Cloud Capacity Management

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Abstract

Capacity Management continues to evolve as a practice with new environments in IT. The inclusion of the Cloud infrastructure within IT requires the Capacity Management discipline to be extended. There are several variables in dealing with Cloud Capacity Management. Many of them depend on where the Cloud infrastructure is hosted and the type of control a user has over the environment. On-Premise hosting, Hybrid hosting or Cloud provider hosting fit into the equation. The purpose of this presentation is to discuss the variables that one needs to consider when extending Capacity Management to the Cloud.

Agenda

- Capacity Management
- Capacity Management variables introduced by the Cloud
- Overview of the most prominent Cloud offerings
- Planning your move to the Cloud
- Metrics for capture with the Cloud Infrastructure
- Reporting examples

Presenter

- Principal Consultant at Metron-Athene, Inc.
- Involved in the IT industry for 30+ years
- Involved with Capacity Management for 25+ years
- Presenter at conferences such as CMG, GSE, Share and regional / local User Groups
- Certifications in ITIL, VMware and other disciplines

Poll

What Cloud Services Provider are you using?

A: AWS
B: Google
C: Azure
D: IBM Softlayer
E: Other, including Oracle & Rackspace

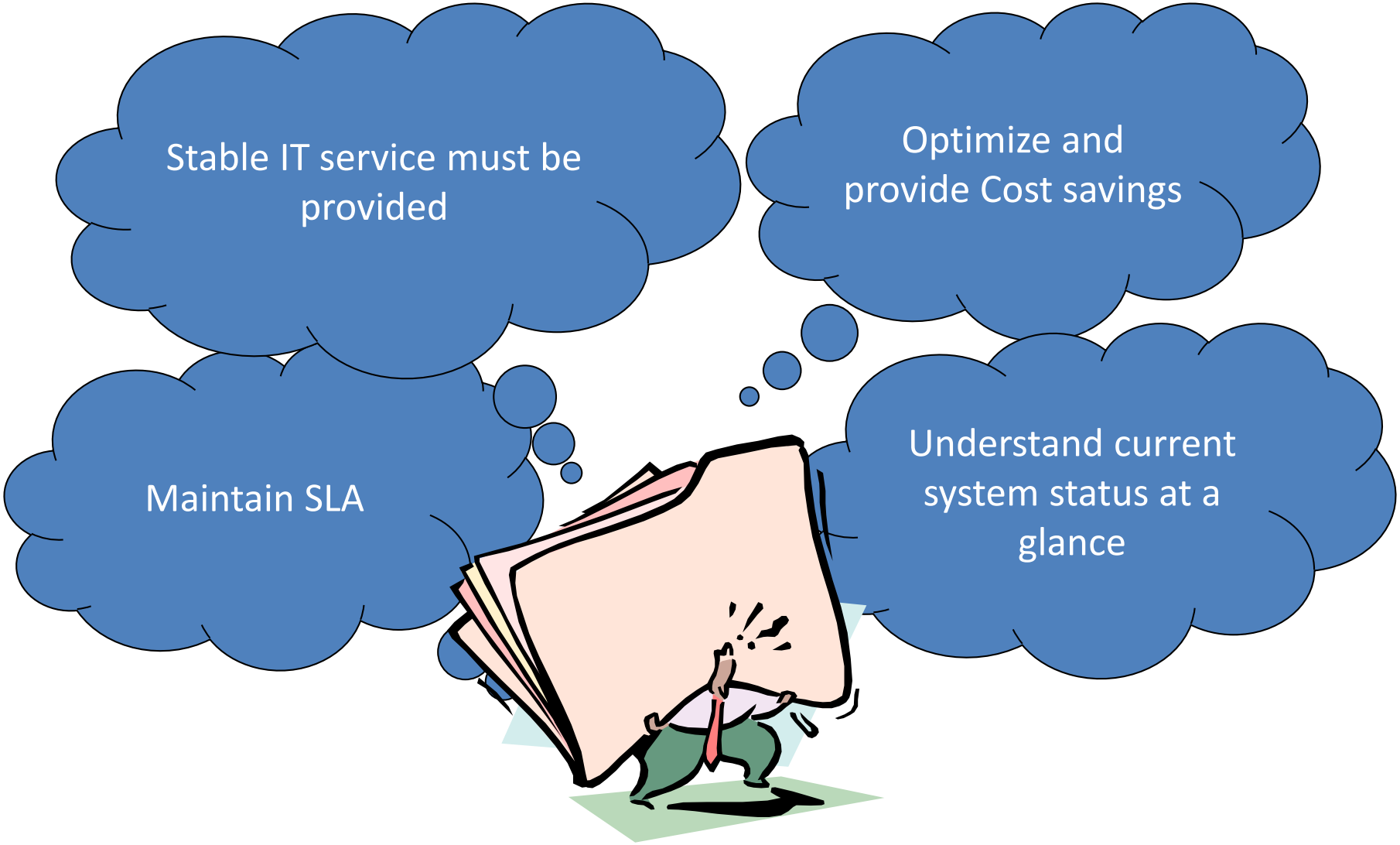
Defining Cloud Computing

Cloud computing is a type of Internet based computing that provides shared computer processing resources and data to computers and other devices on demand. It is a model for enabling ubiquitous, on-demand access to a shared pool of configurable computing resources (e.g., computer networks, servers, storage, applications and services), which can be rapidly provisioned and released with minimal management effort.

