

ORACLE

Migrate Oracle Databases onsite and to the cloud

with a Safety Net using Migration Workbench

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Agenda

Challenges in Database Migrations

Database Migration Workbench

Migration to Oracle Cloud

More Migration Destinations

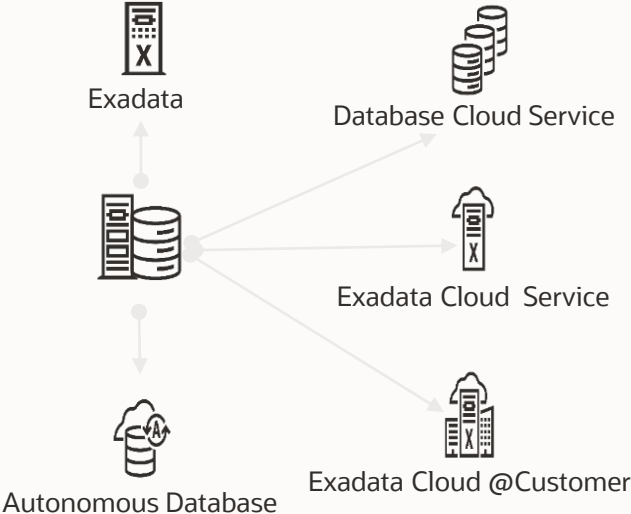
Demo

Q&A

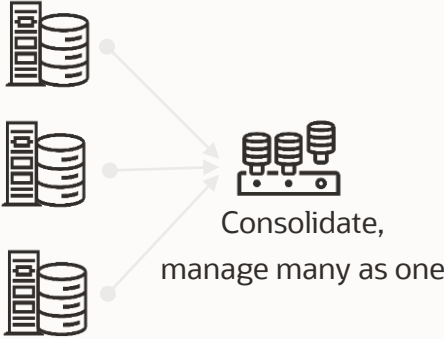


Common reasons for performing a database migration

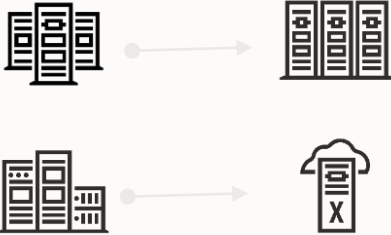
Migrate to Oracle Cloud



Move to Multitenant



Upgrade Infrastructure



Migration challenges



Complexity

Integration,
Dependencies, Code
& Application
changes



Time-to-market

Database size,
Legacy setups,
Application testing,
Multi-team
involvement &
dependency



Predictability

Making precise
predictable &
repeatable process
with timeline



Testing

Production like
simulation, achieve
performance
benchmark, data &
business validation



Business Continuity

Fallback
mechanism &
Business continuity
with minimum
downtime

Reducing risks and automating the migration of a fleet of databases

Migrate with confidence using Real Application Testing

SPA Quick Check

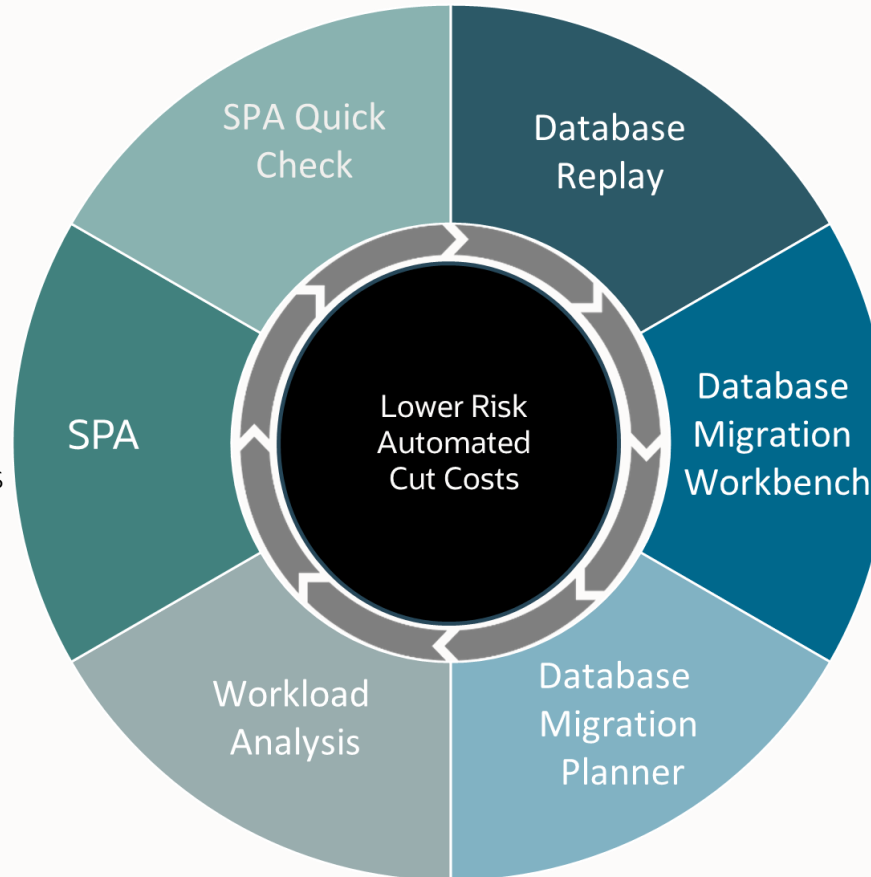
Proactively identifies impact of routine DBA tasks on database performance

