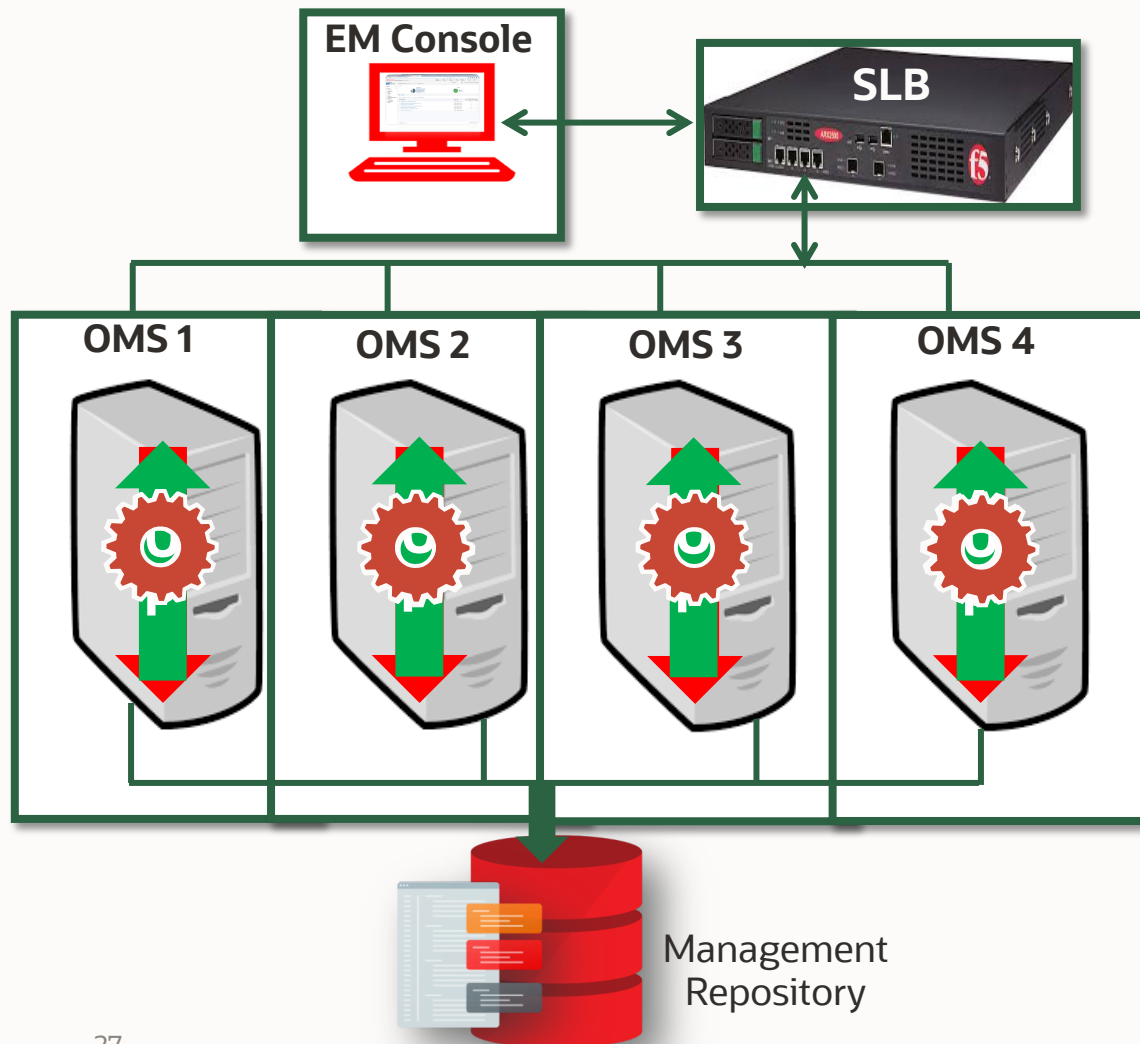## Software Only+ Plug-ins Install = Reduced Downtime

- Copying Software + Plug-ins and create new homes

    - em13400_linuxx64.bin INSTALL_SWONLY_WITH_PLUGINS=true PLUGIN_LOCATION=<plug-in zip location>

- No Impact to the running OMS while creating new homes

- Schedule downtime – Repository Upgrade + OMS Configuration

    - $MW_HOME/sysman/install/ConfigureGC.sh

Upgrade Optimization: Additional OMSs Upgrade in Parallel

1. On Primary OMS install Software only with Plug-ins flag
    - em13400_<platform>.bin PLUGIN_LOCATION=<absolute_path_to_plugin_software_location> INSTALL_SWONLY_WITH_PLUGINS=TRUE

