



Ribbon Solutions

Sam Bucci
Chief Operating Officer

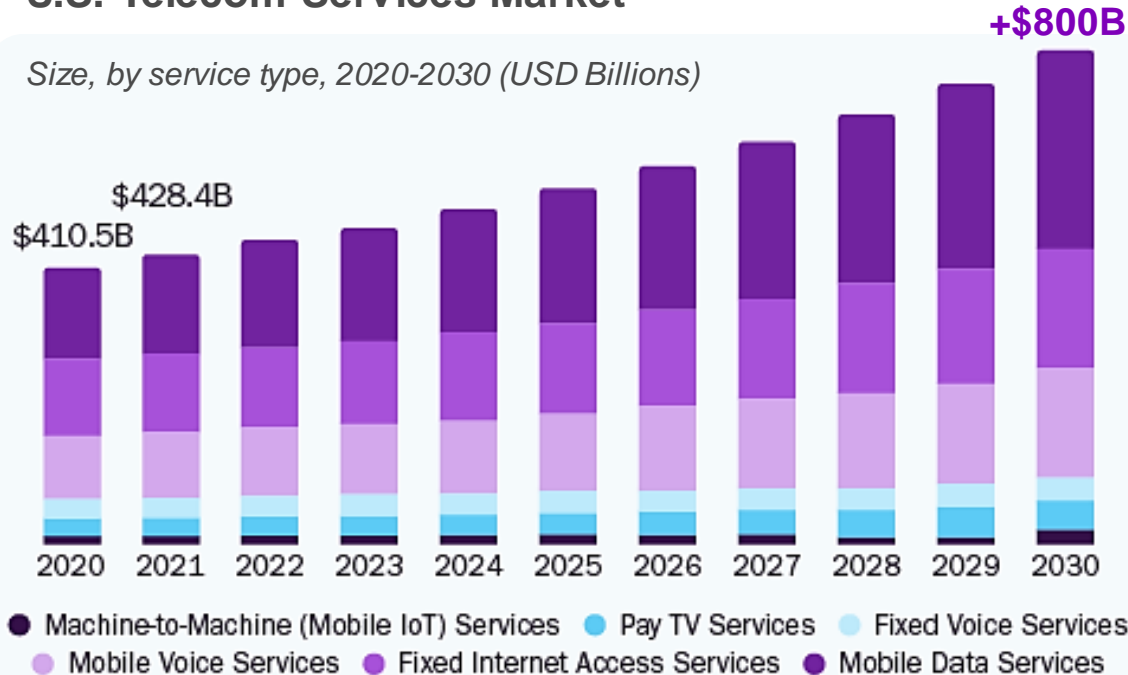
**Thank you
for trusting us**



Communications Market Growing Rapidly

U.S. Telecom Services Market

Size, by service type, 2020-2030 (USD Billions)



6.5% CAGR

US Market 2023-2030

Grand View Research 2023

Business Challenges



\$ ▲ Revenue

🐷 ▼ Costs

🔒 ++ Security

**“Victory comes from
finding opportunities
in problems.”**

Sun Tzu

Author – *Art of War*



Twin Valley Telephone

Twin Valley's Challenges

Scale to Provide Robust Middle Mile

- Backbone Sized to Accommodate Current and Projected Growth

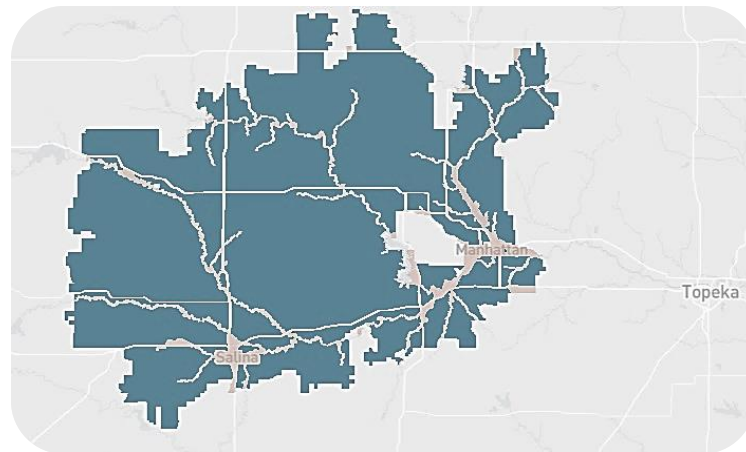
Network Reliability

- Automated, Flexible and Optimized Traffic Failover

Ribbon's Solution

IP/MPLS 400GbE Backbone

- Service Aware
- Sub 50ms Service Restoration
- Advanced Traffic Engineering
- Advanced Network control using MUSE



