The Fabrics Journey – How to build and deploy scalable, versatile, secure Fabrics

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Extreme™
Customer-Driven Networking

Edge Complexity is Increasing

Automation at the Network Edge has never been more important

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What is Fabric?

The basic nature of the Fabric is how all of the servers and hosts are connected to one another, communicate through networking HW/SW regardless of network complexity and fulfil the following infrastructure requirements:

- Agility
- Availability
- Security
- Scalability

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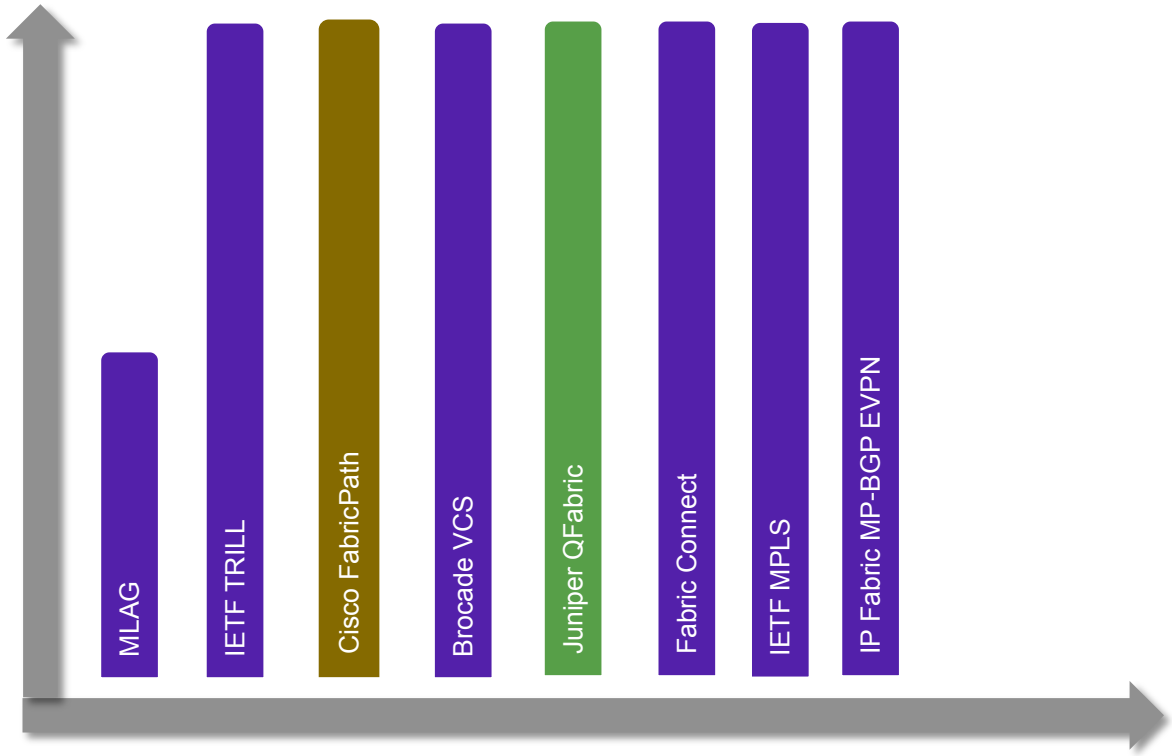
Fabric Technologies



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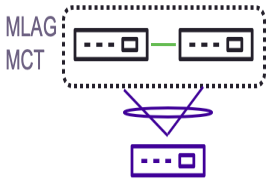
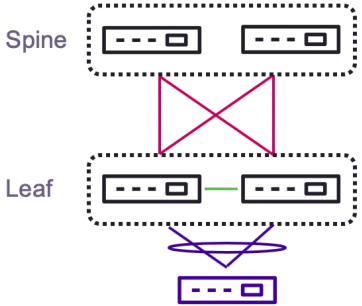
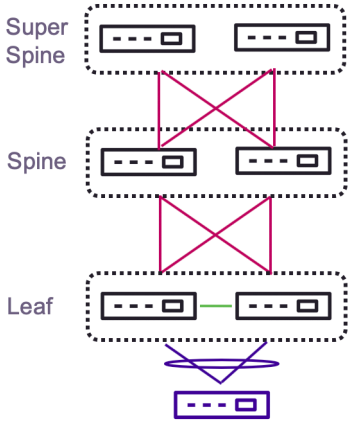
Which Fabric?



L2 Fabric



IP Fabric
(EVPN-VXLAN)



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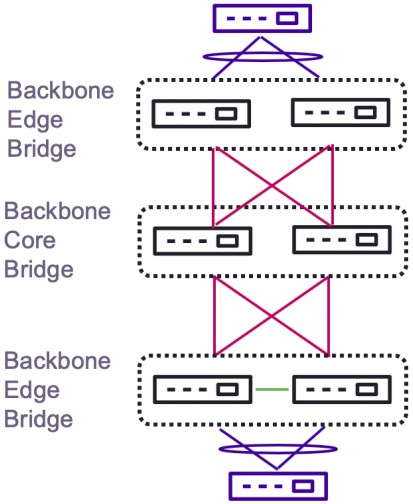

Fabric Connect

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Where to Start

- Logical design
  - Major traffic flows as driven by the key applications
  - Server virtualization: Degree and type (NSX or EVPN)
- Physical design
  - Number of hosts and connectivity
  - Oversubscription
  - External connectivity to Internet and/or other Data Center(s)
- Automation / integration in business processes
- Management of infrastructure
- Visibility & Analytics
- Security

