

# Engaging Cloud Vendors

## Scenario Details

This outline captures the recommendations to transition “Company A” from its on-premise physical infrastructure to a “Hybrid Cloud” Infrastructure.

- Define Current Organizational Details
- Define Organizational Cloud Requirements
- Establish Migration Goals
- Vendor RFI
- Vendor RFP
- Migration Plan
- Summary

## Current Organization Details

In this example scenario this company operates a web application hosted on Linux servers in co-located data centers in California. Users (Workers/Clients) gain access to the company through a web browser to a virtualized network that hosts various devices. Current Software licensing is established on each device (VM). Company “A” Consists of :

- Current HQ location is downtown San Francisco California and Offices in Irvine, CA.
- Two small data centers of 6 racks of 15 servers each (COLO / co-location).
- Linux servers in the data center and clients use browser-based access to web application with unit licensing (Apple, Microsoft, Droid, IOS, etc.).
- Backup is to tape and off-site storage twice a week.
- 24/7 on-call support is mandatory.
- Downtime needs to be limited.
- Testing before application update is mandatory.
- Applications are virtualized currently by platform.
- Web services are handled in-house.
- VPN access to company resources.
- Limited space and growth are essential.
- Current CAPEX are at \$1 million a year.
- Current OPEX are at \$2 million a year.
- Licensing is open source (no cost).

# Organizational Cloud Requirements

From the scenario details we have refined list of requirements for the Cloud Transition. These requirements form the basis of our vendor research “Company A” needs to following to maintain and operate efficiently:

- 1. 180 Linux Servers- Backend, with browser-based access to Windows web application on the Front End; (BYOL options)
- 2. Disaster recovery as a service (DRaaS)- Dedicated backup servers
- 3. 24/7 on-call support is mandatory
- 4. Web services
- 5. VPN access to company resources.

To provide context to the scenario we queried Chat GPT for an idea and an example asset inventory and implementation of these scenario details

The scenario describes two data centers with 6 racks and 15 servers per rack (total: 180 servers), thus we can assume the following distribution of server roles based on typical IT infrastructure:

Server Type	Quantity	Purpose
Web Servers	50 (28%)	Hosts the web application, handles browser-based user requests
Application Servers	40 (22%)	Manages business logic, APIs, and backend processing
Database Servers	30 (17%)	Stores and processes structured/unstructured data
VPN & Security Servers	15 (8%)	Provides secure remote access, firewall, and IDS/IPS
Backup & Storage Servers*	20 (11%)	Handles data backups, tape storage, and disaster recovery
Load Balancer Servers	10 (6%)	Distributes traffic across web and application servers
Monitoring & Logging Servers	10 (6%)	Monitors system health, logs events, and alerts administrators
Development & Testing Servers*	5 (2%)	Used for application updates, patch testing, and staging

\*Note: Backup & Storage and Development & Testing Servers will not operate 24 hours.

The following table provides general server specification requirements for the current asset inventory.

VM Type	vCPUs	RAM	Storage	Network	OS	Software
Web Server	4-8	16-32 GB	200-500 GB SSD	1 Gbps	Ubuntu/RHEL	Apache/Nginx, Node.js, PHP
App Server	8-16	32-64 GB	500 GB - 1 TB SSD	10 Gbps	Ubuntu/RHEL	Java, Python, Docker/K8s
Database Server	16-32	64-128 GB	2 TB NVMe SSD	10 Gbps	Ubuntu/RHEL	MySQL, PostgreSQL
VPN & Security	4-8	8-16 GB	100 GB SSD	1-10 Gbps	Ubuntu/RHEL	OpenVPN, WireGuard
Backup Server	4-8	16 GB	10-20 TB HDD	1-10 Gbps	Ubuntu/RHEL	Bacula, Veeam

This asset organization accomplishes 4 of the 5 of the aforementioned operational requirements. We will evaluate the cost against the most resource intensive server requirement. Although each server type may have different requirements, general VM's are customizable to meet our needs. For example, a General EC2 VM from AWS can configure as a Web or App server for a small to medium size organization. The 5<sup>th</sup> asset requirement is to provide 24/7 on-call support.

