Networking & Security Opportunity

David Goeckeler
SVP/GM, Networking and Security Business
Agenda

1. Enterprise Networking
   Todd Nightingale and Scott Harrell

2. Webscale

3. Data Center
   Roland Acra

4. Service Provider
   Yvette Kanouff

5. Security
   David Ulevitch

6. Q & A
Driving Networking Growth

- Integrated Architecture
- Best of Breed Products
- Powered by Intelligence
- Analytics

Silicon
Optics
Software

Best of Breed Products
Integrated Architecture

Automation
Security

FAC 2017 at Cisco Live!
Automation – by Segments
Same value proposition solved in a different way

Integrated Fast IT
- Simplicity
- Cloud Managed
- Highly Secure

Web Scale Economics
- Automation
- Scalability
- Operational Efficiency

SMB
Commercial
Global Enterprise
Service Providers
Web Scale
Automation – by Segments

Same value proposition solved in a different way

Integrated Fast IT
- Simplicity
- Cloud Managed
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Web Scale Economics
- Automation
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- Operational Efficiency

Cisco Meraki

SMB
Commercial
Global Enterprise
Service Providers
Web Scale
Automation – by Segments

Same value proposition solved in a different way
Effective Security Requires the Network

Contain Threats
Segmentation
Software Defined Access automates containment of threats

Find Threats
Defend network interior
Network analytics

Automated Remediation
Lower time to remediation
Analytics Driving Increased Network Relevance
Leveraging the value of our network data

Portfolio breadth and depth — a valuable source of data
Innovation vector woven into every business we have
Continued advances in data science will unlock value
Ability to solve high value use cases (assurance, security)
Cisco Meraki

Todd Nightingale
SVP/GM, Cisco Meraki
Simplifying powerful technology
to free passionate people to focus on their mission
and reach groups previously left in the darkness.

*Technology that simply works*
Simplicity Value Proposition

Simplicity value proposition driving
  • Nimble operations, lean IT
  • Lower TCO
  • Mission-driven IT

Cloud is the delivery tool for simplicity
Meraki leading the Simple IT movement
  • Over 140,000 unique customers
  • Over 1 million active networks
Portfolio Journey

MR
Wireless

MX
Security & Routing

MS
Switching

Systems Manager
Mobility Management

MC
Communications

MV
Security Cameras
Meraki MV

Simplicity Value Proposition
- Cloud removes need for NVR/VMS

Simplicity Value Proposition
- Zero-touch deployments
- Remote management
- Granular access control
- Export/share clips directly from Dashboard
- Motion Search analytics tool
Platform Efficiency

Over $1B bookings with fewer than 250 R&D headcount

R&D Efficiency of 12x ($GM/$R&D)… outpaces Google, Facebook, SFDC

Durable R&D Leverage hasn’t decreased since acquisition (13x ago)
Meraki Platform in the Market

# of Products

- 1
- 2
- 3
- 4
- 5
- 6
**Account Growth**

**Account purchases (as % of initial purchase)**

<table>
<thead>
<tr>
<th>Number of months after initial purchase date</th>
<th>Initial Purchase</th>
<th>12 Months</th>
<th>18 Months</th>
<th>24 Months</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>100%</td>
<td>239%</td>
<td>303%</td>
<td>384%</td>
</tr>
</tbody>
</table>

Presentation ID
Innovation Strategy

Innovate Selectively

IT Complexity

Cloud Management
Meraki @ Cisco

Powerful IP Portfolio
Campus Switching
RF Excellence
SourceFire AMP
ThreatGrid
OpenDNS Umbrella
APIs / DNA Center

Operations
Local Depots
Component Pricing

Globalization

Channel Momentum
Simplifying powerful technology
to free passionate people to focus on their mission
and reach groups previously left in the darkness.