SQL Performance Analyzer (SPA)

SQL response time (unit) testing solution
Designed for identifying and tune regressed SQLs

Workload Analysis

Reactively identifies impact and root cause of workload changes like changed execution plans, increased volumes, new SQL statements



Database Replay

Load and throughput testing solution
Designed for detecting and remediating throughput problems

Database Migration Workbench

Identifies the optimal migration strategy
Execute the migration of your databases

Database Migration Planner

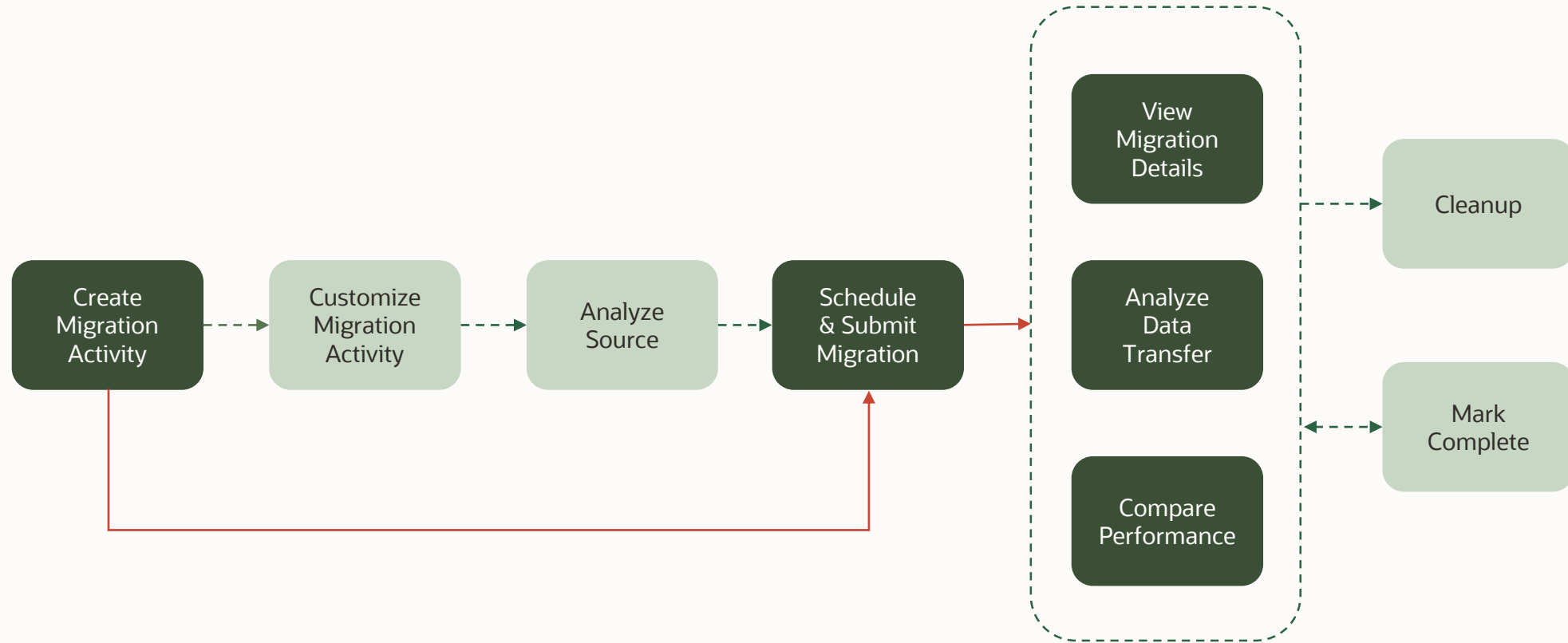
Migration & consolidation simulation & capacity planning solution