2. On Additional OMS instances install Software only with Plug-ins and Parallel OMS flag
    - em13400_<platform>.bin PLUGIN_LOCATION=<absolute_path_to_plugin_software_location> INSTALL_SWONLY_WITH_PLUGINS=TRUE **PARALLEL_ADD_OMS_UPG=true**

3. Invoke the ConfigureGC.sh script on Primary OMS and complete the Upgrade

4. Invoke the ConfigureGC.sh script on each of the Additional OMS's and complete the Upgrade

Upgrade Optimization: Additional OMSs Upgrade in Parallel

- Shutdown all OMS's [Primary & Add. OMS's]

- Start Primary OMS Upgrade – ConfigureGC.sh

- Primary OMS **UP** after Upgrade

- Start Additional OMS's Upgrade in Parallel Invoke ConfigureGC.sh on each additional OMS instance

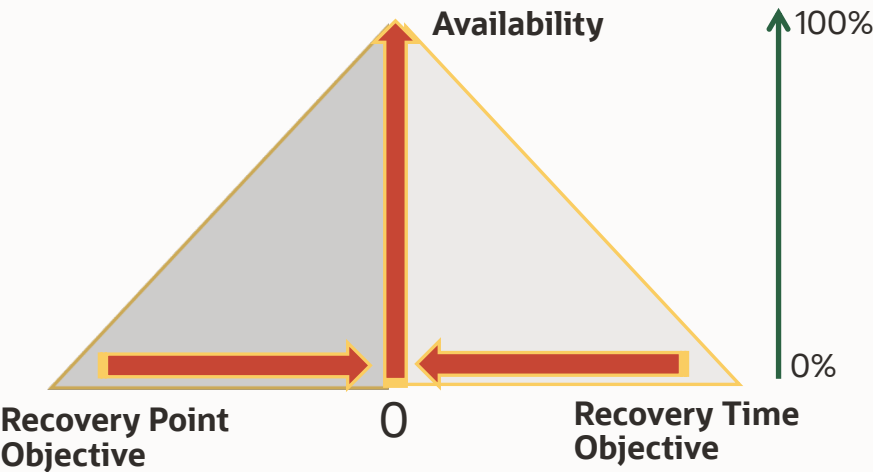- Additional OMS's **UP** after Upgrade

Agenda

Enterprise Manager Upgrade and Transitioning to DR Readiness

Upgrade an existing Enterprise Manager deployment

And

Configure it for Level 4 High Availability Architecture

High Availability Consideration Metrics

Three prime components determining the choice of high availability options:

- Recovery Time Objective
- Recovery Point Objective
- Availability Percentage

High Availability Options Available	Configuration
Level1	Single OMS SI Repository DB Instance
Level2	Active /Passive OMS DG(local)
Level3	Active/Active OMS RAC + DG (local)
Level4	Global Load Balanced Multi-site(DR)

