Mphasis
The Next Applied

ASSESSMENT REPORT

Migration to Cloud

CLIENT : XYZ COPORATION

Contents

1. DISCOVERY

1.1 Current Mode of Operation

Type	SID	SAP Product	Version	Type	CPU Type	CPUs	RAM	DB Size	OS
PRD	PER	SAP ERP	ECC6, EHP7	App	Xeon E7-8890 v4	15	126 GB	5 TB	SUSE Linux Enterprise Server 12 (x86_64)
					Xeon E7-8890 v4	15	126 GB		
		ORACLE	12.2.0.1	DB	Xeon Gold 5220	30	450 GB		
DR	PER	SAP ERP	ECC6, EHP7	App	Xeon E7-8890 v4	15	126 GB	5 TB	
					Xeon E7-8890 v4	15	126 GB		
		ORACLE	12.2.0.1	DB	Xeon Gold 5220	30	450 GB		
QA	QER	SAP ERP	6.07	App	Xeon E7-8890 v4	15	80 GB	2 TB	
					Xeon E7-8890 v4	15	80 GB		
		ORACLE	12.2.0.1	DB	Xeon Gold 5220	20	350 GB		
DEV	DER	SAP ERP	ECC6, EHP7	App	Xeon E7-8890 v4	15	60 GB	800 GB	
					Xeon E7-8890 v4	15	60 GB		
		ORACLE	12.2.0.1	DB	Xeon Gold 5220	20	250 GB		

DEV	DBW	SAP BW	BW/4HANA	App	Xeon E7-8890 v4	1	32 GB	750 GB	SUSE Linux Enterprise Server 15 (x86_64)
	DHW	HANA	2.0 SP4	DB	Xeon Gold 5220	3	64 GB		
PRD	PBW	SAP BW	BW/4HANA	App	Xeon E7-8890 v4	2	64 GB	2.5 TB	
					Xeon E7-8890 v4	2	48 GB		
	PHW	HANA	2.0 SP4	DB	Xeon Gold 5220	4	100 GB		

DEV	DSO	SOLMAN	7.2	App ABAP +JAVA	Xeon E7-8890 v4	2	32 GB	150 GB	Windows Server 2012- R2
		SYBASE	ASE 16.0	DB	Xeon Gold 5220	5	64 GB		
PRD	PSO	SOLMAN	7.2	App ABAP +JAVA	Xeon E7-8890 v4	8	128 GB	400 GB	
					Xeon E7-8890 v4	8	128 GB		
		SYBASE	ASE 16.0	DB	Xeon Gold 5220	10	200 GB		

Current SAP System Applications / Landscape Discovery

SAP Landscape Total Number of SAP Products: 3

DEV	QA	PROD	DR

1.2 Hardware Systems / Data center Discovery

Total Number of Physical Systems: 22

All Server Mounted in: Customer Data center (On-premises)

Customer Data Center Location: Houston (US)

Total Number of VM's: 0

HA – Cluster Systems: 0

Hardware Vendor OEM Name: IBM

All SAP Servers Installed in: 2015

Hardware OEM Support type: Extended Warranty (Onsite Support)

Hardware OEM Support ends on: 31.03.2023

Hardware Scalability type: Can increase resource if required offline during migration

Note: - Hardware & Data Center details are collected from customer inputs

1.3 DB Growth / End of Support Discovery

Landscape	Prod DB Size	Avg DB Growth Per Month	DB Name	DB Version	End of Maintenance
SAP ERP	5 TB	50 GB	Oracle	12.2.0.1	31.03.2022
SAP BW	2.5 TB	80 GB	HANA	2.0 SP4	30.06.2025
Solman	400 GB	4 GB	Sybase	ASE 16.0	31.12.2027

Note: - DB Growth Data collected from latest Early watch report

1.4 SAP Application / End of Support Discovery

Landscape	SAP Version	End of Maintenance
SAP ERP	EHP7 FOR SAP ERP 6.0	31.12.2027
SAP BW	SAP BW/4HANA 2.0	31.12.2024
Solman	SAP SOLUTION MANAGER 7.2	31.12.2027

