Patch and Upgrade Oracle Databases with Enterprise Manager’s Fleet Maintenance

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Agenda

1. Challenges with Software Maintenance aka Patching and Upgrade
2. Solution: Fleet Maintenance using Enterprise Manager
3. Our Customers
Safe Harbor

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Business Challenges

1. Applications face business and security risks
2. Longer downtimes for applications leading to revenue losses
3. Spiraling maintenance costs
## Challenges with Typical Patch Management Process

| Complex, time consuming and multiple stakeholder dependency | High Downtime | Lack of standardization makes patching success unpredictable |
Database Software maintenance is critical to security of business, data and applications.

Patching, an essential part of DB operations.
Fleet Maintenance using Enterprise Manager

- Minimal Downtime
- Centralized Operations
- Patch and Upgrade
- Schedule, fix, retry
- Enterprise Scale
- Flexible and extensible
- Automated and cyclic
- Self Service Maintenance

*Only GI/Clusterware/Database Targets
*Enterprise Manager DBaaS
Database Fleet Maintenance – Process

Patching Cycle 1 Goal: Patch Production 18.3 DBs to 18.6

Enterprise Manager 13c

Production

*OH = Database Oracle Home
Database Fleet Maintenance – Process

Patching Cycle 1 Goal: Patch Production 18.3 DBs to 18.6

Gold Image Creation: Version 18.6

Enterprise Manager 13c

Gold Image Environment

Production

OH – 18.6

OH – 18.3

*OH = Database Oracle Home
Database Fleet Maintenance – Process

Patching Cycle 1 Goal: Patch Production 18.3 DBs to 18.6

Gold Image Creation: Version 18.6

Subscribe: Target Subscription

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Gold Image Environment

Production

OH – 18.6

OH – 18.3

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Database Fleet Maintenance – Process

Patching Cycle 1 Goal: Patch Production 18.3 DBs to 18.6

Gold Image Creation: Version 18.6
Subscribe: Target Subscription
Deploy: Software Deployment

Enterprise Manager 13c

Gold Image Environment

Production

OH – 18.6
OH – 18.3

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Database Fleet Maintenance – Process

Patching Cycle 1 Goal: Patch Production 18.3 DBs to 18.6

- Gold Image Creation: Version 18.6
- Subscribe: Target Subscription
- Deploy: Software Deployment
- Update

Enterprise Manager 13c

Gold Image Environment

- OH – 18.6

Production

- OH – 18.6
- OH – 18.3

*OH = Database Oracle Home

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Database Fleet Maintenance – Process

Patching Cycle 1 Goal: Patch Production 18.3 DBs to 18.6

- Gold Image Creation: Version 18.6
- Subscribe: Target Subscription
- Deploy: Software Deployment
- Update
- Rollback

Enterprise Manager 13c

Gold Image Environment

- OH – 18.6

Production

- OH – 18.6
- OH – 18.3

*OH = Database Oracle Home

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Database Fleet Maintenance – Process

Patching Cycle 1 Goal: Patch Production 18.3 DBs to 18.6

Gold Image Creation: Version 18.6
Subscribe: Target Subscription
Deploy: Software Deployment
Update

Enterprise Manager 13c

Gold Image Environment

Production

OH – 18.6
OH – 18.3

*OH = Database Oracle Home

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Database Fleet Maintenance – Process

Patching Cycle 1 Goal: Patch Production 18.3 DBs to 18.6

Gold Image Creation: Version 18.6
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Deploy: Software Deployment
Update
Cleanup

Enterprise Manager 13c
Gold Image Environment
Production

OH – 18.6

*OH = Database Oracle Home

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Database Fleet Maintenance – Process

Patching Cycle 2 Goal: Patch Production 18.6 DBs to 18.7

Gold Image Creation: Version 18.7

Enterprise Manager 13c

Gold Image Environment

OH – 18.6

OH – 18.7

*OH = Database Oracle Home
Database **Fleet** Maintenance for Multitenant

- **Solution for Containers**
  - Switches existing CDB to the new OH
  - All PDBs patched in one operation

- **Solution for PDBs**
  - Each PDB patched individually
  - PDB patched by relocating to a CDB created on patched home.
Oracle Database as a Service

Fully functional Database with any Data on any infrastructure

Integration
API integration with 3rd party tools, change requests, dev workflows

Self Service Application Users

Self Service Application Administrator

Physical, Virtual, or Engineered Systems

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EM Self Service Portal – PDB Monitoring and Management

**Patching**

**Performance Monitoring**

**Resource Usage**
Extensibility and Customization

End to End Automation with Pre-Post Scripts – DB Plug-in 13.3.2

Automate pre-post patching maintenance operations

Operations: DEPLOY | UPDATE | ROLLBACK | CLEANUP

```
emcli db software_maintenance -performOperation -name="Deploy 12.2 Home" -purpose="UPDATE_DB" -target_type=oracle_database -target_list=DB122 -normal_credential="ORACLE:SYSMAN" -privilege_credential="ORACLE_ROOT:SYSMAN" -input_file="data:/scratch/input_updatedb.prop"

$ cat updatedb.prop

one:74A730047930C5FDE053DF0FC40A3E69:0.1

one:74A730047935C5FDE053DF0FC40A3E69:0.1
```

*Supported with 13.2.2 latest OMS Plug-in Bundle Patch*
Our Customers
Fleet-wide Database Automation

- On-demand database provisioning
- On-demand database patching
- Standardization for compliance

Solution: Enterprise Manager

Minutes
Down from 2-3 months for provisioning

2100
Databases patched automatically

Reduced
Database maintenance downtime
**Multitenant + Fleet + Patching Journey**

**How Multitenant + Fleet makes maintenance easy?**

- Centralized Image Creation & Patch Deployment & Switch procedure
- Dev/QA/INT env's with one container per 100 PDB's, so one switch, technically patches 100 db's in < 90 mins
- HA multitenant 3 Node RAC clusters provides 100% availability even during patching
- Self service option available for Application teams who want to choose their own patching window.
Nationwide

2019 Patching Results  
99% Success Rate  
2 “Part-Time” DBAs  
Increase Patch Frequency

~350 Clusters
~3350 Databases
Large Automobile Conglomerate

1. Two Week POC in September 2018

2. First production patching in December 2018

3. 1500 DBs patched in Aug 2019 production patching window
Results from first production patching cycle:

600 SIHA
200 RAC Clusters
580 Standalone DBs
Our Guiding Principles

1. Continuous Evolution
2. Focus on Quality and Usability
3. Ease of Onboarding
References

- Enterprise Manager Page on O.com
- Enterprise Manager Fleet Maintenance Page on OTN
- Lifecycle Management Guide
- Master Note for Database Patching Using Fleet Maintenance. (Doc ID 2435251.1)
- OEM Advisor Webcast Schedule and Recordings (Doc ID 1456167.1)
- Enterprise Manager Blog
Thank You

Product Management Team

Oracle Enterprise Manager
Database Lifecycle Management &
Cloud Management Pack