PTC® Live Global

PTC 120 - Deploying PTC Windchill and Other PTC Software Solutions in the Cloud

Adam Suber
Principal Solution Architect

Sessions of Interest

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HERE

Title	Presenter(s)	Day	Time
HOW101 Workshop: Cloud Solutions Beyond The Hype (I) A Realistic Review of Business Benefits, Challenges, and Opportunities	Ron Pascuzzi	Monday	1:00 PM - 3:00 PM
PTC101 PTC Windchill Business and System Administration Roadmap	Walid Saad	Monday	1:15 PM - 2:00 PM
PTC205 PTC Windchill Roadmap	Darryn Kozak, Kevin Wrenn	Monday	2:15 PM - 3:00 PM
HOW102 Using PTC System Monitor to Effectively Monitor and Troubleshoot your PTC Windchill Environment	Walid Saad	Monday	4:00 PM - 6:00 PM
PTC120 Deploying PTC Windchill and Other PTC Software Solutions in the Cloud	Adam Suber	Monday	5:00 PM - 5:45 PM
PTC205 PTC Windchill Roadmap	Darryn Kozak, Kevin Wrenn	Tuesday	11:00 AM - 11:45 AM
HOW201 Workshop: Cloud Solutions Beyond The Hype (II) Defining The PTC Cloud	Ron Pascuzzi	Tuesday	1:00 PM - 3:00 PM
PTC220 – Improving PTC Windchill Performance	Ram Krishnamurthy	Tuesday	4:00 PM - 4:45 PM
HOW102 Using PTC System Monitor to Effectively Monitor and Troubleshoot your PTC Windchill Environment	Walid Saad	Tuesday	4:00 PM - 6:00 PM
PTC303 Ask the Experts: PTC Windchill	Darryn Kozak, Debbie Schneider, Francois Lamy, Graham Birch, James Gehan, Michael Rygol, Steve Dertien	Wednesday	8:15 AM - 9:00 AM
PTC304 Smart, Connected Products and PLM: The Future is Here	Francois Lamy, Jill Newberg	Wednesday	9:15 AM - 10:00 AM
PTC307 Connecting PLM to PTC: Improving Support and Maintenance	Graham Birch	Wednesday	10:30AM – 11:15AM
CUST331 Connecting the Dots: Things PTC Windchill Administrators Would Benefit from Knowing But Probably Don't	Joe Priest (DePuy Synthes), Stephen Vaillancourt (PTC)	Wednesday	10:30AM – 11:15AM
PTC318 Monitoring PTC Windchill through PTC System Monitor and User Experience Management	Walid Saad	Wednesday	11:30 AM - 12:15 PM
PTC315 PTC's Smart Connected Applications	Matthew Seaman, Stephen Vaillancourt	Wednesday	11:30 AM - 12:15 PM

Forward Looking Information

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This presentation contains forward looking information
that may be subject to change without notice

Published white papers available at http://www.ptc.com/go/install-windchill

Agenda

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An Attractive Alternative To Traditional ‘On-Premises’ Infrastructure

Introduction

Current State of Deploying Enterprise Software

A Brief History of Recent Cloud Computing

Cloud Service Provider Choices

Deployment Challenges

Security In The Cloud

EDC Design for Global Collaboration

Advanced Topics

Network Shaping

WAN Acceleration

Deployment Automation

Current State of Deploying Enterprise Software

Deploying, Maintaining and Expanding Enterprise Software Has Its Challenges

Resource Issues and Constraints

- Budget
- Schedule / Agility
- Overburdened IT Staff / Infrastructure
- Global Collaboration, Scalability and Performance

Improved Development Life Cycle Efficiencies Are Unrealized

- Higher Product Development Costs
- Longer Product Development Cycles
- Failure to Innovate Faster
- Loss of Competitive Advantage

PTC customers have another option to accelerate and achieve greater ***Realized Value***

Pop Quiz

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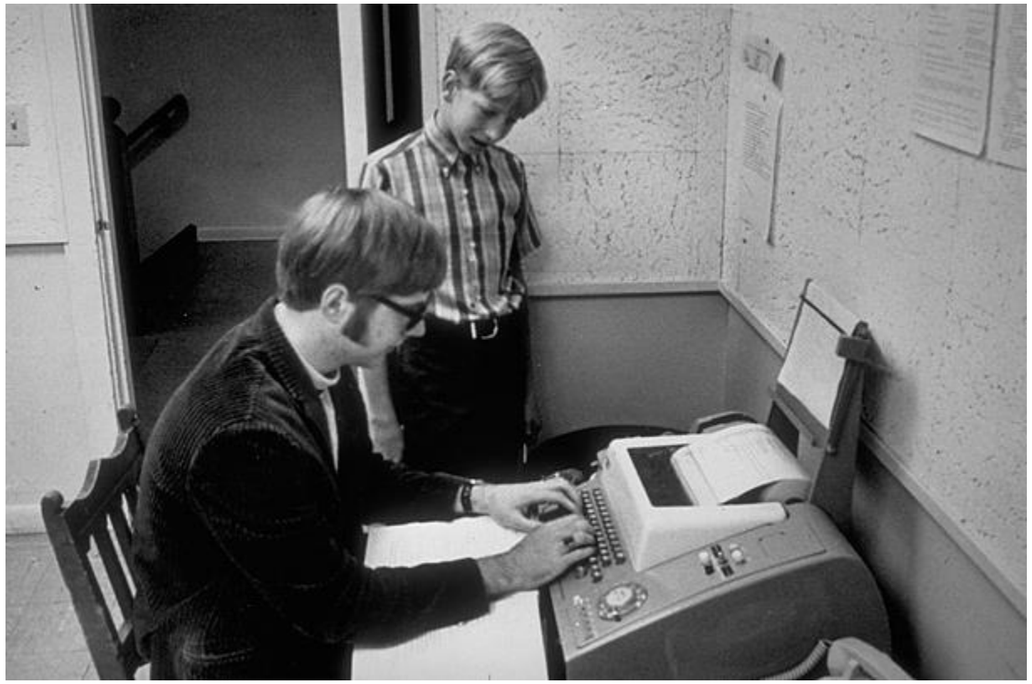
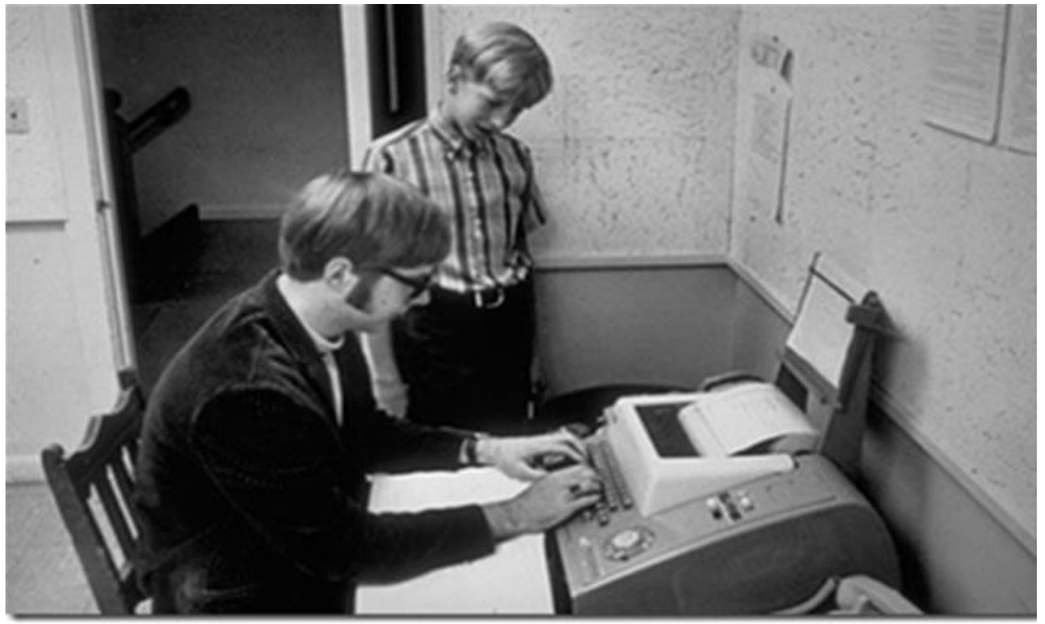
Can You Name These Two People?



Pop Quiz



1968: Bill Gates (standing) and Paul Allen working at the computer terminal at Lakeside school

A Brief History of Recent Cloud Computing

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2006: Amazon launches Amazon Web Services (AWS)

2007: Netflix launches video streaming service (on AWS).

2008: The concept of a *private* Cloud starts buzzing around as a concept. VMware establishes itself in the enterprise.

2010: Microsoft (Windows Azure) is launched

2015: Cloud adoption by major global companies accelerates

BUT, How Do I Get Started?