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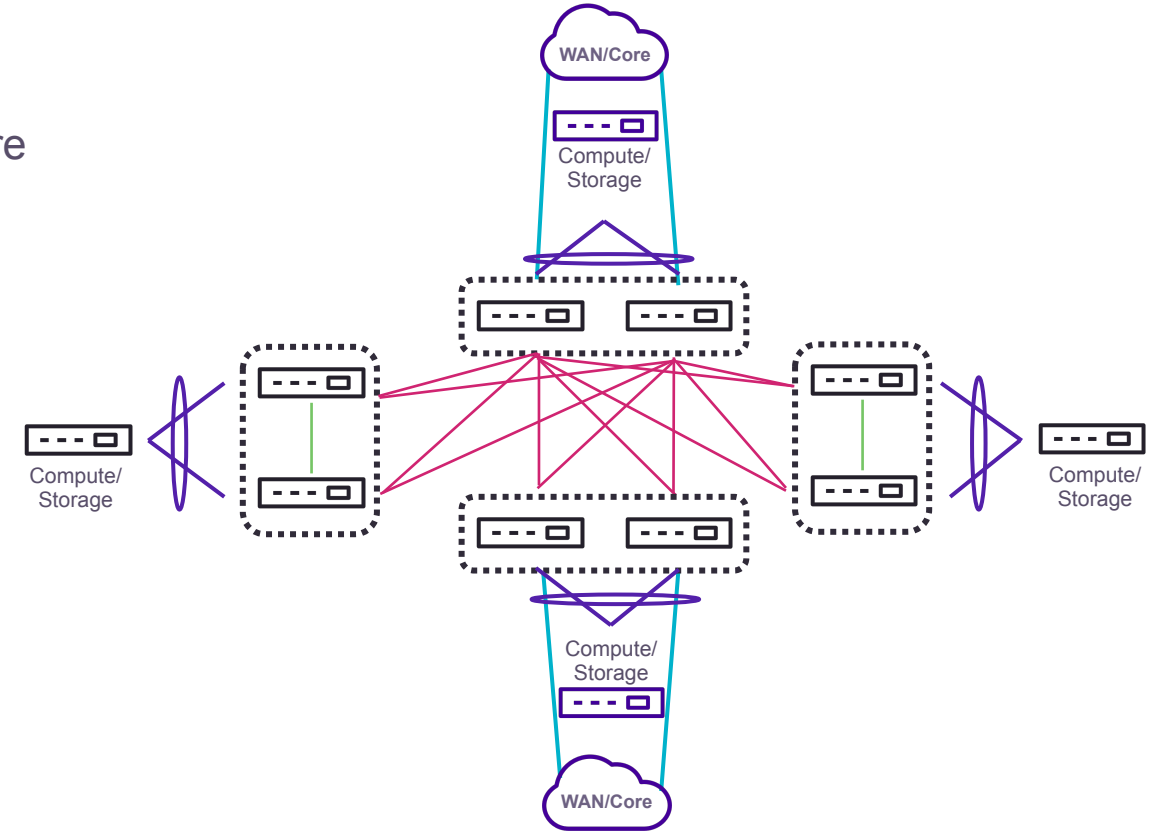
Data Center Fabric Architecture

Start Small and Grow

Use Case Details

- Simple scale-out architecture
- Ideal for:
  - Small data centers
  - Multiple sites
  - Hyperconverged



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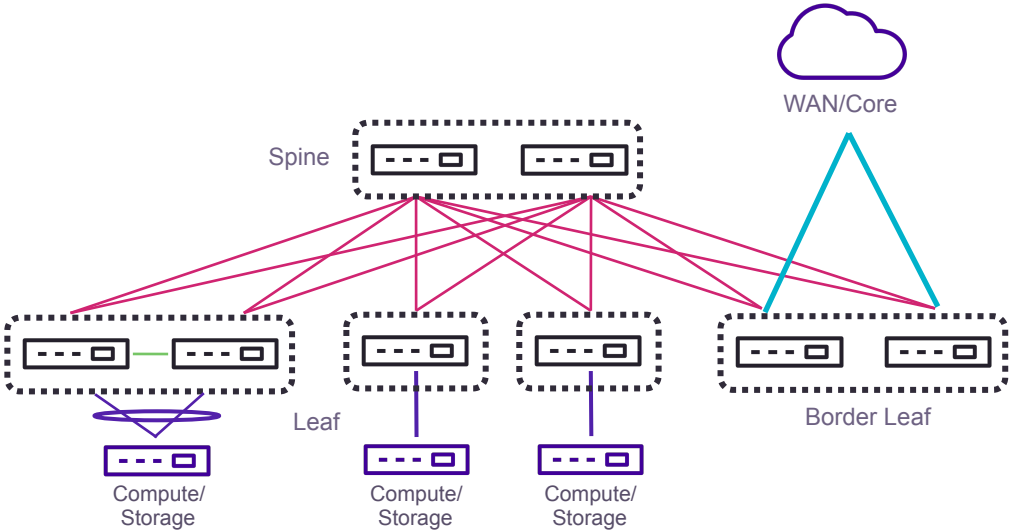
Data Center Fabric Architecture