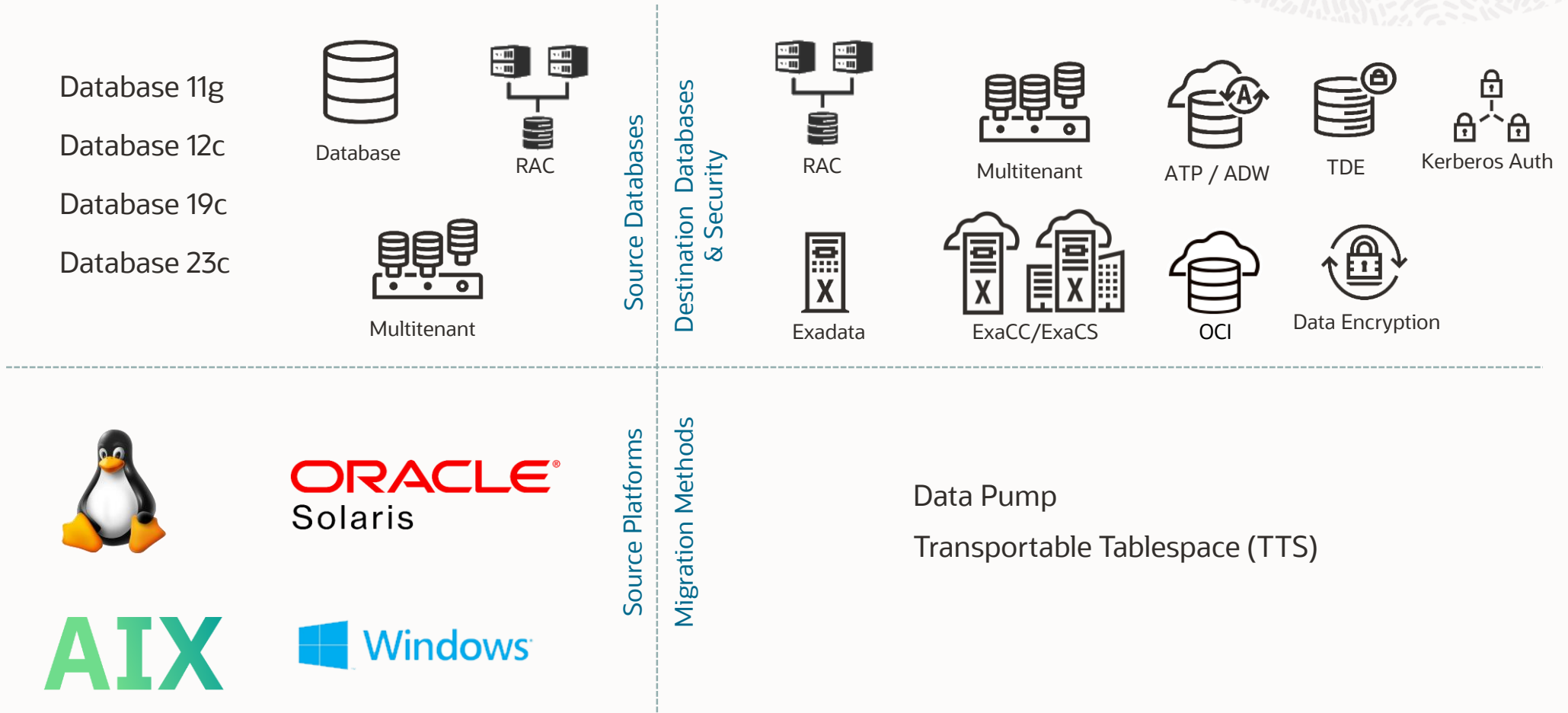
Migration Workbench

Consolidate, migrate and analyze

Migration Workbench overview



Database Migration Workbench support matrix



Benefits when using Migration Workbench



Simple

Unified guided workflow for migrating to on-premises, cloud-based Database Service, and OCI



End-to-End Automation

First class automation with DevOps tools by leveraging JSON



Minimal Downtime

Real time monitoring of migration progress

Insight into time left to complete migration



Accuracy

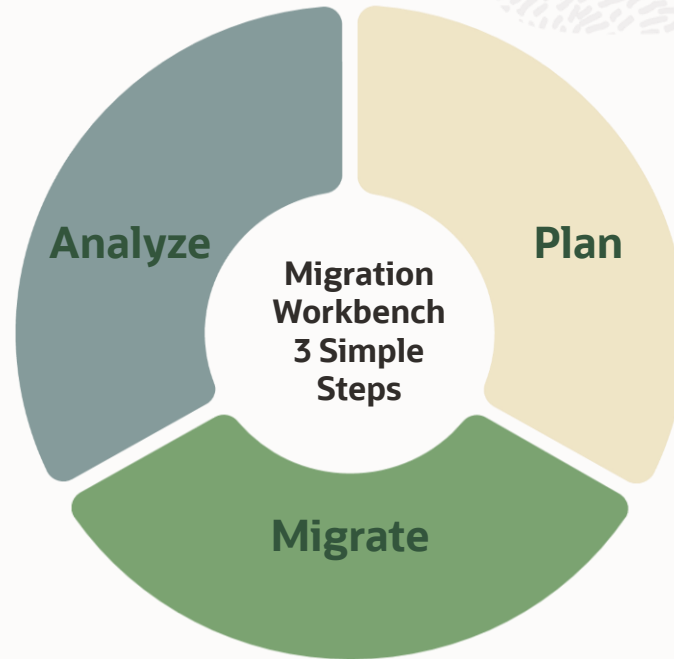
Automatic comparison of performance before and after migration



