SIFY SOLUTION PRESENTATION TO UTI AMC J2C

February ‘19

AGENDA

01 SIFY STRENGTH

02 SCOPE UNDERSTANDING

03 PROPOSED SOLUTION

04 IMPLEMENTATION METHODOLOGY & PROJECT PLAN

05 TEAM STRUCTURE

06 POST IMPLEMENTATION SUPPORT & OPERATION

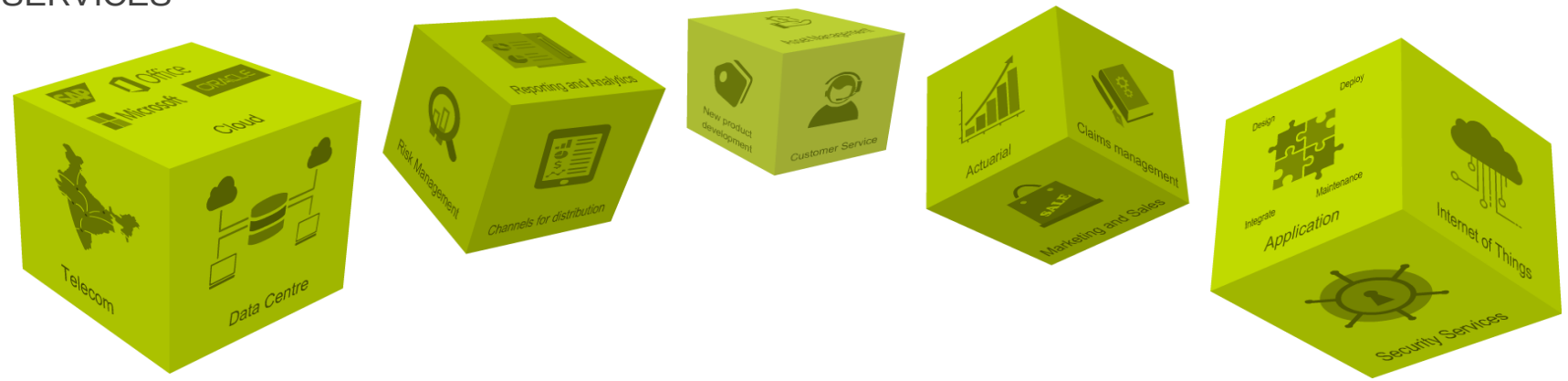
07 CUSTOMER REFERENCE

08 KEY DIFFERENTIATOR & VALUE PROPOSITION

SIFY STRENGTH

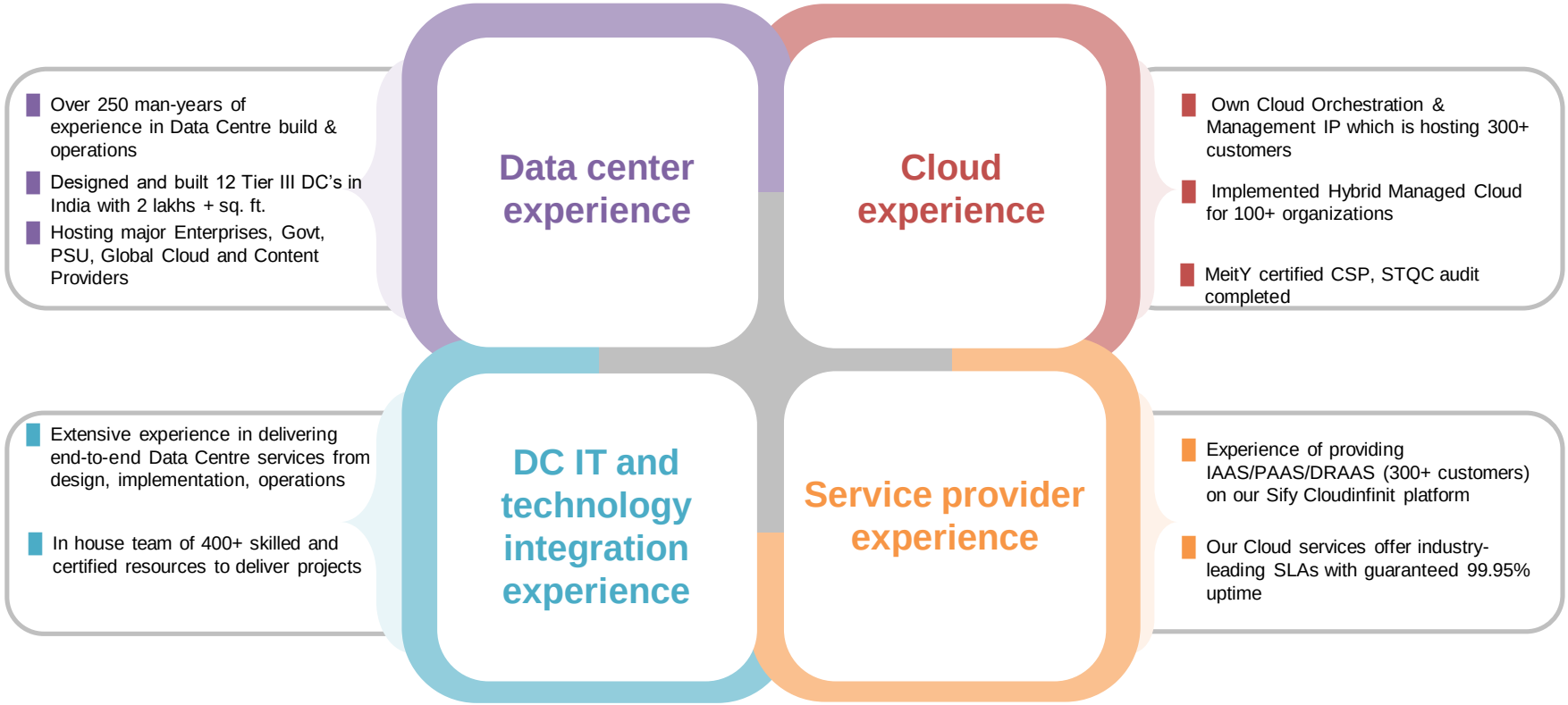
OUR PORTFOLIO OF SERVICES

SPECTRUM OF SIFY'S PRODUCT AND SERVICES



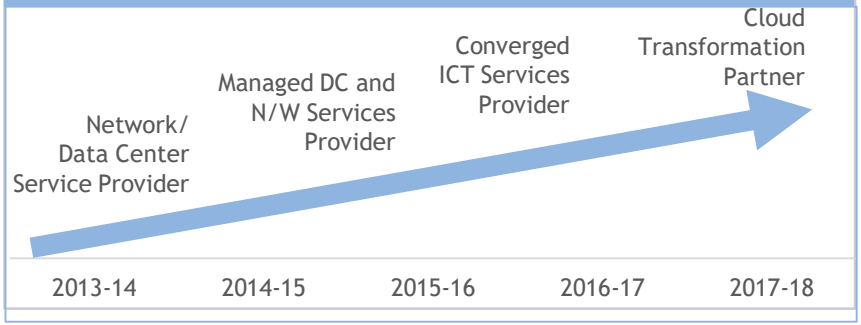
- DATA CENTER TRANSFORMATION AND INFRASTRUCTURE SERVICES
- HYBRID CLOUD SERVICES
- NETWORK TRANSFORMATION AND CONNECTIVITY SERVICES
- APPLICATION AND PLATFORM SERVICES
- TECHNOLOGY INTEGRATION SERVICES
- MANAGED SECURITY SERVICES
- INTERNET OF THINGS

DATA CENTER AND CLOUD SERVICES DRIVEN INFRASTRUCTURE TRANSFORMATION PARTNER

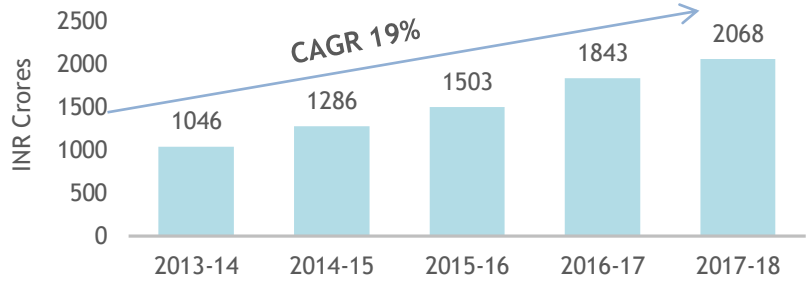


SIFY FINANCIALS

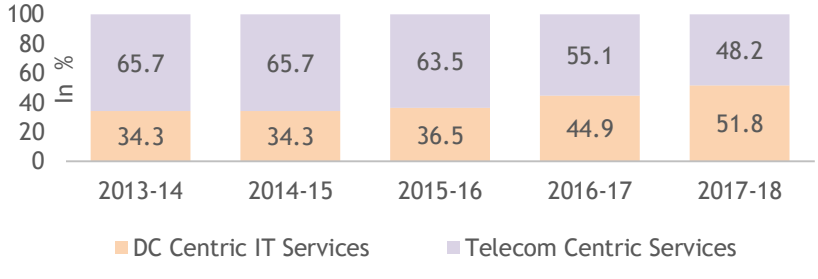
SIFY'S EVOLUTION



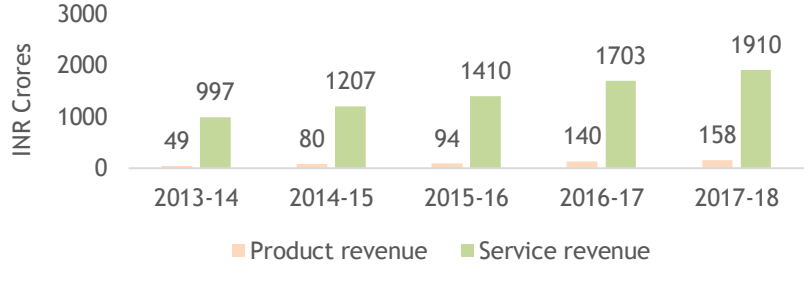
REVENUE & GROWTH



TELECOM SERVICES : IT SERVICES WALLET SHARE



PRODUCT REVENUE VS SERVICE REVENUE



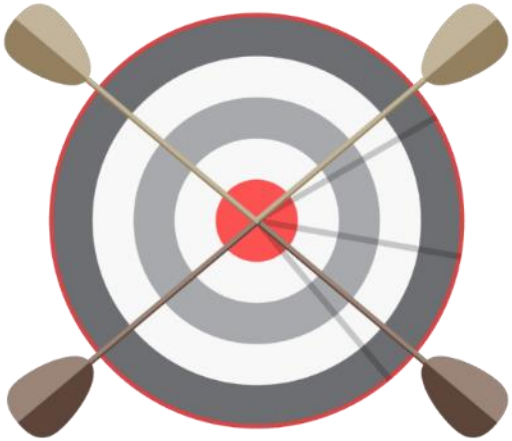
EXECUTION CAPABILITIES

LARGE DATA CENTER TRANSFORMATION PROJECTS

Preferred over players like IBM, Wipro, HCL & TCS

LARGE NETWORK TRANSFORMATION PROJECTS

Preferred over players like IBM, Wipro, Dimension Data, Tata Communications & Airtel



LARGE SECURITY SOLUTIONS PROJECTS

Preferred over players like Wipro, IBM, Dimension Data and Tata Communications

BUSINESS OUTCOME BASED MODELS

Preferred over players like: TCS, Wipro, Netmagic

Uttar Pradesh Power Corporation Limited

OUR PEOPLE CAPABILITIES AND STRENGTHS

550+
DATA CENTER AND MANAGED SERVICES

1800+
NETWORK SERVICES

70+
SECURITY SERVICES

225+
APPLICATION SERVICES

STRATEGIC PARTNERSHIPS

sify

Technology Partners

Cloud and Acceleration Partners

Application Partners

Security Partners

RECOGNITIONS

Sify moves up to the challenger position in the Gartner MQ for Managed Hybrid Cloud Hosting – Asia Pacific (2017)

sify SERVICE PROVIDER OF THE YEAR 2017

Microsoft Hosting Partner of the Year 2016

vmware PARTNER PREMIER SERVICE PROVIDER

CISCO PARTNER Premier Certified

Partner of the year 2017

Network Transformation Services 2018

Data Center Transformation Services 2018

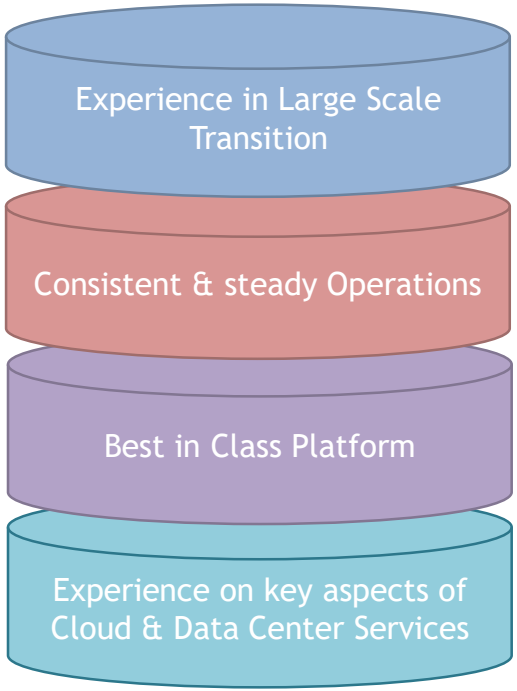
WHY SIFY FOR UTI AMC J2C?

Credible Hybrid IT Competencies
- *Private Cloud, Enterprise Cloud + Public Cloud*
- *Integrated Security and Network solution*

Operations Transformation
- *Strong management across hybrid IT platform*
- *Automation, tools and SLA driven framework*

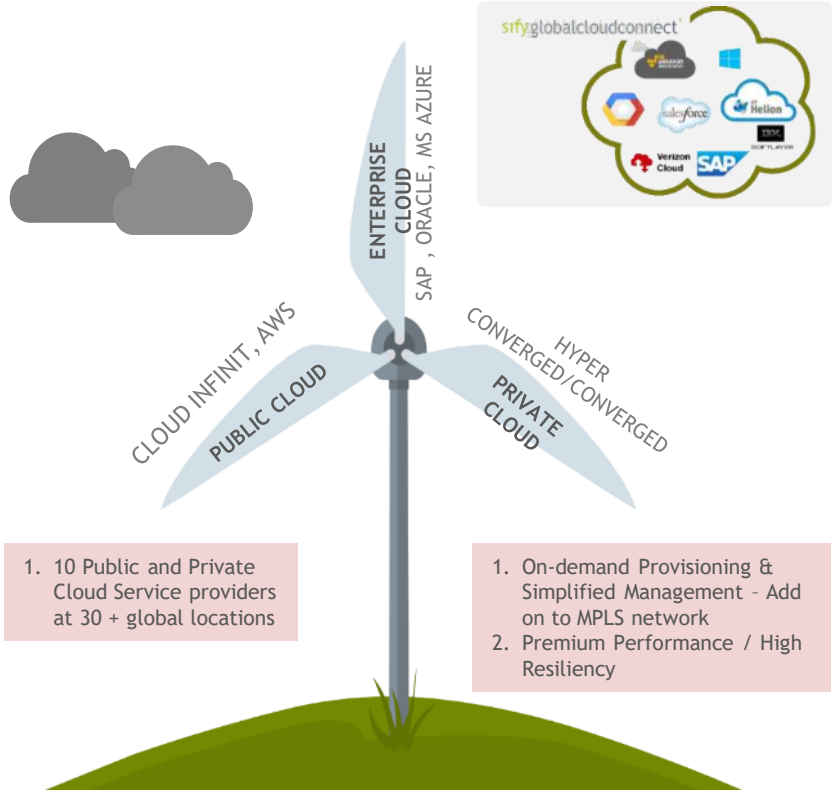
Future Ready – Innovation Led
- *Investments in IOT, DPH, Azure Stack, Vmware on AWS*
- *Enterprise Cloud with AllFlash Storage, ACI Fabric*

Security partner
- *Zero Trust Security Framework across Hybrid IT*
- *End Point to Applications security services spectrum*
- *Consulting, Audit & Integrated Cloud Security Partner*



DATA CENTER AND CLOUD TRANSFORMATION CAPABILITIES

HYBRID CLOUD SERVICES



1. 10 Public and Private Cloud Service providers at 30 + global locations

1. On-demand Provisioning & Simplified Management – Add on to MPLS network
2. Premium Performance / High Resiliency

UNIFIED VISIBILITY

INTEGRATED ORCHESTRATION AND MANAGEMENT

SECURITY AND SERVICE GOVERNANCE

PUBLIC CLOUD	PRIVATE CLOUD	ENTERPRISE CLOUD
• Hyper Scale • Pay per Hour • Globally available	• Fully dedicated • Compliance driven • Flexibility to own, outsource and buy back	• Application Centric Architecture • Application Blueprint driven • Hybrid cloud ready

SEAMLESSLY INTERCONNECTED – MPLS, INTERNET VPN EXPRESSROUTE, DIRECT CONNECT

SCOPE UNDERSTANDING

UTI Mutual Fund

SCOPE UNDERSTANDING

INFRASTRUCTURE SCOPE

- Design Cloud-based technology landscape comprises of
- Public Cloud DC & DR
- Private Cloud DC & DR
- Multi Cloud Management Platform to orchestrate, manage, automate provisioning, de-provisioning of public & private cloud infrastructure & other SaaS Clouds(in future)
- Robust Security Controls
- Network Operation Center
- ITSM & Monitoring Tool
- Resilience architecture of cloud to provide HA for all Business Applications
- Scalable infrastructure to enable Quicker provisioning of technology

IMPLEMENTATION AND INTEGRATION

- Implementation & configuration of hardware, software components
- Virtualization and cloud Set-up
- Install Multi cloud management platform
- Configure ITSM & Monitoring tool
- Configure DR Automation tool
- Configure virtual machines (VMs)
- Install & configure the Win OS, Linus OS & MS SQL, Oracle, PostgreS database etc.
- Block Storage
- Object Storage
- Backup & Restore
- Internet Connectivity
- Configure Internet Proxy
- Configure other security controls

MIGRATION

- Migrate existing application from Physical to Virtual (P2V), Virtual to Virtual(V2V), Cloud to Cloud(C2C) as per provide inventory from Customer.

SCOPE UNDERSTANDING

DOCUMENTATION

- **Project Management Documents**
  - Project Charter, Project Schedule / Plan, Project Stakeholders
- **Standard Operating Procedures**
  - Contact details and procedures for obtaining service from OEMs, OEM product and User manuals
  - detailed instruction for operation and maintenance of the hardware (if any) and software is to be delivered

TRAINING

- Provide training covering the following:
- Entire Deployment Architecture
- Managing and Administration of Public Cloud Infrastructure and Private Infrastructure
- Security Solutions Management
- Backup and Recovery Management
- Disaster Recovery Management
- Monitoring of Infrastructure
- Provide training documents for the proposed solution.

WARRANTY/ AMC

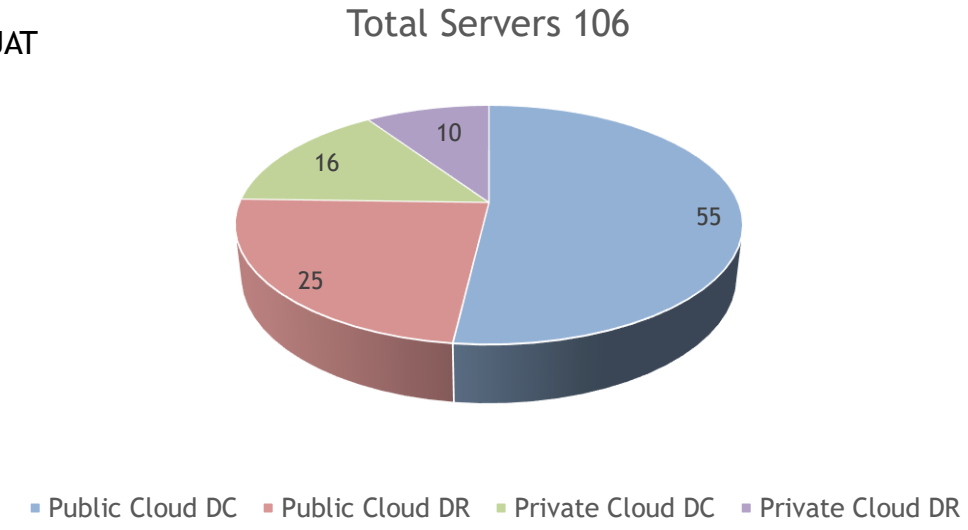
- Warranty/AMC for 5 years for all supplied H / W & S / W Components

FMS

- Provide Remote Operations & Management Services to operate and maintain the proposed solution for 5 Years.

