

Cloud Integration

A focused discussion on cloud platforms

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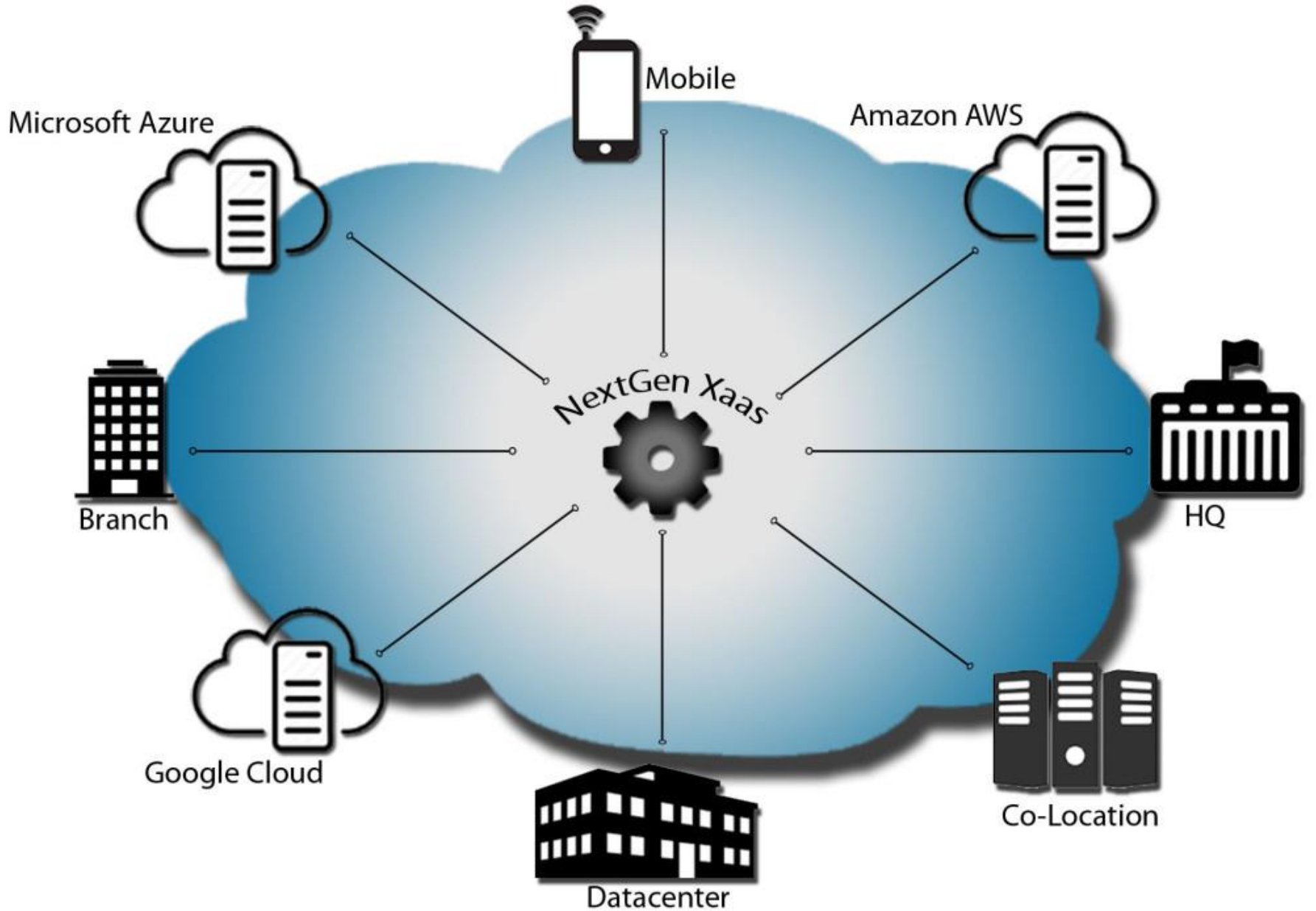
Who is ITC³?

- **Managed Service Provider**
- **Cloud Service Interconnect**
- **Cloud / Hybrid WAN Consulting**



CloudFusion





Facts

- Not everyone needs the cloud
- I'm not here to convince you that you do
- You don't have to convince me that you don't

What exactly is the cloud?

Cloud Services

Dropbox
Google Drive
Exchange Online/
Office 365

Private Cloud

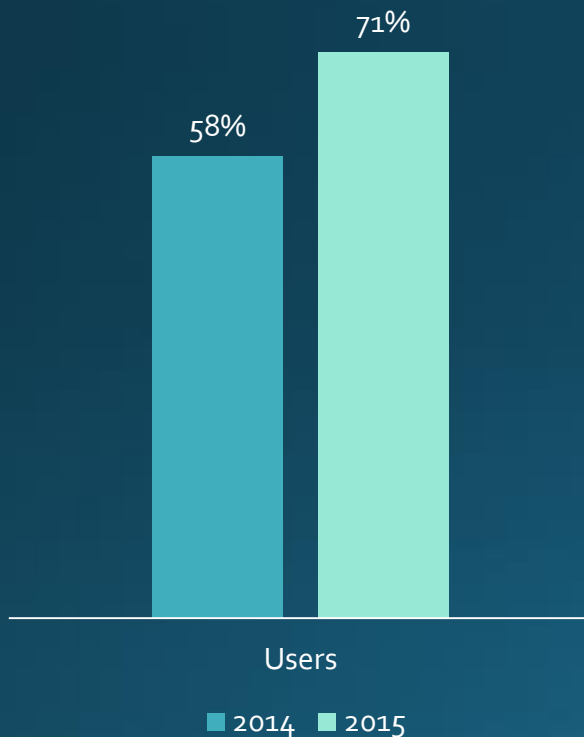
Openstack
Rackspace

Public Cloud

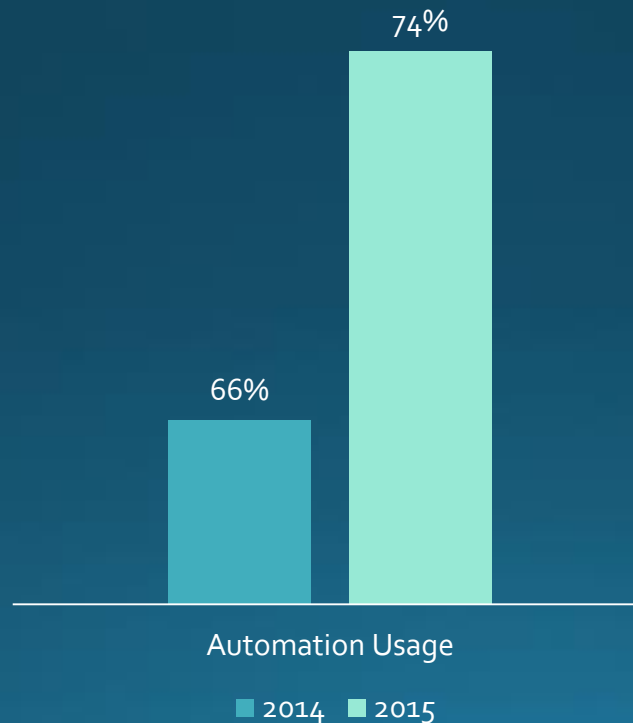
Amazon AWS
Microsoft Azure
Rackspace

Current Trends

Hybrid Cloud Adoption



DevOps (Automation)



On average
cloud users
leverage
services from 6
different cloud
providers

Cloud Stability

- Cloud reliability has improved
(Major vendors downtime for 2015 combined from all services)
 - AWS 2 hours and 30 minutes
 - Azure 10 hours and 49 minutes
 - Google 11 hours and 34 minutes
 - IBM 17 hours

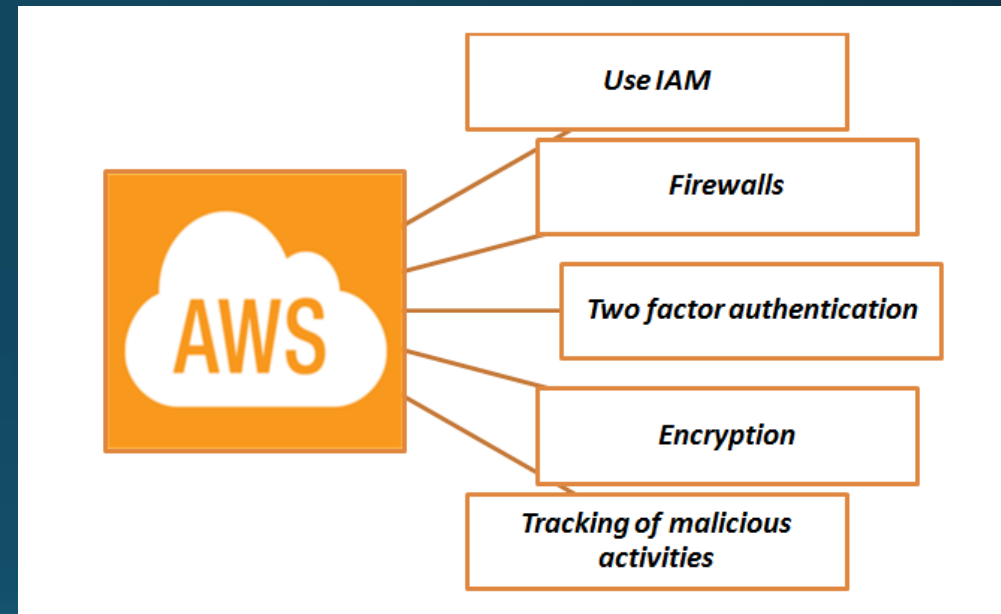
So what's the problem?

- Security concerns are real
- Reachability and reliability to resources is only as good as your Internet connection
- Lack of expertise has emerged as the #1 Challenge

How to solve it

Security concerns are real

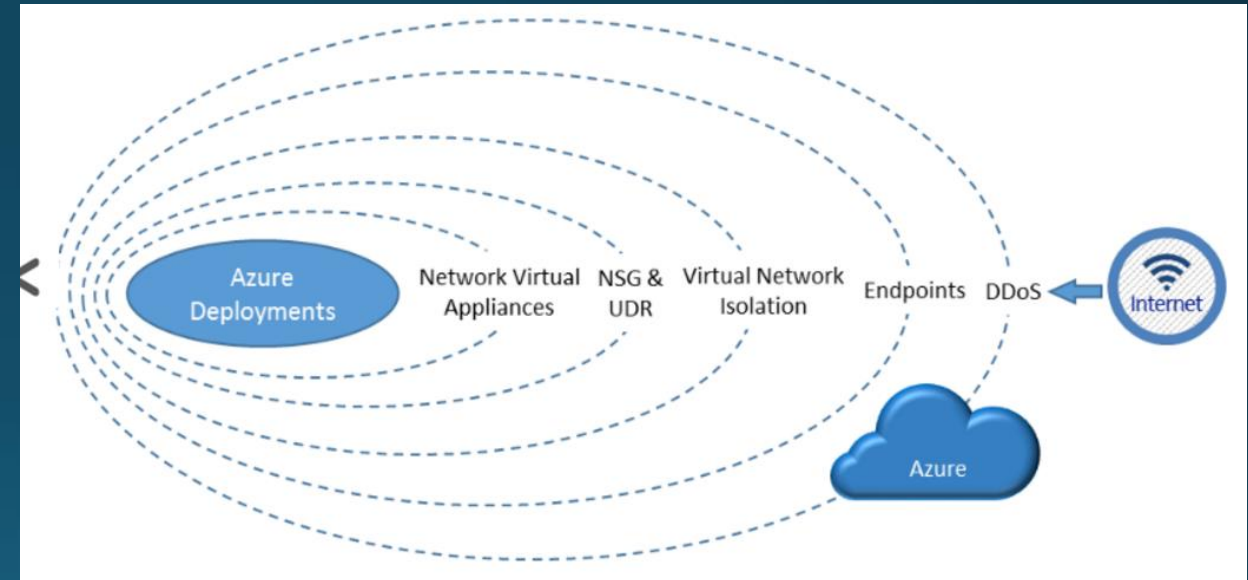
- Infrastructure Security
 - Network Firewalls
 - Web Application Firewalls
 - Secure Private Connections from On-Premise Environment



How to solve it

Security concerns are real

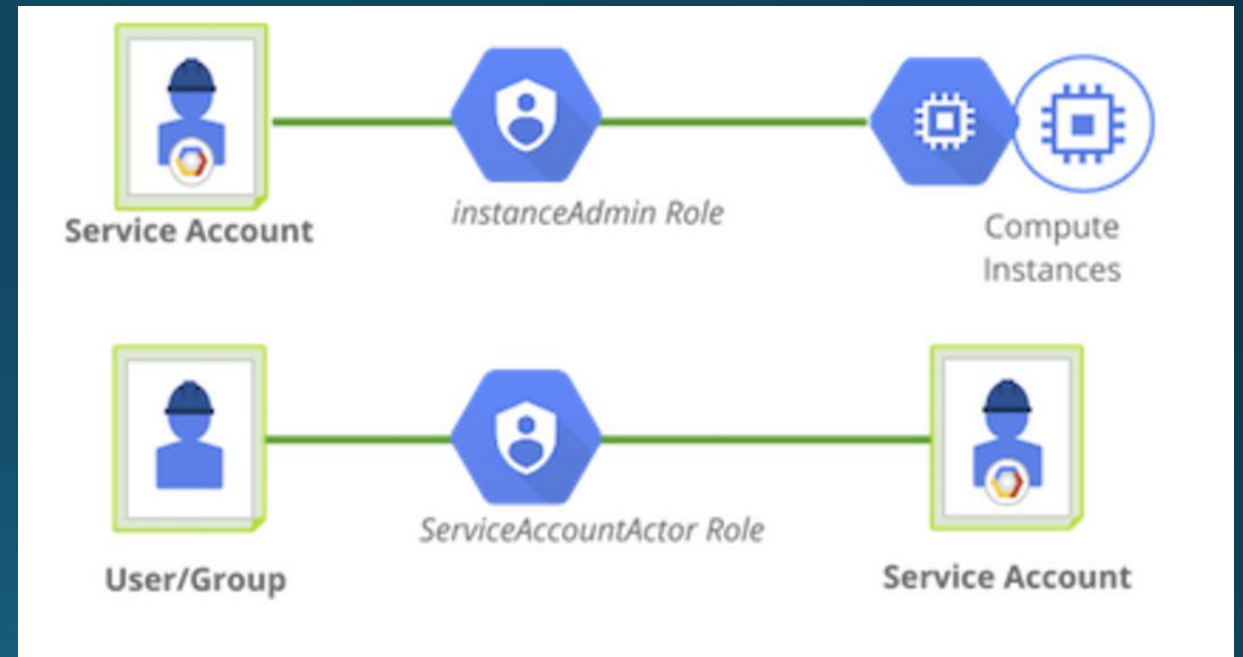
- DDoS Mitigation
- Data Encryption
- Dedicated hardware-based crypto key storage



How to solve it

Security concerns are real

- Monitoring and Logging
- Identity and Access Control
- Penetration Testing



Myth vs Reality

"To date, there have been very few security breaches in the public cloud — most breaches continue to involve on-premises data center environments."

