

Pathbreaking Azure Solution Based on Cloud Adoption Framework Delivered for Nodal Ministry with Complex IT Environment

A new approach to MS Azure Migration solution design.

The Government of Qatar had partnered with Microsoft to move all its entities to cloud. Our client supported over 60 government entities, maintaining mission-critical shared services for network and infrastructure environment. Microsoft chose Cloud4C; the most trusted Azure Expert MSP in the region, to deliver the highly customized migration, aligned to stringent government requirements. Our team delivered a pathbreaking solution design, recognized as a new chapter in Azure Migration strategies.

About the Client

Supporting
60+
Entities

300+
Virtual Machines

Taking forward Qatar National Vision 2030, the client acts as the key nodal entity to develop the communications and information technology sector, through implementing and overseeing e-government programs; with the objective of building an active, dynamic and secure sector.

The Challenge

Onboarding Client Teams for Digital Transformation Journey

The client was apprehensive of cloud migration challenges given the criticality of shared services operations. Their ambitious digital transformation journey needed support and guidance at every step to build trust in cloud.

Phased Migration

Azure Migration strategy had to take into account the scale, complexity and criticality of each of the Government Network (GN) and Shared Services (SS). Migration with zero disruption to business as usual required a phased approach.

Stringent Security Requirements

The client was accountable for the sanctity and sovereignty of the IT environment for over 60 entities. As a custodian of sensitive data and mission-critical applications, supporting numerous end-user utilities and services, they needed foolproof security architecture.



Complex Landscape Design

The client had a highly heterogeneous on-premise landscape with complex networks, multiple databases and server platforms. The challenge was to design a similar build on Azure, ensuring ease of access, scalability, agility and high security.

The Solution

Cloud4C designed a novel solution, recognized as a new chapter in Azure Migration approach, added to the solution library by Microsoft. The solution had a unique three-layer architecture that included greenfield deployment of 3 mission-critical workloads and migration of on-premise landscape for a highly secure, scalable and available environment. The project was governed under a single SLA, with complete ownership and accountability.

Building a Comfort Zone for Azure Migration

The client wanted to move from on-premise to Azure for proven cloud advantages but had apprehensions on various aspects of migration. Our teams undertook CAF (Cloud Adoption Framework) based assessment of the existing client environment. We conducted workshops with business stakeholders to understand their priorities and expected outcomes from cloud migration. The solution was accordingly designed, to create a new landing zone for a successful migration.

Delivering Phased Migration with Minimal Disruption

The current project covered operations of 7 entities, out of the 60 entities supported by shared services. Their 24*7 operation mandated negligible downtime and minimal disruption to business as usual. We delivered to the requirements of each entity, following a phased approach for quality validations and necessary checks and balances.

Designing Unique Customized Solution

The on-premise landscape comprised of 20+ databases, 6 NVAs, 2 next-generation firewalls and 200+VMs. The solution architecture included:

Hub and Spoke Architecture – We built a differentiated architecture that included the main hub, a few sub hubs and a number of spokes, all working in tandem to provide a robust IT landscape, aligned to the client’s requirements.

Out of Box Third-Party Integration – The client wanted to retain existing vendors and OEMs for their applications and appliances in the cloud environment. Available connectors in Azure required customization of existing APIs to support these appliances. Managed instance integration was implemented to re-architect on-premise landscape on Azure.

Modernizing Databases – The MS SQL, Oracle, PostgreSQL and other databases maintained on on-premise servers were re-architected as PaaS on MS Azure to access advanced features. Processes were automated for swift, scalable, error-free and effortless operations.

Multi-skill Expertise for Heterogeneous Environment – The heterogeneous on-premise client environment with MS SQL, MySQL, Sitecore, Sharepoint, Oracle, MS Dynamics, CRM, HPSM, GD, SMS Gateway, Payment Gateway and more was migrated on cloud. We built a multi-skilled team with experts from 22 CoEs having a vast experience of migrating 40,000+ VMs through 250 cloud migrations, to deliver the requirement.