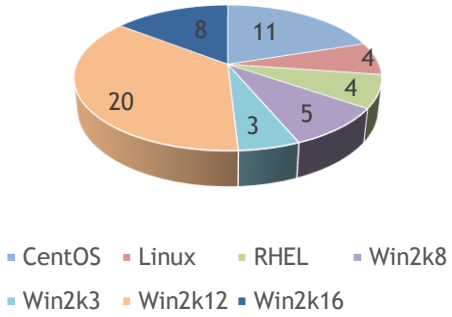
ENVIRONMENT ANALYSIS

- 97 Production Application Servers including DC & DR
- Applications are categorized and have Prod/DR/UAT
- 9- Dev/Test servers in the environment

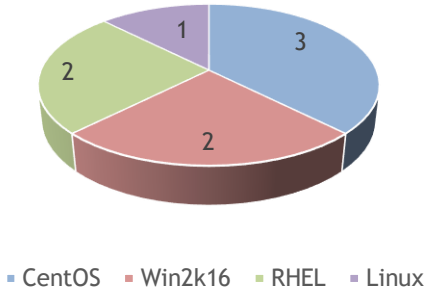


ENVIRONMENT ANALYSIS – OS SPLIT

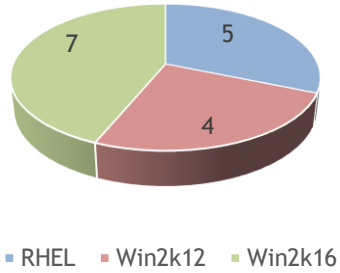
OS Analysis - AWS



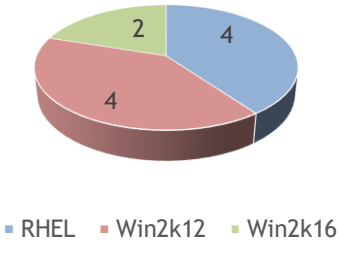
`Public Cloud DR - SIFY



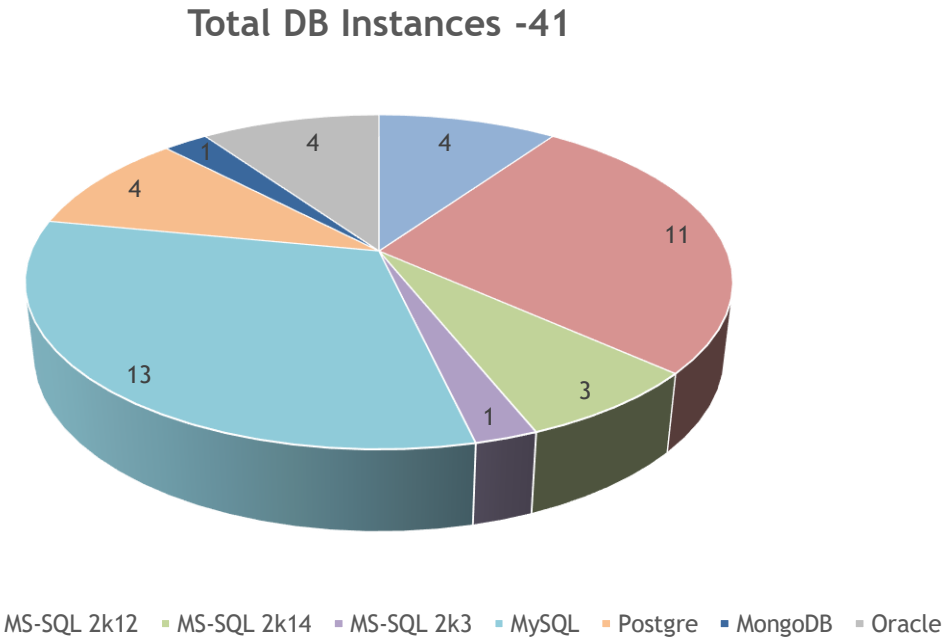
Private Cloud DC-SIFY



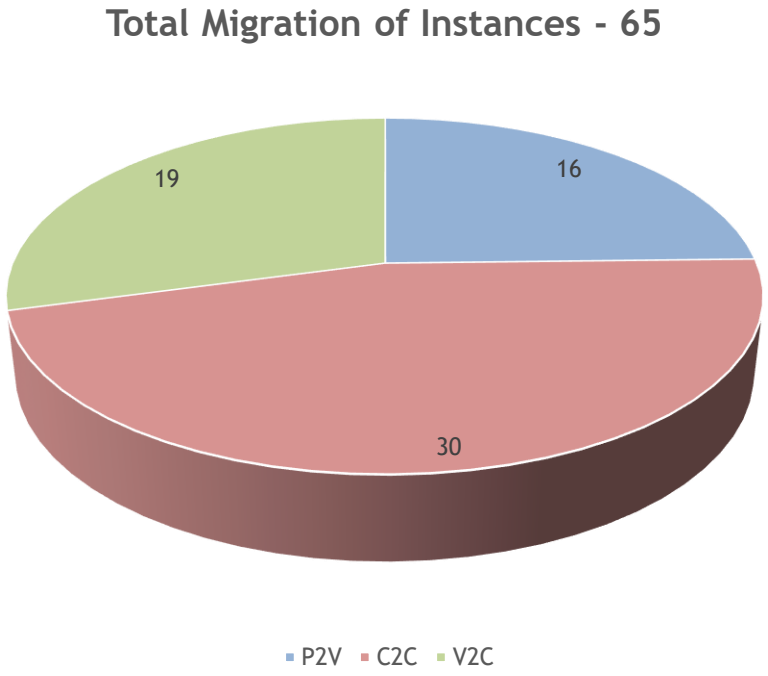
Private Cloud DR - SIFY



DATABASE ANALYSIS



MIGRATION ANALYSIS



PROPOSED SOLUTION

ENVIRONMENT AS-IS VS PROPOSED

CURRENT LANDSCAPE DC & DR

- Co-located hosted environment
- Legacy Hardware
- Isolated workload distributed hosted & cloud
- No Automation
- Siloed security deployment
- Partial HA & Business Continuity

PROPOSED LANDSCAPE DC & DR

- Multi Cloud Architecture
- Automation
- Direct Cloud Connects
- Controlled Cloud Security framework
- Unified ITSM layer
- Unified Orchestration & dashboard
- HA & Business Continuity

BILL OF QUANTITY - COMPUTE

Sr. No.	Hardware/Software/Services	Public Cloud– Primary AWS Mumbai	Public Cloud –Disaster Recovery Sify Bangalore	Private Cloud DC Primary Sify Mumbai	Private Cloud - Disaster Recovery Sify Bangalore
A	**- Server, Storage, Backup, Virtualisation, CMP, DR, Migration, OS, DB**				
1	Server	VM as per RFP requirement -55 VM for Management -19	VM as per RFP requirement -25 VM for Management -14	Cisco HCI HX2X0C-M5S (Node -HX240C-M5SX -4) VM asper RFP requirement -16 VM for Management -2	Cisco HCI HX2X0C-M5S (Node -HX240C-M5SX -4) VM asper RFP requirement -10 VM for Management -2
2	Storage	AWS Cloud- as a Service - 48TB + 10TB of Object Storage	Sify Cloud-as a service - 17.8TB	8.69TB (Part of HCI Solution)	7.22TB (Part of HCI Solution)
3	Backup Software	Commvault as a service	Commvault as a service	Commvault + Netapps D2D Low End Storage	Commvault + Netapps D2D Low End Storage
4	Operating System Licenses	Cent OS -12, RHEL-4, Suse -1, Linux-3, Windows OS-43, Custom OS -11	Cent OS -3, RHEL-2, Linux-1, Windows OS-23, Custom OS -10	Window OS -17, RHEL -1	Window OS -12
5	Orchestration, Multi cloud Management Platform	Cisco Cloud Center			
6	Database				
6a	Database-MySQL	2	0	6	5
6b	Database - MS SQL -2003/2008/2012/2014	13	6	0	0
6c	Database - Mongo	1	0	0	0
6d	Database - PostgreS	3	0	0	0
6e	Database-Oracle 11g/12C	3	1	0	0
7	DR Automation	Doubletake tool	Doubletake tool	Doubletake tool	Doubletake tool
8	DR-Drill		2		2
9	Migration	Doubletake tool	Doubletake tool	Doubletake tool	Doubletake tool

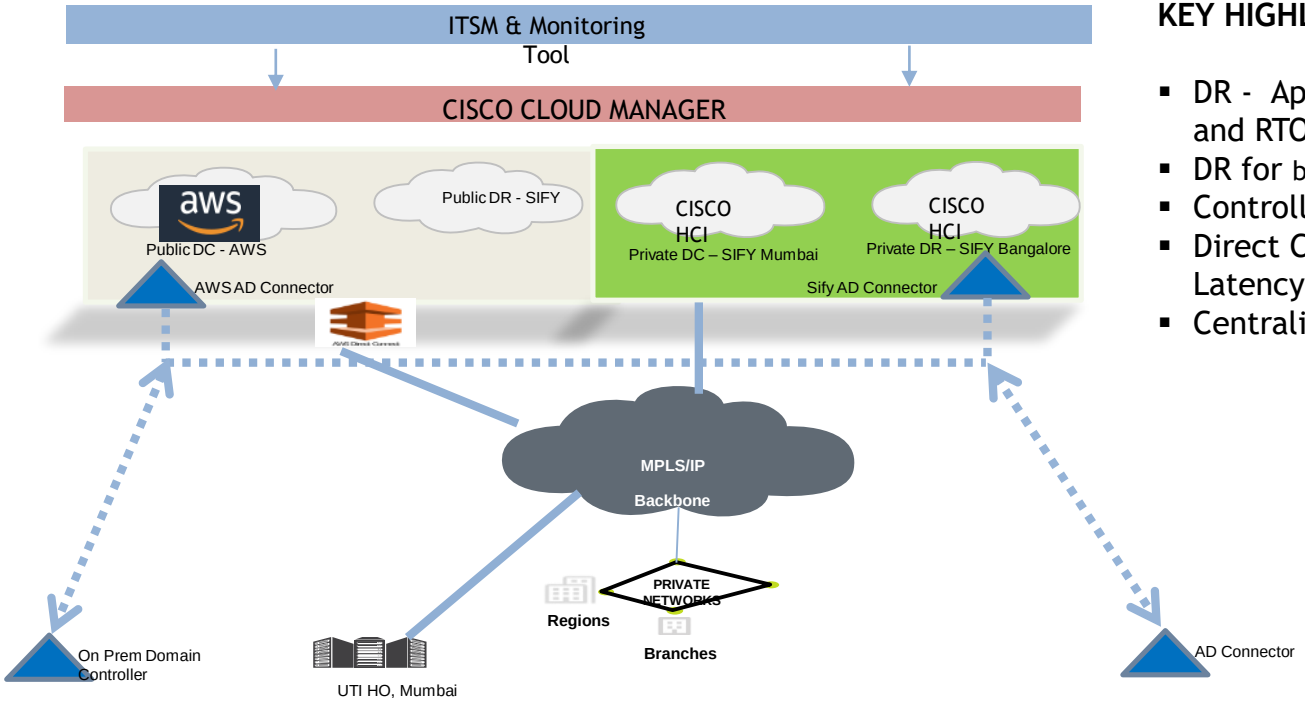
BILL OF QUANTITY - NETWORK-ITSM-COLO

Sr. No.	Hardware/Software/Services	Public Cloud– Primary AWS Mumbai	Public Cloud –Disaster Recovery Sify Bangalore	Private Cloud DC Primary Sify Mumbai	Private Cloud - Disaster Recovery Sify Bangalore
B	**Solution Components - Network**				
1	Switch	AWS Cloud- as a Service (Bundle in VM)	Sify Cloud-as a service (Bundle in VM)	Cisco 3850-24XS-S (4 Qty)	Cisco 3850-24XS-S (4 Qty)
2	Core Router	AWS Cloud- as a Service (Bundle in Solution)	Sify Cloud-as a service (Bundle in Solution)	Cisco ASR1001-HX (2 Qty)	Cisco ASR1001-HX (2 Qty)
3	IP Load Balancing	AWS Cloud- as a Service (Amazon ELB)	Sify Cloud-as a service (SLB as Service)	Not Required as per RFP	Not Required as per RFP
C	Links Monitoring	71 Links Monitoring as Service			
D	Monitoring Tool	Sify MSP Tool			
E	ITSM	Incident, Problem, Change, Hardware Asset Management & CMDB -50, ServiceNow® Approver User-10, ITOM (IT Operations Management) Standard - Discovery + Event Management -150, Software Asset Management -1500			
F	Colocation	AWS Service	Inclusive	42 U Rack with 6KVA Power-2Nos.	42 U Rack with 6KVA Power-2Nos.

BILL OF QUANTITY - SECURITY

Sr. No.	Hardware/Software/Services	Public Cloud– Primary AWS Mumbai	Public Cloud –Disaster Recovery Sify Bangalore	Private Cloud DC Primary Sify Mumbai	Private Cloud - Disaster Recovery Sify Bangalore
G	**Solution Components - Security**				
1	Perimeter NGFW	Checkpoint virtual -perimeter-,	Checkpoint virtual -perimeter-,	Not Required as per RFP	Not Required as per RFP
2	MPLS NGFW	Fortinet virtual- 2 Nos	Fortinet virtual- 2 Nos	Fortinet physical 1500D- 2 Nos	Fortinet physical 1500D- 2 Nos.
3	Host Intrusion Prevention/ Antivirus/FIM	Trend micro as service -120 Nos.		Trend micro - Sify Services -30 Nos.	
4	Encryption Keys (Generation and Management)	AWS/Gemalto HSM	Gemalto HSM	Not Required as per RFP	Not Required as per RFP
5	Encryption (Data-at-rest)	Gamelto HSM	Gamelto HSM	Not Required as per RFP	Not Required as per RFP
6	Database Activity Monitoring	Macfee - 29 Qty	Macfee - 29 Qty	Not Required as per RFP	Not Required as per RFP
7	Encryption Certificates (Procurement and Management)	Global Sign certificate - 2 Qty		Not Required as per RFP	Not Required as per RFP
8	Existing Privileged Accounts Management	iRaje (Exisitng 35, propose additional -25)- Total No of License is 60			
9	Web Application Firewall	AWS Service F5- 2 Nos.	Sify Service F5- 2 Nos.	Not Required as per RFP	Not Required as per RFP
10	Proxy	Symantec user count 1350	Symantec user count 1350	Not Required as per RFP	Not Required as per RFP
11	Ddos	AWS Service F5- 2 Nos.	Sify Service F5- 2 Nos.	Not Required as per RFP	Not Required as per RFP
12	VAPT	Third Party -Application Security testing (DAST) -52		Not Required as per RFP	Not Required as per RFP

HIGH LEVEL SOLUTION OVER VIEW



KEY HIGHLIGHTS

- DR - Application level RPO and RTO
- DR for business continuity
- Controlled security Layer
- Direct Connect for low Latency
- Centralized user control

CLOUD CENTER ARCHITECTURE

- ✓ Abstracts application from underlying cloud environment
- ✓ Ensures infrastructure adapts to meet the needs of each applications

MANAGER

CCM : Cloud Center Manager

- ✓ Users - Model, Deploy, Manage
- ✓ Admin - Govern Applications, Clouds, Users

APPLICATION PROFILE

Cloud - Agnostic Portable

CCO : Cloud Center Orchestrator

ORCHESTRATOR

AMQP

VM VM VM VM VM

AWS Public Cloud Primary - Mumbai

ORCHESTRATOR

AMQP

VM VM VM VM VM

Public Cloud DR Sify - Bangalore

ORCHESTRATOR

AMQP

VM VM VM VM VM

Private Cloud DC Sify - Mumbai

ORCHESTRATOR

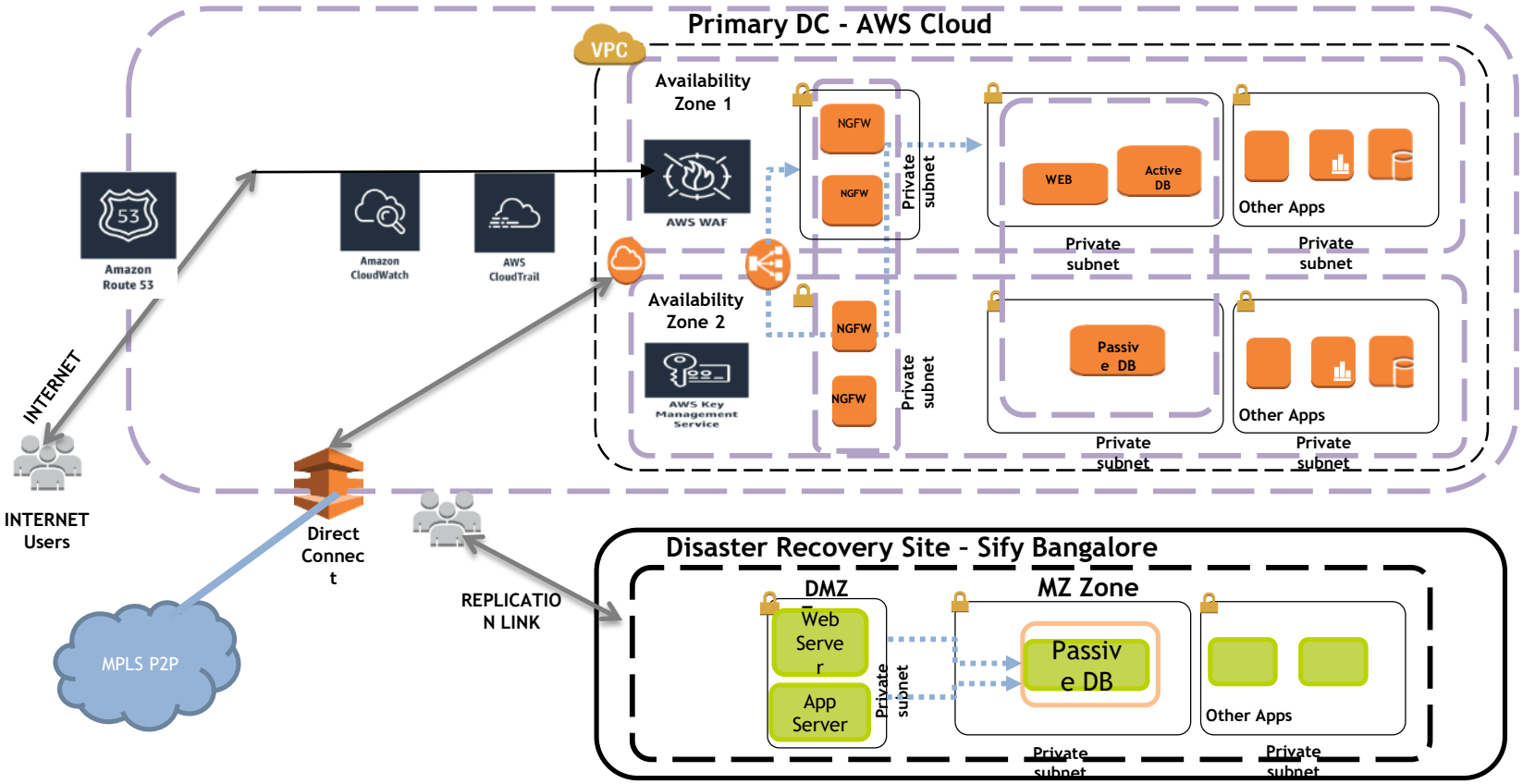
AMQP

VM VM VM VM VM

Private Cloud DR Sify - Bangalore

AMQP : Conn Broker

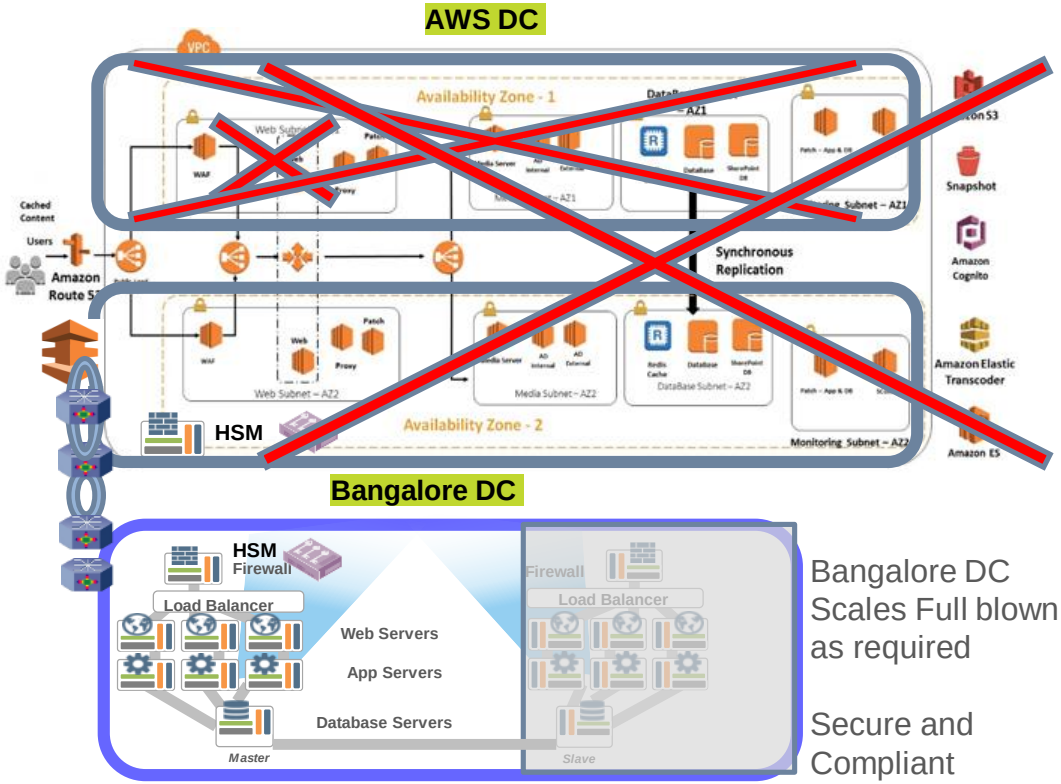
ARCHITECTURE - PUBLIC CLOUD



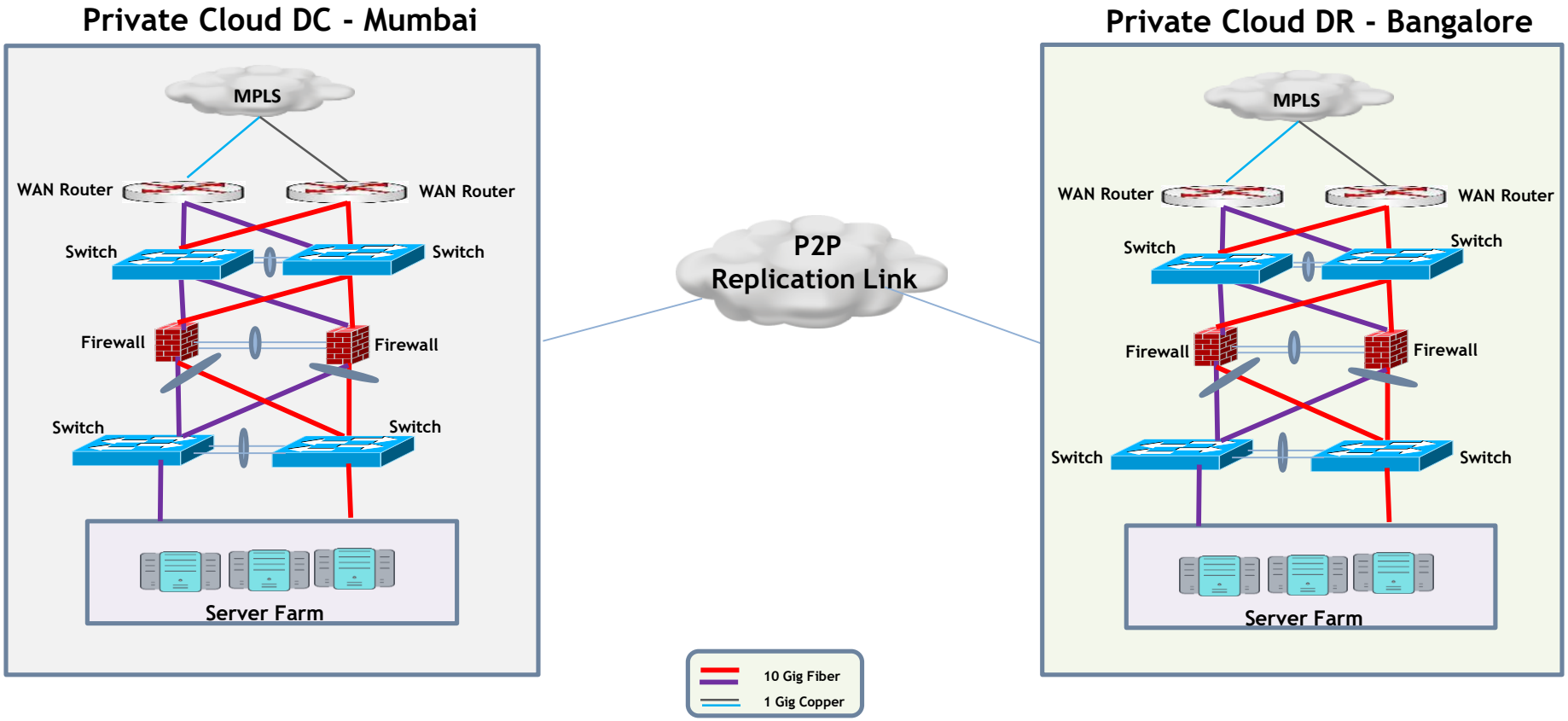
HIGH LEVEL FLOW - AWS PRIMARY WITH SIFY DR