Availability

100%

0%

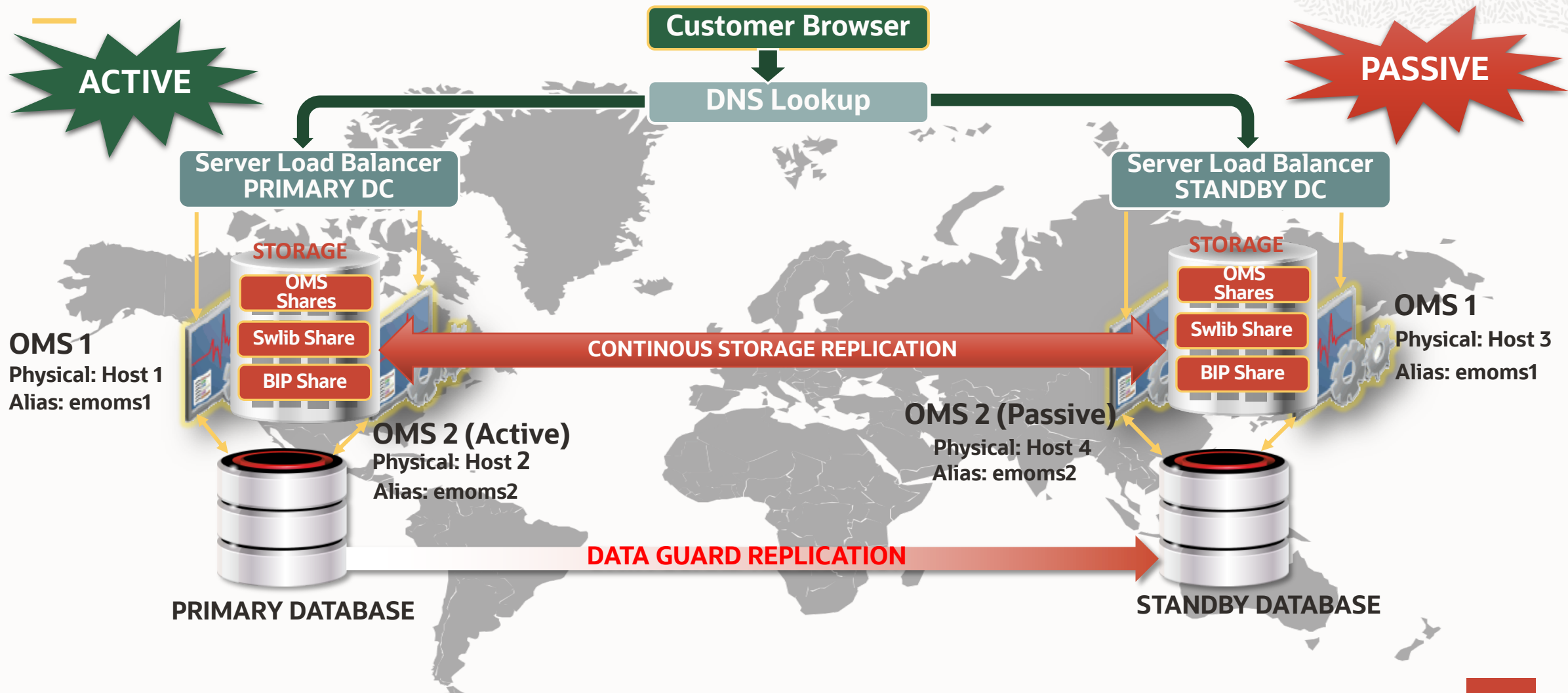**Recovery Point Objective**   0   **Recovery Time Objective**

Protection Offered with HA Levels

High Availability Levels	Configuration	OMS Host Failure	OMS Storage Failure	Database Host Failure	Database Storage Failure	Site Failure
Level1	SI Repository DB Instance Single OMS					
Level2	Active /Passive OMS DG(local)	✅		✅	✅	
Level3	Active/Active OMS RAC + DG (local)	✅	✅	✅	✅	
Level4	Global Load Balanced Multi-site(DR)	✅	✅	✅	✅	✅

HA Level 4 – MAA Deployment
Recommended design pattern for reliable and scalable deployment