~ David Mitchell Smith, Gartner Analyst

So what's the problem?

Reachability and reliability to cloud is only as good as your Internet connection

- Redundant Internet connection from different providers is now considered mission critical
- Implementing DDoS Mitigation
- Distribution of workloads over multiple cloud vendors

So what's the problem?

Lack of expertise

- Internal training
- Self Study
- MSP Partners



Deployment Considerations

- What are you trying to accomplish?
- How tightly do you want the cloud integrated with your existing environment?
- Are you using cloud for internal operations, or offering services to your customers, or both?

Why are people moving?

- Speed to Implementation
- End to End Security
- Lower Cost
- Ability to Scale
- Global Visibility
- Failure Isolation with Microservices

Power Executives Highlight Urgency⁴

93%
Put Big Data
analytics in
top 3 Priorities

31%
Make it their
#1 Priority

50%
Urgency driven
by Board of
Directors

With this sense of urgency, the cloud approach is a key enabler to achieve objectives around Big Data and analytics.

Case Study: GE




Case Study: GE

NETWORKWORLD
FROM IDG

Home > Cloud Computing

How a giant like GE found home in re:Invent



General Electric CIO Jim Fowler told the crowd at AWS re:invent's first day keynote that the company is heavily using Amazon's cloud Credit: Amazon

GE's CTO for IT talks about the obstacles and opportunities when transitioning to the cloud

on IDG Answers How does 5G compare available!

GE and Capital One endorse AWS at re:Invent

AWS emphasizes cloud for IaaS



penetration at re:Invent. Companies considering the Amazon on their short list.

(04:55 PDT) | Topic: Cloud Computing: Moving to IaaS

By Chris Kanarac



on IDG Answers How does 5G compare available!

ERP systems, to AWS while reducing its Digital Industrial Company, transforming predictive. Jim Fowler, General Electric's chief partner that is going to run our they by migrating more than half of its

ive interview, C...
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blic cloud services...
organizati...

AWS Blog
by Jeff Barr | on 02 MAY 2016 | In Enterprise, Gu...

GE Oil & Gas - Digital Transformation in the Cloud
Electric starting in the late 19...
Ben Cabanas, the CTO...
involved in a major...
You may also...

GE and Others Shut Data Centers, Move to Amazon, Microsoft — Market Talk

30/01/2016

By

17:07 ET – As big companies such as General Electric shut down more data centers, they're moving a significant portion of their IT infrastructure to cloud services from Amazon (AMZN) and Microsoft (MSFT). The two companies are continuing to lower prices to gain market share for big enterprise cloud customers. "Enterprise cloud opportunity is massive," said Microsoft CEO Satya Nadella during an earnings conference call with investors on Thursday afternoon. (rachael.king[awsj.com]; [a]sfwriter)


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AWS Case Study: General Electric

About General Electric

General Electric (GE) is migrating more than 9,000 datacenter footprint from 34 to four over the industry with software-defined machine- chief information officer, noting the company for the next 140-year core applications to AWS

TECH
GE's Internet of Things Platform to Run on Microsoft's Cloud
GE's Predix software platform will come to Microsoft's Azure cloud platform



GE is attempting to expand from its legacy businesses into areas more focused on mobile and the internet. PHOTO: SSENDA/N

GE: We're going all-in with the public cloud

MORE LIKE THIS

Cloud computing claims a pivotal role in 2015

GitHub's new CEO: We're serious about the enterprise

5 techniques for securing your enterprise data

Have revelations about government spying slowed cloud adoption?

POWERFUL, AFFORDABLE IT MANAGEMENT

Transformation in the Cloud

Permalink | Comments
...the product of a series of acquisitions made by parent company General...
...engineering the digital transformation of the company. In the guest post below,
...cloud architect for GE Oil & Gas, talks about some of the key steps...
...scent presentation at the 2016 AWS Summit in Sydney, Australia,
...with AWS.

How GE is closing datacenters and moving to the public cloud

Case Study: GE

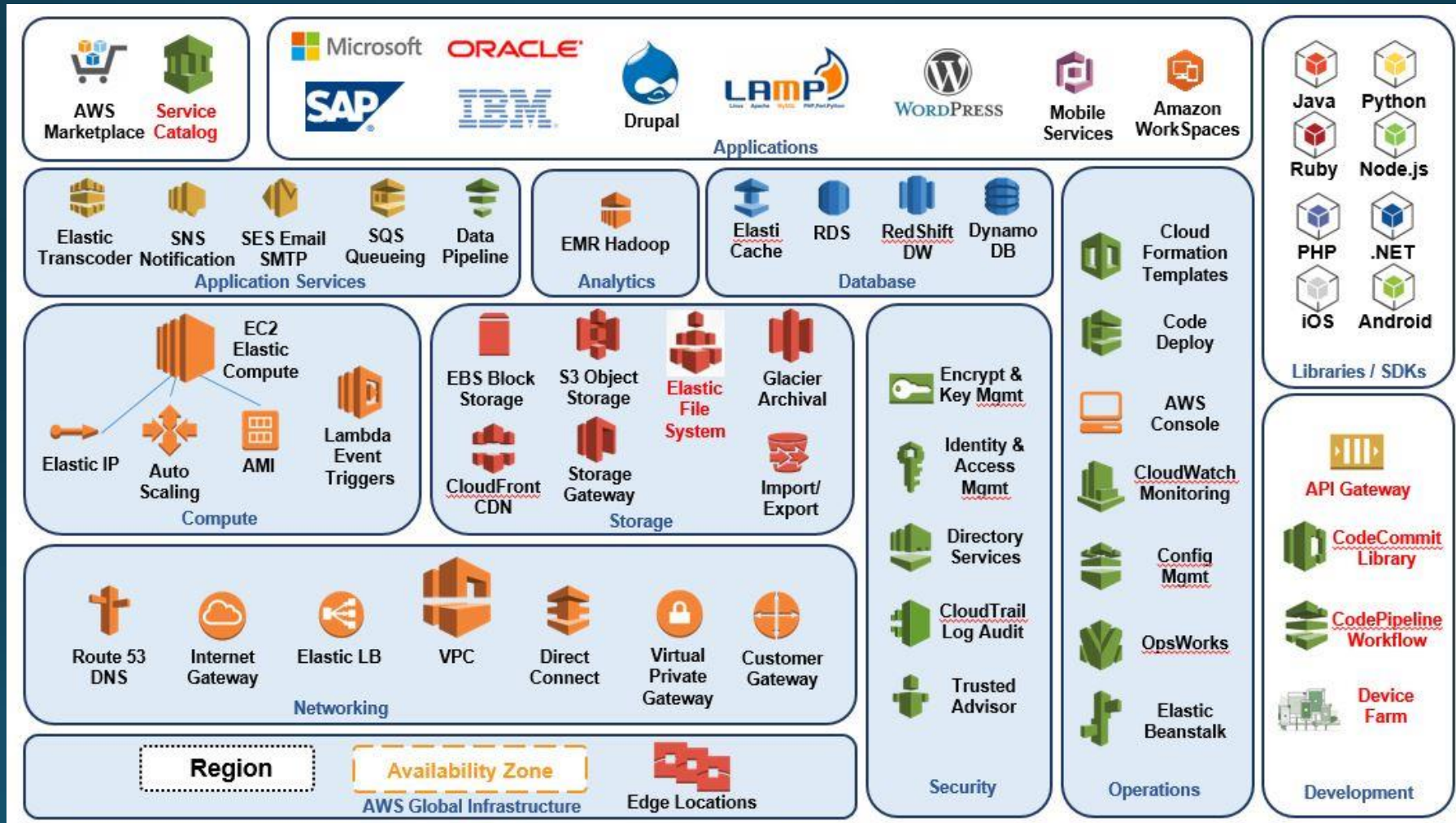
Fun facts for the network nerds

- GE owns the largest privately owned network in the world.
- Their core BGP ASN is 80
- They have exhausted an entire Class A Public IP block
- In their 140 year history, GE had never completed a global network overhaul.

Case Study: GE

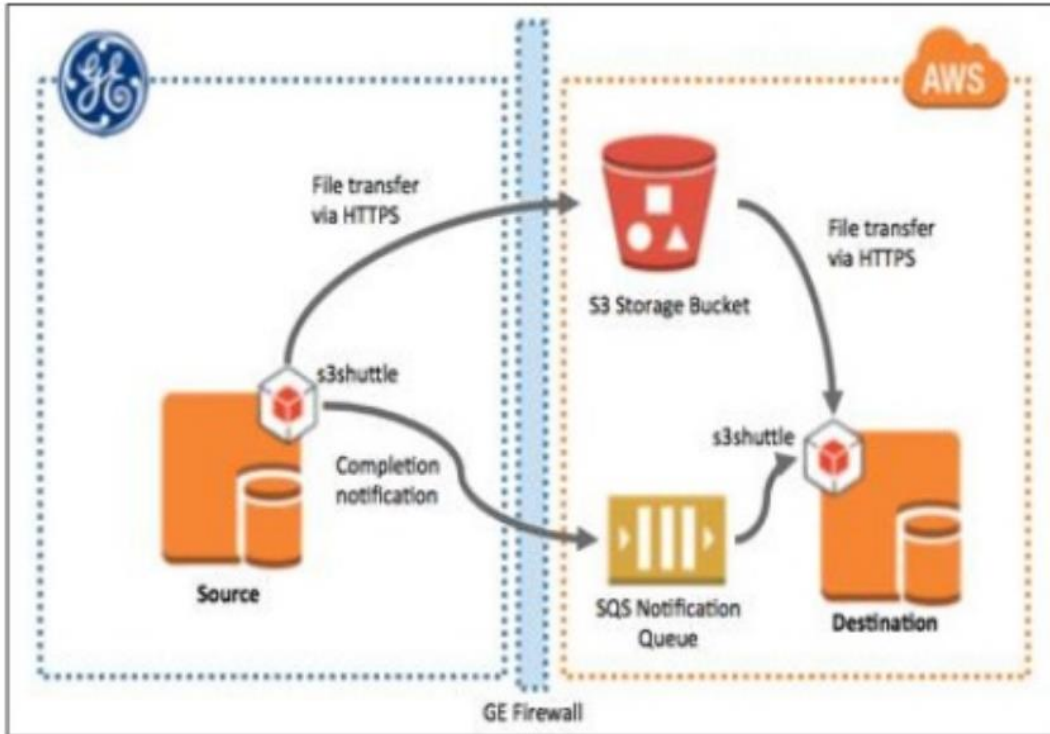
- **Build a global Hybrid WAN Interconnect**
- **Shut down 30 datacenters and replace with 8 regional cloud hubs**
- **Move over 9,000 workloads to public cloud (AWS, Azure)**
- **Ultimately run 100% of application resources in public or private cloud space**
- **GE would then sell IC and Cloud services to its business units**

GE had to become the largest managed service provider in the world offering services to over 500,000 end users daily



Data Storage

s3 Publish & Subscribe



Java + AWS Native Services



- Flexible bucket/folder config
- Leverages multipart upload
- STS support w/ AWS SDK