Adapted from Infographic: A brief history of Cloud – 4/15/2015

Cloud Support

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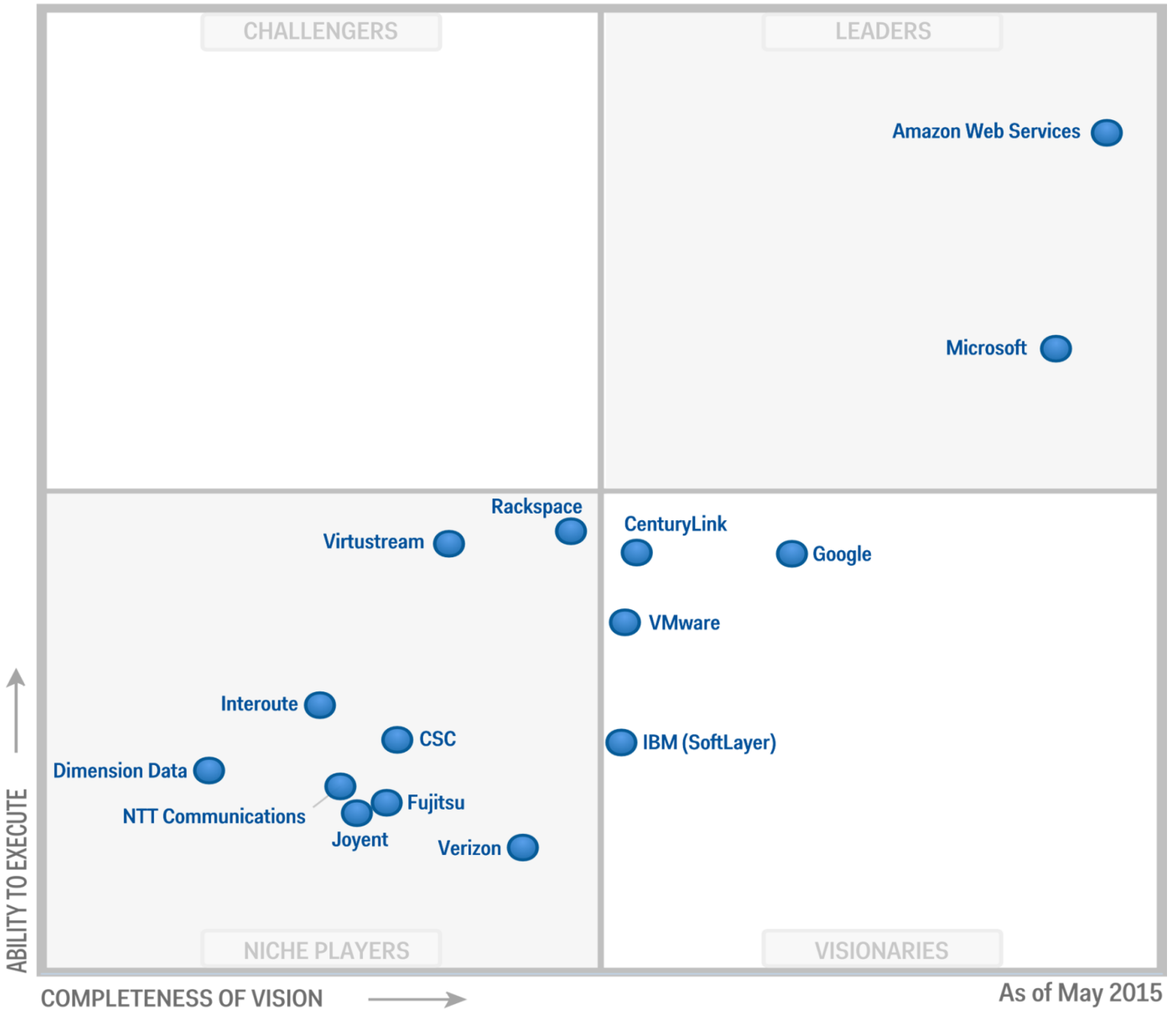
- PTC Supports Amazon Web Services and Microsoft Azure
  - Comparable and Evolving Technology and Service Offerings
  - Treated in accordance to our Platform Support and Virtualization Policy
  - Complex Installations Work Well On Both
- PTC Cloud Services currently utilizes a hybrid of AWS and dedicated hosting
- PTC recommends choosing any provider based on the merits of your relationship with the provider

Figure 1. Magic Quadrant for Cloud Infrastructure as a Service, Worldwide



Source: Gartner (May 2015)

Gartner "Magic Quadrant for Cloud Infrastructure as a Service, Worldwide," Lydia Leong, Douglas Toombs, Bob Gill, May 18, 2015. This Magic Quadrant graphic was published by Gartner, Inc. as part of a larger research note and should be evaluated in the context of the entire report.

PTC Cloud Services

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PLM/SCM/ALM Customers

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COVIDIEN
positive results for life
Shaw
FRESENIUS MEDICAL CARE
AUSTAL
BOART LONGYEAR™
ConMED
Baxter
TTI
ORECK ROYAL
TTI Floor Care North An

PLM On-demand

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Rocket Company ™
ASTRA
warburtech.com
WARBURTON TECHNOLOGY™
TREADWELL CORPORATION
RAB LIGHTING
EATON
Powering Business Worldwide
LOCUST POV
POWER WHEN YOU NEED
UltraClenz™
SentrySafe

SLM Customers

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harmonic
McN
An Oshkosh Co
DELL
Liu
Electrolux
Pitney
sears
LEXMARK™
sysmex
HITACHI
DATA SYSTEMS
BR
Mahindra
VOYT
Pierce
tellabs
Linde Material Handl

IoT Customers

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VAISALA
FUJIFILM
FUJIFILM Medical Systems USA, Inc.
PACIFIC BIOSCIENCES
DIEBOLD
Hitachi High-Tech
HITACHI
Hospira
Advancing Wellness
BrainLAB
ISILON SYSTEMS
Microsoft
ACCURAY
NCR
IMRIS
at&t
Parata
ELEKTA
SuHai
McKESSON
EMC²
where information lives
SIEMENS
VARIAN
medical systems
CareFusion
VENTANA
MEDICAL SYSTEMS, INC.
MAQUET
smiths medical
bringing technology to life
applied biosystems
part of life technologies
TERADATA.
Quantum.
KEY TECHNOLOGY
HOLOGIC
CLARITY OF VISION
Leica
MICROSYSTEMS
BelMed
Infection Control
GERBER SCIENTIFIC
PHILIPS
SAKURA
NetApp
3PAR
Serving Information
ITW
talaris
METTLER TOLEDO
SAIC
VIRTUAL INSTRUMENTS
Orbotech
Medtronic
TomoTherapy
Agilent Technologies
SPACELABS Healthcare
Sealed Air
Our Products Protect Your Products
Omnicell
MINNETRONIX
THINKING MEDICAL SYSTEMS
SMC
sierra monitor
Swissray
medra
Performance. For life.
MINNETRONIX
THINKING MEDICAL SYSTEMS
Ilyn
TIDEL
KONICA MINOLTA
Waters
SOLTA MEDICAL
Kodak
Ingersoll Rand
Hill-Rom
A HILLENBRAND INDUSTRY
COMVERSE
Carestream
HEALTH
Automated PACKAGING SYSTEMS
ATHENA CONTROLS, INC.
JOY
JOY MINING MACHINERY
sysmex
Cornelius
ALL TRAFFIC SOLUTIONS
ONFARM
GROW INFORMED
SMARTSTRUCTURES
ATI
pactera
MONSANTO
MOEN
maxta
Aquamatix
YANKEE CANDLE
company

4

Agenda

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An Attractive Alternative To Traditional ‘On-Premises’ Infrastructure

Introduction

Current State of Deploying Enterprise Software

A Brief History of Recent Cloud Computing

Cloud Service Provider Choices

Deployment Challenges

SSL Security

Security In The Cloud

EDC Design for Global Collaboration

Advanced Topics

Network Shaping

WAN Acceleration

Deployment Automation

A Word About SSL Security

PTC Adheres to the current IETF recommendations

- IETF RFC7525 – Recommendations for Secure Use of Transport Layer Security (TLS)
  - Widely used to protect data exchange over application protocols - HTTP(S)

- PTC regularly updates the security configurations
  - Customers should continually evaluate and update their PTC software installations
  - Critical Patch Sets (CPS) – PTC Windchill 10.2
  - Maintenance Only Release (MOR) and Apache Early Release - Windchill 10.1 and prior

- PTC is increasing our customers awareness around security best practices
  - Security Best Practice Notice – April 2015
  - Out with the OLD, in with the NEW!
    - Apache 2.4 in PTC Windchill X-26
    - Move from using less secure version of SSL/TSL to more secure versions - TLS 1.2
    - Stronger Cipher Suites, Longer Key Lengths – At Least 2048