Technology that simply works
The Enterprise Networking Launch

Cisco unveils a new era of intent-based networking

- DNA Center
- New Platforms: Catalyst 9000 Series
- Encrypted Traffic Analytics

Moving to a recurring revenue model in our core business

- Establish software innovation and monetization model
- Catalyst 9000 requires a subscription
- Potential to sell subscriptions on install base
- Platform effect – upsell / cross-sell GTM motion
Enterprise Networking

Scott Harrell
SVP of Product Marketing, Enterprise Networking
Networking Enterprise Power User

Meraki

- Aironet Wireless APs
- Catalyst Switches
- ISR and ASR 1k Routers
Rebuilt and Unified for the Digital Age

The power of IOS

- Feature Rich
- Open
- Programmable
- Modular
Catalyst 9000 Platform
World’s Most Advanced Enterprise Switches

- Programmable
- Integrated Security
- Cloud Ready

- IoT Ready
- Mobile Ready
- Design

Catalyst 9400
Modular Access

Catalyst 9300
Fixed Access

Catalyst 9500
Fixed Core
Powered by Intent. Informed by Context.

LEARNING
DNA Center
Policy  Automation  Analytics

INTENT

CONTEXT
Intent-Based Network Infrastructure

SECURITY
Automation Impact

- One time provisioning across access, campus, and WAN
- No IP Address Management
- No ACL Management
- No VLAN Management
- No CLI

Powered by Intent
DNA Center and Software Defined Access

Limit Lateral Movement of Threats

Automate Threat Response

Default Deny

IoT Virtual Network

Employee Virtual Network

Routers

Switches

Wireless

Deny
Informed by Context

Leveraging analytics to transform network operations

DATA

INSIGHT

Assurance
Apps
ANALYTICS

NETWORK DATA PLATFORM
IT Operations Impact of New Approach

- Reduce Network Provisioning: 67%
- Improve Issue Resolution: 80%
- Reduce Security Breach Impact: 48%

Current: $14M
With Cisco DNA Center: $5.4M

61% reduction in OPEX

**Capex Reduction based on converging IOT Networks
Adoption Drives Greater Value

Simplicity for the Power User

Cisco DNA Center

Adoption Scale Maximizes Benefits

OpEx Savings  Insights  Security

Aironet Wireless APs  Catalyst Switches  ISR and ASR 1k Routers
Identify and Resolve Issues Faster
Respond in Machine Time
Extend Workflows Across Ecosystem

Cross Domain Integration
DNA Center
3rd Party Integrations

Security
Meraki
Data Center
IT Service Mgmt.
IP Address Mgmt.
Security

DNA Center
Innovation-Led Growth, Changing the Business Model

Sold as a subscription on every network device

DNA-Center
- Policy
- Automation
- Analytics

Intent-Based Network Infrastructure
Transforming the Switching Business Model
Delivering more value at every price point with subscriptions

Legacy Model

IP Services
IP Base
Platform
Hardware + LAN Base

Subscription Model

5 & 7yr DNA Advantage*
5 & 7yr DNA Essentials
3yr DNA Advantage*
3yr DNA Essentials

*Note: Includes IOSXE features and advanced DNA-C (SD-Access & assurance)
Upsell the Installed Base
SD-Access brownfield architecture

SWITCHING
- Catalyst 9400
- Catalyst 9300
- Catalyst 9500
- Catalyst 4500E
- Catalyst 6K
- Nexus 7700
- Catalyst 3850 and 3650

ROUTING
- ASR-1000-X
- ASR-1000-HX
- ISR 4430
- ISR 4450
- CSR 1000V

WIRELESS
- AIR-CT5520
- AIR-CT8540
- AIR-CT3504
- Wave 2 APs (1800, 2800, 3800)
- Wave 1 APs* (1700, 2700, 3700)

*with Caveats
Viptela and the New Era of Networking
Accelerating the transformation

Architecture Alignment

Subscription-Led
Webscale
Webscale Dynamics

The Market

Our Investments

Our Approach
Our Approach

- Modularized OS to enable micro-releases
- Programmability at every layer
- Model-driven architectures
- Silicon innovation / breadth to drive density and cost
- Virtualized and containerized SW to run on 3rd party HW
- 3rd party networking SW to run on our HW
Our Progress