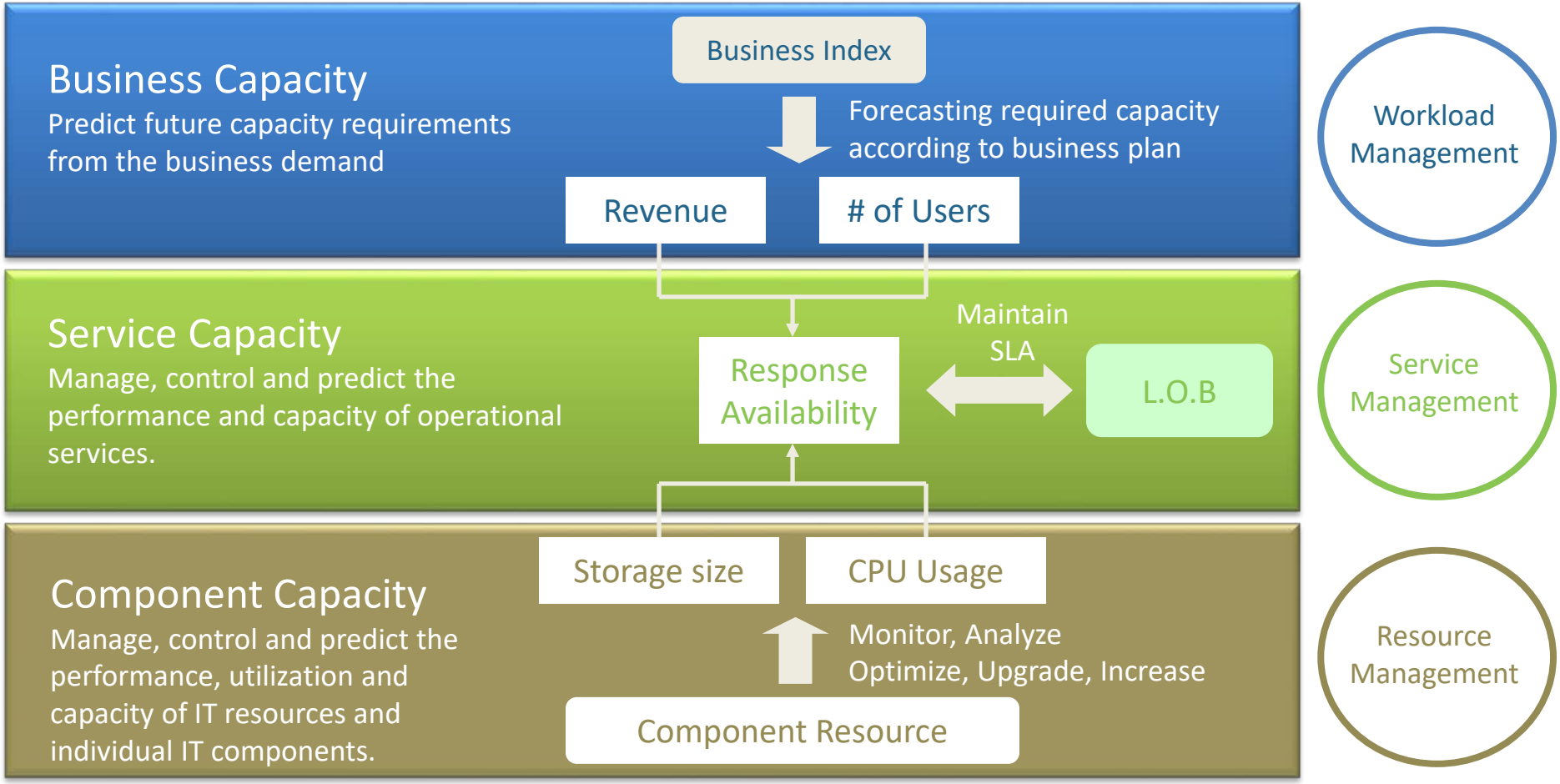
https://en.wikipedia.org/wiki/Cloud_computing

Capacity Management

Why is Capacity Management needed?



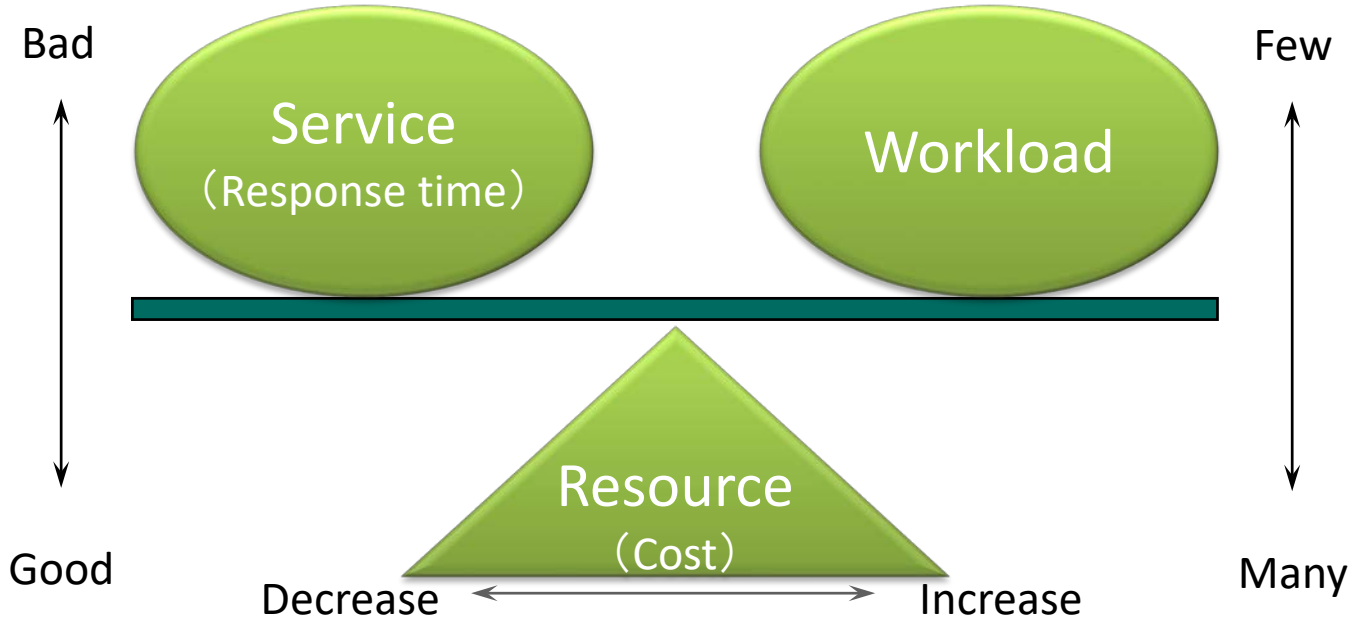
Capacity Management



Benefits of Capacity Management

Understand your workloads and implement continuous system optimization equals

"Stable IT Service" and "Optimize Costs"



Capacity Management variables introduced by the Cloud

Cloud Capacity Management Variables

- Can be out of your control
- Possible impact on performance by outside influences
- Cloud Pricing

Cloud Pricing

What do Cloud Providers Charge for?

