CAPTURING THE SDN & NFV OPPORTUNITY

Real Use Cases to Drive Revenue & Network Optimization

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AGENDA

1 Evolving Market Dynamics

2 Meeting Customer Needs

3 Some Real Examples

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MAJOR INFLECTION POINTS
More Pressure On The Network – Innovation Is Required

Mobile Internet

2013 SMARTPHONE PROJECTIONS

1B

Cloud

% of New Enterprise Apps Deployed in the Cloud:

80%

Video & Content

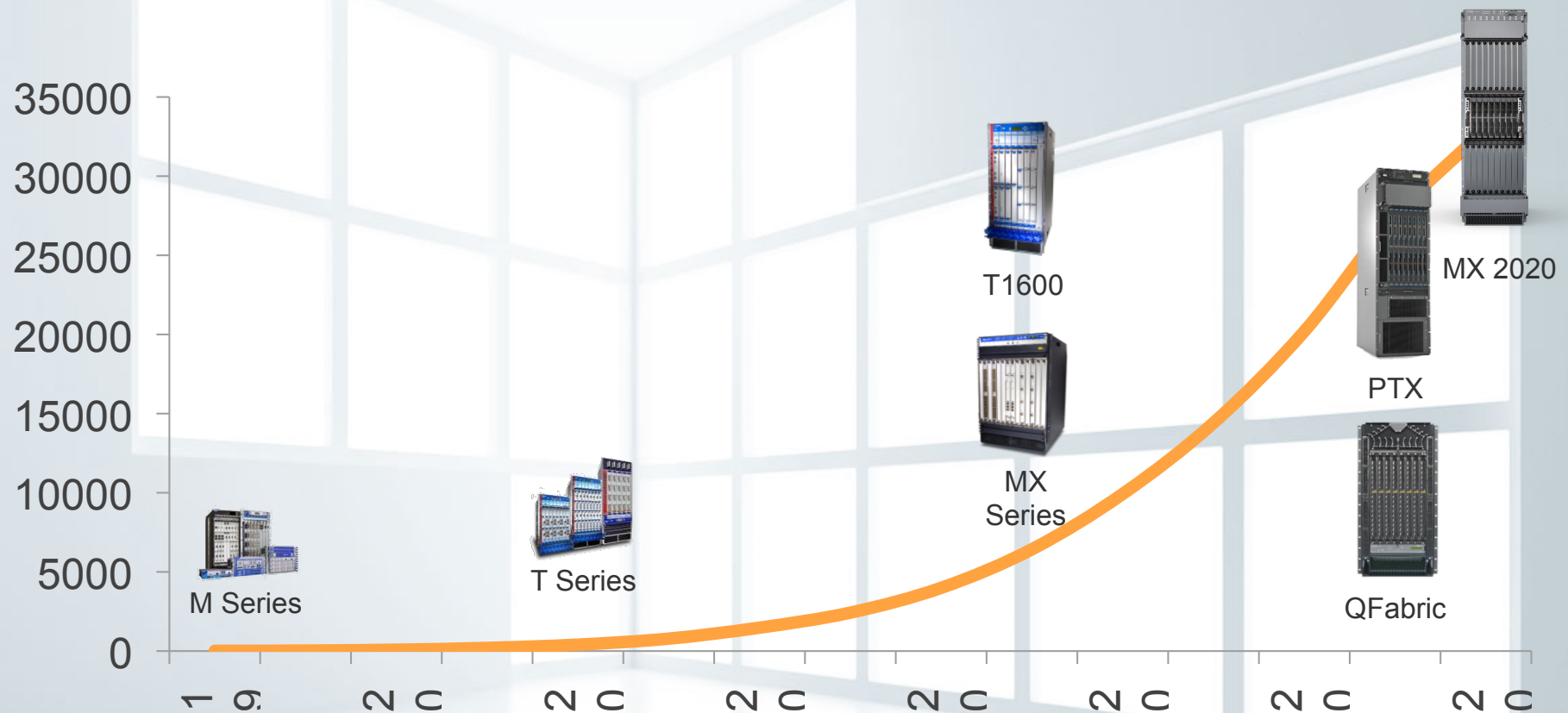% of Broadband Traffic that will be Streaming Video by 2015:

60%

Security

% of IT Practitioners that Report a "Serious" Web-Based Attack:

60%

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TRAFFIC IS CONTINUING TO GROW

Petabits Per Second Per Month

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WHO IS DRIVING TRAFFIC GROWTH?

rackspace.
the open cloud company

- Public Cloud
- Private Cloud
- Dedicated Hosting

amazon webservices™

- Compute
- Storage
- Database

Google

Google App Engine

YouTube

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AVERAGE REVENUE PER USER IS DECLINING