1.5 Operating System / End of Support Discovery

Landscape	Operating System	End of Maintenance
SAP ERP	SUSE Linux Enterprise Server 12 SP3	30-Jun-22
SAP BW	SUSE Linux Enterprise Server 15 SP2	31-Dec-24
Solman	Windows Server 2012 R2	10-Oct-23

1.6 Current SLA Discovery

Description	Prod	Non-Prod
Recover Time Objective	<2 Hours	<6 Hours
Recover Point objective	RPO 15 minutes	RPO 30 minutes
Availability	99,5% (< 3,6 hours / month)	98,0% (< 14,4 hours / month)
Planned Maintenance Time (SAP)	On demand on Saturday and/or Sunday (CET) with info > 14 days ahead	On demand from Monday to Sunday (CET) with info > 14 days ahead
Service operation hours	7 x 24 x 365	7 x 24 x 365
Database backup retention	Daily / 28d	Daily / 15d

1.7 Discovery Phase - Major Points / Recommendations:

Sno	Analysis	Recommendations
1	SLES 12 SP3 Support Ends on June 22	Move Application to latest SLES version on FMO
2	Oracle 12C Support Ended on March 22	Oracle DB Version to be Upgraded from 12C to 19C before migration starts
3	No HA Setup Found in CMO	HA for App & DB setup in FMO
4	DER & DSO System looks less load as per EWA, at present these systems running on 2 App servers + 1 DB Server,	Build a target system DB + APP on single host in FMO

1.8 Assumptions:

Customer has a plan to upgrade Oracle version from 12C to 19C before the migration project starts.

2. SCOPE

2.1 FMO - Infrastructure Recommendations.

FMO Infrastructure - Solution on Azure												
SID	Type	SAP Product	Version	Type	VM	Qty	Azure OS	OS License	CPU2	MEM	SAPS VM	SAPS total
PER	PRD - Primary	HANA	2.0 SP6	DB	M208msv2	1	SLES-SAP	Azure	208	3 TB	259,950	259,950
		SAP ERP	ECC6, EHP7	App	D32asv4	2	SLES-SAP	Azure	32	128	48,350	96,700
				ASCS + ERS	D4asv4	2	SLES-SAP	Azure	4	16	6,044	12,088
	HA	HANA	2.0 SP6	DB	M208msv2	1	SLES-SAP	Azure	208	3 TB	259,950	259,950
	DR	HANA	2.0 SP6	DB	M208msv2	1	SLES-SAP	Azure	104	1.5 TB	129975	129975
		SAP ERP	ECC6, EHP7	App	D32asv4	2	SLES-SAP	Azure	32	128	48,350	96,700
QER	QA	SAP ERP	ECC6, EHP7	App	D8asv4	1	SLES-SAP	Azure	8	32	12,088	12,088
		HANA	2.0 SP6	DB	M208msv2	1	SLES-SAP	Azure	104	1.5 TB	129975	129975
DER	DEV	SAP ERP + HANA 2.0	ECC6, EHP7	App + DB	M208msv2	1	SLES-SAP	Azure	64	500 GB	96700	96,700
DBW DHW	DEV	SAP BW + HANA	BW/4HANA	App + DB	M208msv2	1	SLES-SAP	Azure	64	500 GB	259950	96,700
PBW	PRD	SAP BW	BW/4HANA	App	D8asv4	1	SLES-SAP	Azure	16	128	24,176	24,176
PHW		HANA	2.0 SP4	DB	M208msv2	1	SLES-SAP	Azure	104	1.5 TB	129975	129975
DSO	DEV	SOLMAN 7.2 _ Sybase ASE 16.0		App ABAP +JAVA + DB	M32ls	1	Win2016	Azure	32	256	33,300	33,300
PSO	PRD	SOLMAN	7.2	App ABAP +JAVA	D8sv3	2	Win2016	Azure	16	128	17,420	34,840
		SYBASE	ASE 16.0	DB	M32ls	1	Win2016	Azure	32	256	33,300	33,300

SAP on Azure – Migration Overview

Sno	SW Component	DEV	QAS	PRD	Source			Target		Migration Method
					Application	DB	OS	DB	OS	
1	SAP ERP	DER	QER	PER	EHP7 FOR SAP ERP 6.0	Oracle	SLES 12	HANA	SLES 15	SUM DMO
2	SAP BW	DBW		PBW	SAP BW/4HANA 2.0	HANA	SLES 15	HANA	SLES 15	Lift and Shift
3	Solman`	DPO		PPO	Solution Manager 7.2	SYBASE	Win	SYBASE	Win	Lift and Shift