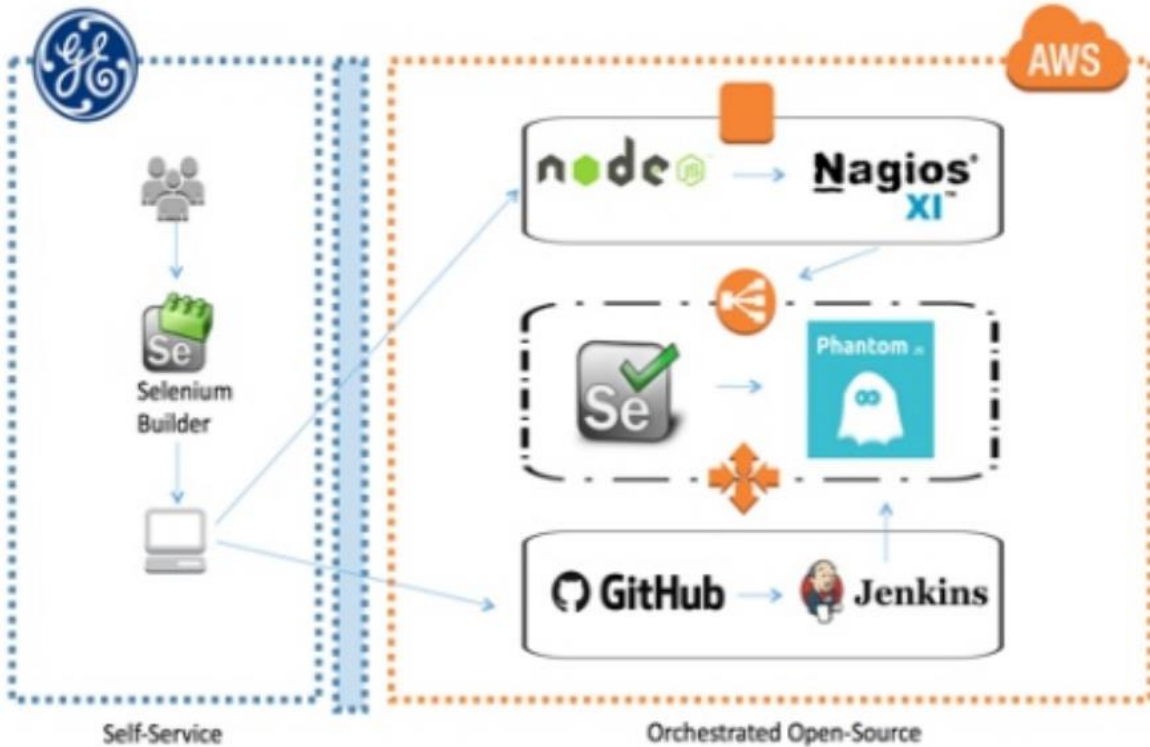
- SNS notification on upload
- SNS notifies SQS queue



- Loosely coupled with SQS
- Simple command line interface
- Optional delivery notification

Automation

Self-Service Web Monitoring



Scalable Automation for the Cloud



- Scalable distributed monitoring
- Integrated ASG & ELB
- Integrated with Nagios XI



- Headless webkit (GhostDriver)
- GUI Recorder – Selenium Builder
- Jenkins/JUnit Capable integration



- Low cost framework
- Compatible with any webdriver client
- Pre-built Nagios alerting/metric capture

► Cloud Service CTQ's

Cross Business

Migration Acceleration

Cycle Time Reduction

Automation

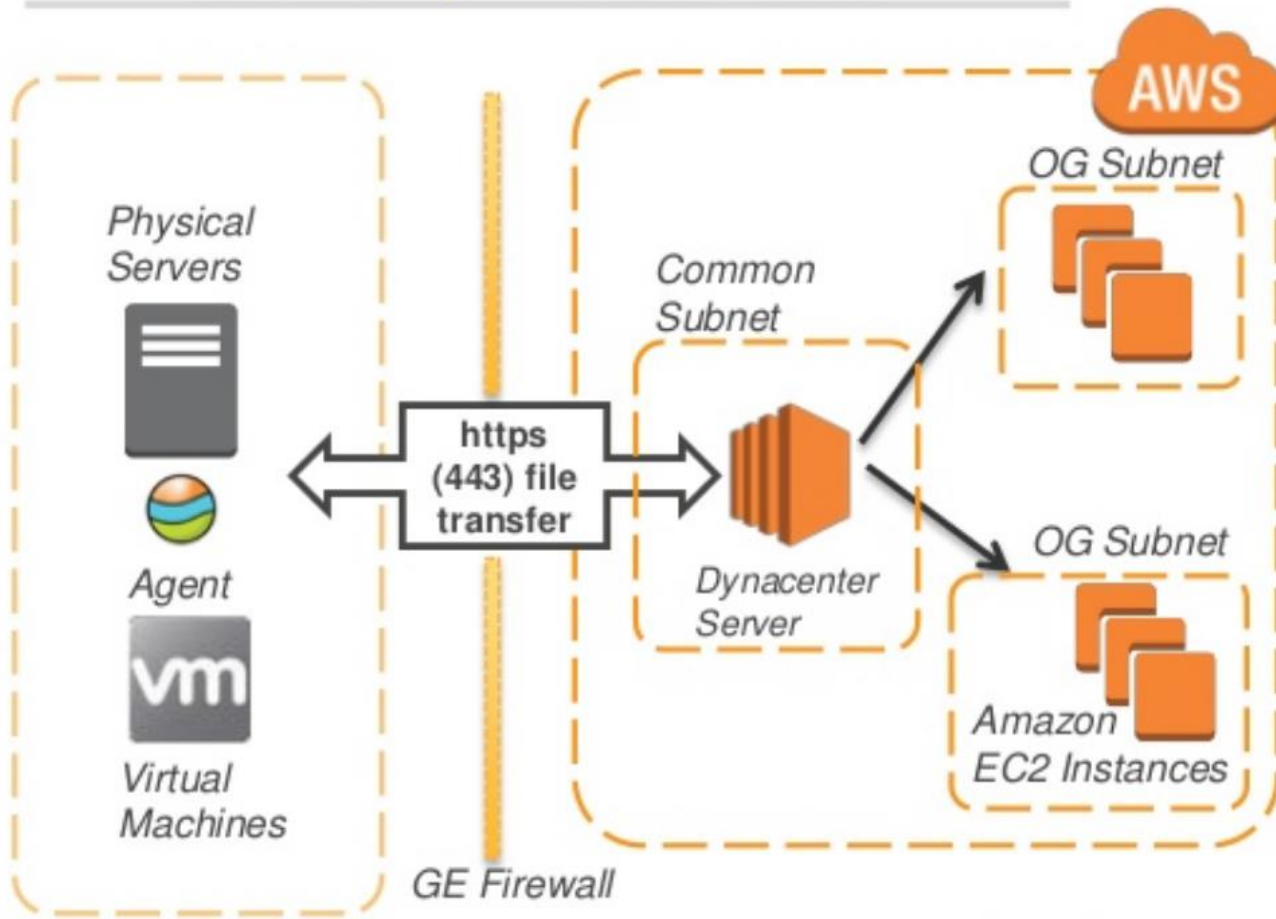
Cost Benefit

Simplification

Service Status

CLI & Identity Management

Cloud Migration Solution



Racemi Benefits



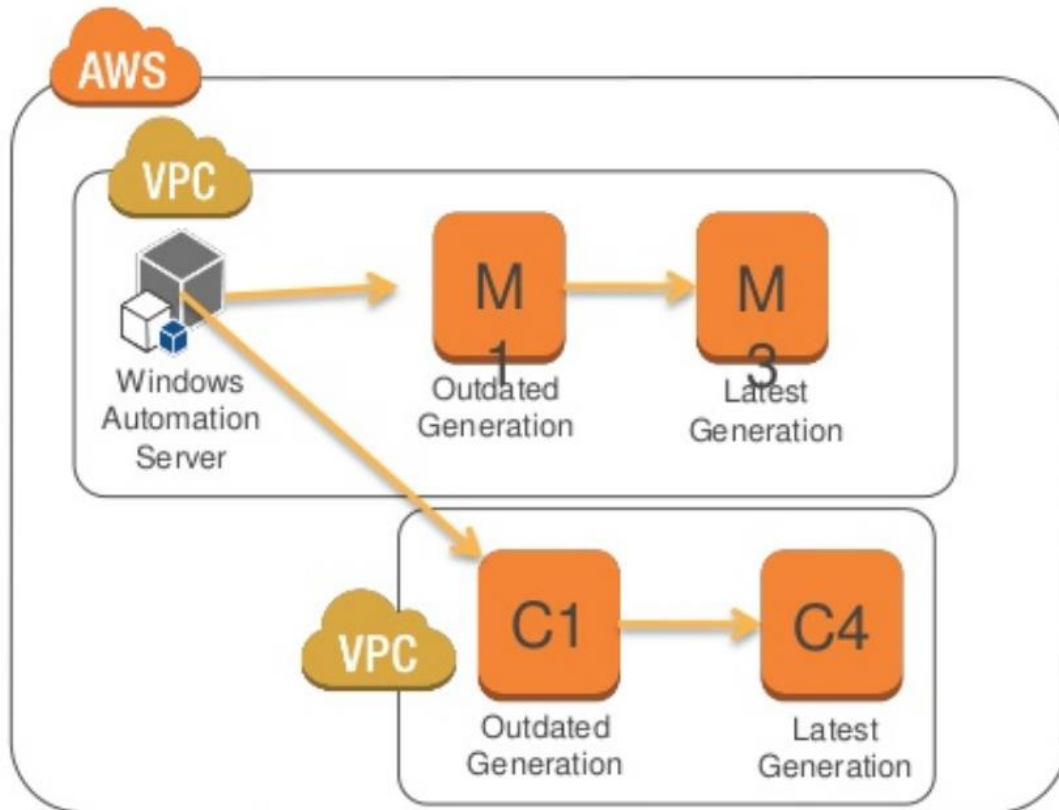
- Deployed on Source server.
- Secure and firewall friendly.
- Supports Live capture, low overhead, fault tolerant.



- Simple Command line interface
- Supports security delegation via **AWS Identity and Access Management (IAM)** and **AWS STS** services.
- Capture once, deploy many.

Lifecycle Management

Upgrade EC2s to the next gen



Optimize Performance & Reduce Cost



- IDs instances that can be upgraded to the next EC2 generation
- Builds communication email
- Leverage AWS PowerShell SDK



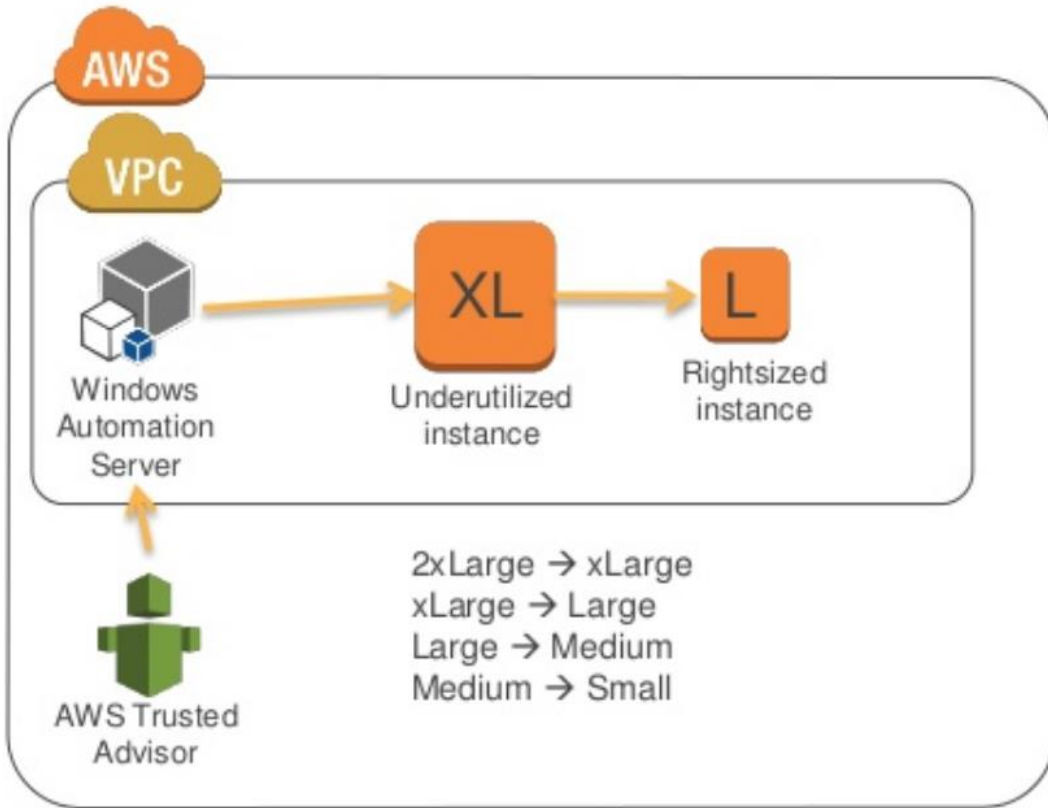
- Scheduled monthly against QA and Dev
- New EC2 gens offer better performance at reduced cost



- Upgrades C1 → C4, M1 → M3, M2 → R3
- Continuously ensures Cloud VMs operate at most efficient and effective levels
- Upgraded 73 QA + 29 DEV last month

Auto-Scaling

Downsize underutilized EC2s



Maximize efficiency



- Pulls "underutilized" EC2s from AWS Trusted Advisor report, monthly
- Leverage AWS Powershell SDK