Designing Failsafe Security Architecture

Our team designed a unique, highly resilient and fully compliant architecture of network, server and applications, ensuring data sovereignty and privacy. We went beyond the standard security solution to deliver the following:

Multi-layer Network Security
The client needed a nuanced network security design to secure massive data routing. Our solution included encryption of all traffic in rest and motion through 4 firewalls. We also designed a two-layer encryption for all virtual machines.

Advanced Threat Modeling
Microsoft Azure lists down 162 instances of possible threats through Operating Systems, network, physical layer and applications. We collaborated with Microsoft to improve upon available threat modeling processes. We deployed Advanced Threat Protection (ATP) algorithms and AI Workspace for intelligent segregation of possible threats and pre-emptive action.

Customized Security Policies
Our solution is aligned to enhance the security policies along with Microsoft recommended best practice guidelines. These included: ISO 270001, Azure Security Center (ASC), CIS and MIS. We deployed Sentinel on a centralized workspace, and integrated all Azure VMs without internet access, using OMS gateway. CEF collectors were used to integrate multiple native resources and NVAs with Sentinel. Customized dashboards, analytics and playbooks were enabled for automated incident response.

Complex RBAC
The client required a complex access and control design to allow ease of operations while maintaining safety and security of systems and applications. Our teams designed gated access points with an evolved Role Based Access Control (RBAC) framework to allow easy access to required applications, systems and processes, without compromising on data sovereignty.

Backup Architecture
We delivered an independent, isolated and application-consistent backup architecture for reduced restoration time and quick return to running state. Both in-transit and at-rest data were encrypted. Azure backup was enabled for VMs hosted on Azure, SQL Server on Azure VM, and Azure File Share. Recovery Services vaults were used for short-term and long-term data retention, and alerts were set up with built-in monitoring and alerting capabilities. Geo-redundant storage (GRS) was deployed to replicate backup data for higher durability, in the event of any regional outage.

Delivering Zero Downtime with 24*7*365 Managed Services

We delivered 99.95% application-level uptime by identifying forward blockage points for both infrastructure and network, maintaining zero tolerance for any intrusion. Predictive analytics algorithms provided advanced insights on network volatility for quick actions to avoid any downtime. Network express routes and VM appliances were monitored in real-time for pro-active incident management and issue resolution. Customized dashboards monitored the health of express towers by spotting changes in bandwidth to predict possible downtime. Robust round the clock monitoring with SMEs on-call, ensured highly efficient operations with optimal productivity.

Validating Each Process with Stringent Quality Checks

The solution architecture designed went through multiple quality checks before being rolled out in the live environment. Each component of solution design was reviewed and approved by Microsoft to ensure the best-qualified solution, despite the massive customizations involved at every stage.

Optimal Disaster Recovery Solution

The entire IT environment was secured with a geo-redundant DR solution, hosted in a different region on Azure, with stringent RPO/ RTO, for data resilience. A combination of native and Azure recovery methodologies including ASR (Azure Site Recovery), Oracle Active Data Guard, MS SQL mirror and log shipping, and others, were deployed.

Key Accelerators

Unique Hub and Spoke Architecture, A New Chapter in MS Azure Migration
scripted to build a resilient, secure and highly available infrastructure, aligned to stringent government regulations.

ASC and Sentinel Frameworks
for advanced threat protection and vulnerability management. Centralized dashboard to constantly monitor unwanted intrusion and mitigate possible risks.

Multi-Skill, Multi-Technology Expertise
spanning 23 CoEs across Cybersecurity, SAP, Azure, DR and Backup and next gen tech experience of 2000+ professionals support heterogeneous IT environments with 24X7 monitoring.

AIOps and DEVOps Expertise
leveraging Big data, Machine learning, and Analytics to augment IT Operations with reduced event noise, predictive alerting, probable cause analysis and intelligent capacity management to predict, find, and fix issues faster.

PaaS Services on Azure
delivered through modernization of legacy systems and applications, for ease of management and access to latest updates.

Results

Compliance

Fully compliant, benchmark solution architecture for highly customized MS Azure Migration

Security

AI based threat modeling for pre-emptive action, protecting IT landscape

40%

Reduction in TCO by 40%

Zero

Zero disruption complex Azure Migration under single SLA

24*7

Uninterrupted operation with 24*7 monitoring and SMEs on call

99.95%

99.95% application level uptime and zero tolerance for intrusion