Large Rural Service Provider in Clay Center, Kansas

Utility Customer

Their Challenge

- Large utility in the US - millions of consumers.
- Expanding to increase surveillance, security, dynamic power models, and more automation
- Need greater bandwidth, scalability & performance

Ribbon's Solution

Ribbon offered end to end solution – with Muse management

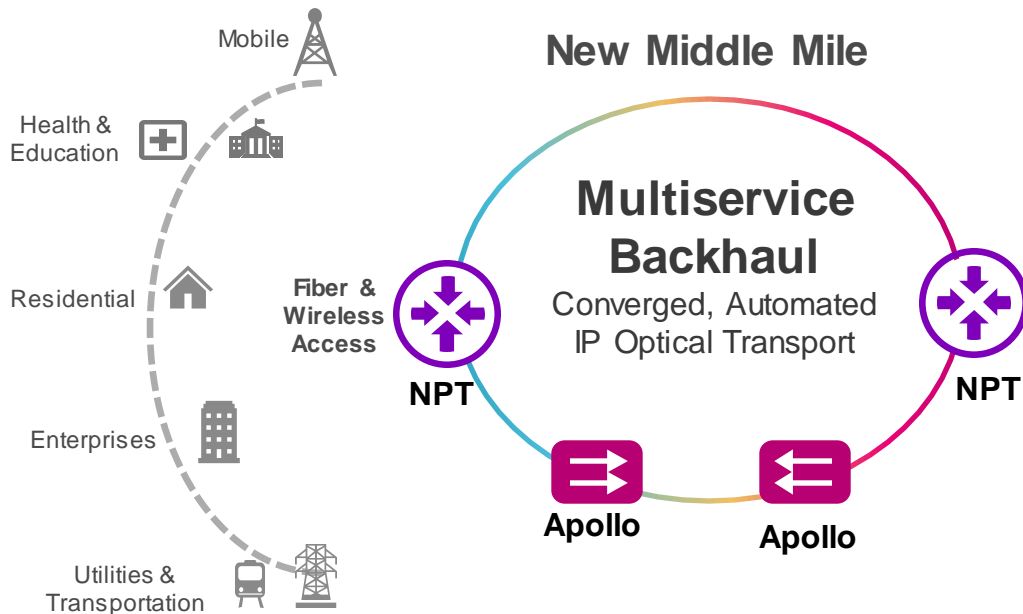
- High performance, reliability, and scale
- Layer 0/1 underlay Apollo - DWDM and OTN
- IP service layer, access to metro core
- Bullet proof reliability & most cost effective 5-year TCO
- White glove service with in-country support



Unlock Value of Access Investment with New Middle Mile

More than just high-capacity & scale!

- Service performance control on a service-by-service basis
- Operational simplicity
- agility to support the next opportunity



Enables Disruptive Evolution of the Metro Network



4.8 Tbit/s Router
(Jericho 2 silicon)



24 x 100G interfaces
6 x 400G interfaces



IPoDWDM



- High-capacity 100G Aggregation
- Service Creation Extends To Edge
- Telco Spine-Leaf (multi-homed ring)

