

ORACLE



# Fortify hybrid Multi-Cloud database environment

Using EM Fleet Maintenance against cybersecurity risks, ensuring a resilient and secure enterprise posture

**Romit Acharya**

Product Manager

# Modernize your data center and keep assets secure

## Lower costs

Simplify and automate IT operations to lower CapEx and OpEx



## Reduce risks

Patch to secure  
Standardize configurations  
Audit for compliance



## Enable hybrid cloud

Hybrid PDBaaS for increased efficiency and faster innovation pace

### Automate IT operations

- Consolidate to Multitenant
- Automation of database operations
- One tool for hybrid cloud platforms

### Strengthen security posture

- Security-first, by default
- Modernize processes to standardize
- Continuous check for compliance

### Activate DevOps model

- Increase SLAs and cater to customers faster
- Eliminate silos between IT and dev teams
- On-demand deployment of secure configuration

# Database management scenarios



## Lifecycle management

### Higher productivity

Automate complex and time consuming tasks for database patching



## Patch recommendations

### Security patches

Deploy recommended patches with ease, reduce breaches



## Configuration sprawl

### Standardization

Use well defined secure configurations, reduce maintenance and risks



## Security compliance

### Compliance

Secure assets with out-of-box standards and audit for compliance



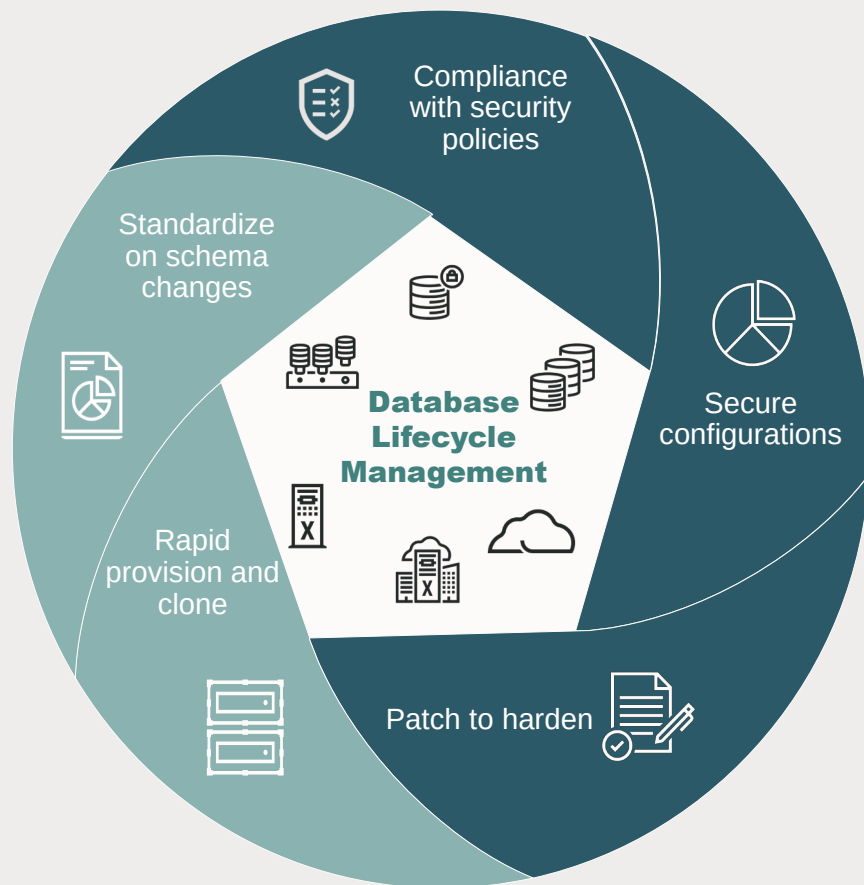
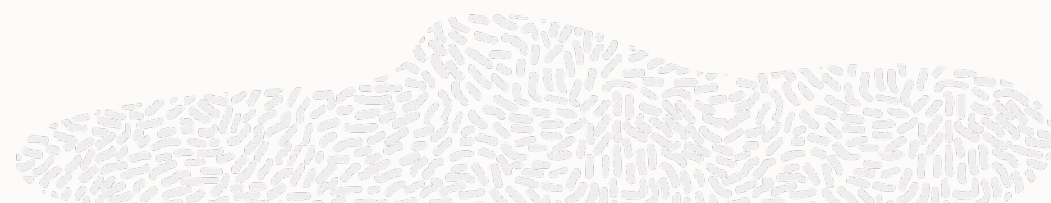
## Inventory insight

### Reduce cost

Get insight into inventory utilization, reduce CapEx, and OpEx

# Security hardening

## Database Lifecycle Management Pack (DBLM)



### **Protect from breaches**

Automated security patch recommendations, intuitive interface to patch and secure assets

### **Audit and manage compliance**

Regulatory and industry standards (CIS, STIG, HIPAA, PCI-DSS, custom)  
Secure infrastructure with Oracle Autonomous Health Framework EXAchk