- 2 AZ's in Mumbai Region each with 1+ DC's
- AZs <2ms apart
- No Single Point of Failure
- Secure and highly scalable
- **Near Zero RTO and RPO**

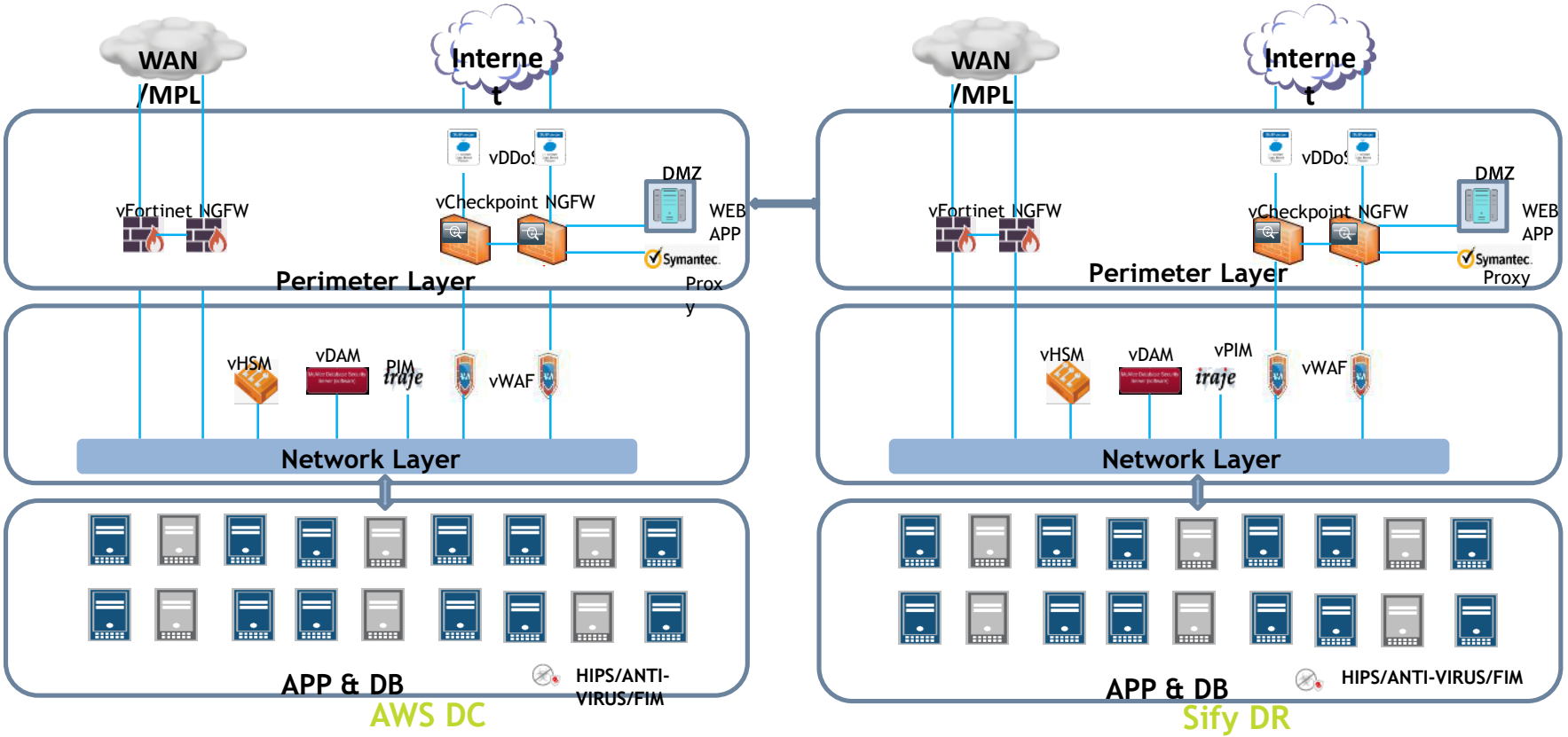
- DR Enabled at Sify Bangalore DC
- Scale on Demand
- RPO 30 Min & RTO < then 4 Hrs
- Highest level of **Data Assurance**



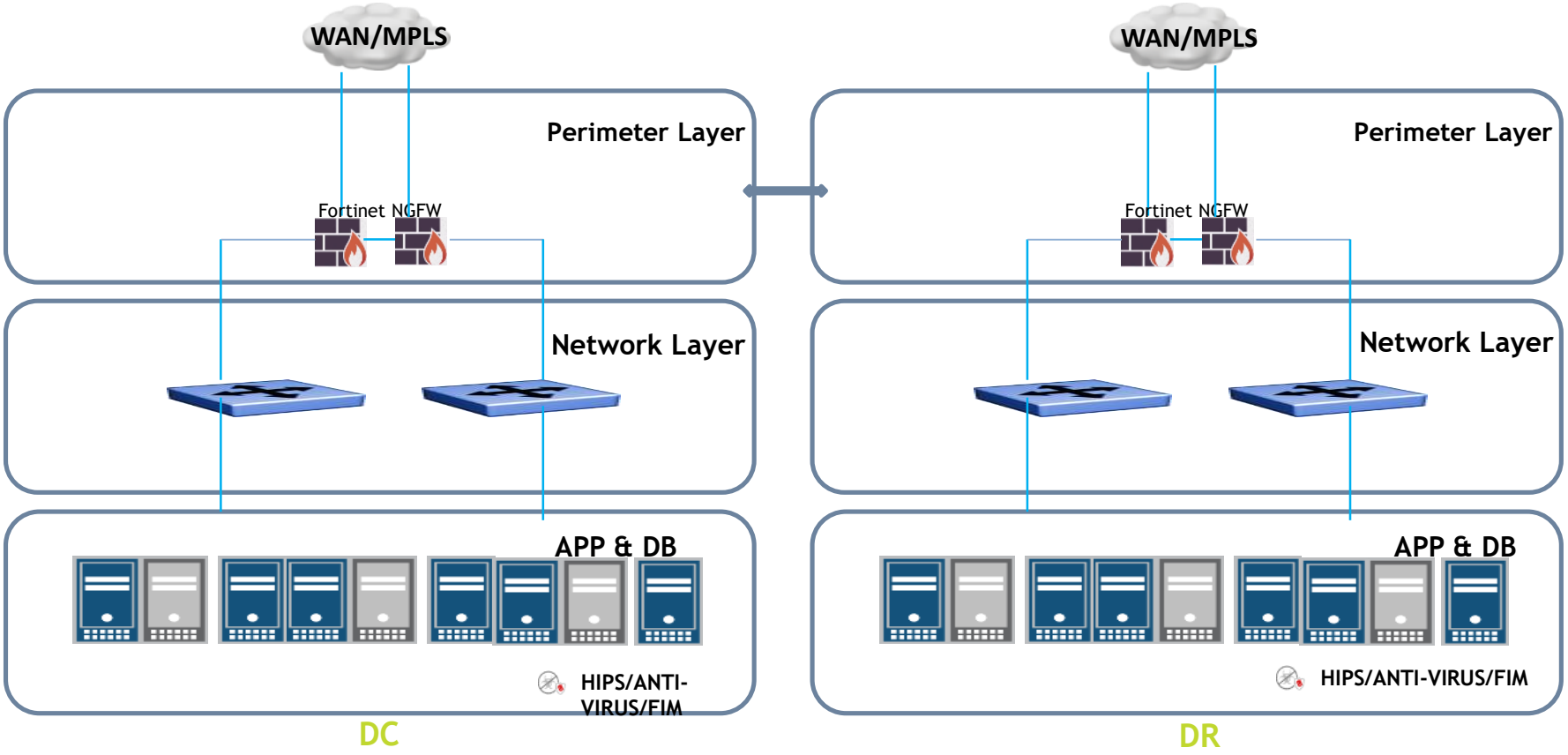
HIGH LEVEL PRIVATE CLOUD ARCHITECTURE



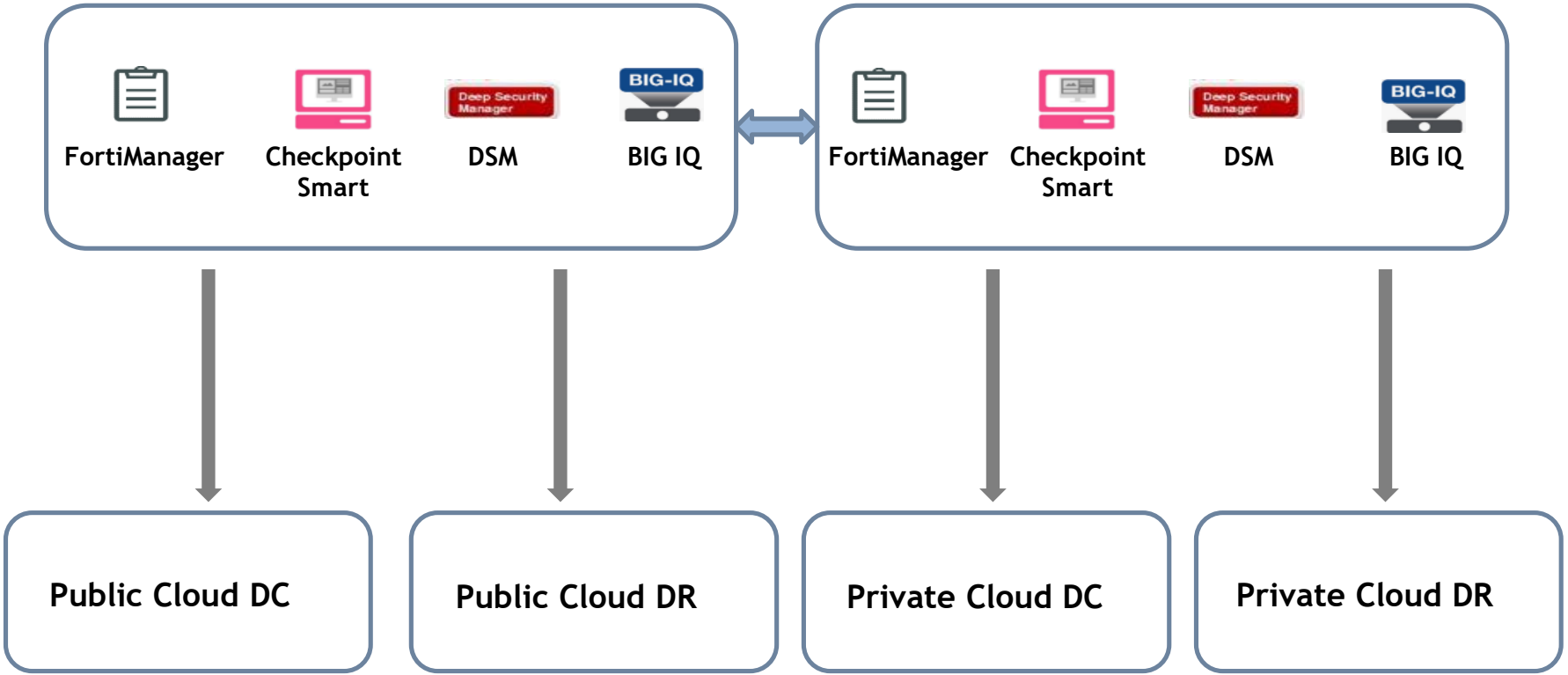
PROPOSED LOGICAL SECURITY ARCHITECTURE-PUBLIC CLOUD DC & DR



PROPOSED LOGICAL SECURITY ARCHITECTURE-PRIVATE CLOUD DC & DR



PROPOSED SECURITY MANAGEMENT LAYER



SOLUTION DESCRIPTION

NGFW

- Unified Threat intelligence sharing, policy definition and distribution across public and private clouds.
- Higher performance, Greater throughput
- Lowest latency across all firewall vendors
- Consistent security, receiving “Recommendation” rating in NSS labs NGFW Test from last 5 years
- Presence in Gartner Enterprise Firewall Leader Quadrant
- Complete network visibility across private and public cloud from single pane of glass
- Higher VPN performance, provides better user & application experience between private cloud to public cloud connectivity

WAF

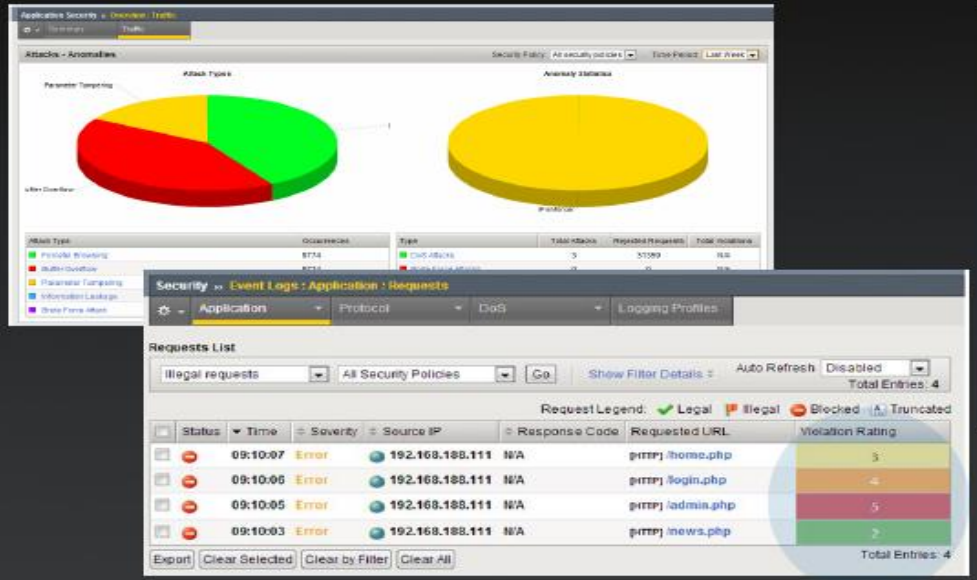
Application Security Not Addressed by Traditional Firewalls

BIG-IP ASM delivers comprehensive protection against critical web attacks

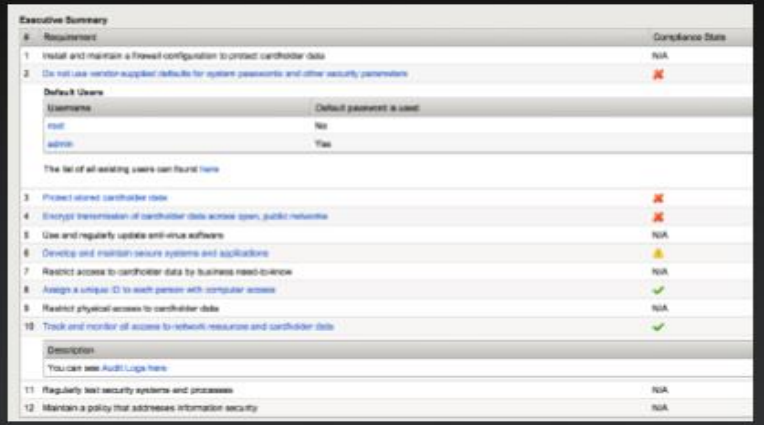
- CSRF
- OWASP top 10
- Forceful browsing
- Web scraping
- SQL injections
- Field manipulation
- Cross-site scripting
- Command injection
- Bots
- Cookie manipulation
- Brute force attacks
- Buffer overflows
- Parameter tampering
- Information leakage
- Session high jacking
- Zero-day attacks
- Malformed headers
- Business logic flaws

Detailed Logging, Actionable PCI Compliance Reports

Drill-down to URLs or Attack Categories



At-A-Glance PCI Compliance Reports



DDOS

Network DoS Protection

ATTACKS

- Server L2-L4 attacks
- SYN Flood
- UDP Flood

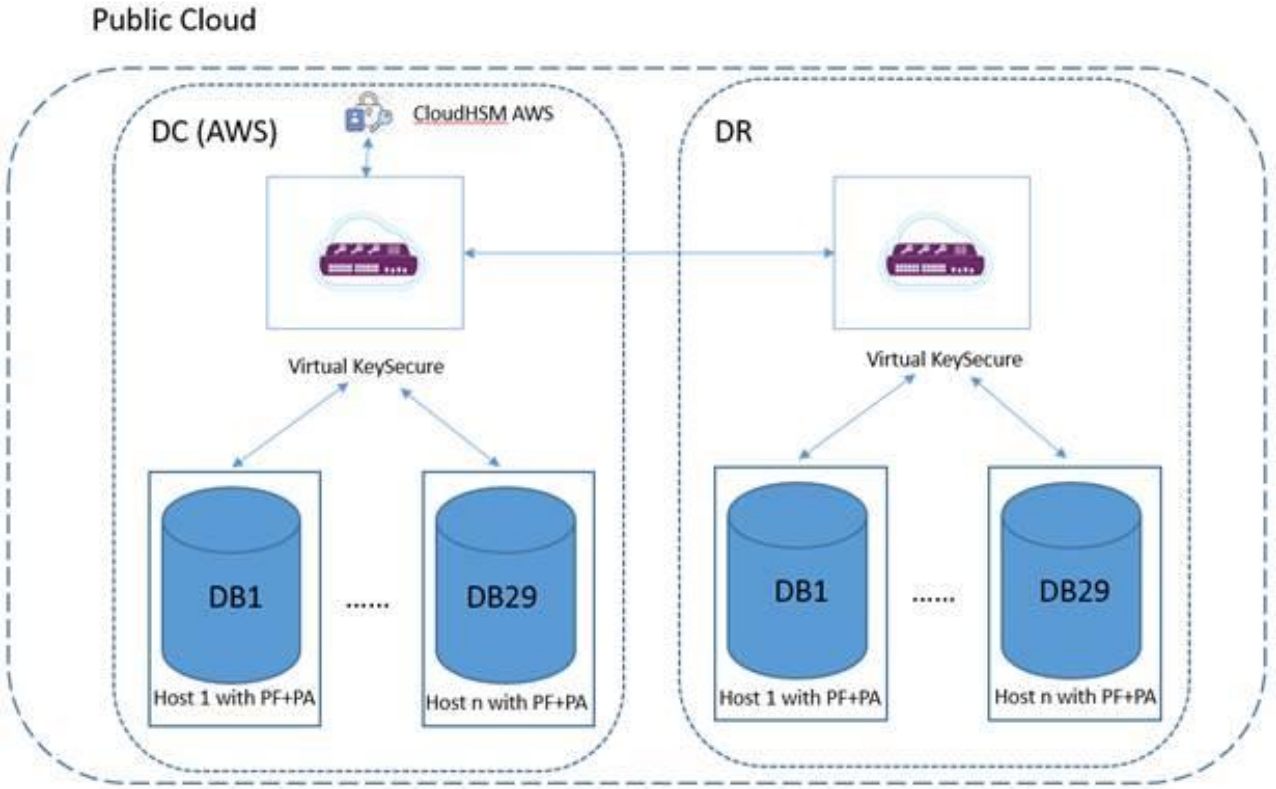
- ICMP Flood
- Fragment, LAND, Christmas Tree
- TCP Connection Flood

MITIGATIONS

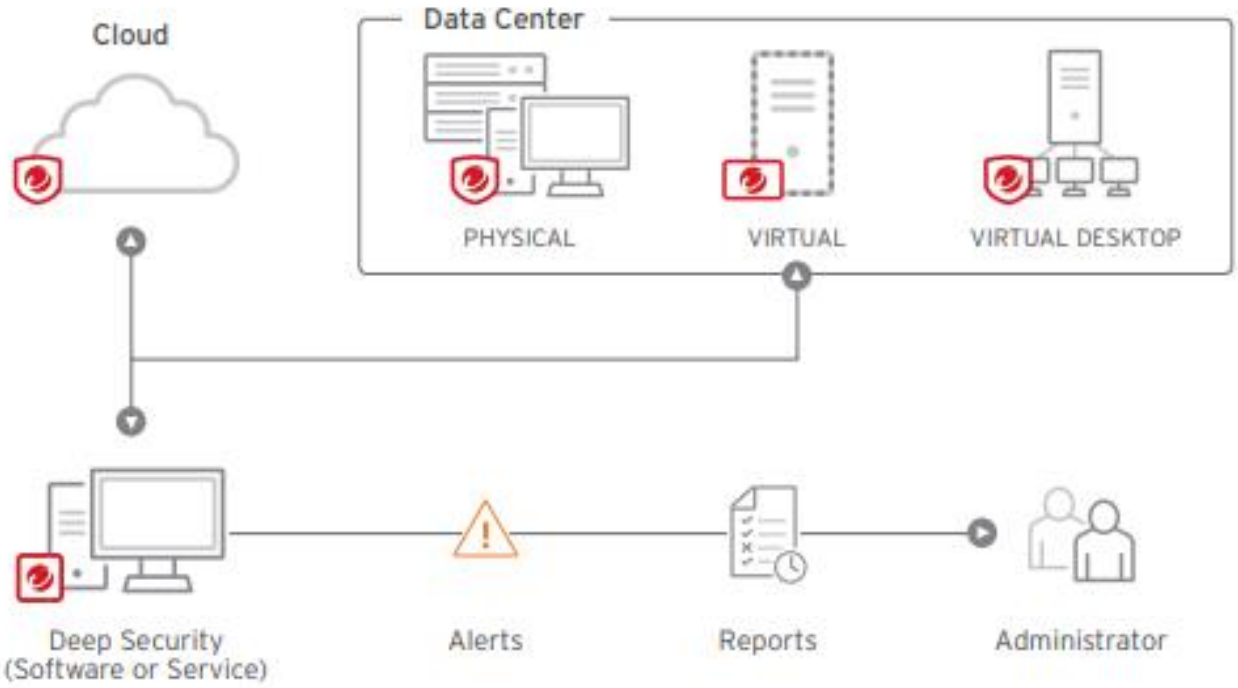
- Full-Proxy Virtual Servers
- Hardware (5K+)/Software SYN Cookie
- AFM Traffic Pattern Analysis
- Industry Leading Connection Capacity
- AFM Traffic Pattern Analysis
- DDoS Profile
- Industry Leading Connection Capacity
  - Virtual Edition = 3 Million
  - VIPRION 4480 = 144 Million
- Adaptive Reaping
- TCP Idle Timeouts
- Rate Shaping

Attack Type	Detection Status
Host Unreachable	Enabled
ICMP Fragment	Enabled
ICMPv4 flood	Enabled
ICMPv6 flood	Enabled
IP Fragment Flood	Enabled
IP Option Frames	Enabled
IPV6 Extended Header Frames	Enabled
IPV6 Fragment Flood	Enabled
IPv6 extension header too large	Enabled
IPv6 hop count <= <tunable>	Enabled
Option Present With Illegal Length	Enabled
Sweep	Enabled
TCP Bad URG	Enabled
TCP Option Overruns TCP Header	Enabled
TCP RST Flood	Enabled
TCP SYN ACK Flood	Enabled
TCP SYN Flood	Enabled
TCP SYN Oversize	Enabled
TCP Window Size	Enabled
TIDCMP	Enabled
TTL <= <tunable>	Enabled
Too Many Extended Headers	Enabled
UDP Flood	Enabled
Unknown TCP Option Type	Enabled