2 OF THE Top 7  Spine-Layer insertions

3 OF THE Top 7  Top-of-Rack footprint

2 OF THE Top 7  Leaf footprint with 3rd party SW / Cisco HW

4 OF THE Top 7  Data Center Interconnect insertions

3 OF THE Top 7  Routing platform / software insertions

2 OF THE Top 7  Route Reflector insertion
Data Center

Roland Acra
SVP/GM Data Center Business
Every company must now express its uniqueness with software.
Developers Move at Market Speed … With or Without IT

80% Employees use software not cleared by IT

83% IT Staff admit to using unsanctioned software and services

8% Enterprises understand impact of Shadow IT

Study by Stratecast and Frost & Sullivan
58% Costs per transaction have increased

43% Companies are concerned about lock-in

42% Data sovereignty remains an issue

Source: Forbes Insights: When Clouds Connect—How Hybrid IT is Transforming Enterprises
Powering a Software First, Hybrid Cloud World

Developer Enablement Tools

Cloud Portability and Policy Management

Infrastructure Automation and Simplification
Application Relevance in a Hybrid Cloud World

APM
AppDynamics

Business Insights and Impact

App Portability
Cloud Center

Infrastructure Independence
IaaS or On-Premise

On-Premise IT

Private Cloud

Public Cloud

Amazon
Microsoft Azure
Google Cloud Platform

AUTOMATION
ANALYTICS
ENFORCEMENT

Policy Lifecycle
The Triathlete

Hyperflex — Hyper-Convergence in a Snap
The Mechanic, The Driver, The Passenger
ACI and Open Fabric for Policy Automation
See Everything...Don’t Talk to Strangers!

Tetration — ML Based App Visibility, Compliance

- App dependency maps
- Inferred white list policy
- Policy enforcement
- Network and OS based
- Hybrid cloud delivery
Nexus 9000 – Cloud Scale Platform
Line Rate Telemetry, Encryption, Segmentation at 100G

Innovations
- One-chip 6.4Tbps line rate routing
- Line rate flow capture and encryption
- Unified ports: 10/25GE, 8/16/32G FC

Richest Switching Portfolio
- Built-in visibility, telemetry, security
- Cloud Scale ASICs or merchant Si
- Cloud-ready NX-OS tools and APIs

CloudScale | Nexus Foundation
The ASAP High Impact Cycle

- Automated infrastructure
- Expressed for developers
- Inferred and enforced policy
- Deliverable in hybrid clouds
- Open and programmable
Service Provider
Leading the Digital Transformation
Financial Analyst Conference

Yvette Kanouff
SVP/GM, Service Provider Business Unit
Trends Driving Digital Transformation by 2021

The World Has Gone Mobile & Wi-Fi

7X Mobile Data Traffic Growth: 48.3 EB /mo
63 percent of IP traffic will be mobile/Wi-Fi
Smartphone traffic will exceed PC traffic (33 % versus 25%)

Internet Traffic Growth Is At the Edge

60% Metro Traffic growth - to 35%
15% Regional Traffic growth - to 23%
29% Cross Country Traffic decline - to 41%

Source: Cisco VNI and Industry Data
Cisco Creates Value for SPs

### Spend

<table>
<thead>
<tr>
<th>Category</th>
<th>How We Help</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer Service</td>
<td>Automation, self-healing</td>
</tr>
<tr>
<td>Facilities</td>
<td>Focus on density – leveraging virtualization; MSDC solutions</td>
</tr>
<tr>
<td>Power</td>
<td>Low power focus, new mechanical designs</td>
</tr>
<tr>
<td>Truck Rolls</td>
<td>Network intelligence to lower truck rolls, zero-touch deployment</td>
</tr>
<tr>
<td>Operations OpEx</td>
<td>Automation, self-healing</td>
</tr>
<tr>
<td>Infrastructure: Outside and Inside</td>
<td>Outside and inside – virtualization, more throughput/density, performance</td>
</tr>
<tr>
<td>Services: B2C</td>
<td>Video, service creation tools, orchestration, mobility</td>
</tr>
<tr>
<td>Services: B2B</td>
<td>Enterprise products, e.g. Meraki, collaboration, security, IoT</td>
</tr>
</tbody>
</table>
Cisco’s SP Strategy