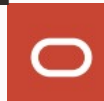
### **Manage configuration drift and deviation**

Baseline definition and compare to detect differences, export/import baselines between development and production

### **Automate repetitive provision and clone activities**

Deploy standardized database configuration

### **Multiple interfaces – REST APIs, EMCLI and UI**



# Automate active management in Exadata (On-premises and Cloud)

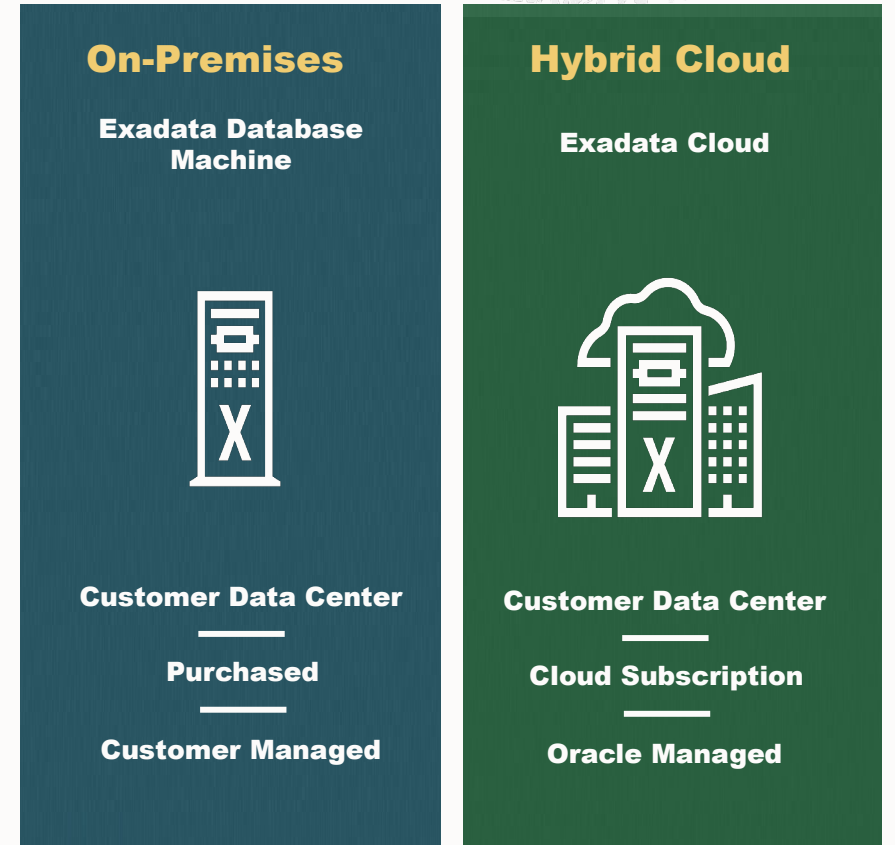
One management tool for hybrid multicloud environment

## Database management

- Compliance with industry and regulatory security policies
- Secure configuration deviations with baselines
- AHF EXAchk for Exadata health and performance management
- Upgrade and patch all supported databases at scale
- Automate database deployment – provision, create, unplug, plug, clone

## Hybrid cloud management

- Enable DevOps users for on-demand deployment
- Tenant isolation, and security
- Database-as-a-service options: DBaaS, PDBaaS, Hybrid-as-a-Service
- Rapidly clone and save storage with Snap clone
- Chargeback and metering



# Secure databases

Automated timely patching reduces downtime, enhances security posture and achieves compliance with IT security policies