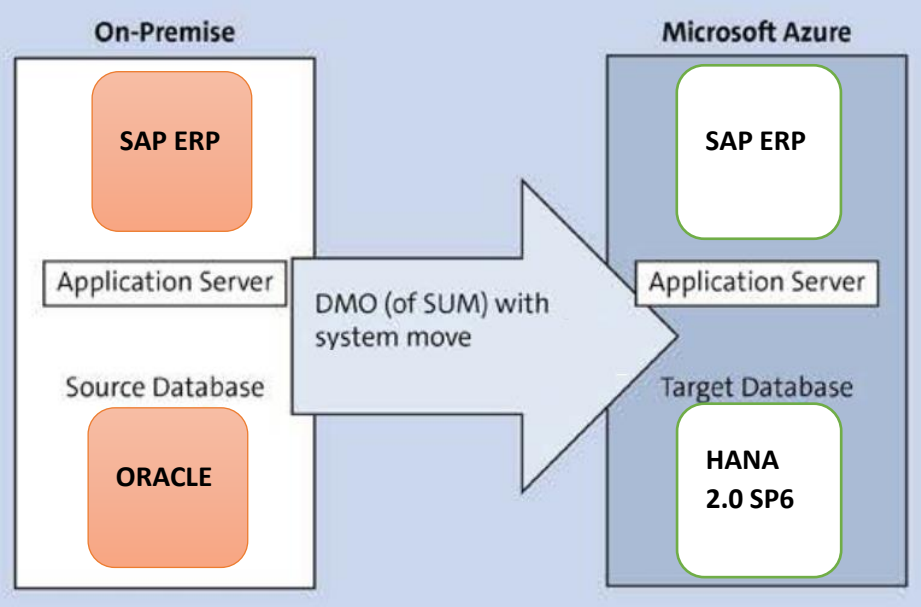
High Level Technical Solution for Cloud Migration

2.2 Approach -1: SUM DMO Using System Move Option

Landscape: SAP ERP

Environment: Non-Prod Systems (DEV, QAS)

SID: DER, QER

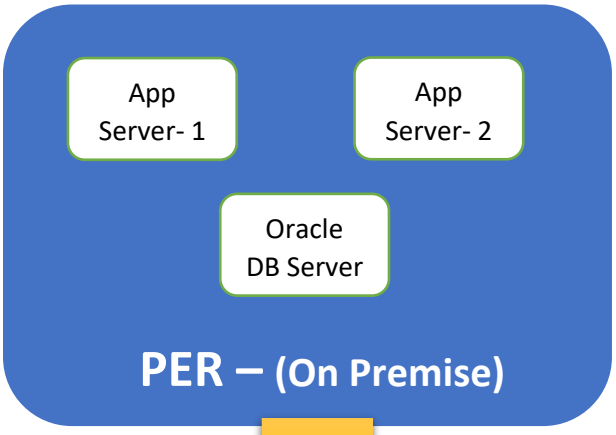


Landscape: SAP ERP

Environment: Production System

SID: PER

Target: HA + DR Option

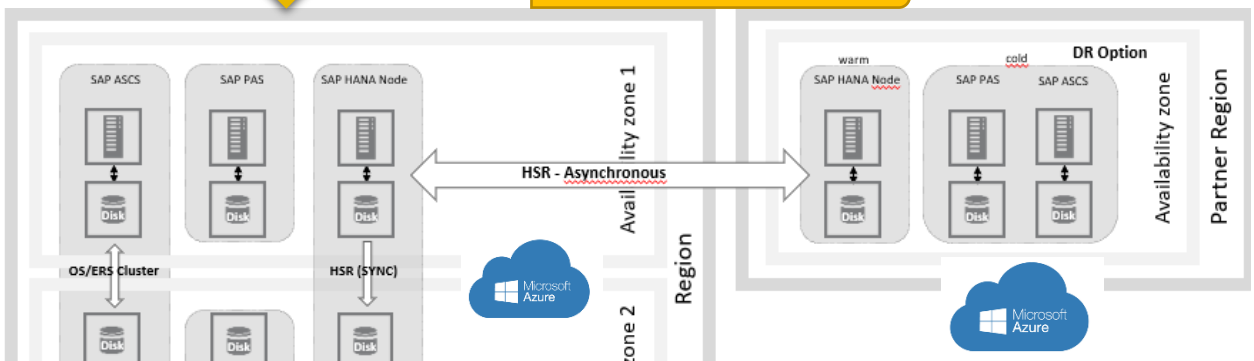


SUM DMO

Parallel Mode:

DMO with system move supports parallel mode as well, similar like parallel export/ import of classical migration.