Migration Workbench intuitive steps

Analyze

- Pre & post validation analysis
- Post migration analysis
- Post migration performance comparison
- Performance improvement recommendations
- Rationale for migration failure



Plan

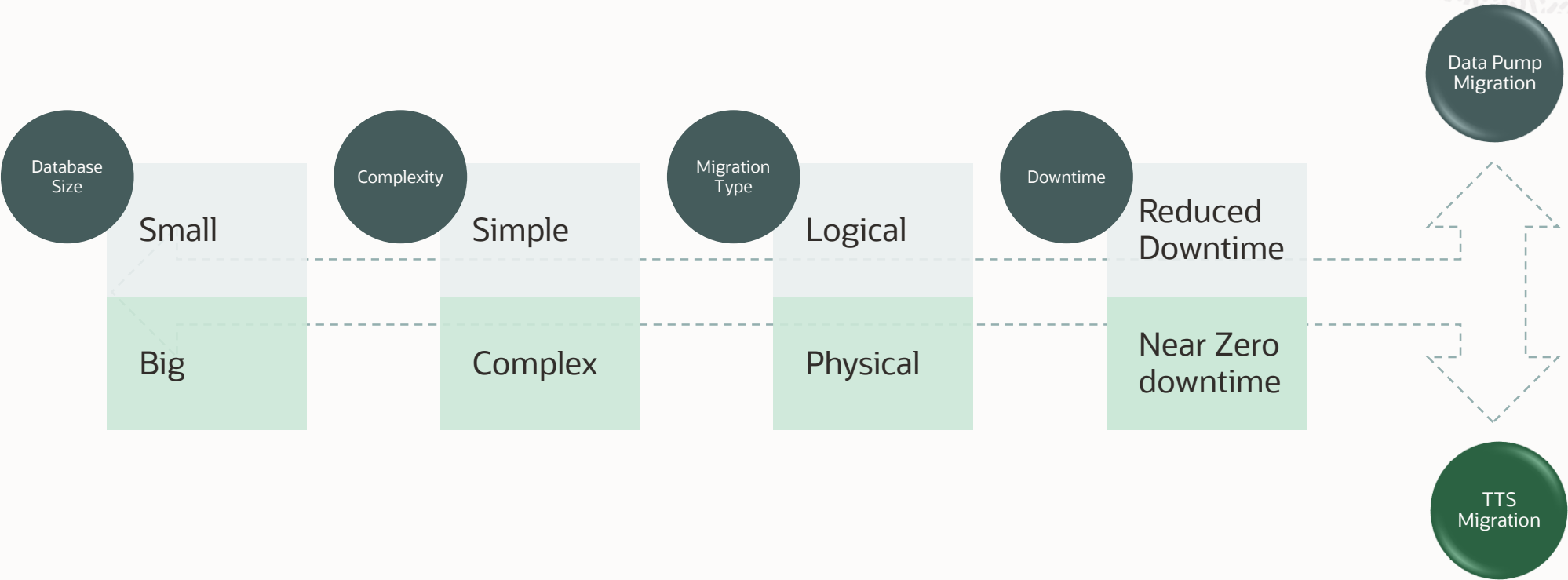
- Identify databases to migrate
- Analyze source database
- Decide migration method
- Decide UI or REST API flow
- Built-in Database best practices
- Parameters to optimize downtime

Migrate

- Customize & schedule migration
- Track and diagnose migration operation
- 3rd party API tools integration

Migration techniques

Guidelines for selecting migration method



Database Migration Workbench

Launchpad for a guided migration

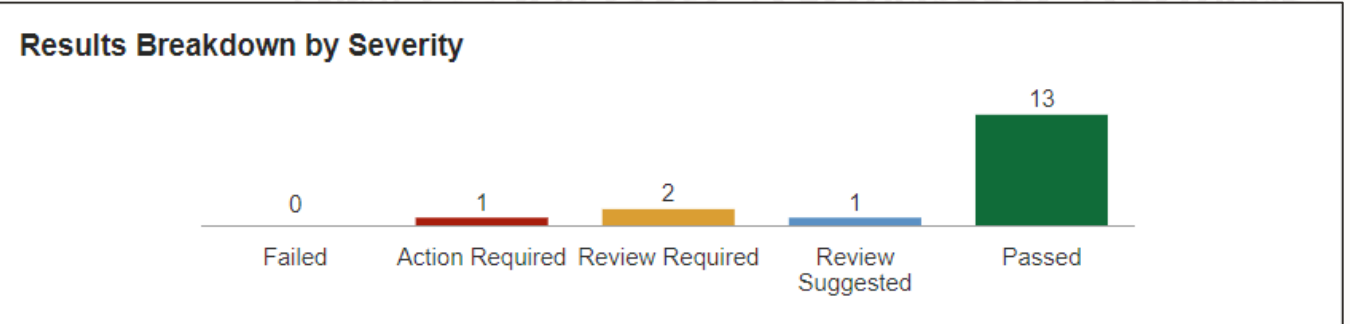
- Single pane of glass for all migrations
 - Deep pre-migration & dependency analysis
 - Encrypted data movement across the network
 - TDE & Kerberos User Authentication
- Customizable migration workflows
 - Custom pre-scripts and post-scripts
 - Export and Import options
 - Compare performance after migration
- Pause, Rollback or Cancel the entire workflow