Standard 3 Stage Clos Topology

Common Design Scenario

- Spine
- Leaf
- Border Leaf



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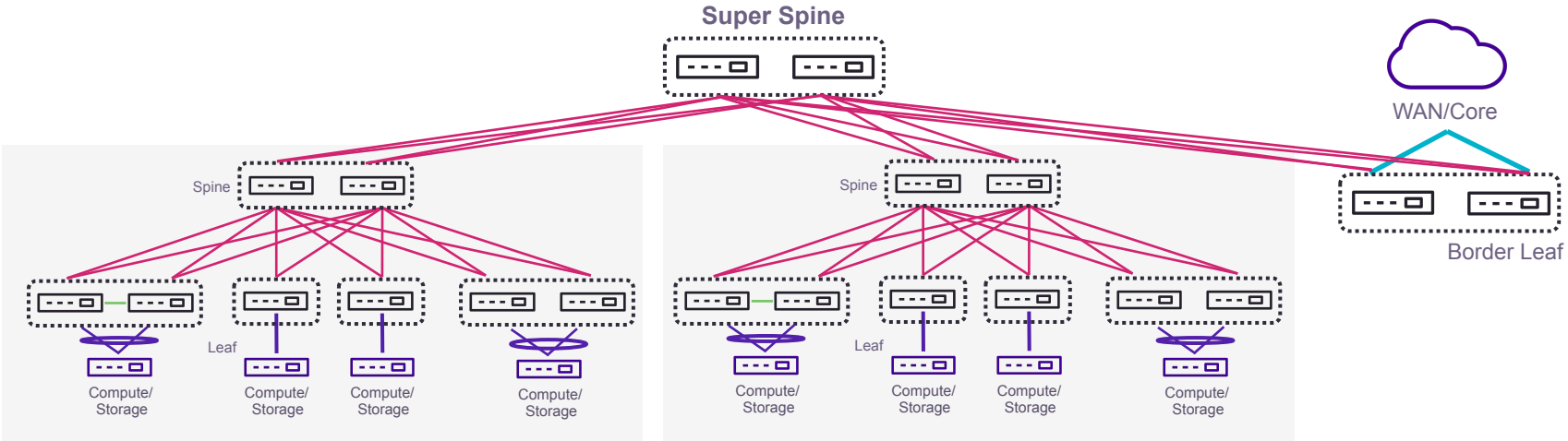
Data Center Fabric Architecture

Standard 5 Stage Clos Topology

Moving to Larger Scale

- Add a Super Spine to interconnect 3 Stage Clos PoDs
- Border Leaf can be shared by all PoDs
- Design consideration for oversubscription and traffic flow between PoDs



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Adaptable Infrastructure

Underlay and Overlay Networking

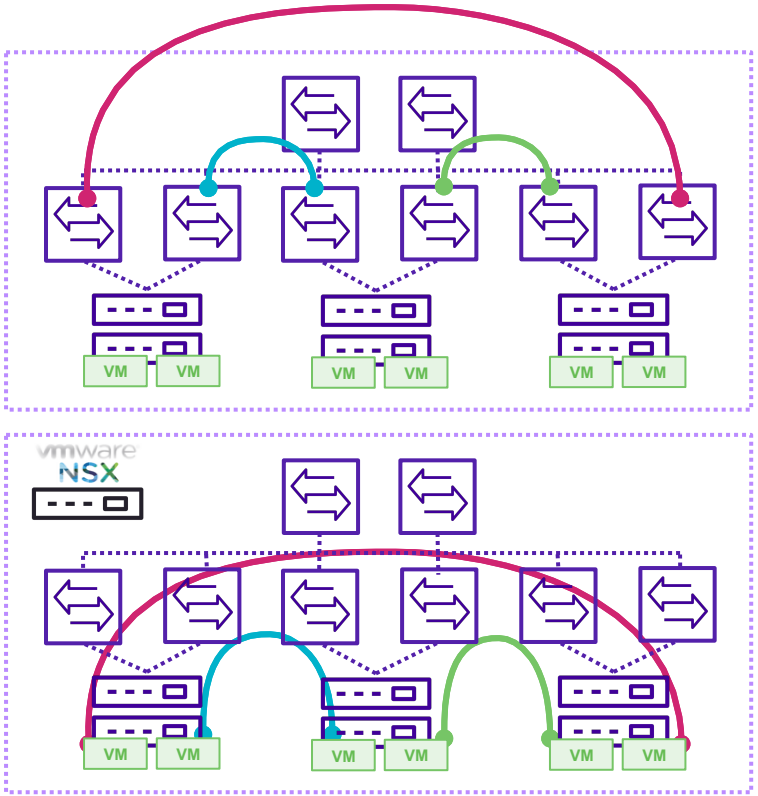
Underlay Network

- Single instance of eBGP (iBGP also supported)

Overlay Network

- Controller-less virtual network
  - BGP-EVPN control plane
  - VXLAN Data Plane
  - Extension of layer 2 and layer 3 services
- Controller-based virtual network
  - VMware NSX
  - VXLAN Data Plane
  - Extend Layer 2 VLANs between hosts

