

ORACLE

Lifecycle Management and Security Innovations for Oracle Databases

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Safe harbor statement

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Rise in data breaches – an ever-growing challenge



+490%

More than 1 billion records breached in first half 2024

6TB

Change Healthcare data claimed stolen in ransomware attack

\$9.48M

U.S. average cost of a data breach, 9% increase (Global \$5.3 M)

\$300K

Average cost of a single hour of downtime

Attack vectors¹

Unpatched systems

Misconfiguration (Human Error)

Configuration sprawl

Misuse of elevated privileges (Insider Threats)



Modernize your security compliance and patching process



**Patch to secure,
encrypt to protect**

26% of breaches¹ due to
unpatched systems



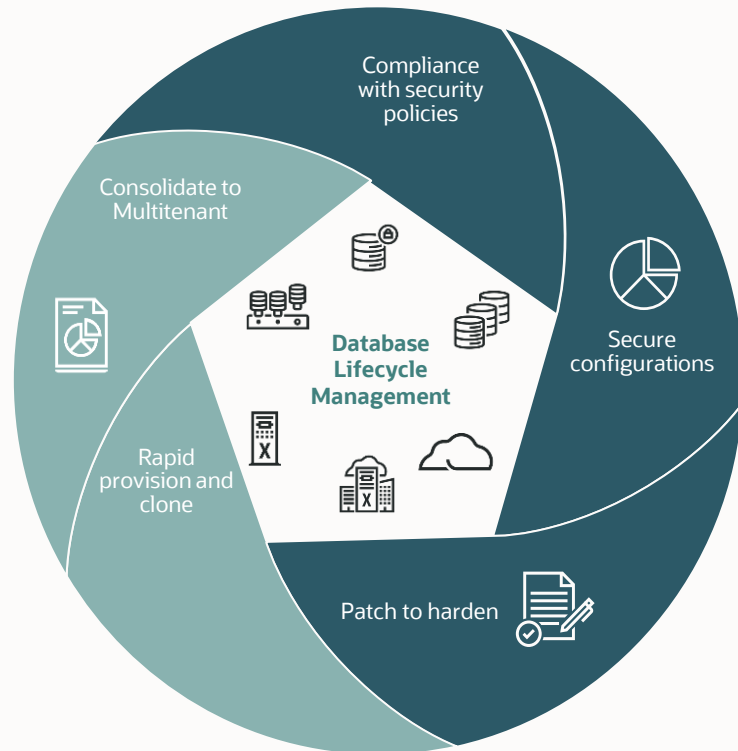
**Secure configuration and
audit for Compliance**

45% of breaches¹ due to
misconfiguration



Strengthen database security with automated operations

Secure assets across hybrid and multi-cloud environment



Protect from breaches

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

Audit and manage compliance

Regulatory and industry standards (CIS, STIG, HIPAA, PCI-DSS, custom)

Fleet-level sensitive data assessment using Oracle DBSAT

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

Real-world database management scenarios

Inventory insight

Reduce cost

Optimize inventory management, reduce CapEx and OpEx

Patch recommendations

Security patches

Effortlessly deploy patches, minimize breaches

Configuration sprawl

Standardization

Minimize risks with standardized secure configurations

Security compliance

Audit for Compliance

Safeguard assets with standards, ensure compliance

Automation

Higher productivity

Automate complex and time-consuming tasks

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
- Automate quarterly patching model

Audit for Compliance

- Continuous check for compliance
- Automate remediation for immediate alignment
- Align with industry and regulatory standards

Innovations for enhancing efficiency and security



Strengthen Security Posture, Lower OpEx Costs

Single pane of glass for patch recommendations and compliance

- Secure managed database assets across on-premises, and cloud
- Proactively identify vulnerabilities, patch to secure and eliminate breach risk
- Audit for compliance with deploy and update patch history

Fleet Maintenance Hub

Effortless, Consistent, Cost-saving updates

Seamless end-to-end guided workflow to refresh image versions

- Identify patches to include both recommended security and any one-off patches
- Guided workflow to create or refresh images and mark them Current for active deployment
- Integrated deploy and update operations

Gold Image Management

Efficient, Reliable, Hassle-free patching process

Automate fleet-level patching of Exadata On-premises infrastructure

- Physical/Virtual Compute nodes, storage cells, KVM/Xen DomU guests and InfiniBand switches
- Fleet level patch of multiple components with scheduling flexibility
- License Exadata Management pack

