WAN Transformation
Delivering Managed SD-WAN Simply and Securely

Cisco Knowledge Network
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Presenters

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Distinguished Engineer - Technical Marketing

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Service Provider SE - Meraki
Connecting Users to the Data Center was the Priority

Branch/Campus

WAN

Data Center

Applications

Internet

Best Effort

Users
Then the Way We Worked Changed

- Devices & Things
- Campus & Branch Users
- Mobile Users

WAN

Services:
- Office 365
- Google Cloud
- Cisco Webex
- Salesforce
- Amazon Web Services
- Dropbox
- Azure
Applications Moved to Not One Cloud, But Many

Devices & Things

Campus & Branch Users

Mobile Users

WAN

DC/Private Cloud

SaaS

IaaS

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SD-WAN in Simple Words...

MULTIPLE UPLINKS
Differing connectivity options and speeds

OVERLAY VPN
VPN out of the box

PERFORMANCE ROUTING
Application-aware path control
Addressing Next-Generation Partner and End-Customer Business Outcomes

Visibility, Assurance, Automation, Analytics and Workforce Experience

Pervasive Security – Identity, Mobility, Policy and Compliance
SD-WAN is a Key Component in the IBN Journey

Improve your WAN experience and evolve to an intent-based network in four easy steps:

Step 1: Move to hybrid WAN
Are WAN costs getting out of control?

Step 2: Deploy SD-WAN
Is managing your branches a burden?

Step 3: Secure branch connectivity
Are you concerned about security?

Step 4: Improve application performance
Is application experience predictable?
Evolving End-Customer WAN Strategies

One Carrier          Single Global WAN          Centralized Apps

Is evolving into...

Multiple Carriers       Multicloud WAN          Distributed Resources
SD-WAN Customer Buying Triggers

- Shifting to cloud applications (G Suite, Office 365) and need to address performance concerns
- The need for real time, end to end visibility from device, LAN, WAN and Cloud Applications
- Reduction in the complexity and managing the costs of the WAN
- Deploying real-time or bandwidth-hungry applications across multiple locations
- Many small to medium offices in a distributed environment
- Limited or no IT personnel at branches
- Looking to refresh the WAN routers, or negotiate a managed WAN contract
- Small and medium offices looking for an integrated cloud managed branch solution including wired and wireless access, security with SD-WAN

Cisco’s meets these requirements with its SD-WAN platforms
Flexible Offers and Solutions From Cisco
Cisco Software Buying Programs
Addressing the needs of the entire market

Subscription Agreement
- All customers
- Manage multiple subscriptions and user enrollments

Managed Services License Agreement (MSLA)
- Partners delivering managed services
- Scale license capacity based on consumption

Enterprise Agreement (EA)
- Enterprise (Large & Medium)
- Commitment to Enterprise-wide purchase of Cisco software architecture(s)
Poll

Do you currently sell an “all in one” SD-WAN and security solution, or are they typically sold separately?

1) Yes, we have an all in one product
2) No, these products are sold separately
3) We offer SD-WAN, but not security
4) We offer security, but not SD-WAN
Common Architectural Use Cases
Deployed Use Cases - Sample

Critical Applications SLA

- Each vEdge router continuously monitors path performance and adjusts forwarding
- Configurable probing intervals

App Aware Routing Policy
App A path must have:
- Latency $\leq$ 150ms
- Loss $\leq$ 2%
- Jitter $\leq$ 10ms

Path 1: 10ms, 0% loss, 5ms jitter
Path 2: 200ms, 3% loss, 10ms jitter
Path 3: 140ms, 1% loss, 10ms jitter
Deployed Use Cases - Sample

Bandwidth Augmentation

- Augment MPLS with Internet bandwidth
- Create traffic engineering policy to steer application traffic
  - Active/Active if no policy

Traffic Engineering Policy (data policy)
- App A -> MPLS TLOC
- App B -> Internet TLOC
Deployed Use Cases - Sample

Secure Segmentation

- Complete isolation in the control and data plane
- Not all VPNs have to be present everywhere
- Policies are VPN-aware