ARPU is expected to decline by 18% through 2018
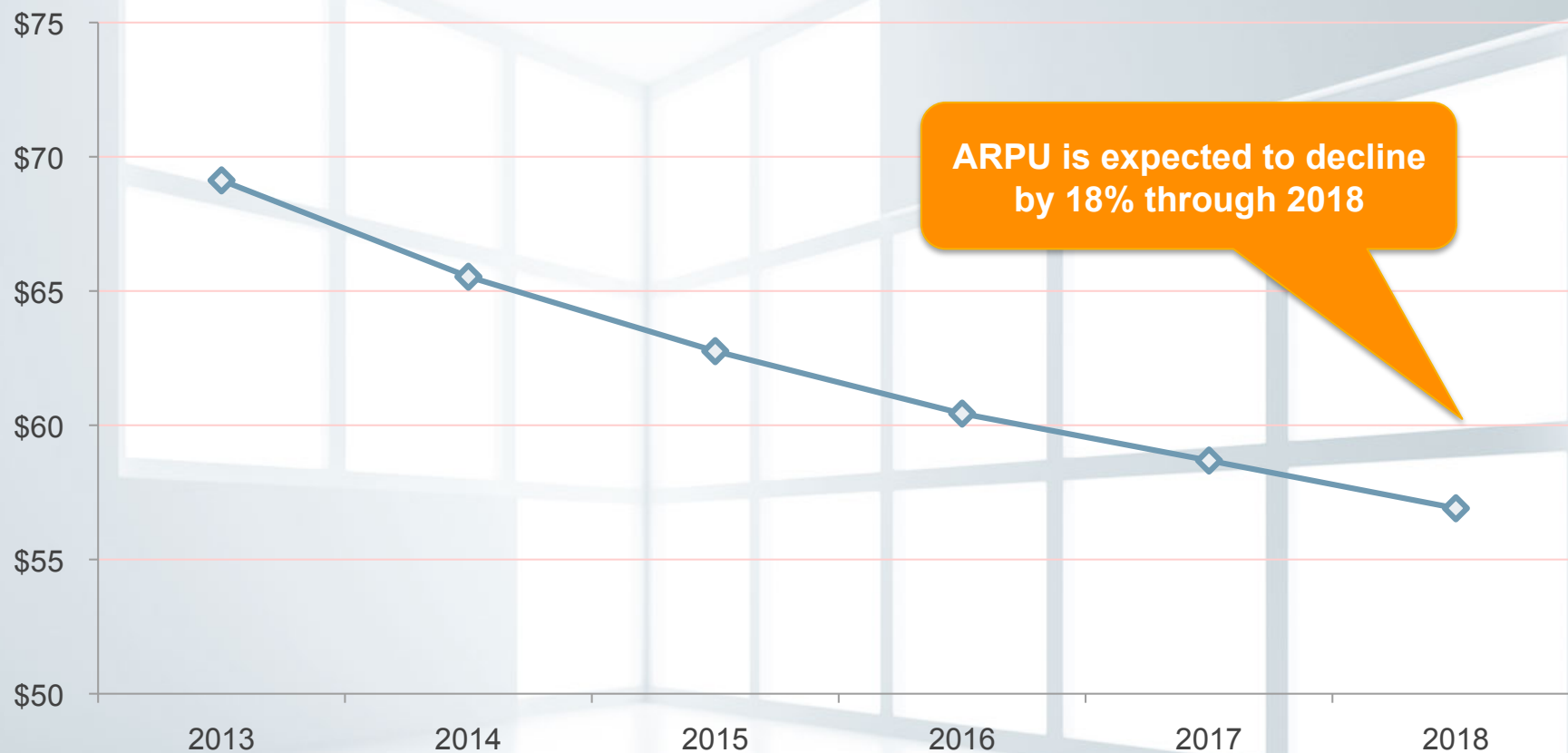
Source: Pyramid - Average Spend per Business per Month on All Connectivity Services

Business Connectivity Monthly ARPU
$ / month / firm

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WHAT OUR CUSTOMERS ARE SAYING

- Need to launch new services faster: 24 months → weeks
- Need to lower my operating costs: reduce complexity
- Need real differentiation in the Cloud
- Need breakthrough approaches to security

Consistent Theme: Agility

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WHY NOT BOTH?

PERFORMANCE **AND** AGILITY

AGENDA

1 Evolving Market Dynamics
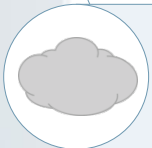
2 Meeting Customer Needs

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ENTERPRISE TRENDS IMPACTING SERVICES