Enhancing the Customer Edge



**10G Enterprise
Router - Voice & Data**



**Session Border
Controller**



**Analog/PRI
Gateway**

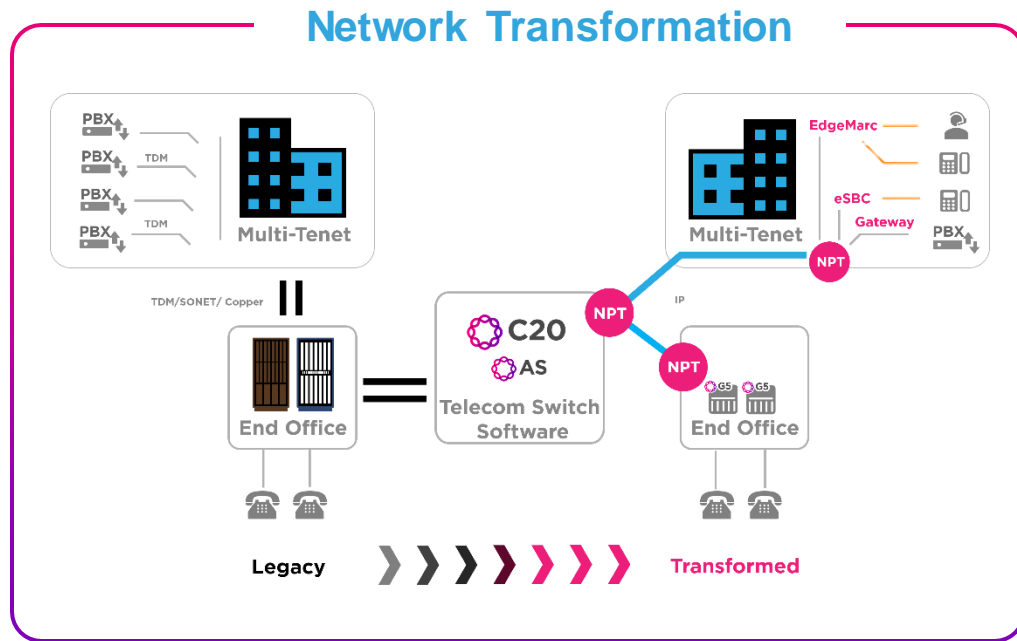


New Edge 8000

- Deployed in customer premises
- Creates a single demarcation point for remote services
- Simplifies legacy device migration
- Platform for future services – Vnf, Cnf

Multiple Customers: Network transformation

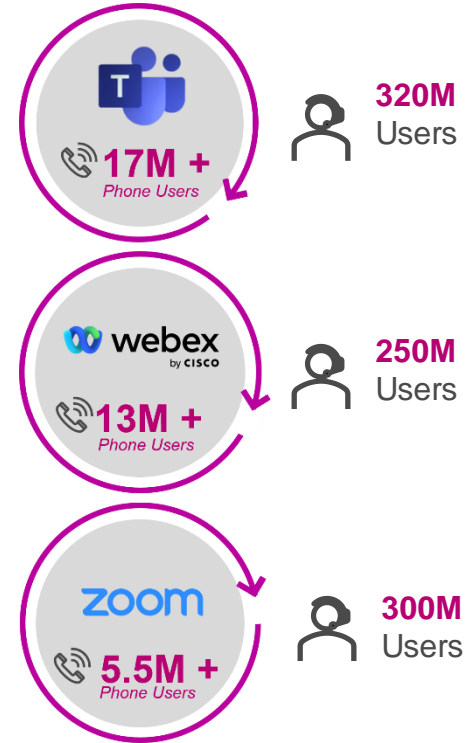
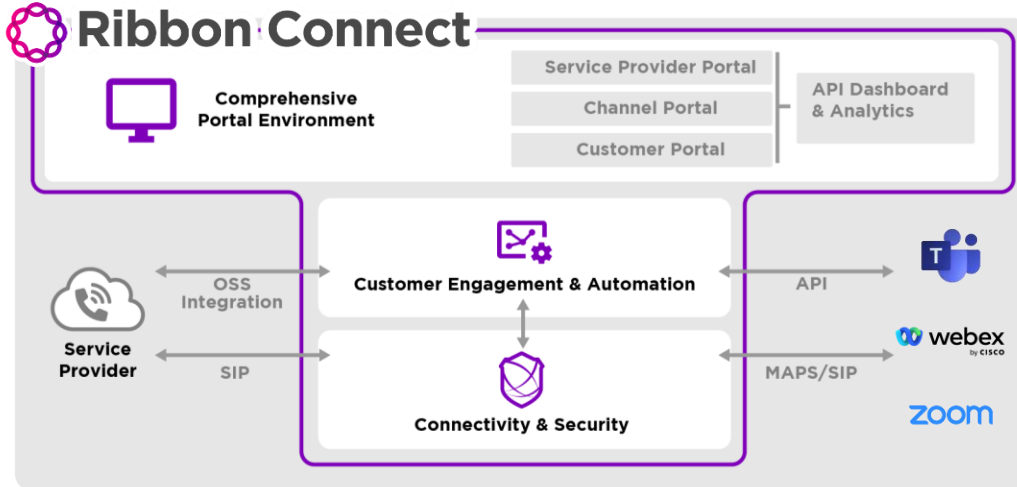
- **Replace TDM with IP technology**
 - Ribbon NPT Routers & Virtual C20
- **Dramatically simplifies network design**
- **Enhances security**
- **90+% savings in power & footprint**
 - Reduces HVAC too
- **Retains existing services & revenue streams**