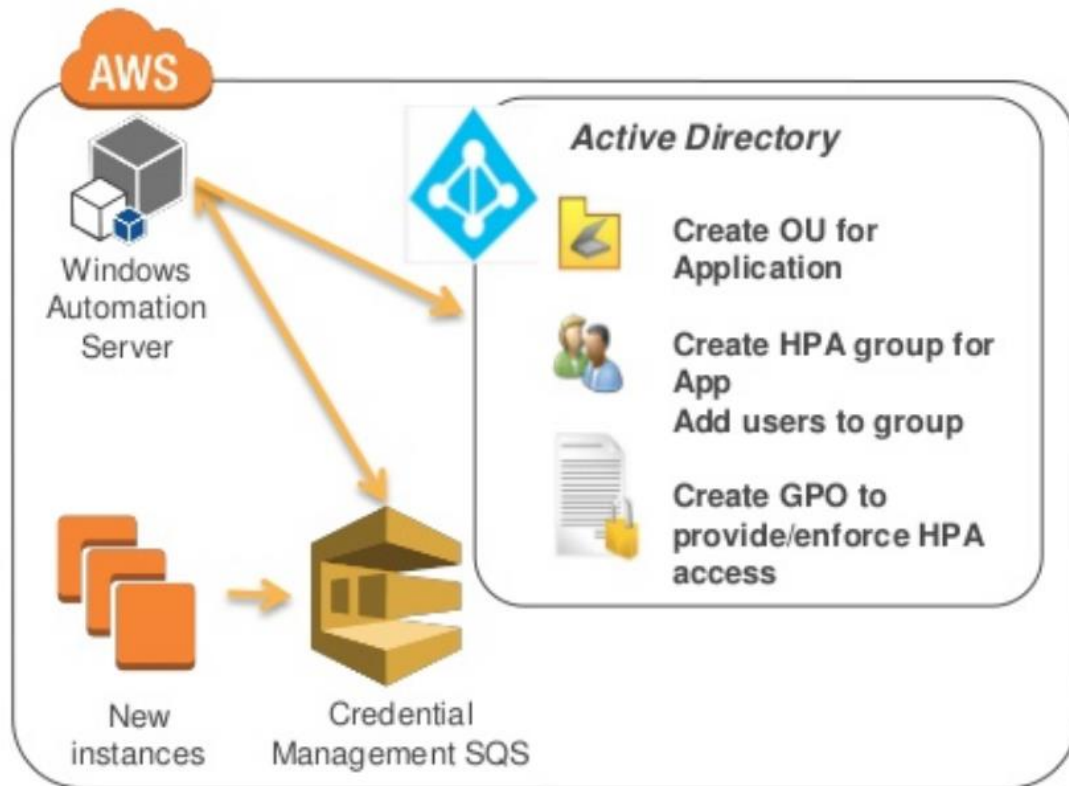
- What is underutilized?
<10% CPU utilization for 14 days
<5MB network I/O for 4 days or more



- Scheduled against Development envs today
- 96 machines downsized
- Cost Savings

Provisioning

Automated Access Provisioning



Hands free Active Directory



- Provides immediate access to new Windows and Linux builds
- Enables personal account use
- Leverage AWS Powershell SDK, AWS SQS



- Runs every 15 minutes
- Processed 891 instances to date
- Streamlines operations

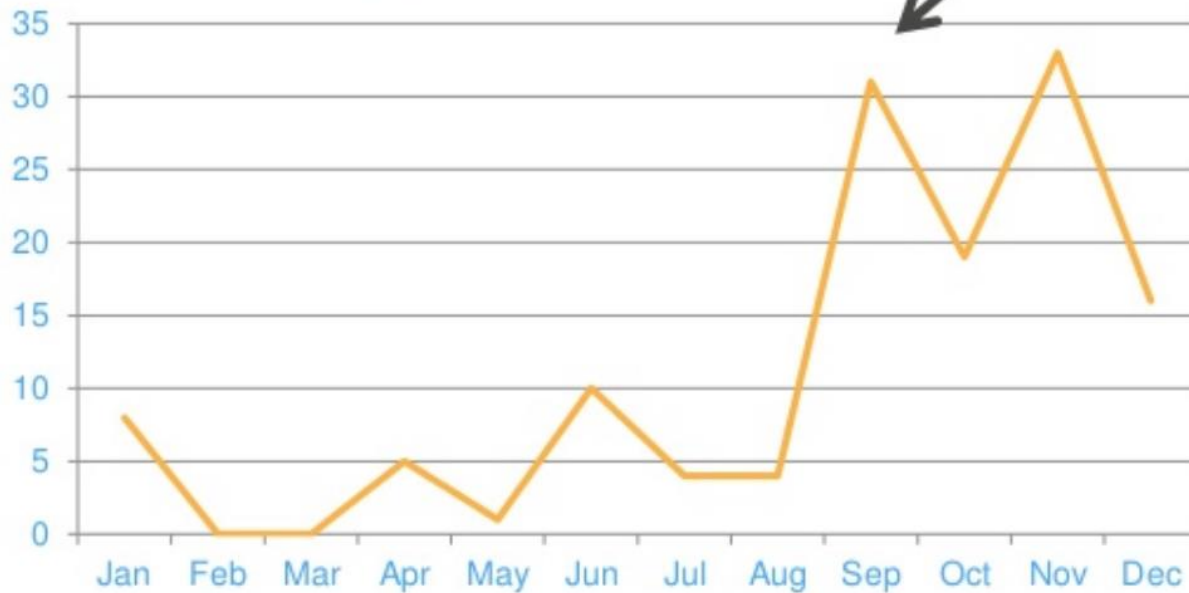


- Delivers full Active Directory automation
- Sets patching windows based on environment
- Best practice enterprise automation

Realistic Expectations

Step change in performance

Apps Moved in 2014



What did we change?

[Clip slide](#)

Agile Execution Mechanism YTD

52 Week Journey effort

26 Sprints

Every 2 Weeks completions

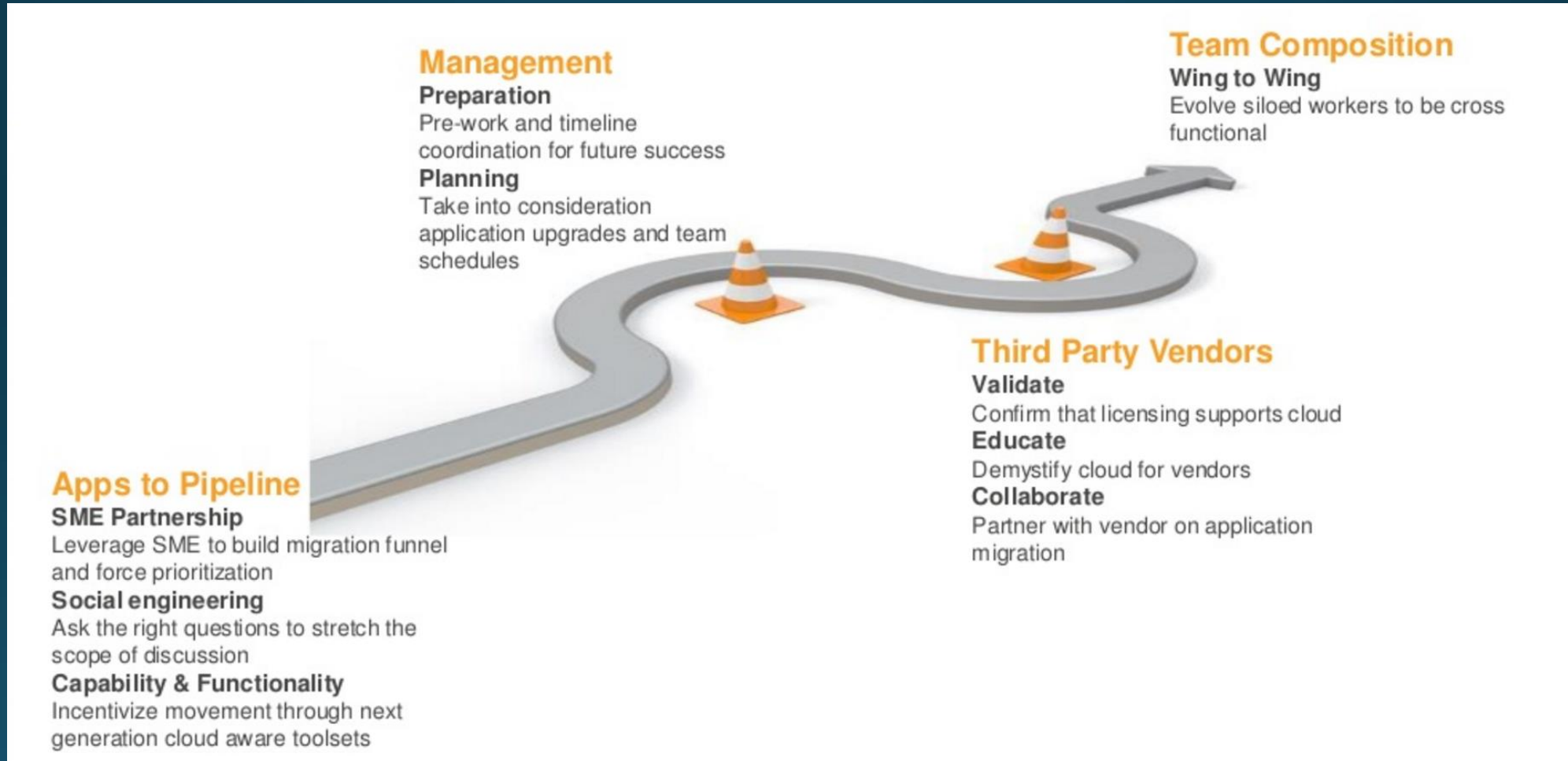


Cloud Party after 2-3 Sprints reviews



9 Product Streams driving execution

Navigating the Roadblocks



Lessons Learned

Automate, then Automate More

Everything we do is with automation in mind, from deployment to operations. This is the only way to survive at scale.

Embrace Agile

From organization structure to project management, everything we do is with agile principles in mind.

Work Instead of Workflow

Embracing automation has allowed our employees to concentrate on doing work, instead of filling out workflows.

Security at Every Layer

Fully utilizing the security provided in the public cloud allows us to have confidence in a multi-tenant world.

Bias toward action

Everyone has a reason not to move to cloud. Our mission is to find more reasons why we should.

Encourage (calculated) Risks

Celebrate failure. Talk about pivots. Continuously examine new tools. This leads to rapid innovation resulting in progress.

Enablers

Collaboration - Embed Security & Risk teams, CIO + CTO + Corp partnership

Transformation - Rebuild technology skill

Cloud Aware - Rehosting is OK if it maximizes margin, agility, resilience & performance

Pipeline - A pipeline of 50+ will ensure

Case Study: You



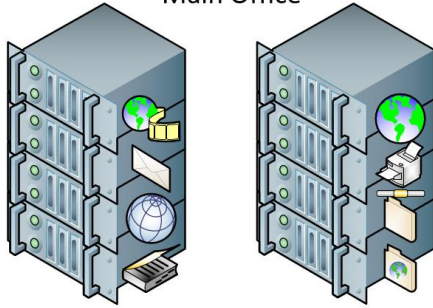
Disaster Recovery

**Practically everyone can benefit from
the cloud when it comes to DR**

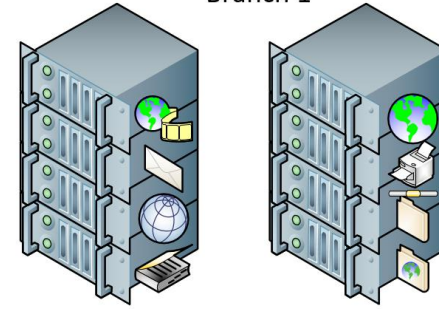
Disaster Recovery

Did you know that in AWS you only have to pay for an instance when it's turned on and running?