Note: VMware VXLAN and BGP-EVPN VXLAN are not interoperable



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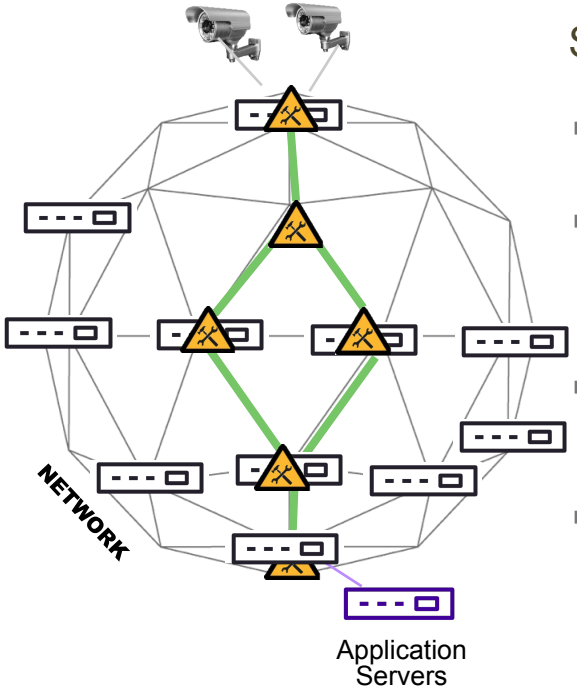
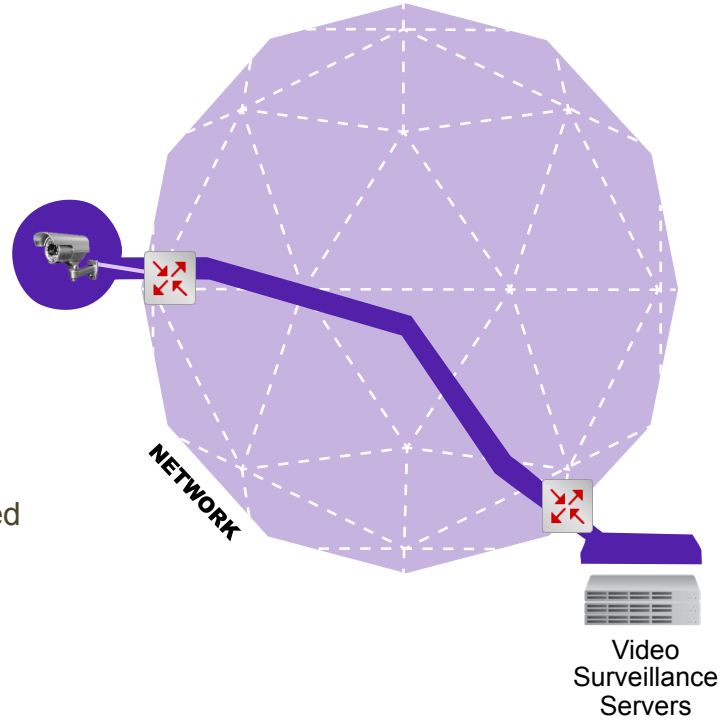
Faster time to Service with Simple Edge Provisioning



Status Quo

- Hop by hop provisioning
- Moves, adds and changes require core reconfiguration
- Vulnerable to human error during change
- Services coupled to physical topology



With Extreme

- Edge Provisioning only
- Core is hands-off
- Moves, adds, and changes on the fly (no more maintenance windows)
- Services abstracted from topology

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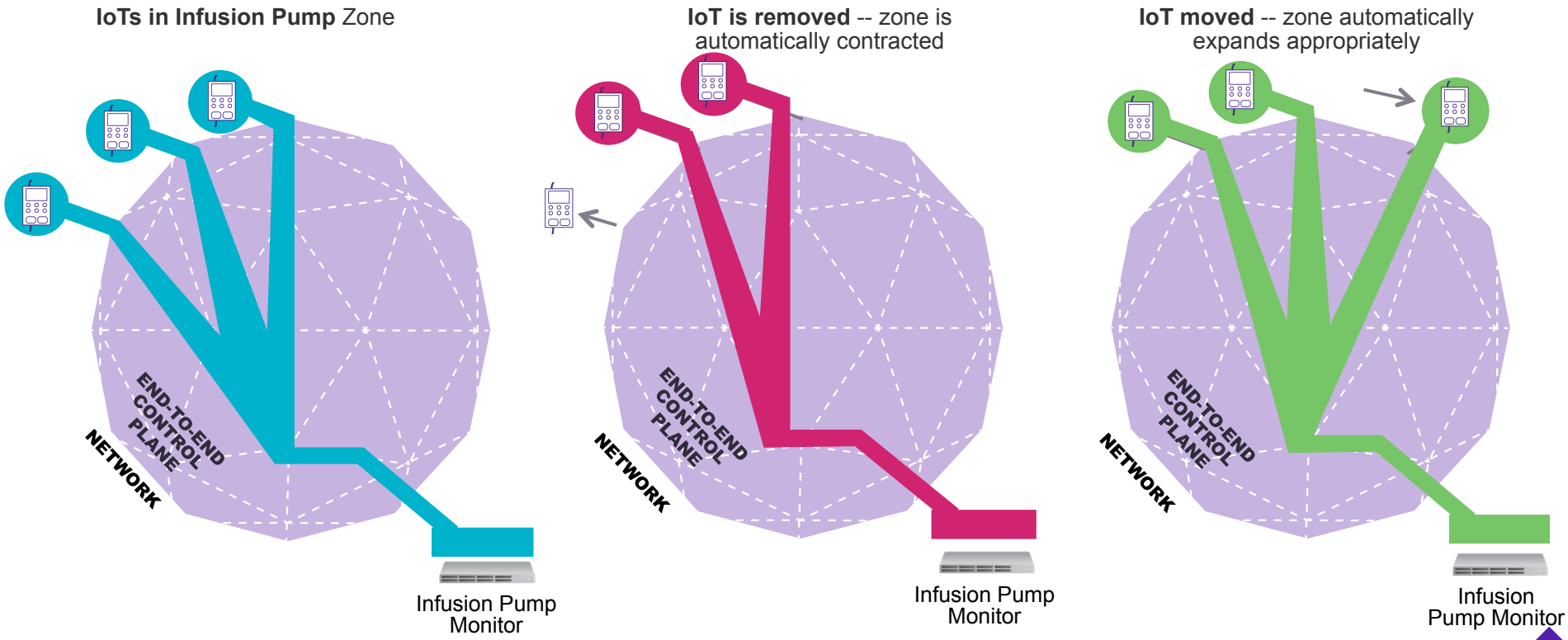
Enhanced Security with Elasticity

