

Cloud Migration Strategy & Approach

July 2019



Agenda Overview



- | | |
|-------------------|--|
| Section 1: | About HCL |
| Section 2: | HCL's Cloud Competency |
| Section 3: | HCL Approach for Azure Region Migration |
| Section 4: | Azure region Migration Demo Scenarios |
| Section 5: | Proof Points |

HCL OVERVIEW

\$8.6B
Annual Revenue

137,000+
Employee Strength

44
Countries

PROJECT CITRUS



VISION

Establish market leadership for large digital transformational deals on the MS Cloud platform for 21st Century Enterprises



STRATEGY

Penetrate HCL's Top 150 Accounts with horizontal and industry solutions on MS Azure



IMPACT

Scale HCL's Azure based cloud business and Azure consumption (FY18 - \$100m Achieved)

DCX Cloud Migration Partner

Largest Dynamics Practices worldwide



MSFT PRESENCE

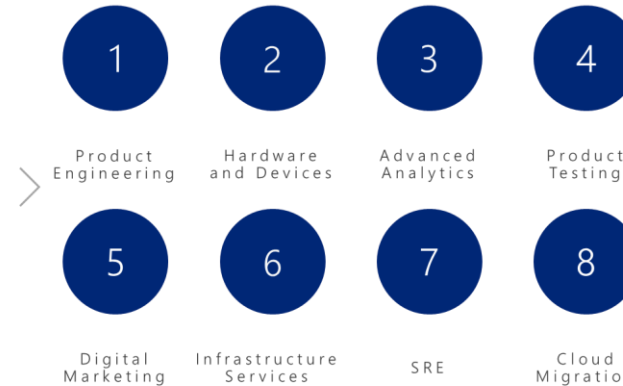
“ I really appreciate the partnership we have with HCL and am excited about the work that is happening, and the pace at which things are accelerating ”
Scott Guthrie
EVP, Microsoft

“ Microsoft and HCL (one of Microsoft's top GSI's) have shared a strategic and valuable 360 alliances for over 3 decades
■ HCL has consistently delivered outstanding results with strategic investments aligned to market needs and Microsoft's strategy
■ Jointly help our customers in their digital transformation initiatives and in their journey to cloud ”

SUSAN HAUSER
CVP, Microsoft

“ HCL's Microsoft services expand around CRM, cloud, analytics, infrastructure, and workplace innovation. HCL brings a fairly unique play in the Microsoft partnership as it has been a product engineering partner to Microsoft for over a decade ”

IDC MarketScape: Worldwide Microsoft Implementation Services 2017 Vendor Assessment



4 Joint Patents

Partnered in 7+ critical Product launches

5 Dedicated Labs

HCL Microsoft RELATIONSHIP



Azure Active Directory



2800

Engineers across Engagements



4

Dedicated Facilities



15+

Years of Relationship

Cloud Competency

HCL Cloud Practice

51%

Growth in overall Cloud Revenues over last 2 years

20K

Cloud SME's

100+

Projects Executed

1.8BN

USD Overall Revenues from *Cloud Services

- Focused investments on our strategic levers to continue our transformation and market leadership in new growth areas. HCL has spent **US\$ 2 billion dollars in M&A** in the past 24 months.
- Transitioned **over 80 +** Customers to Cloud last **12 months**
- **HCL- My cloud tooling based automation for holistic cloud management**
- **Highest Level of Partnership with all Cloud Providers**

- Achieved Premier Partner status for **AWS** with a growth of more than 250% YoY joint business.,200% yoy growth with **Microsoft**,
- Strategic partnership with **PIVOTAL, Openshift , Anthos , IBM ICP for Hybrid cloud**
- DATA/PAAS/AI engagements
- **Cloud native Labs based engagements – London , NYC**
- **End to End Cloud services- Advise , Execute and Operate**

Extended Partner Ecosystem



HCL Cloud Competency

CORE PARTNERSHIPS



- Premier consulting partner
- 650+ AWS certified experts
- Managed services partner
- AWS storage competency
- Lifesciences competency



- Certified Cloud Service Provider
- Gold cloud platform competency
- 800+ azure certified experts



Google Cloud Platform

- Emerging global SI partner
- Key focus areas established in AI and ML



- Global partner of the year for SDDC
- VVD certified
- Partner for VMC



- 360° partnership covering GTM and solution development
- Special focus IoT partnership
- Core automation and orchestration



Pivotal CF

- Focus on creating core resource capability and showcase labs
- Pivotal Certified and trained resources of 100 Architects and 1000+ Ops and Developers

CLOUD COMPETENCY SCALE



200 +
CUSTOMER
SUCCESS
STORIES, 1000+
PROJECTS



CLOUD
INNOVATION
LABS/COE IN
NORTH AMERICA,
INDIA , UK



120k+ Managed
VMs &
123 PB+ Cloud
Storage on Cloud
Native Platforms

CLOUD NATIVE DEVELOPMENT



Full-Lifecycle
Platform
Engineering
Services



2000+ DIGITAL
EXPERTS ON
MICROSERVICES,
API'S, LOW CODE.



FULL LIFECYCLE
DEVICE INTEGRN.
WITH IOTWORKS®

DATA CENTER TRANSFORMATION & OPERATIONS SCALE



Next Generation
Hybrid DC Design,
Implementation &
Operations for over
300+ Customers



- 1.2 MN Servers
- 400 PB Storage
- 60K Databases
- 275,000 MIPS
- 350K NW Devices

AUTONOMICS & ORCHESTRATION



Automation
Consulting, Build &
Integration services



AI powered
Automation
(Autonomics)
Platform



50+ MODULES
COGNITIVE, RPA,
ANALYTICS, NLP,
MACHINE LRNG.