The screenshot displays the Database Migration Workbench interface. At the top, there's a 'Getting Started' section with a help icon. Below it, the 'Migration Activities' section shows a summary of migration status: All (1), Completed (1), In Progress (0), Problems (0), Scheduled (0), and Warnings (0). A 'Create Migration Activity' button is visible. The main table lists migration activities with columns for Activity, Status, Migration Method, Source, Destination, Start, End, Time Taken, and Owner. A context menu is open over the first row, showing options like Cleanup, Complete Migration, View Analysis, View Performance, and Revert Status.

Activity	Status	Migration Method	Source	Destination	Start	End	Time Taken	Owner
Database Migration - 12c-NonCDB to 19c Existing PDB	Marked Completed	Transportable Tablespace	V12CN	R19C_PDB1	Apr 10, 2023 8:04:24 AM UTC	Apr 10, 2023 9:01:27 AM UTC	48 minutes, 56 seconds	SYSMAN
Database Migration - 12c-NonCDB to 19c Existing PDB	Succeeded	Transportable Tablespace	V12CN	R19C_PDB1	Apr 10, 2023 8:04:24 AM UTC	Apr 10, 2023 8:09:28 AM UTC	5 minutes, 4 seconds	
Incremental Database Migration Mon Apr 10 2023 08:14:20 UTC	Succeeded	Transportable Tablespace	V12CN	R19C_PDB1	Apr 10, 2023 8:14:24 AM UTC	Apr 10, 2023 8:17:35 AM UTC	3 minutes, 11 seconds	
Final Database Migration Mon Apr 10 2023 08:20:41 UTC	Marked Completed	Transportable Tablespace	V12CN	R19C_PDB1	Apr 10, 2023 8:20:46 AM UTC	Apr 10, 2023 9:01:27 AM UTC	40 minutes, 41 seconds	

Pre-migration advisor

- Determine suitability of source database
- Severity based results breakdown of the source database
- Insight into each severity, along with corrective actions
- Recommendations to address issues
- Enable you to accelerate migration



TTS

▶ Stale statistics are present.

▶ **Review Suggested (1)** The Pre-migration analysis indicates that migration should succeed but database administrators should evaluate each check with this status to look for any unforeseen consequences.

▶ Source database size.

▶ **Passed (6)** The Pre-migration analysis indicates prerequisites are passed and migration should succeed.

▶ Tablespaces are online.

▶ Database Objects are valid.

▶ GoldenGate is not installed at the source.

▶ The source and the destination database TZ_VERSION are compatible.

▶ National character set is valid.

▶ No CRON jobs running/scheduled on the source host for database owner.

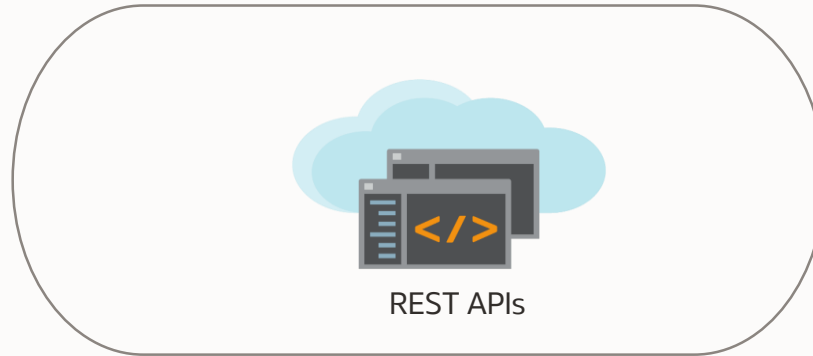
Integration with orchestration tools

vmware®

servicenow®

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Orchestration Engines



- Integration with broad ecosystem with tools like Ansible, Chef, Terraform
- Integrate with 3rd party orchestration engines
- Automation Flows: Pre migration Analysis, Full, Schema & TTS migration
- Easy to build, run and manage

Analyze migration workflow

Identify and remediate failures efficiently

- Validation check summary & details
- Severity-wise Pre-migration & Post-migration summary chart & details for TTS Migration.
- DBA action required with a recommended solution
- Export and import summary chart & detailed deep insights for failed objects
- Download report options

