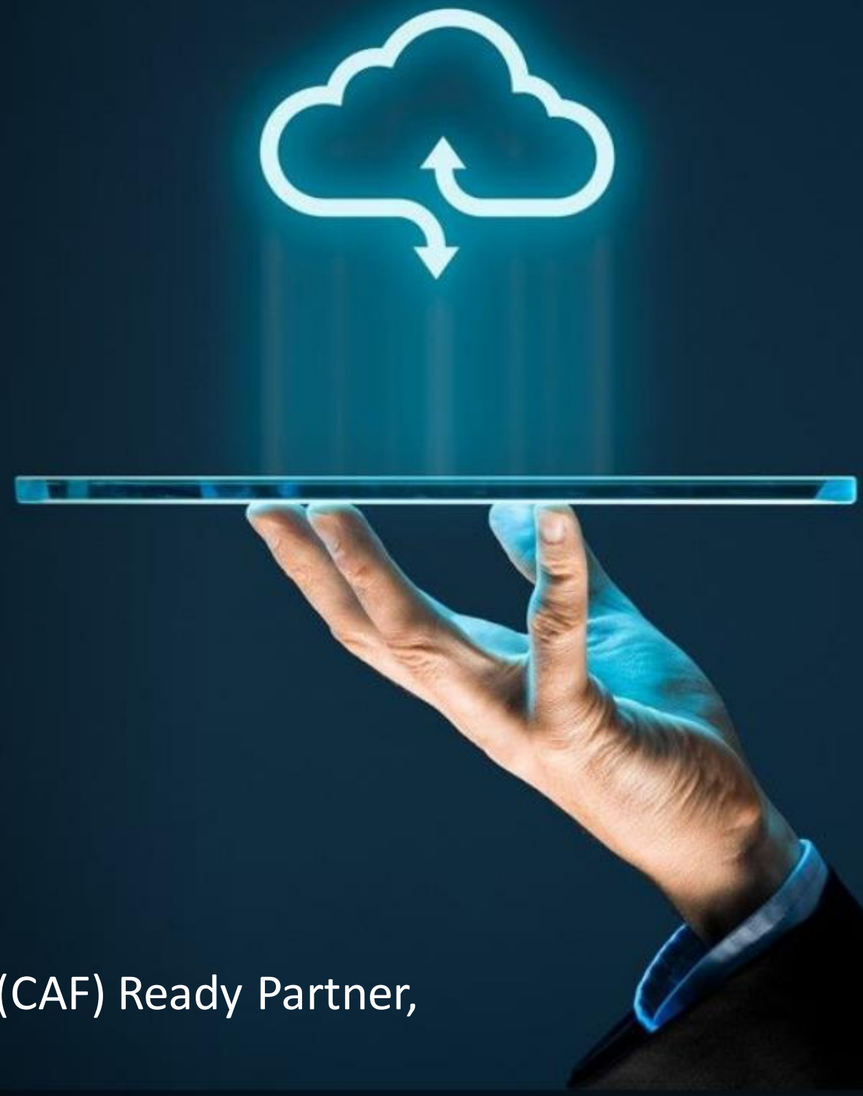
Oracle DB Migration to PostgreSQL on Azure



Tech Mahindra is Certified Cloud Adoption Framework (CAF) Ready Partner, and our Azure Cloud offerings are aligned to CAF

Tech Mahindra

Gold Microsoft Partner
Azure Expert MSP
Microsoft

Partner Advanced Specialization
Kubernetes on Microsoft Azure

Customer’s challenges with Oracle at on-prem

- ✓ High Licensing cost.
- ✓ Depends heavily on built-in authentication system.
- ✓ Not open source. The developers can not directly access any Oracle component simply by including the header file in their project.
- ✓ Need additional efforts for rolling out updates, upgrades, security patches, monitoring , troubleshoot and manage at scale.

Why PostgreSQL on Azure?