Base IaaS Elements

- Compute
  - CPU
  - Memory
- Storage
- Operating System
- Storage/Disk I/O
- Network Egress

Additional Services

- Load balancers, F/W
- PaaS services
- Analytics, Bigdata, AI,
- Streaming Services, CDN
- IoT
- Management tools and services
- 100s of other products

Cloud Provider Pricing

- Pricing Parameters for an Instance Type
  - Zone
  - Storage options
  - Tenancy: dedicated, shared
  - OS
  - Software preinstalled
  - License type

- Cloud Pricing – the Nuances
  - Pricing Vs Discounts
  - Cloud services location

Overview of the most prominent Cloud offerings

Vendor Strategies - AWS

- Started with public cloud for SMEs and startups
- Actively focused on the enterprise – reaching into the datacenter from the Cloud
- Strategy
  - Innovation
    - Deep knowledge of customer usage and ability to both react to and build solutions
    - First to offer new category-defining features and services
  - Ease of adoption
    - Snowball, Snowmobile
    - AWS Server Migration Service

Vendor Strategies - Google

- Strategy
  - Emphasizes its technology leadership in building distributed systems
  - Its global network
  - Strong commitment to open source
  - Low costs
  - Sheer technology brilliance
  - Willingness to invest in cutting edge datacenter technology; purpose-built hardware backed by deep pockets
  - Integration with Google owned data services
- Popular with media and entertainment, life sciences, retail, financial services, gaming and technology companies
- **NEW announced at Google Next march 8th**
  - *Compute Engine price cut by 8%*
  - *Committed Use Discounts - up to 57% discount for 1 or 3 year commitment paid monthly, with no upfront costs*

Vendor Strategies - Azure

- Leveraging existing installed base to expand the Datacenter to Azure
- Thorough understanding of enterprises' needs, and the resources in place globally to serve them well
- Embracing non-Microsoft technologies, including Linux and iOS
- Developer friendly – Integrated Visual Studio and .NET tools for developing, building and to deploying to Azure
- Platform also delivered by partners for wider geographical and local coverage – Azure Stack
- Licensing – EA, Server and Cloud Enrollment

Vendor Strategies – IBM Softlayer

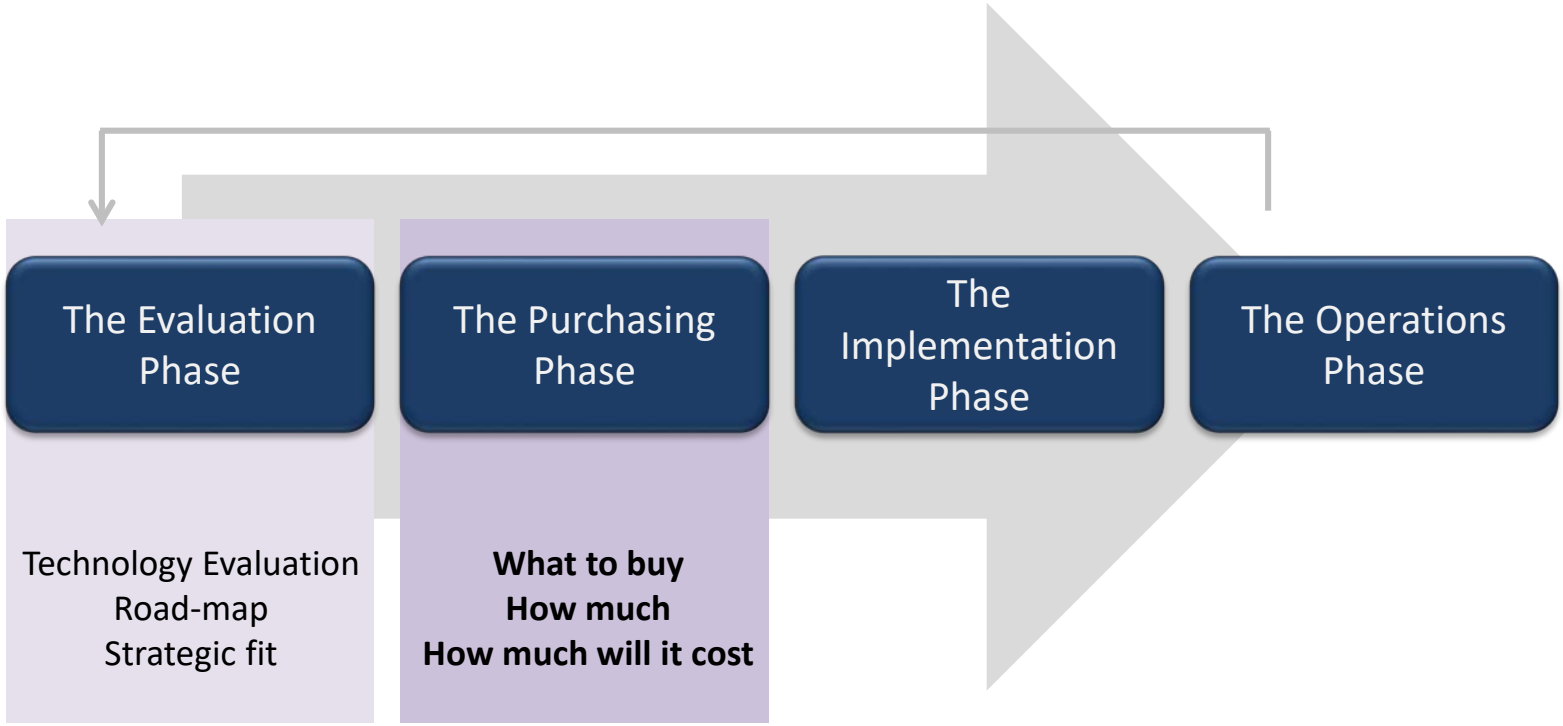
- IBM SoftLayer rebranded to BlueMix – SoftLayer IaaS and Bluemix PaaS platform combined
- Focused on Hybrid Cloud
- Solid understanding of enterprises' needs
- Leverage existing installed base to expand to the Cloud
- *IBM is also a Cloud broker. Resells AWS, Azure and Google Clouds*
- Differentiated with Bare Metal Server offering and wide array of application services
- Licensing – simplified pricing with simple options; EA

