knowledge17

WORK at LIGHTSPEED™

BRE4101: AWS & VMware – Architecting Hybrid Cloud Environments

ZAKI BAJWA
SR DIRECTOR – ITOM SOLUTION ARCHITECTS
ServiceNow, Inc.

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Agenda

- Hybrid Cloud Requirements
- ServiceNow Cloud Management
- Customer Use Cases and Solutions
- PTC – AWS Case Study
- Solution Showcase
- Q&A

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Speaker Introduction



NAME: Zaki Bajwa

TITLE: Sr Director ITOM Solution Architects

FUNCTION: ITOM

COMPANY: ServiceNow

EXPERIENCE: 2 years at ServiceNow, 18 years in ITOM industry. Over 200+ clients consulted

EXPERTISE: 10 Years of software consulting with over 200+ clients. All verticals, understanding business problems and helping solve them through innovative cloud and automation solutions. 7+ years on Wall Street designing and managing high scale, high performance, low latency applications

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Session Overview



Objectives

- Get best practices and real-world examples on how customers are using our CMP solution to manage a Hybrid Cloud environment. Showcase the cloud operating model and how it is is fundamentally changing the typical approach of Change & Release, CMDB, etc., and while different, still very much a necessary framework for IT to operate to reduce risk and effectively deliver and manage services, while increasing velocity and agility.



What You Will Learn

- What is a Common Cloud Operating Model
- How CMP is solving customer challenges around cost, asset, compliance.
- Processing events into actionable alerts
- Q & A

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Customer Requirements for Hybrid Cloud

Management
Operations and Governance

Self-Service
Catalog / Infra As Code

Cost Management
Reporting and Optimization



Service Management and 3rd party Integration

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ServiceNow Cloud Management

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Cloud Management Differentiation

- Business Management
  - Application management dashboard
  - Pipeline Management
  - Line of Business Demand
- Cloud Management
  - Self Service Automation Day 1 (aws, azure, vmw)
  - Governance, control & financial management
  - Automating Process & Technology on the same platform
  - DevOps Dashboard
- Operations Intelligence
  - “Service Health” Management Ongoing

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Common Operating Model: Hybrid Cloud Use Cases



Service Management:

Incident, Problem, Change, Config Management



Cost Management & Reporting:

Cost Analytics and Reporting, Resource Optimization



Agility: Self-Service Catalog

Automate service requests



Agnostic

Avoid lock-in, maintain workload portability



Visibility & Control

Manage SLAs and ensure business and service management



Lifecycle Automation

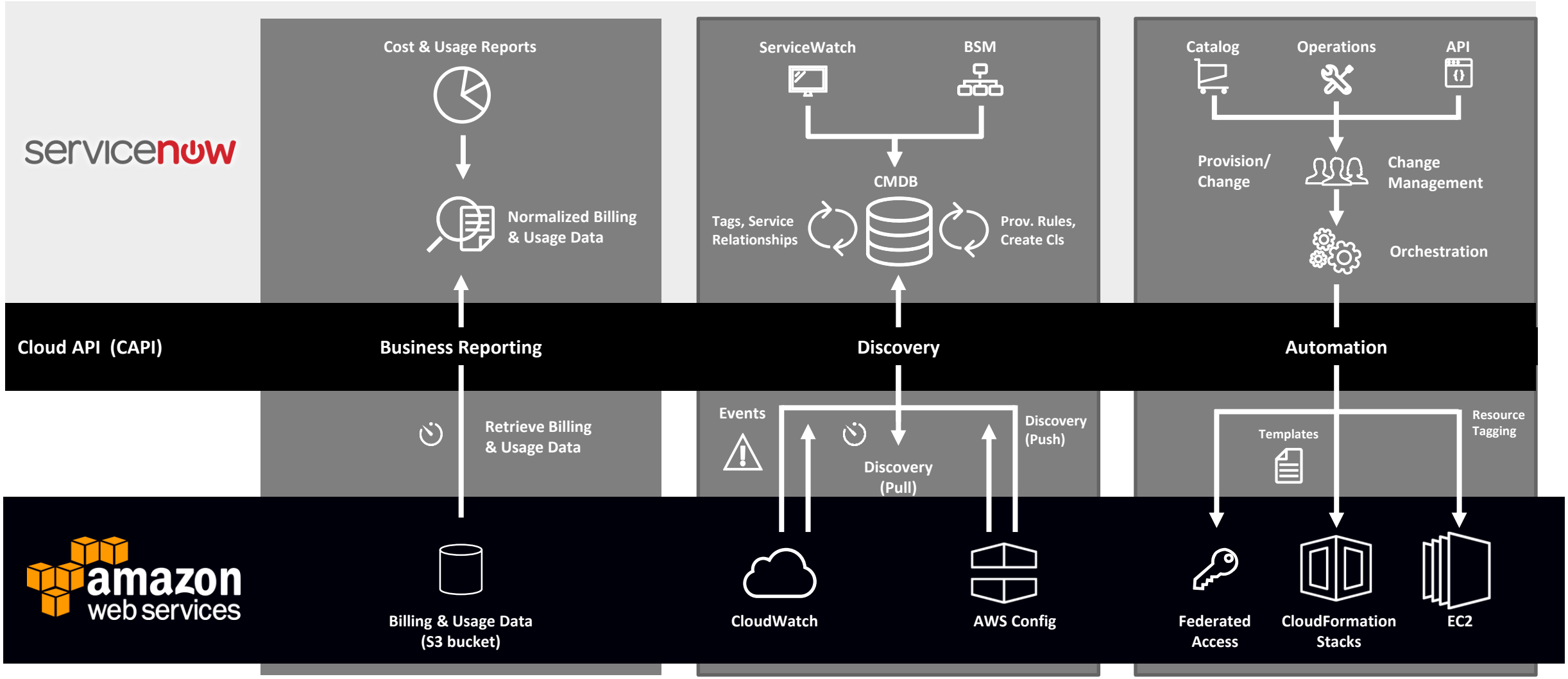
Configure, monitor, scale, alert, patch, release, decommission



Governance & Compliance: Control, secure and audit cloud access and application changes

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ServiceNow and AWS Integration Architecture



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Customer Examples

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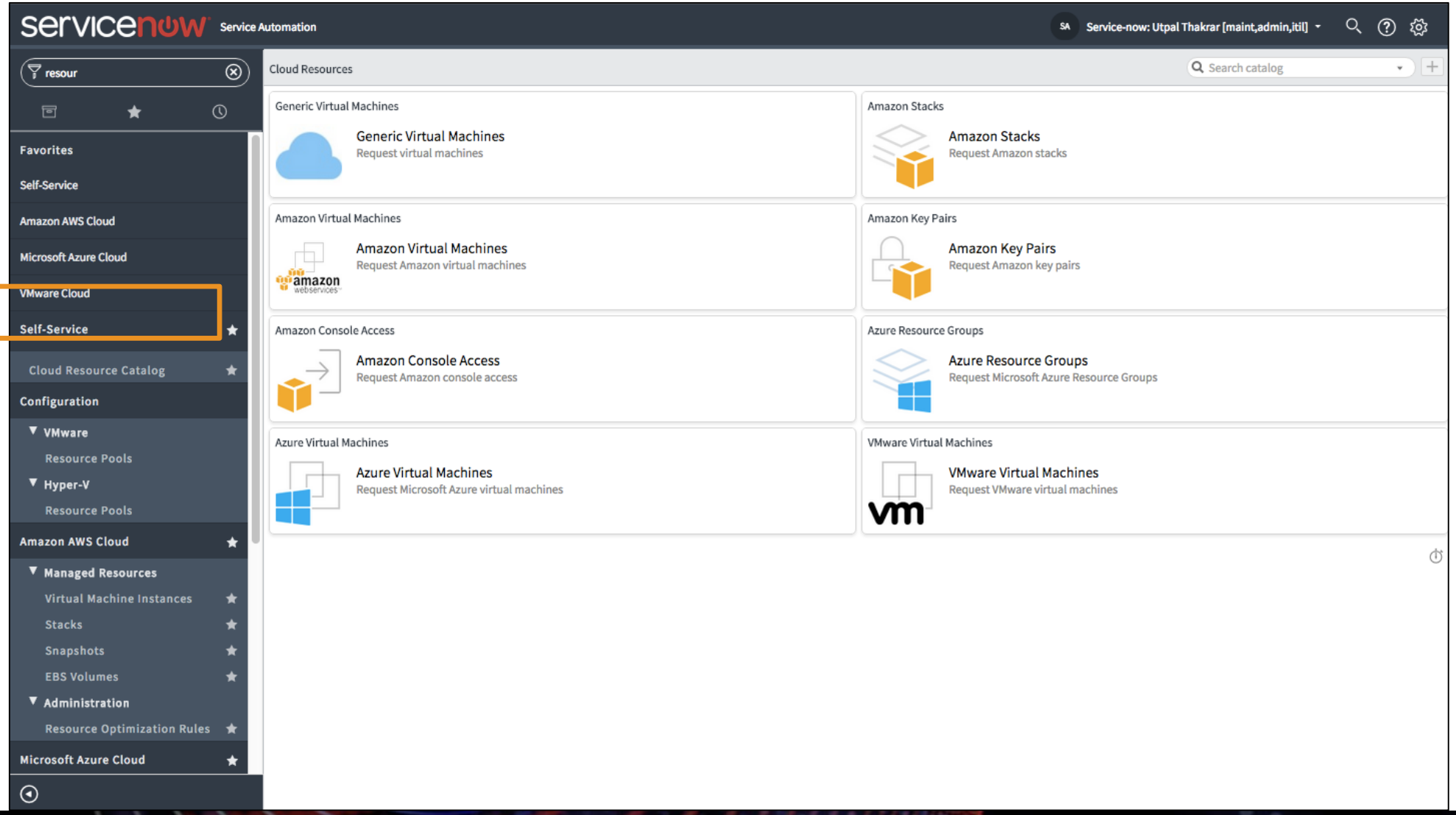
Customer Examples

1. Asset inventory
2. Cost Management
3. Policy & Compliance
4. Future capacity planning

+ Many more detail capabilities

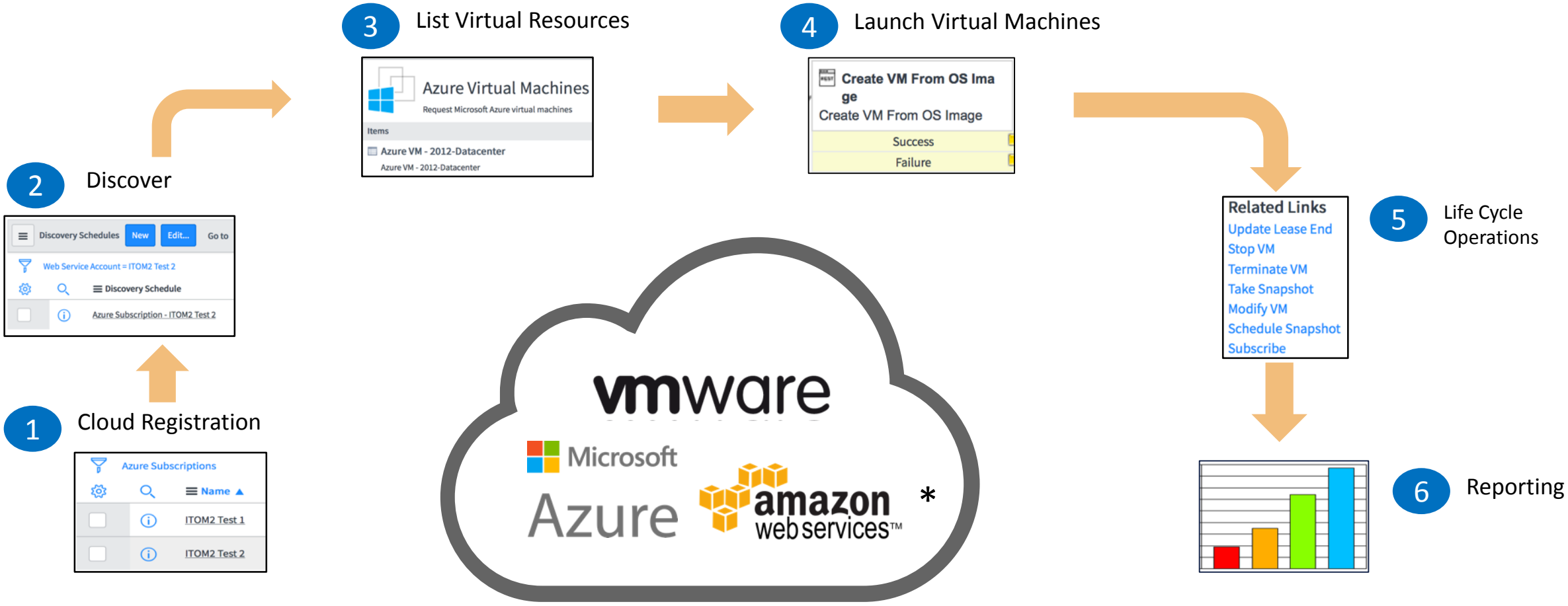
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A Single Pane of Glass to Consume / Manage Cloud Resources