Multiple Global Deployments

Simplify Adding Phone Services to Cloud Collaboration

- Per seat, per month solution to enable UCaaS
- Superior QoS for enterprises
- Faster time to market for service providers



Threats Vectors are Changing – Are We Ready?

Business and **cyber leaders** believe global & geopolitical instability may lead to a **catastrophic cyber** event in the **next two years**



Cyber Leaders



Business Leaders

We have the people and skills we need today (by industry)



Global Security Outlook 2023 – World Economic Forum

Vulnerabilities

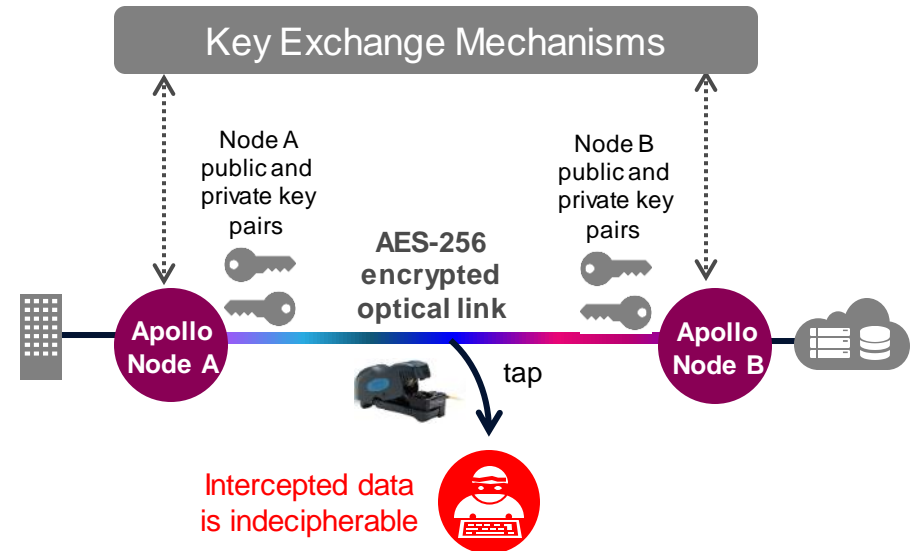
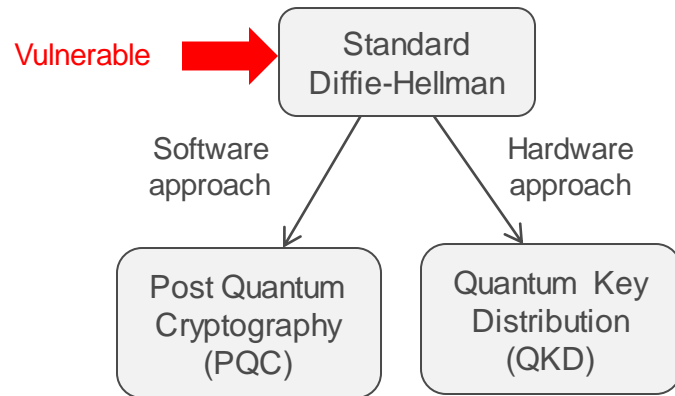
- Old OSs
- Legacy open source
- Full of latent security threats
- Little or no encryption