Database Migration

Migration Activities > View Analysis

Database Migration Wed Apr 05 2023 08:47:35 UTC: Analysis Report ⚠

[Download Report](#)
Auto refresh off

Input Validation

Status PASSED

Source DB: V12CN Destination DB: V19CN
 Source Version: 12.2.0.1.0 Destination Version: 19.3.0.0.0

Results Breakdown by Severity

Severity	Count
Failed	0
Action Required	0
Review Required	0
Review Suggested	0
Passed	19

Pre-Migration

Status REVIEW REQUIRED

Results Breakdown by Severity

Severity	Count
Failed	0
Action Required	0
Review Required	1
Review Suggested	2
Passed	7

Post-Migration

Status ACTION REQUIRED

Results Breakdown by Severity

Severity	Count
Failed	0
Action Required	1
Review Required	2
Review Suggested	2
Passed	3

Result Detail

- ⊖ Failed (0) The post-migration analyzer was unable to complete its analysis.
- ⊗ Action Required (1) The post-migration analysis discovered something that would typically require some action by database administrators.

Migrate 12c Database to 19c PDB: Analysis ✓

Refresh every minute

Validation

Source DB: FINPR12C Checks: 89 (100%)

Source Version: 12.2.0.1.0

Destination DB: PR19CCDB

Destination Version: 19.3.0.0.0

Export

Job Name: EXPORT_PDBMIGARTEJOB2 DB Objects: 439 (100%)

User: SYS

Type: FULL

Status: Succeeded

Error Count: 0

Import

Job Name: IMPORT_PDBMIGARTEJOB2i DB Objects: 415 (98%)

User: SYS

Type: FULL

Status: Completed with errors

Error Count: 7

Object Errors

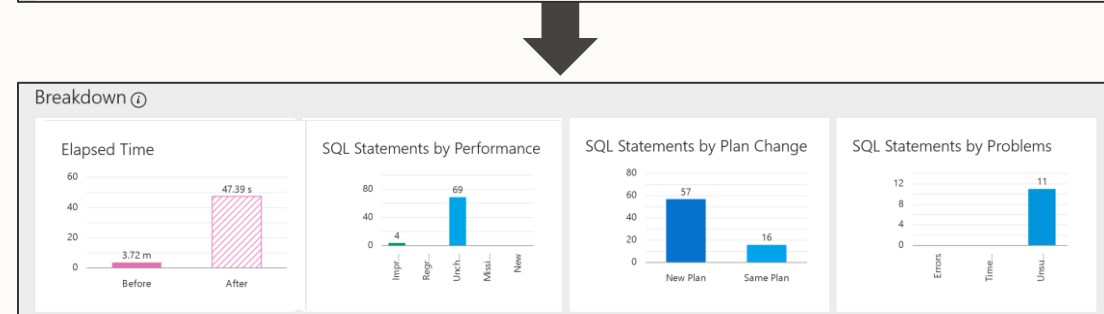
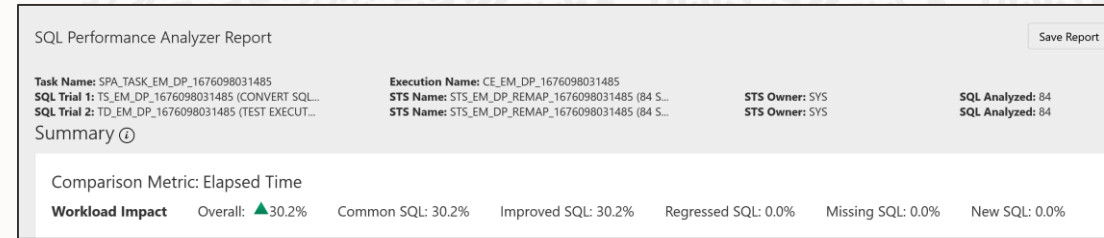
Schema	Object Type	Object Name	Processed	Errors	Error Message
▶ NA	NA	N/A	1	1	
▶ NA	DEFAULT_ROLE	N/A	1	1	
▶ NA	PROCACT_SCHEMA	N/A	1	1	
▶ NA	TABLESPACE	N/A	2	2	
▶ NA	USER	N/A	1	1	

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Performance comparison

Comparison using SQL Performance Analyzer

- HTML report with drill-down analysis
- Pre and post-comparative change analysis
- Top 100 SQL Sorted by +ve or -ve change impact
- Projected overall impact on workload due to Elapsed Time, CPU Time, User I/O Time, Physical I/O, etc.
- Break down of overall improved, regressed, unchanged & unsupported SQLs
- Regressed SQLs & improvement recommendations
- REST API automation to generate report