Target HA + DR on Azure



SAP Application with HANA in HA Using Microsoft Azure

1) Establish dedicated Network Connection between On-Premises to cloud.
2) Deploy ASCS, ERS and HANA DB Instances on Different Azure Availability Zones for HA.
3) Migration On-Premises DB to HANA on Azure using SUM DMO.
4) Deploy DR database system in separate region will be realized: “Warm” DB with asynchronous replication on basis HANA System Replication.

HA + DR Features:

High availability of SAP single point of failure (SPOF) and redundant components and the specifics of Azure infrastructure high availability.

Protects single point of failure (SPOF) components, such as SAP Central Services (ASCS, ERS and database)

Pacemaker on SUSE Linux Enterprise Server in Azure to create a basic Pacemaker cluster and handle Auto Failover for application and database

Primary and Standby HA Nodes CPU & RAM should be same.

DR Site CPU & RAM kept minimal sizing until it becomes active.

Primary to Standby Replication = Sync

Standby to DR Replication = Async

Operation modes on HSR = Log Reply

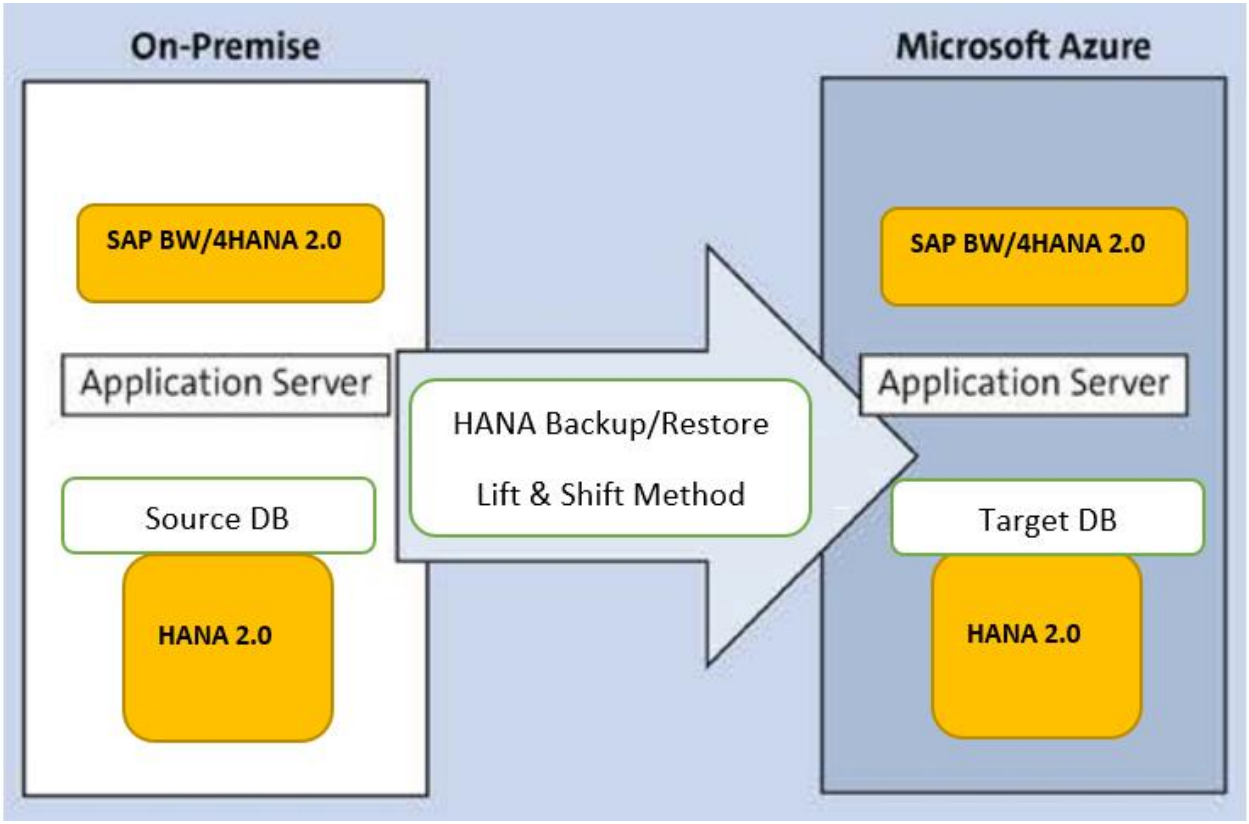
DR Site - application servers will be moved via Azure Site Recovery (ASR): “Cold” server systems*. Microsoft charges only the additional storage