HSM

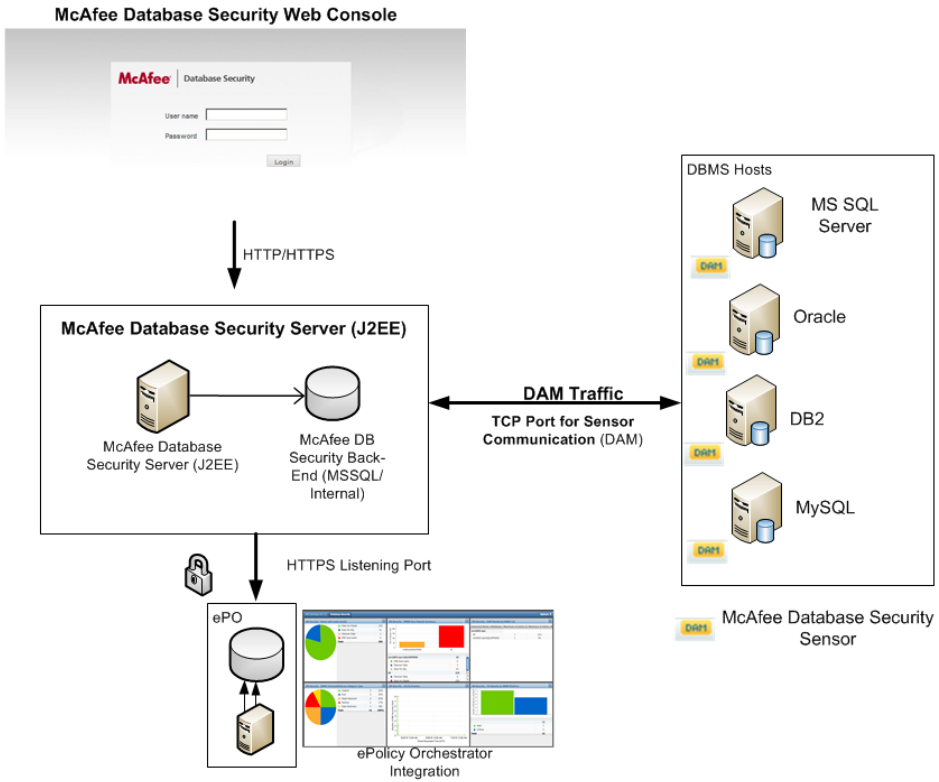

Public Cloud
DC (AWS)
CloudHSM AWS
DR
Virtual KeySecure
Virtual KeySecure
DB1
.....
DB29
Host 1 with PF+PA
Host n with PF+PA
DB1
.....
DB29
Host 1 with PF+PA
Host n with PF+PA

TREND MICRO DEEP SECURITY



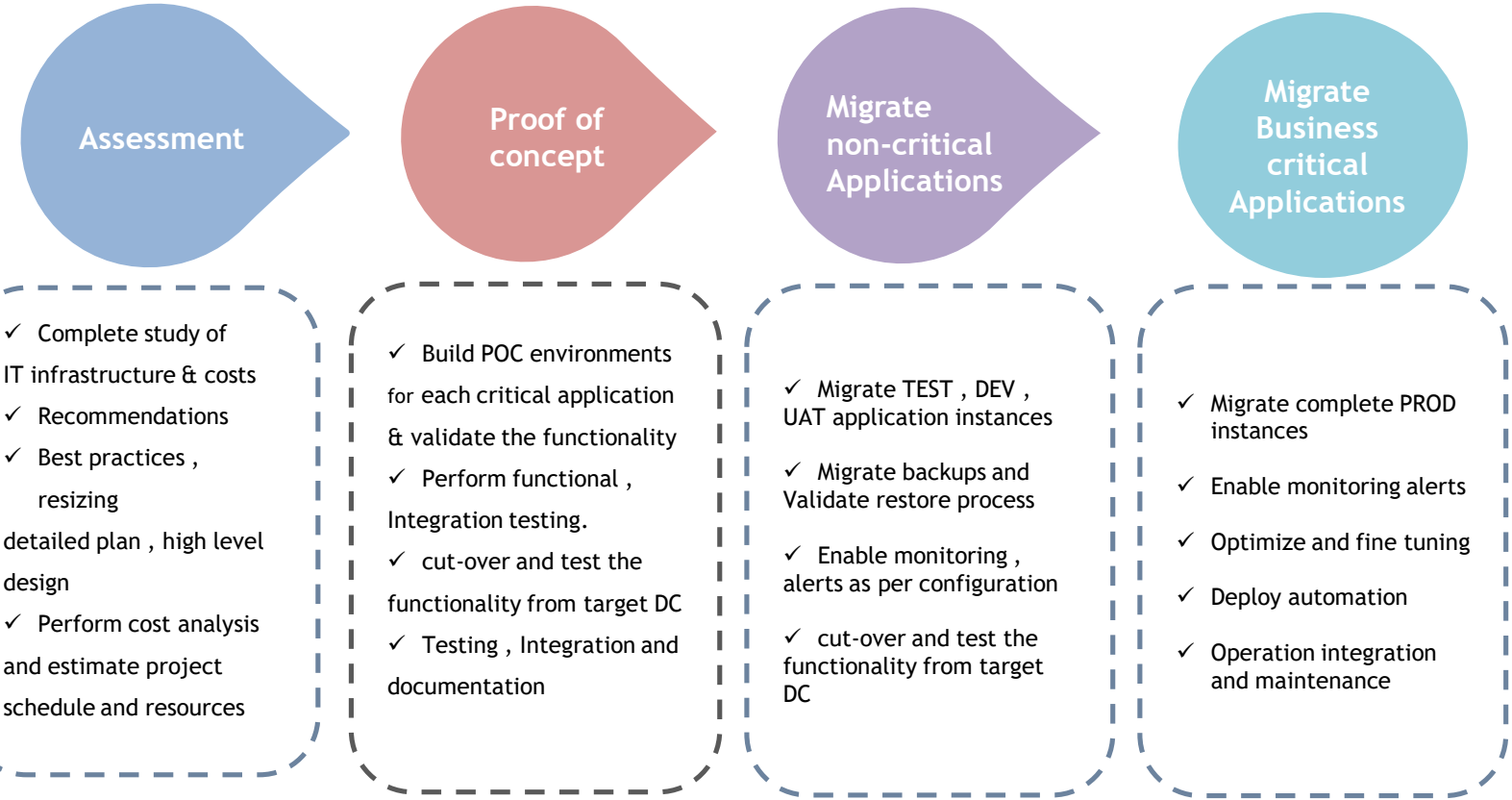
DAM

McAfee Database Security Detailed Architecture



Cloud migration approach

CUSTOMER DC TO CLOUD - MIGRATION APPROACH



MIGRATION PLAN

Conduct an AS-IS Infrastructure assessment

Estate Review (Server Hardware, Storage, Network, Backup & DR Infrastructure), Business requirements, Process Requirements, etc.

Conduct a thorough workload (IT Infrastructure, Applications, Databases) portfolio analysis

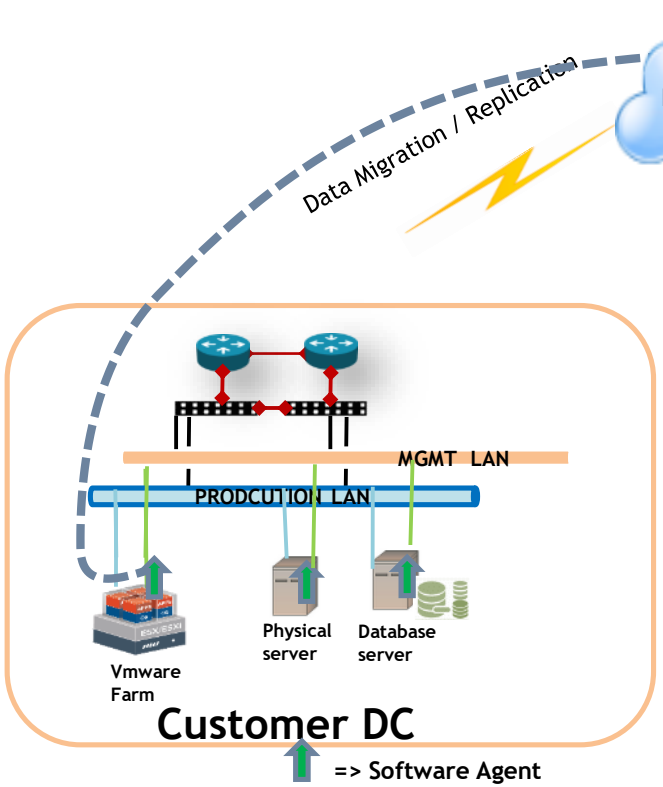
Compute, Network, Storage resource utilization, criticality, clustering solutions, platform dependency, backup strategy, Test / Dev / prod environment, etc.

Check for the dependencies on existing Infrastructure, Applications & Databases

Example: Mac address or HW dongle based licensing, IP addressing / VLAN dependency, Other application services dependency, etc.

Sequencing the migration, data migration, re-sync of data before cut-over, testing and hand-over to managed services team

AGENT BASED MIGRATION



Support matrix

- P2V , V2V
- Physical servers (limited to x86 only)
- Virtualization - Vmware , Hyperv
- OS - Windows , Linux , cent OS

Pre-requisites

- Software agents for each server OS
- Migration tool server at target
- Bandwidth for data migration

Key Highlights

- AS-IS migration of OS and applications along with data
- Ease of deployment
- Minimal switch over time

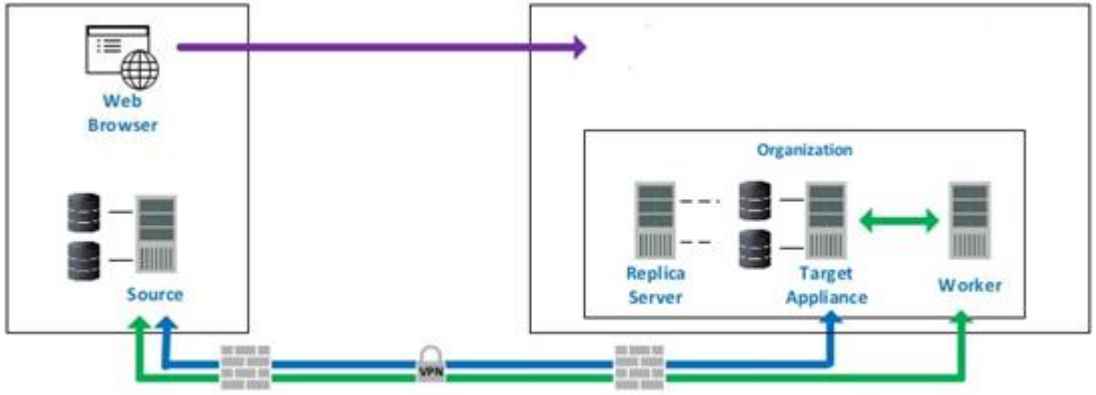
Methodology:

- Migration server communicates to the source server through software agents installed on OS.
- Initial Full data is migrated over WAN / IpsecVPN
- Incremental Data is then replicated to the multi-Cloud over IPSEC

MIGRATION STRATEGY

- Based on the shared inventory by UTI team, SIFY team will migrate the Instances from current location to SIFY cloud & AWS.
- SIFY will use CARBONITE MOVE tool for the on the on-time migration of onsite instances in to the AWS platform.
- Carbonite Move Powered by Doubletake quickly and easily migrates physical, virtual and cloud workloads over any distance with minimal risk and near-zero downtime.
- To avoid downtime and data loss, Carbonite Move replicates the source system to the primary target, using AES-256 encryption to pass the data over the wire
- Carbonite Move enables you to make new infrastructure choices without impacting system availability. With the power to migrate workloads to and from the cloud, between physical and virtual systems, and around the world, you're free from platform lock-in. And, Carbonite Move supports Windows file and folder migrations, as well as full Windows and Linux system migrations.
- The Carbonite Move solution can also streamline upgrades to Microsoft SQL Server. By maintaining a synchronous source and target, Carbonite Move enables you to cut over between two instances of your database with almost no downtime for end users

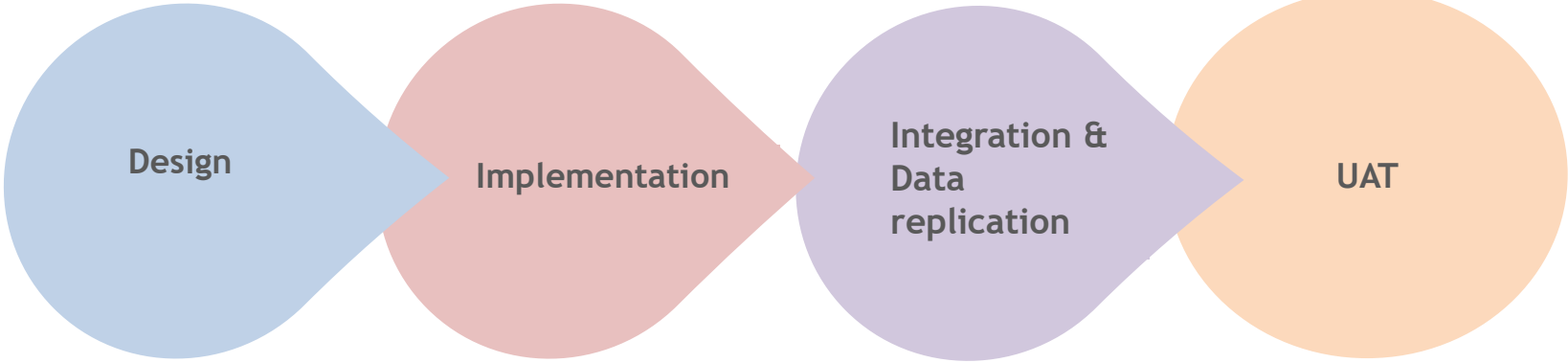
MIGRATION STRATEGY



Component to Component	Communication and Port	Arrow Color
Web Browser to Carbonite Recover	HTTPS port 443	
Source Server to Worker Target Appliance to Worker	HTTPS port 6326 HTTP port 5985 and HTPPS 5986	
Source Server to Target Appliance	Recover replication agent ports 6320 and 6325	

- Data replication between DC and DR always on secure port and encrypted
- All the DR operation infra system is associate at DR site
- DR target server will be paced into groups as per application and OS segregation
- Replication group will be into multiple streams

UTI DR APPROACH



- ✓ Study of IT infrastructure
- ✓ Recommendations
- ✓ Resizing & detailed plan
- ✓ Perform cost analysis
- ✓ Estimate project schedule and resources

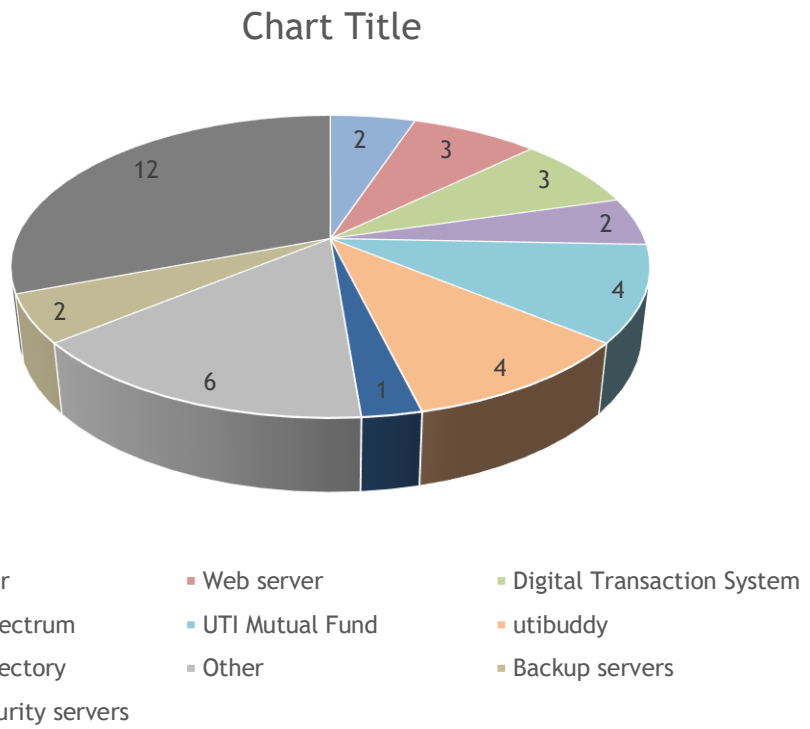
- ✓ Implement Network/Security for UTI DR environment
- ✓ Implement application and database Instance
- ✓ Implement and Configure storage/volumes for all identified Instances

- ✓ Integrate Sify DR with initial data copy from AWS
- ✓ Enablement of data replication for all protected Instances
- ✓ Creation and enablement of application grouping

- ✓ Identify application for UAT
- ✓ Sify shall work with UTI team for UAT testing
- ✓ Perform functional , Integration testing.
- ✓ Cut-over & test functionality from target DC

PUBLIC CLOUD DR – APPLICATIONS FACTORED WITH SIZING

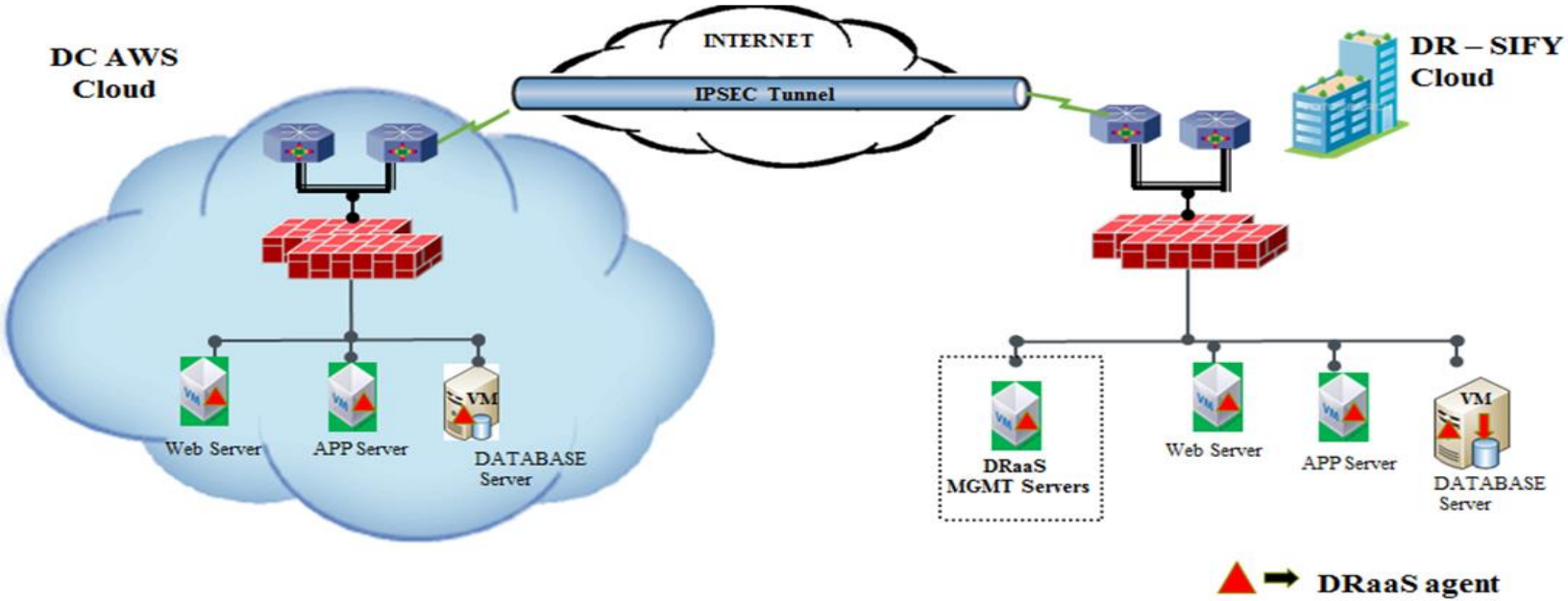
PMS Server	2
Web server	3
Digital Transaction System	3
Wealth spectrum	2
UTI Mutual Fund	4
utibuddy	4
Active Directory	1
Other	6
Backup servers	2
Other security servers	12



VCPU	199
Memory	669
Storage	17861

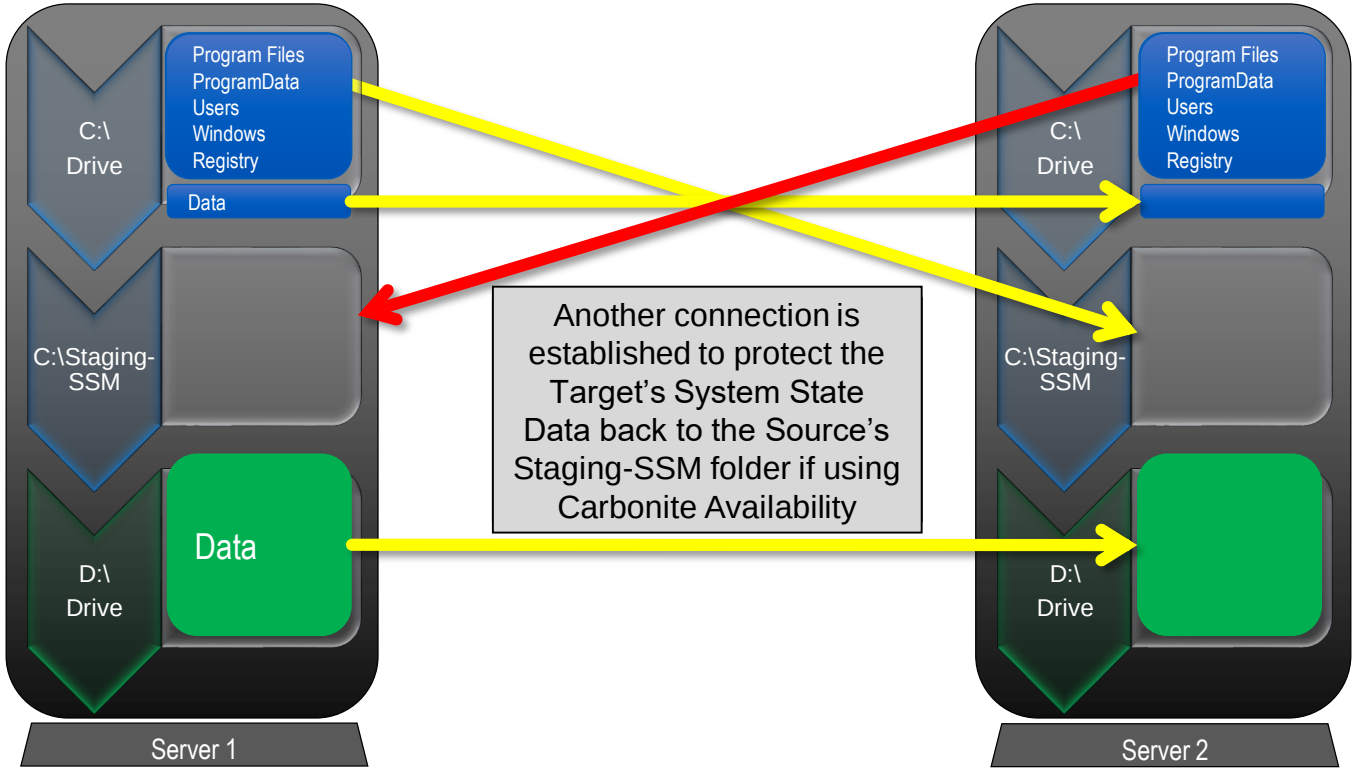
REPLICATION STRATEGY

Architecture Overview



An **3-tier environment (web , app and DB)** was setup in AWS- Mumbai region replicating to Sify Cloud in Rabale, Navi Mumbai. The connectivity between these locations was established and tested separately, using Route 53.