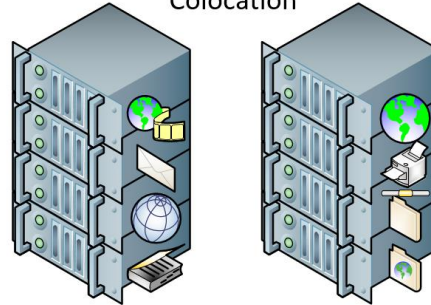
Main Office



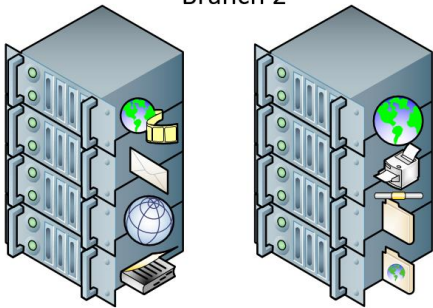
Branch 1



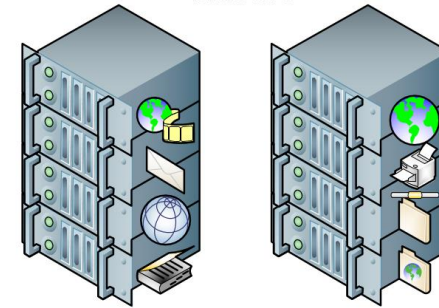
Colocation

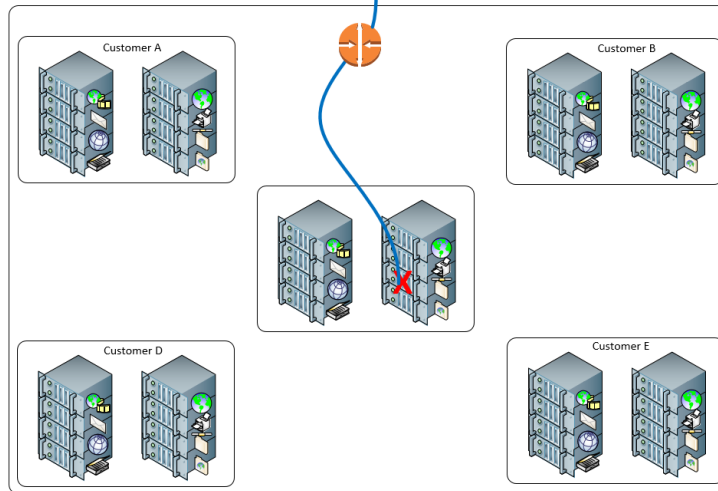
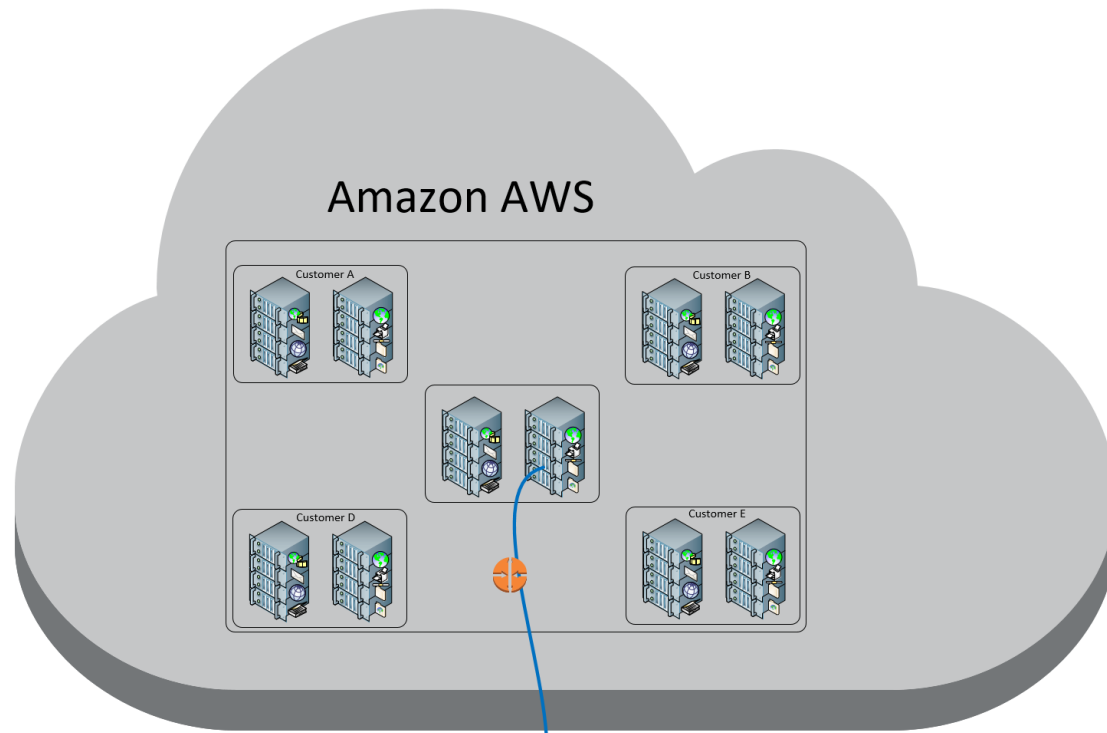