Service
Orchestration, IT4IT
aligned Service
Management

SAAS COE



2000+ Person
Strong SaaS
Practice. 100+
Customers.
Strategic
Partnerships with
major vendors



Data Migration
Accelerators &
Toolset



Partnerships &
capabilities in
vertical saas
solutions across
major
Industries

CYBERSECURITY



Security
Consulting,
Architecture &
Build Services



AI enabled
CyberFusion
Centers for
Managed Security
Operations

CLOUD COE INVESTMENT



HCL's 'Lab 21'- Based
in Redmond,
Washington, HCL to
develop and deploy
high-impact business
solutions based on the
**Microsoft AI platform
and Azure Cloud.**

Cloud - Industry Credentials



**2015, 2016, 2017 DC & IUS
LEADER IN U.S. & EUROPE**



**2017 & 2018 CLOUD & INFRA
SVCS STAR PERFORMER**



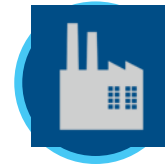
**2016 & 2017 WORLDWIDE
LEADER CLOUD
PROFESSIONAL SERVICES**



**CLOUD INNOVATION LABS/COE IN NORTH
AMERICA, INDIA , UK**



**PROVEN CLOUD ASSESSMENT, MIGRATION & OPS
TOOLSETS**



**COMPREHENSIVE CLOUD BUSINESS SOLUTIONS
TO SUPPORT MAJOR INDUSTRIES**



**PLATFORM PARTNERSHIPS WITH
ALL LEADING CLOUD,ECOSYSTEM PLAYERS**

Hcl's Cloud Migration Framework - EXACT

EXplore

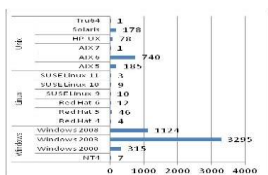
- Understand the current Organization and IT Landscape
- Understand long term goals and strategy
- Absorb the provided applications and infrastructure inventory

S. No.	Questions / Application	AdobeCreativeReporter	Remarks
1	Application Name	AdobeCreativeReporter	
2	Application Description	CrashReporter GUI	
3	Business Unit	AI	
4	Functionality of the product	Report Generation	
5	Version number of the product		3
6	Vendor name	Adobe Systems Inc.	
7	Support available from vendor	Yes	
8	Usage time		0.05
9	Average Machine usage time		0
10	Percent of Total Usage		4
11	Number of Days Used		10-05-2013
12	Last Day Used		5
13	Machine Count		
14	Interfacing applications	Adobe Output Designer	
15	Reports generated and their purpose	Yes	
16	License requirement	Yes	

Applications Template

Application Technical Details	
Is the application Regional or local	must have
Application Category - Indicate the type of application	must have
If the application is Packaged Software / COTS/Customized COTS, please specify the vendor name and package/ module	must have
If the application is Packaged Software / COTS/Customized COTS, please specify the level of customization (Very High / Level of customization of the application has been implemented to support	Must have
For Homegrown or Customized COTS applications, please list programming languages and Version/Generation	must have
What is the operating system of database and its version?	must have
Specify the middleware technology and version being used for the application	must have

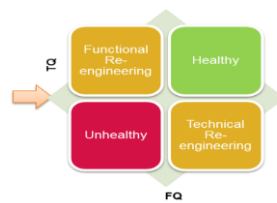
Infrastructure Templates



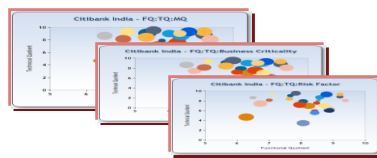
Program Plan

Analyze

- Perform GAP analysis wrt future technology reference model
- Evaluate inputs from Business Divisions on their Application roadmap.
- Evaluate Migration feasibility onto latest technology stacks from OS, Virtualization / cloud perspective



Application Clusters and Categorization



Application Technology analysis

Development Technology	Version	End of Life of Product
.NET Framework	2.0.5	10/6/2013
Visual Studio	2003	12/7/2009
PowerBuilder	10	12/7/2009
DB Technology	Version	End of Life of Product
IBM DB2	9.5	12/7/2009
MS Access	2003	4/6/2014
MS SQL Server	2000	4/6/2014
Oracle	9.2.0.4	12/7/2009
Teradata	10.2.0	12/7/2009
Informatica	7.1.3	12/7/2009

GAP Analysis w.r.t TRM

Craft

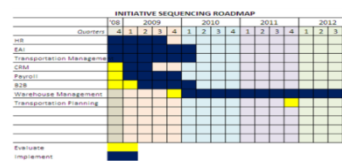
- Migration planning for identified application clusters .
- Understand impact of Apps roadmap on future state Infrastructure.
- Roadmap Creation with prioritization for Data Center transformation.



Migration Plan

Description	Project Type	Business Case	Cost Analysis	Risks
Project Description	Project Type	Business Case	Cost Analysis	Risks
Project Description	Project Type	Business Case	Cost Analysis	Risks
Project Description	Project Type	Business Case	Cost Analysis	Risks
Project Description	Project Type	Business Case	Cost Analysis	Risks

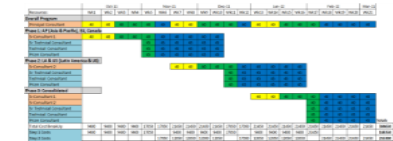
Business Case



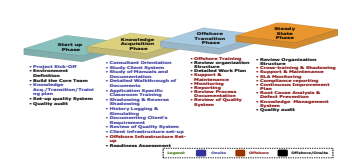
Prioritized Roadmap Creation

Transform

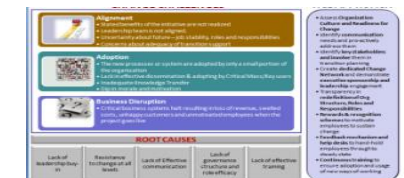
- Create Detailed Solution Design
- Execution of the identified solution scenarios as per the transformation program plan
- Tracking of communication, vendor, risk scope, IT change management plans