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Common Operations on VMWare, Microsoft Azure and AWS



ServiceNow currently supports *Azure*, *AWS* and *VMware*. With the ServiceNow Jakarta release we're looking into also supporting SoftLayer, Azure Stack, OpenStack and Oracle cloud

*AWS follows a similar flow as Azure

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Out of the Box Functionality at a Glance

vmware

vSphere Server

Life-cycle Operations
- **Add Disk**
- **Change Network**
- **Change State**
- **Check VM Alive**
- **Clone (Live or Template)**
- **Configure Linux**
- **Configure Windows**
- **Destroy**
- **Reconfigure (CPUs & Memory)**
- **Revert to Snapshot**
- **Snapshot**
- **Get VM event**
- **Get Guest Information**
- **Delete Snapshot**

Visibility:
- Discover Guest Customization
- Discover Customization Specifications

Intelligent Placement:
- **Cluster Finder/Reservation**
- **Multi vCenter Support**
- **VM sizing**
- **Multi disk**
- **Add/Remove Network Interface**

amazon web services™

Amazon EC2

- **Change State**
- **Describe Images**
- **Describe Instances**
- **Describe KeyPairs**
- **Describe Regions**
- **Run Instances**
- **Terminate Instances**
- **Activities use REST API**
- Create Tags (deprecated Create Tag)
- Create Volume
- Delete Snapshot EC2
- Delete Tags
- Describe Resources
- Describe Tags
- Execute EC2 Action
- Instance Volume
- Snapshot EC2
- *Note: Technically we deprecated all of them and rewrote even the ones not listed here but they have the same names*

Amazon PaaS Integration

- CloudWatch
- Download Billing Report
- Execute CloudFormation Action
- Execute CloudFormation Post Action
- Execute Security Token Service Action
- File UploadDownload Linux
- File UploadDownload Windows
- Query AWS

Numerous Workflows exist as well e.g.
- AWS Security Token Request
- VM Snapshot Schedule

Microsoft Azure

Azure Resource Manager (ARM)

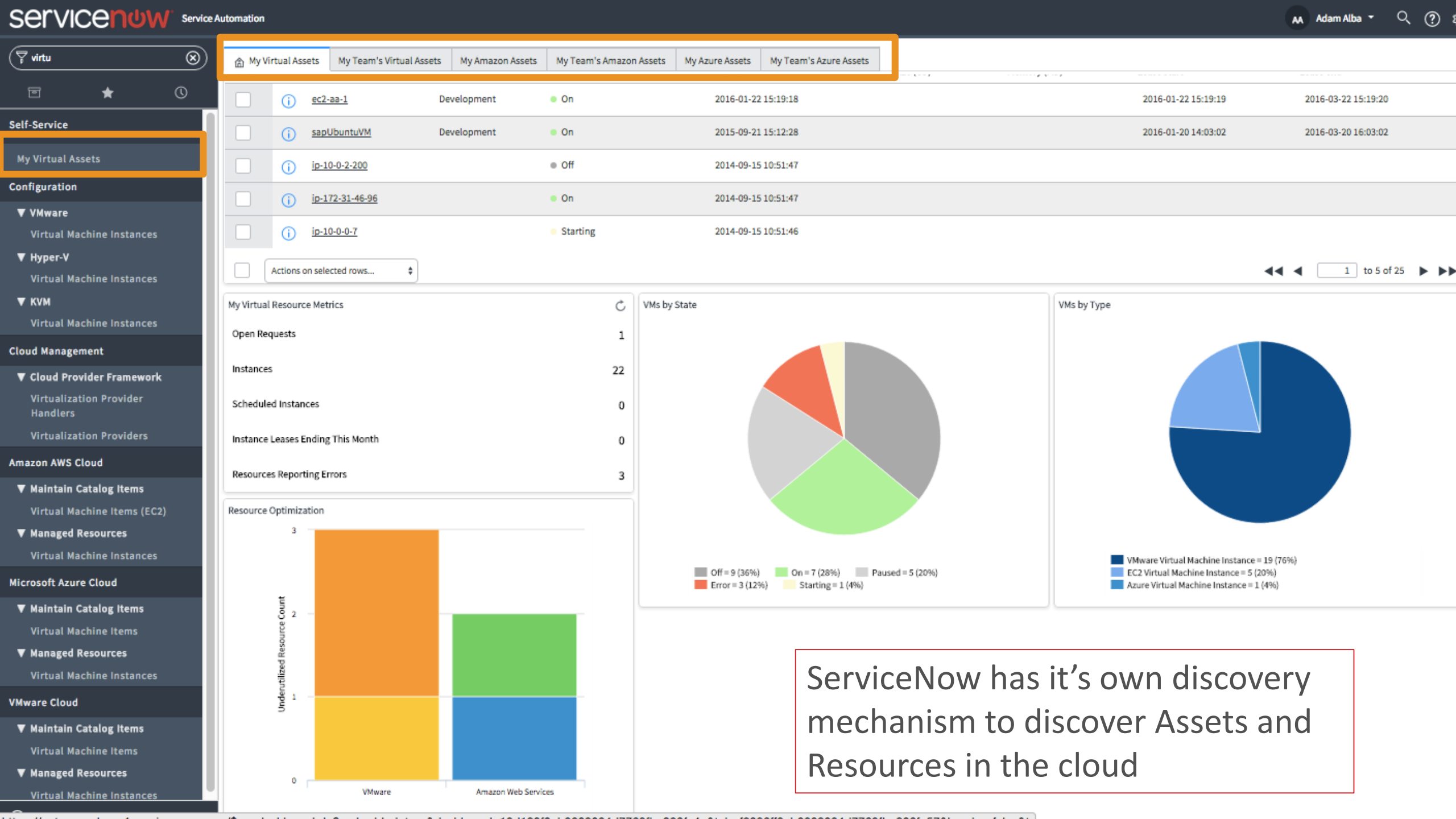
- Provision VM
- Resource Group Deployment
- Snapshot
- Change VM Size
- Get Template Deployment
- Get Resource Group Status
- Put snapshot
- Create VM from OS image
- Get Template Deployment Operations
- Template Deployment Validation
- Get Resources in Resource Group
- VM CRP Delete Operation
- Create Resource Group
- Fetch Authorization Token
- Delete Snapshot
- VM CRP Start/Stop Operation
- Terminate Resource Group
- Describe VM Instance
- Deploy ARM Template
- Describe VM Model

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Cloud Asset Inventory Examples

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servicenow Service Automation
Adam Alba
virtu
Self-Service
My Virtual Assets
Configuration
VMware
Virtual Machine Instances
Hyper-V
Virtual Machine Instances
KVM
Virtual Machine Instances
Cloud Management
Cloud Provider Framework
Virtualization Provider Handlers
Virtualization Providers
Amazon AWS Cloud
Maintain Catalog Items
Virtual Machine Items (EC2)
Managed Resources
Virtual Machine Instances
Microsoft Azure Cloud
Maintain Catalog Items
Virtual Machine Items
Managed Resources
Virtual Machine Instances
VMware Cloud
Maintain Catalog Items
Virtual Machine Items
Managed Resources
Virtual Machine Instances
My Virtual Assets
My Team's Virtual Assets
My Amazon Assets
My Team's Amazon Assets
My Azure Assets
My Team's Azure Assets
ec2-aa-1 Development On 2016-01-22 15:19:18 2016-01-22 15:19:19 2016-03-22 15:19:20
sapUbuntuVM Development On 2015-09-21 15:12:28 2016-01-20 14:03:02 2016-03-20 16:03:02
ip-10-0-2-200 Off 2014-09-15 10:51:47
ip-172-31-46-96 On 2014-09-15 10:51:47
ip-10-0-0-7 Starting 2014-09-15 10:51:46
Actions on selected rows...
1 to 5 of 25
My Virtual Resource Metrics
Open Requests 1
Instances 22
Scheduled Instances 0
Instance Leases Ending This Month 0
Resources Reporting Errors 3
VMs by State
Off = 9 (36%)
On = 7 (28%)
Paused = 5 (20%)
Error = 3 (12%)
Starting = 1 (4%)
VMs by Type
VMware Virtual Machine Instance = 19 (76%)
EC2 Virtual Machine Instance = 5 (20%)
Azure Virtual Machine Instance = 1 (4%)
Resource Optimization
Underutilized Resource Count
VMware
Amazon Web Services
ServiceNow has it's own discovery mechanism to discover Assets and Resources in the cloud

my vir

Favorites
Self-Service
My Virtual Assets
Self-Service
My Virtual Assets

My Virtual Assets | My Team's Virtual Assets | My Amazon Assets | My Team's Amazon Assets | My Azure Assets | My Team's Azure Assets

AWS Console Access

Request a new token

Select Catalog Item

My Amazon Virtual Resource Metrics

Amazon Instances	2
EBS Volumes	1
EBS Snapshots	0
Stacks	1
Scheduled Stacks	0
ELBs	1
VPCs	0
Subnets	0
VPC Security Groups	0

Resources by Class



EC2 Virtual Machine Instance = 2 (50%)
AWS Auto Scaling Group = 1 (25%)
AWS Elastic Load Balancer = 1 (25%)

Stacks by Status



Create Complete = 1 (100%

Resource Optimization

Cannot generate chart: No matching records

My CloudFormation Stacks

Stack name	Updated	Stack status	Description
AutoScaling-Policy-Demo	2016-01-23 14:47:06	Create Complete	AWS CloudFormation Sample Template AutoS...