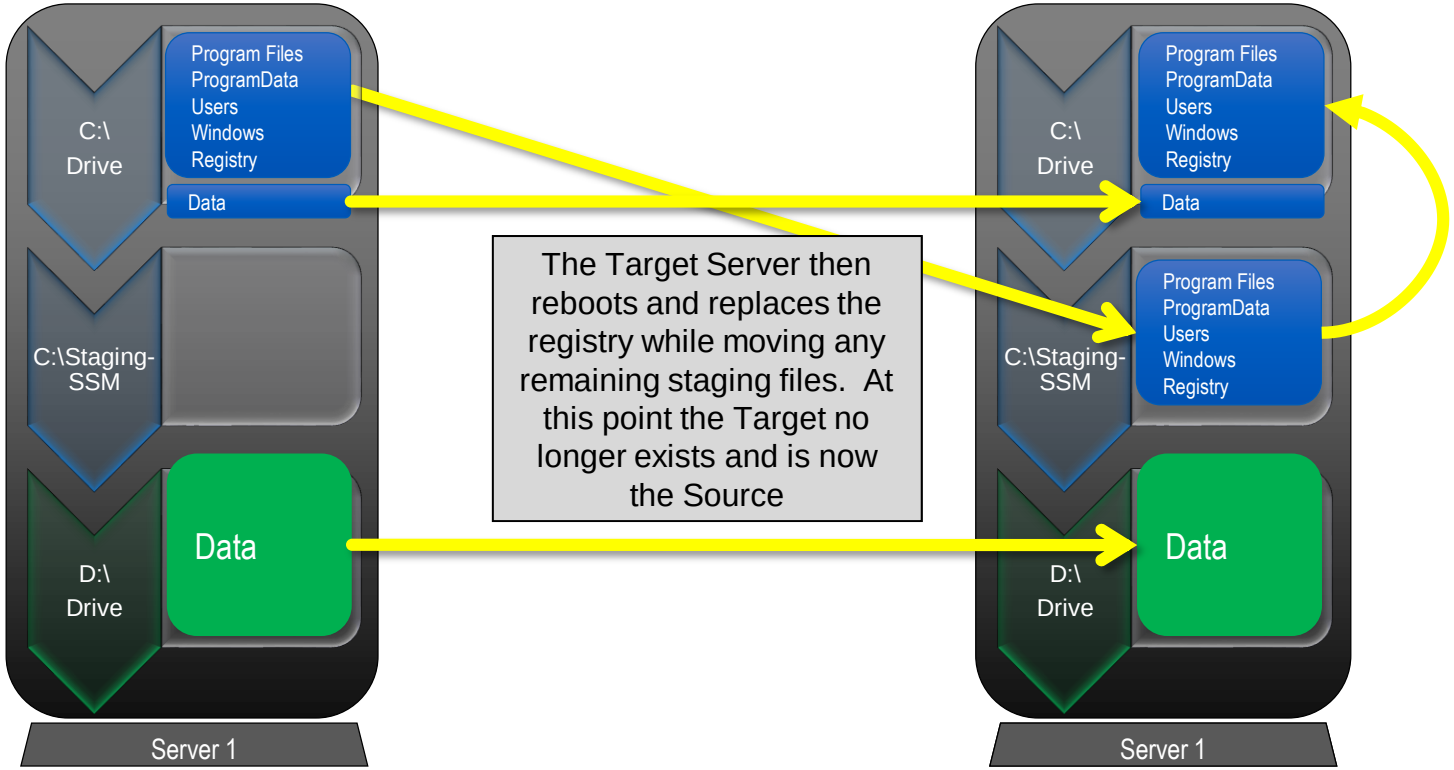
WINDOWS: HOW DOES FULL SERVER WORK



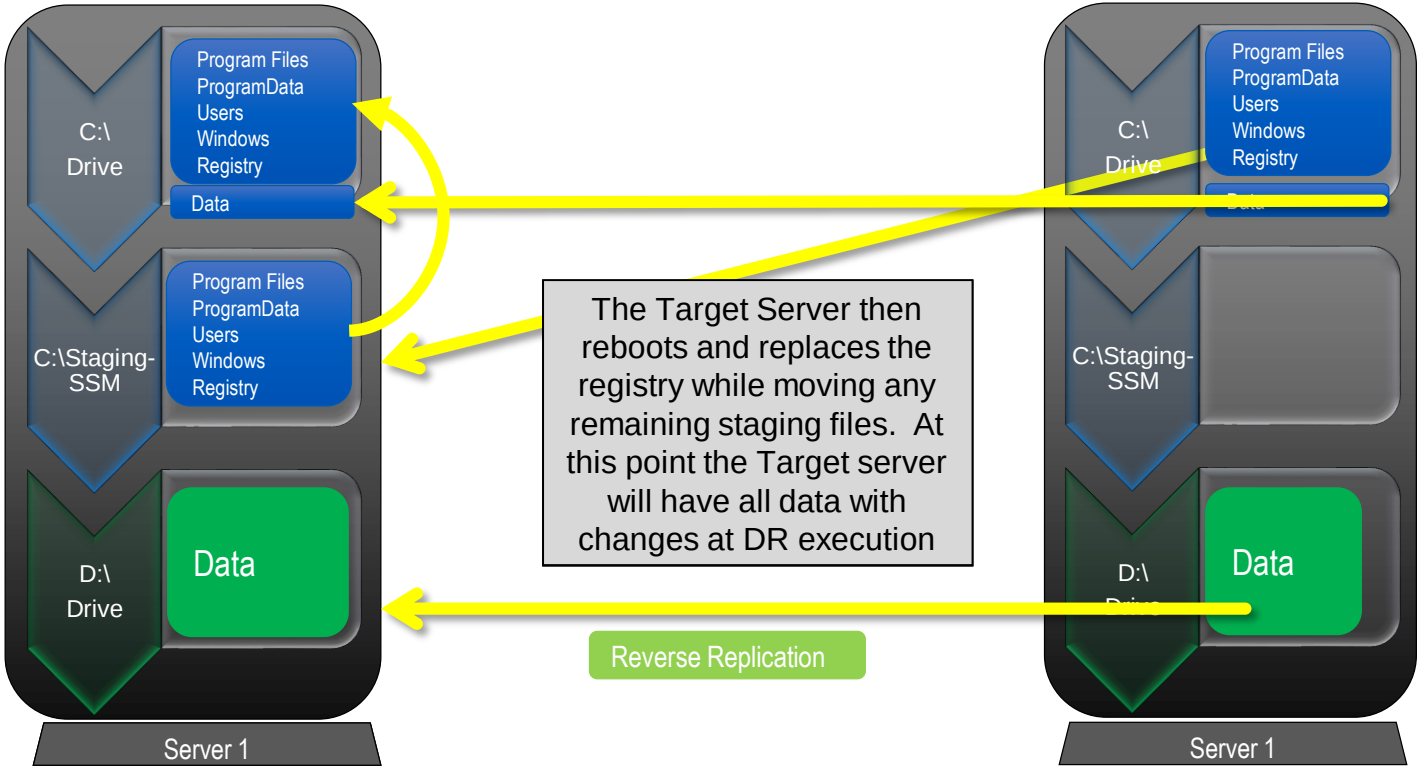
Pre-Requisites

- Size of the system state @ both DC and DR
- Both OS version are identical
- Data drive size is sized as per actual data size

WINDOWS: HOW DOES FULL SERVER FAILOVER/CUTOVER



WINDOWS: HOW DOES FULL SERVER FAILBACK WORK

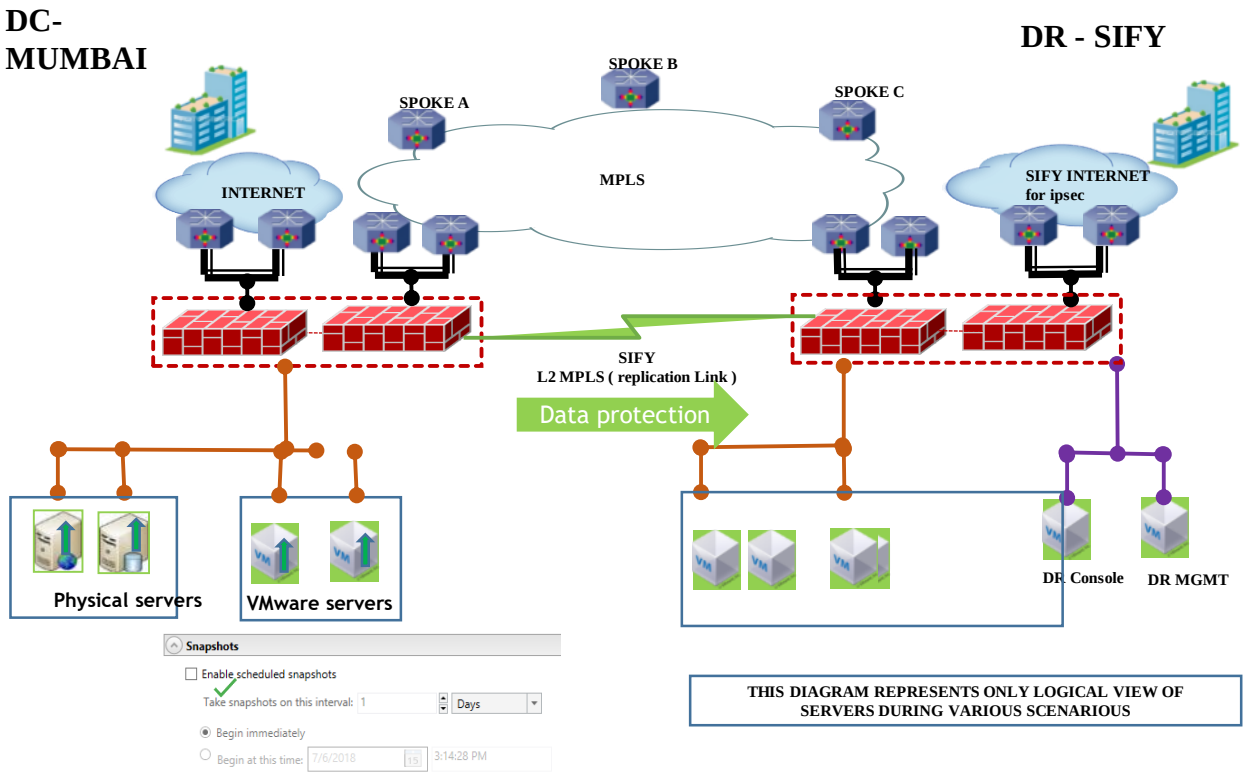


Note :

Based on the number of days to retention data at the DR and the rate of data change , the storage size of the staging SSM has to be factored at DC end.

For Example :
If the data retention is for 7 days with rate of data change 50 GB per day for the VM , we need to factor 350 GB at source server.

DATA PROTECTION FROM DC TO DR



Work Flow :

- DR agent installed on each guest OS at DC will constantly communicate with DR console server at DR site
- Initial Full data is migrated to the external storage and shipped to Sify DC and VMs are imported from Sify Cloud (VPE)
- Incremental Data is then replicated over WAN through DR tool

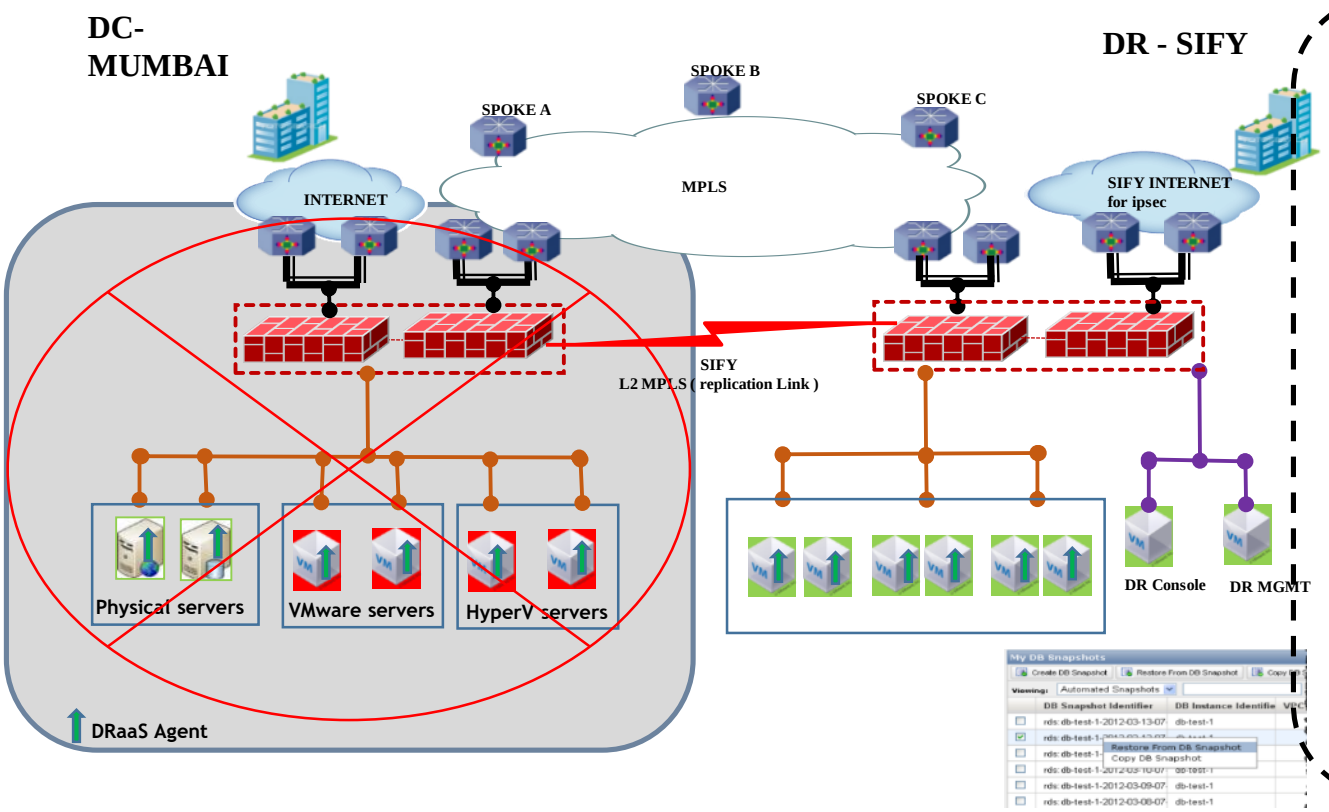
Pre-requisites:

- DR agents at DC site,
- DR Console server at DR site
- Replication link as per data rate of change.

Key Highlights

- Easy to deploy by installing a simple DR agent on OS
- System state of source servers will be continuously replicated to target VM
- Applicable for all x86 servers (physical or Virtual)

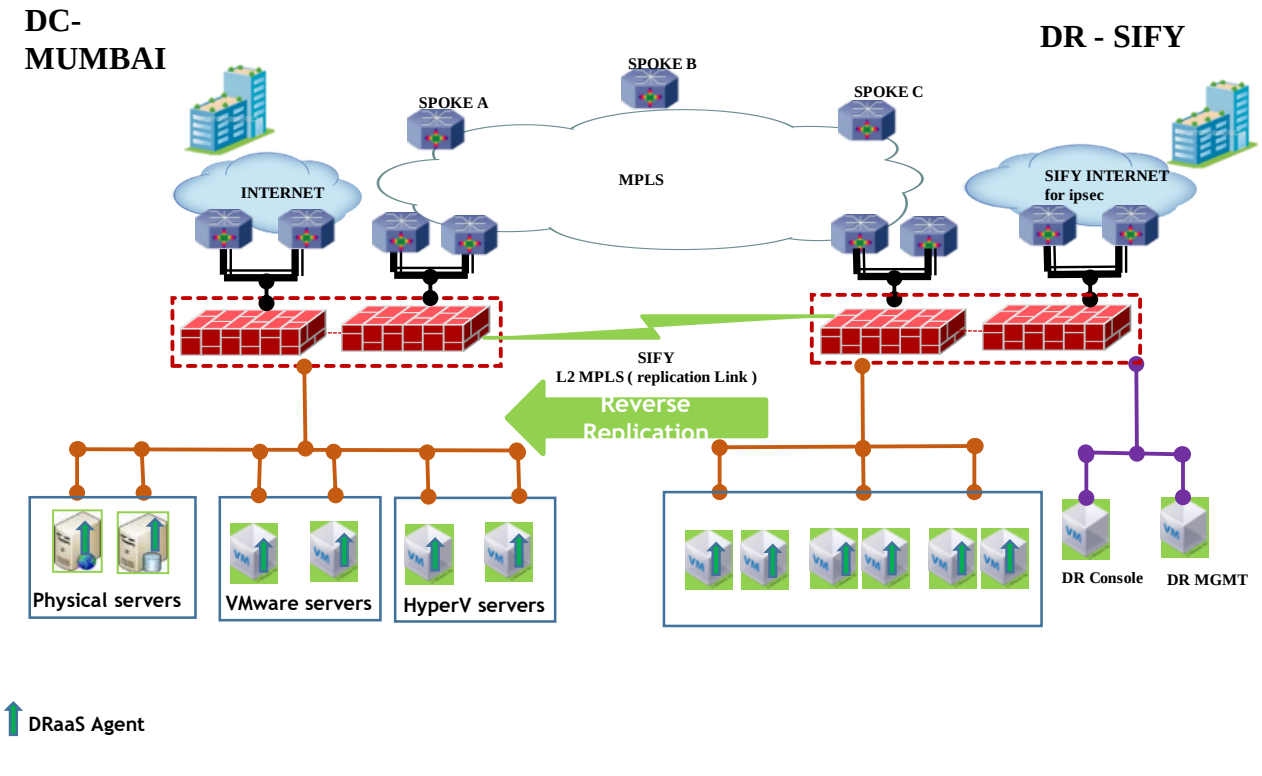
FAIL OVER FROM DC TO DR



Work Flow :

- During the failover or during the DR drill , the source will be powered off by DR tool and the replication will be broken.
- The DR tool will automatically overwrite the system state of source server through the failover process.
- In case of snapshot configured , we can restore the VM from the previous snapshot.
- The specifications like Ip segments , server name , compute can be pre configured in the DR console and automatically brought up during the VM startup process.
- Sanity health check will be performed by Sify technical support and VM will be handed over within agreed RTO.

REVERSE REPLICATION FROM DR TO DC

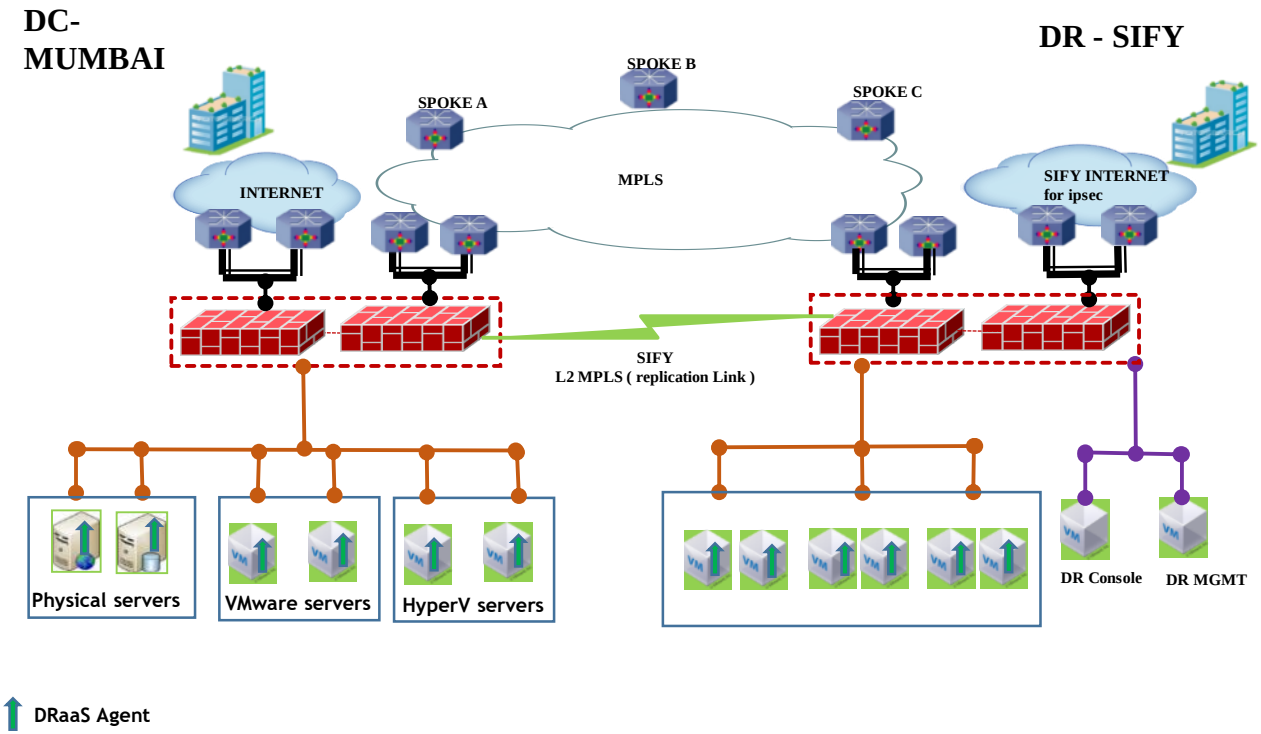


Work Flow :

- Once the primary site is up or DR drill is completed , the reverse replication process will get started.
- Through DR tool , data replication will be initiated between the servers at DR and DC.
- DR tool validates the data availability and copies only the delta changes from DC to DR.

Note : Both DC and DR has got the agents installed during the reverse replication.