Eliminates Back Door Entry Points



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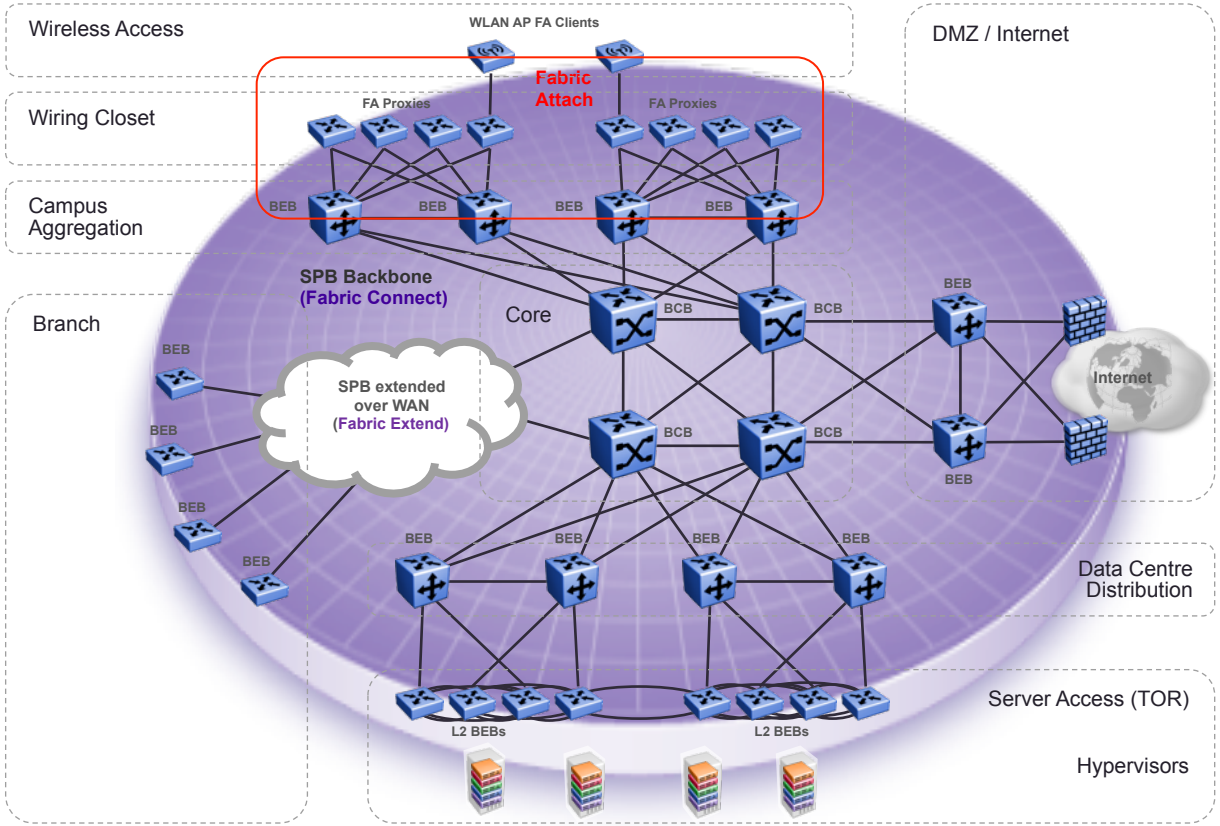
Fabric Attach



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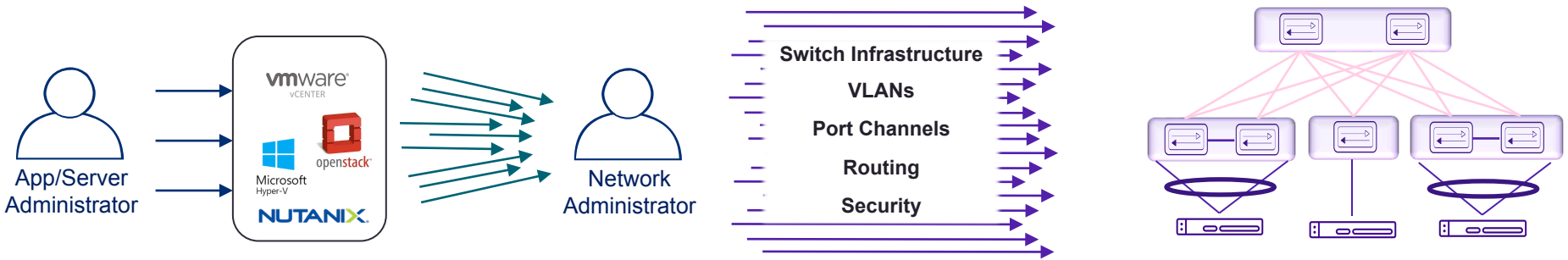
Automation

What Problem Are We Solving?

Network provisioning is slow, complex, time intensive and subject to errors

Virtualization / HCI requires network provisioning → *Manual CLI configuration of Fabric and Services* → *Time consuming and higher probability of human error*



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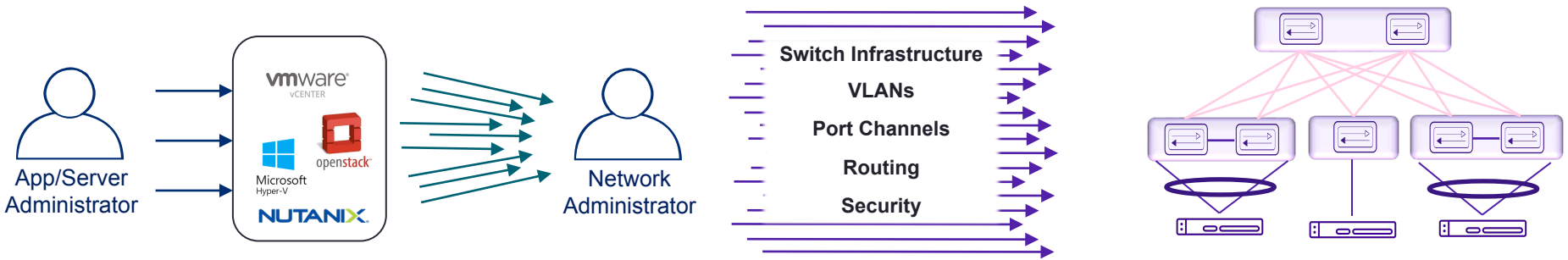