Solution Execution Plan

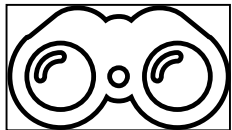


Program Management



Change Management

Migration Tool Sets – AWS to Azure



Discovery

Azure Migrate
discovery and
assessment

AWS
Application
discovery
service



Migration

AWS Migration
Hub/Azure
Migrate

Azure Site
Recovery

AWS Server
migration
Service



Database Migration Service

AWS database
Migration/Schema
Conversion

Azure Data
Migration
Assistant/Azure
Database
Migration Service



Data Transfer

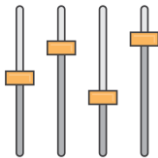
AWS Snowball/
Snowmobile

AWS EFS File Sync

Azure Databox

AWS VM Export /
Import

Azure Export /
Import

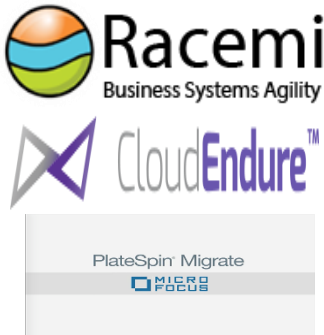


Optimize

AWS Trusted Advisor
Azure Advisor
Azure OMS+Cloudyn

From
AWS/Microsoft

Partner
Solution



Robocopy
SIOS Data keeper



HCL

Region to Region Migration

Scope Understanding

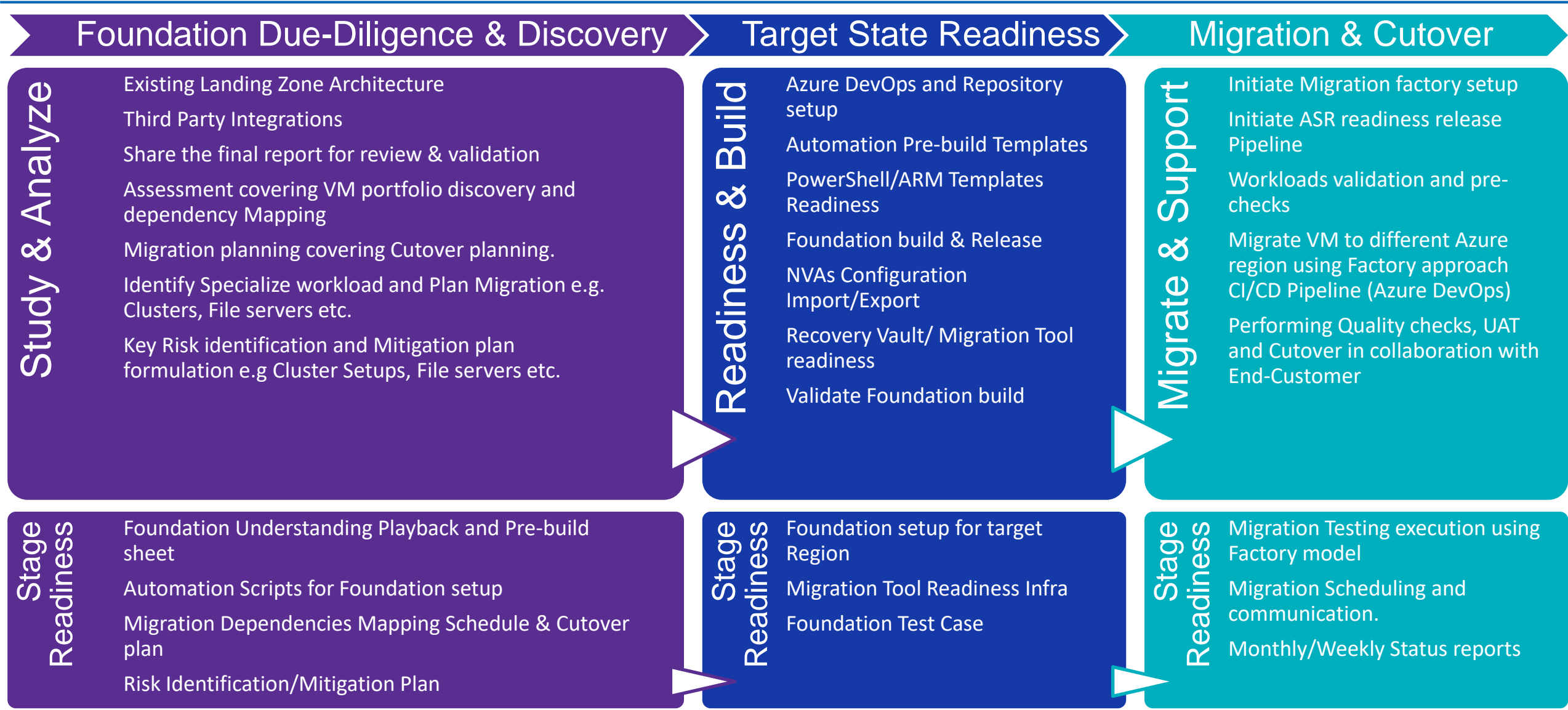
Understanding

- 2 regions – Expansion of China Azure from 4 to 6 Datacenters
- Azure region migration – China (non-Sovereign cloud)
- End to End Migration with limited remediation only if required.
- Offer Partner support to customers to migrate workloads
- Local Presence is required including Mandarin language capability
- Ability to Scale the team since all customers from the old datacenter must migrated