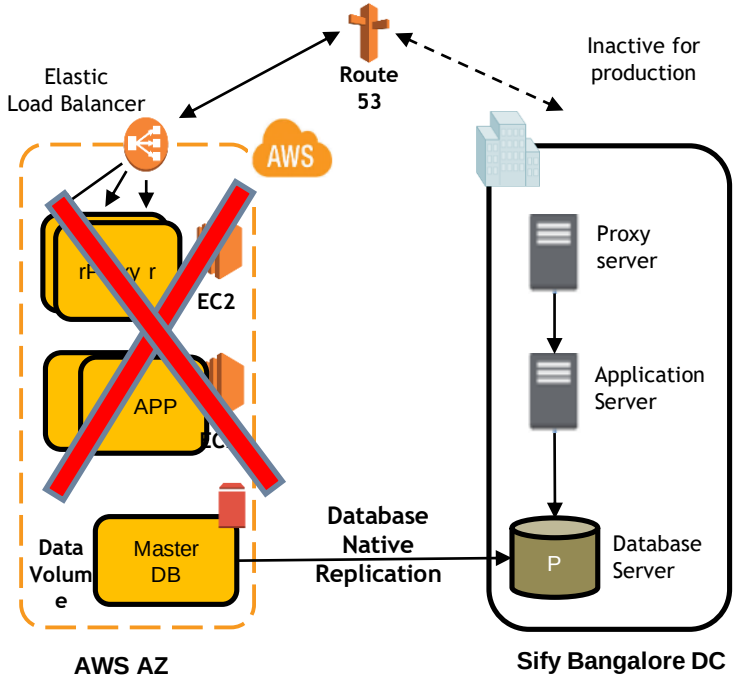
FAIL BACK FROM DR TO DC



Work Flow :

- Once the reverse replication is completed and the complete data has been migrated from DR to DC , we initiate the failback process.
- During the failback , we break the replication through the DR tool
- Servers at DR will be shut down automatically once the replication is broken.
- Finally we initiate the failover so that the data will be replicated from DC to DR as it was originally done.

AWS DC & SIFY DR DATA REPLICATION ARCHITECTURE



Scaled down stand-by DR

Scale up for production use

Pre-requisites

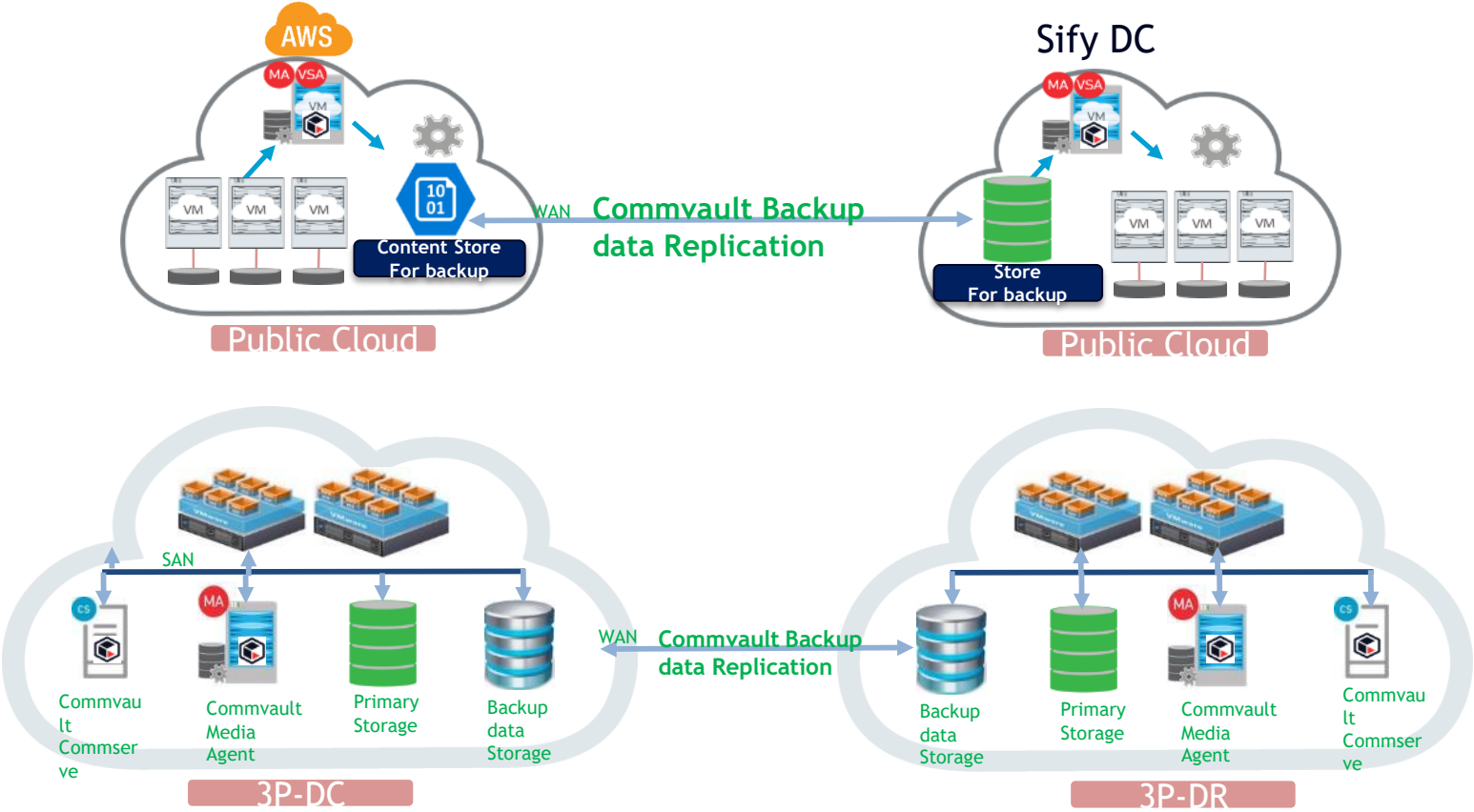
1. Carbonite agents in the primary site
2. Carbonite console server in DR site
3. Carbonite management server in DR site

Work Flow

1. Carbonite agent is installed at each of source servers.
2. The agent communicates to the Carbonite Console server
3. Data is replicated to the DR site from primary to DR
4. During the fail over , final sync is performed by the Carbonite console server and VM at the DR site is brought up.
5. During fail back , the data is replicated back to primary site (reverse replication.

BACKUP METHODOLOGY

SOLUTION ARCHITECTURE FOR 3P-DC & PUBLIC DC



COMMVAULT BACKUP DATA STORAGE (D2D) SIZING

Type of Backup	Retention on Disk in Weeks
Daily Incremental Backup	4 Weeks
Weekly Backup FULL	4 Weeks
Monthly FULL	1 Year
Yearly Backup	10 Year

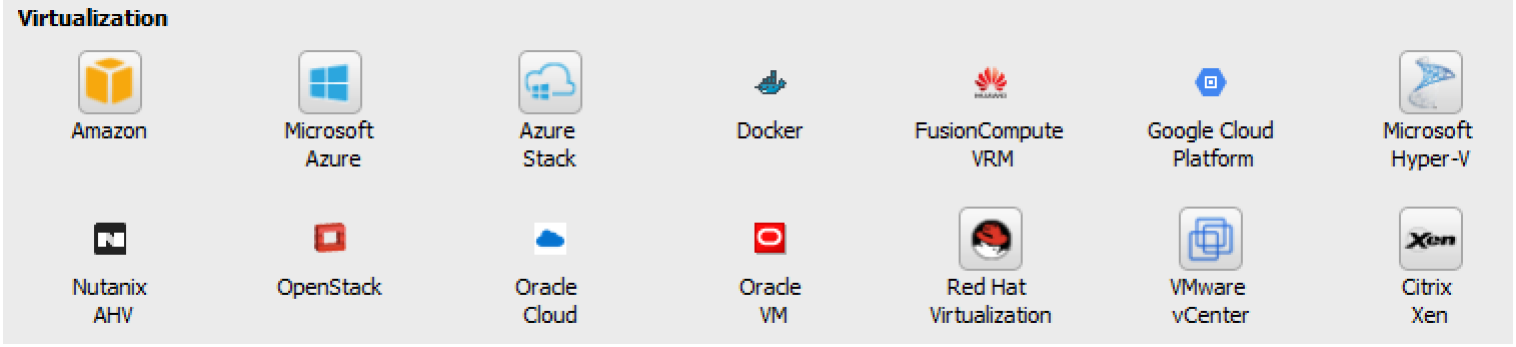
S/N	DC Location	Total No. of VM's	Total Front End Data (TB)	D2D Size (TB) Usable
1	Public Cloud Primary	55	57	97
2	Public Cloud DR	25	14	17
3	3P-DC	16	9.28	14
4	3P-DR	10	7.5	12

AGENTLESS HYPERVISOR SUPPORT

- Private
- VMware
- Microsoft Hyper-V
- Nutanix AHV
- OpenStack
- Oracle VM

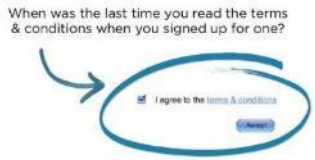
- Red Hat Enterprise Virtualization
- Citrix Xen
- Huawei

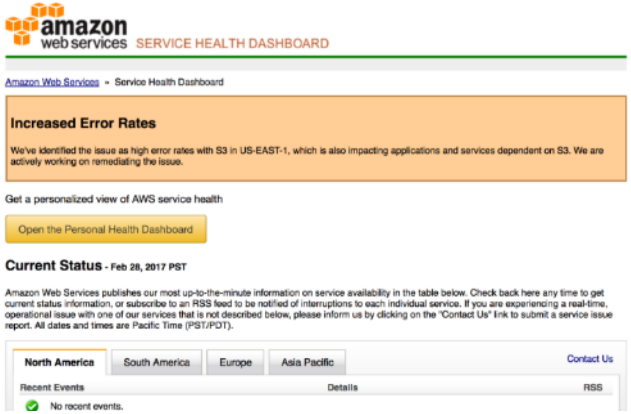
- Public
- Amazon
- Microsoft Azure
- Oracle Cloud
- Google Cloud Platform
- VMware on AWS

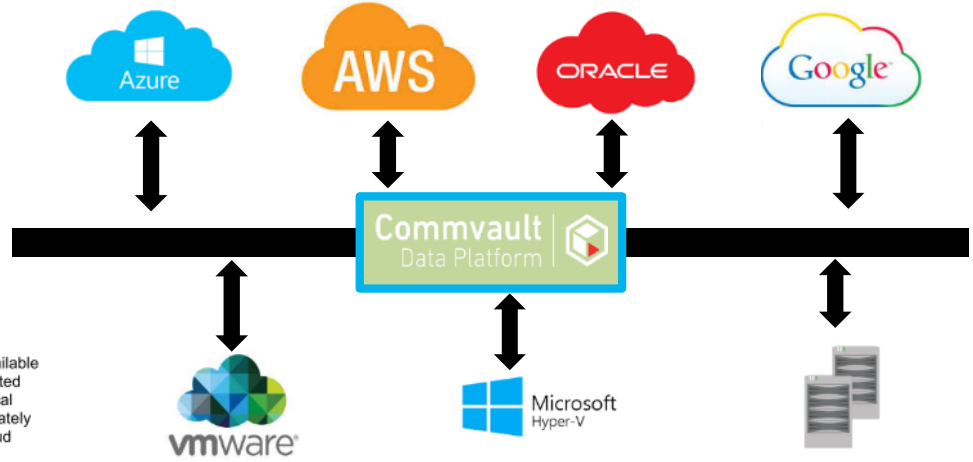


DATA PORTABILITY

Quote from a big pharma prospect: *"So you want my cloud vendor to host my **production as well as backup data**?"*



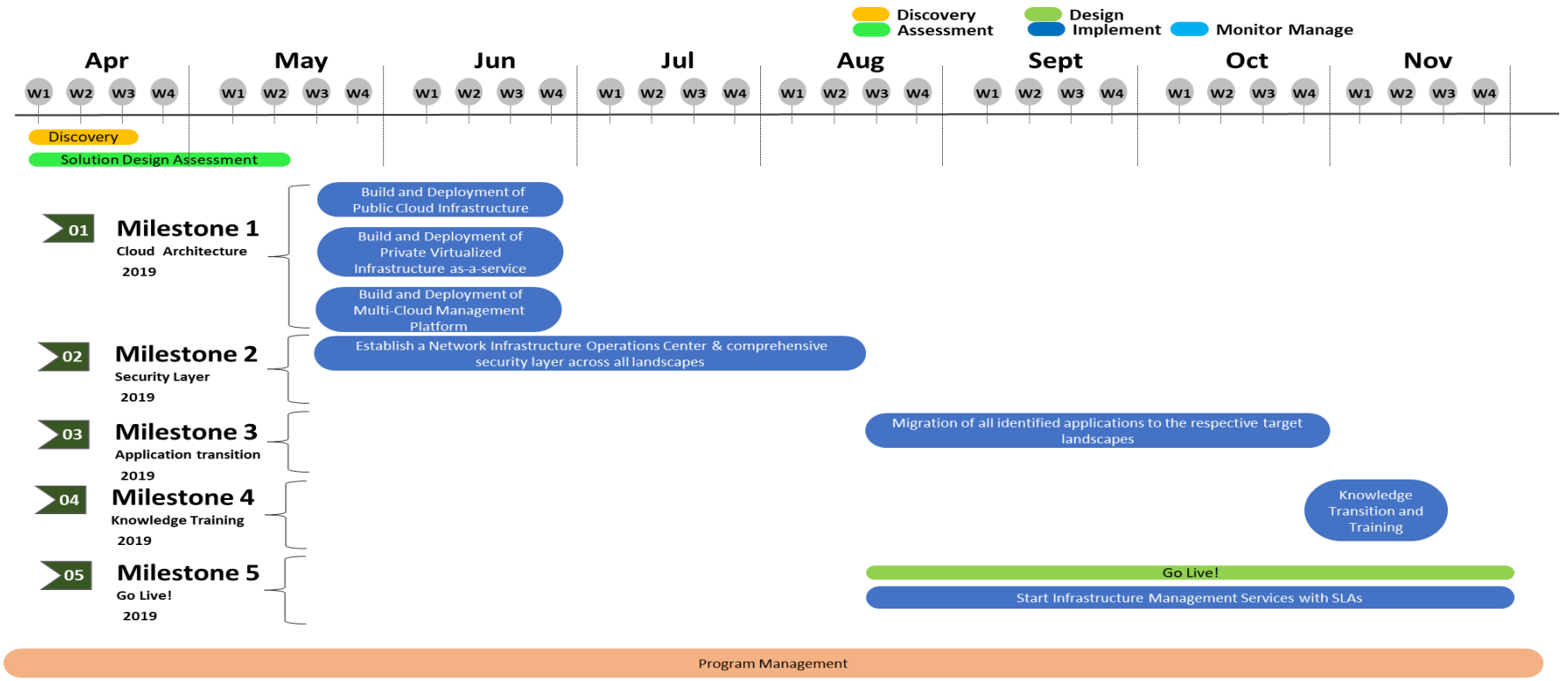




Oracle reserves specific maintenance periods for changes that may require the Cloud Service to be unavailable during the maintenance period. Oracle works to ensure that change management procedures are conducted during scheduled maintenance windows, while taking into consideration low traffic periods and geographical requirements. The typical scheduled maintenance period is once a month on Friday, initiating at approximately 20:00 data center local time, lasting around 10 hours. There are exceptions to this schedule for some Cloud services; further documentation is available on My Oracle Support in Knowledge Article 1681146.1: https://support.oracle.com/epmos/faces/DocumentDisplay?id=1681146.1.

Control your own data, don't let the cloud vendor control your data and your business

IMPLEMETATION METHODOLOGY & PROJECT PLAN

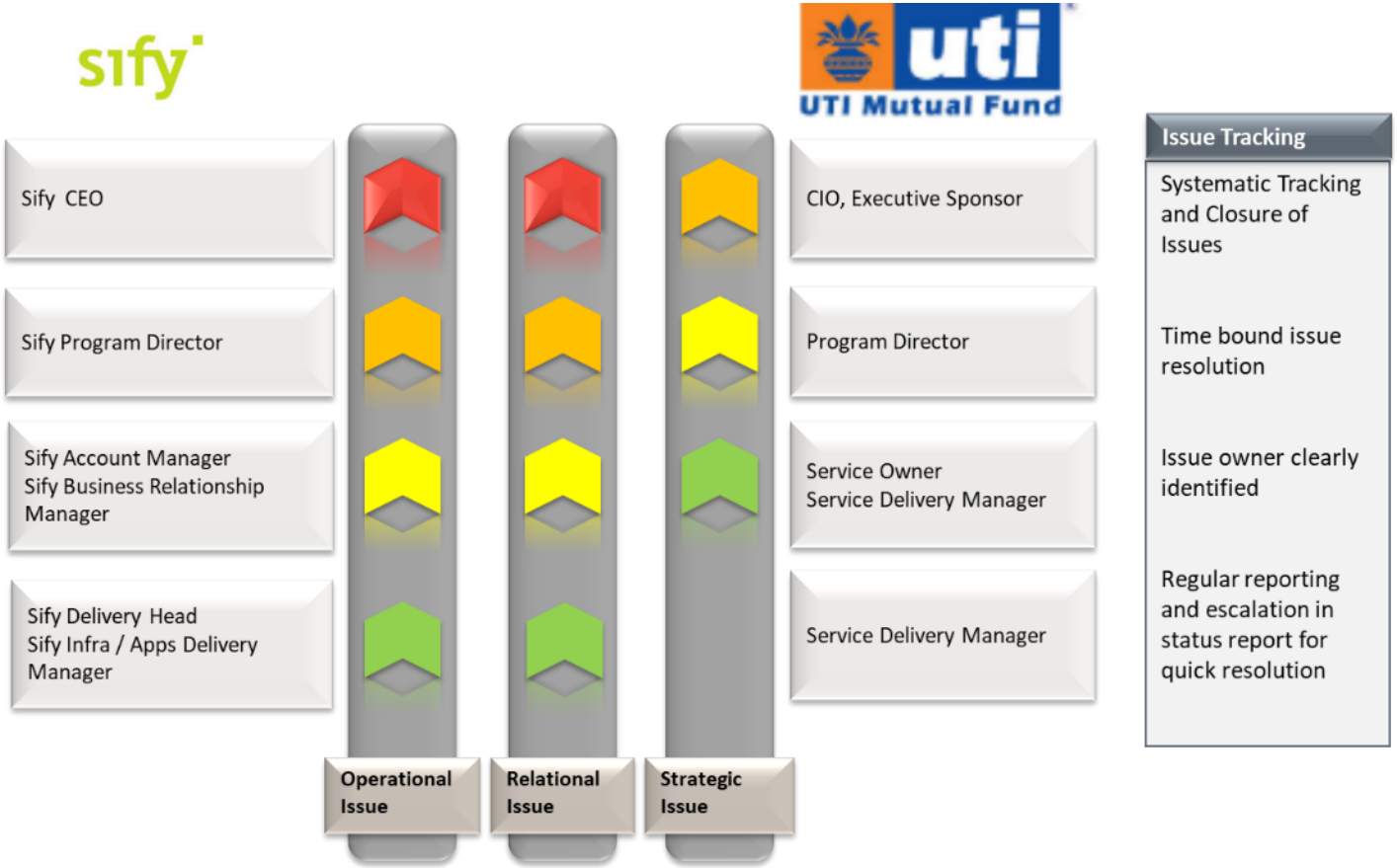

Discovery
Assessment
Design
Implement
Monitor Manage
Apr
May
Jun
Jul
Aug
Sept
Oct
Nov
W1 W2 W3 W4
Discovery
Solution Design Assessment
01
Milestone 1
Cloud Architecture
2019
Build and Deployment of Public Cloud Infrastructure
Build and Deployment of Private Virtualized Infrastructure as-a-service
Build and Deployment of Multi-Cloud Management Platform
02
Milestone 2
Security Layer
2019
Establish a Network Infrastructure Operations Center & comprehensive security layer across all landscapes
03
Milestone 3
Application transition
2019
Migration of all identified applications to the respective target landscapes
04
Milestone 4
Knowledge Training
2019
Knowledge Transition and Training
05
Milestone 5
Go Live!
2019
Go Live!
Start Infrastructure Management Services with SLAs
Program Management

PROJECT GOVERNANCE

GOVERNANCE ORGANIZATION

ESCALATION MATRIX

ESCALATION MATRIX



EXPECTATION FROM UTI

EXPECTATION FROM UTI

A dedicated project team from UTI AMC's side is a must to ensure that we collectively meet the end goal.

Critical Tasks / Dependencies

Task	Duration
Provide input to the detailed requirements definition	Within 3 days
Provide input, feedback and approval for the acceptance test process.	Within 5 days
Approval of Design by UTI AMC	Within 7 days

ITSM & Monitoring Tool

OUR TOOLS AND AUTOMATION CAPABILITIES

UNIFIED MONITORING OF PUBLIC AND PRIVATE IT ENVIRONMENTS

FEATURES

- Multitenancy
- Dashboard & Reports
- Distributed Architecture
- Unified Trending
- Visual Alarms & Reporting
- Email Alerting
- 3rd Party Integration (Service Now for ITSM)
- Agent and Agent less Monitoring
- UMP (Portal) available via Mobile

Dashboards and Reporting

Service Levels

End User Response Time

Performance and Availability

Events and Faults

WHAT CAN WE MONITOR

- Application Monitoring
- Server Monitoring
- Cloud Monitoring
- Virtualization Monitoring
- Database Monitoring
- Storage Monitoring.
- Data Center Monitoring
- Main Frame Monitoring
- Response Time Monitoring
- Big Data Monitoring
- Basic Network Monitoring

Power
Efficiency

Network
LAN & WAN

Server
Physical & Virtual

Database
IT & Business

Application
Commercial & Custom

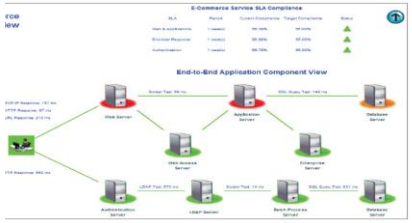
Cloud
Public & Private

WHY CA TOOLS

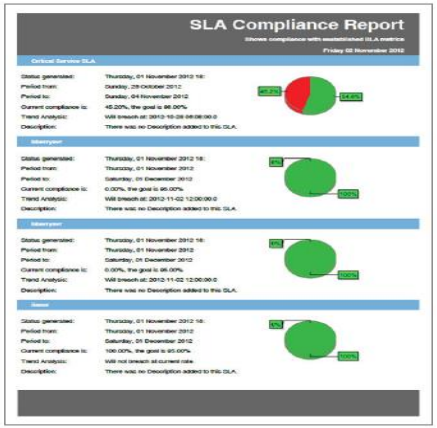
- Unified view of all services
- Proven and Matured Player for Delivering on Managed Services Platform
- Expand to other Infrastructure Devices and Applications
- Enables from moving from Reactive support to Proactive
- Industry Standard Proven Tool for Large customer base and Deployments
- Excellence in Monitoring and Management – Scalable, Robust, and Ease of Mgmt.
- Improved Visibility - Reducing MTTR (Mean Time To Resolve)
- Better Integration among across various industry recognized tools
- Plug and Play with custom probes to monitor certain features
- Enables Pay-As-You-Go Model

Unified view of IT

Pinpoint issues in IT



SLA Dashboard

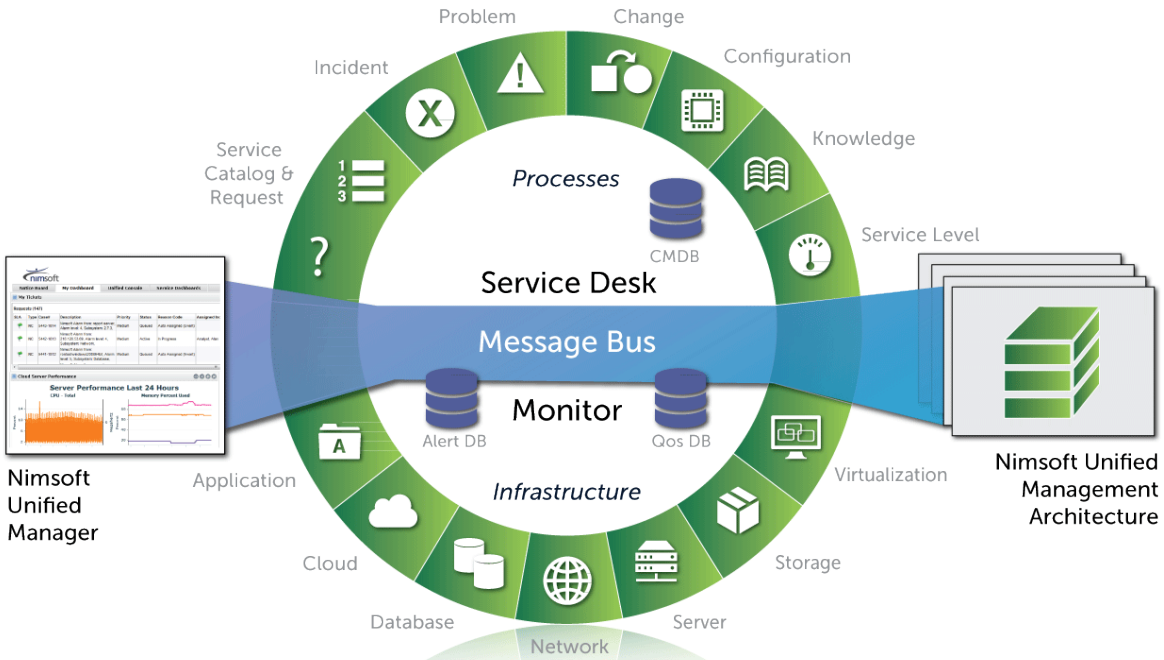


Dashboard of Service Availability

SERVICE NOW ITSM TOOL INTEGRATION WITH CA UNIFIED INFRASTRUCTURE MGMT.