A Word About SSL Security

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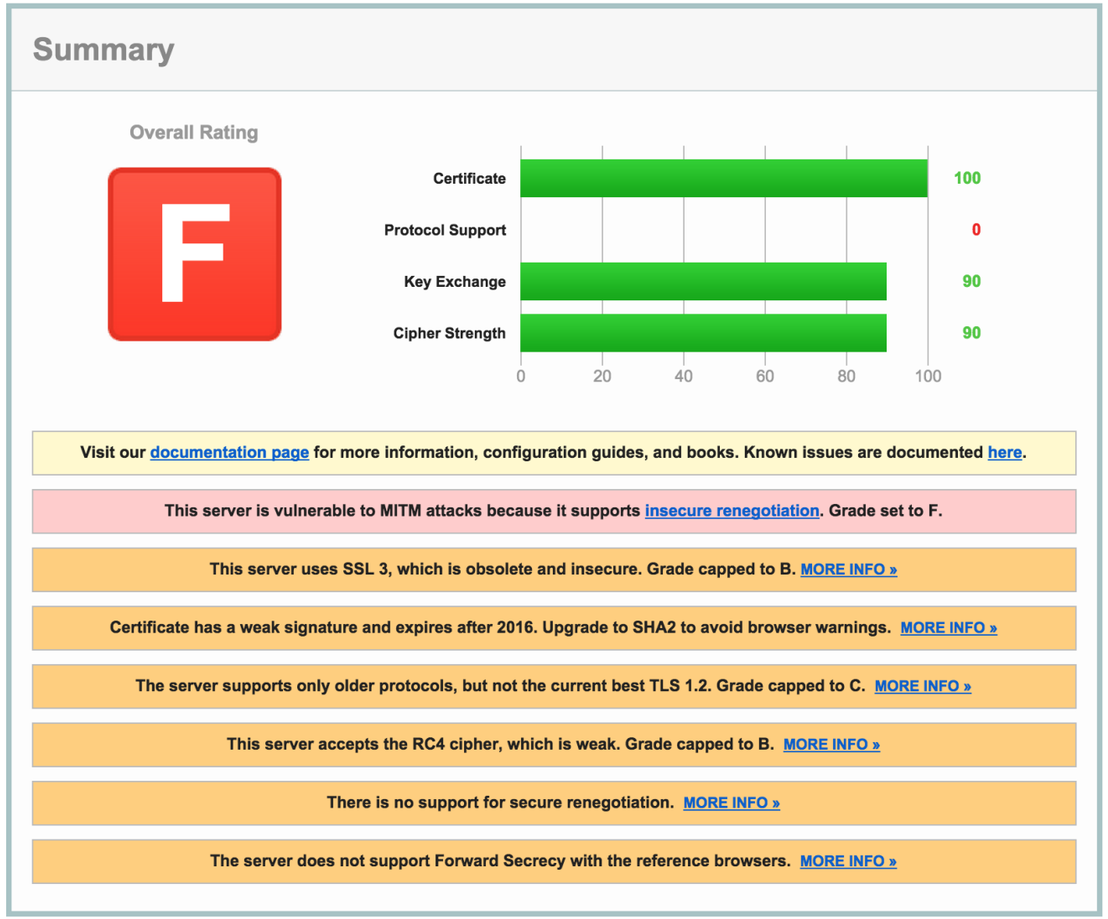
Raising IT Awareness

- Customers utilizing a Load Balancer / Network Appliance for SSL are NOT immune!
  - Awareness brought to light by AWS continually evolving their default load balancer policy rules
  - Verify your SSL appliances for compliance to IETF recommendations
- Test your implementations with the Qualsys SSL Tool
  - https://www.ssllabs.com/ssltest/
- Apache 2.2 Rating
  - With latest PTC CPS/Apache – B Rating
- Apache 2.4 Rating
  - Default IETF Configuration – A Rating
  - Can be increased to an A+ with post install configuration



PTC Windchill Cloud Deployments

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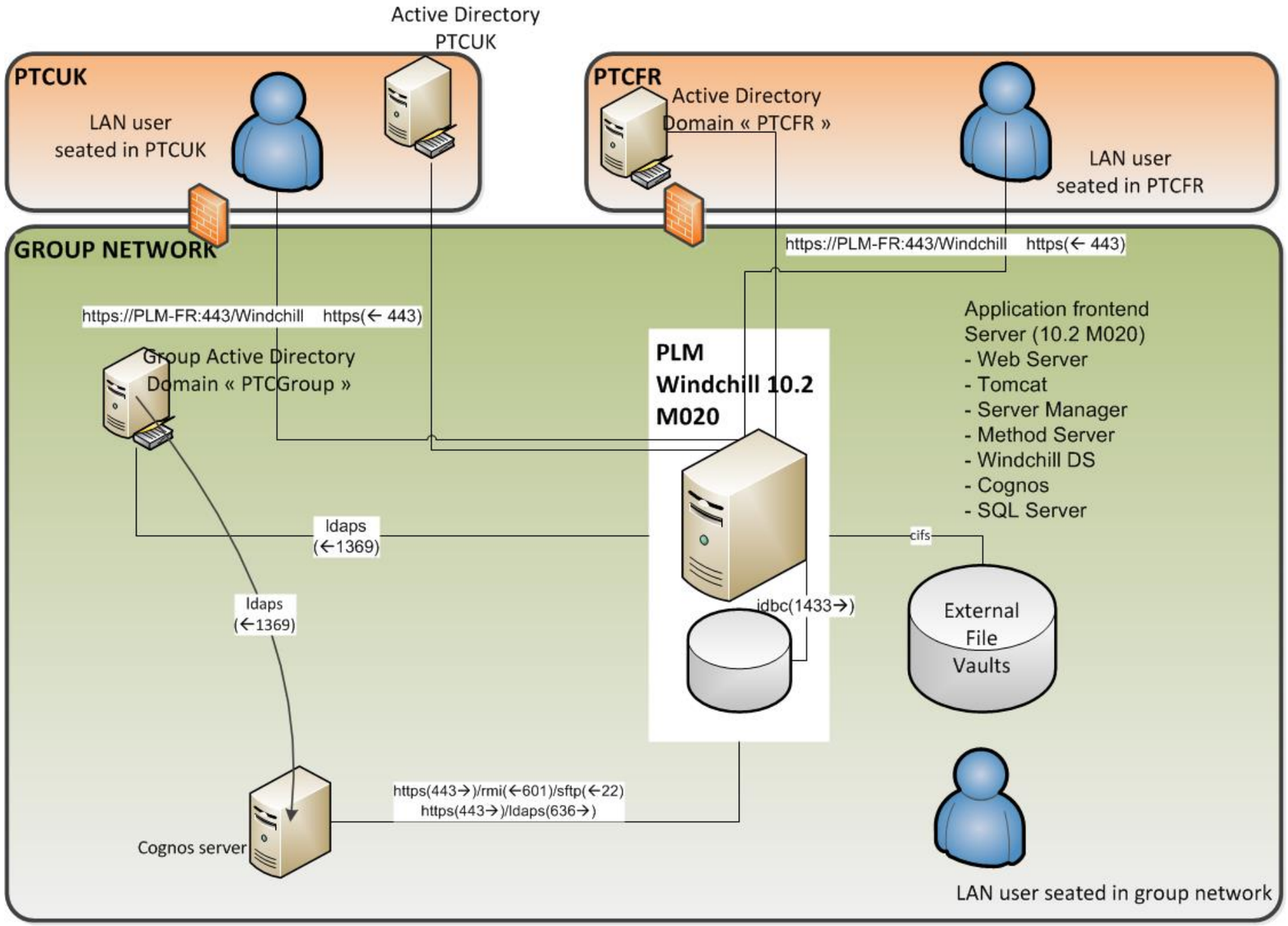
Example 1: Microsoft Azure – Customer POC For Secure Authentication Across Mixed Domains



Secure Remote Client Access

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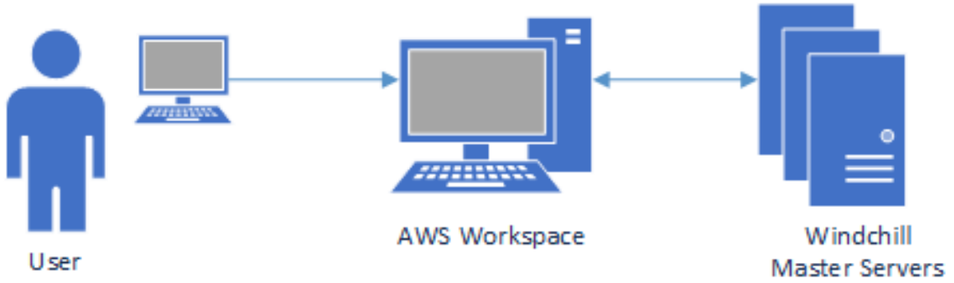
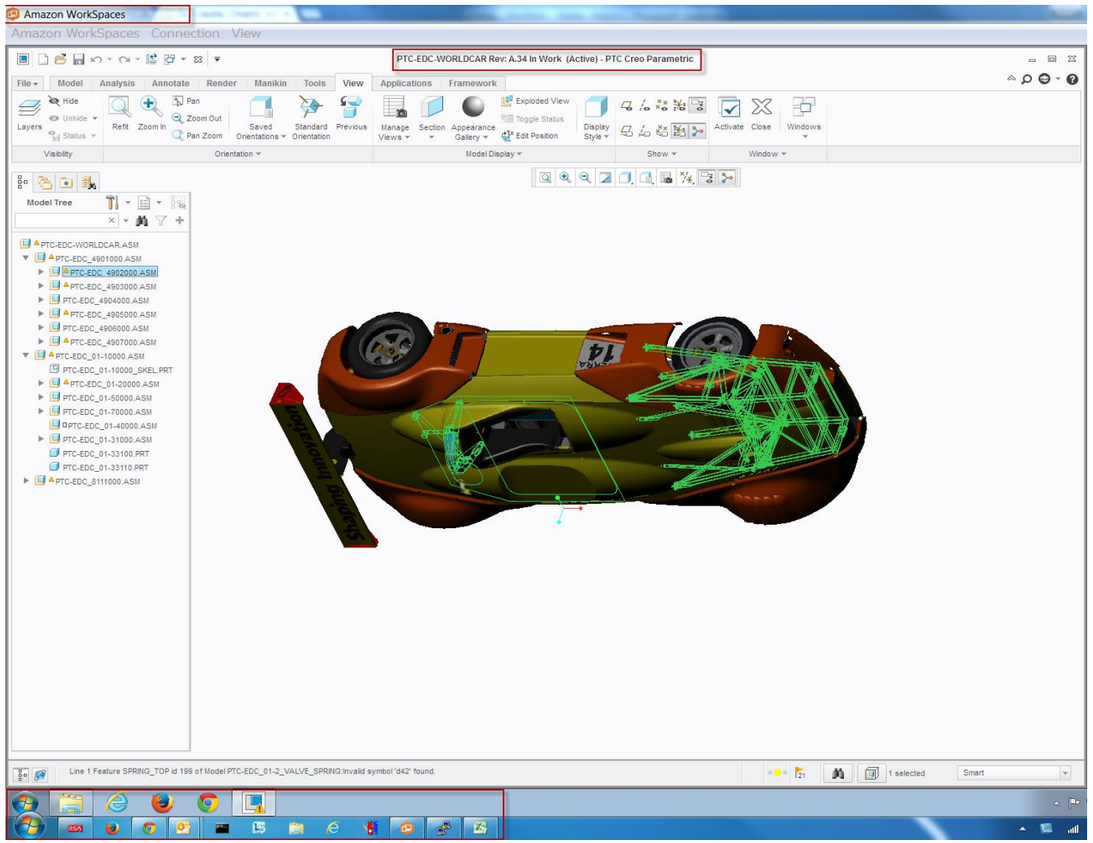
Ship Pixels, Not Data