- Silicon Disruption
- Automation
- Software Value
- Grow Enterprise
What Cisco Does For Service Providers

- Mass-Scale Networking
- Automation
- Applications B to C
- Enterprise B to B
SP Routing

Invest in maximizing performance of current silicon

Multi-Purpose NCS 5500
Traditional SP & Web Scale

Platform consolidation with disruptive next generation silicon

5 New Routing & Optical Insertions in Cloud Scale Customers in Q3 FY17
Cisco Leading in SP IP Core Routing

<table>
<thead>
<tr>
<th>Density</th>
<th>NCS5500</th>
<th>Competitor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Per Slot</td>
<td>36 x 100GE</td>
<td>30x100GE</td>
</tr>
<tr>
<td>System</td>
<td>57.6 Tbps</td>
<td>24 Tbps</td>
</tr>
</tbody>
</table>

NG Silicon

Cisco NCS5500 8-slot
Cisco NCS5500 16-slot
Cisco
Competitor
Future

Not to scale
Source: Public Data
### Recent Competitive Announcements

#### Three “Catch Up” Launches
- 16 Slot Chassis @ 57.6Tbps – Ships 2H’17
- MACSEC support on Jericho+ Linecard
- MPLS and VXLAN with EVPN Signaling

#### Cisco Status
- ✓ Shipping since Jan 2017
- ✓ Supported since Q1 CY17
- ✓ Already shipping

- FP4 Silicon: 1.2Tbps Full Duplex targeted Q4’17
- 7950 System BW upgrade to 48T per chassis
- 7750 System BW upgrade to 60Tbps on fabric
- Telemetry Support/Deepfield Integration

- ✓ Differentiated silicon roadmap
- ✓ Shipping 57.6Tbps chassis BW since Jan ’17
- ✓ Shipping 57.6Tbps chassis BW since Jan ’17
- ✓ In Customer Trials now

- JunOS Node Slicing
- New Universal Chassis
- NorthStar Controller Support for SPRING

- ✓ Supports Node Slicing since 2016
- ✓ N/A
- ✓ Lead industry in Segment Routing
SP Routing

Invest in maximizing performance of current silicon

Multi-Purpose NCS 5500 Traditional SP & Web Scale

Platform consolidation with disruptive next generation silicon

5 New Routing & Optical Insertions in Cloud Scale Customers in Q3 FY17
Disaggregation Business Model Value

Legacy Model

Value Attribution

Software Creates Stand-alone Value with new business models
Hardware Leads Industry Trends
Cisco’s Optical Platforms
Leading in Data Center Interconnect

- Industry First 1 Tb per RU
- Deployed in 3 out of 5 Top Cloud Scale Providers
- 250G Wavelengths Using Pluggable Optics
Top SPs Use Cisco Automation

**Multi-vendor WAN Automation**
- Level(3)
- at&t
- Sprint
- T-Mobile
- WIND
- Turk Telekom
- TELE2
- orange
- ETISALAT
- SKYLOGIC
- Telefonica
- Telstra
- Deutsche Telekom

**Virtual MS/NFV/vEPC**
- at&t
- SingTel
- verizon
- NTT
- SoftBank
- Deutsche Telekom
- Spark
- Telkom
- Telia
- ngena
- Expedia
- SES

**Data Center Automation**
- at&t
- PayPal
- Equinix
- KPN
- Docomo
- Workday
- Societe Generale

**Cloud Interconnect**
- Microsoft
Automation: Making Data Actionable

- Machine Learning
- Knowledge Derived from Machine Learning
- Correlation Engine
- Relevant Metrics
- Alert Engine
- Predictive Engine
- Training Data
- Network Data (HW, SW, configs)
- Real-time Telemetry
- TOOLS
- Reactive Remediation
- Proactive Remediation
Leadership in Moving Video to the Cloud