Globalization
Employees/Customers Dispersed Geographically

Adoption of Cloud Services
Driven By Agility, Scale, Flexible Pricing

Outsourcing
Shed Non-core Functions

Consumerization of IT
BYOD Changing IT Challenges
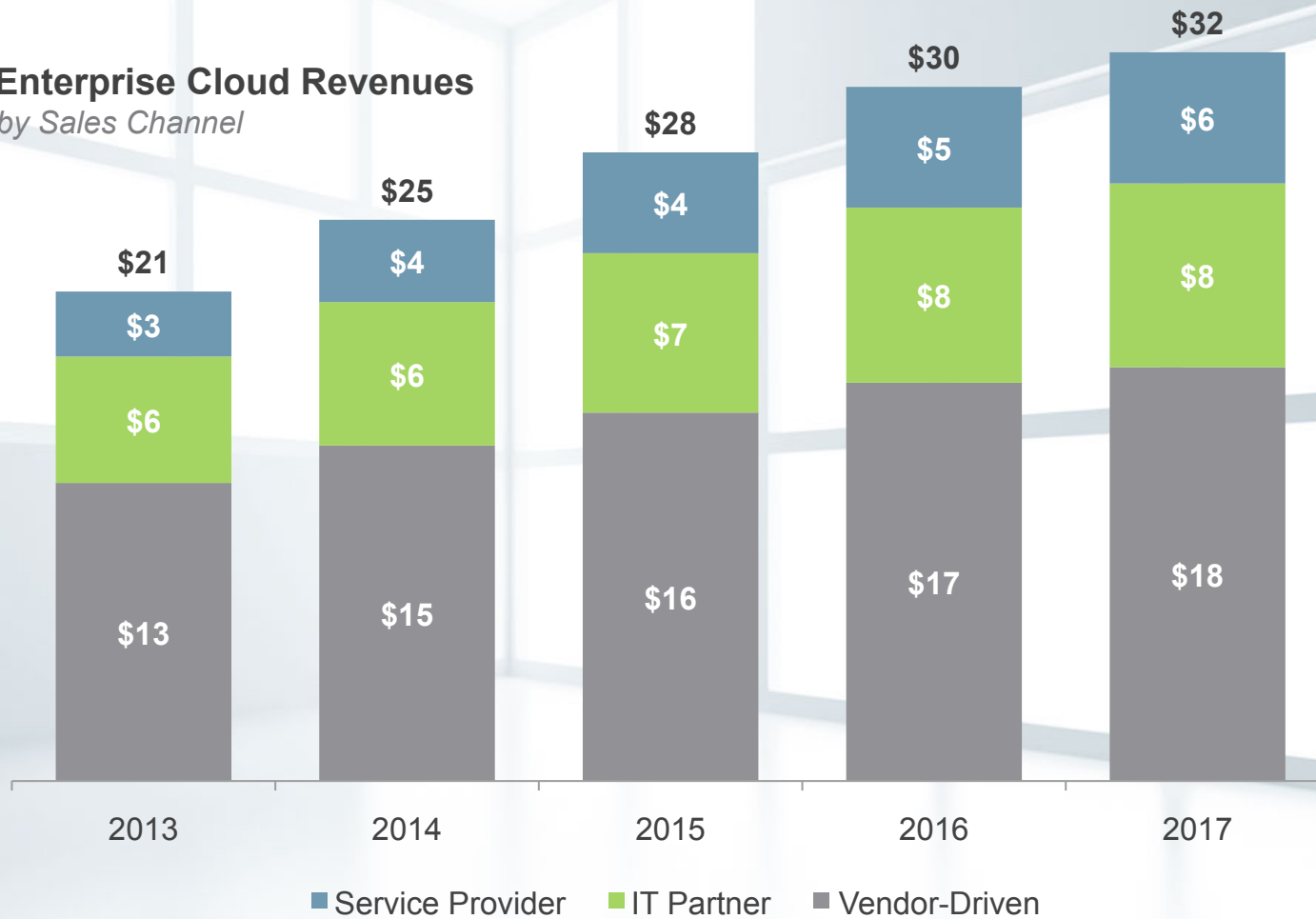
Security Concerns
Security is more critical than ever before across diverse networks, applications and devices

NEW ENTERPRISE REQUIREMENTS

✓ **Anywhere, Anytime Service Availability**

✓ **On-Demand, Rapid Service Provisioning**

✓ **Flexible Consumption Based Pricing Models**

✓ **Performance & Maintenance SLA's**

✓ **Self Service Capabilities**

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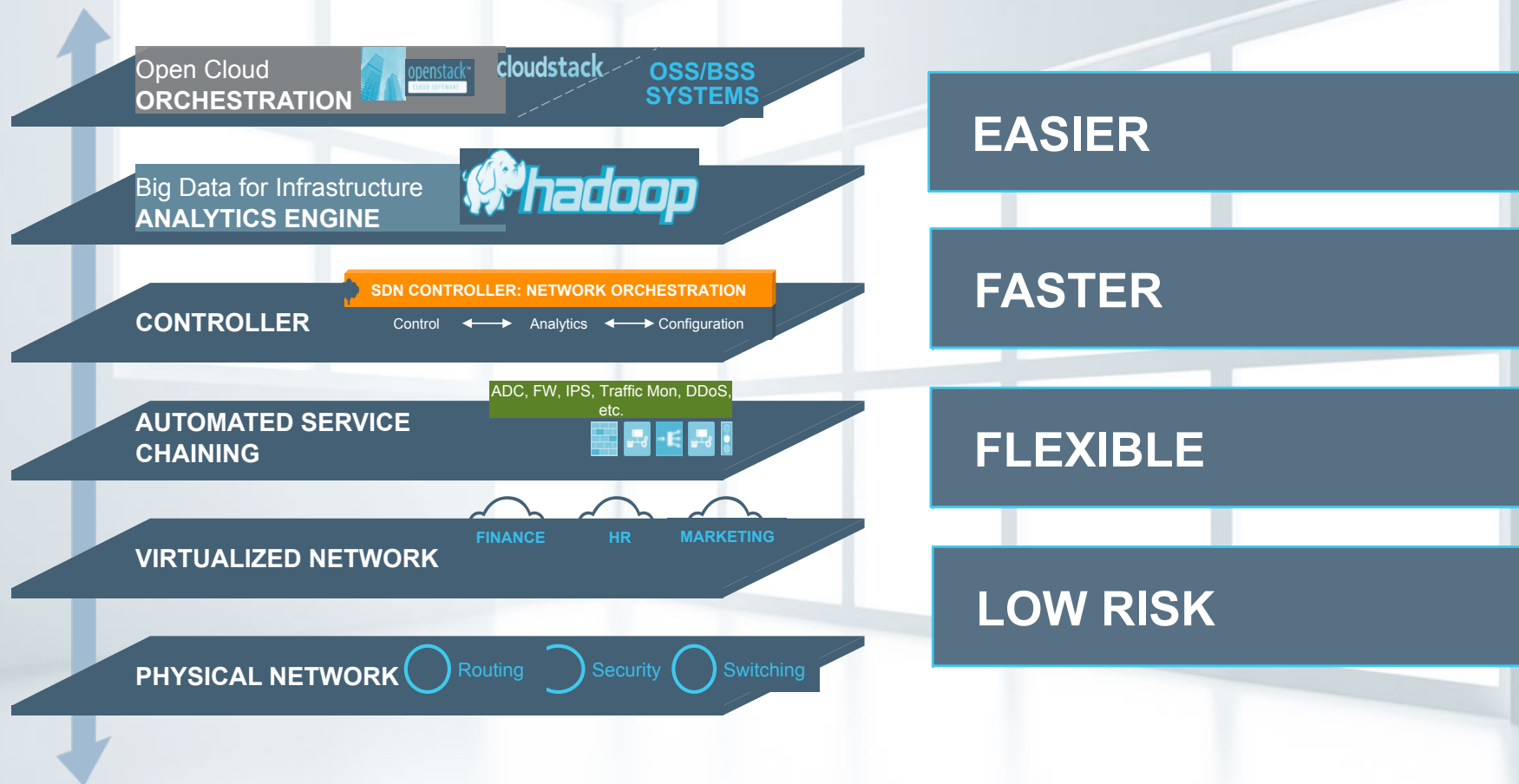
HOW DO YOU GET AGILITY <u>AND</u> PERFORMANCE?