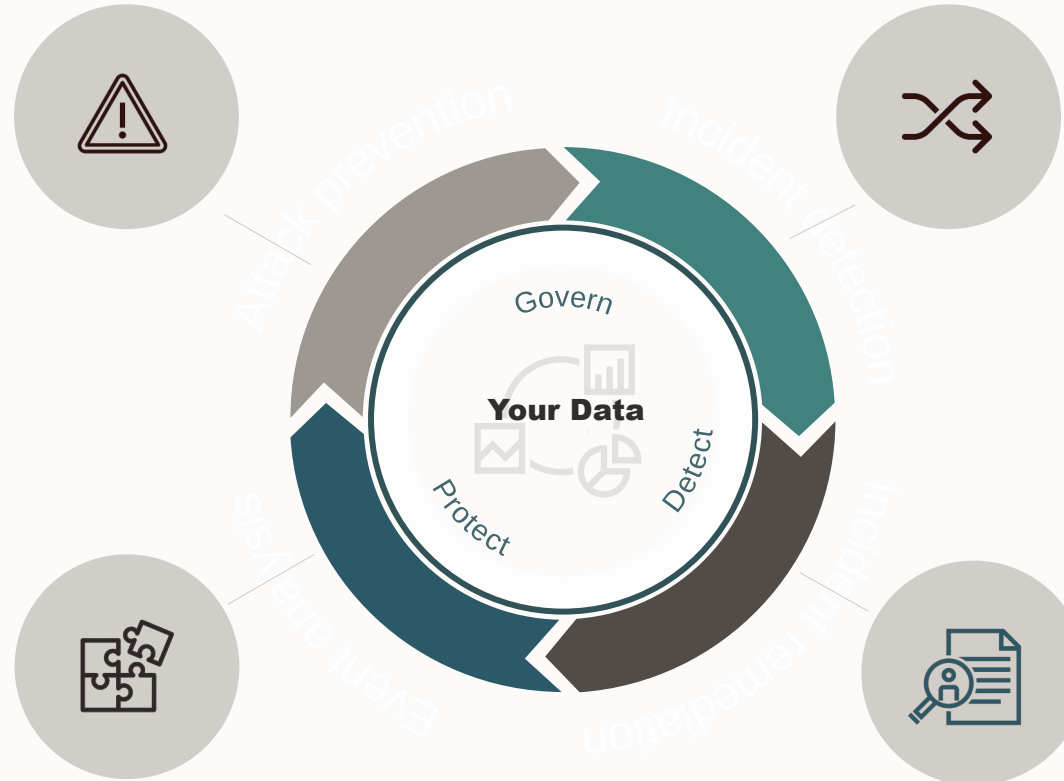
# Modernize your security compliance and patching process

## Patch to secure, encrypt to protect

26% of breaches<sup>1</sup> due to unpatched systems

## Manage elevated privileges

More than 50% of breaches leveraged weak credentials



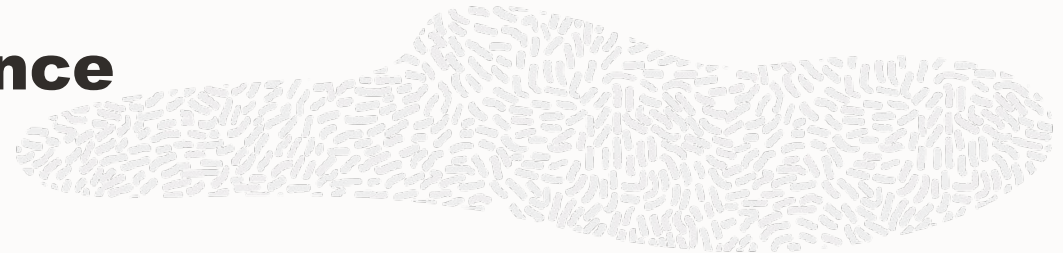
## Standardize and track configuration sprawl

45% of breaches were due to misconfigurations<sup>1</sup>

## Risk management and compliance

#2 in IT risk assessment priorities

# Enterprise Manager Fleet Maintenance



Features

- Security patch recommendations
- Configuration standardization advisor
- Out of place, end state driven patching
- Custom pre-scripts and post-scripts
- Automate with Orchestration and DevOps tools
- Zero downtime rolling patch at scale

- Security-first processes
- Compliance with regulatory
- Insights to vulnerabilities
- Lower OpEx with standardization
- Reduce maintenance window
- Near zero-downtime

efits





# Patching across hybrid environment

One management tool for hybrid multicloud environment

## Lower costs

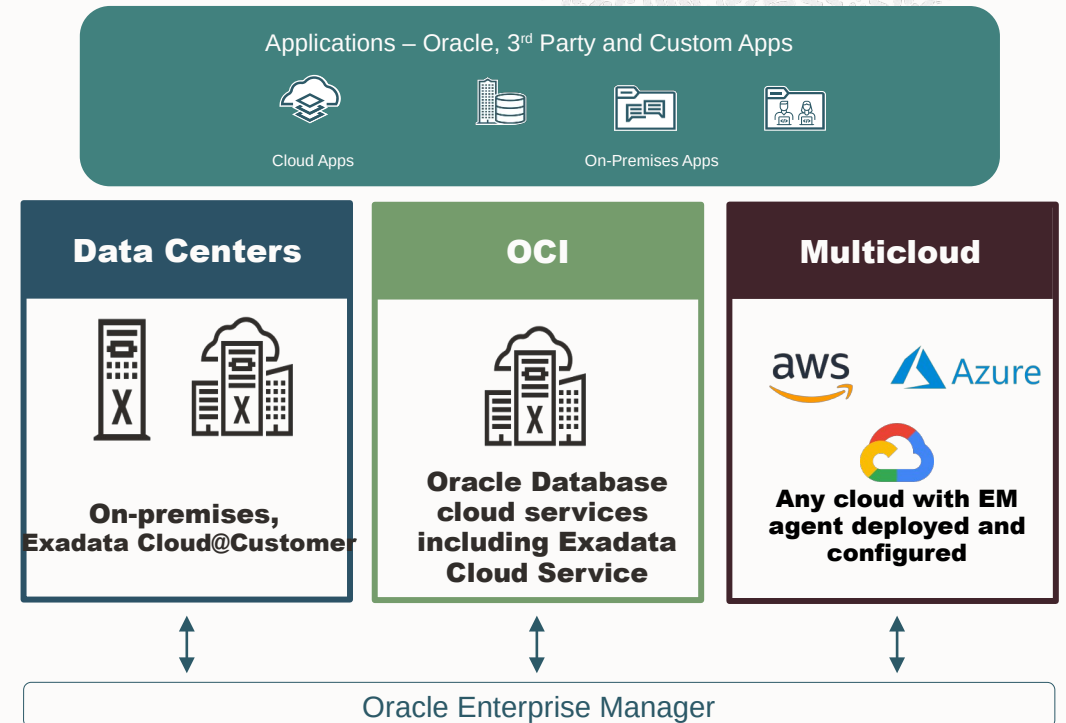
- Optimize CapEx by consolidating to Multitenant
- Reduce OpEx by automating database operations
- Modernize upgrade and patch processes