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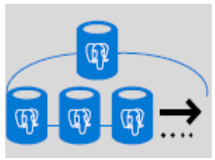
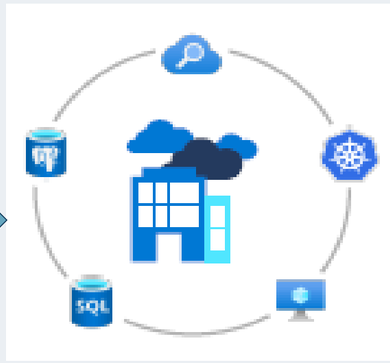
Seamless Migration	Enterprise-ready			Developer Productivity	
Fully managed **Open-Source Software** community database PostgreSQL	**Industry standard SLA and TCO**	**Enterprise grade scale with Azure** - Scale PostgreSQL databases across 100s of nodes with Azure	**Secure and compliant** with Advanced Threat Protection and Azure IP Advantage	**Built-in intelligence** optimizes performance and security, interfaces for AI/ ML	**Integrates Azure services** with streamlined provisioning and management experience for common OSS frameworks and languages
					

Open-source community along with the manageability and integration benefits of Azure



Complimented by Azure Arc for hybrid and Muti-cloud environments

Why Oracle to PostgreSQL on Azure ?

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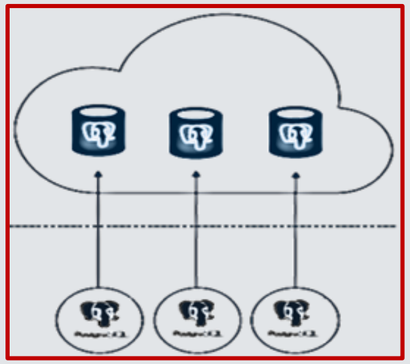
1

- ✓ PostgreSQL is **highly compatible with Oracle** with reduced Migration effort/cost and risks.
  - ✓ Oracle database objects like SP, Queries, datatypes, packages, sequence etc. migrate to PostgreSQL with no code/ little Changes.
  - ✓ Migration cost not costlier than upgrading from one major version of oracle to the next major version of oracle.

2

- ✓ **Manage Community Version**
  - ✓ Automatic Updates
  - ✓ Automatic security fixes
  - ✓ Automatic new feature updates



3

Migration of Oracle to Azure database for PostgreSQL **reduces overall cost of ownership by up to 95%** in savings*

Configuration is based on a 4 socket, 32 core x86 possessor Oracle Cloud Service editions are based on virtual machines

Estimates Only	Oracle Database Cloud Service Enterprise Edition	Oracle Database Cloud Service Enterprise Edition High Performance	Oracle Enterprise Edition	Azure Database for PostgreSQL
Database	$9,599 / month	$19,801 / month	$47,500* / per CPU	$2,046.34 / month
Virtual Private Database	Included	Included	Included	Row level security
Partitioning	Not included	Included	$11,500* / per CPU	Included
Data Guard	Not included	Not included	$11,500* / per CPU	Included
Spatial	Not included	Included	$17,500* / per CPU	Included
Diagnostics	Included	Included	$7,500* / per CPU	Included
Tuning Pack	Included	Included	$5,000* / per CPU	Included
Lifecycle Management Pack	Not included	Included	$12,000* / per CPU	Included as part of OSS tool suite
Total Capex	$0	$0	$1,800,000*	$0
Annual Support / Maintenance per Server (Opex)	Included	Included	$396,000**	Included
Total 3 Year Cost of Ownership	**$345,564**	**$712,836**	**$3,294,000*** **	**$73,668**

Source: Microsoft

- *Oracle licensing for Enterprise Edition is based on number of processors
- **Annual maintenance and support for Oracle is 22% of the annual license cost.
- ***This example accounts for the 50% list pricing for 3 years in the total.
- #Based on customer deployments at TechM

Migration Pathways to Azure

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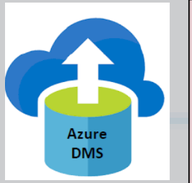
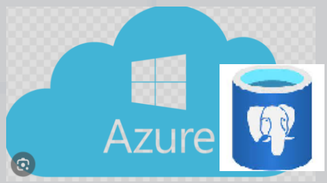
Azure Native Pathways

PostgreSQL on Azure VM (IaaS)



Oracle 12c
Oracle 18c
Oracle 19c



Azure Database for PostgreSQL (PaaS)

PostgreSQL 11 to PostgreSQL 15*

Alternate (EPAS) Pathways on Azure Cloud

EDB Postgres Advanced Server on Azure VM (Self-Managed)