- 80+ deployments with 60+ customers
- 30+ active customer trials
- 40+ consumer devices supported, and growing
- 20+ partners on the Platform
- Deployed across Cable/Telco/OTT/DTH Operators, Broadcasters
- Across End-to-end platforms, Security, Video Processing & Distribution

Source: Cisco VSS
Cisco + SP Driving Enterprise Digitization

SP Bundle Advantage

Shaw + Cisco Meraki
= greater foothold in SMB
Bundled WiFi and Security

• Quick time-to-market
• Low upfront CAPEX
• Simplified operating model

Cisco Verizon
DNS Safeguard built on OpenDNS

• Managed Security Offering
• Cloud delivered security against every circuit Verizon sells

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## Differentiated Competitive Advantage

<table>
<thead>
<tr>
<th>Leadership in Data Center Interconnect with packet + optical</th>
<th>Leadership in Optics and Optical</th>
<th>Best routing platform – investing for leadership and growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leadership in creation of recurring revenue through disaggregation</td>
<td>Leading in next-generation cable access and fiber deep</td>
<td>Leading in Mobile Packet Core – growth in mobile back haul now and with 5G</td>
</tr>
<tr>
<td>Leading with video in the cloud</td>
<td>Ruthless network simplification through automation</td>
<td>Best portfolio for SP-led enterprise product growth</td>
</tr>
</tbody>
</table>

**Core to Cisco**

**Investing to Win**

**Web Traction**
Thank you
Security Update
Catalyst 9000 + Encrypted Traffic Analytics

Visibility and malware detection without decryption

- **Malware in Encrypted Traffic**: ETA algorithms analyze multiple network data sources
- **Security AND Privacy**: No information is decrypted
- **Detection Accuracy**: High rate of accuracy
How ETA Works

• Talos threat intelligence understands malware behaviors and characteristics
• Catalyst 9000 provides multiple sources of enhanced network context
• Machine learning identifies malware in encrypted traffic
Cisco Security Commitment

- Security is Cisco’s #1 Priority
- Billions Invested
- A Threat-Centric Approach

Cognitive
- Sourcefire
- ThreatGRID
- Neohapsis
- OpenDNS
- Portcullis
- Lancope
- Cloudlock

Managed Security Services

Broad/Deep Portfolio

5K People Strong

Customers’ Trusted Advisor

Securly Connect Everything to Make Anything Possible

#1 Preferred Security Vendor
PiperJaffray
Cisco Security Today – Leading Growth

Security Vendor Consolidation

ELA Adoption

50%+ Software Revenue
Cisco Security Today – Leading Growth

- Security Vendor Consolidation
- ELA Adoption
- 50%+ Software Revenue
Creating Three Billion-Dollar Franchises in Security

Network
- NGFW
- ISE
- StealthWatch

Advanced Threat / Endpoint
- AnyConnect
- AMP
- EMAIL

Cloud Security
- Umbrella
- Cloudlock

Talos Services
Creating Three Billion-Dollar Franchises in Security

Network
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Talos Services
When it Comes to Security, a Vendor Buffet is **Not a Strategy**

Source: Momentum Partners
We leverage our architectural advantage to shorten the ‘time to detect,’ and tightly couple it with an ever shortening ‘time to respond.’
The Architectural Advantage

Common scenario

SEE ONCE

Threat
AMP for Endpoint

ENFORCE EVERYWHERE

Cloud
NGFW Umbrella Threat Grid
ESA AMP ISE
Third-Party Integrations

1 AMP Cloud
2 Threat Grid
3
Securing THE CLOUD TRANSITION
Cloud Security Three Ways

1. Highly secure access to the internet
2. Highly secure usage of SaaS and IaaS
3. Security orchestration and intelligence
Q&A
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