Solution Highlights

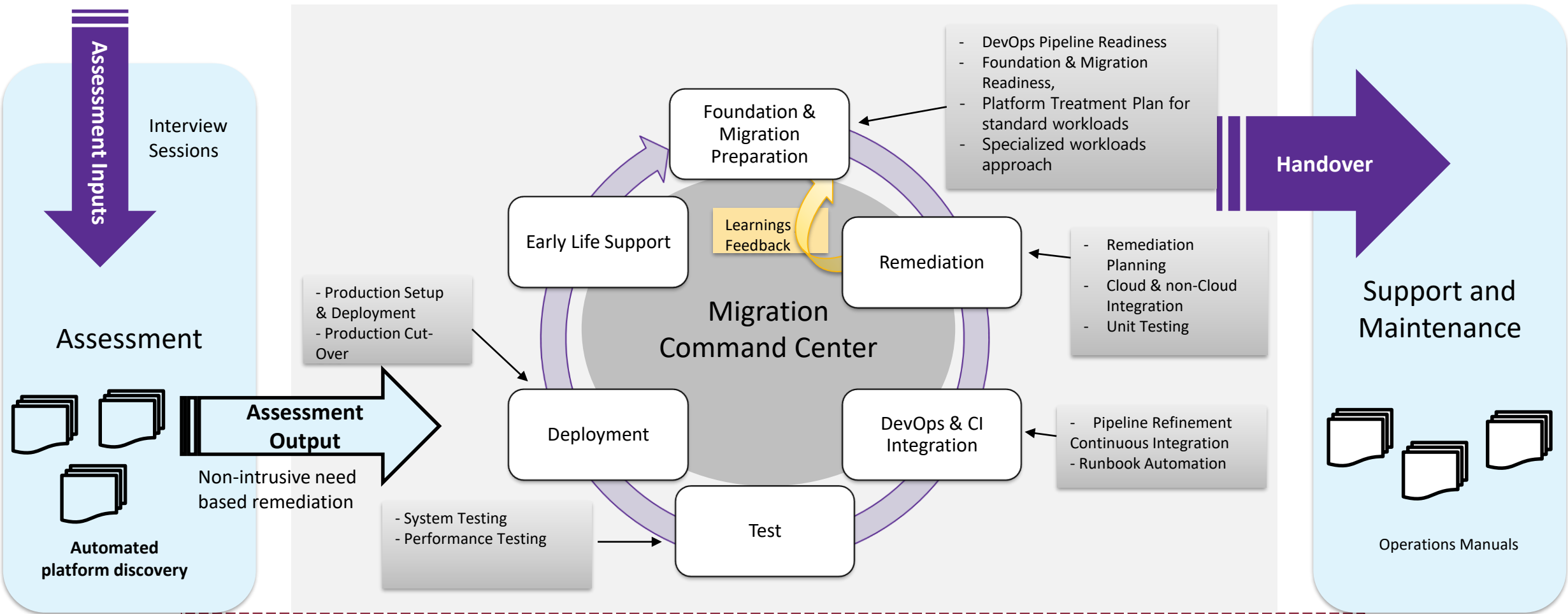
- Region to Region Migration (Azure China (non-sovereign cloud))
- Automated Foundation Build and Migration Approach using Azure DevOps

Azure Region to Region Migration Approach



Factory Approach for Azure Region Migration

Program Management, Standard Practices, Iterative Feedback for Improvement



- HCL Migration Factory setup includes different teams with clear roles and follow established processes
- HCL Architect groups and DevOps teams will work in conjunction with Customer and 3rd Party vendor to provide continuous delivery and integration
- Factory Setup is governed by Migration Command Center for smooth execution and cater outlier scenario

Demo

Scenarios and related slides

Azure Migration Demo – Structure, Story and Focal points

Use Case Stories

UC01 – One HUB vNET, 10 Subnets and One SPOKE vNET 3 Subnets in new Resource Group

UC02 – VPN and Local Gateway with HUB vNET

UC03 – Palo Alto Firewall Deployment in High Availability

UC04 – vNET Peering with Gateway Transit Enabled between Spoke & HUB

UC05 – Enable UDR and Routes for Incoming and Outgoing traffic via Palo Alto Firewall

UC06 – Apply NSG at Subnet to allow App/Infra ports

UC07 – Availability Set creation with stand alone VM in HUB VNet and INFRA Subnet for New AD Forest and Promote new AD/DNS

UC08 – Creation of Recovery Services Vaults , Backup Polices with VM Back Up Enable Daily

UC09 – Enable replication for all the listed VMs and Check the status of replication. Output will be in CSV.

UC10 – Once the VMs are replicated/protected, Using new Release to update the target properties of the VM (Compute and Network properties) and verify

UC11 – Start the test failover of the VMs listed, Once you manually validate the VMs that were test failed-over then clean up the test failover VM

UC12 –Perform an unplanned failover for the VMs listed in Sequence as per recovery Plans