The SDN Cloud Network

Open Cloud **ORCHESTRATION** — openstack CLOUD SOFTWARE — cloudstack — **OSS/BSS SYSTEMS**

Big Data for Infrastructure **ANALYTICS ENGINE** — hadoop

CONTROLLER
SDN CONTROLLER: NETWORK ORCHESTRATION
Control ←→ Analytics ←→ Configuration

AUTOMATED SERVICE CHAINING
ADC, FW, IPS, Traffic Mon, DDoS, etc.

VIRTUALIZED NETWORK
FINANCE   HR   MARKETING

PHYSICAL NETWORK   Routing   Security   Switching

EASIER

FASTER

FLEXIBLE

LOW RISK

SOME OPERATORS HAVE ALREADY STARTED

Telstra

Health
Telemedicine, Home Healthcare Emergency services mgmt

Transport
Fleet Management Equipment Tracking

Utilities
Remote Meter Reading Monitor Power, Water & Gas
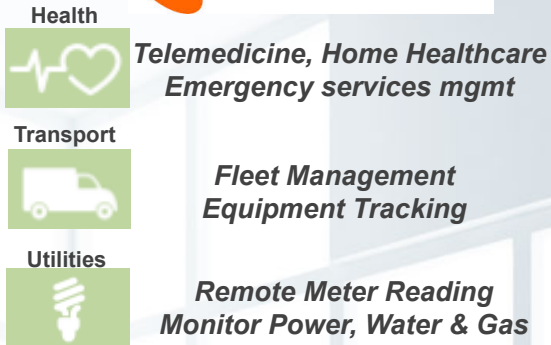
TARGETING VERTICALS
M2M SIM Cards
Data Plans
M2M Device Purchase Plans

verizon

Media Owners

Retail

Data on 86M + Retail Customers

Advertisers

Sponsors

MONETIZING USER DATA
Outdoor Media Measurements Venue
Audience Measurements Retail Site
Analytics

at&t

AT&T Synaptic Storage as a Service

AT&T Synaptic Compute as a Service

AT&T Platform as a Service

AT&T Medical Imaging & Information Management

COUNTERING AMAZON
Variety of IaaS and PaaS Services
Enablement for 3rd party developers