## Reduce risk

- Compliance with industry and regulatory security policies
- Secure configuration deviations with baselines
- AHF EXAchk for Exadata health and performance management

## Enable hybrid cloud

- Enable DevOps users for on-demand deployment
- Database-as-a-service options: DBaaS, PDBaaS, Hybrid-as-a-Service
- Chargeback and metering



# Fleet Maintenance – upgrade and patch at scale



1

Scan fleet, discover configuration pollution  
 Advisor scans the fleet for configuration variations  
 Provides recommendations to standardize

2

Create new image and subscribe  
 Define end states for software as images  
 Subscribe databases/pools to the images

3

Push image and switch  
 Deploy image and schedule the subscribes to switch

11.2.0.4


12c


18c


19c


21c


23ai


  
 Database Instance


  
 Oracle RAC and RAC One  
 Grid Infrastructure


  
 Oracle Restart  
 Data Guard configurations

  
 Exadata

  
 Exadata Cloud /  
 OD@Azure

  
 Commodity hardware

  
 Public Cloud



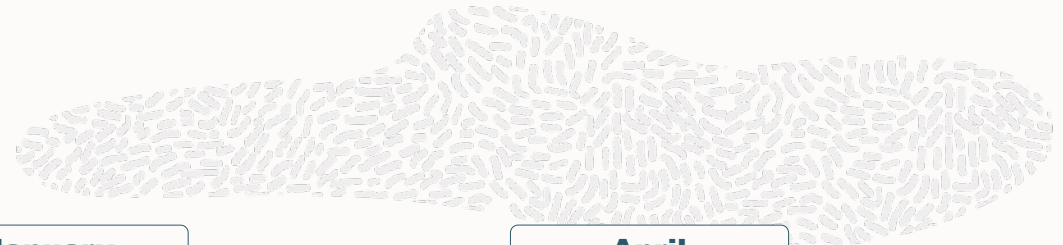


# Intelligent patch recommendations to enhance security posture

Fleet Maintenance Hub

# Fleet Maintenance Hub

Automated security patch recommendations



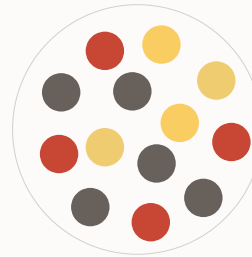
July



October



January



April



**Patch severities and affected targets**

determine priorities to patch now or later

Insight into **patch recommendations and vulnerabilities** helps in

faster decisions

**High OpEx** for manual patch analysis. Automated prioritized list leads to quicker response

Quickly apply **to secure and manage risks** from multiple sources

*Enterprise IT spends 12+ person weeks in a year for one DBA to do this entire assessment*