Vendor Strategies – Oracle

- Oracle Cloud is designed to preempt and steer the bleeding from the datacenter to Oracle instead of AWS
- Solid understanding of enterprises' needs
- Only provider for SPARC compute instances as VM or Bare metal
- Strategy
  - Focused on Hybrid Cloud
  - Leverage existing installed base to expand to the Cloud
  - Converting on-prem installed base onto on-prem Clouds with direct connect to Oracle Cloud
  - Licensing – Simplified pricing; EA

Planning your move to the Cloud

The Cloud Deployment Cycle



Metrics for capture from the Cloud Infrastructure

Types of Cloud Metrics to Capture

- Metrics – Cloud point of view, e.g. Cloud Watch

- Metrics – Guest point of view, e.g. operating system

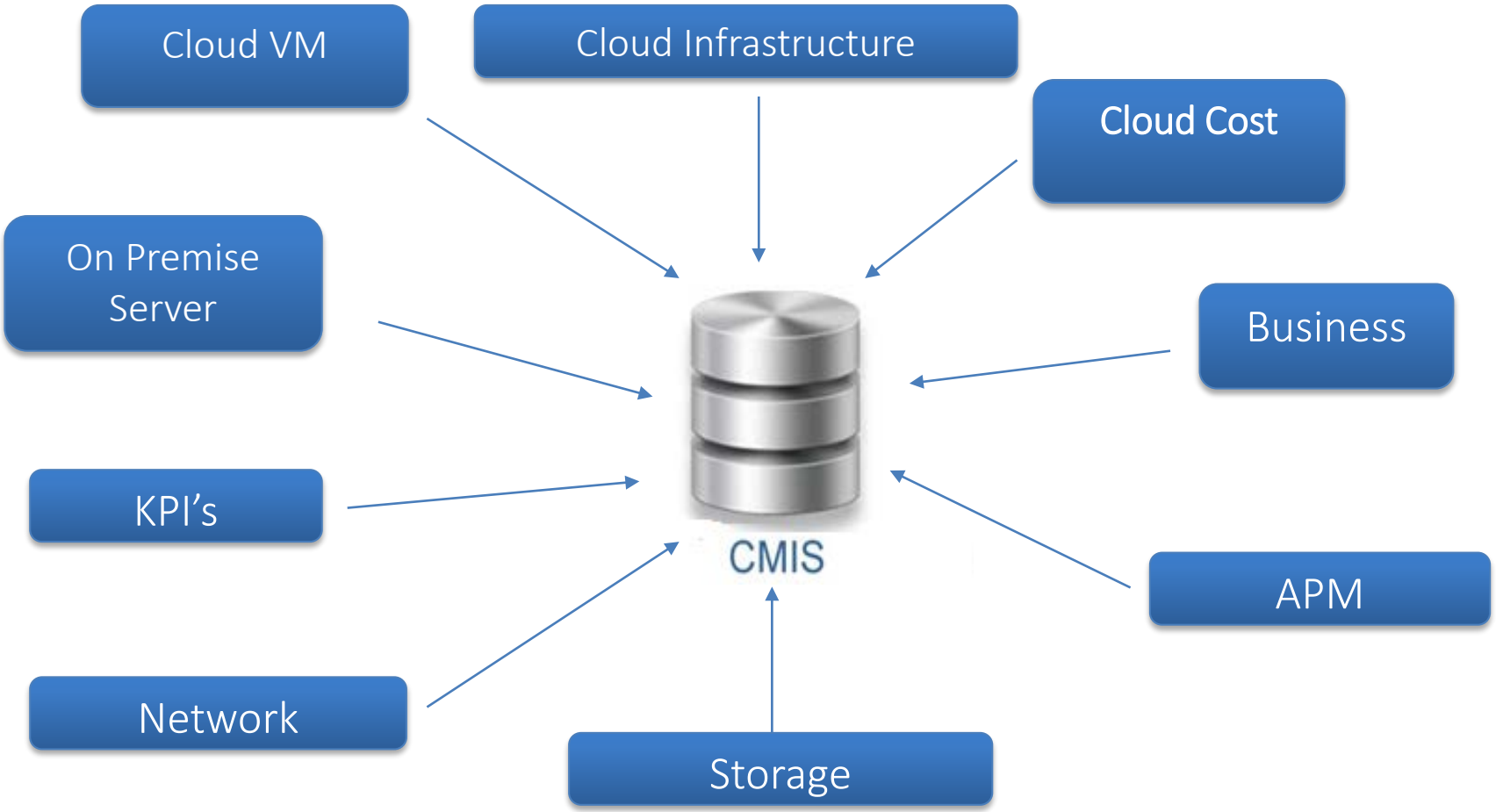
Metrics to Capture

- Cloud Hosted Metrics
  - CPU
  - IOPs
  - Average Transaction Time
  - Volume Busy
  - Data Transfer Rate

- On Premise Metrics
  - CPU Utilization
  - Storage (Allocation, Transfer Rate)
  - Network
  - Number of Transactions