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SDN AND NFV CREATE NEW SERVICE OPPORTUNITIES

SECURITY

WAN OPTIMIZATION

BANDWIDTH ON DEMAND

CLOUD CPE

BANDWIDTH CALENDARING

VIRTUAL WLAN CONTROLLER

REPORTING & ANALYTICS

CURRENT CPE DEPLOYMENT

ENTERPRISE SITES

SERVICE PROVIDER EDGE

Management

**Appliances
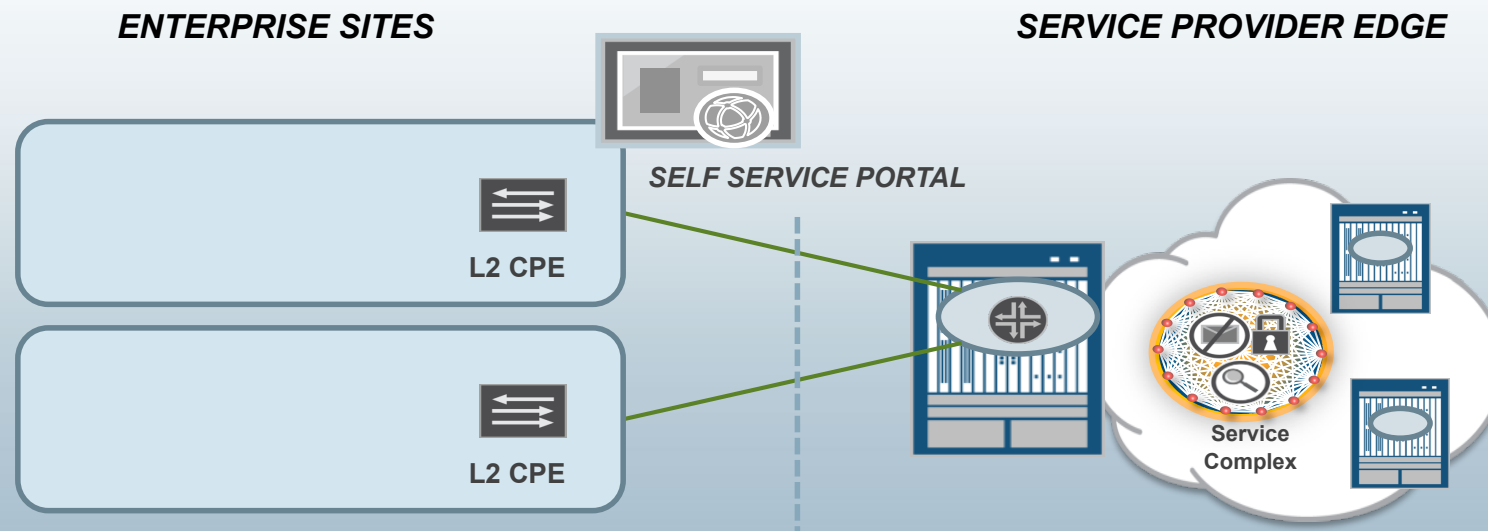(Probe, FW,…)**

L3 CPE

L2 CPE

Management

**Appliances
(Probe, FW,…)**

L3 CPE

L2 CPE
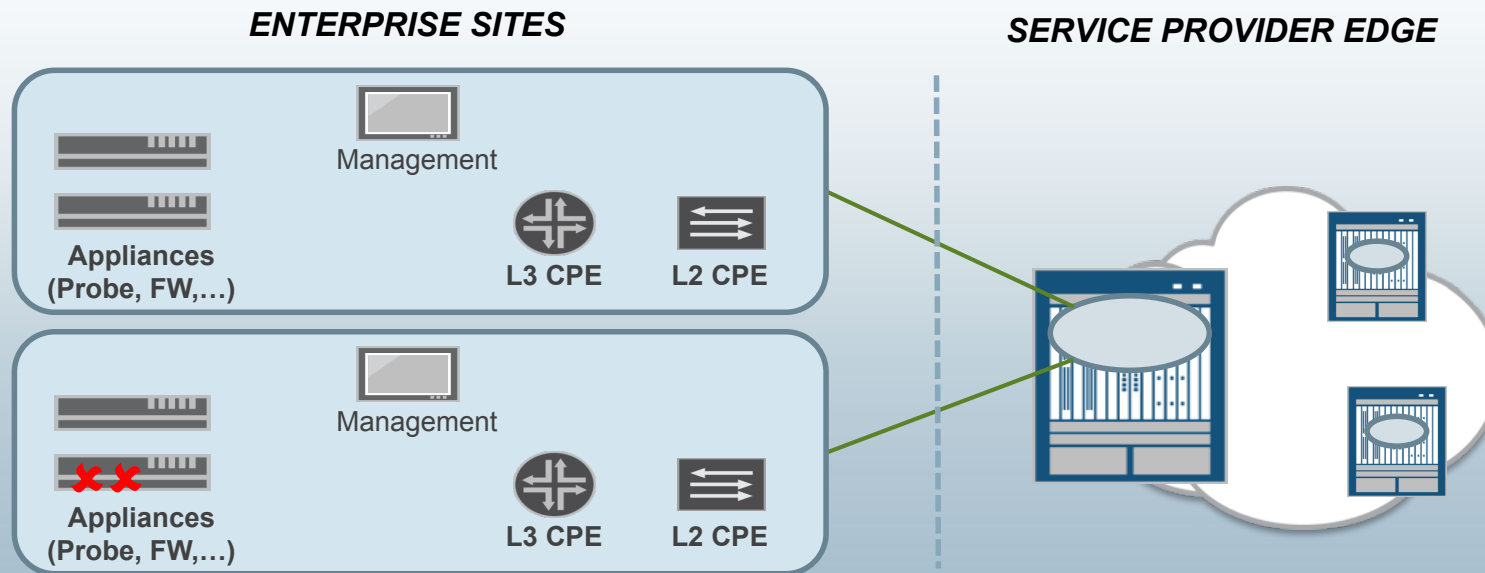
EACH SITE COSTLY
Dedicated Appliance Per Site
Layer 3 Routing, Firewall, CGNAT On Premise
Higher Capital Expense
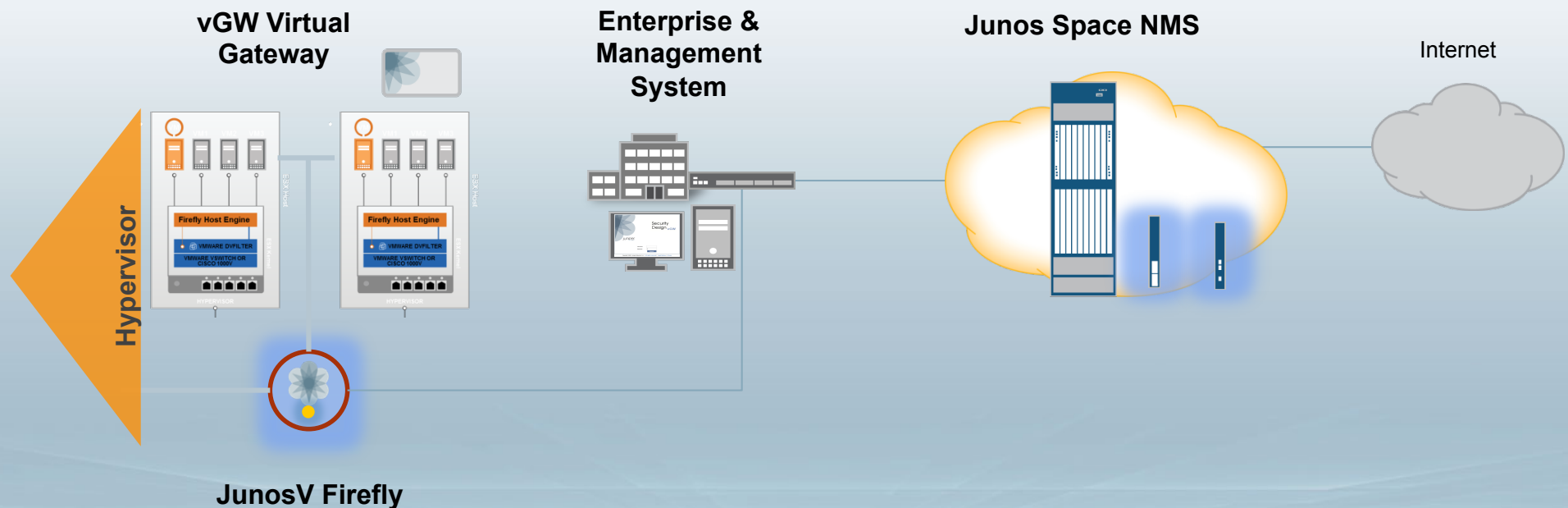Complexity Results In Higher Maintenance Costs