Top SQL Statements By Workload Impact

Category: Plan Changed

Impact	SQL ID	SQL Text	Plan Change	Net Absolute Impact on Wor
↑	f12y5n96ay0u0	SELECT COUNT(*) FROM SYS.V_\$PARAMETER2 WHERE NAME='_gwm_database_flags'	Yes	█
↑	196mqnmqxp1	select sysStat.branchnodesplits, sysStat.consistentreadchanges, sysStat.consistentreadgets, sys...	Yes	█
↑	48xvndg86sau	SELECT TO_CHAR(FROM_TZ(CAST(end_time AS TIMESTAMP), TO_CHAR(systemstamp, 'tzz')) AT TIME ZO...	Yes	█
↑	5wvnrj5t3676	select sysStat.pxdwngdr25, sysStat.pxdwngdr50, sysStat.pxdwngdr75, sysStat.pxdwngdrserial, sysS...	Yes	█



On-Premises to Cloud

ExaCC, ExaCS, ADB, Base Database Service (VM, BM)

Migration destinations and methods: Cloud

Migration destinations

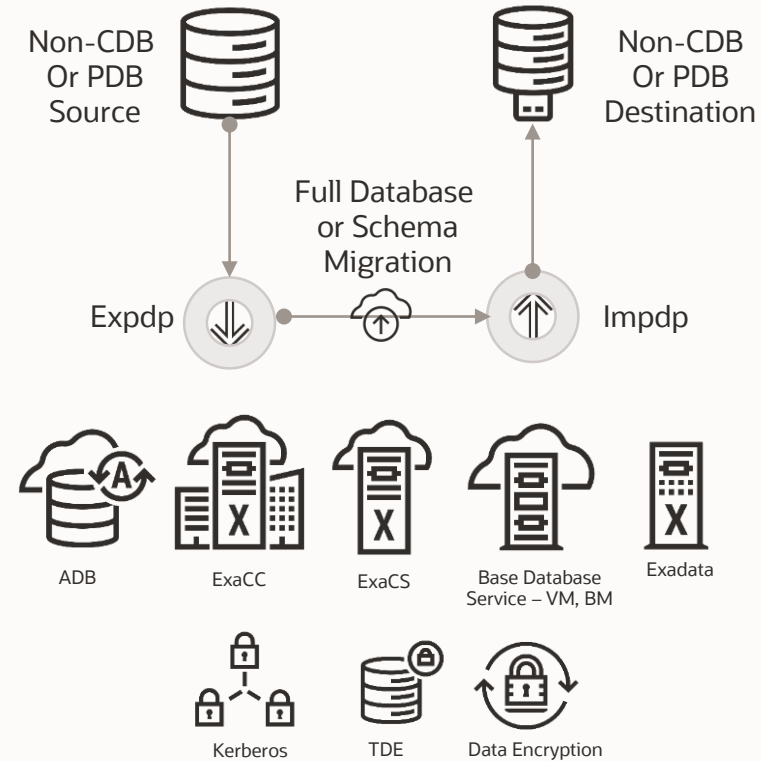
- ExaCC, ExaCS
- ADB
- Base Database Service - BM, VM

Migration methods

- Data Pump
- Transportable Tablespace (TTS)

Database configuration

- Single Instance, RAC, PDB



Migration Workbench
Available On These Platforms
Using Data Pump Migration Method