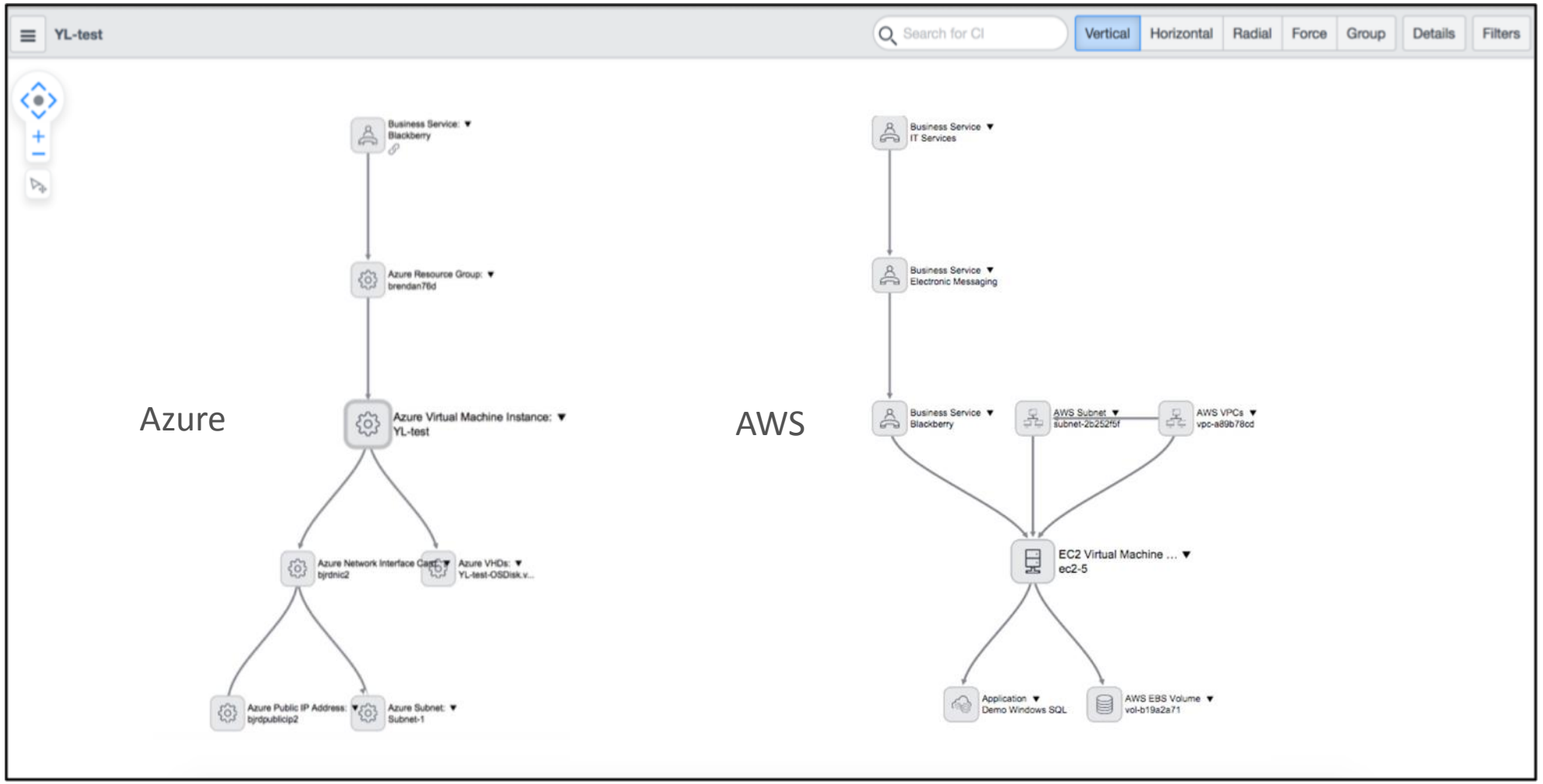
Actions on selected rows... 1 to 1 of 1

My CloudFormation Stack Requests

Number	Catalog	Item	Approval	Quantity	Stage
RITM0010015		AutoScaling Policy using Cloud Formation	Approved	1	

https://autoappsdemo4.service-now.com/$pa_dashboard.do?embedded=true&dashboard

Discovered VM’s and Resources + Relationships



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Cloud Consumption Examples

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Filter navigator

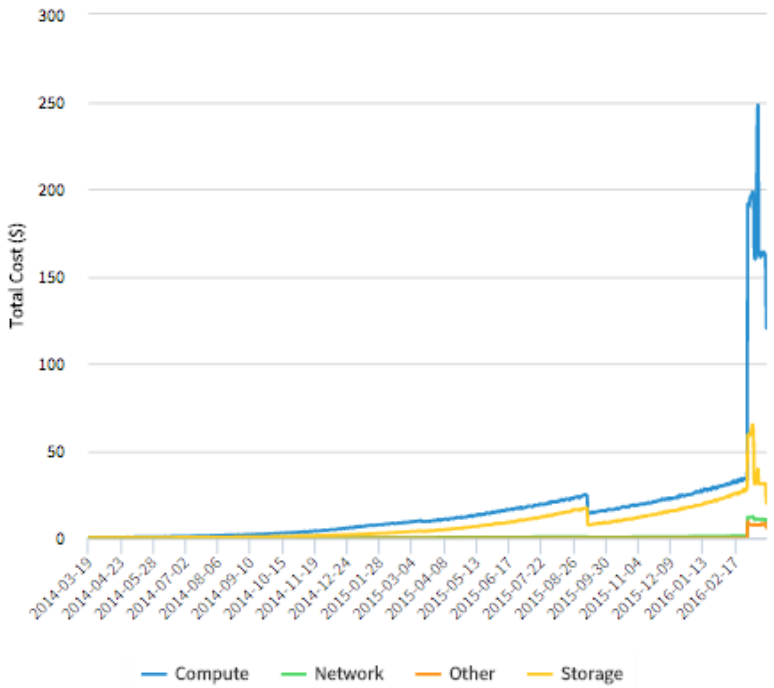
Self-Service
My Requests
Requested Items
Cloud Management
Cloud Admin Portal
Cloud Operations Portal
Administration
Tags
Reports
Cost & Usage Reports
Microsoft Azure Cloud
Amazon AWS Cloud
VMware Cloud
System Logs
Edit Favorites

Cost Report | Compute Usage | Network Usage | Storage Usage

Total Cost ($)

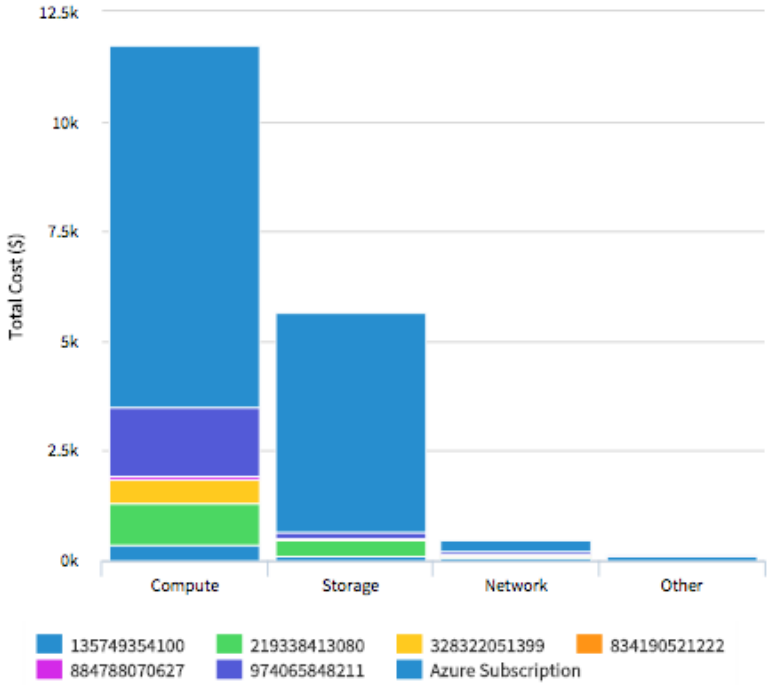
18,023.16

Cost Trend Over Time



Group by Category

Cost Aggregate



Group by Category Stacked by Account

Time Range: All

Cloud Provider: All

Account: All

Region: All

Application: All

Business Service: All

Cost Center: All

Project: All

User Name: All

Filter navigator

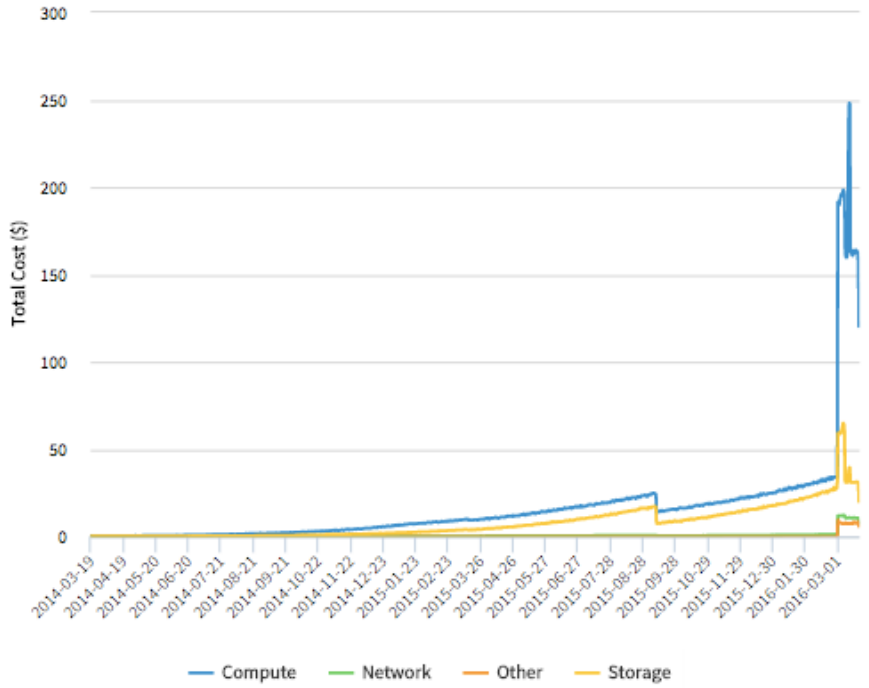
Self-Service
My Requests
Requested Items
Cloud Management
Cloud Admin Portal
Cloud Operations Portal
Administration
Tags
Reports
Cost & Usage Reports
Microsoft Azure Cloud
Amazon AWS Cloud
VMware Cloud
Configuration
Maintain Catalog Items
Sizes
Offerings
Edit Favorites

Cost Report | Compute Usage | Network Usage | Storage Usage

Total Cost ($)

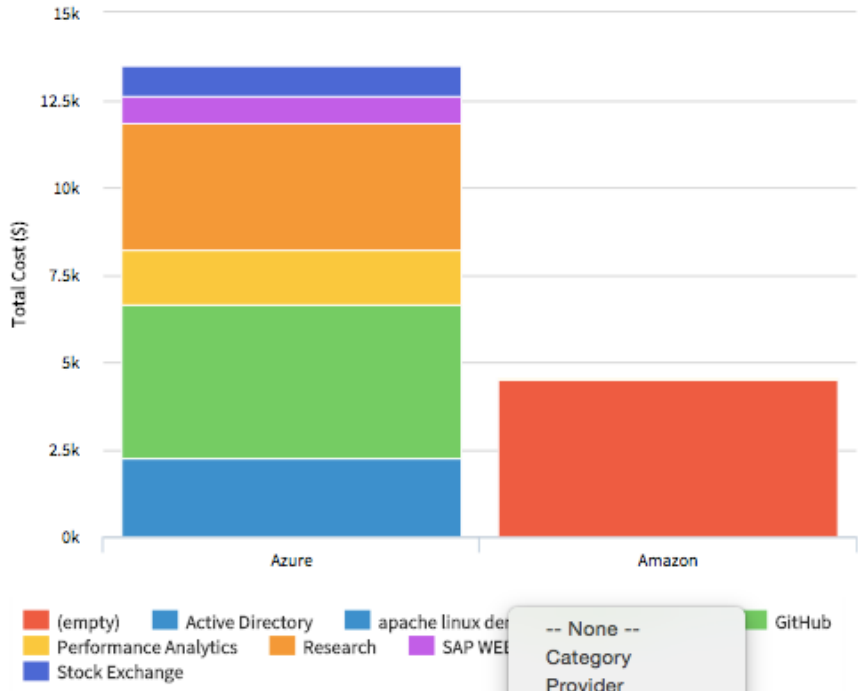
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Cost Trend Over Time