Days/Weeks of manual provisioning

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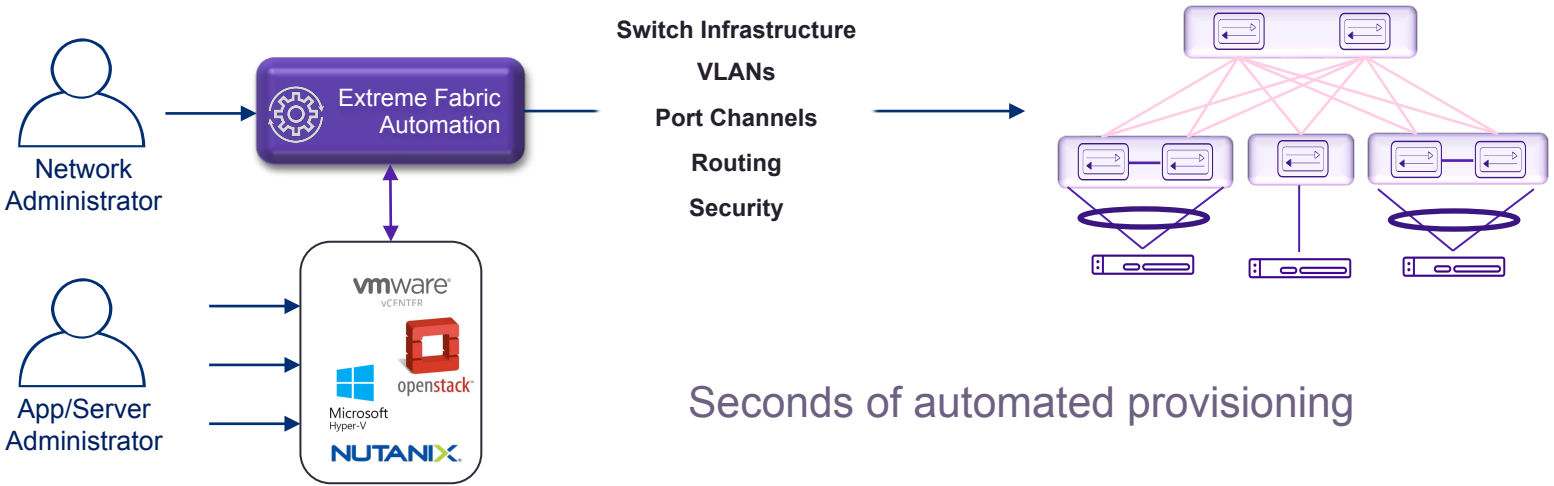
How Are We Solving The Problem?

Extreme Fabric Automation simplifies provisioning at Cloud Speed

Virtualization / HCI requires network provisioning → *Automated configuration of Fabric and Services* → *Reliable provisioning at Cloud Speed*



Seconds of automated provisioning

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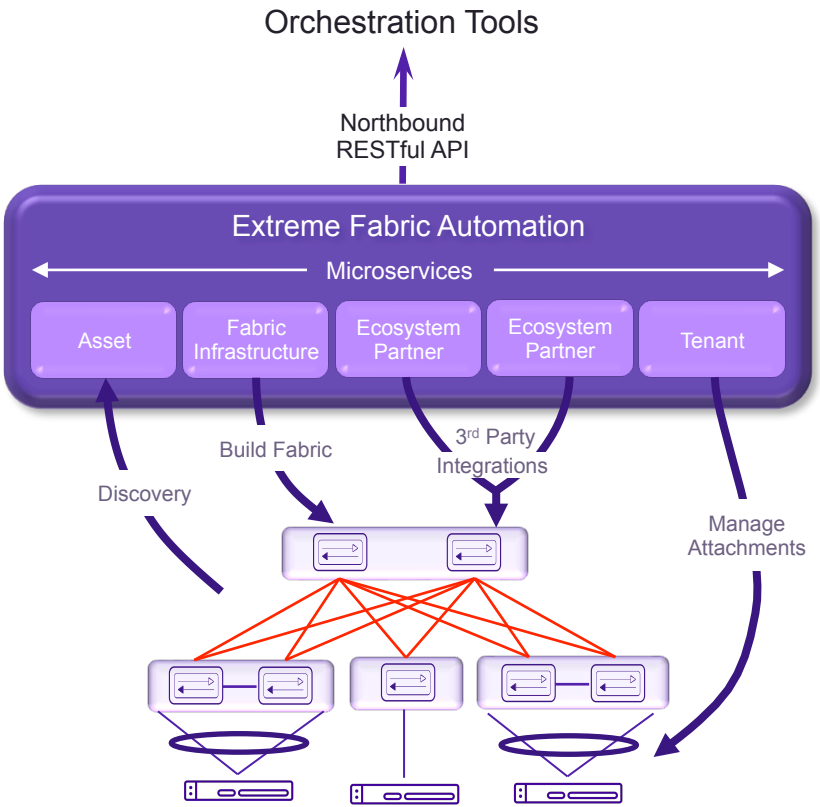
Extreme Fabric Automation

- Fabric-aware Unified Automation
  - Single Entry Point for Provisioning
  - Multiple Topology Profiles
  - Day 0 Infrastructure Provisioning
  - Day 1 Tenant/Services Provisioning
- Deployment Flexibility
  - On-box SLX Guest VM
  - Off-box VM host for large scale networks
  - HA & Federated Services via Kubernetes Cluster *
- Expand Capabilities for Fabric Functions *
  - Ecosystem partners integration
  - Validation
  - Security/Policy
  - Lifecycle Management
  - Intent-based Provisioning