- Considered for secure access to content and challenging remote user access/network conditions
  - Technology includes significant protocol optimization
  - No content transfer to the client, only pixels
  - Can be secured within the data center and closer to the servers
  - Good User Experience / Performance to latencies approaching 200ms

- Virtual Desktop Integration (VDI)
  - Centrally managed, remote desktop environment on internal infrastructure
  - Citrix HDX, VMware Horizon, Microsoft Remote Desktop
    - Citrix HDX is Creo Certified

- Desktop-as-a-Service (DaaS)
  - DAAS uses a Cloud service provider to provision and manage the desktop
    - Virtualized Windows 7 desktop
    - Install, configuration and manage like a normal workstation
  - Azure RemoteApp and AWS Workspaces are Under Review by PTC
    - Potential is extremely promising





Amazon AWS – EDC POC For Global Collaboration

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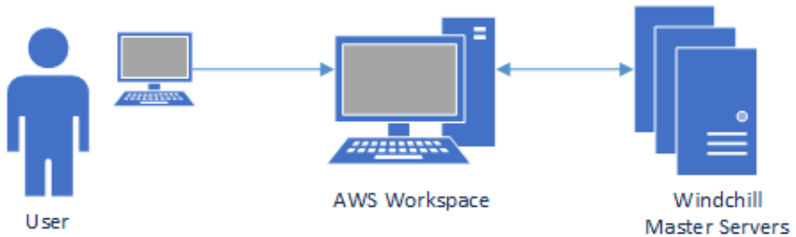
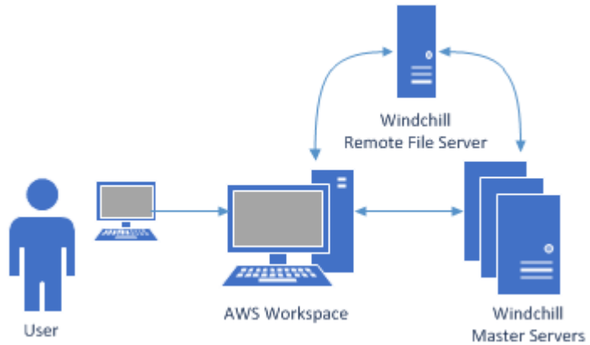
Which Is Faster For Global Collaboration – Master vs. RFS?

Master location using AWS Workspaces



Remote location using AWS Workspaces



PTC Windchill Cloud Deployment

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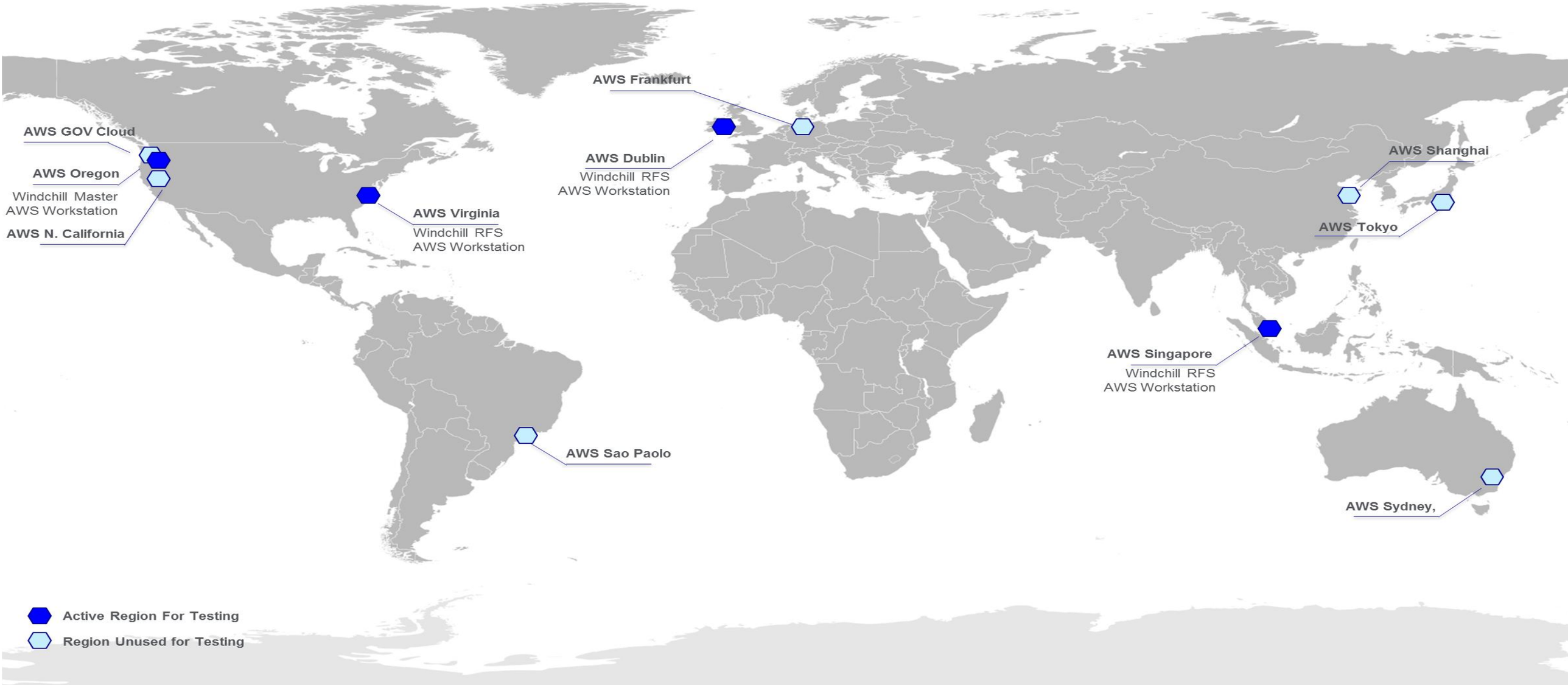
Example 2: Amazon AWS – EDC POC For Global Collaboration Using RFS'



Amazon AWS – EDC POC For Global Collaboration

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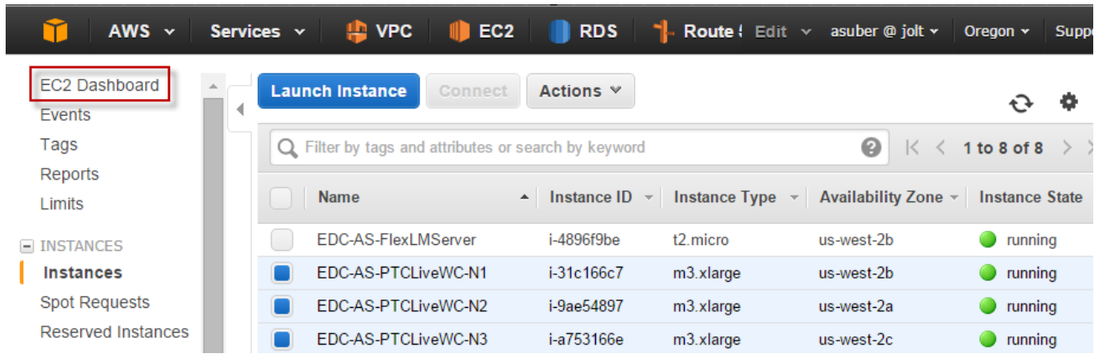
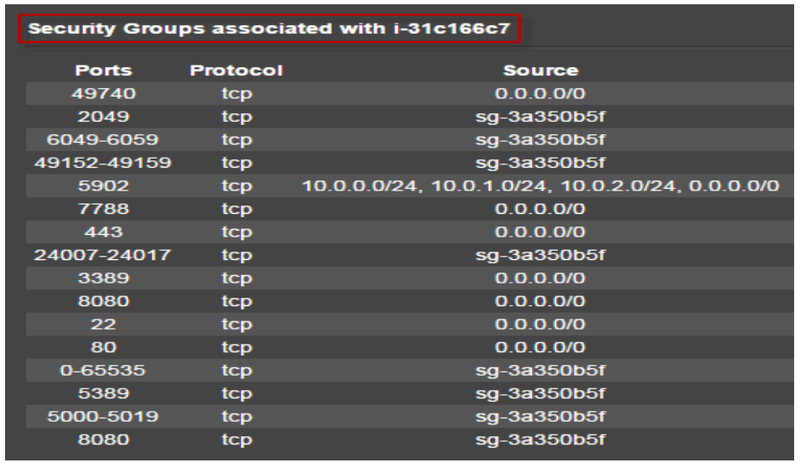
AWS Dashboards Examples – Under The 'Hood' of AWS