UC13 –Apply Polices at Subscription level and Locks at Resource Groups

FOCUS

Reusable Code

Patterns & Best Practices

Cloud Native

Automated

CI/CD Enabled

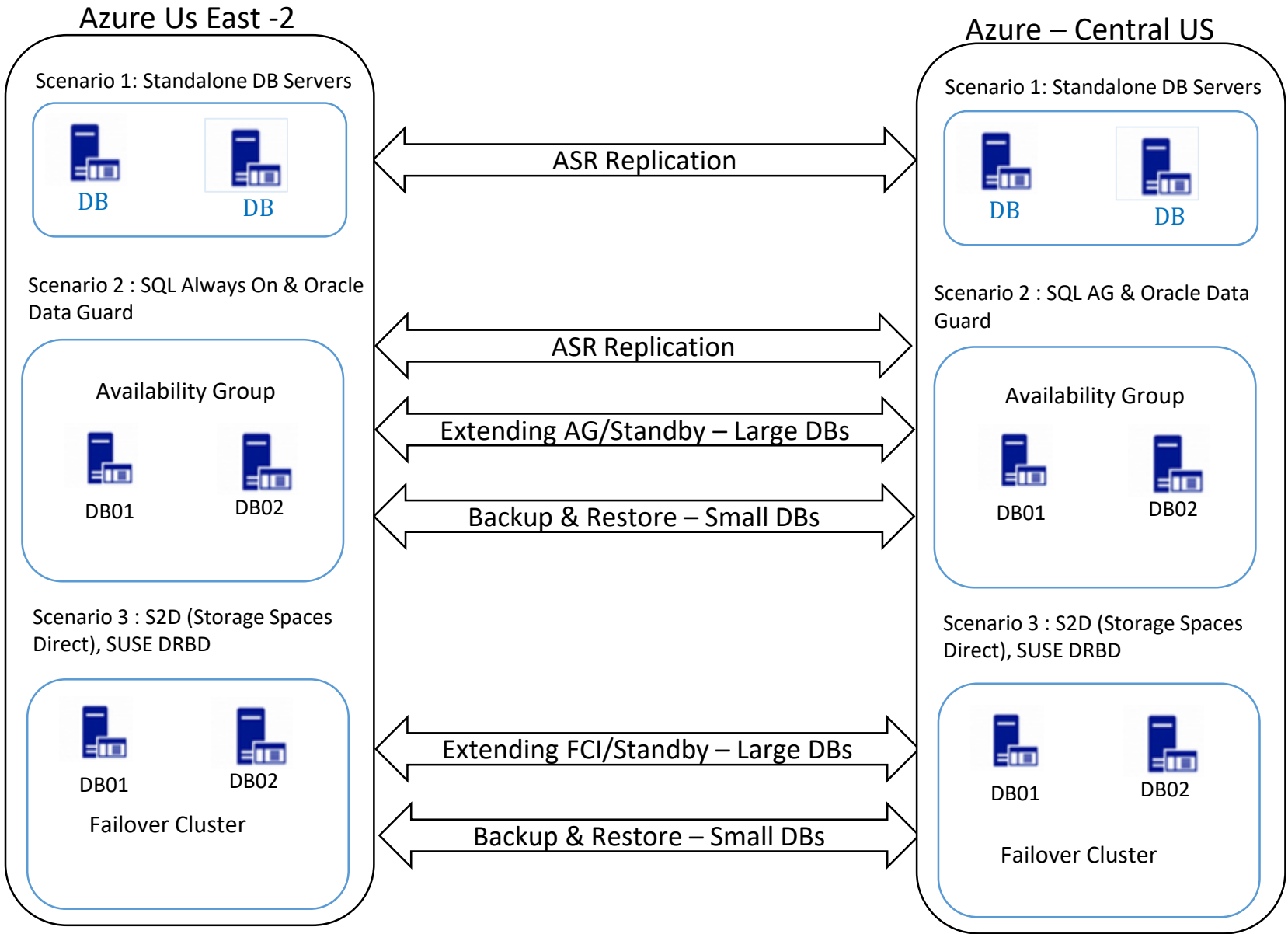
Dynamic, Fast & Automated Builds

Visible, Traceable

Tagging Strategy

Zero Touch/Trust

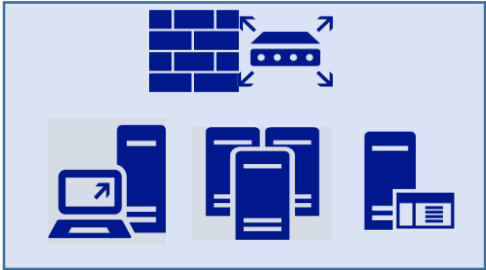
Database Scenarios and Migration Approach



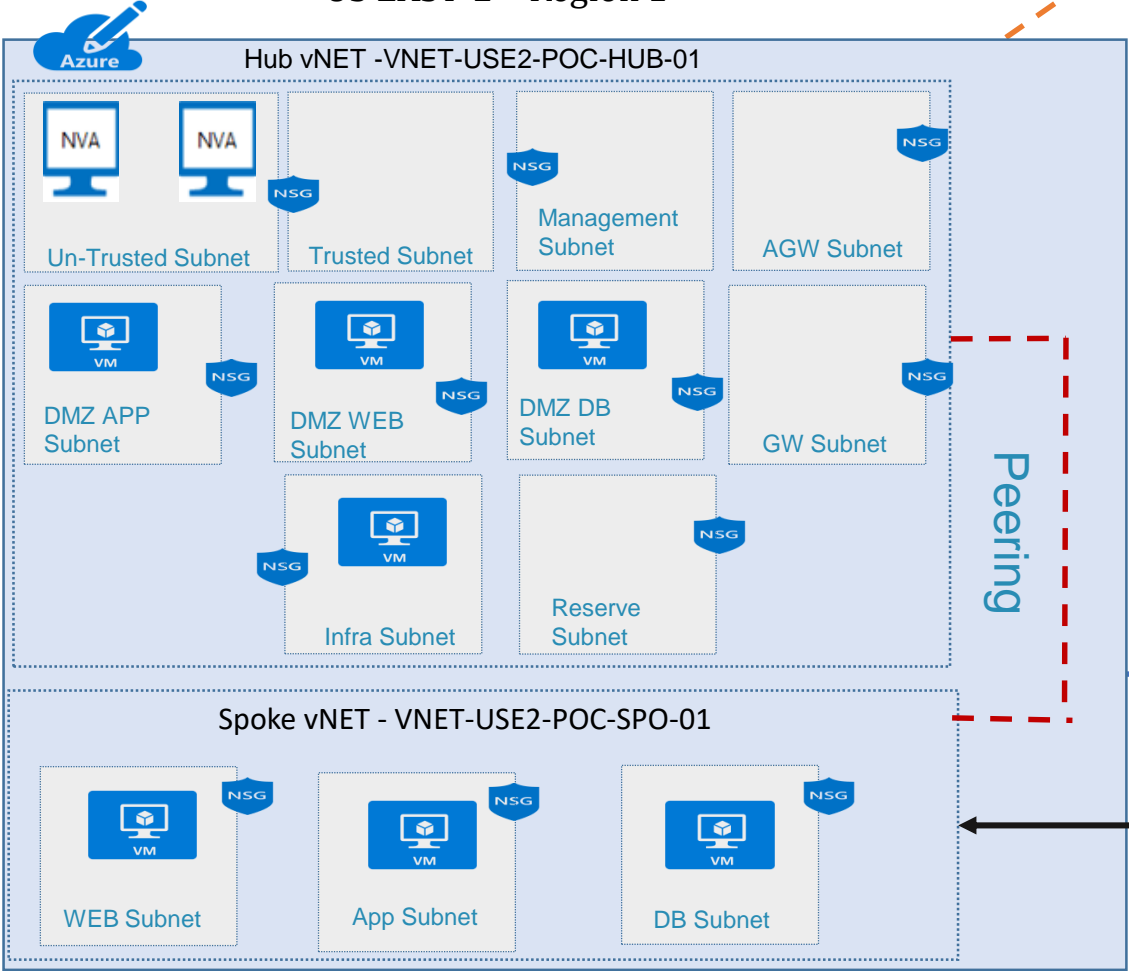
- Standalone DBs with ASR Replication
- Extended AG approach for larger DBs and Clustered servers. Refer the architecture in next slide.
- Backup and Restore approach for DBs small in Size (Optional).