Branch 2



Branch 3





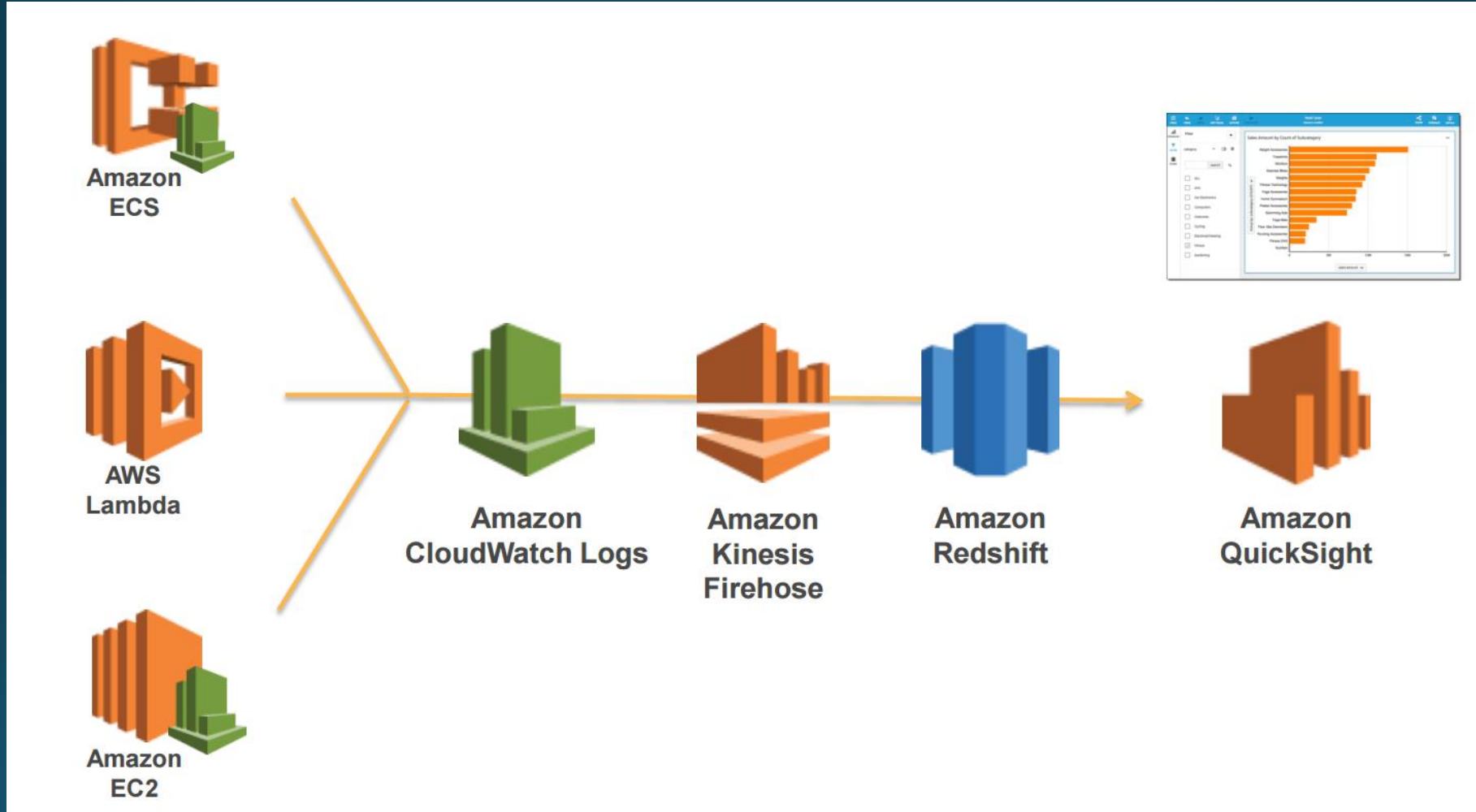
Data analytics



Integrated Tools



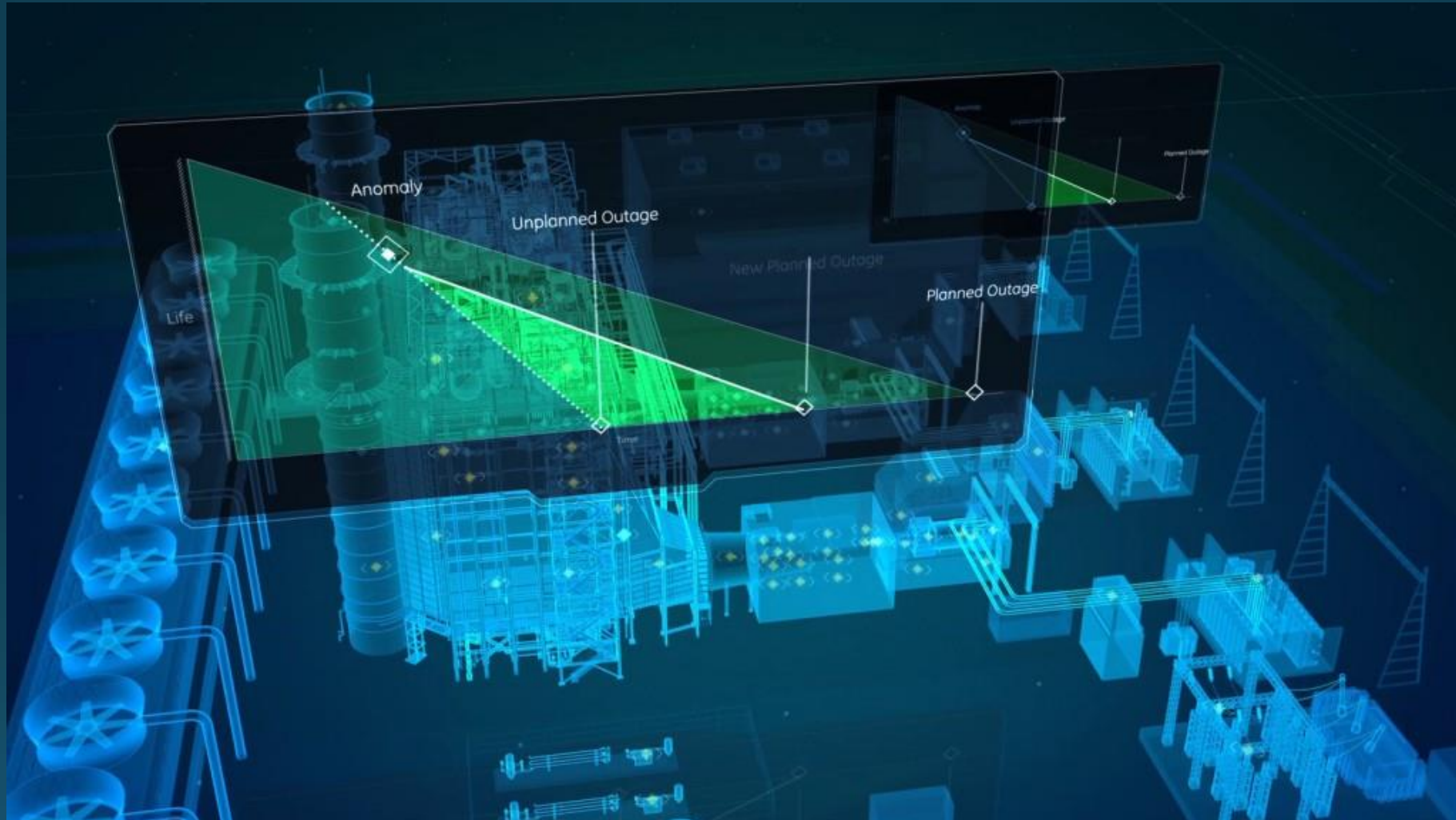
Big Data Crunching Simplified



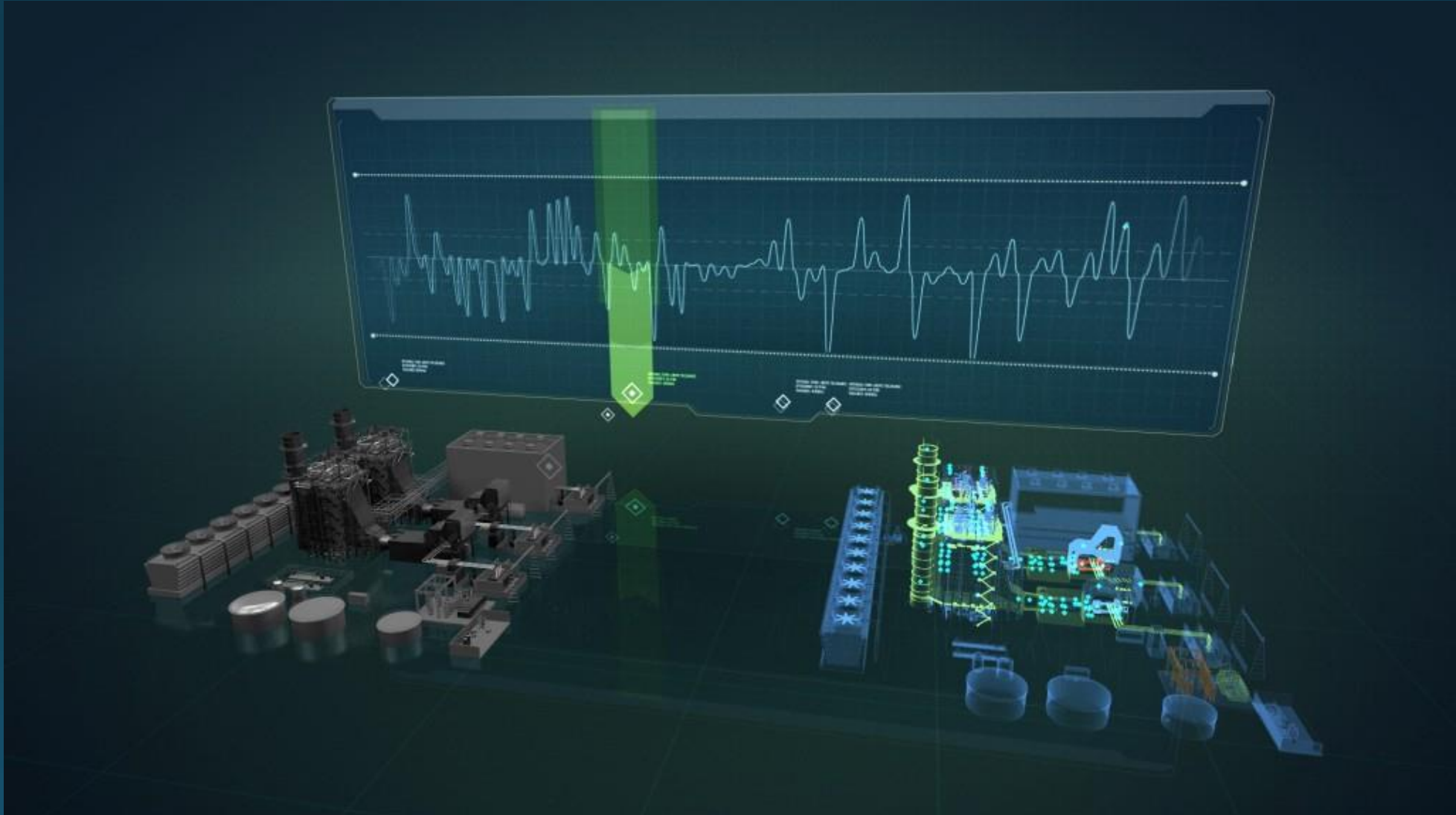
Salt River Project



Salt River Project



Salt River Project



AT&T NetBond

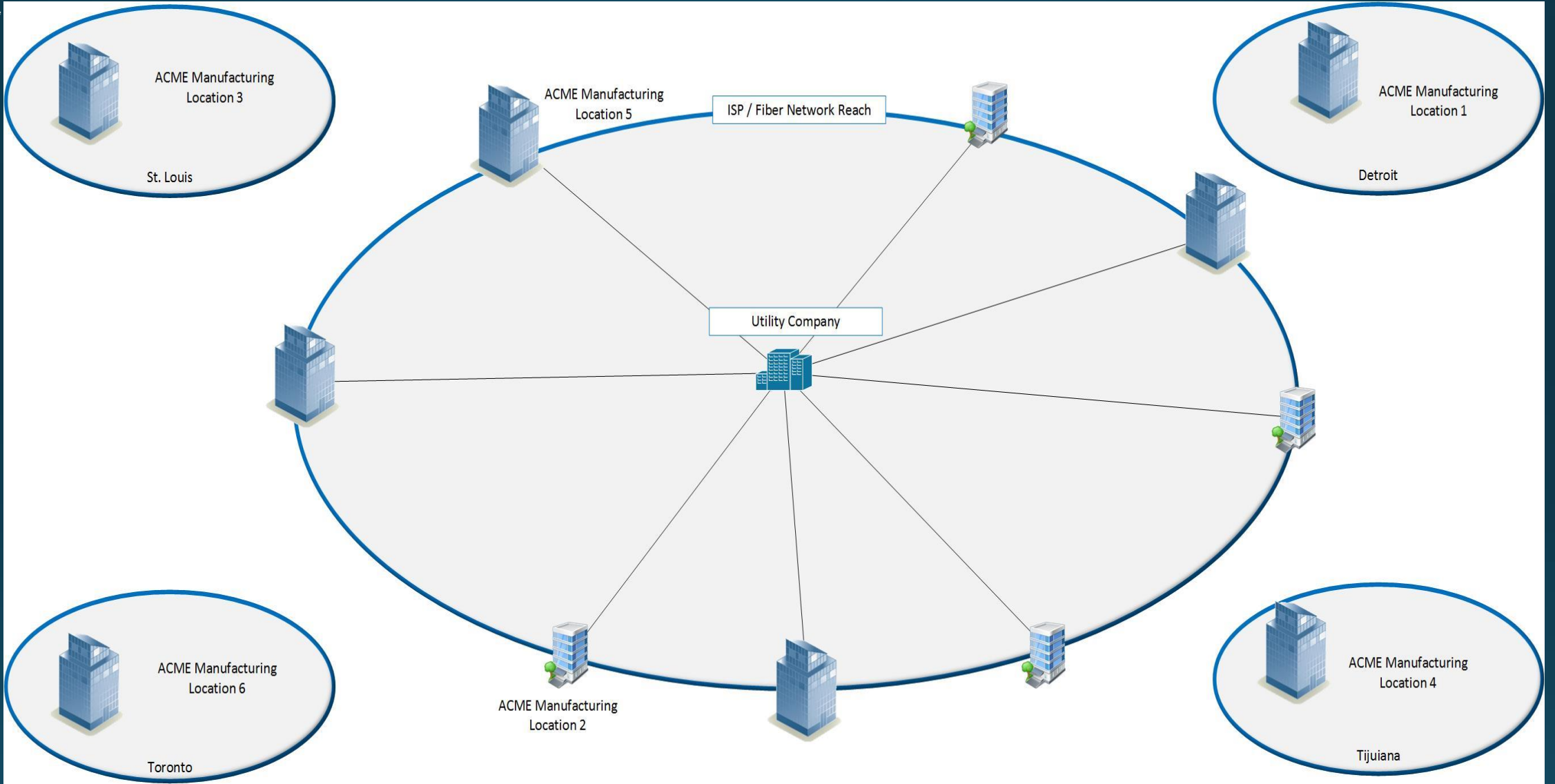
Verizon SCI (Secure Cloud Interconnect)