2.3 Approach – 2 Lift and Shift (Backup/Restore)

Landscape: SAP BW

Environment: Non-Prod & Production

SID: DBW/DHW & PBW/PHW

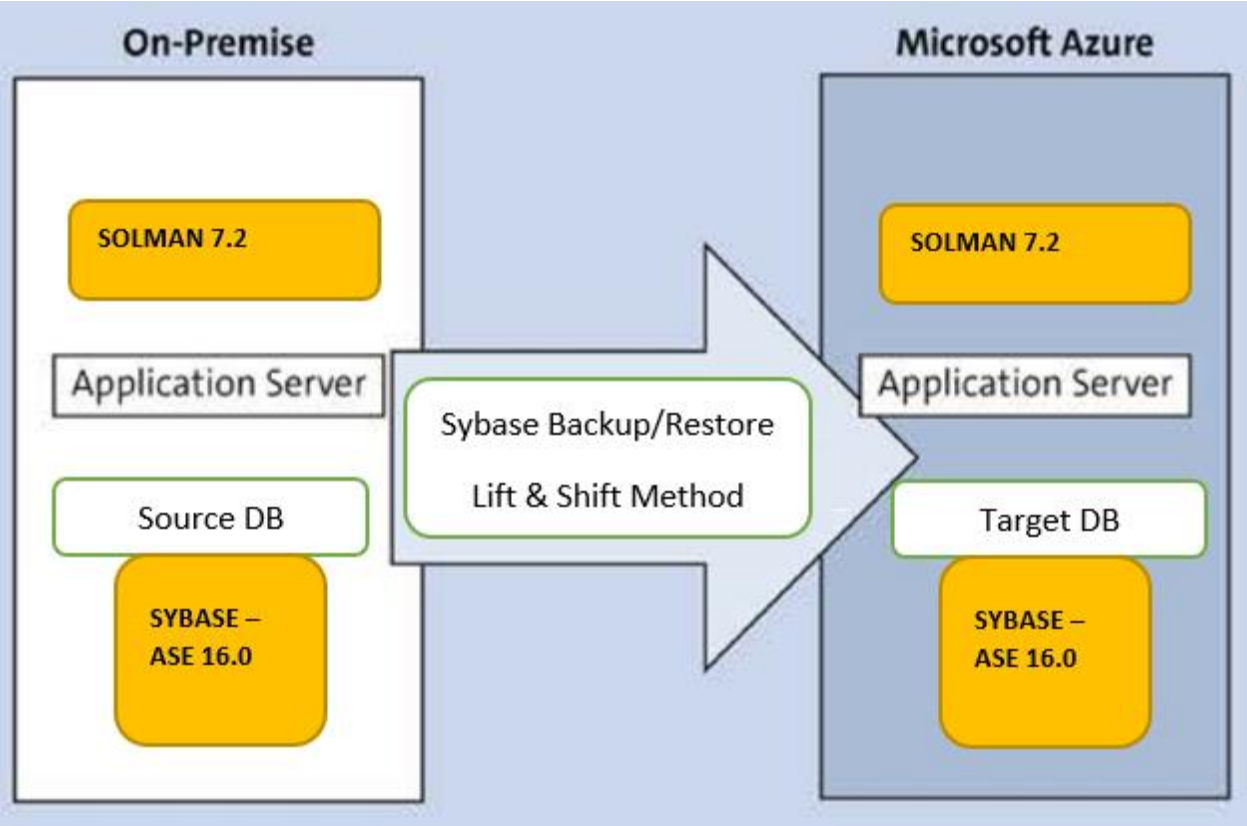


2.4 Approach – 2 Lift and Shift (Backup/Restore)

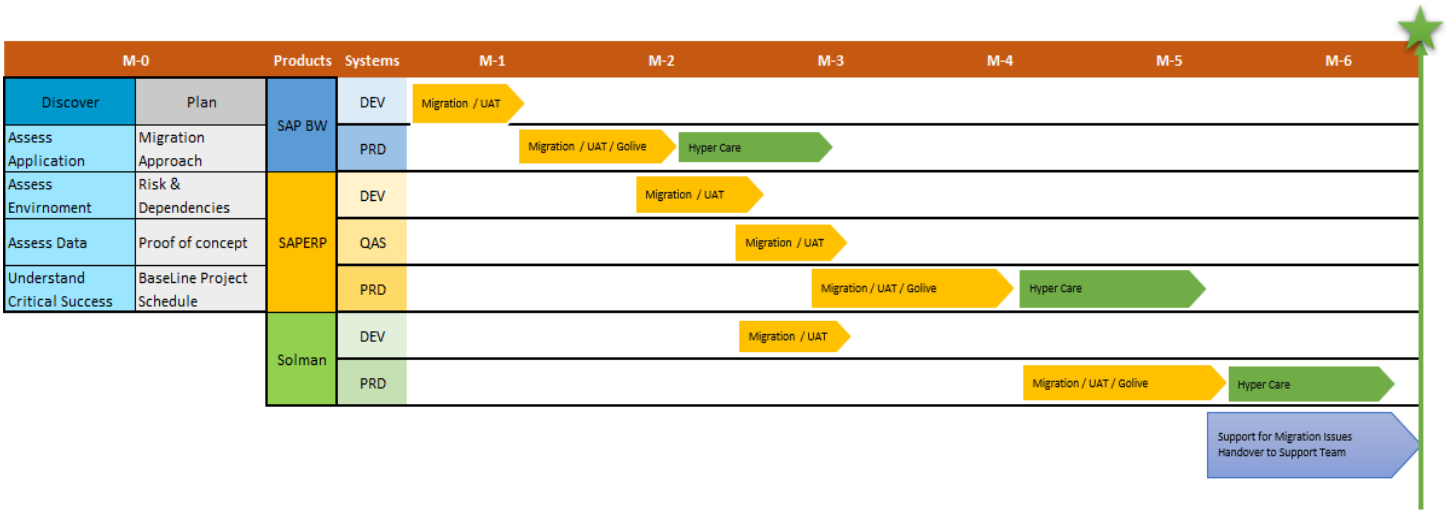
Landscape: SAP SOLUTION MANAGER 7.2

Environment: Non-Prod & Production

SID: DPO & PPO



3. ROADMAP



Approximate Downtime Timeliness

Small Landscape

Solution Manager

DB / Size	Sybase / 400 GB
Migration method	Backup / Restore
Approx. Downtime	10 Hrs

Downtime Activities:

1. Application Stop,
2. Initiate Backup in Source
3. Move the Backup files to Target
4. Restore DB
5. Perform Post restore activity
6. Start Application
7. Handover for testing.

Medium Landscape

SAP BW/4HANA

DB / Size	HANA / 2.5 TB
Migration method	Backup / Restore
Approx. Downtime	14 Hrs

Downtime Activities:

1. Application Stop,
2. Initiate Backup in Source
3. Move the Backup files to Target
4. Restore DB
5. Perform Post restore activity
6. Start Application
7. Handover for testing.

Complex Landscape

SAP ERP

DB / Size	ORACLE / 5 TB
Migration method	SUN DMO
Approx. Downtime	36 Hrs

Downtime Activities:

1. As per SUM tool Process
2. Perform post DMO activities
3. Handover for UAT

3.1 Post Migration Testing Recommendations: Mphasis

- HANA DB HA Failover / Fall back testing
- Application HA Failover / Fall back testing
- DR Drill testing
- Mock Backup / Restore testing

3.2 UAT Recommendations – Customer

- Complete End to End Functional testing.