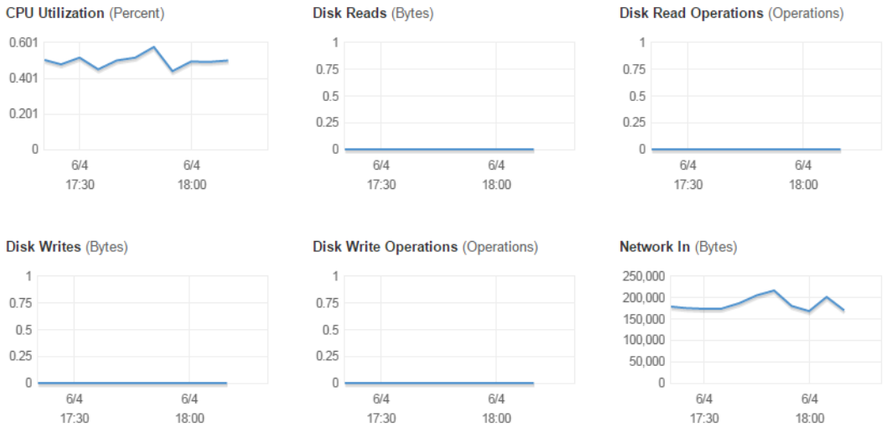
- EC2 Instance Listing



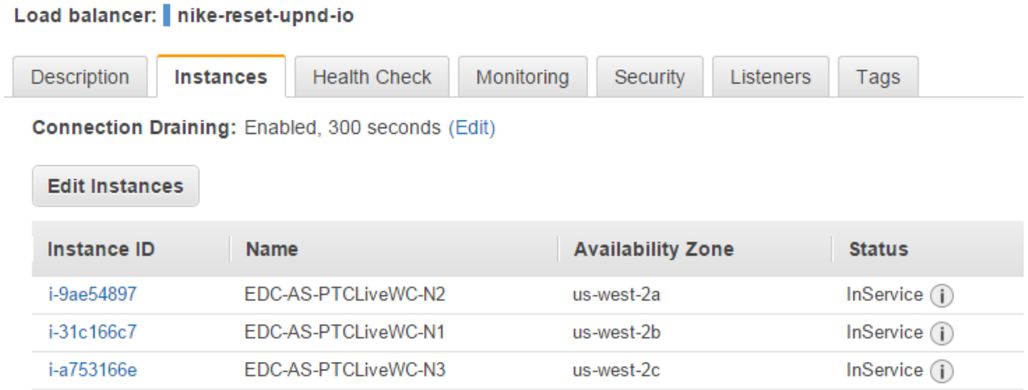
- Security Rules



- Monitoring



- Load Balancer



Amazon AWS – EDC POC For Global Collaboration

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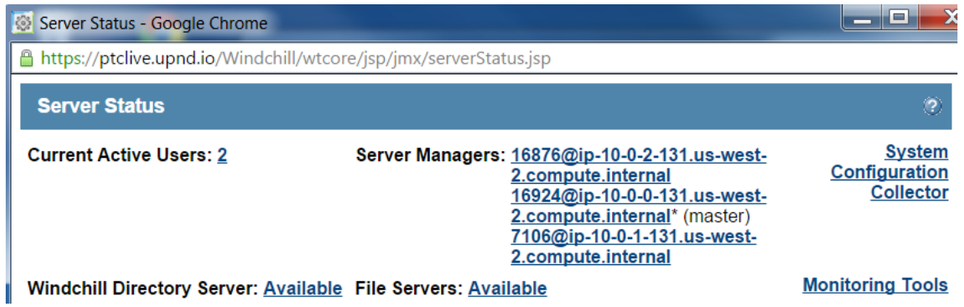
PTC Windchill on AWS Dashboards Examples – The Good Ol' Server Status Page

- Server Manager Listing



- Master Server Manager

Master Server Manager:	16924@ip-10-0-0-131.us-west-2.compute.internal*				**Uptime:**	10 days, 02:44:09.50	
JMX URL:	service:jmx:rmi://n2.upnd.io:6049/jndi/rmi://n2.upnd.io:6049/jmxrmi				**Deadlocked:**	No	

	Recent	Baseline	Memory In Use		Available System Memory		Other System Info	
Time In Garbage Collection	0%	0%	Heap	18.627%	Physical	207.863MB (1.391%)	Load Average	0
CPU Used by Process	0.069%	0.033%	Perm Gen	45.745%	Swap	0MB (%)		

Method Server Data	BackgroundMethodServer.16969	MethodServer.16966*	MethodServer.17274
Uptime	10 days, 02:44:05.874	10 days, 02:44:05.864	10 days, 02:43:20.57
Deadlocked	No	No	No

- PTC Windchill DS

Windchill Directory Server:	1305@ip-10-0-0-131.us-west-2.compute.internal				
JMX URL:	service:jmx:rmi:///jndi/rmi://nike-reset.upnd.io:1689/org.opends.server.protocols.jmx.				

	Recent	Baseline	Memory In Use		Av
Time In Garbage Collection	0.023%	0.012%	Heap	3.176%	Phy
CPU Used by Process	0.131%	0.134%	Perm Gen	46.353%	Swa

- RFS'

File Servers			
Site URL	**Name**	**Status**	**Time of Last Ping**
https://ptclive-rfsapsgp.upnd.io/Windchill/servlet/WindchillGW	Site_RFS_APSGP	OK	2015-06-04 13:29:43.168 -0400
https://ptclive-rfseuire.upnd.io/Windchill/servlet/WindchillGW	Site_RFS_EUIRE	OK	2015-06-04 13:29:43.617 -0400
https://ptclive-rfsuseast.upnd.io/Windchill/servlet/WindchillGW	Site_RFS_USEAST	OK	2015-06-04 13:29:42.867 -0400
https://ptclive.upnd.io/Windchill/servlet/WindchillGW	master	OK	2015-06-04 13:29:43.160 -0400

Amazon AWS – EDC POC For Global Collaboration

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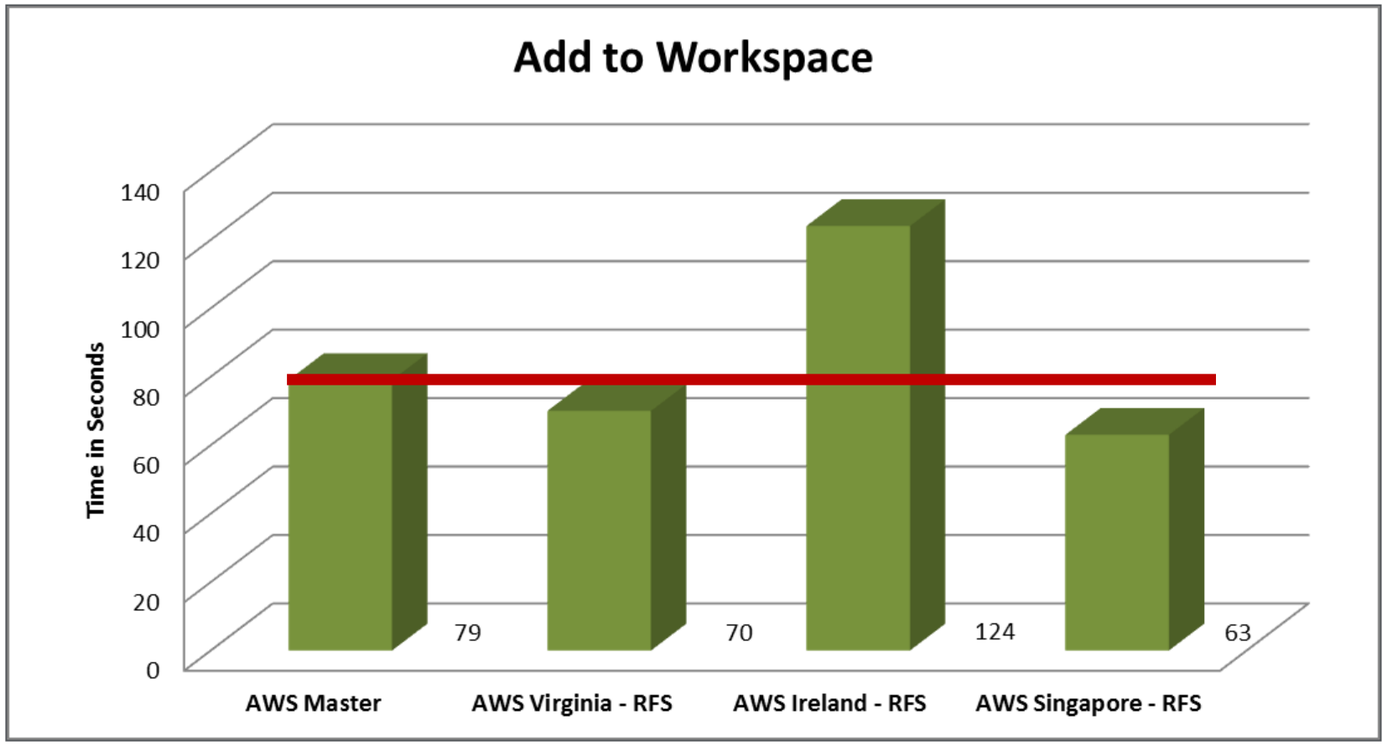
Which Is Faster For Global Collaboration – Master vs. RFS?
Example:

Master location using AWS Workspaces

Remote location using AWS Workspaces



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Why Networking Matters for Global Deployment

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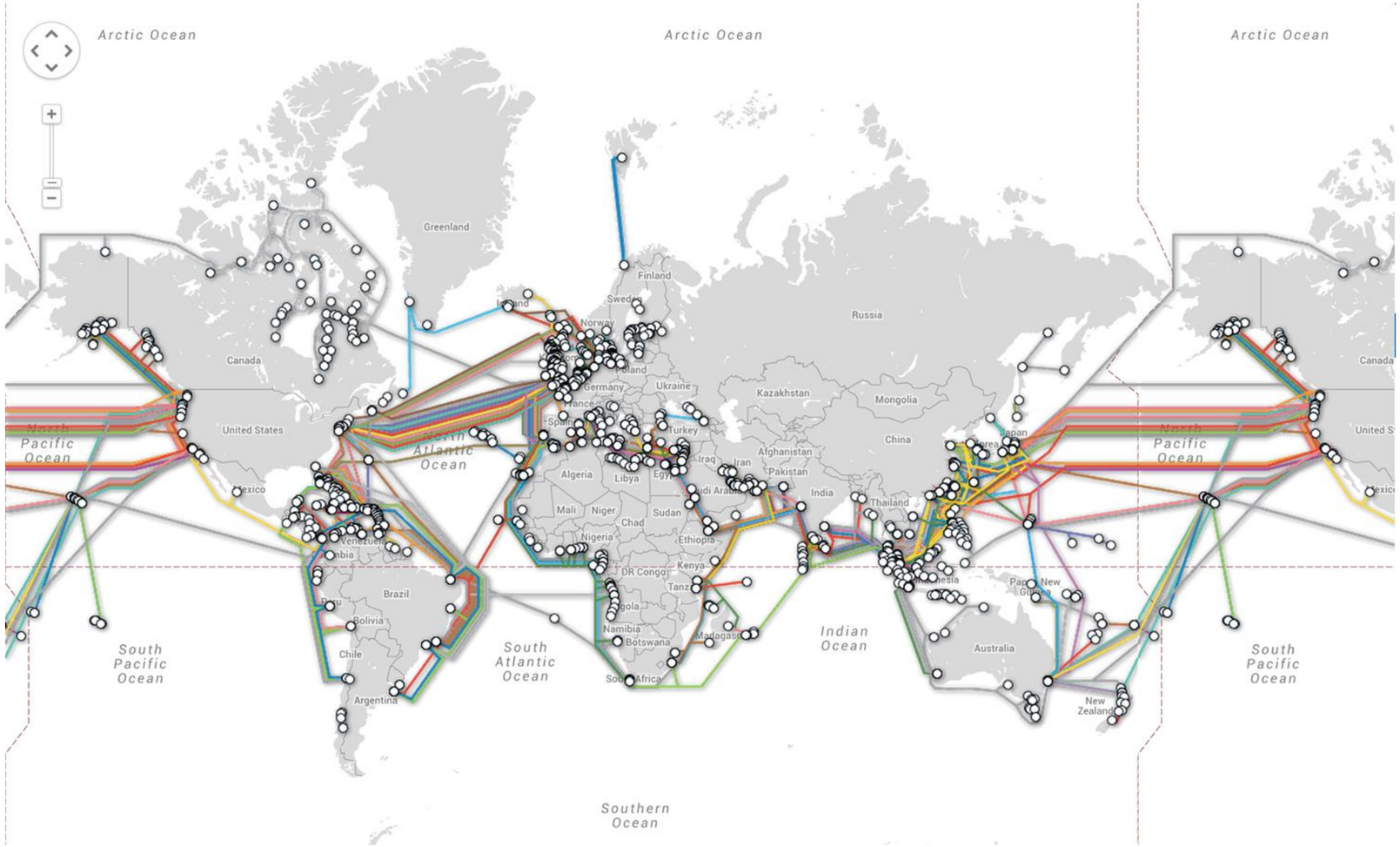
Internet routes are not all created equal

- Latency is the most notable factor on performance
- Network Tier Interconnect is often a hidden consideration
  - The closer a connection gets to a Tier 1 network the fewer the hops and the better performing the connection
- Be cautious that corporate routing rules may direct all global internet to a distant internet gateway at a corporate office
  - Don't trust a map



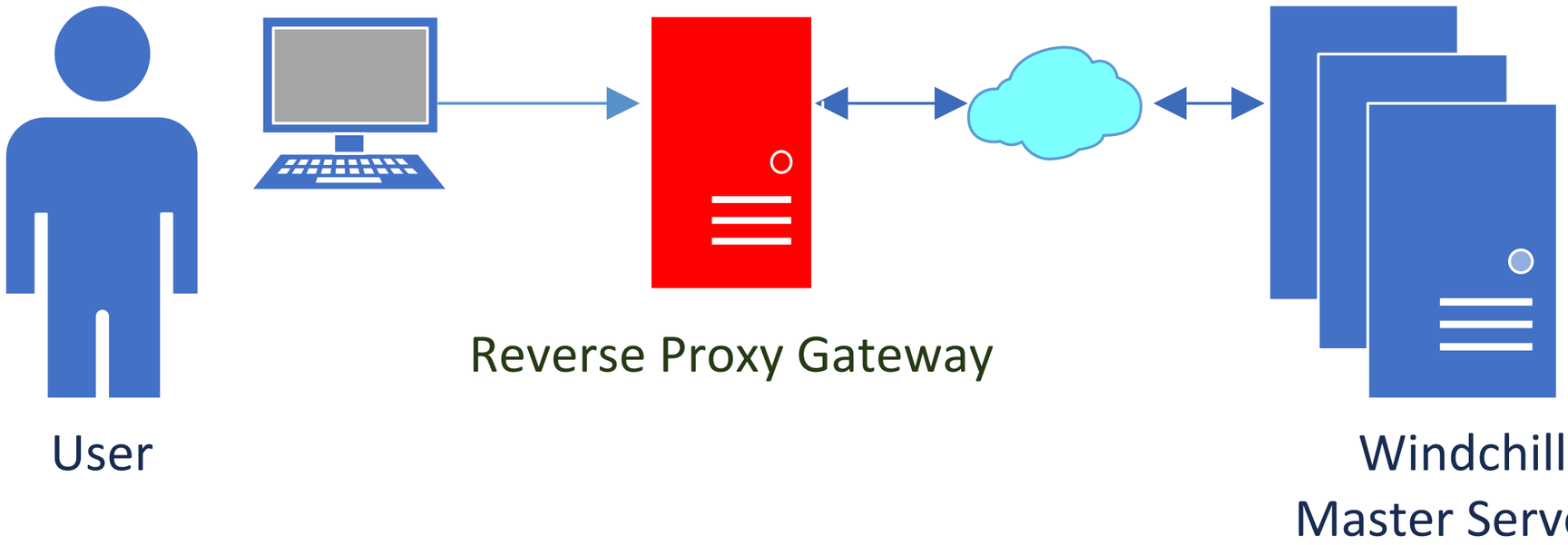
Global Network Submarine Map - http://www.submarinecablemap.com/

Latency Based Routing (LBR) With Route 53 And Windchill

*Route 53 is AWS' authoritative Domain Name Service (DNS)

Route 53 will route end users to the end-point that provides the lowest latency

Goal: Obtain the shortest network path onto the fastest optimized network a user can obtain