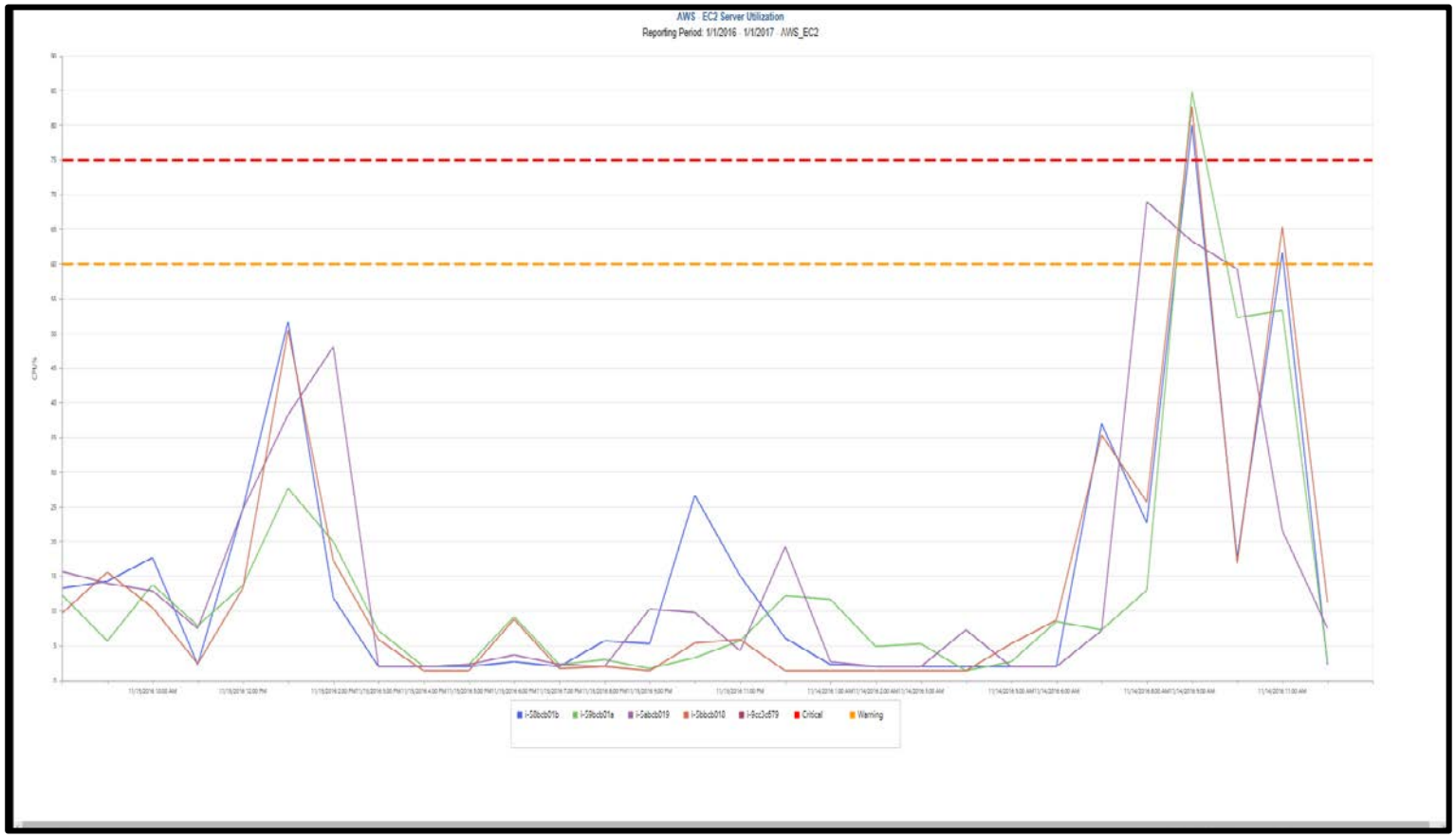
Metrics for successful Capacity Management

Centralized Capacity Management Information System (CMIS)