EDB Tools

Migration Portal Version 4

Migration Toolkit Version 55

Replication Server Version 7

Oracle 11g
Oracle 12c
Oracle 18c
Oracle 19c

EDB BigAnimal on Azure Cloud (Fully Managed)

EPAS 11.x to EPAS 15.x

* PostgreSQL 15 is under Public Preview for Azure database for PostgreSQL flexible server

TechM's Migration Approach - Oracle to PostgreSQL on Azure

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We follow Cloud Adoption Framework for the migration

Assess

- Analysis of technology-related issues, compatibility of client, application server, data access and database features.
- Tool based assessment for Oracle database objects
- Existing landing zone assessment and recommendation for the best practices.
- Evaluation of application code dependency on Oracle-specific frameworks (e.g., Pro*C, Bulk Data Loader, PL/SQL Debugger etc.) compared to open classes.
- Estimation of re-code work, syntax corrections and the time necessary to complete migration.
- HA requirements.

- Assessment and Discovery
- Inventory build up and prioritization
- PoC/ PoV setup
- TCO

Plan

- Finalize the Target environment between Azure native PostgreSQL or EPAS on Azure based on various criteria listed in decision trees.
- For Azure native PostgreSQL choose between IaaS (PostgreSQL on Azure VM) or PaaS (Azure DB for PostgreSQL) model.
- For EPAS on Azure Cloud choose between self-managed (EPAS on Azure VM) or fully managed (EDB BigAnimal) model.
- Detailed database migration plan
- Map the required compute/ storage/networking specifications to cloud services
- To-be architecture with all required components in Cloud
- Design roll-Back mechanism
- Detailed release plan
- Risk mitigation plan

- To- be architecture
- Target database mapping
- Migration plan and release plan document
- Skill readiness plan

Ready

- Build the foundation infrastructure elements e.g., Azure VM (if needed), Network, Storage etc.
- Set up the tools i.e., ora2pg for Azure native implementation OR EDB Migration Portal, Toolkit and Replication server for EPAS on Azure.
- Entry and Exit criteria – verification definition
- Plan the RACI for different stake-holders.
- Plan the procedure for establishing connections with applications.
- End to end verification plan

- Cloud landing zone readiness report
- Tools set-up

Migrate

- Schema Migration with DDLs of all objects.
- Code re-work and syntax correction for invalid objects.
- Functional & Performance Testing on small amount of dataset.
- Data Migration
- Data sync for incremental changes.
- UAT Testing.
- Establish connections with applications and sanity check
- Cut-over.
- Follow the release procedure for end-users after confirmation