Customer Browser

ACTIVE

PASSIVE

DNS Lookup

Server Load Balancer PRIMARY DC

Server Load Balancer STANDBY DC

STORAGE

OMS Shares

Swlib Share

BIP Share

STORAGE

OMS Shares

Swlib Share

BIP Share

OMS 1
Physical: Host 1
Alias: emoms1

OMS 1
Physical: Host 3
Alias: emoms1

CONTINOUS STORAGE REPLICATION

OMS 2 (Active)
Physical: Host 2
Alias: emoms2

OMS 2 (Passive)
Physical: Host 4
Alias: emoms2

DATA GUARD REPLICATION

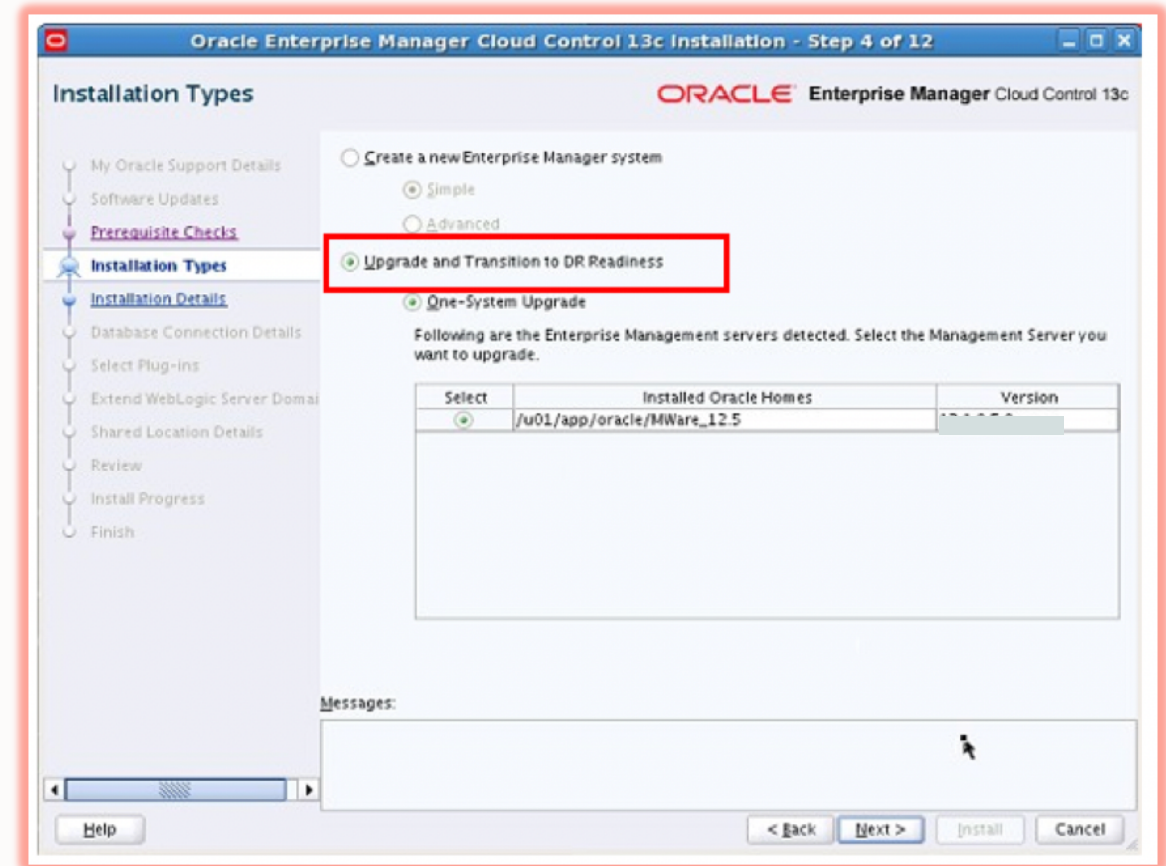**PRIMARY DATABASE**

STANDBY DATABASE

Enterprise Manager Upgrade and Transitioning to DR Readiness
When to use this method?

1. Use the Upgrade and Transition option in the installer if:

    - Enterprise Manager 13c is not configured with Level4 High Availability

    - OMSs and Central Agent are not configured with Alias Hostname

    - OMS and Agent software are not on storage replication

2. Perform the upgrade using the installer option

    - **em13400_linuxx64.bin UPGRADE_TRANSITION=true**

Special Installer mode - Upgrade and Transition

- Enabled by passing new parameter UPGRADE_TRANSITION=true

- Also requires additional new parameter OLD_INVENTORY_LOCATION

- Extends support for existing parameter ORACLE_HOSTNAME

- Only supported in OUI (**no support for Software Only or ConfigureGC.sh**)

Enterprise Manager Upgrade and Transitioning to DR Readiness

1. Do **not** use the Upgrade and Transition option if:

   - Enterprise Manager 13c was already implemented with Level4 High Availability

   - OMSs and Central Agent are configured with Alias Hostname

   - OMS and Agent software are on storage replication

2. In this case standard upgrade is sufficient by invoking the installer

   - em13400_<platform>.bin PLUGIN_LOCATION=<absolute_path_to_plugin_software_location> INSTALL_SWONLY_WITH_PLUGINS=TRUE

Post Upgrade Phase

- Apply the latest Release Update Patch on top of EM 13.4 version

- Master MOS ID for 13.4 RUs - **2647078.1**

- Reconfigure custom certificates on Weblogic Server

- Deleting Old Middleware Home

- Reset Optimizer Adaptive Features for Oracle Database 12.2, 18.x or 19.x

- Verify the upgraded environment for SSO login

- Verify the Agents and Targets are showing UP and communicating with upgraded OMS.

- Roll out Agent Upgrade using Gold Agent Image or Agent Upgrade Console

Additional Resources

Enterprise Manager Page on O.com

Install and Upgrade Page on OTN

Upgrade Guide (Documentation)

Web: http://www.oracle.com/enterprise-manager

Blogs: http://blogs.oracle.com/oem

Communities: https://einstein.oracle.com/apex/f?p=EINSTEIN:QUESTIONS:115355775023301::NO:RP:DOMAIN:em-support