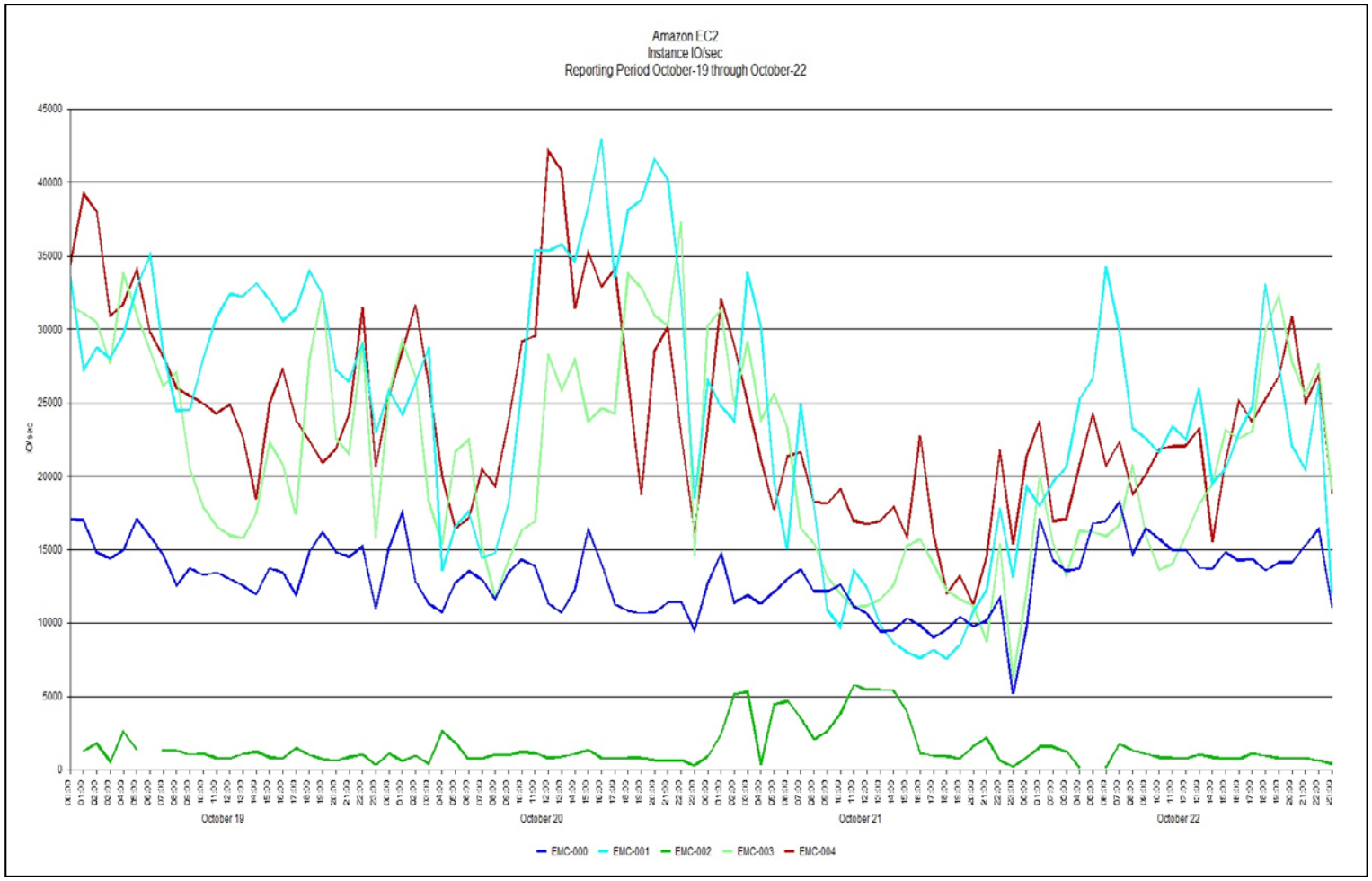


Reporting examples

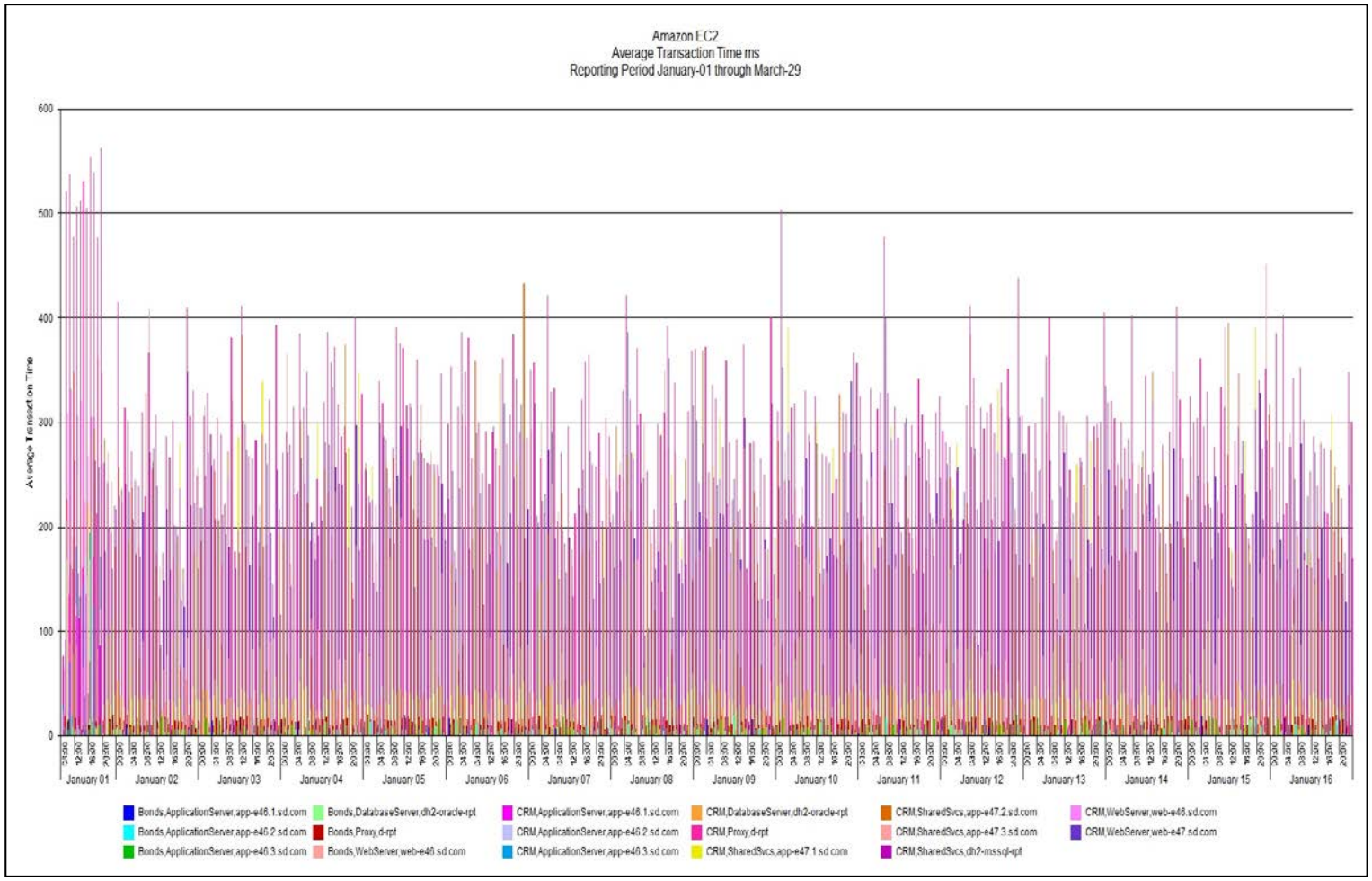
Amazon EC2 CPU Percentage



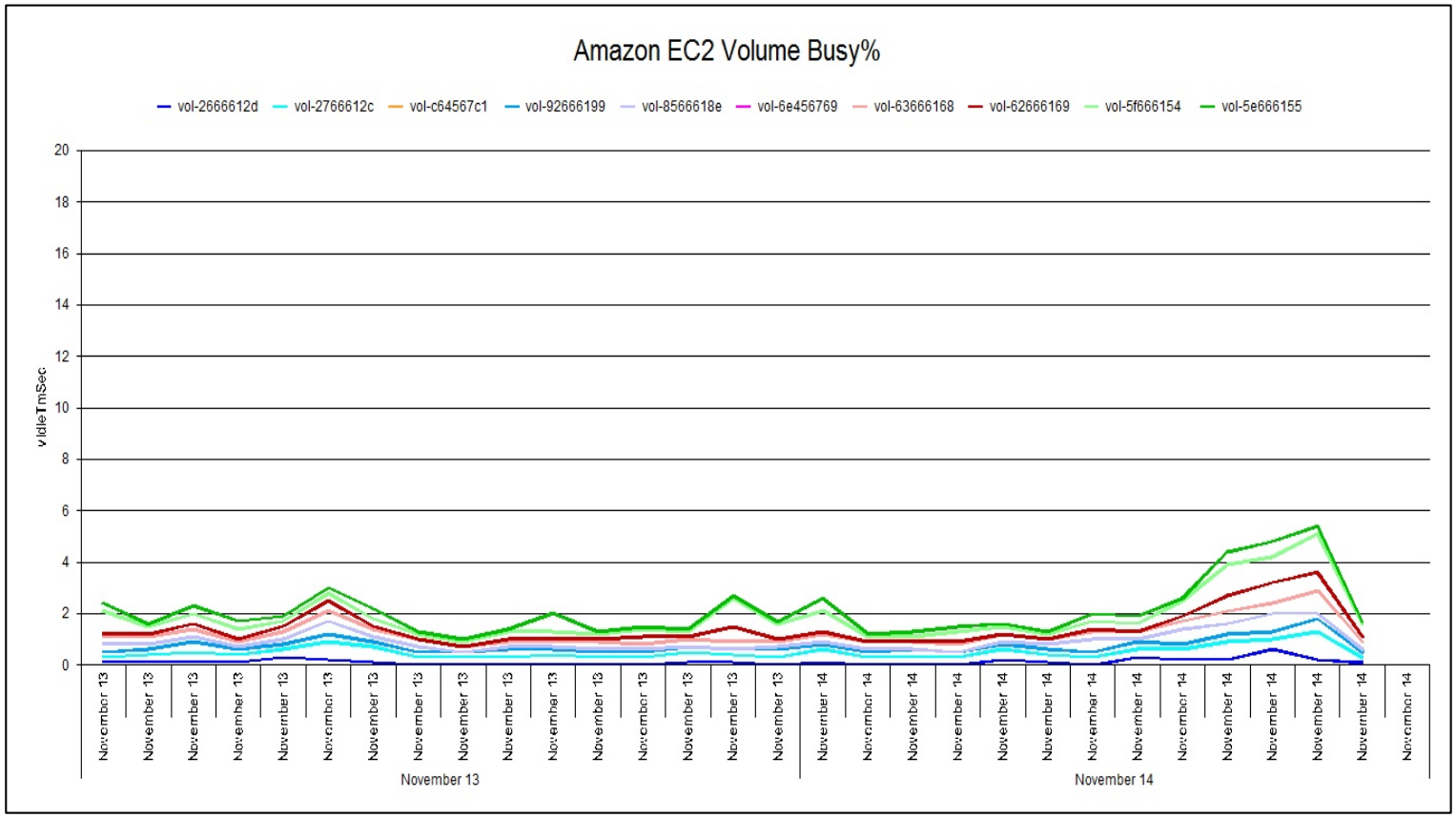
Amazon EC2 Instance IOs per Second



Amazon EC2 CPU Transaction Time



Amazon EC2 Volume Busy %



How to Plan for the Cloud

Fundamental Questions

- What do I have?
- Which Cloud?
- What should I buy?
- How much should I buy? As provisioned or utilized?
- What are my buying options?
- What will it cost?
- How does it compare across clouds and on-prem?

This is where Akasia helps you by providing you actionable information including:

- *What do you have on-prem, and how much is it costing you*
- *Equivalent Cloud resources (AWS, Azure, Google, IBM, Oracle) – exact BOM*
- *Cost estimates of running your workloads in the Cloud*

View On-Premise Data – Hosts, VMs

AKASIA CLOUD VIEW
Cloud Costs Planning