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MOVING TO THE CLOUD

ENTERPRISE SITES

SERVICE PROVIDER EDGE

SELF SERVICE PORTAL

L2 CPE

L2 CPE

Service Complex

MAXIMUM OPTIMIZATION
Simple L2 Device On Premise
Virtual CPE's on MX 3D Router
MX 3D Based FW, CGNAT
Central, Cloud Based Self Service Portal

VIRTUALIZED SECURITY SERVICES AT THE EDGE OR IN THE CLOUD

vGW Virtual Gateway

Enterprise & Management System

Junos Space NMS

Internet

Hypervisor

JunosV Firefly

DELIVERS COMPREHENSIVE PROTECTION IN A SCALABLE, FLEXIBLE MODEL

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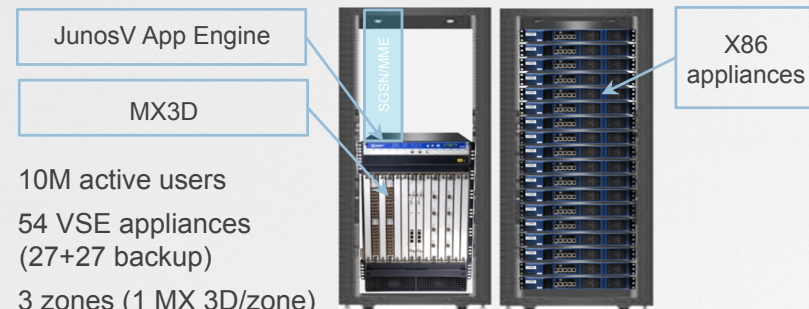
VIRTUALIZED MOBILE CONTROL

SGSN / MME

Traditional Mobile Control Gateway

MCG ATCA chassis

- 10M active users
- 32 ATCA chassis
- 3 zones (11 ATCA per zone)
- 300K subscribers per chassis

Virtual Mobile Control Gateway

JunosV App Engine

MX3D

X86 appliances

- 10M active users
- 54 VSE appliances (27+27 backup)
- 3 zones (1 MX 3D/zone)
- 3.3M users per MX 3D, 400K users per VSE