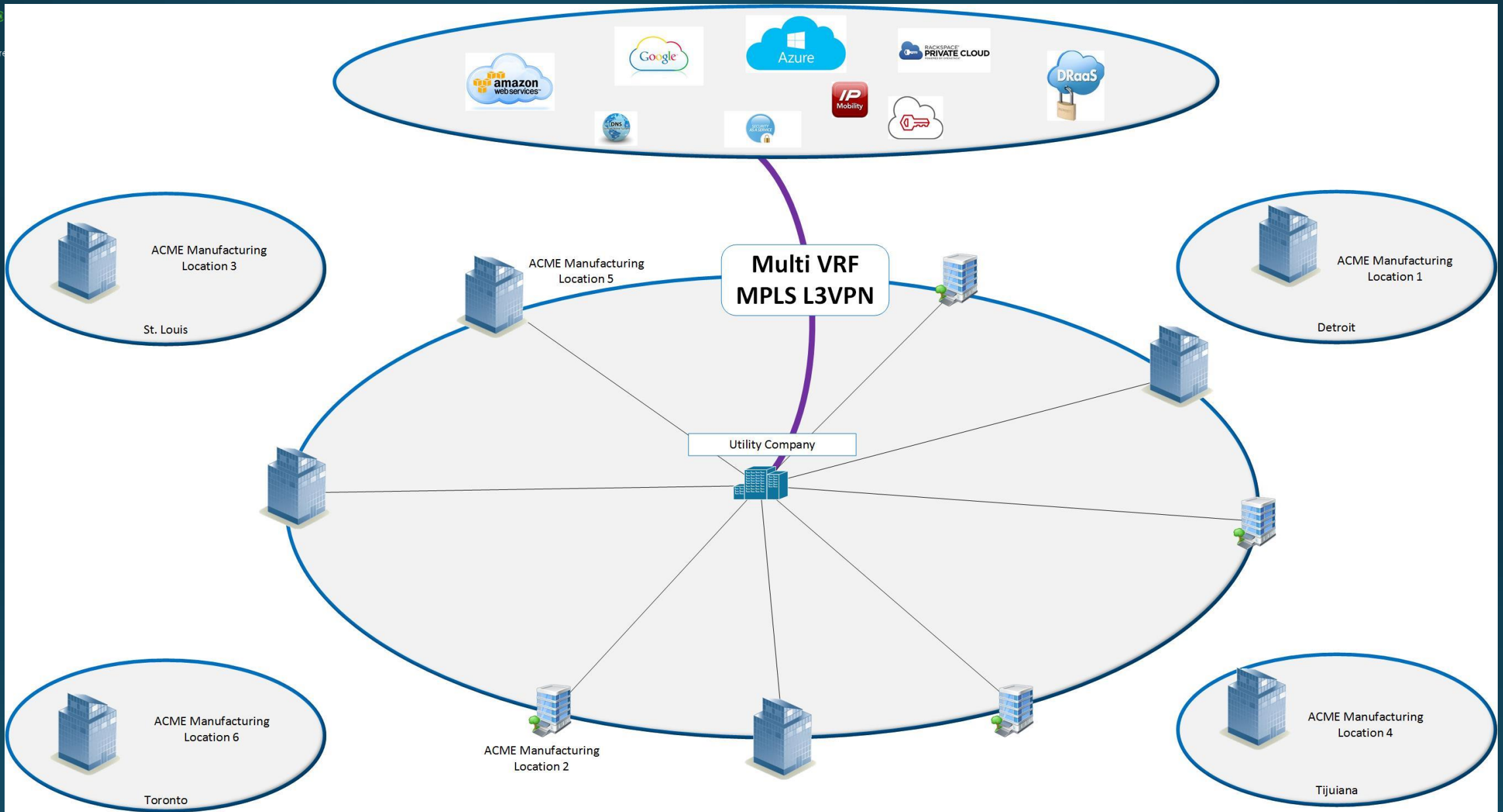


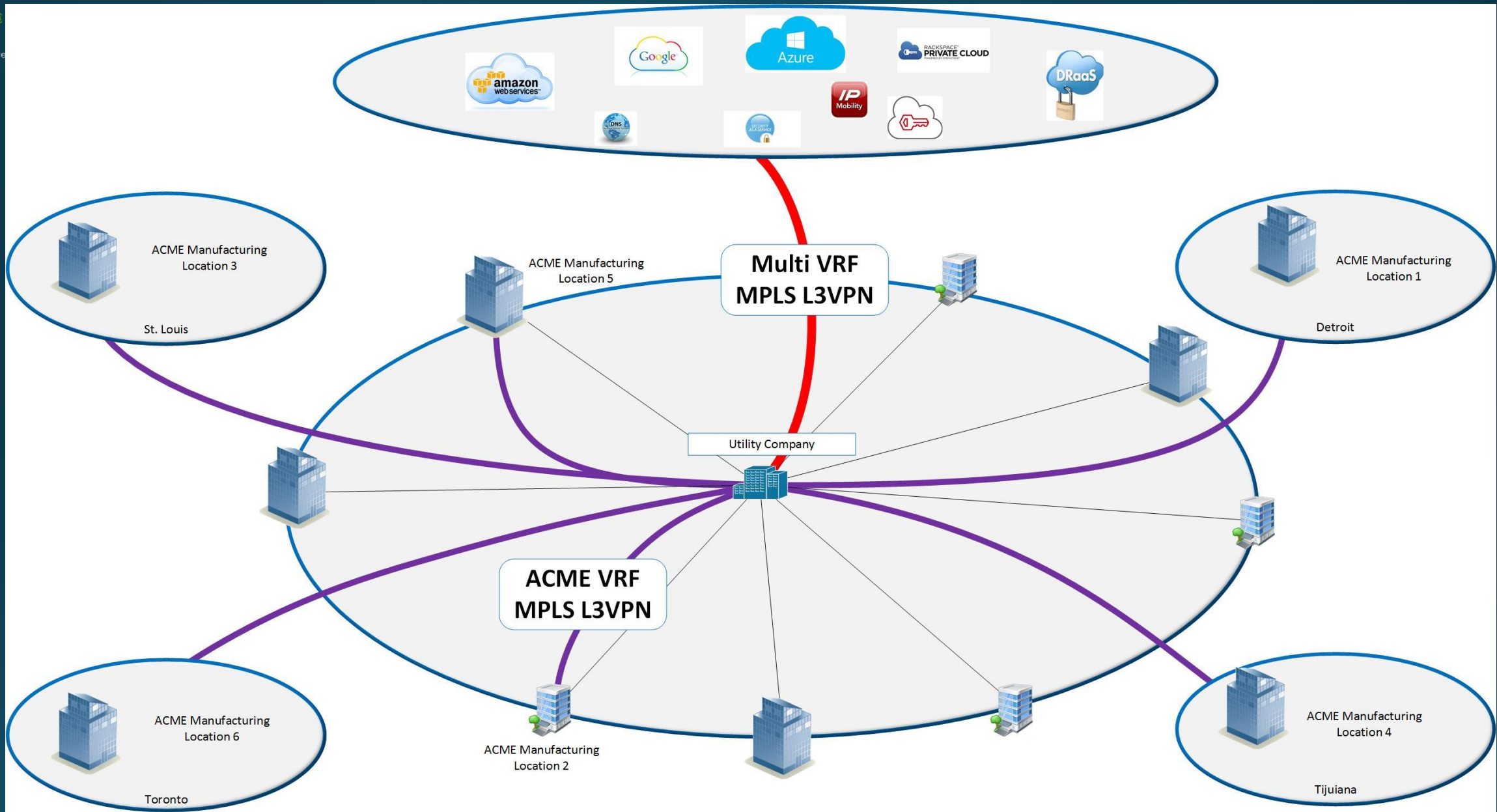
NetBond

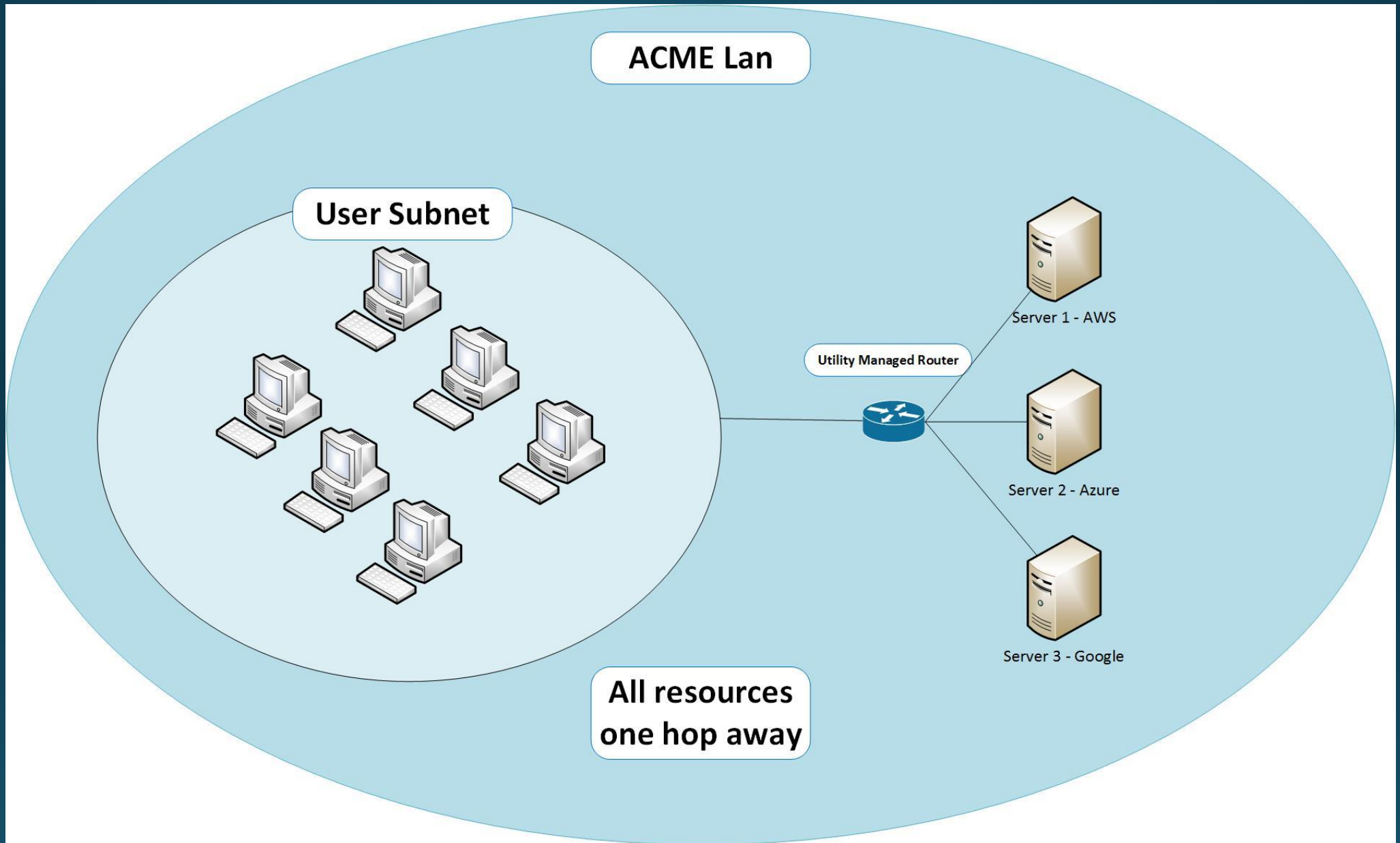
ITEM	SERVICE	DESCRIPTION	GSAFIXED PRICE W/FEE
212566	NetBond Minimum Bandwidth Commitment - 1M	120033	\$1,209.00
212567	NetBond Minimum Bandwidth Commitment - 3M	120033	\$1,843.73
212571	NetBond Minimum Bandwidth Commitment - 10M	120033	\$2,669.88
212568	NetBond Minimum Bandwidth Commitment - 25M	120033	\$3,508.12
212572	NetBond Minimum Bandwidth Commitment - 40M	120033	\$4,344.34
212573	NetBond Minimum Bandwidth Commitment - 100M	120033	\$7,572.37
212574	NetBond Minimum Bandwidth Commitment - 155M	120033	\$11,390.80
212575	NetBond Minimum Bandwidth Commitment - 300M	120033	\$19,543.49
212576	NetBond Minimum Bandwidth Commitment - 600M	120033	\$27,772.75
212577	NetBond Minimum Bandwidth Commitment - 800M	120033	\$33,974.92
212578	NetBond Minimum Bandwidth Commitment - 1000M	120033	\$37,472.96
212579	NetBond Minimum Bandwidth Commitment - 2000M	120033	\$69,948.71
212569	NetBond Minimum Bandwidth Commitment - 3000M	120033	\$75,490.77
212570	NetBond Minimum Bandwidth Commitment - 4000M	120033	\$88,101.04
212600	NetBond Minimum Bandwidth Commitment - 5000M	120033	\$101,050.64

**What if you follow GE, Pearson,
AT&T, and Verizon's model
and become a managed service
provider for your customers?**





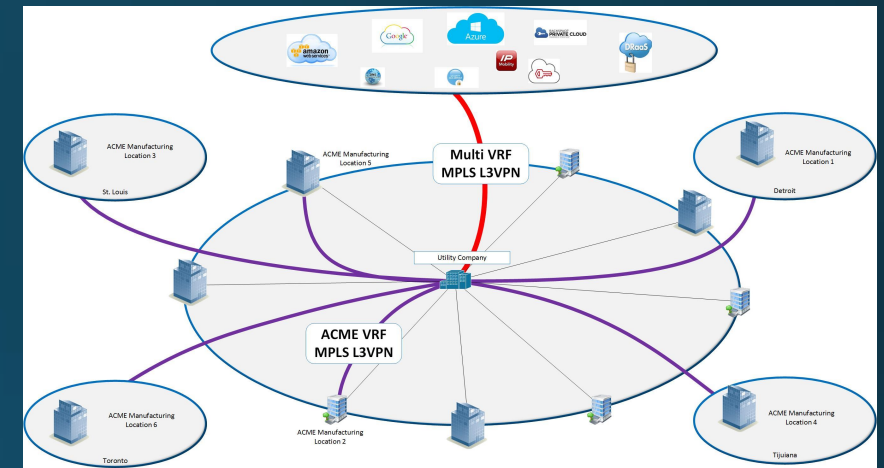




Why does this matter?

So what's the problem?

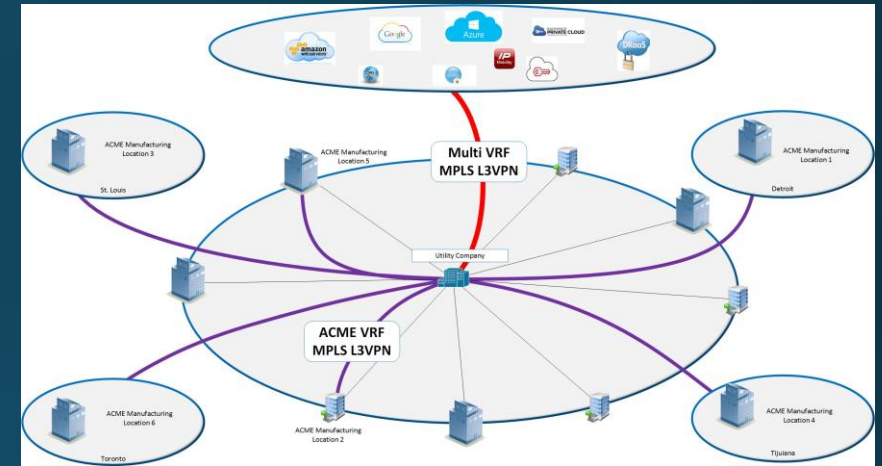
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- Reachability and reliability to cloud is only as good as your Internet connection
- Lack of expertise has emerged as the #1 challenge



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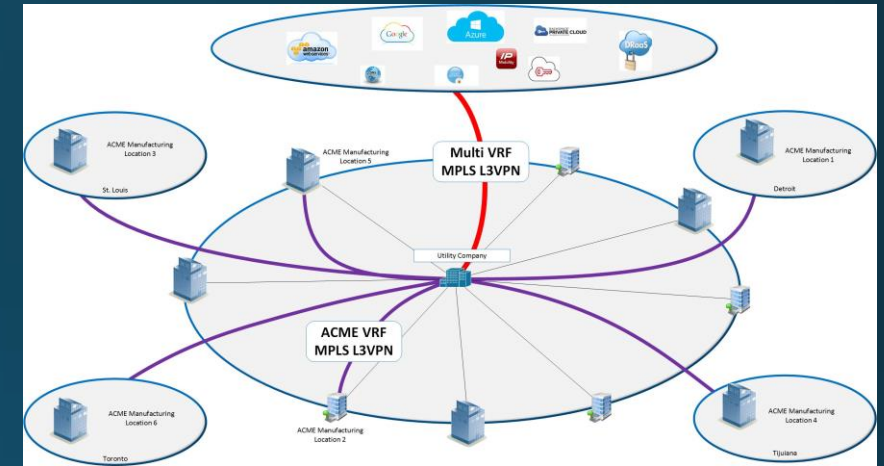
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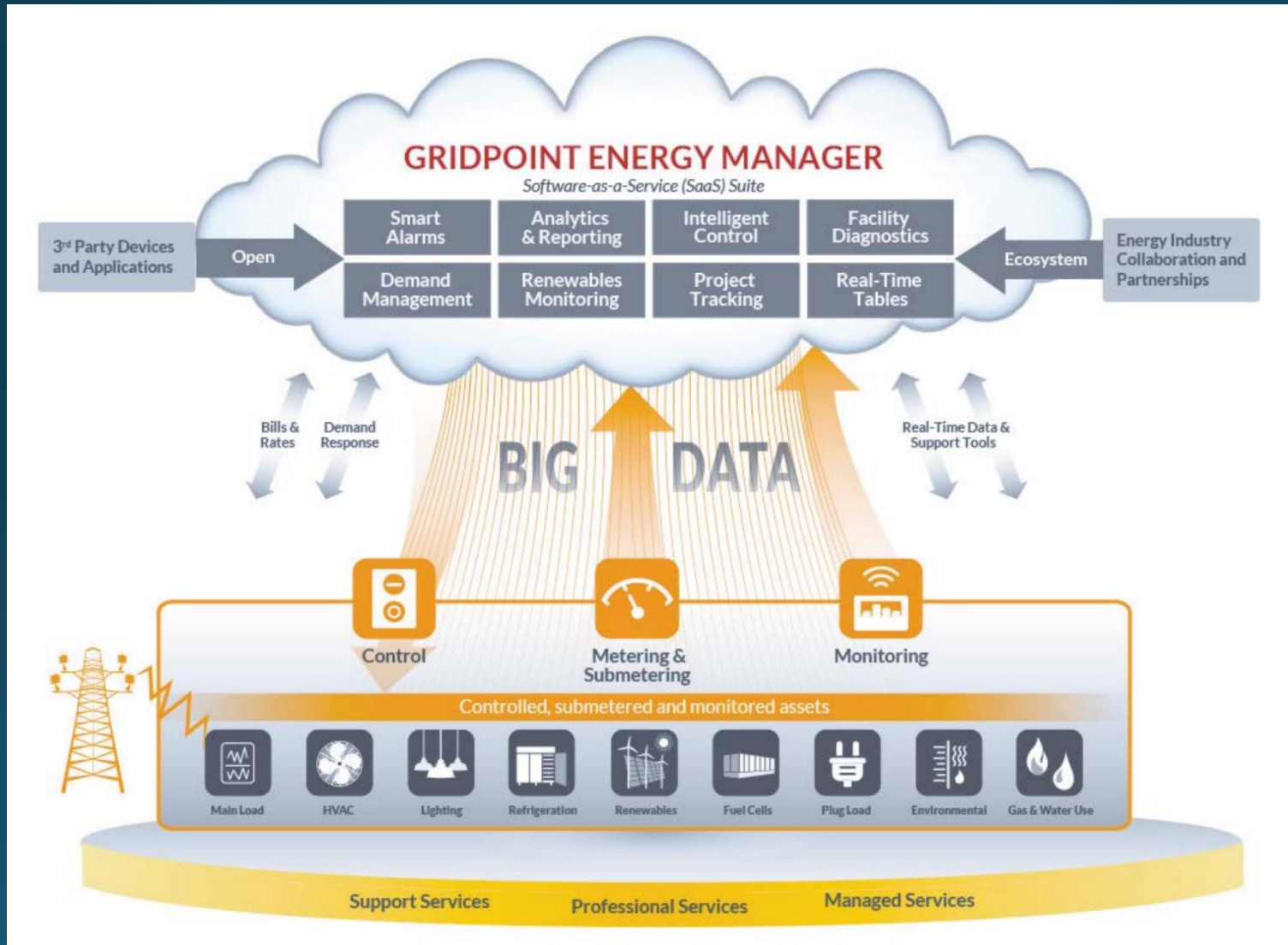
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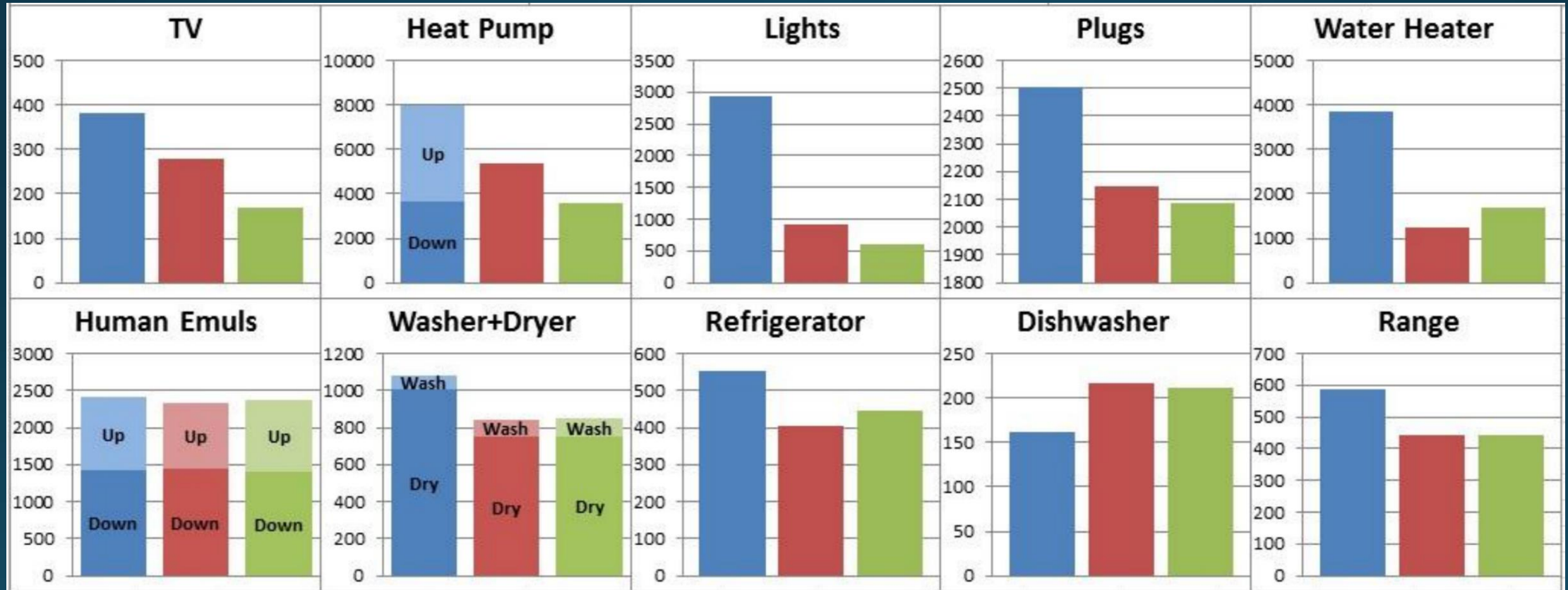
- ~~• Security concerns are real~~
- Reachability and reliability to cloud is only as good as your Internet connection
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Energy United