Configuration Templates
Assign interfaces and sub-interfaces to respective VPNs

Remote Site 1
VPN1
VPN2
VPN3

Remote Site 2
ge0/2.1 -> VPN1
ge0/2.3 -> VPN2
ge0/3.3 -> VPN3

Data Center
VPN1
VPN2
VPN3

SDWAN Tunnel
SDWAN Fabric
Deployed Use Cases - Sample

Regional Secure Perimeter

- Firewall service is advertised into the VPN of choice from regional hub
- Control (or data) policy is used to steer the traffic of interest from remote site through Firewall

Service Insertion Policy
(control policy)
App A -> Route
App B -> FW Service

• App A -> NH DC, LBL VPN1
• App B -> NH RegHub, LBL FW (OMP)
• App A -> NH Remote Site, LBL VPN1
• App B -> NH RegHub, LBL FW (OMP)

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Deployed Use Cases - Sample

Guest WiFi

- Guest WiFi traffic is segmented off. Guest WiFi VPN is not carried over the fabric.
- Support both simple DIA and DIA through Cloud Security

vManage

Guest WiFi (data policy)
App A -> DIA

SDWAN Tunnel

SDWAN Fabric

Internet

Remote Site

VPN1

VPN2

App A -> DIA

VPN1

VPN2

Data Center

MPLS
Deployed Use Cases - Sample

DIA & DCA

- DNS-based security
- Overrides client DNS settings

Configuration Templates
Configure DNS server in service side VPN and activate DPI
Cisco SD-WAN

End-point flexibility:
- Physical or Virtual
- Rich Services or Lite
- Branch, Agg, Cloud

1. Cloud Delivered WAN with Operational Simplicity and Analytics
2. Superior Security Architecture: Cloud based and On-prem
3. Application QOE
4. End-point flexibility:
   - Physical or Virtual
   - Rich Services or Lite
   - Branch, Agg, Cloud
5. Cloud Delivered Wan with Operational Simplicity and Analytics

WAN

Transport Independent WAN Fabric

SD-WAN

Cloud OnRamp

Use-Cases

DC
IaaS
SaaS
vDC

Apps

DNA Center

Analytics

Intent-based Network Infrastructure

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## SD-WAN Cloud Access: Re-thinking of Security Architectures

<table>
<thead>
<tr>
<th>Compliance</th>
<th>Guest Access</th>
<th>Direct Cloud Access</th>
<th>Direct Internet Access</th>
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<tbody>
<tr>
<td>Protect sensitive data (card holder data, patient data) before, during and after a transaction.</td>
<td>Prevent guest users from disrupting my network when browsing the internet via guest wi-fi</td>
<td>Protect branch office when using direct cloud access to provide better user experience for cloud apps</td>
<td>Protect myself against potential threats when using the local internet path for all internet traffic</td>
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**Compliance**
- Protect sensitive data (card holder data, patient data) before, during and after a transaction.

**Guest Access**
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**Direct Cloud Access**
- Protect branch office when using direct cloud access to provide better user experience for cloud apps

**Direct Internet Access**
- Protect myself against potential threats when using the local internet path for all internet traffic

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**Diagram**

- SD-WAN Cloud Access: Re-thinking of Security Architectures

- **Compliance**
  - Protect sensitive data (card holder data, patient data) before, during and after a transaction.

- **Guest Access**
  - Prevent guest users from disrupting my network when browsing the internet via guest wi-fi

- **Direct Cloud Access**
  - Protect branch office when using direct cloud access to provide better user experience for cloud apps

- **Direct Internet Access**
  - Protect myself against potential threats when using the local internet path for all internet traffic

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Cisco SD-WAN Operations

vManage
Single Pane Of Glass Operations

vAnalytics
Rich Analytics

- Cloud-first management and orchestration
- Zero-touch provisioning

- Troubleshooting with simplified workflows
- Advanced analytics and assurance

Simplicity and Visibility
Cisco SD-WAN
Powered By Meraki
Meraki Customer Profiles

SMALL MEDIUM BUSINESS
Customers with up to 200 users with any number of sites can deploy SD-WAN in a cost efficient manner