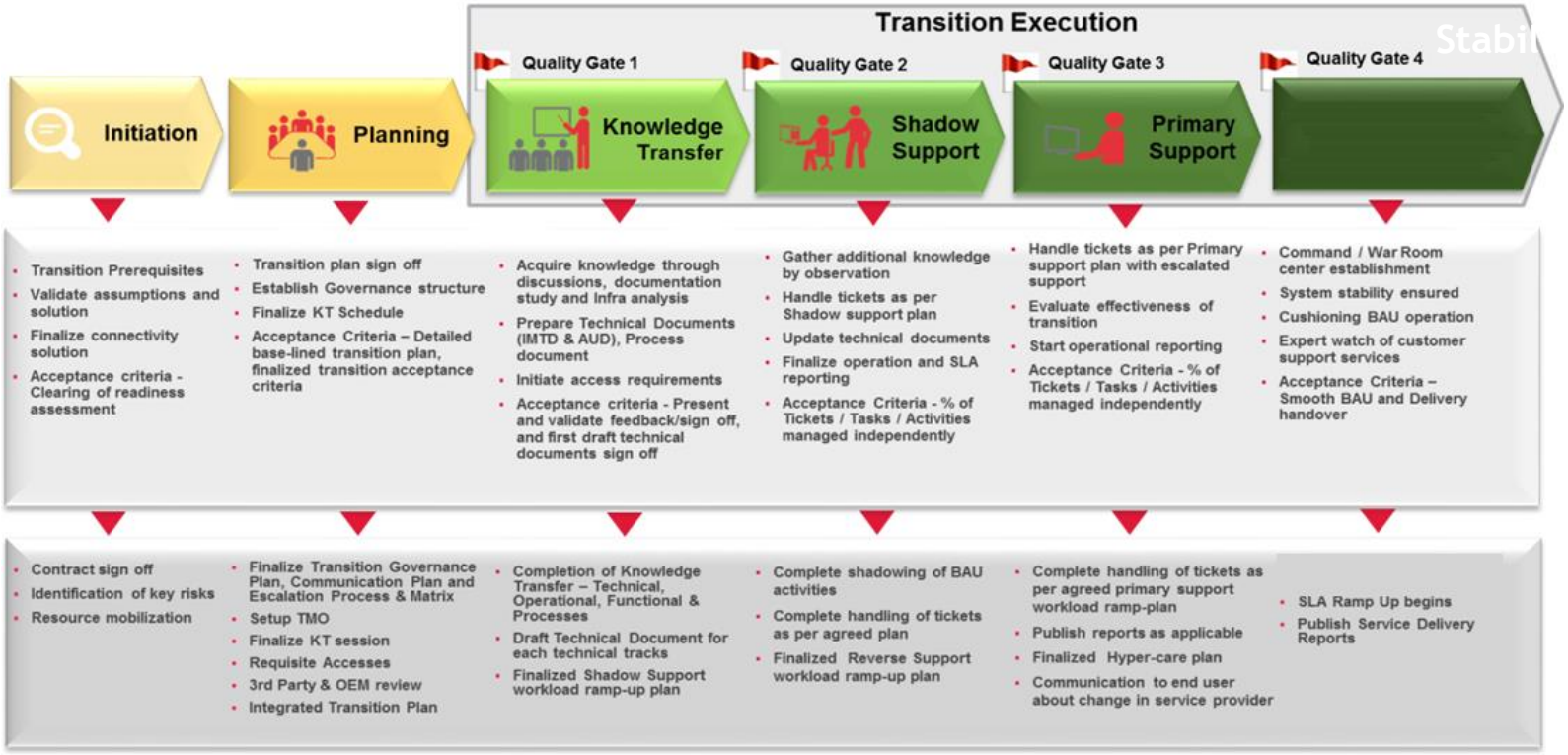
sify

Bridging the gap between Business and IT



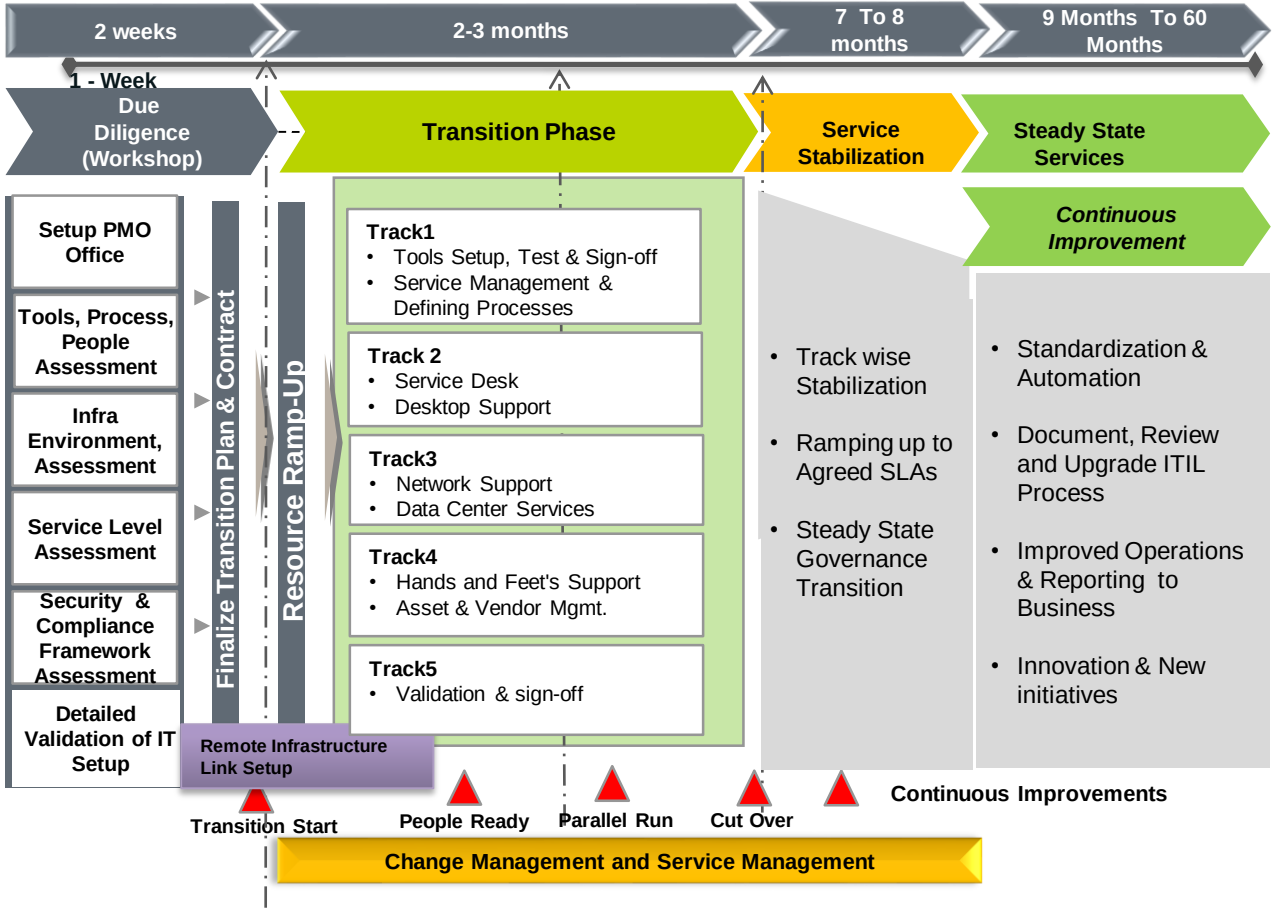
TRANSITION

TRANSITION METHODOLOGY



TRANSITION ROADMAP

- Identify the complexity
- Load Program manager
- Parallel Off-shore team readiness
- Named Lead Resources travelling to on-site for KT
- Validate available doc's
- Prepare SOP, Process & Procedure Doc's
- Take over the (Specific) primary support role after 45 to 60 days
- Stabilize the services
- Providing standard reports
- After the stabilization phase mutually agree on the standard SLA's
- Continues Service Improvement



SERVICE DELIVERY MODEL

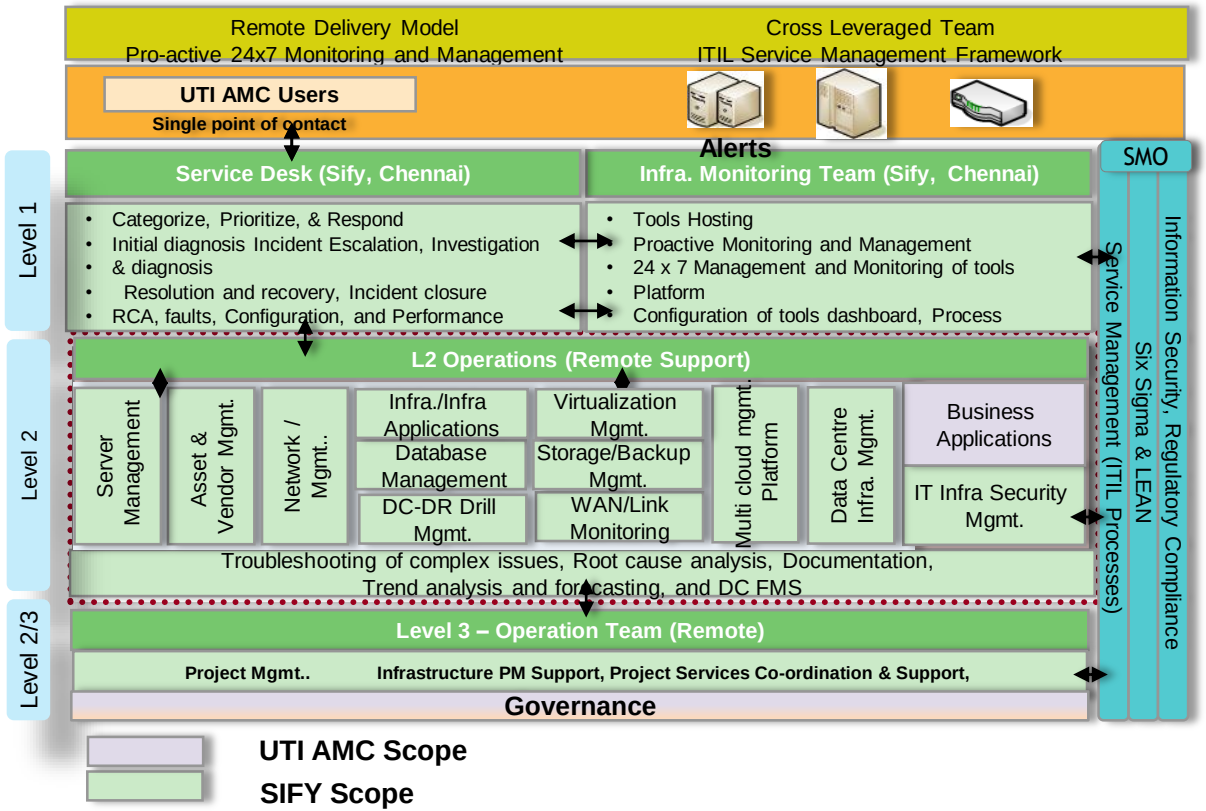
INTEGRATED SERVICE DELIVERY MODEL

Solution drivers

- **Risk mitigated** Transition of Services
- **Process** standardization

Solution Highlights

- This **Integrated Service Delivery Model** provides **tiered operations** for **onsite team** with **clear ownership** boundaries
- Integrated Service Delivery Model leveraging cross tower synergies between Service Desk and Tier-1 DC Operations
- **Single point of contact** and SLA based **Service Ownership** across the entire Data Centre Network
- Consistent Service experience through **Service Management Office** (**SMO**) to implement and ensure ITIL process and compliance
- Covers **range of devices** from **leading vendors** supporting various business needs
- Single point of ownership – **End to End SLA Based Delivery**
- **Delivery using ITIL V3 Compliant Process framework**
- Maximizing remote monitoring and management of L1 and L2 Operations with optimal presence at **Onsite / Datacenters** for co-ordination and touch service

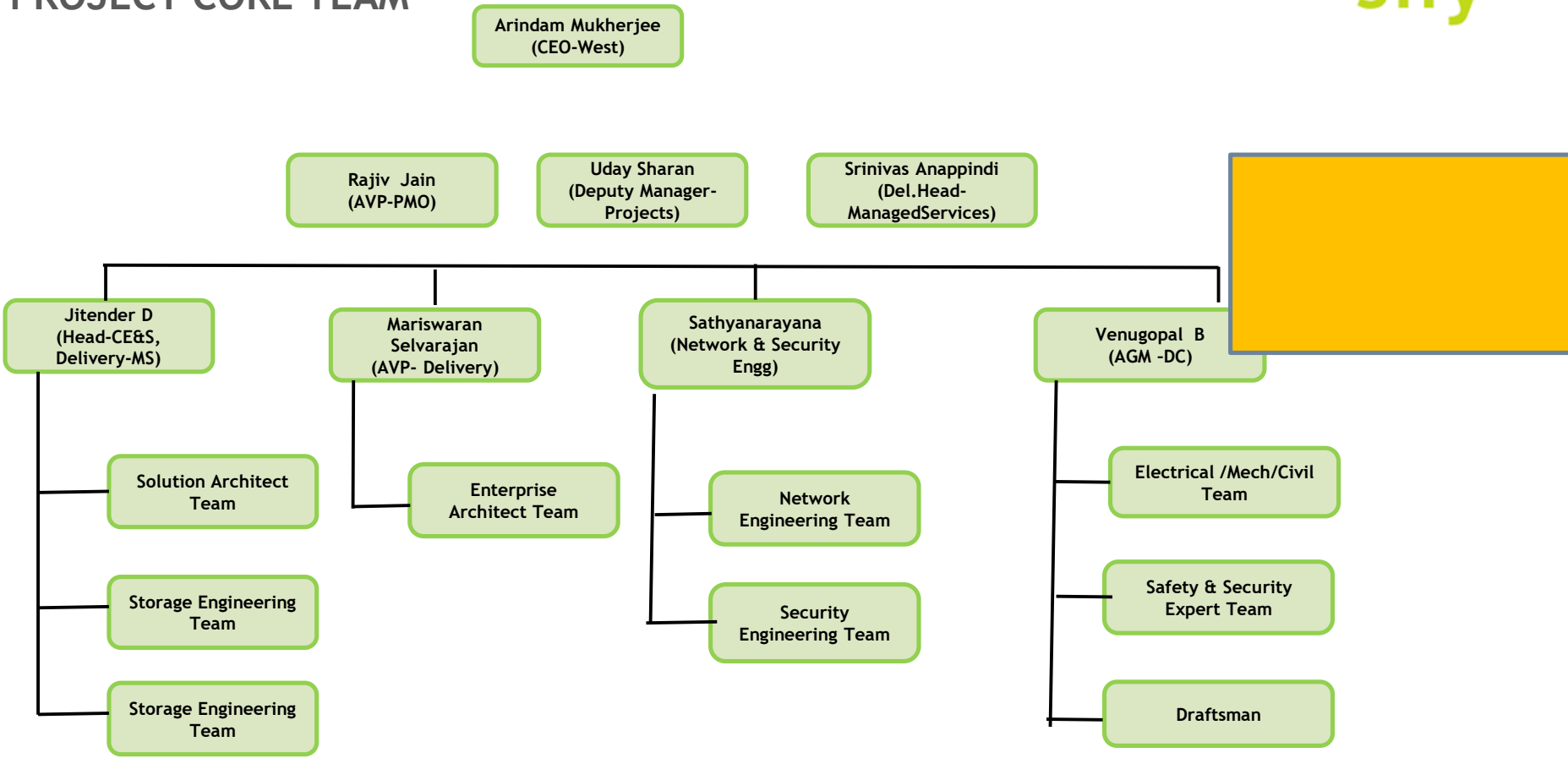


CHALLENGES & MITIGATION PLAN

CHALLENGES	MITIGATION
Application functionality testing in New virtualized infra after P2V migration	Feature of non disruptive testing helps to test the application functionality in new infrastructure without disturbing the production setup and incremental data replication will happen at backend.
Cut-off time planning;	Cutoff time/switchover time can be well planned in advanced and during the scheduled period all the servers will be migrated from P to V.
Application testing and grouping	Servers role and application dependency will be well planned and servers will be grouped accordingly. Non disruptive testing will helps us in validating the groups. This will helps batch wise migration with very minimal downtime.

TEAM STRUCTURE

PROJECT CORE TEAM



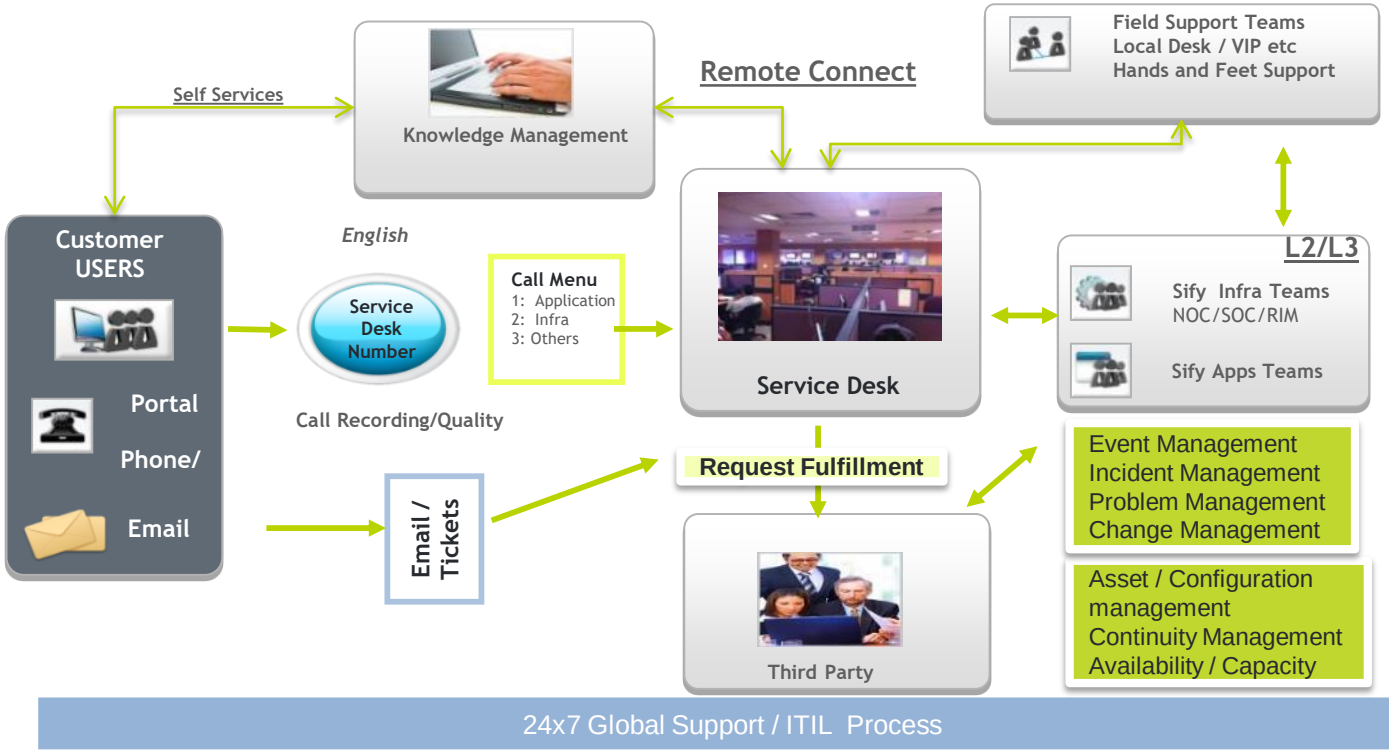
POST IMPLEMETATION SUPPORT & OPERATION

DELIVERY PROCESS – CALL FLOW

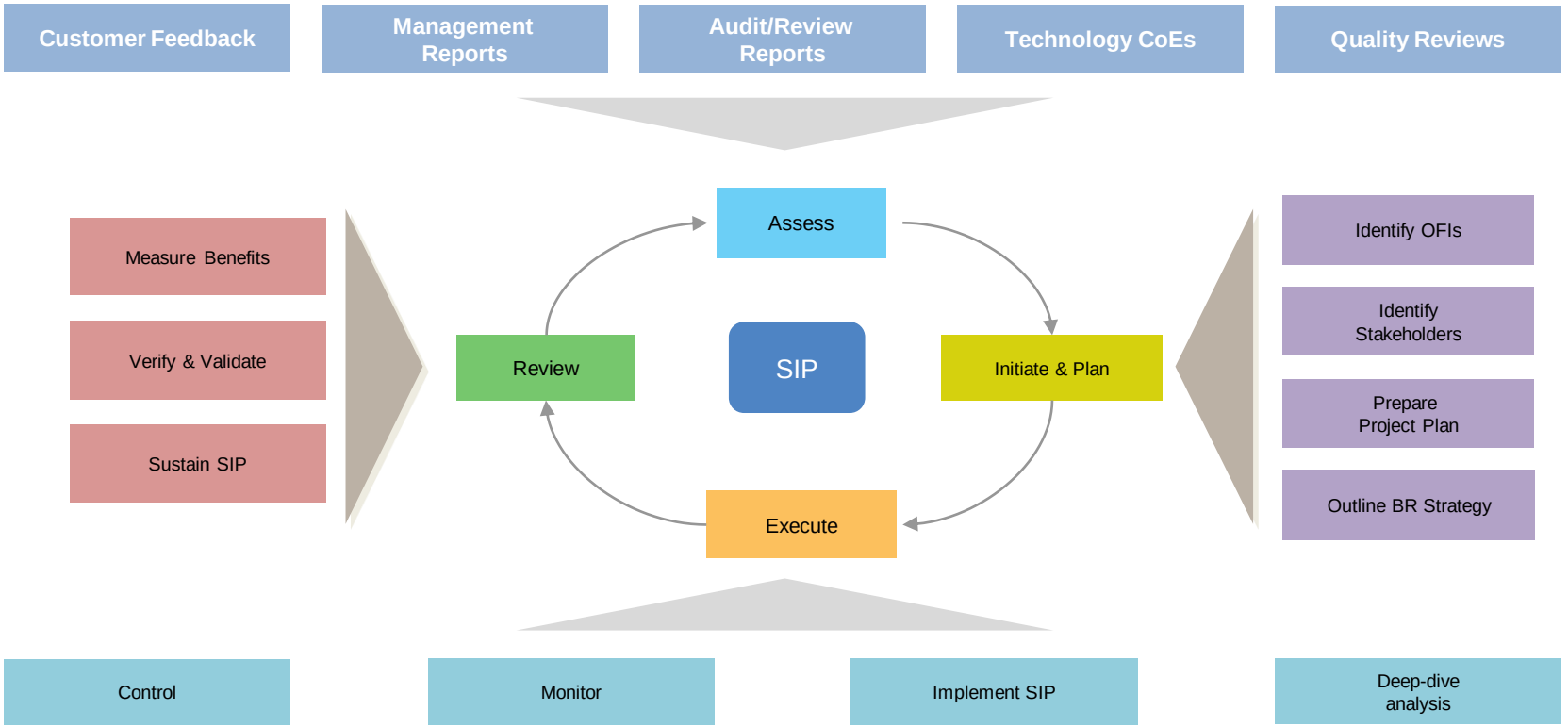
Highlights

- Integrated Service Desk
- End-to-end ticket Ownership
- Proactive Service Desk
- Process Standardization
- Knowledge Mgmt.
- Automated tools