Campbell Creek Project



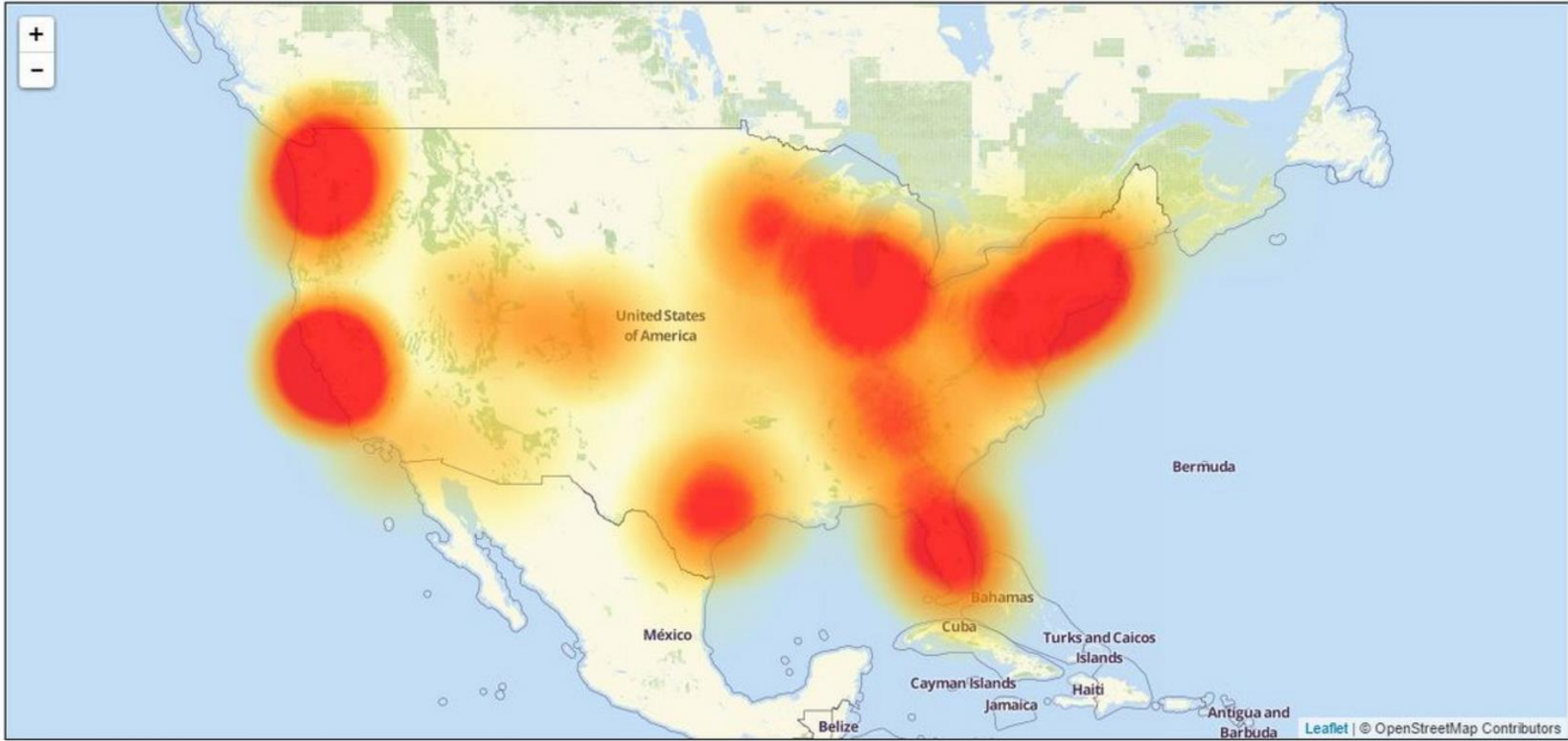
IoT Trusted Advisor



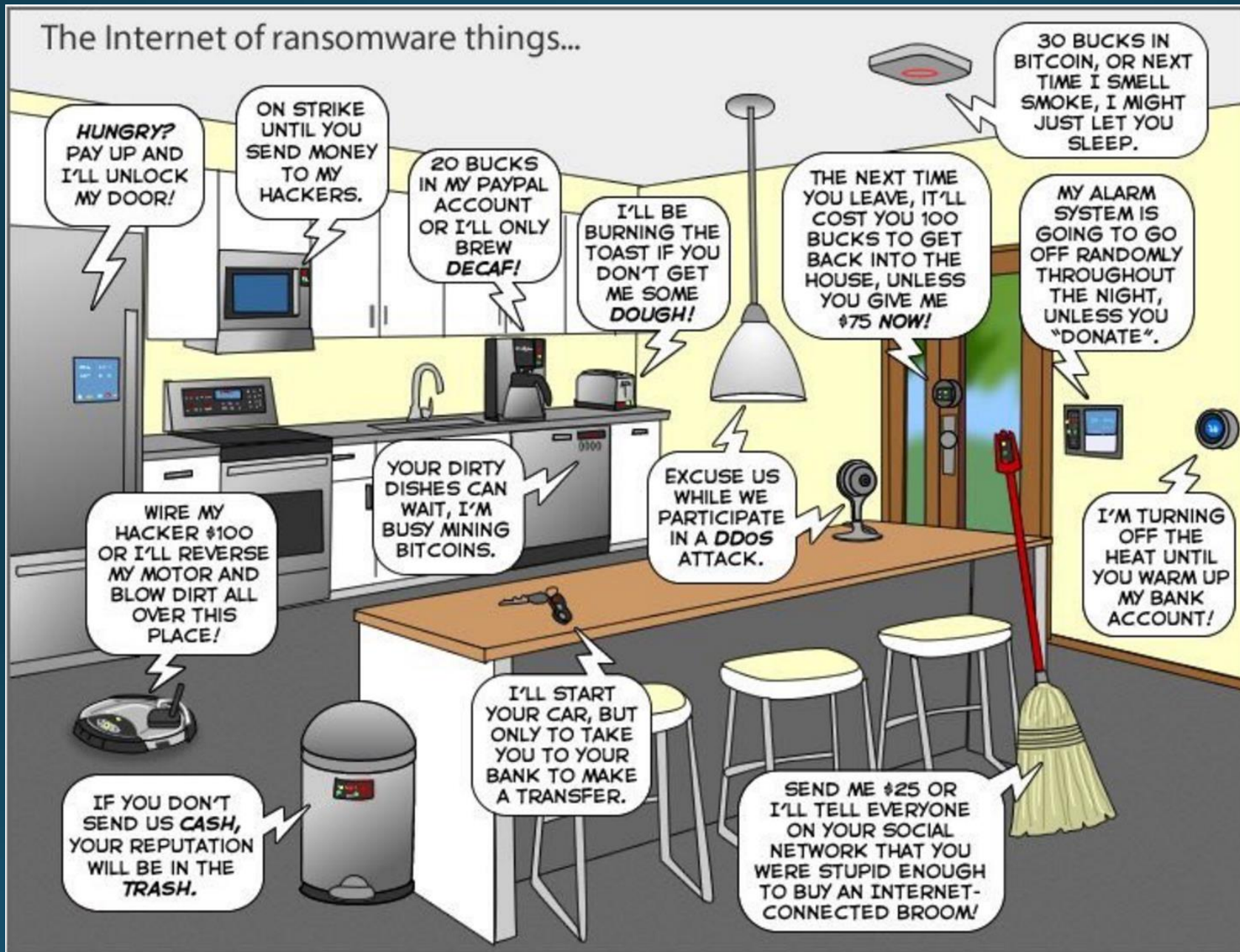
Recent Internet Outage

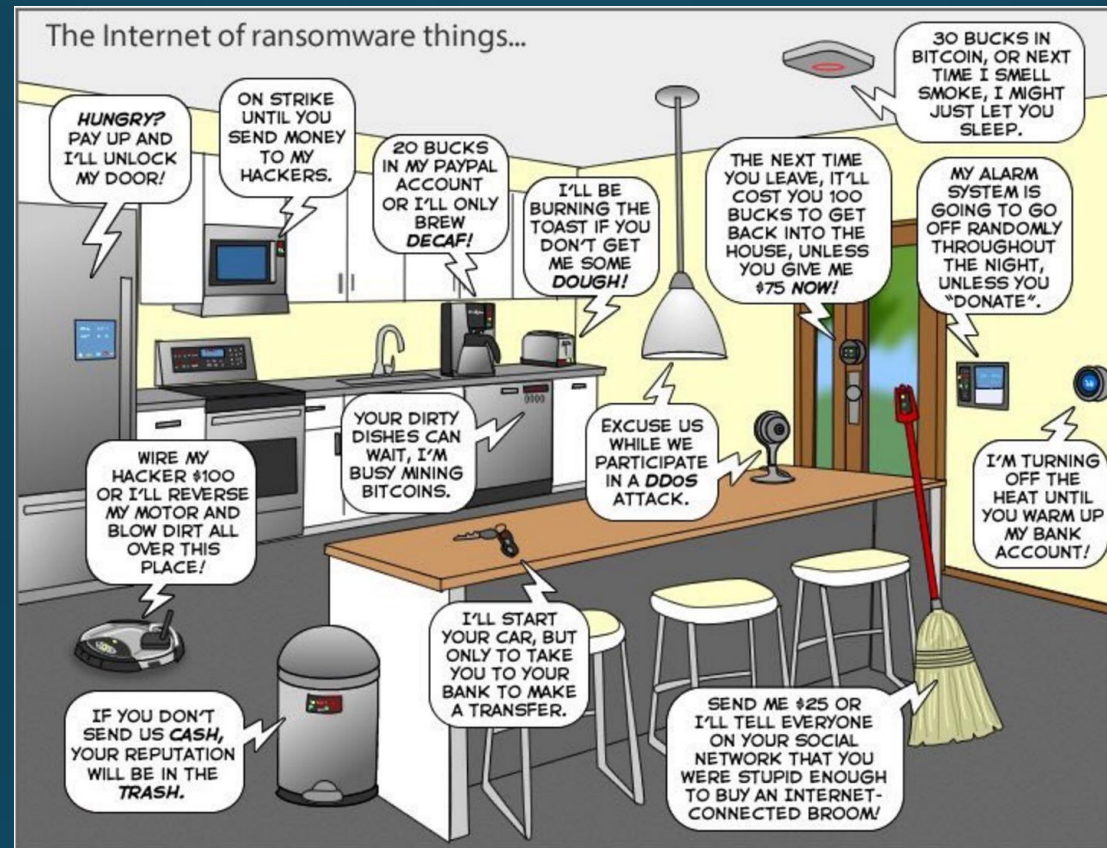
Level3 outage map

Level3 outage chart



The Internet of ransomware things...





Q&A

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www.itc3.guru