## Establish Migration Goals

Current Capital Expenditures are \$1 Million annually. While the current Operating Expenditures are approximately \$2 million annually.

Major Capital Expenditures include the following:

- Physical Hardware, Software, and Infrastructure
  - a. The 180 servers need periodic refresh (typically a 3-5 year lifecycle).
  - b. Maintaining backups to tape and long-term off-site storage.

The Major Operating Expenditures include

- Maintenance, support, staffing and utilities:
  - a. Data Center (Co-location) Costs which are based on rack space, power consumption, and bandwidth
  - b. 24/7 on-call support requires staffing or outsourced NOC services (Network Operations Center).
  - c. Tape backup and off-site storage require regular transport and archival costs.

- d. Cost for the physical office space may reduce based on organization remote work policy.

The primary goal of migration is cost optimization. By reducing the physical infrastructure, we establish a \$1 ROI, in cost savings for Current Capital Expenditures, reducing that figure to appx \$500,000, and potentially \$1 million in Operating expenses.

## Vendor RFI

We requested information from Amazon Web Services, Google Cloud, and Microsoft Azure. The intent of the RFIs are to assess the costs associated with the VMs and operating specification requirements. All VM's were assessed utilizing the organizations price calculators. Each VM is equipped with Linux Ubuntu-OS, and comparable CPU, RAM, Storage, and Network capacities for each category. The monthly cost for each server category follows:

	<b>AWS</b>	<b>Google Cloud</b>	<b>Microsoft Azure</b>
Web Server	3,675.55	5,658.54	3,237.55
App Server	5,883.80	8,972.06	4,589.95
Database Server	9,890.04	13,396.89	7,772.53
VPN & Security	1,169.46	1,406.67	1,618.78
Backup Server	1,470.22	2,232.21	860.01
Other Servers	1,837.78	2,790.27	1,158.36
Service Support	1,974.88	100	100
Total	25,901.73	34,556.64	19,337.18

Microsoft Azure proposed the lowest monthly cost in every category except VPN & Security Servers from AWS. A hybrid solution between the two providers does not optimize cost due to the inurred service support cost from both vendors. Microsoft Azure is the vendor of choice to move forward with a Request for Proposal. Other cost optimization considerations include:

- Fully funded IT Support Team vs. Microsoft Support Services
- Reduced Data Center OPEX for space, utilities, and security.
- Reduced physical tape maintenance
- Licensing cost if BYOL is not permitted

## Request for Proposal

Although we completed an initial analysis, a request for proposal solicits guidance from Microsoft to best implement the cloud services and how Microsoft can address the cost optimization goals while maintaining performance.

Microsoft has a published SLA for all aspects of their cloud services. The VM's SLA is as follows:

“The following Service Levels and Service Credits are applicable to Customer's use of Virtual Machines in an Availability Set or same Dedicated Host Group. This SLA does not apply to Availability Sets leveraging Azure shared disks:”

Uptime Percentage	Service Credit
< 99.95%	10%
< 99%	25%
< 95%	100%

Microsoft must provide a SOW that includes :

- Migration objectives, including business, technical, security, and administration requirements.
- Description and scope of services, including key deliverables and timelines
- Key performance indicators (KPIs)
- Roles and responsibilities of both Microsoft and “Company A”
- Standards, compliance, and testing, as needed
- Terms and conditions, such as how long the SOW will be valid for
- Payment and/or billing terms
- Points of contact for both parties

## Migration Plan

This migration plan outlines a proposed phased migration, Lift/Shift from an On-Premise data center to a Public Cloud Infrastructure.

	<b>POC/POV</b>	<b>Pilot</b>	<b>Production</b>
Duration	1-2 Weeks	2-3 Months	3-6 Months
% of Servers	5% (1 server for each operation)	50% (1 Physical Data Center)	100% (Both Data Centers)
Number of Users	30 users	50% of company users	All Users
Goal	Stress the system and support services	Phase 1 of migration	Phase 2 of migration
Risk to Operations	Low	High	Medium
Subscription	Subscription is on demand through migration and the first year of operations to establish a baseline cost. “Company A will transition to reserved lease agreements after the first year”		