# Simplify security across hybrid environment

Single pane of glass for patch recommendations, patching and patch compliance

**Security patch recommendations**  
for all database versions and types supported

---

**Insight into affected database targets**  
assets across on-premises and cloud

---

**Apply to be patch compliant**  
deploy security patches to all targets



# Fleet Maintenance Hub

One stop place for operational control, and enhanced security

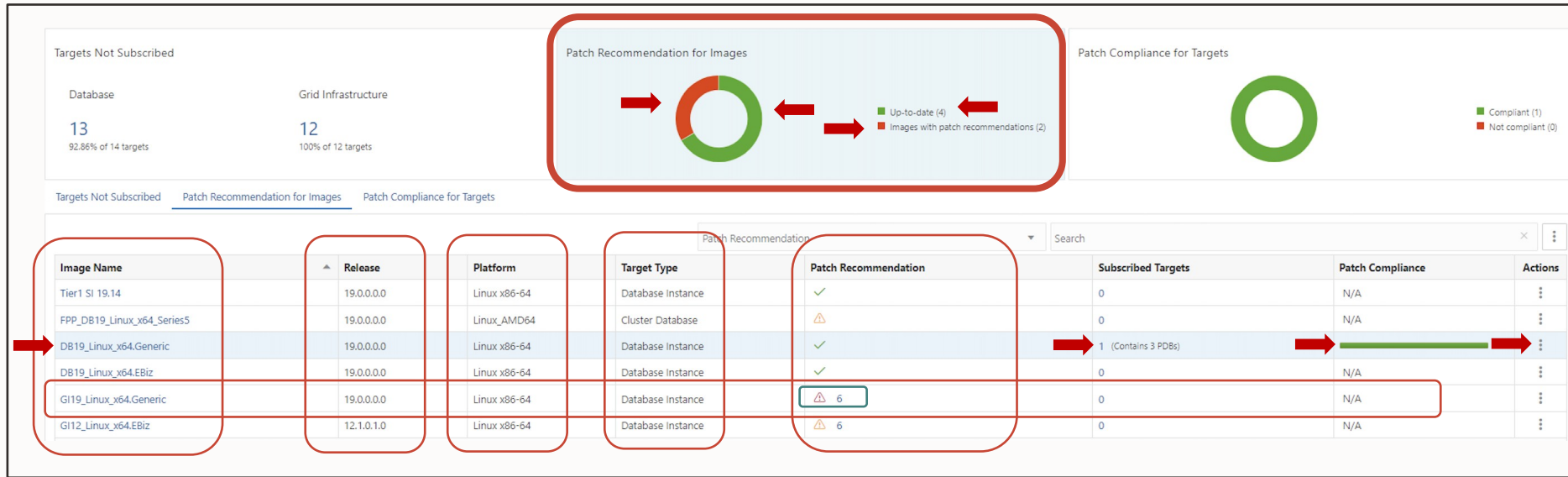


Security patch recommendations

Database compliance with patch policies

Automated insight into affected gold images

Risk assessment of targets to subscribe

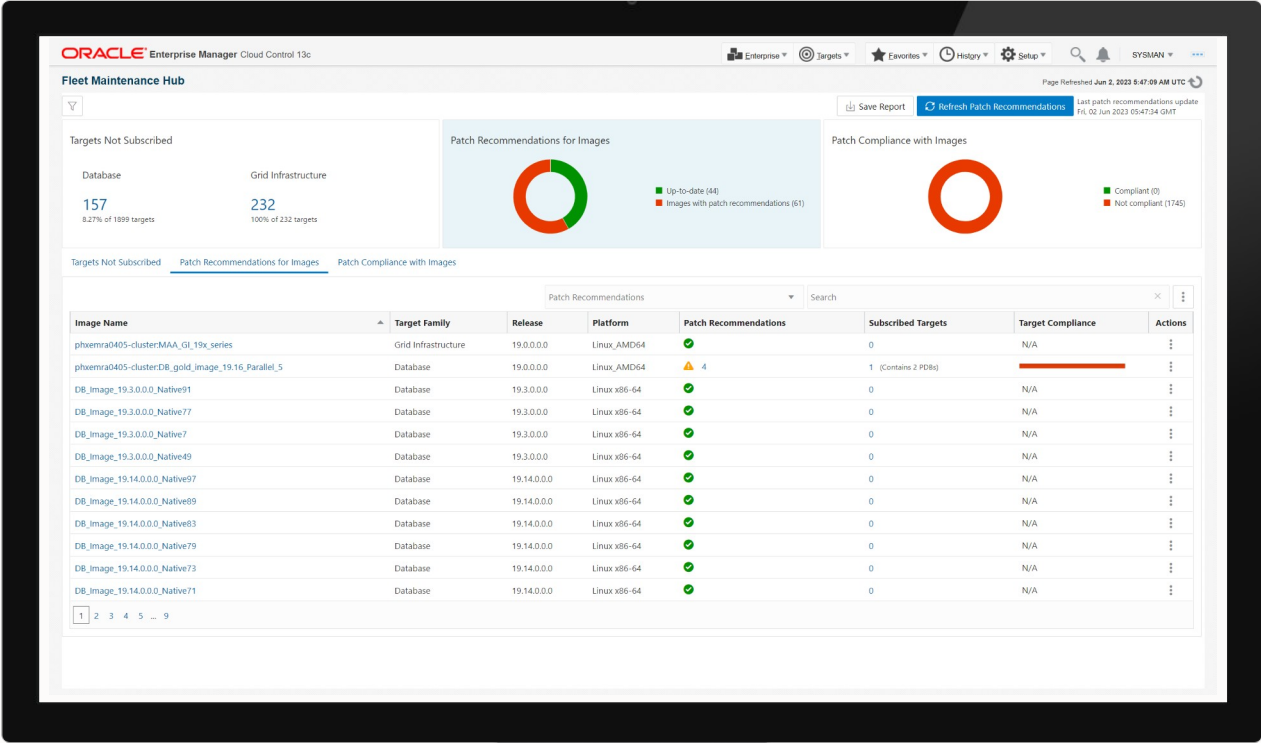


Seamless end-to-end fleet-level integrated story across hybrid environment



# Fleet Maintenance Hub

## Benefits



Fleet Maintenance Hub

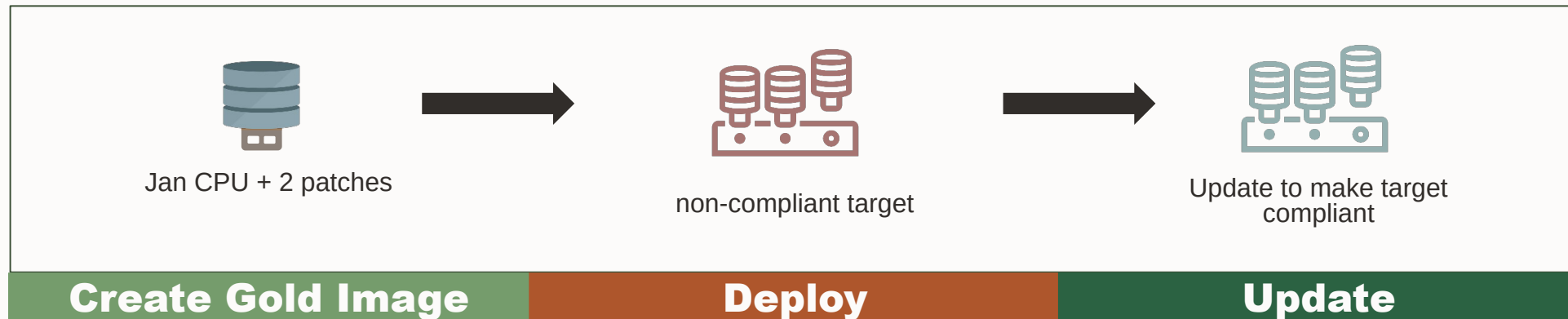
- Tangible OpEx savings
- Eliminate human error
- Proactively keep security posture at higher levels
- Reduce long maintenance downtime



# Patch recommendation and gold image management

Create and manage gold images with all recommended patches, so you don't miss out on any security patches

Patch in 3 steps to secure your database estate



Proactive security automation, including automated patching can reduce risk of data breaches occurring after common vulnerability and exposure alerts have been issued