Recommended Approach : ASR Replication as applicable

Logical Target Architecture



US EAST-2 – Region 1



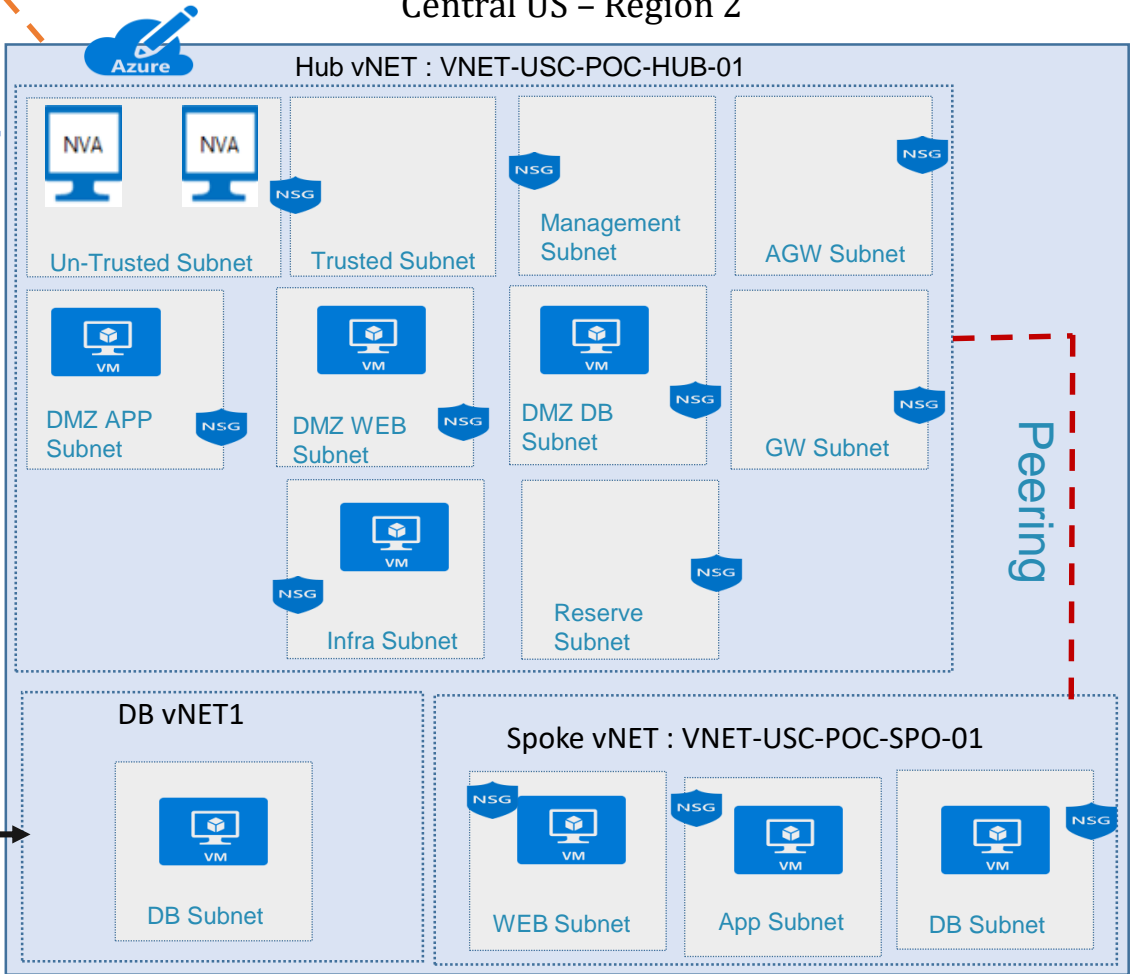
IPSEC VPN TUNNEL



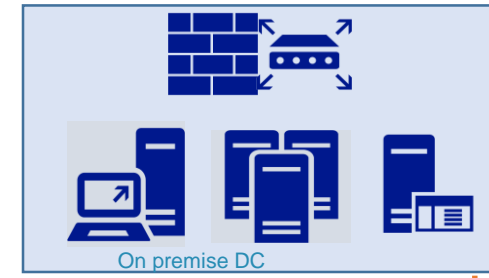
ASR

vNET Peering

Central US – Region 2



- - - - - Hub and Spoke Peering
- - - - - Site to Site VPN Tunnel
- - - - - Azure to Azure ASR