* Future software releases

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Plug-n-Play In Action

Run Extreme Fabric Automation to provis
Fabric and end devices

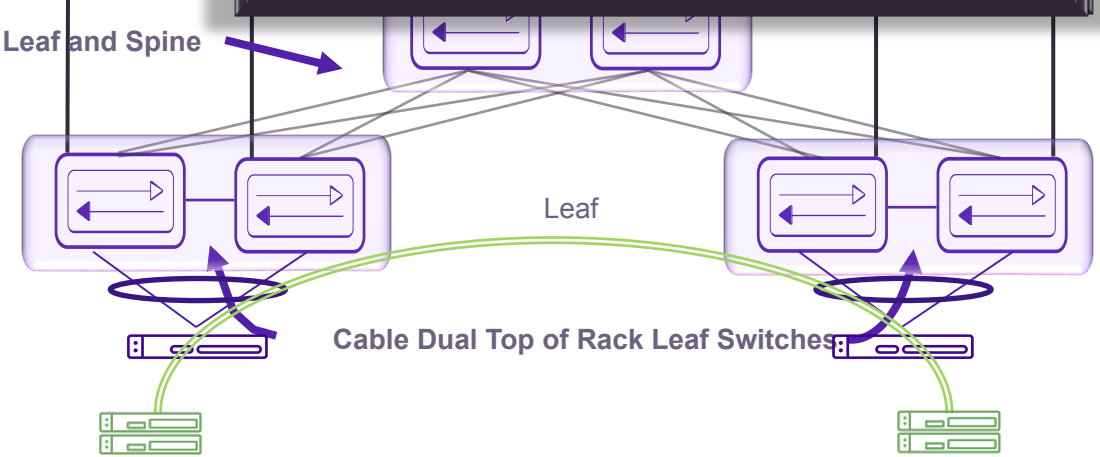
Extreme Fabric Automation

```
root# efa tenant po create --name Po10 --port 10.26.8.10[0/3],
10.26.8.11[0/3] --speed 10Gbps --negotiation active

root# efa tenant epg create --name tenant1 --po Po10 --ctag
100

root# efa tenant network create --name Host1 --epg tenant1
```

Cable Uplinks between Leaf and Spine



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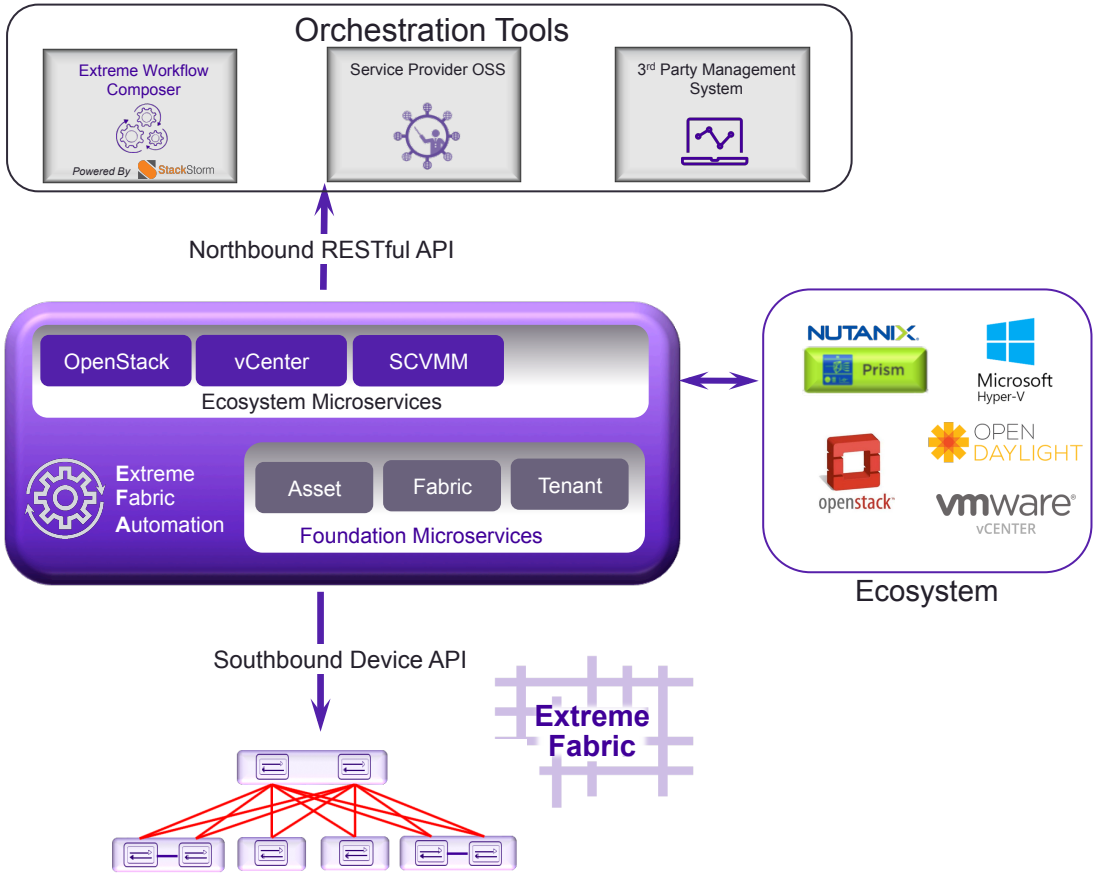
Ecosystem Integration