Exadata Management

Innovations for enhancing efficiency and security

Extend Enterprise Manager richness to FPP customers

Automated risk assessment with security patch recommendations

- Secure managed database assets across on-premises, and cloud
- Proactively identify vulnerabilities, patch to secure and eliminate breach risk
- Automation to deploy FPP Server/Clients

Fleet Maintenance

Fleet Maintenance to AutoUpgrade customers

Fleet-level upgrades with integrated AutoUpgrade

- Upgrade non-multitenant and multitenant databases with intuitive workflow
- Leverage Hub to assess vulnerabilities of upgraded databases
- Get precise security patch recommendations

Fleet Maintenance

Audit for Compliance with new standards

Secure configuration and minimize administrative privileges

- CIS Benchmarks v1.1.0 & v1.2.0 for Oracle Database 19c (SI, RAC and Multitenant)
- New generation DoD DISA STIG for Oracle Database 12c and 19c
- DBSAT 2.x out-of-box standards for SI, RAC and Multitenant

Compliance Standards

O&M Service - Vulnerability Detection

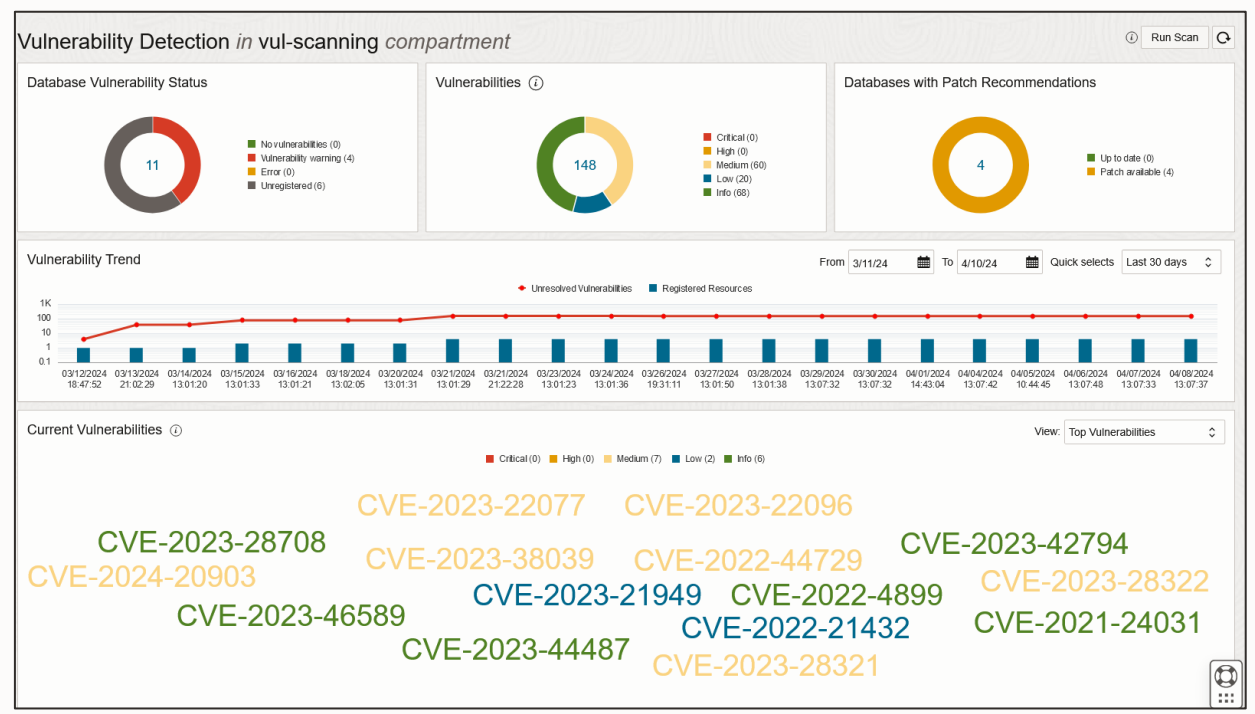
Elevate security posture with Critical Vulnerabilities and Exposures (CVE) insights

Fleet-level Oracle Databases Vulnerability Detection

- Get insights for databases in on-premises and Base Database Service Virtual Machines
- Critical Patch Update (CPUs) release notification
- Observe top CVEs and deep dive details for each CVE
- Know about most vulnerable databases
- Precise security patch recommendations for each CVE

Benefits

- Enhanced security posture of managed assets
- Reduced risk of data breaches
- Minimized downtime, and continuous operational efficiency