Advanced Networking

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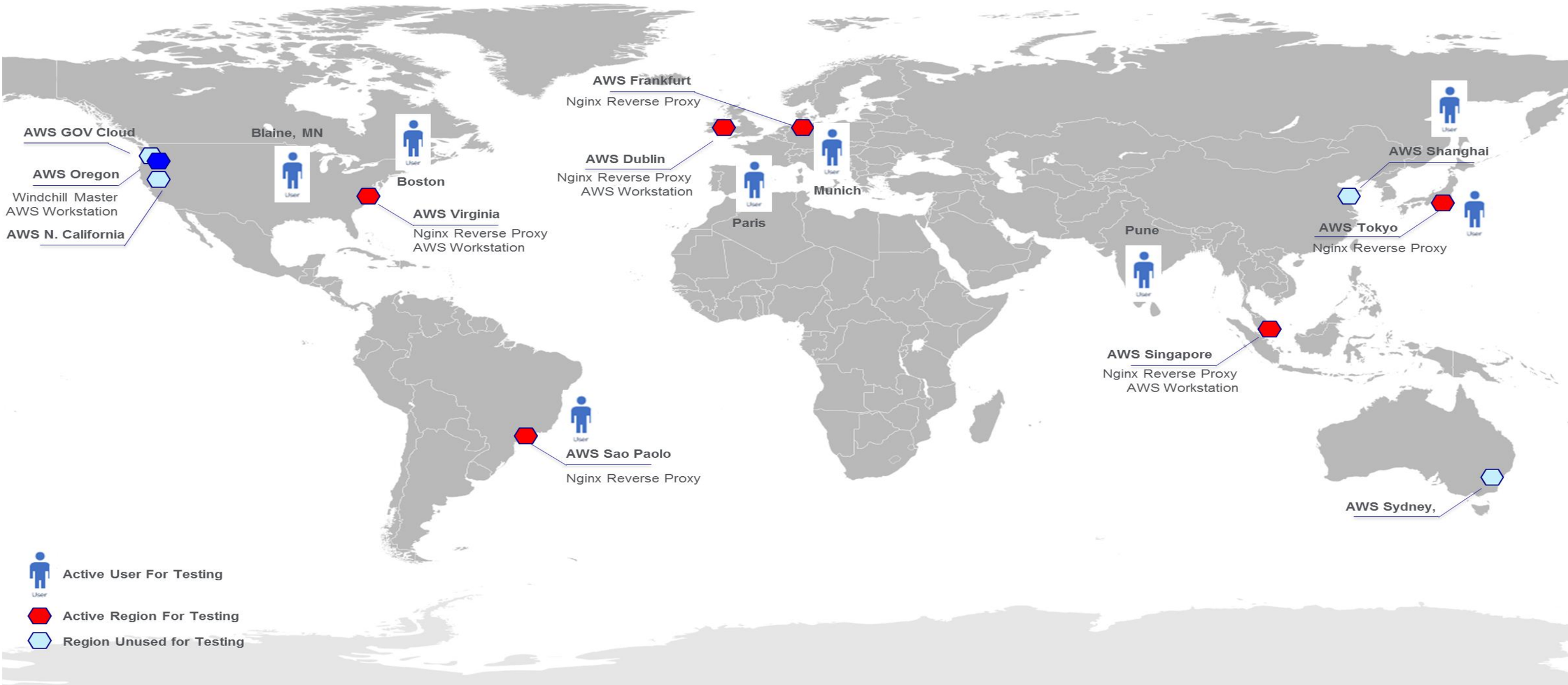
Latency Based Routing (LBR) With Route 53 And Windchill Users Distributed Globally



Reverse Proxies As An Alternative To RFS'

Use Latency Based Routing (LBR) With Route 53 And Windchill

1. Run multiple stacks of reverse proxies (RPs) in different EC2 regions around the World
2. Create a Latency Based Routing DNS records using the Route 53 console
   - Tag each destination end-point to the EC2 region that it is located within
   - End-points can either be Elastic IP's or preferably Elastic Load Balancers for HA
3. Route 53 will route end users to the end-point that provides the lowest latency relative to the client location
   - The latency calculation can change depending on the conditions of the client network

Amazon AWS – EDC POC For Global Collaboration

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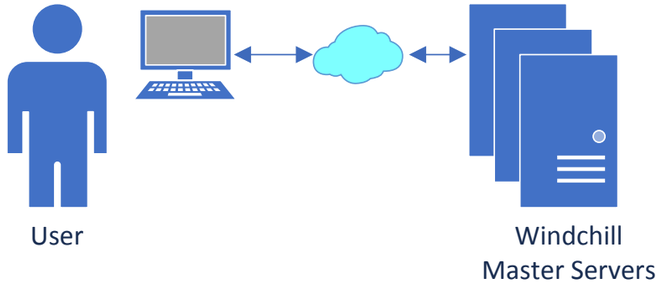
Which Is Potentially Faster For Global Collaboration?

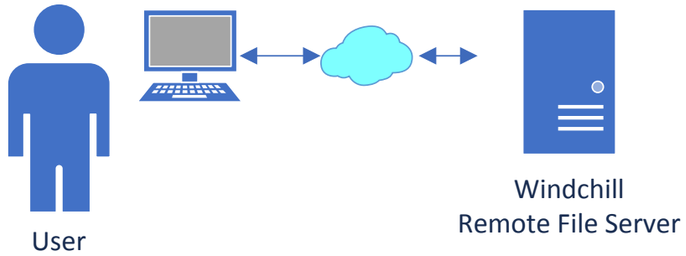
Master w/o Reverse Proxy

master.server.com/filesize.file



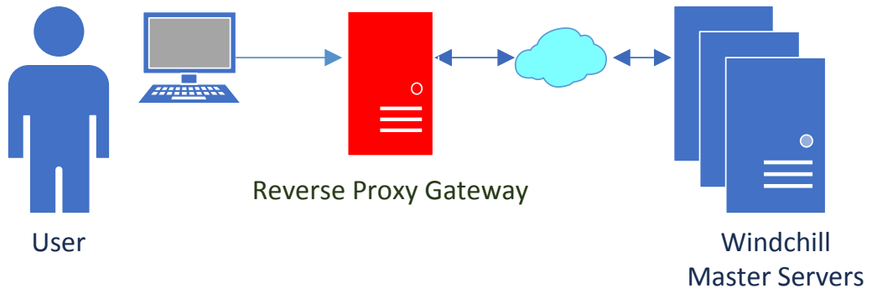
Straight To The RFS

rfs-server.com/filesize.file



Master w/Reverse Proxy

rp-server.com/filesize.file



Amazon AWS – EDC POC For Global Collaboration

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Preliminary Testing Sample

Simple Download/Upload of 1, 10, & 100 Mb Files Using “cURL”

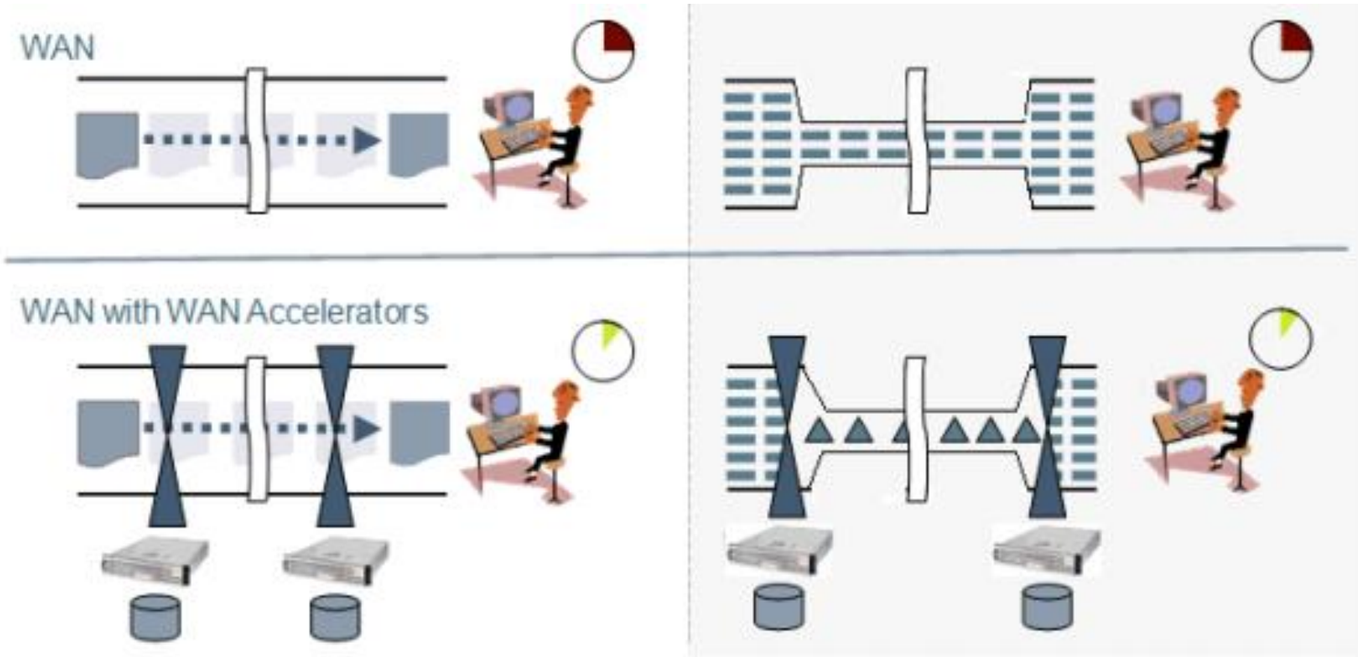
- The Americas
  1. Blaine, MN
  2. Boston, MA
  3. Sao Paolo, Brazil
- The EU
  1. Munich, Germany
  2. Paris, France
- APAC
  1. Pune, India
  2. Shanghai, China
  3. Tokyo, Japan

WOW! That’s A Lot Of Numbers To Crunch, To Review And To Verify Before I Present at PTC Live Today!!!!