# Secure credential management <sup>New</sup> Privilege Access Management integration (PAM) with Enterprise Manager

## Seamless integration

PAM integration bolsters security by enabling secure, controlled access to privileged accounts

## Protect from security breaches

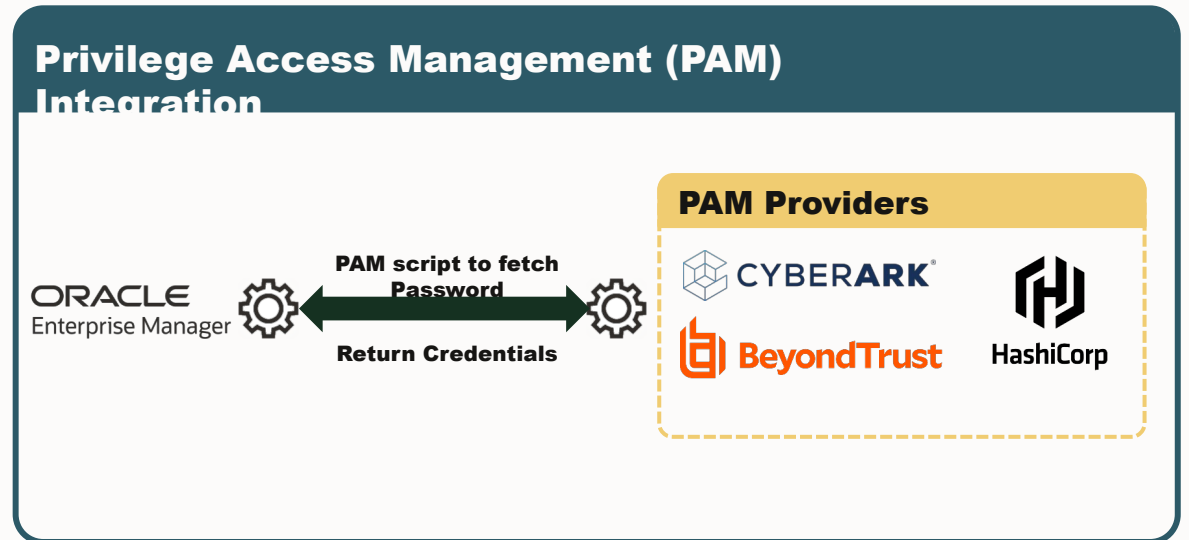
Protects against privilege abuse by centralizing and controlling privileged account access, periodic password rotations

## Elevated security posture

EM-PAM integration aligns security policies, ensuring privileged credentials are handled securely and transparently within EM's framework

## Streamlined credential management

PAM-integrated named credentials streamline the management of password rotations, reducing operational overhead and potential points of exploitation



# Modernize your security compliance and patching process

**Patch to secure,  
encrypt to protect**

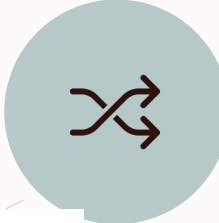
Patch Recommendations for Images

- Up-to-date (1)
- Images with patch recommendations (5)

Custom Scripts

Stage	Script Location	Run as
Deploy: Pre	Select or enter a script location in Software Library	Root

Dropdown that are loaded from Software Library folder: "Fleet Maintenance/User Defined Scripts", or specify your custom location.