What's Next: Upcoming innovations for efficiency and security

Security

Database configuration security and compliance

- DBSAT 3.1 support for SI, RAC, and Multitenant
- CIS Oracle Database 19c Benchmark v1.2.0.next
- Oracle Database STIG Version 3, Release 2

Oracle Linux 9 configuration security and compliance

- Security Content Automation Protocol (SCAP) based standards
- NIST, STIG, PCI-DSS and Standard System Security Profile

Fleet Maintenance

- Exadata Cloud CDB-level patching – extend PDB-level support to CDB
- Patch databases based on EM groups (static, dynamic)
- Patch databases based on target properties (like cost center)
- Audit for Patch Compliance – extend existing patching history
- Gold Image/Version CRUD operations management
- Create software image using out-of-box Oracle shipped gold image
- Orchestrating patching of primary and multiple standbys together

High Availability

Remote Agent support for

- Database and grid infrastructure upgrade and patching
- Database compliance standards – out-of-box and customized
- Autonomous Health Framework Exachk for Exadata Infrastructure

Data Guard per Pluggable Database (DG PDB)

- DG PDB aware Data Guard Administration Page
- CDB home page displays DG PDB configuration
- Pluggable Databases in DG PDB are listed with role and metrics
- Displays role of PDB in the top info banner
- Jobs: two new role change jobs
- Remove PDBs from DG configuration

Data Guard per Pluggable Database

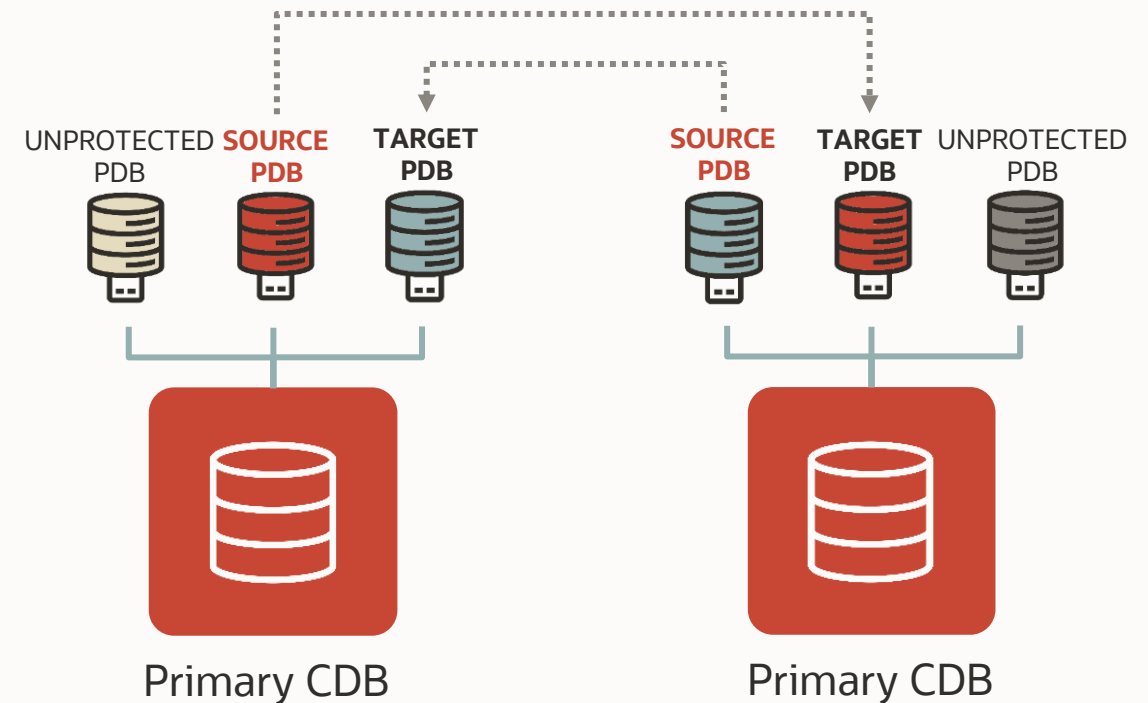
High availability, data protection and disaster recovery for enterprise data

Features

- Oracle Data Guard per PDB (DGPDB) for data protection
- PDB replication between two primary CDBs
- Asynchronous redo transport - same as traditional Data Guard
- Switchover/failover at PDB level to remote site
- No need to switchover/failover a full CDB

Benefits

- Balance workload between two sites
 - Drain one CDB for maintenance by switching over one PDB at a time
 - Rebalance workload by switching over individual PDBs
- Sick PDB protection
 - Failover a single PDB in a failed state without impacting entire CDB
- Single PDB Disaster Recovery tests one application at a time
- Role transition of a single PDB is faster than entire CDB transition