Group by Category

Cost Aggregate

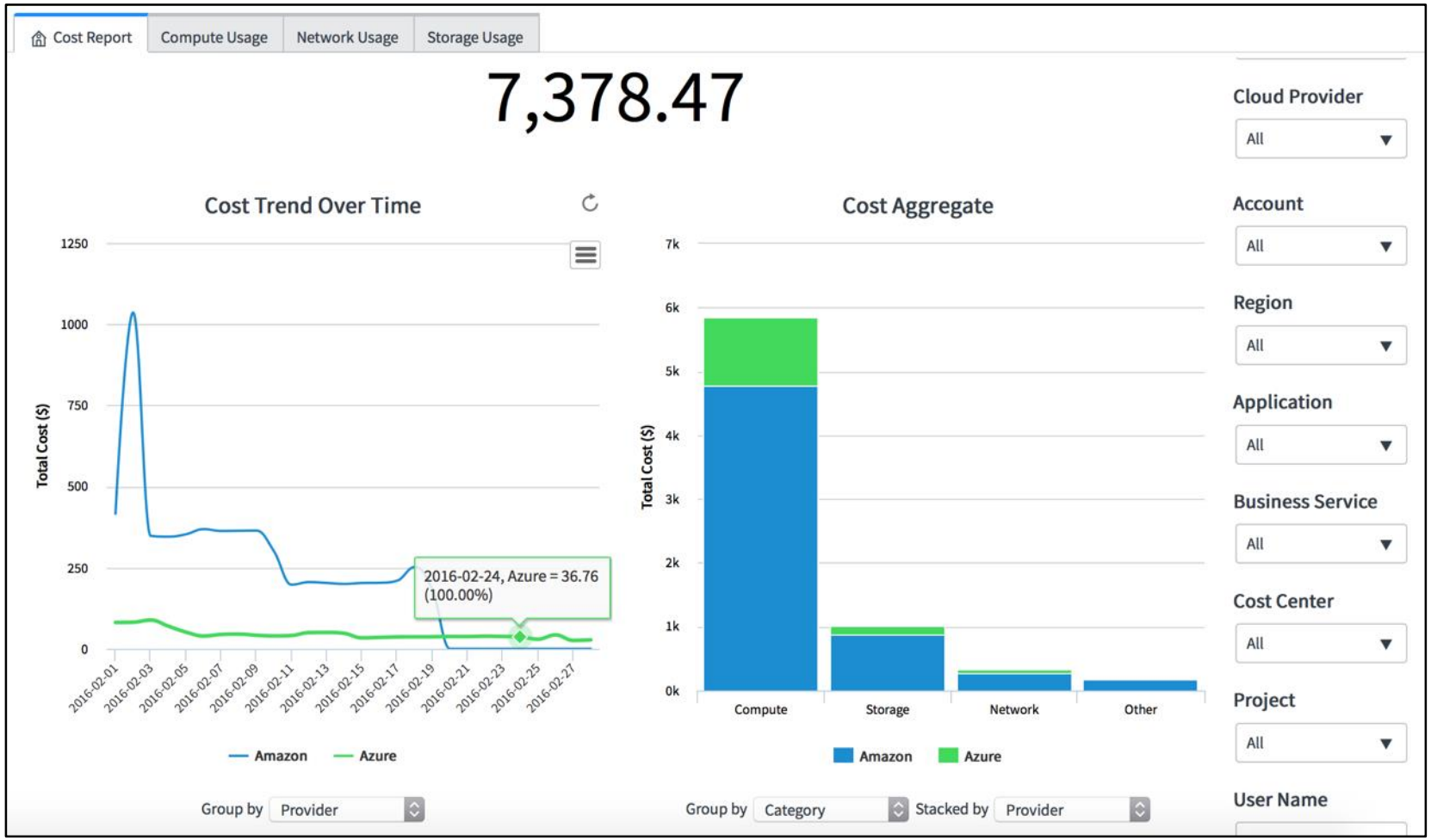


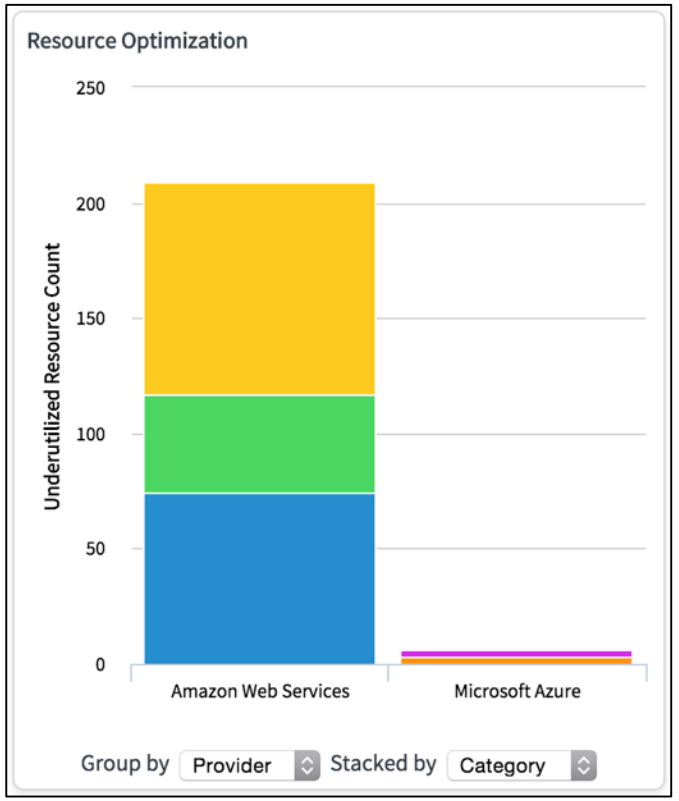
Group by Provider Stacked b

-- None --
Category
Provider
Account
✓ Application
Business Service
Cost Center
Project
Region
User Name

Time Range: All
Cloud Provider: All
Account: All
Region: All
Application: All
Business Service: All
Cost Center: All
Project: All
User Name: All

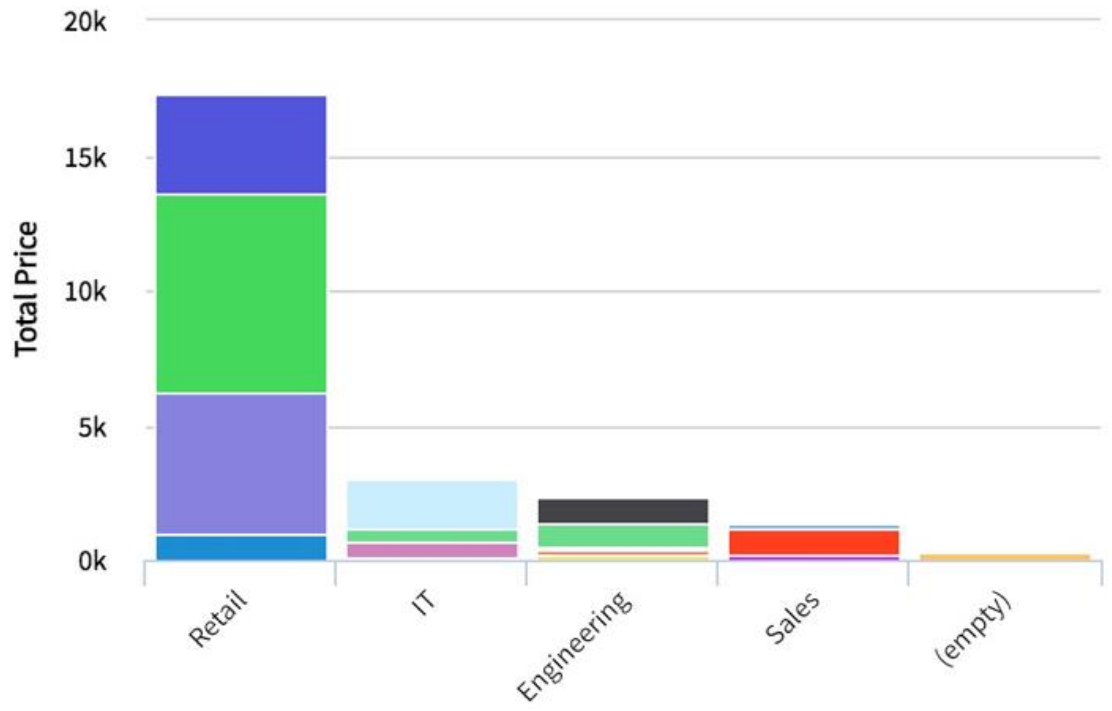
Combined Cost and Usage Reports





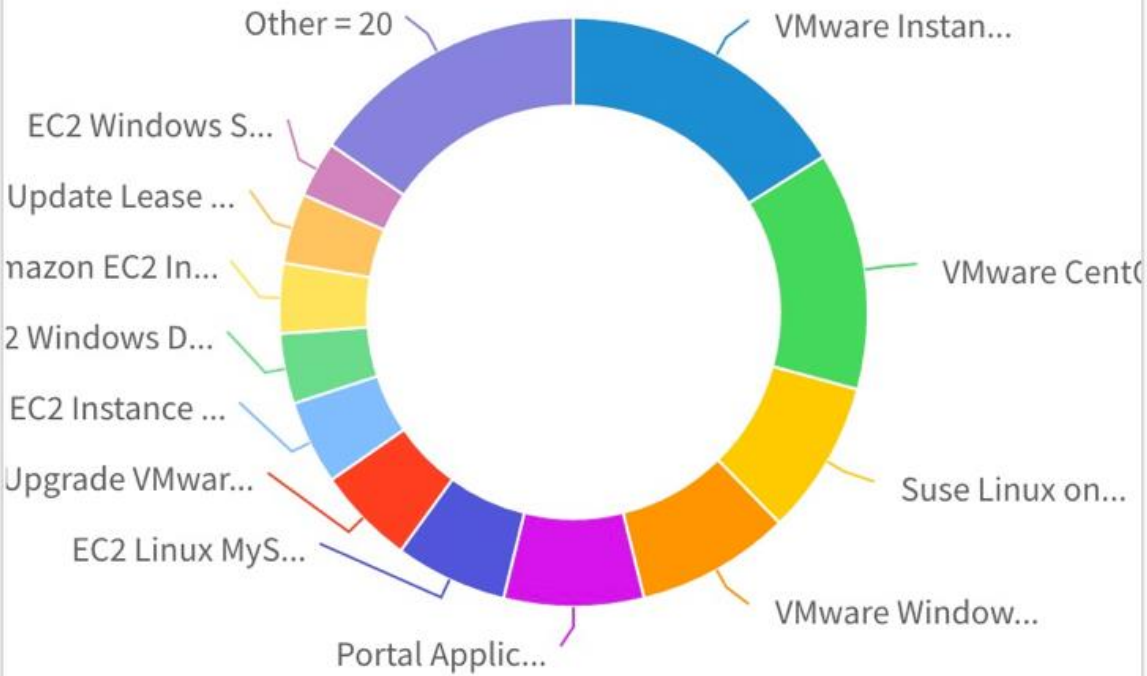
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Virtualization Chargeback



EC2 Windows Development
EC2 Windows SQL Server
Active Directory uses existing VPC with private subnet
1/5

Service Catalog Virtual Requests by Type



VMware Instance = 21 (16.15%)
VMware CentOS Webserver = 17 (13.08%)
1/6

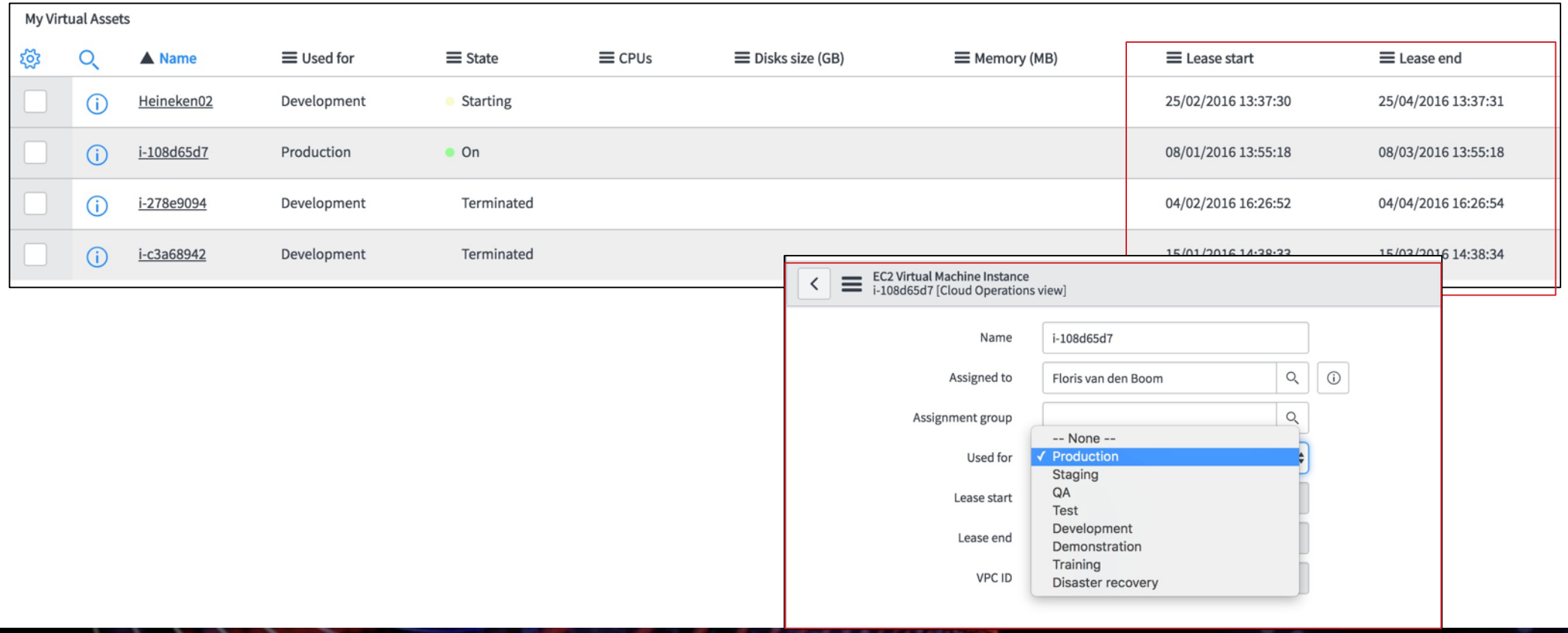
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Compliance Examples