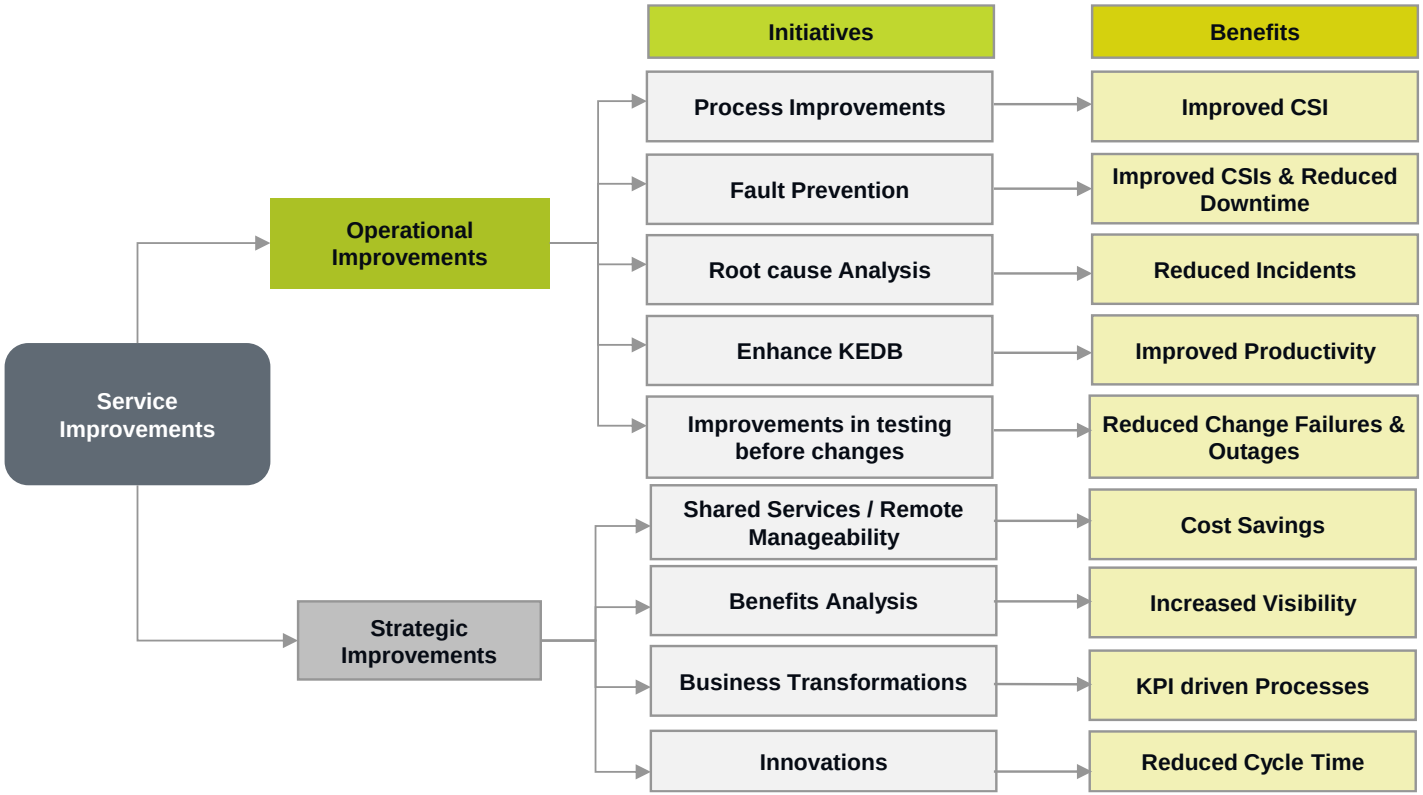
Service Delivery Model (SDM)



CONTINUOS SERVICE IMPROVEMENT FRAMEWORK



CONTINUOS SERVICE IMPROVEMENT STRATEGY



CUSTOMER REFERENCE

DC TRANSFORMATION & MANAGED SERVICES FOR MAX BUPA HEALTH INSURANCE

A leading heath insurance company & *growing at a 30 % YOY rate*. With a *client base of 2 million*. To support the expected growth required to have an *IT set up which is reliable, Scalable, Optimised, Secure, and always available. This initiative covers the technology upgrade & transformation of the IT infrastructure and also the consolidation of the IT infrastructure and the Datacentre.*

Drivers for the Opportunity

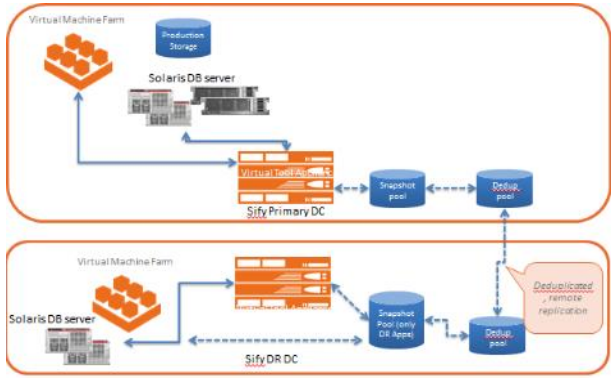
- Transform the current Infrastructure to have the latest in technology, efficient and ready to scale.
- Consolidate the applications infra in different data centre.
- Provide high availability for the application with improved security.
- Provide a round the clock monitoring and support

Solution

- Built a Private Cloud for DC & DR
- Migrate 100+ servers and 60 TB data migration
- VMware, OVM based Hypervisors
- Enabled DRaaS tool based replication and recovery at DC and DR with RTO/RPO SLA's
- Improved Security Significantly
- Project Management for Implementation
- Managed Services for 5 years

IT Landscape

- Data Centre - 2 at Delhi, 1 at Mumbai
- DR @ Bangalore



Managed Services

- Incident Management
- Change Management
- Problem Management
- IT Security Support
- Call Centre, VC &Telecom Support
- Network Support
- Datacentre, Server, Storage, Back-up and disaster recovery Mgmt services
- Database Support
- Hardware Warranty/ AMC
- Strategic Planning

Solution benefits

- Business Services are continuously available
- Improved Performance & Operational Efficiency
- New Age DC + DR set-up
- Zero Downtime Migration
- Quick set up reducing planning & deployment time
- Granular recovery intervals & data protection
- Large Bandwidth to replicate DC data
- Seamless transition to Managed Services
- State of art tools, process and procedures

DATA CENTER TRANSFORMATION & MANAGED SERVICES FOR GIC RE

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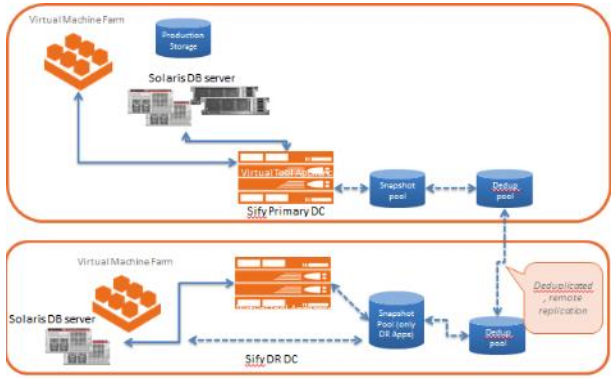

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CASE STUDY – DHFL GI

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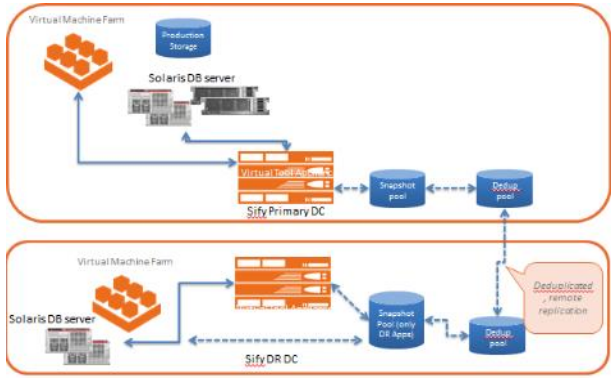

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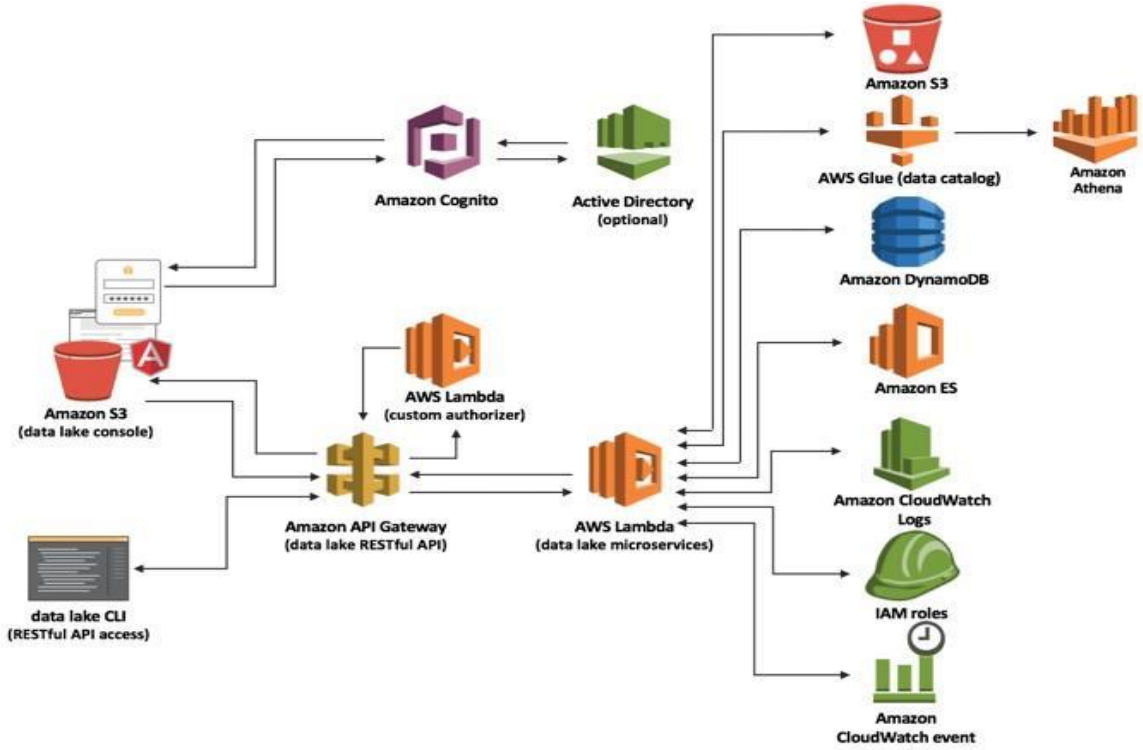
Key differentiator & Value Proposition

SIFY KEY DIFFERENTIATOR

APPROACH	Consultancy Approach
TECHNOLOGY	Early adaptor of cloud player
SKILLS	Multi-domain skill set & certified professionals
AREA OF EXPERTISE	Wide experience in large migrations
AUTOMATION AND TOOLS	Built on automation across all layers - infra , application , data

Enterprise Data Repository

ENTERPRISE DATA REPOSITORY ARCHITECTURE



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thank you

Oracle Exadata as a Service -Optional

UNDERSTANDING THE SCOPE

Sr. No.	UTI Database (Exadata Requirement)			
		Applications		
		MIS VPAY	UTI Intranet site	Wealth Spectrum
1	Required No of Cores (VCPUs)	12	2	2
2	CPU Family	Intel	Intel	Intel
3	OS version	RHEL 7.2	Linux	Linux
4	OS Disk Capacity	80	100	100
5	RAM in GB	128	1	4
6	Storage type	SAN	SAN	SAN
7	Total Storage allocated in TB	10	0.04	0.1
8	Oracle DB Version	12c	11g	11g
9	RTO/RPO (In HOURS)	24/24	24/24	0.5/24
10	Existing DB License	6 Core	100 NUP	100 NUP
11	Encryption (Data-at-rest)	Yes	Yes	Yes
12	Encryption (Data-in-Transit)	Yes	Yes	Yes
13	Data Storage IOPS	2000	1000	1000

SIZING ON EXADATA X7-2

Database Name (The Database which need to be migrated to Exadata)	Processor	Cores/ vCPUS	DB Size in (GB)	Write IOPS	Sizing on Exadata X7-2 core Requirements
MIS VPAY	1	12	10000	2000	2
UTI Intranet site	1	2	40	1000	2
Wealth Spectrum	1	2	100	1000	2

MIS VPAY	
Exadata X7-2 Full Rack (384 cores) OLTP Write IOPS = 5.4 M	5400000
Per Core Write IOPS	14062.5
UTI Core Requirement (As-Is)	0.14222222
Minimum Cores Required	1

https://www.oracle.com/technetwork/database/exadata/exadata-x7-2-ds-3908482.pdf

RECOMMENDED SOLUTION

Solution Exadata As A Service					
	Prod	DR	UAT	SIT	Dev
MISPAY	1 Proc RAC/DB/AS/AVDF/DV	2 Proc RAC/DB/AS/AVDF/DV	1 Proc RAC/DB/AS/AVDF/DV	2 Proc DB/AS/DV	2 Proc DB/AS/DV
UTI Intranet	1 Proc RAC/DB/AS/AVDF/DV				
Wealth Spectrum					
Environment	Exadata as a Service	Intel server	Exadata as a Service	Intel Server	Intel Server

LICENSE REQUIREMENT

Required License as Per Proposed Solution			
	Processor	Available	To be Purchased
Oracle RAC	6	3	3
Oracle DB	9	3	6
Advance Security (AS)	9	0	9
Audit Vault and database firewall(AVDF)	5	0	5
Database Vault (DV)	9	0	9

BOM

Sr. No	Category	PROD CODE	Description
1	DB SERVER	EXAAS-6CORE-48GB-1TB-NL-DBRAC	ExaData Database Machine X7-2 – 6 Cores Cloudinfinit orchestration for Oracle Exadata Database Machine Managed Services for Exadata Environment at Sify DC Includes 1TB Storage in ExaData
		EXAAS-STR-PER500GB	Additional 10TB (20 * 500GB) Storage in ExaData

IMPLEMENTATION METHODOLOGY

1. Sify will provide Exadata-as-a-service to run Oracle database for applications MIS VPAY, UTI Intranet site, Wealth Spectrum at Sify DC, Mumbai as Primary Production Site and UAT**.**
2. Based on the current requirement, Sify will provide **6 cores of Exadata-As-S-Service** and **12 Cores of Intel Server**.
3. Sify will do the Exadata X7-2 Provisioning including Network, Compute, Storage etc. at PROD and UAT.
4. Sify will apply OS patches and kernel parameters for Oracle.
5. Creation of File systems for Oracle Binary and Oracle Database Files will be done by Sify.
6. Sify will do the Exadata environment at PROD and UAT.

COMPREHENSIVE SUPPORT FROM ORACLE

ORACLE
PREMIER SUPPORT

Complete. Proactive.

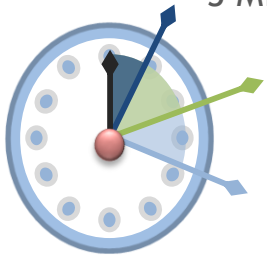
- Specialized Engineered Systems support team
- 24/7 support
- 2-hour onsite response to hardware issues
- Updates and upgrades for Database, Server, Storage, and OS software
- Proactive support portal (MOS)

sify

ORACLE
PREMIER SUPPORT

Integrated. No Additional Cost.

- Oracle engineers perform remote patch installation and 24x7 fault monitoring
- Faster response and restoration:



5 Minute Fault Notification

15 Minute Restoration or Escalation to Development

30 Minute Joint Debugging with Development

ORACLE EXADATA PREMIER SUPPORT SERVICE

1. Oracle Premier Support for Systems includes Oracle Linux support and 24x7 with 2 hour on-site hardware service response (subject to proximity to service center)
2. Oracle Premier Support for Operating Systems
3. Oracle Customer Data and Device Retention
4. Software Configuration Services
5. Oracle Platinum Services (24/7 Monitoring)
6. Business Critical Service for Systems
7. Oracle Exadata Start-Up Pack
8. System Upgrade Support Services including hardware installation and software configuration
9. Oracle Auto Service Request (ASR)

KEY DIFFERENTIATOR

1. Exadata Will better qualify with performance and Elasticity requested as per the RFP
2. Less License Requirement and Major Cost optimization of license due to Exadata solution.
3. Active/Active setup which will provide onsite High Availability
4. Proposed DR for all the system.
5. No of Resource required to manage entire environment is only ONE Exadata DBA
6. Single Patch Management for OS, Network, DB, Storage with Zero down
7. The solution will provide protection of newly discovered and Zero-Day database vulnerabilities, providing immediate protection.
8. As Present setup is Active/Active. This will bring down UTI migration work as it will be as is migration.
9. Future Critical application or new line of business can be accommodate with Active/Active Setup and DR.
10. No Limitation on the Size of the Database that can grow. (>15 TB)
11. Horizontal and vertical scaling will be seamless to enable Data Lake Strategy.
12. Availability of 99.99999 (5 Nine) of Oracle Exadata machine.
13. No impact on Application performance accessing Oracle Database after configuring additional Security component that is TDE, Data Vault and Audit Vault due to Exadata inbuild storage features.

OUR VALUE PROPOSITION

1. By using the Exadata engineered compute, transaction processing time will be reduced.

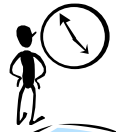
2. The proposed solution will help eliminate bottlenecks and service delays that occurred at month end by using Smart Flash Cache, thus by improving customer satisfaction

3. The proposed solution will ensure stable operations and minimum downtime

4. Exadata Storage compression (HCC) will help reduce data volume by at least 50%

5. The proposed solution will help reduced tuning and maintenance costs with automated tuning capabilities

6. The Exadata-As-A-Service will help McNally in reduction in run-time to generate daily reports



7. The proposed solution will help achieve substantially faster reporting

8. Using this hyper-converged engineered system, this will ensure high transactional performance and guaranteed return on investment

ORACLE EXADATA – THE RIGHT CHOICE (HARDWARE + SOFTWARE + DATABASE + AVAILABILITY)

- Multitenant
- In-Memory DB
- Real Application Clusters
- Active Data Guard
- Partitioning
- Advanced Compression
- Advanced Security, Label Security, DB Vault
- Real Application Testing
- Advanced Analytics, Spatial and Graph
- Management Packs for Oracle Database

All Oracle Database Innovations

All Exadata DB Machine Innovations

- Offload SQL to Storage
- InfiniBand Fabric
- Smart Flash Cache, Log
- Storage Indexes
- Columnar Flash Cache
- Hybrid Columnar Compression
- I/O Resource Management
- Network Resource Management
- In-Memory Fault Tolerance
- Exafusion Direct-to-Wire Protocol

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MILESTONE 1 LLD

Build and Deployment of Public Cloud Infrastructure

- AWS installation & configuration (4 hours for Each Instance)
- Installation & configuration of MZ for all the instances
- Installation & configuration of VPC network
- Installation & configuration of ELB for the servers
- Installation & configuration of NLB for the servers
- Installation & configuration of VPN network
- Installation & configuration of Core & Perimeter firewalls
- Installation & configuration of Storage
- configuration of CISCO cloud tool with AWS platform

Build and Deployment of Private Virtualized Infrastructure as-a-service

- Installation & Configuration of Hyperconverged infra (1 Hour for Each Device)
- Installation & Configuration of OS on all the servers (1 Hour for Each Device)
- Installation & Configuration of vCenter (3 Hours for Single Site)
- Installation & Configuration of cloud center
- Installation & configuration of Storage
- Installation & configuration of service now tool
- Installation & configuration of core switches & routers
- Installation & configuration of replication tool

Establish a Network Infrastructure Operations & comprehensive security layer across all landscapes

- Installation & configuration of security licenses along with Instances on Public Cloud DC & DR
- Installation & configuration of security licenses along with Instances on Private cloud DC & DR
- Configure all the instances with respect to security infra on AWS
- Configure all the instances with respect to security infra on AWS
- Installation & configuration of WAF - SIFY
- Installation & configuration of WAF - AWS
- Installation & configuration of DDOS - AWS

MILESTONE 2 LLD

Migration of all identified applications to the respective target landscapes

- Install the replication agent on identified instances on existing UTI Infra
- Configure the replication tool across all the platform DC & DR
- Migrate the instances over the WAN from existing UTI to AWS
- Migrate the instances over the WAN from existing UTI to SIFY DR Public cloud
- Migrate the instances over the WAN from existing UTI to SIFY DC-DR Private cloud
- Configure the replication tool as per SLA compliance