Look For Future Published Case Studies by The EDC

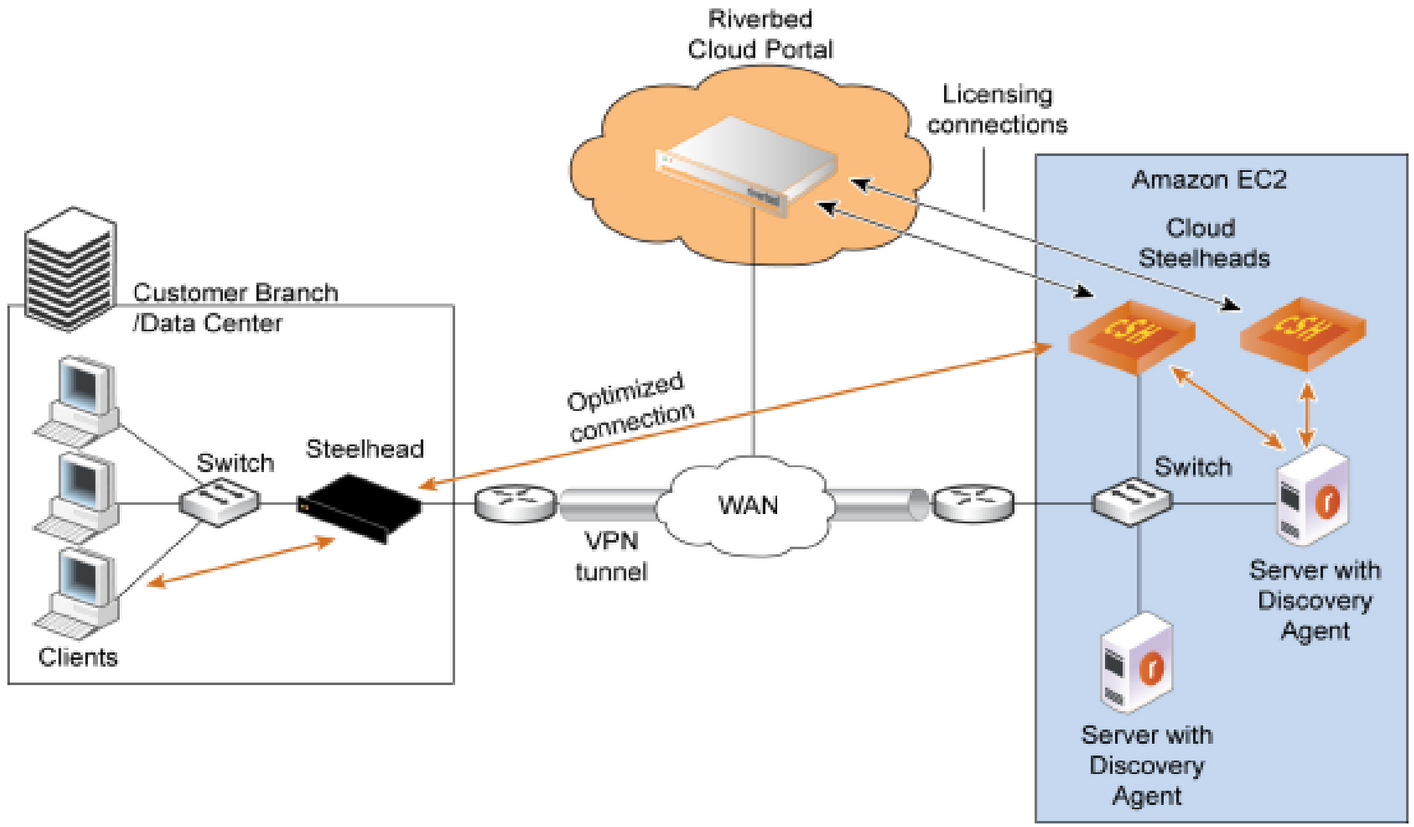
WAN Accelerators and PTC Windchill Performance - Technical Brief

- Quick Overview of WAN Optimization
  - WAN accelerators streamline network communication with caching
  - Reduce sending redundant data through the use of data deduplication
  - Reduces overall bandwidth consumption
  - Increased network quality of service (QoS)
  - Eliminates 65-98% of TCP packets required for transfer



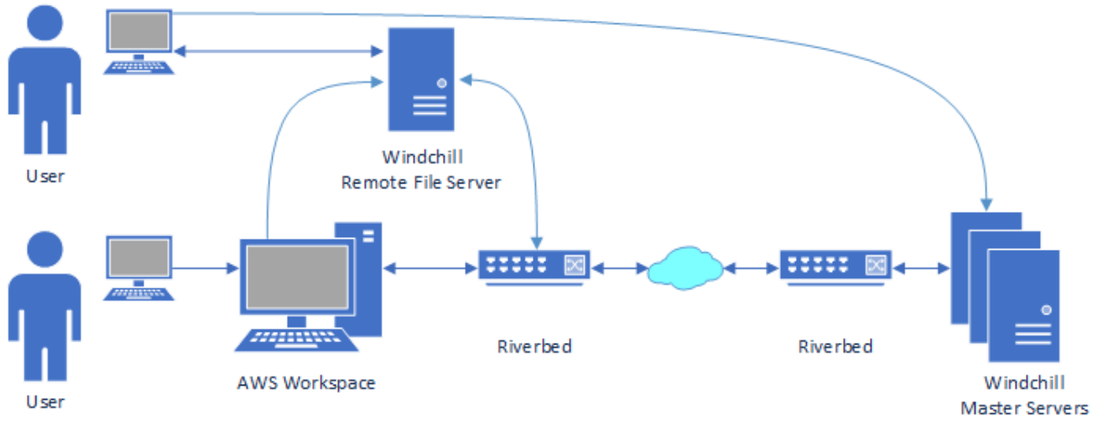
WAN Optimization In The Cloud

- Example: Riverbed Cloud Services
  (Riverbed Cloud Services User's Guide)

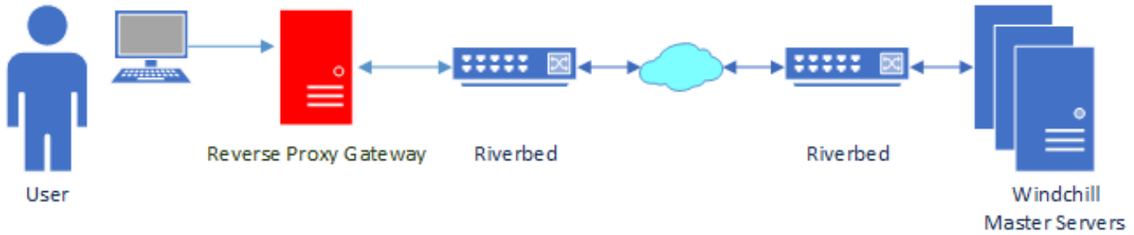


A Future Test Case in Global Performance using Mixed Networks and AWS

Utilizing Riverbed WAN Acceleration between AWS regions with file servers



Utilizing Latency Based Routing With a Reverse Proxy with WAN Acceleration



Which Is Faster?

TBD

Look for Future EDC Results!

Shipping Containers for Software

Docker Containers (www.docker.com)

Malcolm McLean revolutionized globalization with standardized shipping through the use of containers

Docker is revolutionizing software deployments and management through a new form of containers

PTC is evaluating future application delivery and support with Docker

Lessons Learned

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Initial POC's Are Easy To Get Started On

Adoption and Acclimation To Cloud Deployment Is Quick!

1. Like Driving A New Car
   - *You know there's a way to program the radio, you just haven't figured it out yet.*
2. Comprehensive Online Documentation
   - Azure (http://azure.microsoft.com/en-us/documentation
   - AWS (http://aws.amazon.com/documentation/)
3. When in doubt – Google it!
4. Plenty of *How To* Videos on YouTube
5. Azure & AWS user groups through meetup.com
6. Both Azure and & AWS have trial subscription programs

Why Should Your Company Consider The Cloud?

PTC® Live Global

Because Enterprise Software Can Be Complex And Expensive To Deploy Globally!

- ❑ The Cloud Offers Infrastructure
  - ➢ Flexible: Pick-And-Click What You Need (or Don't Need)
  - ➢ Sustainable: Robust Global Components. Secure. Expansive To Meet Performance Requirements
  - ➢ Innovation: Competition Forces Cloud Service Providers To Remain Leading-edge

- ❑ The Cloud Makes Economic Sense
  - ➢ Faster Upgrades and Introduction of New Software Capabilities
  - ➢ "Rent" What You Need Or Pay As You Go – No Infrastructure Capitalization
  - ➢ Reduce IT Administrative Overhead (and bureaucracy)

- ❑ Do **More** with Your PTC Software Investment with **Less** Money To Manage It

The Cloud Is No Longer Just For Netflix, It Is For Your Company Too!

Next Steps

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How Do I Begin To Get My PTC Software In The Cloud

1. PTC Cloud Services
2. PTC Global Services
3. PTC Approved Partners
4. Do It Yourself

The Enterprise Deployment Center Is Here To Help For All The Above!

Contact Your PTC Sales/GS/TS or Partner Representative For Future Inquiries.

THANK YOU!!!

- Your feedback is valuable
- Don’t miss out on the chance to provide your feedback
- Gain a chance to win an instant prize!
- Complete your session evaluation now

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