- Migration tracker
- UAT test repots

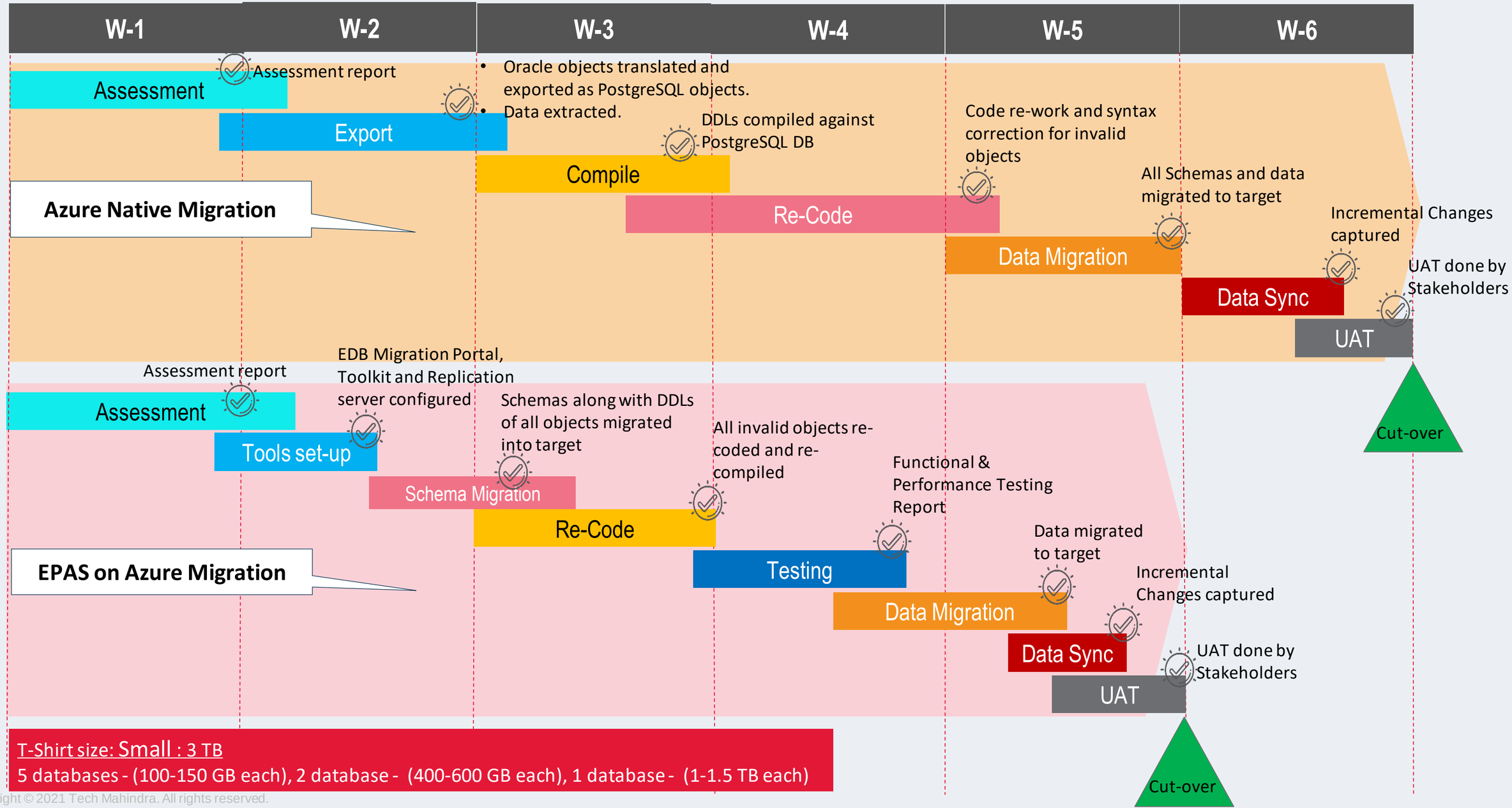
Manage

- Setup helpdesk for L1 onwards support required.
- Follow the managed service contract guidelines
- Establish applicable SLAs
- Plan KT sessions in case of new vendor or client taking hand-over.
- Hyper care support
- Managed service delivery model setup
- Finalize the classification and escalation matrix
- Establish governance model
- Establish the structure for meetings and reporting.
- Establish the protocols for escalation procedures etc.

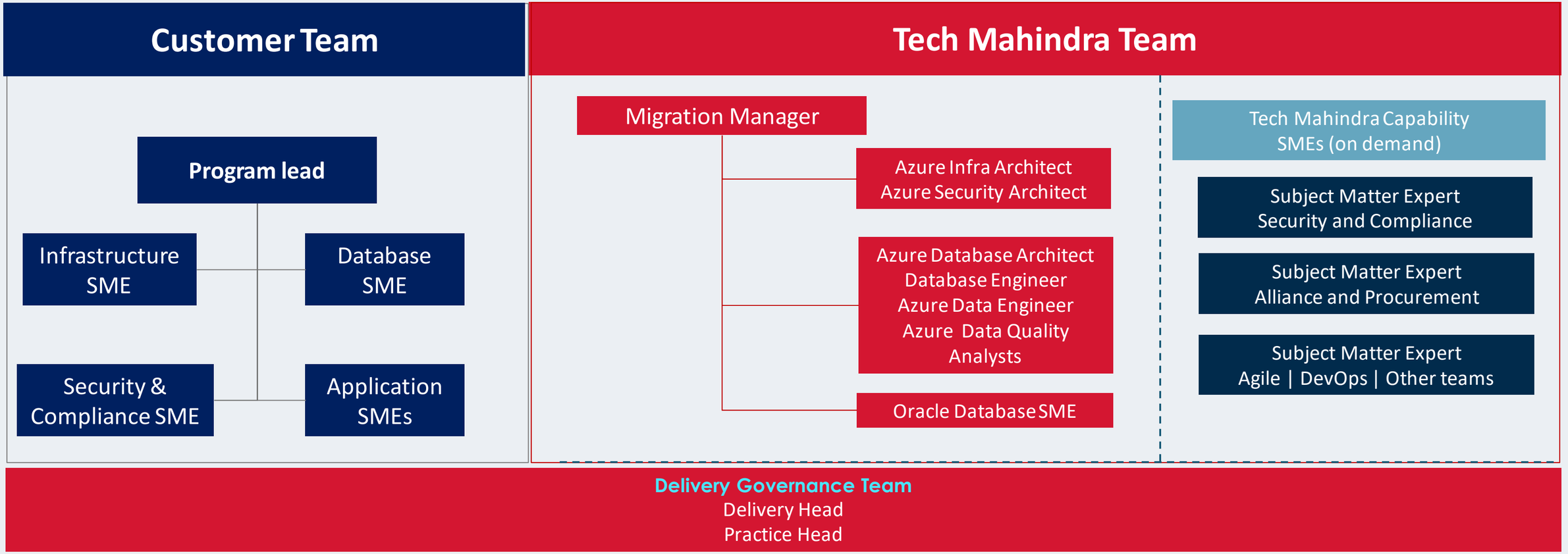
- DB managed service
- Security and performance baseline
- SLA management