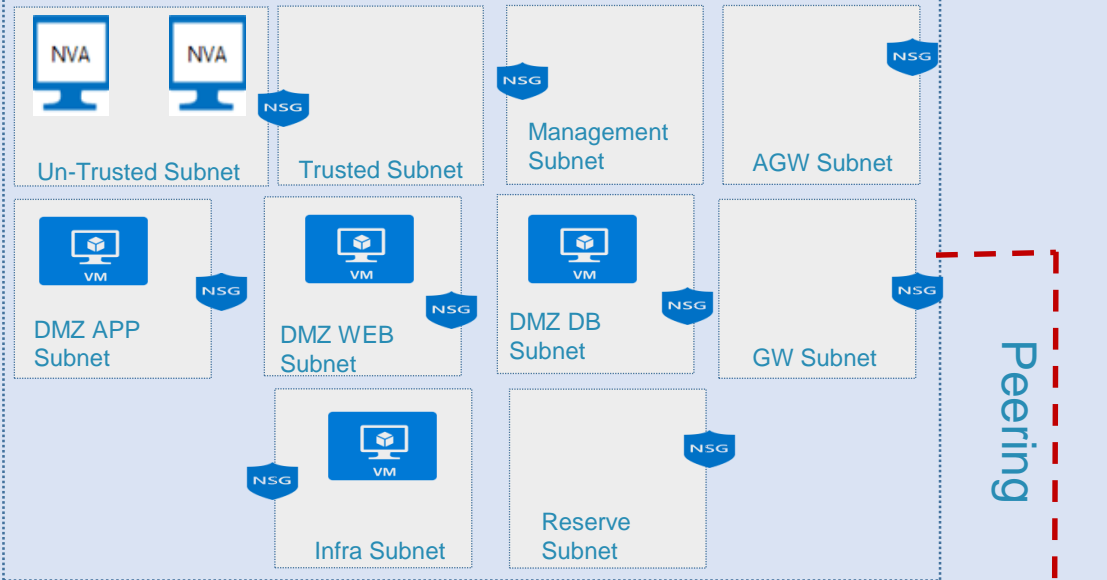
X IPSEC VPN TUNNEL



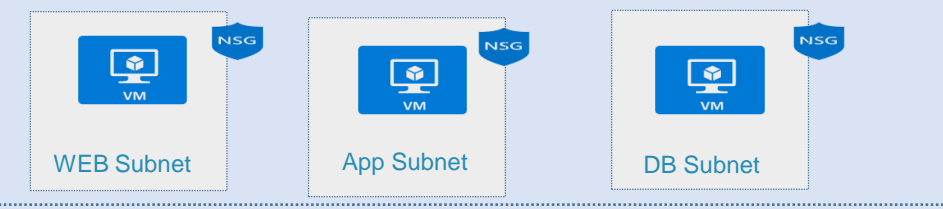
ASR

US EAST-2 – Region 1

Hub vNET -VNET-USE2-POC-HUB-01

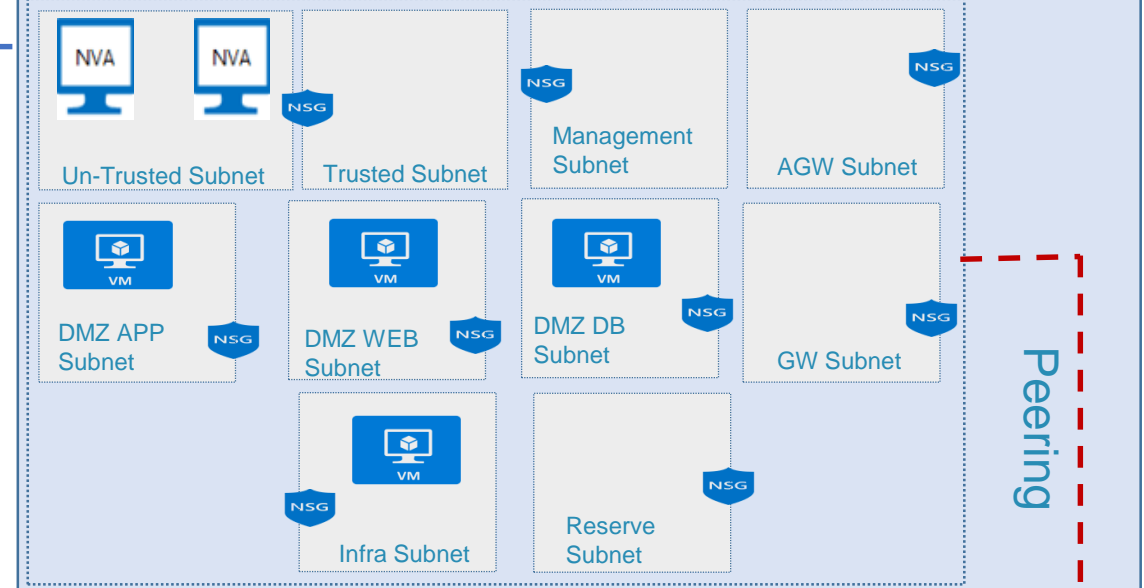


Spoke vNET - VNET-USE2-POC-SPO-01



Central US – Region 2

Hub vNET : VNET-USC-POC-HUB-01



Spoke vNET : VNET-USC-POC-SPO-01



Proof Points

Proof Points - Few Key Clients



World's leading Steel & Mining company

Summary:

Data Center exit and Migration of all applications and corresponding infrastructure to Azure