**Standardize and  
track configuration  
sprawl**

**Manage elevated  
privileges**

Credentials

- Normal Host Credentials \* (Named): ORACLE
- Privileged Host Credentials \* (Named): ROOT
- SYSDBA Database Credentials \* (Named): OEM\_SYSPAM

UserName	Run Privilege	Run as
oracle	SUDO	root
sys		SYSDBA



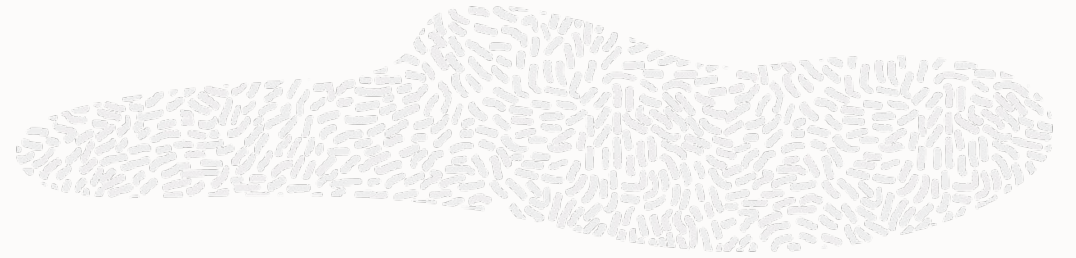
**Risk management  
and compliance**



# Fleet Maintenance User Interface

## Intuitive User Interface

- Simplifies patch and upgrade of entire database fleet, including grid infrastructure
- Perform Deploy, and Update operations
- Include custom pre and post scripts in the same maintenance window
- Intelligent interface assists tracking of operations at every step and provides actionable insights
- Built-in library of pre-checks to improve reliability and diagnosability



Targets

Image: SL\_1910\_Linux.x64 | Target Type: Cluster Database | Operation: Update |

Platform: Linux x86-64  
Created By: SYSMAN  
Created Date: Jun 24, 2021 4:19:19 AM PDT  
Current Version: Version1

Show only Targets with Update Recommended

<input type="checkbox"/>	Name	Target Status	Cluster	Role	Release	Deploy Status	Update Status
<input checked="" type="checkbox"/>	roracdb1 ⓘ	↑ 2	den01nr-cluster		19.7.0.0.0	→	→
<input checked="" type="checkbox"/>	Sales DB1 ⓘ	↑ 6	den01ns-cluster	Primary	19.7.0.0.0	→	→
<input type="checkbox"/>	Sales DB2 ⓘ	↑ 5 ⚠ 1	den02ns-cluster	Physical Standby	19.7.0.0.0	→	→
<input type="checkbox"/>	Sales DB3 ⓘ	↓ 1 ↑ 5	den03ns-cluster	Physical Standby	19.7.0.0.0	→	→
<input type="checkbox"/>	Sales DB4 ⓘ	↑ 4	den04ns-cluster	Physical Standby	19.7.0.0.0	→	→
<input type="checkbox"/>	Sales SIDB5 ⓘ	↑ 2	den05ns-cluster		19.7.0.0.0	✓	✓