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Cloud Compliance

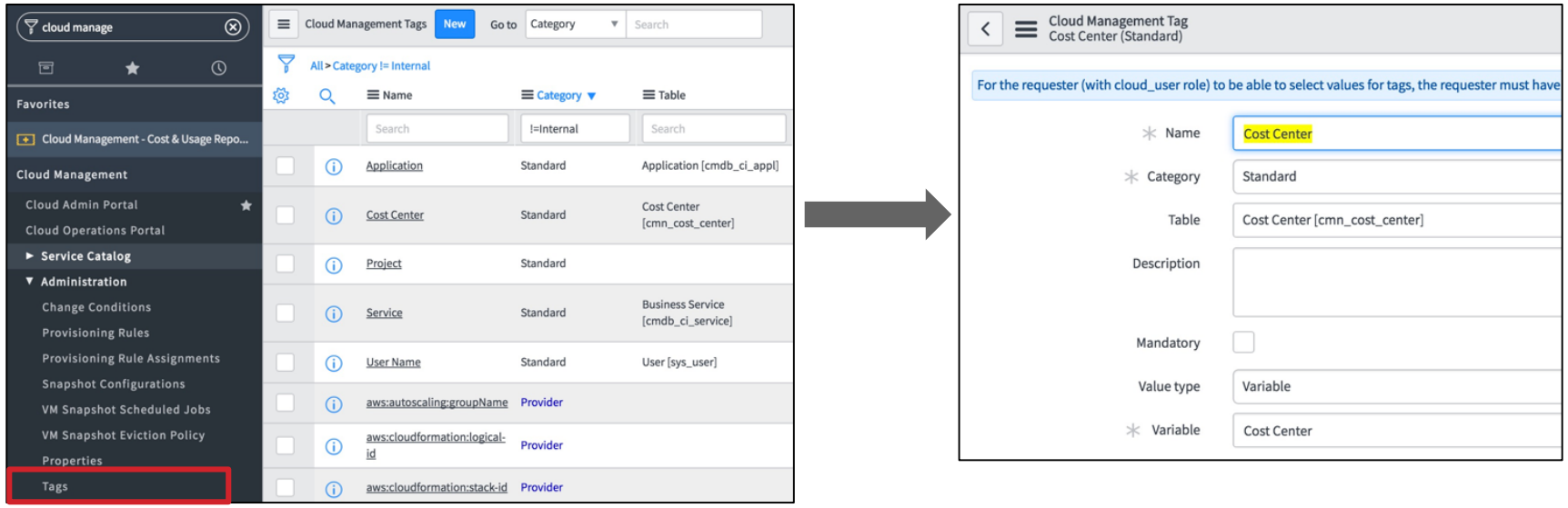
- ServiceNow knows which Virtual Machines are running at a specific time and what the VM is used for (Dev, Test, Prod..). This allows us to report on, and proactively notify, should VM's with a specific state be running outside of pre-set criteria



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Cloud Compliance – Tags

- Tags can be used to track Cloud Resources in multiple ways, for example:
  - Ownerships
  - Cost management
  - Business service/application relationships
  - Audit and compliance
  - Reduce account/subscription proliferation



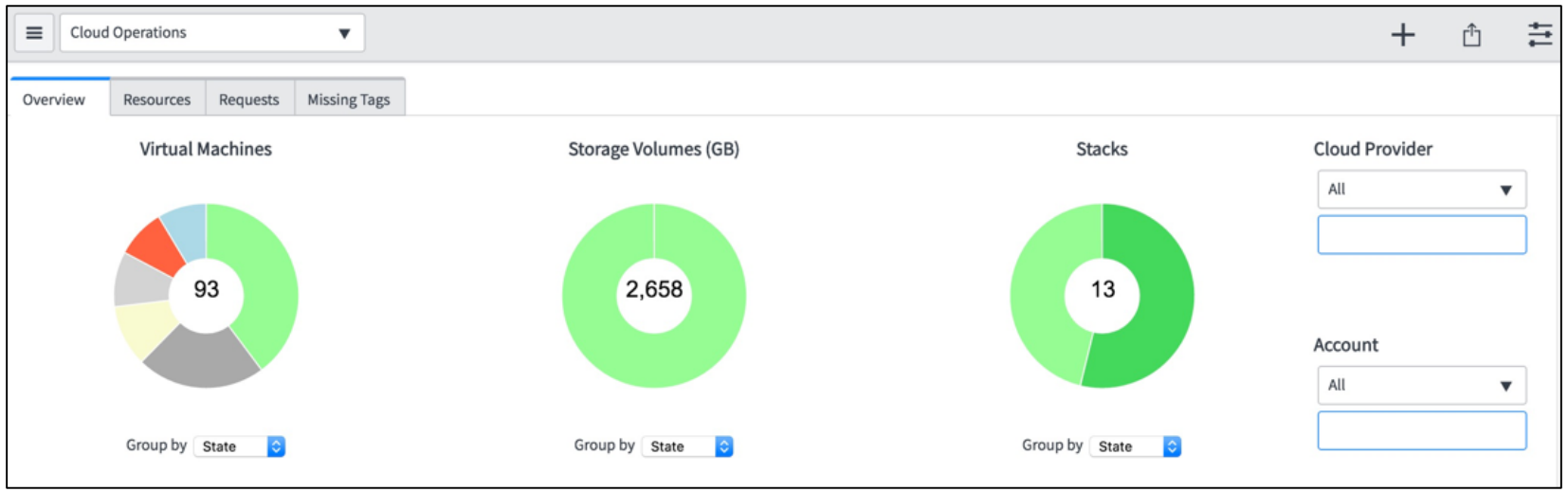
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Capacity Planning Examples

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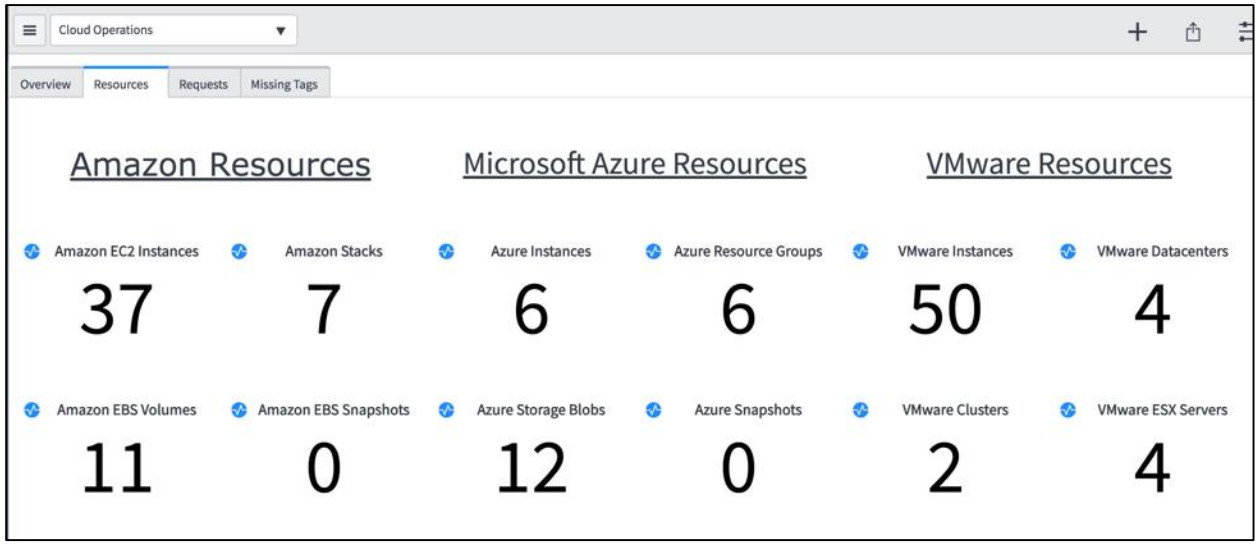
Capacity Planning

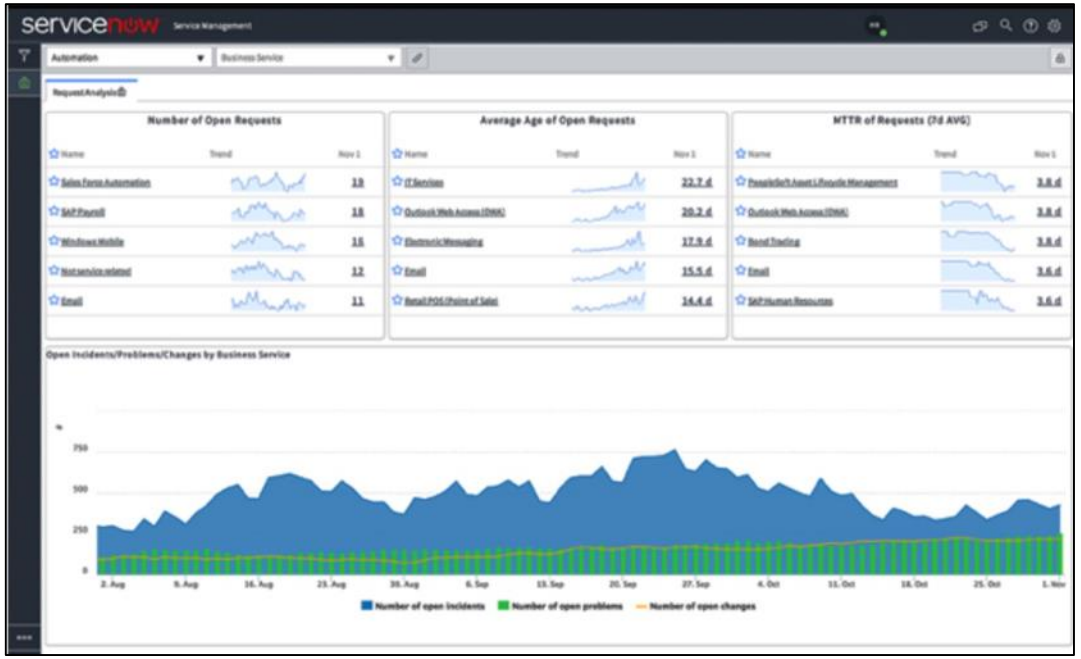
- ServiceNow Performance Analytics provide secure, simple access to key performance indicators (KPIs) and metrics that enable you to be proactive about improving business services
- Stakeholders receive actionable insights to drive efficiency and reduce costs. Using the Cloud Management metrics one can see how many VM's and resources have been used in the past and extrapolate this trend to see what the capacity needs in the future will be