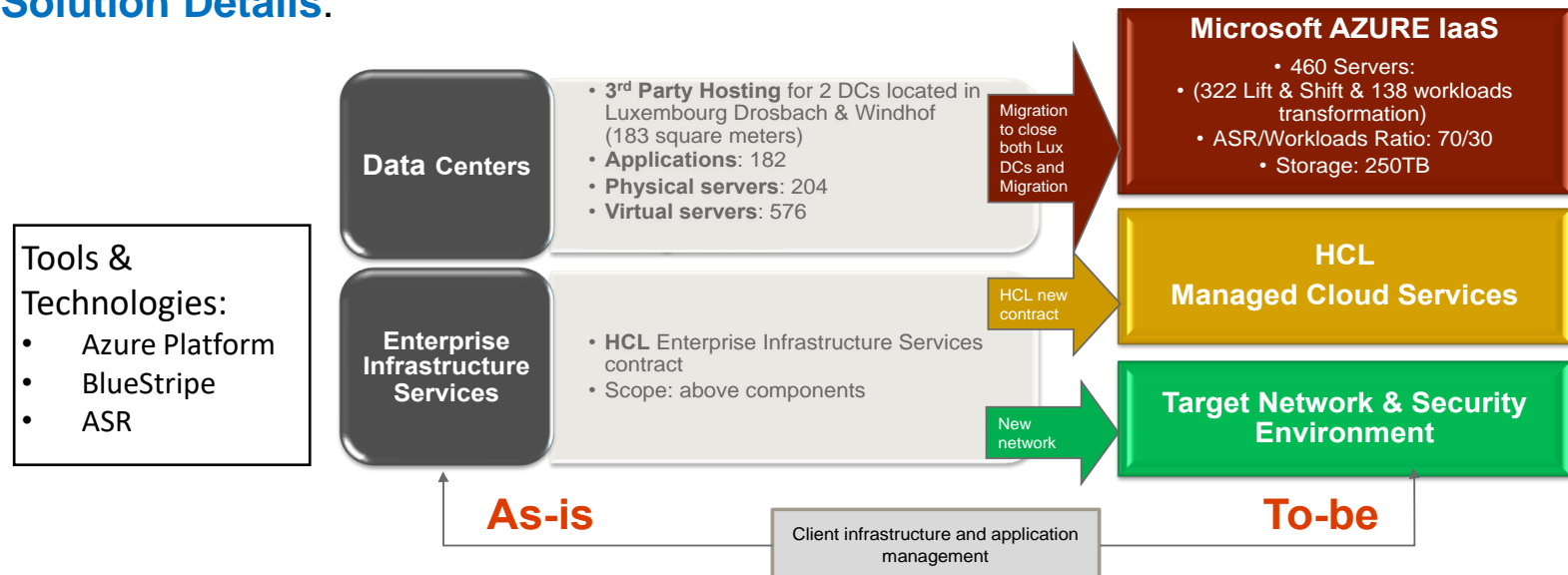
Business Challenges:

Dealing with legacy estate, looming hardware refresh, significant pressure on new CIO to reduce TCO for IT Services. Number of Mission and Business Critical Applications with attached rigorous compliance.

Business Goals:

This corporate program intended to close all legacy Corporate Data center's in Europe and move to Azure as part of the Digital & Cloud transformation plan (with simplification, flexibility and costs reduction associated drivers)

Solution Details:



Benefits / Result:

- Significant Rationalisation of the estate resulting in cost savings
- Modernised and updated landscape
- Reduction in TCO, pay per use Model and clear chargeback
- Acquired new capabilities
- Implemented robust Cyber-Security defence

Paved the way for other global units to follow the same example

World's Largest Staffing Firm



Business Goals

- Build Elastic infrastructure on public cloud - Azure to **migrate existing legacy applications**
- **Optimized run cost** via Cloud service delivery
- Increase in Operations Resiliency
- **Exit Europe and North America Data Center**

Solution Details

- IaaS and PaaS design on Azure for **agility and business continuity**
- Scalable design complying to **GDPR compliance**
- Cloud foundation set up for future **PaaS applications migrations**
- **PaaS first approach** for refactoring leveraging app service bundle
- **Infrastructure as code** through ARM templates and PowerShell and adoption of **DevOps best practices** to reduce cycle times
- **Factory based execution model** to maximize reuse and drive efficiencies
- **DevOps** process around Cloud deployments

Tools & Technology

- IaaS via MCOB- Azure
- AZURE VM, ASR
- Azure Automation, OMS
- Azure Express Route
- HCL MyCloud
- D-Prizm™, Cloudscape, Azure Migrate
- DevOps processes

Results - Before and After

- Migrated approx. 500 Servers in Azure as IAAS
- Migrated 200 Server to ARM Model
- Migrated more than 10 application on Azure WebApp
- (ShaikHR, Fosfor Web, BPM .Net and Finance Applications)
- Successfully Migrated Exchange Server to O365.
- Migrated their Citrix Farm to Microsoft RDS on Azure.
- Migrated application and user shares on SAN to use Azure Share and Windows 2016 SOFS

Global manufacturer and distributor of Chemical products/Ammunition

Client	Olin Corporation is a leading vertically-integrated global manufacturer and distributor of chemical products and a leading U. S. manufacturer of ammunition. Chemical products produced include chlorine and caustic soda, vinyls, epoxies, chlorinated organics, bleach and hydrochloric acid		
Business Challenge	<ul style="list-style-type: none">▶ Reduce overall time to build and deploy SAP infrastructure▶ Flexibility to scale environment for HANA landscape▶ Optimize disaster recovery capabilities▶ Reduce lead time for capacity planning▶ Reduce governance and oversight for IT systems		
Scope	<ul style="list-style-type: none">▶ SAP S/4 HANA 1610▶ SAP Business Objects 4.2▶ SAP PO/PI 7.5▶ SAP SLT 2.0	<ul style="list-style-type: none">▶ SAP BODS & IS 4.2▶ SAP GRC 10.1▶ SAP TM & EM 9.2▶ SAP Web Dispatcher 7.52	<ul style="list-style-type: none">▶ SAP MDG 9.0▶ SAP FIORI 4.0▶ SAP GTS 11▶ SAP Solution Manager 7.2
Key Highlights	Consumption based public cloud solution for production and non production environments and Disaster Recovery Managed Cloud. Integration and optimisation of SAP footprint for efficient service delivery at optimised cost. Consolidation of regional SAP estates into Azure Cloud		
Solution	<ul style="list-style-type: none">▶ Application modernization for customer legacy SAP estate and consolidation of multiple regions to one global SAP landscape.▶ Non Production and Disaster Recovery environments hosted on Azure public Cloud▶ Satellite applications migrated to public cloud Azure▶ Re-platform and remediation of Legacy application with movement to Public cloud Azure▶ SAP S/4 HANA 1610 on premise migration to S/4 HANA 1709 on public cloud		
Benefits	<ul style="list-style-type: none">▶ Reduction in overall infrastructure spend▶ Flexible infrastructure capacity with consumption based cloud▶ Predictable spend and lower governance cost with managed support services		

HCL

www.hcltech.com

\$8.6 BILLION | 137,000+ IDEAPRENEURS | 44 COUNTRIES