VIEW SOURCE ASSETS | EDIT SOURCE COSTS | COST MODELLING | Welcome, Gautam

SOURCE ASSETS FOR

AMG_SC2_11_3

Hosts

VIEW DETAILS

8
Hosts

Disk Physical / Allocated	CPUs
21.59 / 19.30 TB	16
Memory	**CPU Cores**
505.98 GB	72

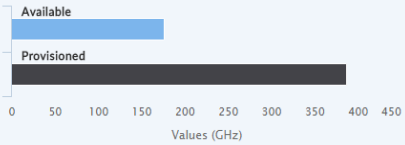
Virtual Machines

VIEW DETAILS

109
VMs

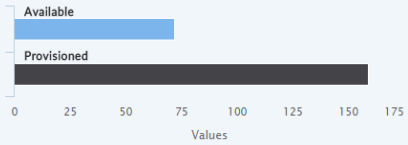
Powered On	Network Usage /mo
99	32,975.75 GB
Powered Off	**I/O /mo**
10	188,216.52 GB

CPU



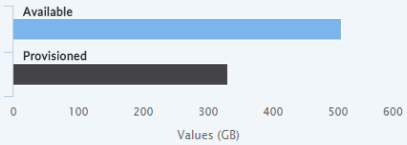
CPU Cycles Available	CPU Cycles Provisioned
175.97 GHz	387.26 GHz
CPU Count	**Commit Ratio**
16	2.20

CPU Core



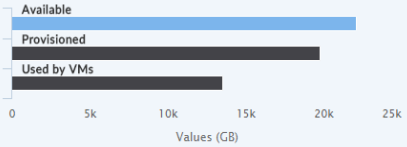
CPU Core Count	CPU Cores Provisioned
72	159
Commit Ratio	
2.21	

Memory



Memory Available	Memory Provisioned
505.98 GB	331.17 GB
Commit Ratio	
0.65	

Storage



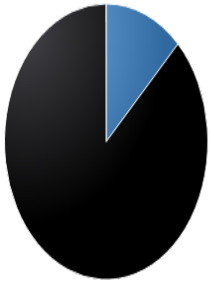
Total Physical Storage	Storage Allocated
21.59 TB	19.30 TB
Commit Ratio	**Storage Used By VMs**
0.89	13.25 TB