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Capacity Planning





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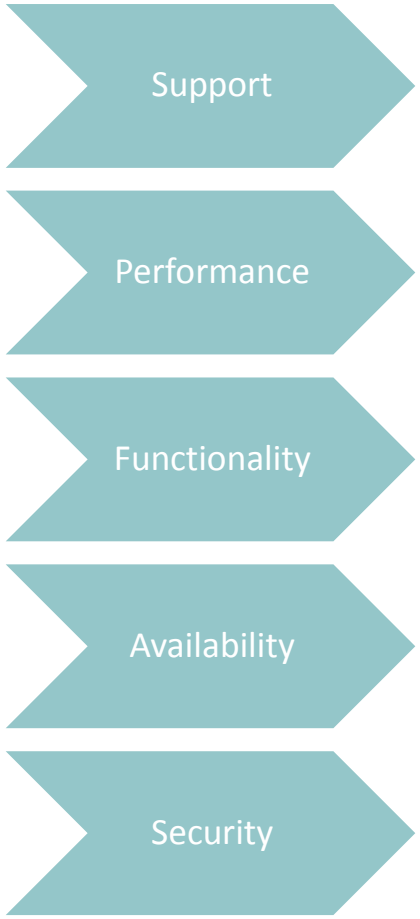


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PTC Cloud Services

ADVOCATE FOR CUSTOMER



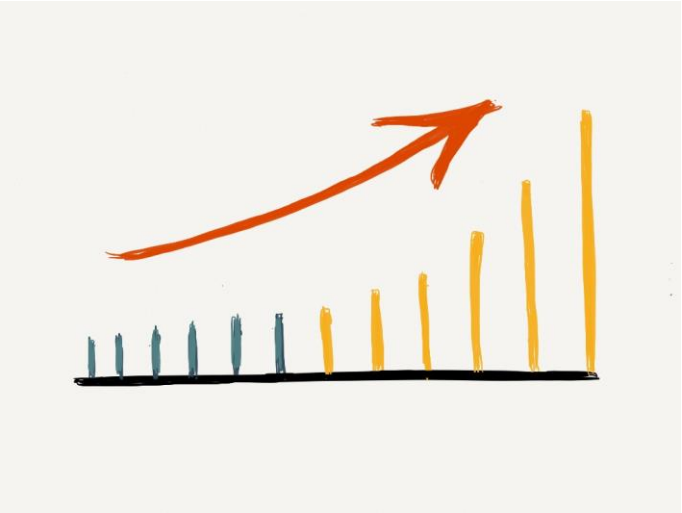
DELIVER CUSTOMER TRANSFORMATION

OPERATIONAL EXCELLENCE



DELIVER ON QUALITY STANDARDIZATION AND SCALABILITY

SUPPORT BOOKINGS AND REVENUE PLANS



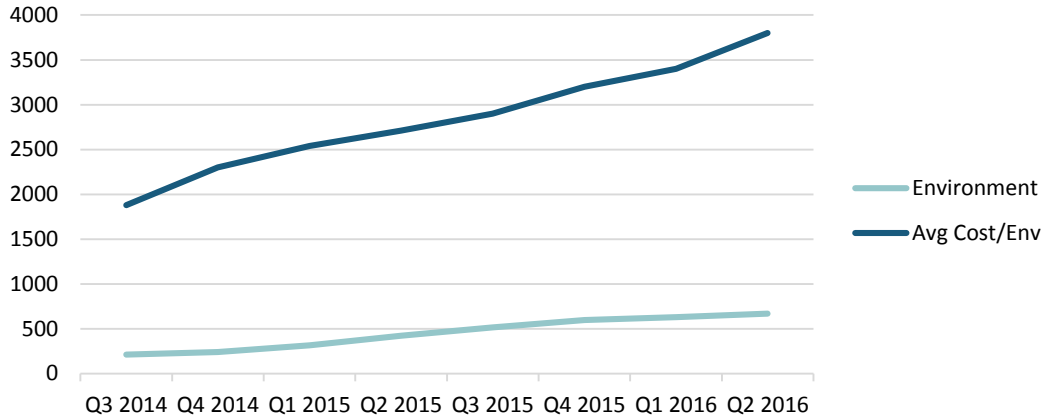
DELIVER ON MARGIN AND SHAREHOLDER VALUE

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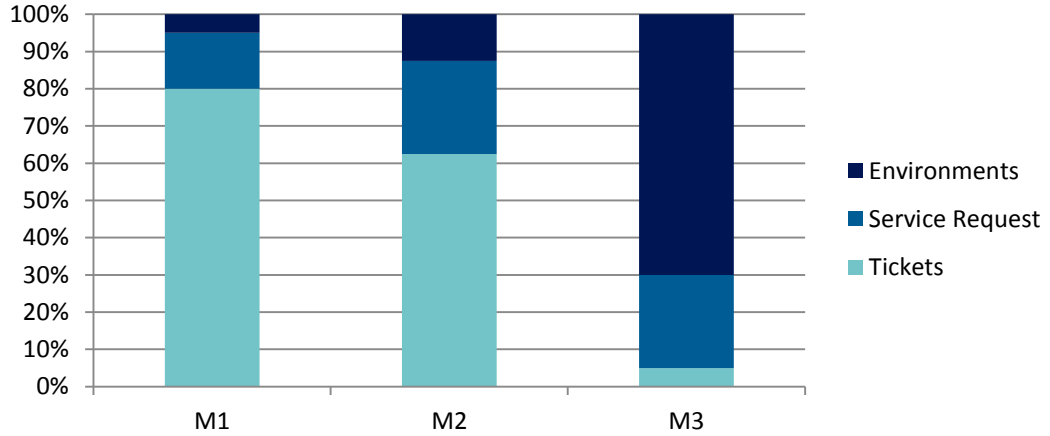
Expansion Challenges

- No Control over AWS Cost
- Focus Strictly on Growth & Delivery
- Rapid Environment Deployments
- Unbalanced Task Distribution

Average Cost per Instance – Total Environments vs Average Cost

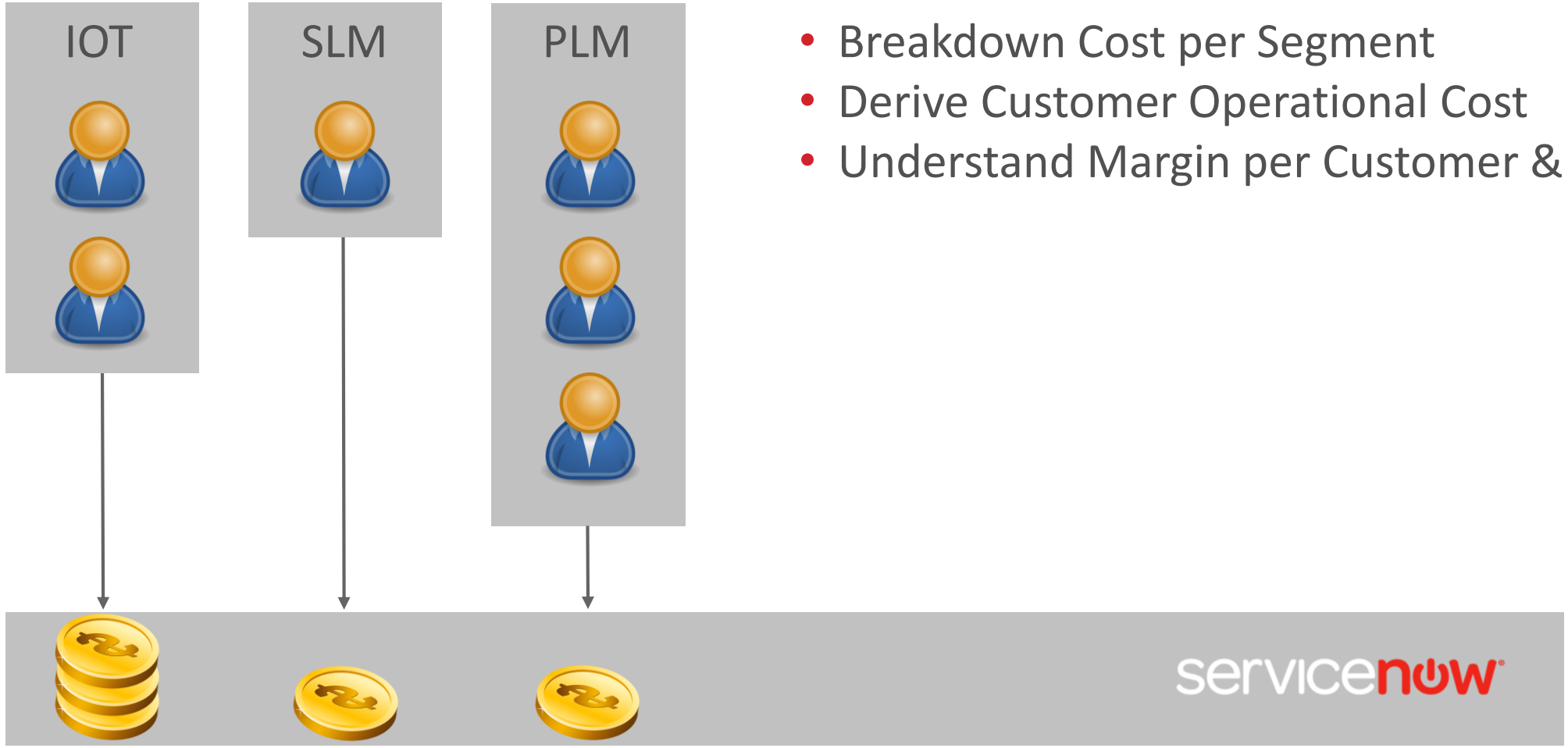


Quarterly Cycle of Escalations - Tickets vs Environment Deployments



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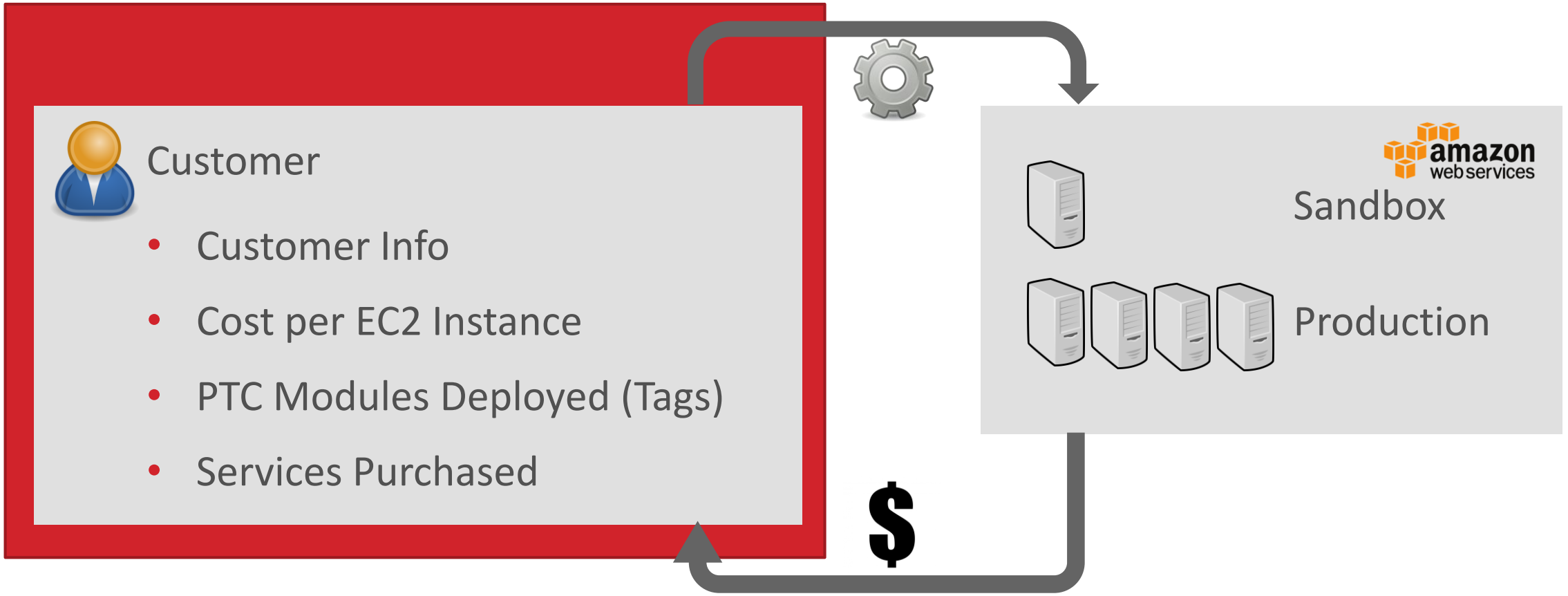
Understanding AWS Spend