On-Premises to On-Premises

Migration destinations and methods: On-Premises

Migration destinations

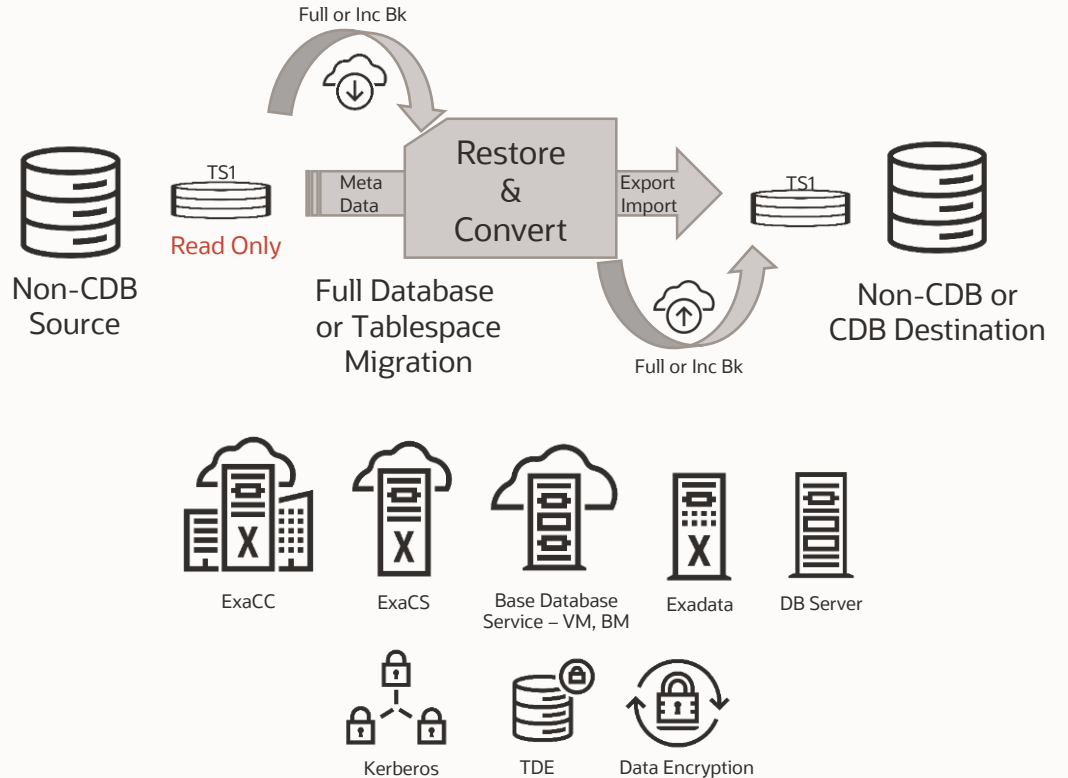
- Exadata
- Commodity hardware

Migration methods

- Data Pump
- Transportable Tablespace (TTS)

Database configuration

- Single Instance, RAC, Multitenant



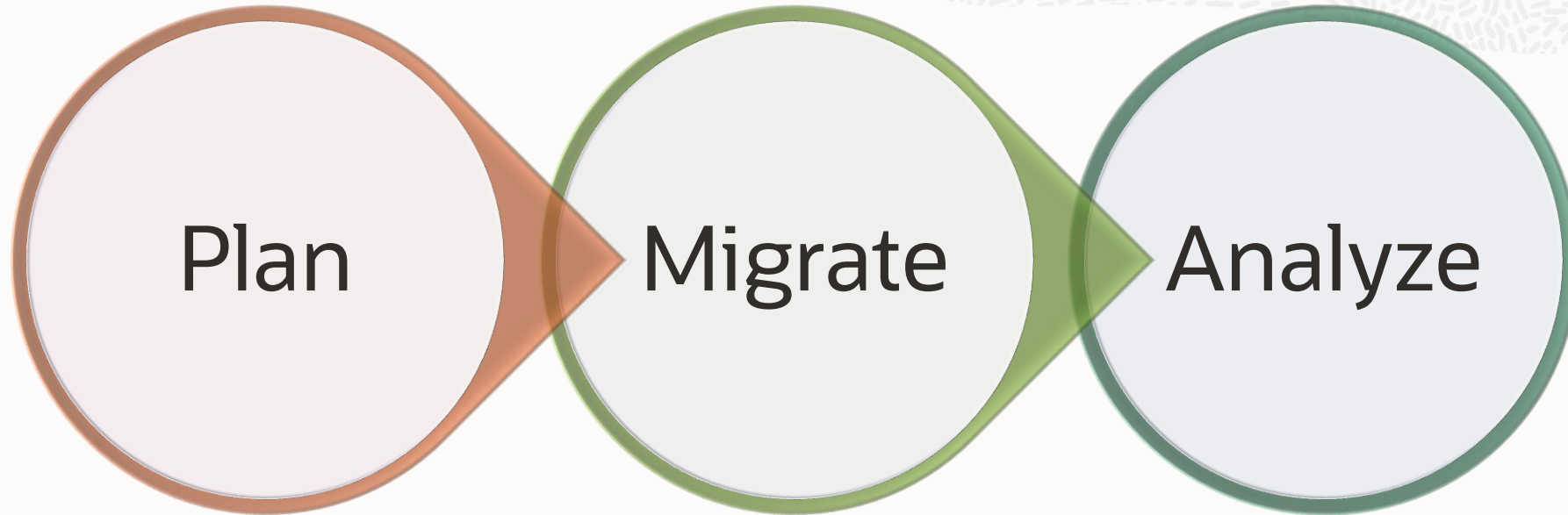
Migration Workbench
Available On These Platforms
Using Transportable Tablespace Migration Method



Product Demo



Summarizing



One Tool for all Migrations

Unified migration experience for all types of migrations

Variety of Migration Targets

On-Premises, Exadata, Oracle Base Database Service (ExaCC/ExaCS, BM, VM) and Autonomous Database

Integrated Performance Analyzer

Insights on performance comparison before and after migration using proven technologies like SPA

Learn More

1. [Oracle.com/manageability_oracle.com/enterprise-manager/#rc30p2](https://www.oracle.com/manageability_oracle.com/enterprise-manager/#rc30p2)
2. Video Series: [Migrate Databases with minimal downtime using Migration Workbench](#)
3. Blog: [Migrate Oracle Databases with a safety net using Migration Workbench](#)
4. Documentation: [EM 13.5 Database Migration Workbench](#)
5. LiveLabs:
 - [Migrate Oracle Databases using Migration Workbench](#)
 - [Migrate Databases Using Migration Workbench - ADB Destinations](#)



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Thank you



Q&A