Data Guard per Pluggable Database

Enterprise Manager UI

Pluggable aware Data Guard Administration Page

- New Jet-based CDB-level UI page
- Pluggable databases listed by role
- Allows for Switchover and Failover at PDB level

CDB Home Page

- High Availability tile detects and displays DGPDB configuration

PDB Home Page

- Displays role of PDB in the top info banner

Monitoring

PDB target

- Transport Lag and Apply Lag are collected if PDB is in a standby role
- Redo Generation Rate is collected if PDB in primary role
- Metric collected at individual PDB level
- Enabled by default only for DGPDB configuration

CDB target

- Data Guard status metric for CDB enhanced to run for DGPDB configuration
- Captures both primary CDBs & their DG status

Management

Jobs

- Two new role change jobs for Pluggable Data Guard
- REST APIs to submit jobs
- Initialization step to do pre-req checks
- Ensures role change is re-evaluated and propagated all the way to EM Repository

Inline Operations

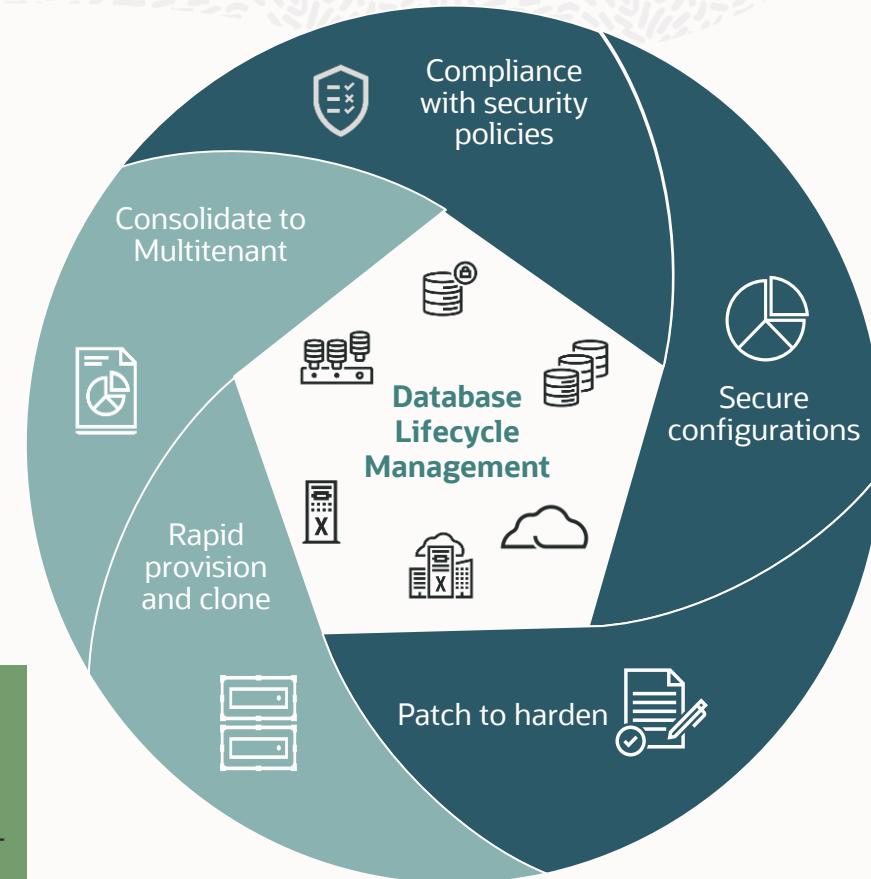
- Set physical standby state to APPLY-ON/APPLY-OFF
- Remove pluggable database from Pluggable Data Guard configuration

Strengthen database security with automated operations

Secure assets across hybrid and multicloud environment

Capabilities

- Audit for compliance with regulatory and industry standards (CIS, STIG, custom)
- Secure Exadata infrastructure with Oracle Autonomous Health Framework EXAchk
- Protect from breaches with automated patch recommendations and guided workflow to remediate
- Manage configuration for consistency between primary and standby databases
- High availability for pluggable database for independent switchover or failover
- Provision or clone standardized secure configuration at scale
- Multiple interfaces – REST APIs, CLIs and UI



Lower Costs

Consolidate and manage in hybrid environment, reduce CapEx and OpEx

Reduce Risks

Secure and standardize configuration, be compliant with audits

Accelerate Innovation

Automate delivery of time-consuming and error prone operations



Q&A

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