- Breakdown Cost per Segment
- Derive Customer Operational Cost
- Understand Margin per Customer & Segment

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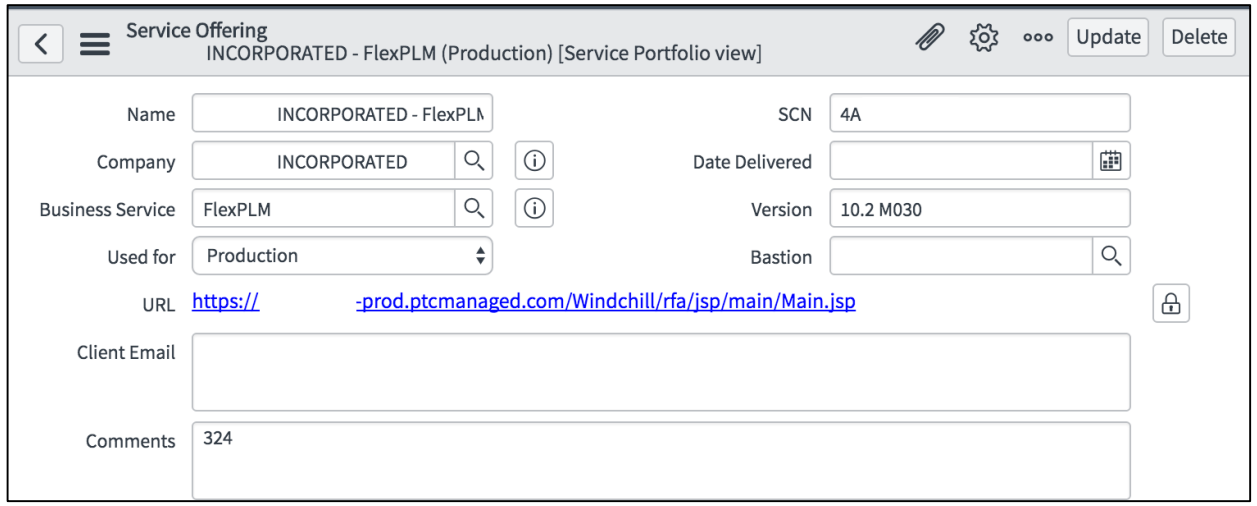
Cost per Customer

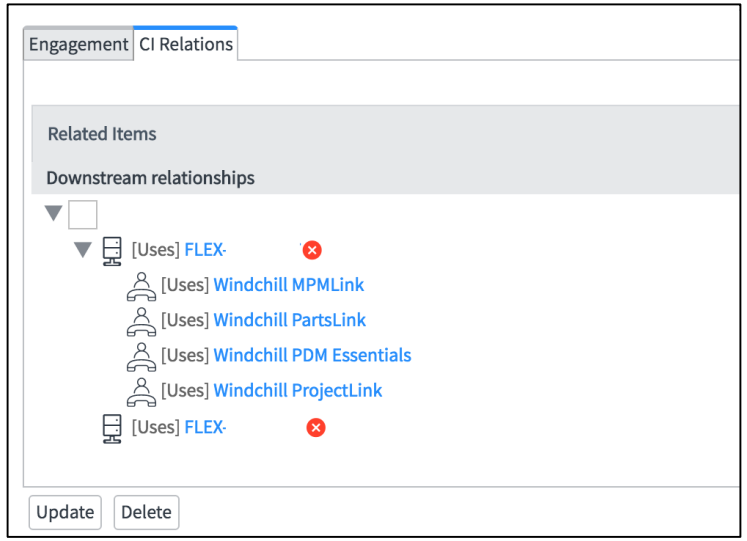


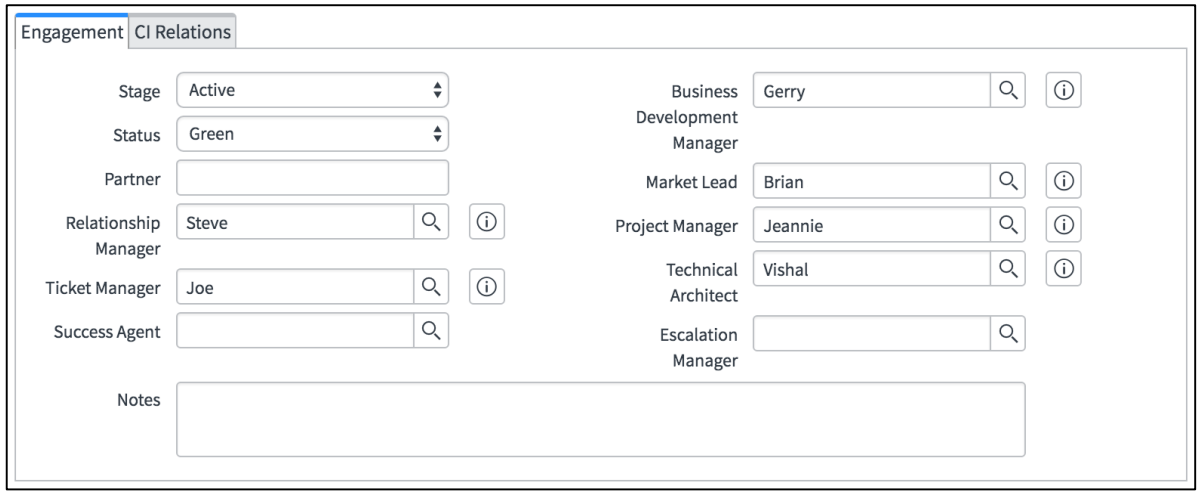
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Customer Tracking

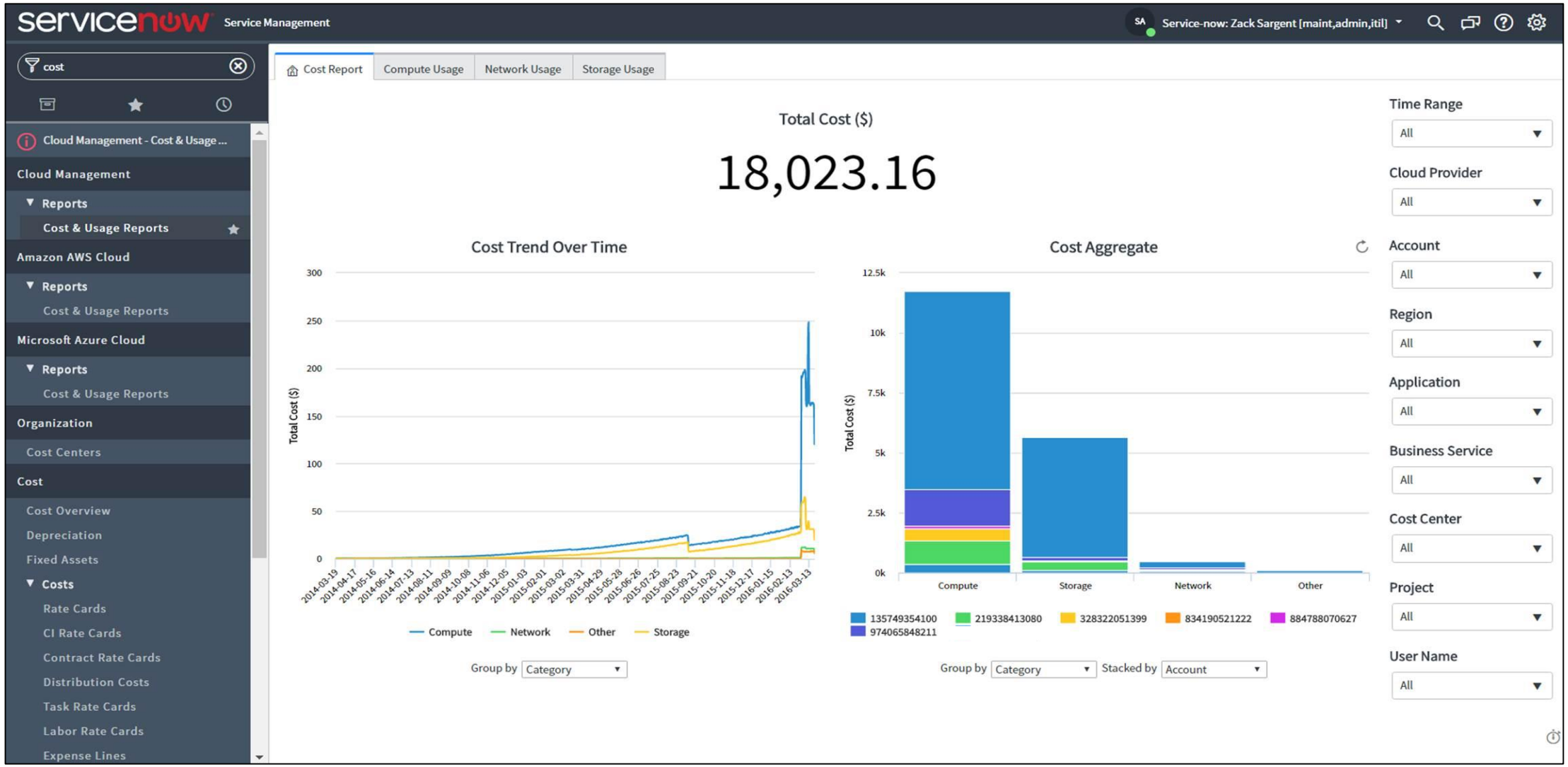






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Cost / Customer



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Monitoring Platform

PTC Cloud (AWS)

ThingWorx IoT Platform

PTC Windchill® flexPLM

SERVIGISTICS™



ZABBIX

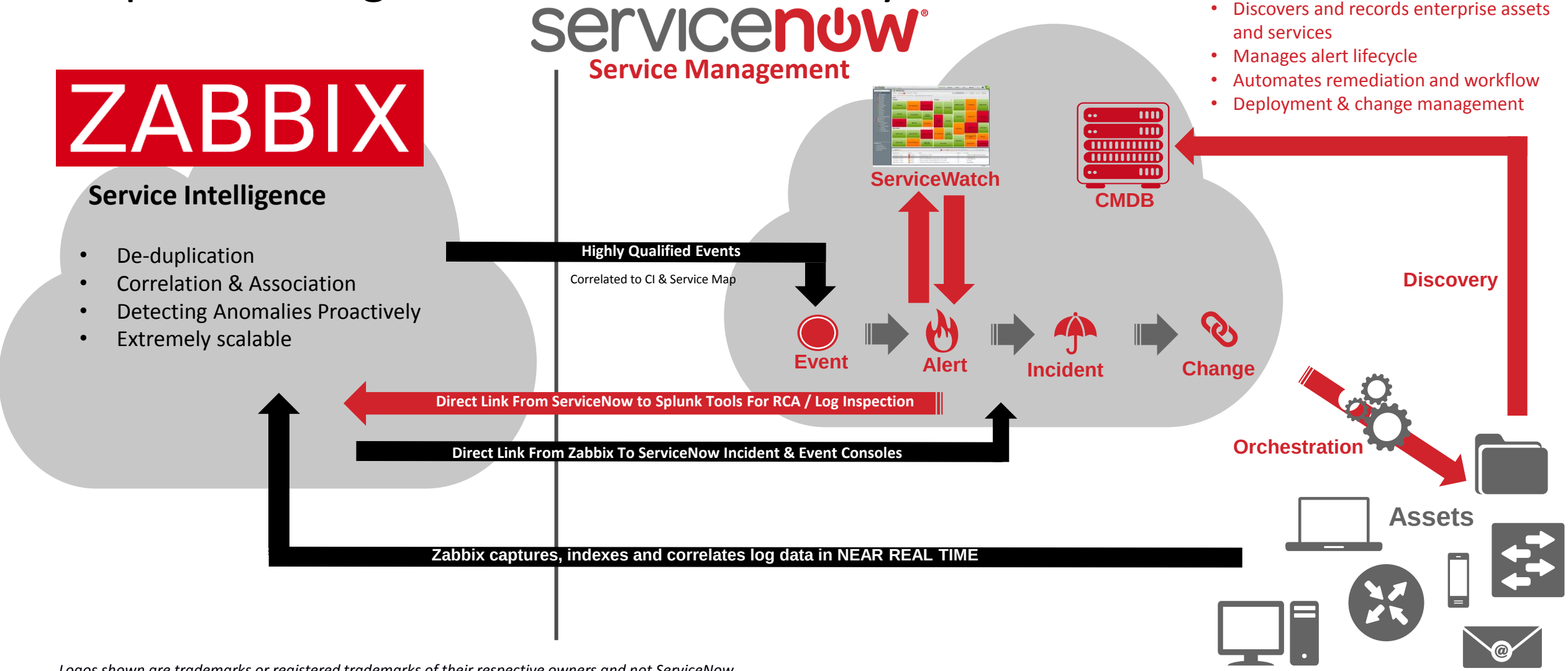
- SW Version
- Patch
- Usage Analytics

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Improved Insight to Service Availability