Widely used logging framework on the Internet



Start at Layer 0/1 - Optical Encryption

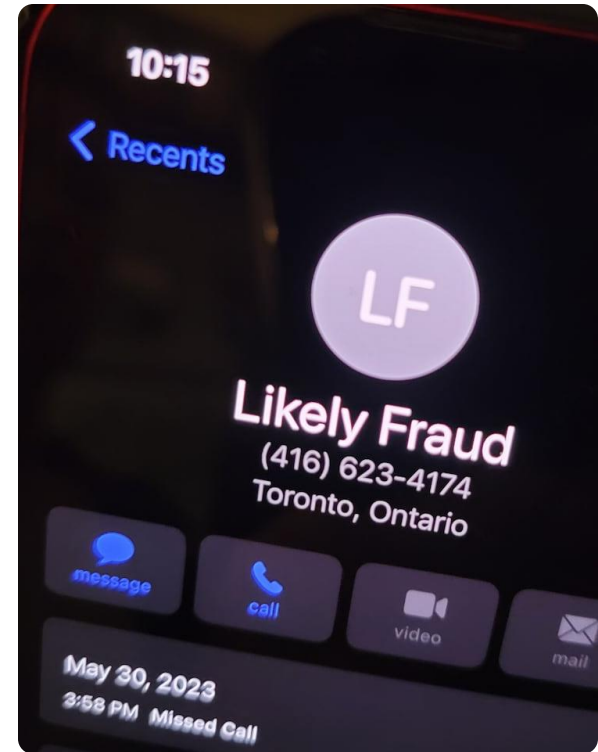
- Protects against data interception via fiber tapping with no added overhead or latency
- Non-crackable AES-256 encoding
- New key exchange mechanisms to deal with threat