Financial Benefits

- **54%** lower TCO
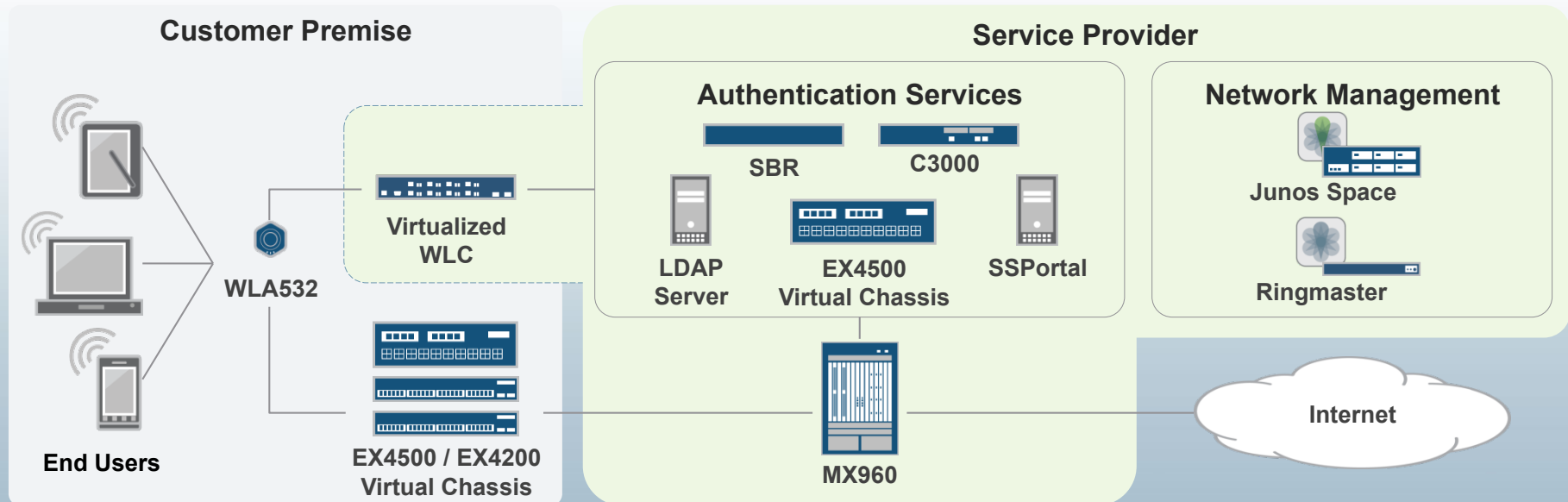- **65%** lower OpEx
- **53%** lower CapEx

Development Time & Cost

- **46%** faster initial deployment
- **61%** less initial deployment cost
- **87%** faster capacity additions
- **92%** less capacity addition cost

Operational Benefits

- **73%** less environmental cost
- **72%** less operator training cost
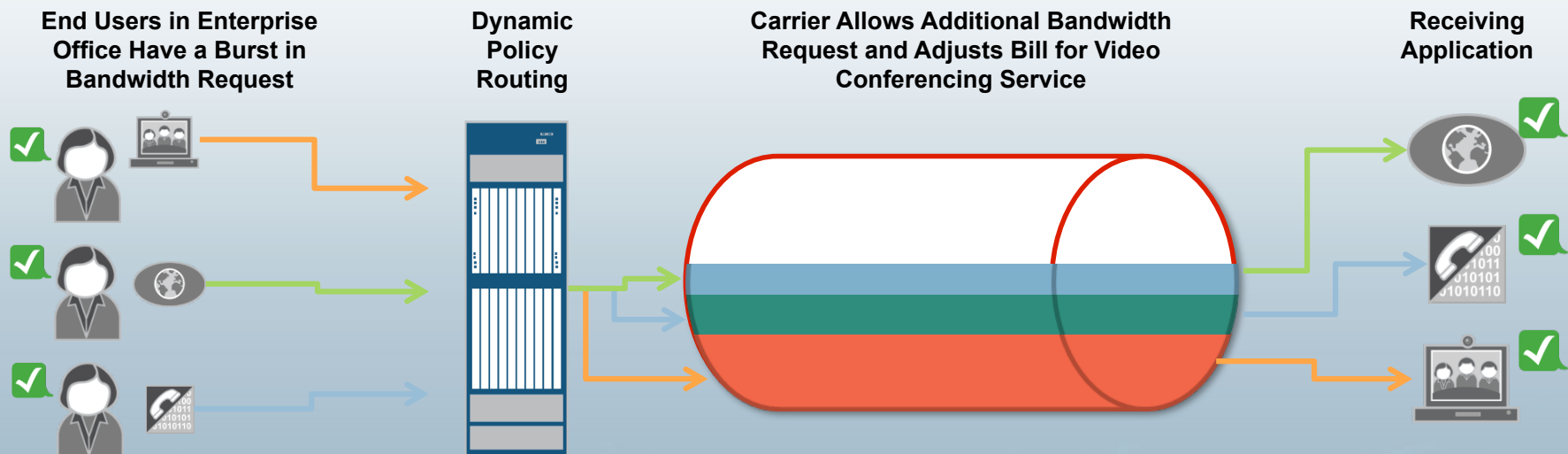- **63%** OA&M cost

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VIRTUALIZED WIFI (WIRELESS LAN) CONTROL