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Keep in Mind As You Leap

- Design for the Future
  - Build the CMDB for tomorrows problems
  - Keep in mind the whole organizations direction
- Discovery Today – not Tomorrow
  - Attempted to cut go-live town by doing manual imports
  - Lost features of hierarchy and CI Relationships
  - Not maintainable as the organization grew
  - Referral CI Model was not sufficient, moving to Relational now
- Cloud Management OTB
  - Multiple value-add INSTANTLY
  - Make sure to use Tags in AWS - we did this manually

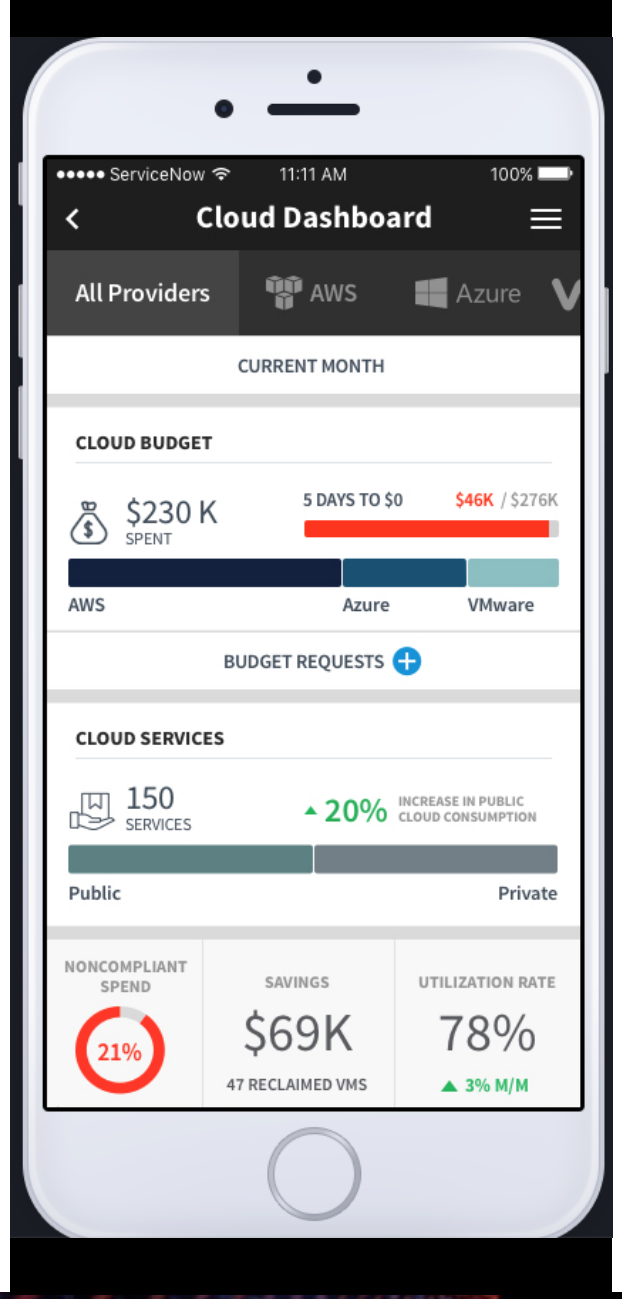
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Solution Showcase

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Manage
Cloud Sprawl





ML/Analyrtics



Service
Portal



Workflow



Contextual
Collaboration



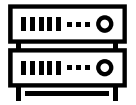
Subscription
& Notification



Discovery



Remediation



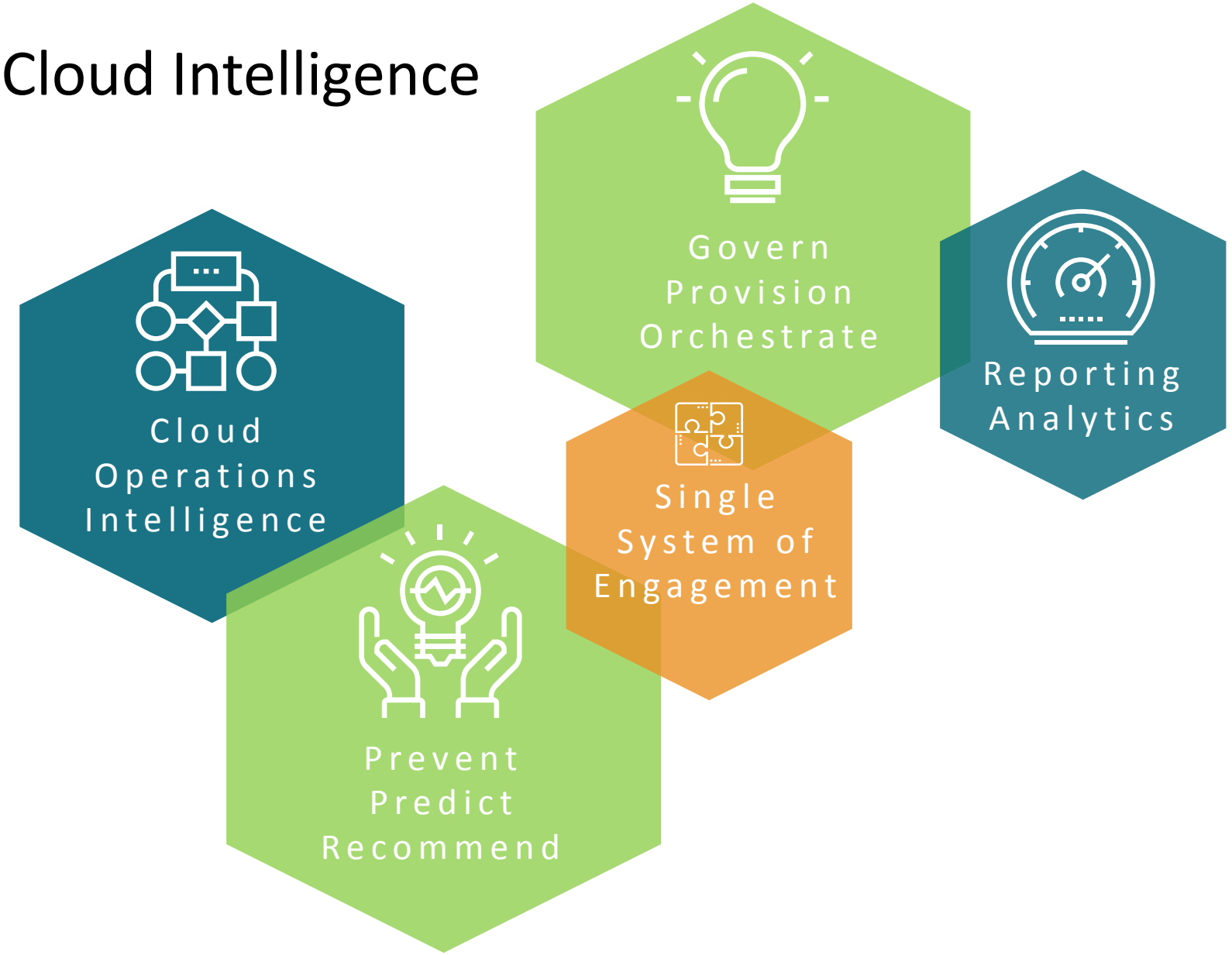
CMDB



CMP

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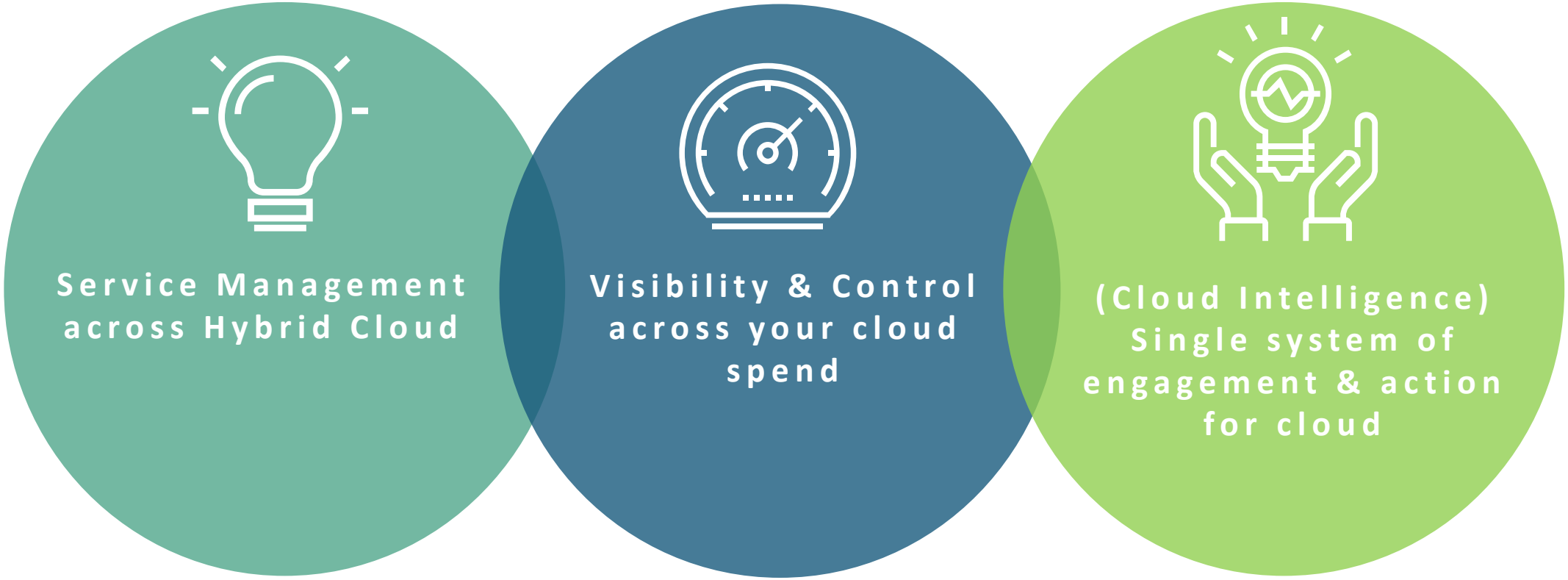
Cloud Intelligence



Bring data from your cloud tools into a single platform that uses intelligent workflows, machine learning, automation, and a deep connection with IT

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Simplified CMP Value



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Take the Survey

Please take a moment to complete a session survey in the Knowledge17 app.

Thank You

Zaki Bajwa

Sr. Director – ITOM Solution Architects

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