- Provides Docker Containerized Services
- Rich set of CLIs and Open API based REST API
- Extreme Fabric Automation provides integration with orchestration mechanisms including:
  - OpenStack
  - VMware vCenter
  - OpenDaylight
  - Nutanix Prism/Cluster
  - Microsoft SCVMM
- Each integration is a separate Microservice
- Integrations leverage the Fabric awareness inherently available in Extreme Fabric Automation

- Microservices
  - Asset Service
    - Discovers and maintains inventory of assets
    - Physical – Interface, Device Model, Firmware etc.
    - Logical – VLAN, BD, VRF, VE, BGP, etc.
  - Fabric Services
    - Automates 3 or 5 stage CLOS/Non-CLOS IP Fabric from assets managed by Asset Service
    - Supports Top-Down and Bottom-Up building for IP Fabrics
  - Tenant Aware Services
    - Create and Manage Attachment Points for Hosts to interwork on IP Fabric

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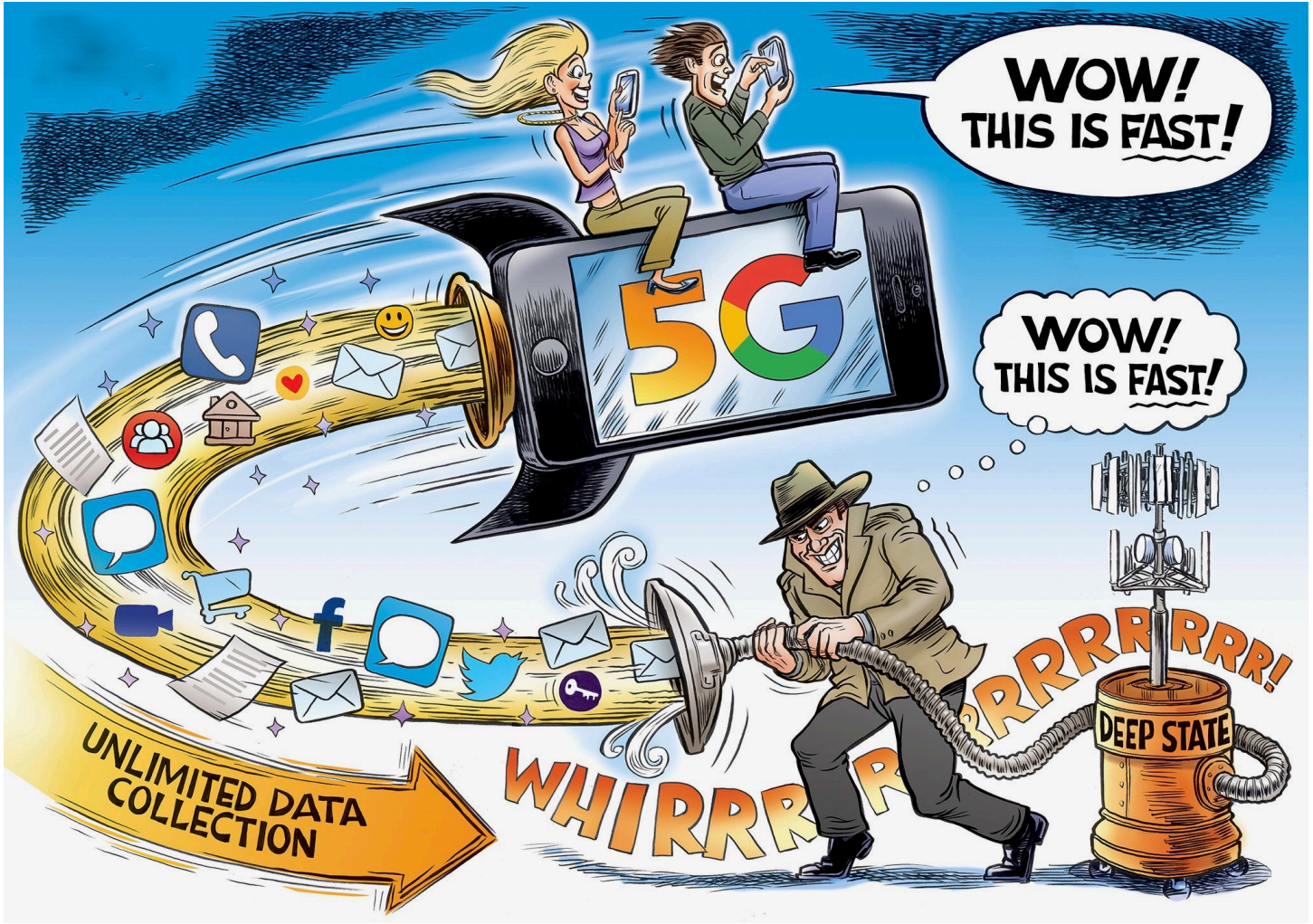

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Summary

The only Network Fabric solution with built-in Automation

Plug-n-Play Turns Days Into Seconds

Reliable Provisioning Provides Peace of Mind

Gartner

After decades of focusing on network performance and features, future network innovation will target operational simplicity, automation, reliability and flexible business models.

Key Findings

- Approximately 70% of data center networking tasks are performed manually, which increases time, cost and likelihood of errors, and reduces flexibility.

Recommendations

- Reduce cost, improve agility and minimize faults by implementing automation, orchestration and intent-based networking (IBN) solutions.

https://www.gartner.com/doc/reprints?id=1-1QKRRA05&ct=191002&st=sb&__hstc=62805235.137399cf40fb81497588e676370cf62d.1571255416636.1571255416636.1571255416636.1&__hssc=62805235.1.1571255416637&__hsfp=3933089016&hsCtaTracking=23bf122d-e6ec-4d5d-9575-66090d21c574%7C259a6a64-8586-44bf-ac85-cc71d66a53b2

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Thank You!

Q&A?