TechM Migration Governance

Indicative Migration Timelines



Customer Engagement Model – Indicative Team Structure



Note: Indicative roles for database migration services, to be customized in discussion with delivery team as per the requirement

Database Managed Services

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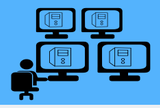
Service Level Definitions

ENGAGEMENT MODEL – RESOURCE AND DATABASE BASED

Dedicated Model
Controlled / Customized



Shared Model
Standardized / Optimized

Hybrid Model
Best of Both Worlds

INNOVATIVE SERVICE LEVELS WITH INDUSTRY LEADING SLA'S *

Service Levels	Gold Service (Prod Env)			Silver Service (Prod + Non-Prod Env)			Bronze Service (Test /PoV Env)		
SLA	**99.95%**			**99.7%**			**99.5%**		
Severity#	Service Hours	Response Time	Resolution Time	Service Hours	Response Time	Resolution Time	Service Hours	Response Time	Resolution Time
Sev-1	24 * 7	30 Mins*	2 Hrs	24 * 7	60 Mins*	3 Hrs	08:00 * 18:00 M-F	2 Hrs	8 Hrs
Sev-2	24 * 7	60 Mins*	4 Hrs	24 * 7	90 Mins*	5 Hrs	08:00 * 18:00 M-F	4 Hrs	1 Biz day
Sev-3	08:00 * 18:00 M-F	2 Hrs	8 Hrs	08:00 * 18:00 M-F	3 Hrs	8 Hrs	08:00 * 18:00 M-F	6 Hrs	2 Biz days

Note: *Indicative SLA's to be customized in discussion with delivery team as per the requirement

Common use cases for Oracle DB migration to PostgreSQL on Azure

USE CASE	DESCRIPTION
Simplified Oracle migration to Azure	The ora2pg tool (a free utility) is widely used for Azure native PostgreSQL migrations. Besides licensed products like Cortex (https://www.splendiddata.com/cortex/) offer highly automated migration with greater efficiency, quality & speed. In case of Oracle to EDB Postgres Advanced Server (EPAS) on Azure, the EDB Migration portals & EDB Migration toolkit are used for the migration.
Reduce costs and boost productivity	Migrating of Oracle workloads to PostgreSQL on Azure in either form (Azure Native or EPAS on Azure) can yield significant savings over time. This is attributed to elimination of costly Oracle licenses plus the hardware, storage, and network costs associated with on-premises deployments.
Maintain Oracle application compatibility	EDB Postgres Advanced Server on Azure Cloud exhibits very high Oracle compatibility. Support for Pro*C, Bulk Data Loader, PL/SQL Debugger and many other Oracle compatible features make it very convenient and easily adoptable for Oracle developers and DBAs.
Optimize the PostgreSQL DB with a 99.99 percent SLA	Azure Database for PostgreSQL offers built-in high availability, elastic scaling for performance and industry-leading security and compliance, with an SLA of 99.99 percent. Similarly, EPAS on Azure offers high-availability that enables 99.99% availability requirements.

Tech Mahindra's Azure Cloud Services

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