View Cost Charts for Public Clouds

AKASIA CLOUD VIEW
Cloud Costs Planning

VIEW SOURCE ASSETS | EDIT SOURCE COSTS | COST MODELLING | Welcome, Gautam

Resource Utilization in $

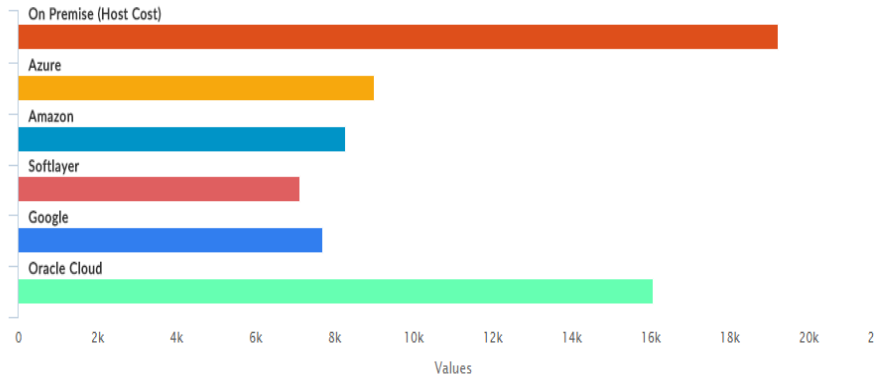


Hosts Total Expenses
$ 19,248.01/mo

VMs Total Expenses
$ 16,845.97/mo

Spare Capacity Savings
$2,402.05/mo

Right Sized Cloud Cost Estimates



Host(s) Monthly Cost	VM Monthly Cost	Spare Capacity
$ 19,248.01	$ 16,845.97	$ 2,402.05
100%	87.52%	12.48%

Spare Capacity Detected - Right-Sizing can save further costs

Akasia has detected 12.48% spare capacity
which can potentially save you $ 2,402.05 monthly costs in the cloud

View Summary Cloud Costs for Candidate VMs

AKASIA CLOUD VIEW
Cloud Costs Planning

VIEW SOURCE ASSETS | EDIT SOURCE COSTS | COST MODELLING | Welcome, Gautam

SELECT CANDIDATES ✓ | COMPARE CLOUD OPTIONS | ADD CLOUD SERVICES | ADD OTHER COSTS | COST MODELLING RESULTS

COMPARE CLOUD OPTIONS

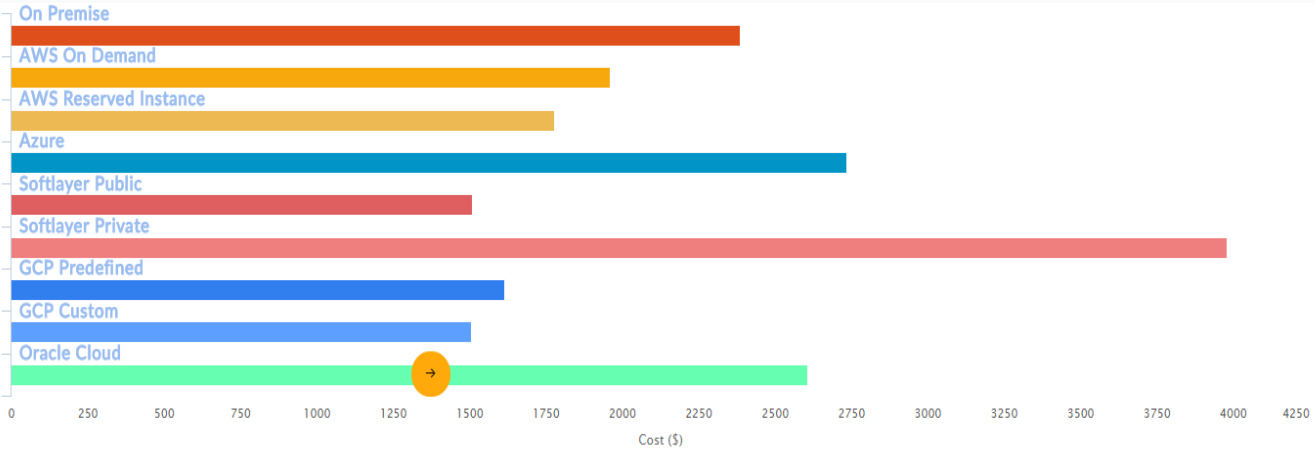
VM Selection Summary — Data Source : AMG_SC2_11_3

18 VMs

vCPUs	Storage	OnPrem CapEx	Total OnPrem Cost
26	8,895.00 GB	$791.39 /mo	$2,388.02 /mo
CPU Cycles	**Memory**	**OnPrem OpEx**	
97.99 GHz	43.00 GB	$1,596.63 /mo	

Details

- CUMULATIVE TOTAL COST
- SAVING - ON PREMISE VS ON CLOUD
- COMPUTE COSTS
- STORAGE COSTS
- NETWORK COSTS
- I/O COSTS



View Detailed Cloud Costs for Candidate VMs

AKASIA CLOUD VIEW
Cloud Costs Planning

VIEW SOURCE ASSETS | EDIT SOURCE COSTS | COST MODELLING | Welcome, Gautam

SELECT CANDIDATES ✓ | COMPARE CLOUD OPTIONS | ADD CLOUD SERVICES | ADD OTHER COSTS | COST MODELLING RESULTS

Estimated Cloud Monthly Costs

	Network Cost	I/O Cost	Storage Cost	Compute Cost	Total Cost	Right Sized Savings
On Demand amazon web services	$365.23	$0.00	$889.50	$708.58	$1,963.30	$186.33
RIGHT SIZED COSTS			Storage Cost $903.96	Compute Cost $507.79	Right Sized Total Cost $1,776.98	
Reserved Instance amazon web services	$365.23	$0.00	$889.50	$524.07	$1,778.80	$136.31
RIGHT SIZED COSTS			Storage Cost $903.96	Compute Cost $373.30	Right Sized Total Cost $1,642.49	
Microsoft Azure	$352.66	$6.01	$198.87	$2,177.70	$2,735.24	$1,336.22
RIGHT SIZED COSTS			Storage Cost $201.48	Compute Cost $838.87	Right Sized Total Cost $1,399.02	
SOFTLAYER	Network Cost	I/O Cost	Storage Cost	Compute Cost	Total Cost	

SELECT THIS CLOUD

Summary

- Plan your Cloud migration strategy
- Understand all the Cloud infrastructure components
- Understand all the Cloud infrastructure costs
- Capture data from both the Cloud provider and application servers
- Continually monitor
- Centralized CMIS

Questions?

Leading the way in
360º Capacity Management