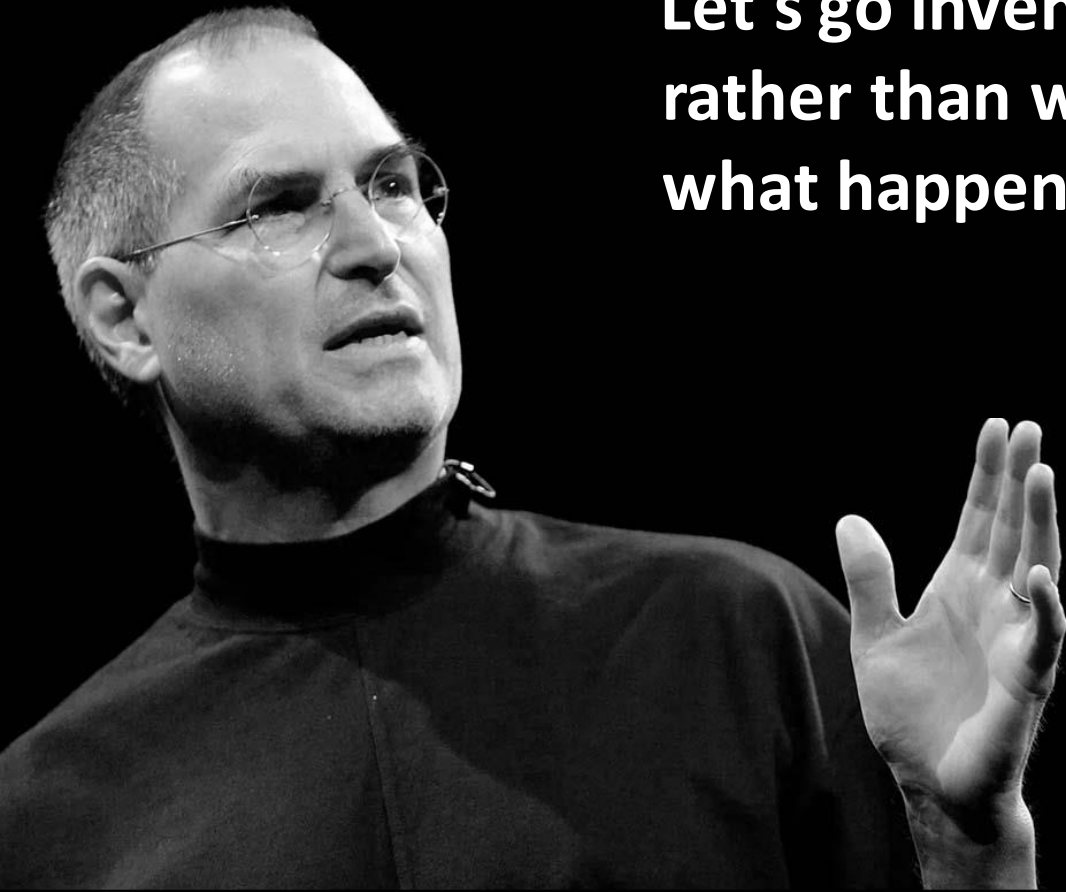


Security Mantra is Extending to Everyday Consumers

STIR/SHAKEN is not “one & done”

- Network intelligence will need to reach end users
- Provide certification for “good” calls
- Remediate issues when legitimate call are blocked
- Network-based Analytics, AI & Automation will need to dynamically assist end users





**“Let’s go invent tomorrow
rather than worrying about
what happened yesterday.”**

Steve Jobs
Apple

9400 Best-in-class Optical Networking Performance and TCO

9400 OT



Industry-leader for high density and low power applications required by large SPs and ICPs

9400 OLS

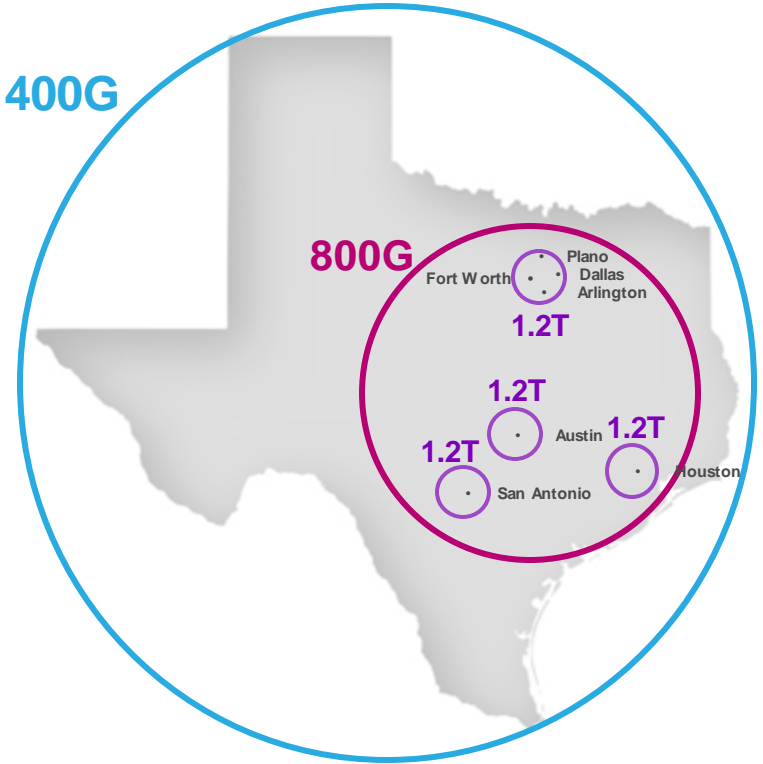


	Performance Optimized	Cost Optimized
Application	Max capacity for any distance	Economical 400G
Short haul (100km)	1.2T	400G
Metro (500km)	1.0T	400G
Regional (1000km)	800G	200G
Long Haul (3000km)	400G	N/A
Power	<0.12W/G, up to 50% less than competitor solutions	<0.10W/G