Page 1 of 1 (1-6 of 6 items) |  | Total Selected Targets: 2



# More new features in Fleet Maintenance



## UI enhancements

Multitenant upgrade and patching operations

Upgrade non-multitenant to multitenant

Integrated with Autoupgrade

Scheduling flexibility for Oracle home deploy and update operations

## Automation

Patch recommendations for creating/refreshing gold images

Rollback support for DB/RAC patching and upgrade failures

Rollback support for GI and Oracle Restart patching and upgrade failures

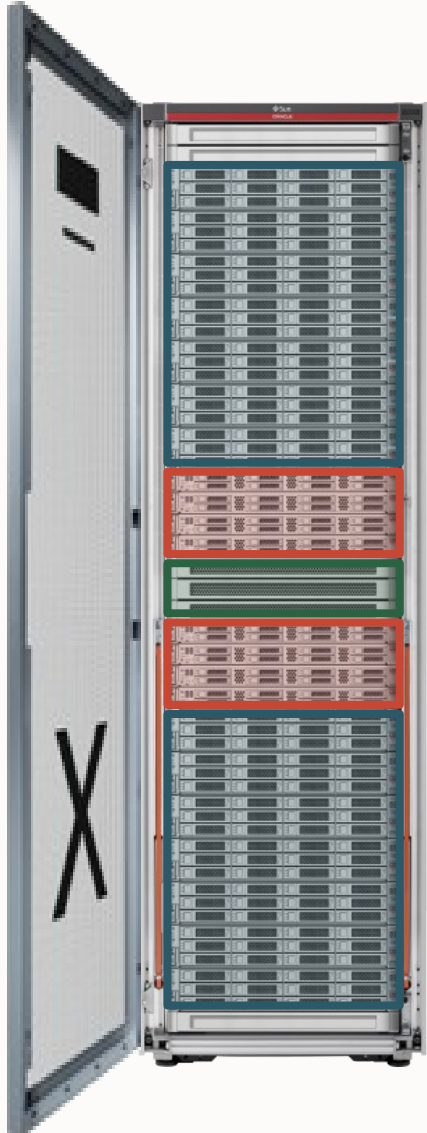
## Security

Privileged Access Management (PAM) based authentication support for patching operations

TDE Support: DB 19c/21c/ExaCC provisioning and patching support

TDE Support: Patching for Init param based config

# Exadata Software Patching



Exadata software patching with REST APIs and EMCLI

- Physical/Virtual Compute nodes
- Storage Cells
- KVM and Xen DomU guests
- InfiniBand network switches

## Features

- Patch multiple components across Exadata Database Machine
- Rollback to last known good state in case of failure
- Rollback to previous version, if required
- Schedule deploy and update operations to align with preferred maintenance window

# Gold Image Management

Seamless workflow in Fleet Maintenance Hub



Create new image with all recommended security and performance patches

Refresh existing image with all recommended security and performance patches

Make a version of gold image Current

## Lifecycle Management history

Availability of lifecycle details of targets

Helpful for Auditors and Admins to review and audit past actions

Download using Hub, emcli and REST APIs

# Demo – Fleet Maintenance Hub

Subscribe Targets

Review Recently Released Recommendations

Create/Refresh Gold Images\*\*

Update Targets

\*\* Upcoming Feature



# Audit for patch compliance

## Lifecycle management history

- Audit patch and upgrade operations
- Use REST APIs or emcli
- Filter your query for required insights like
  - Target name
  - Target type
  - Task type
  - Status
  - Start/End time
- Export data to csv
- In EM 13.5 RU22+

Target Name(s)	df141op_df141op1							
Target Type	oracle_database							
Submitted By	dbadmin							
From (Start Time)	1/8/19 16:00							
To (Start Time)	28/03/24 15:21							
Total number of records	10							
Target Name	Target Type	Task	Status	Start Time	End Time	Patches		
df141op_df141op1	oracle_database	UPDATE_DB	COMPLETED	6/2/23 11:24	6/2/23 10:29	[29517242 29517243 29517244]		
df141op_df141op1	oracle_database	UPDATE_DB	COMPLETED	6/8/22 11:24	6/8/22 10:29	[29517242 29517243 29517244]		
df141op_df141op1	oracle_database	UPDATE_DB	COMPLETED	6/8/22 11:24	6/8/22 10:29	[29517242 29517243 29517244]		
df141op_df141op1	oracle_database	UPDATE_DB	COMPLETED	6/8/22 11:24	6/8/22 10:29	[29517242 29517243 29517244]		
df141op_df141op1	oracle_database	UPDATE_DB	COMPLETED	6/8/22 11:24	6/8/22 10:29	[29517242 29517243 29517244]		
df141op_df141op1	oracle_database	UPDATE_DB	COMPLETED	6/8/22 11:24	6/8/22 10:29	[29517242 29517243 29517244]		
df141op_df141op1	oracle_database	UPDATE_DB	COMPLETED	6/12/22 11:24	6/12/22 10:29	[29517242 29517243 29517244]		
df141op_df141op1	oracle_database	UPDATE_DB	COMPLETED	6/12/22 11:24	6/12/22 10:29	[29517242 29517243 29517244]		
df141op_df141op1	oracle_database	UPDATE_DB	COMPLETED	6/12/22 11:24	6/12/22 10:29	[29517242 29517243 29517244]		

**REST APIs**

**GET**

**POST**

Export Lifecycle Maintenance History

Get Lifecycle Maintenance History





# Q&A

## Learn More

Web: [oracle.com/enterprisemanager](https://oracle.com/enterprisemanager)

Videos: [youtube.com/OracleEnterpriseMgr](https://youtube.com/OracleEnterpriseMgr)

Blogs: [blogs.oracle.com/observability](https://blogs.oracle.com/observability)

Docs: [docs.oracle.com/en/enterprise-manager/](https://docs.oracle.com/en/enterprise-manager/)

[Try it now](#)



Hands-on-labs

## Oracle Cloud Free Tier

### Always Free

Services you can use for unlimited time



### 30-Day Free Trial

Free credits you can use for more services

[www.oracle.com/cloud/free](https://www.oracle.com/cloud/free)