Streamlined Managed WLAN Services
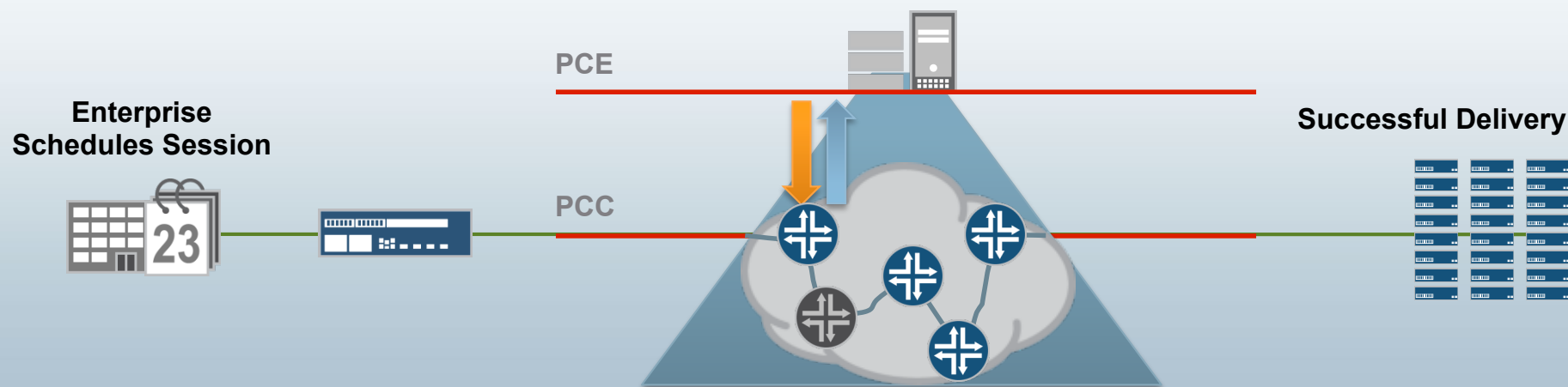For service providers offering managed WLAN
Allows configuration changes with less difficulty
Rapidly scale resources to match customers' demands.

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BANDWIDTH CALENDARING AND NETWORK SLICING FOR QUALITY OF EXPERIENCE

PCE

Enterprise
Schedules Session

PCC

Successful Delivery

GLOBAL NETWORK VIEW

DELEGATION

GREATER REDUNDANCY

ENSURE BETTER CALENDARING

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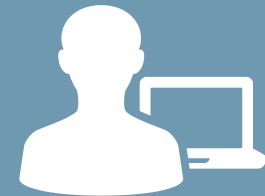# BETTER REPORTING AND ANALYTICS THROUGH VIRTUALIZED ENGINES

J-FLOW, DPI, BGP, NETFLOW
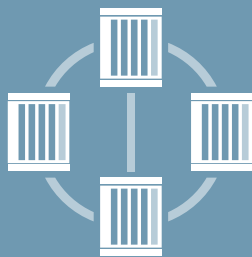
NETWORK

REPORTING & PRESENTATION ENGINES

STORAGE

USER

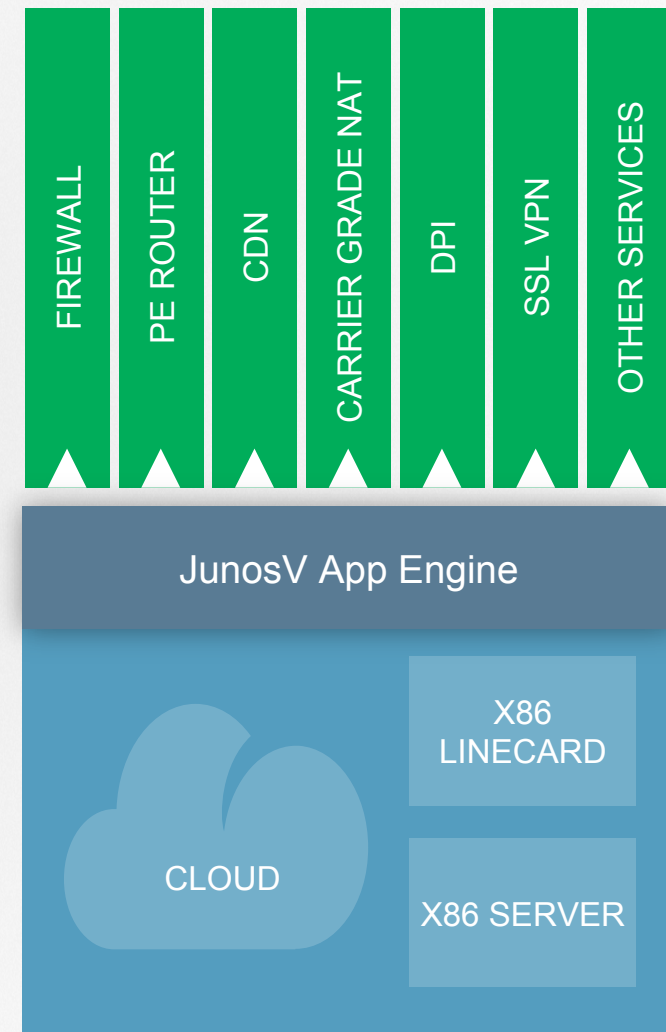DATA EXTRACTION

REPORTING

STORAGE

TIMELY INSIGHT, REDUCED COST, IMPROVED SCALE

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IT IS EASY TO START WITH NFV

OLD APPROACH – NEW SERVICE NEEDS A NEW BOX

CUSTOM ROUTING APPLICATION

CDN

MESSAGE ROUTER

TESTER QoE MONITOR

FIREWALL

PE ROUTER

DPI

WAN ACCELERATION

LOAD BALANCING

CARRIER GRADE NAT

SGSN/GGSN

RADIO ACCESS NETWORK NODES

Traffic Monitoring

SSL VPN

BRAS

Video/ VOIP Monitoring

NEW APPROACH - NFV

FIREWALL

PE ROUTER

CDN

CARRIER GRADE NAT

DPI

SSL VPN

OTHER SERVICES

JunosV App Engine

X86 LINECARD

CLOUD

X86 SERVER

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