Lowering Cost per Bit with 9400 Programmable Optical



400G



NPT: High-capacity, High-performance, & High-density Router

Wide Service set

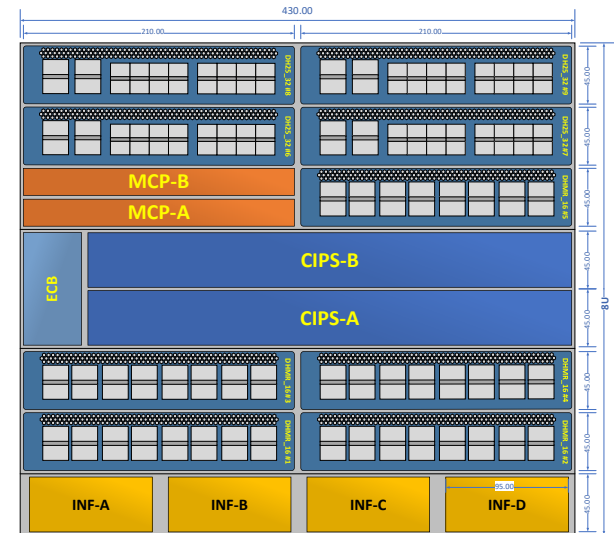
- Supports of 1G → 10G → 25G/50G → 100G
- Designed for 800GE interfaces with 100G backplane lanes
- Uses Ribbon rNOS service stack (IP/MPLS, SR, etc..)

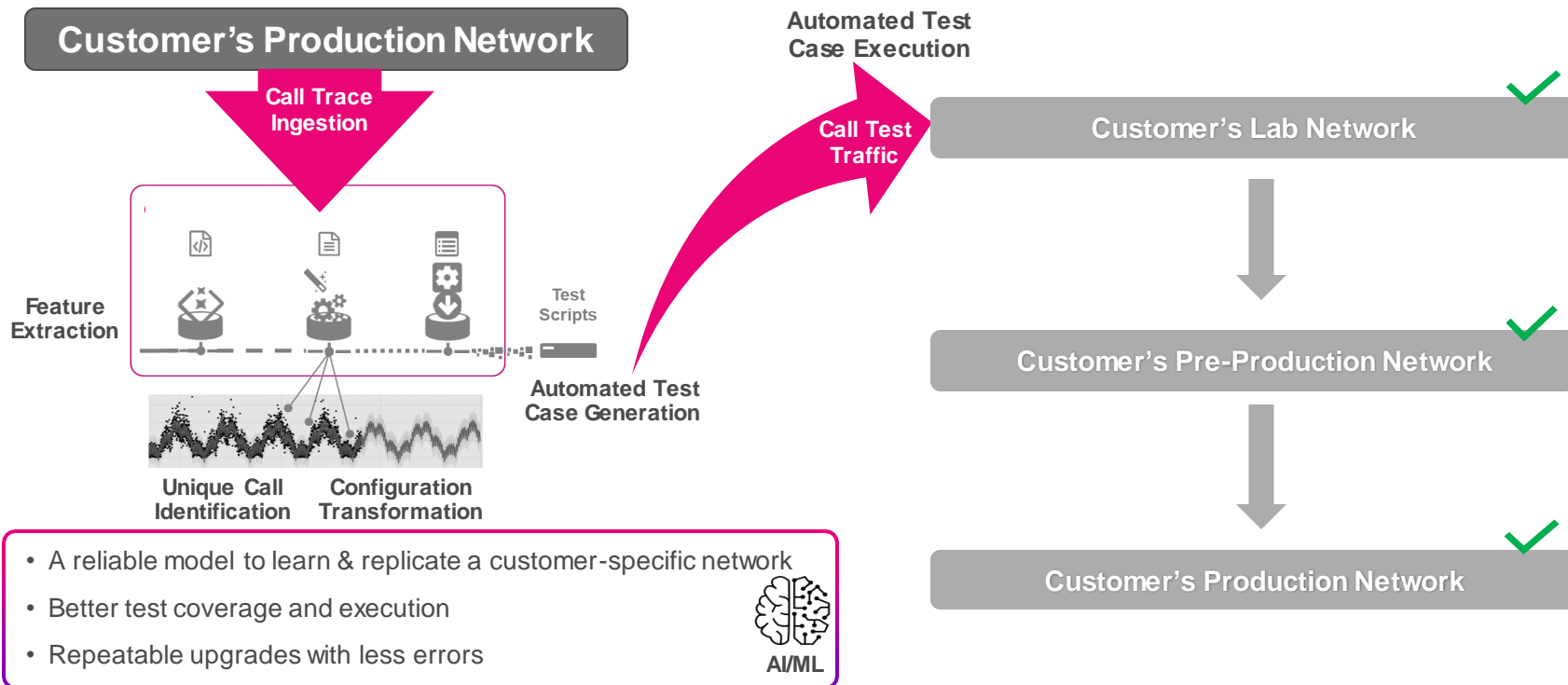
Highest density and scale

- Modular Switching capacity
- 4 matrix slots ...7.2Tb per matrix and 144 I/O ports in 8 RU form factor
- Full scale with 2TCAM per switch device

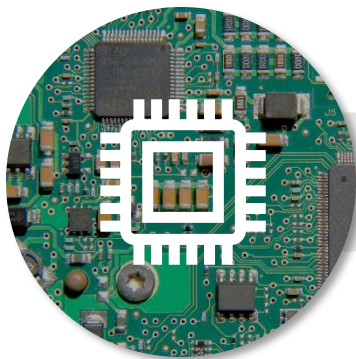
Robustness

- Centralized and Redundant architecture with outstanding recovery times





Common Container SW Architecture - Spanning Deployment Models



Hardware

Application containers packaged in a Ribbon VM, running on a COTs hardware



Virtual Software

Application containers packaged in a Ribbon VM, running in any VM enabled environment



Cloud

Application containers running natively in any Kubernetes enabled environment

Common Management & Services

Unite Analytics, AI & Automation



Service Complexity

Service
Modeling



Security Threats

User
Modeling



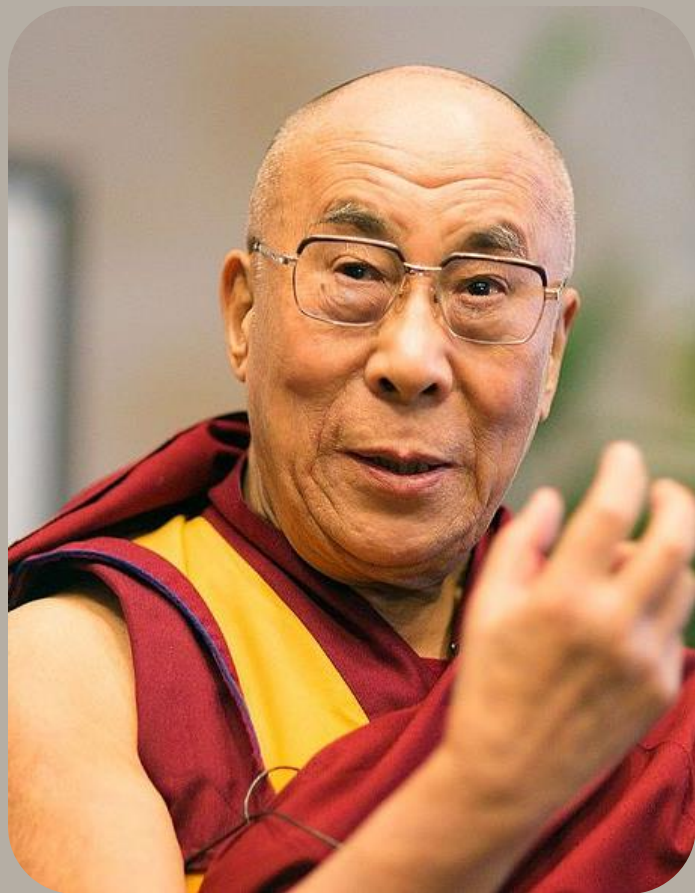
Value Creation

Data
Insights



Cost Savings

Automation



“If you think you are too small to make a difference, try sleeping with a mosquito.”

-Dalai Lama

Thank You

ribbon
TECH FORUM 23