CLOUD APPLICATIONS
Moved to Azure or AWS? No problem! Extend your SD-WAN to the cloud in a simple and secure fashion

DISTRIBUTED ENTERPRISE
Interconnect any site, anywhere with SD-WAN overlay, and reduce complexity

DESIRE VISIBILITY
See more and do more with the most intuitive management interface available today from Cisco Meraki

LEAN IT
Rely on a trusted partner and vendor to manage the full stack IT without compromising on the value

DOWNTIME SENSITIVE
Zero touch deployment gives these customers the fastest migration path to SD-WAN with minimal downtime
<table>
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<th>The Meraki Value Proposition</th>
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<tbody>
<tr>
<td><strong>EASY TO DEPLOY</strong></td>
</tr>
<tr>
<td>Deploy in zero touch, Save cost, Reduce downtimes, Improve productivity. CTRL+C CTRL+V</td>
</tr>
<tr>
<td><strong>CENTRALLY MANAGED</strong></td>
</tr>
<tr>
<td>One single pane of glass, regardless of the customer, regardless of the product, regardless of the location.</td>
</tr>
<tr>
<td><strong>LOW TCO</strong></td>
</tr>
<tr>
<td>In simple math: Hardware + License + Service. That’s it!</td>
</tr>
<tr>
<td><strong>SCALES TO ANY SIZE</strong></td>
</tr>
<tr>
<td>Sell any number of devices, manage any number of devices, dashboard scales to thousands of devices!</td>
</tr>
<tr>
<td><strong>QUICK AND EASY BOM</strong></td>
</tr>
<tr>
<td>All inclusive license with a 1:1 ratio makes the Meraki BoM so simple and easy for anyone to sell!</td>
</tr>
<tr>
<td><strong>SHORT SALES CYCLE</strong></td>
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<tr>
<td>DEMO ➔ TRY ➔ BUY</td>
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Why Does This Matter?

**CAPTURE NEW MARKET**
Meraki SD-WAN offers solutions to more use cases with a Security & SD-WAN solution

**ATTACH SERVICES**
With more sites comes more services, and with more links comes more services as well and more revenue

**CUSTOMER RETENTION**
Reduce churn by offering customers an attractive solution that reduces cost and improves application performance

**MOBILE BACKUP**
Why not offer 4G backup as part of the solution to increase your revenue and improve service footprint??

**UPSELL CONNECTIVITY**
SD-WAN will not run on a single link! Customers moving to SD-WAN will need additional links at EVERY site

**REDUCE OPEX**
Single management platform, simple to use, with zero investment to stand up or manage any number of customers
How?

1. **Problem**: High cost to expand capacity of existing MPLS network to keep up with bandwidth requirements

2. **Supplement an existing MPLS network with broadband for increased bandwidth**

3. **Offload critical traffic from MPLS to broadband with policy based routing, dynamic path selection**

4. **Dual high speed broadband connections**

5. **Load balance business critical traffic based on policy or link performance**
Connectivity and Security With Meraki MX

All-in-one: Secure SD-WAN and advanced visibility

- MX delivers enterprise security directly at the branch
- Meraki Insight provides deep visibility beyond the LAN
- Track client experience for business-critical web applications
- Receive real-time alerts for performance degradation
- Pinpoint root cause of performance issues in minutes
Meraki Full Stack

Leverage the Meraki full stack for even greater benefits

- **Wireless Access Points**
  Optimized for high-density with 802.11ac and Bluetooth

- **Security Appliances**
  Feature rich security and unified threat management platform

- **Switches**
  Layer 2 and layer 3 switches for mission-critical networks

- **Enterprise Mobility Management**
  Unified managed and control of thousands of devices

- **MI**
  Optimize User Experience, Accelerate IT

- **Security Cameras**
  Streamline deployment and monitoring of video security cameras

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Meraki SD-WAN Architecture
Ease of Deployment

1. Create the SLA needed for the application

2. Choose the preferred path for the application provided that it meets and exceeds your SLA

3. Application is routed over preferred path and will fallback in case of performance degradation. Performance routing can be monitored on dashboard
Meraki MX

Everything….plus:

• Wireless Access Point
• Wireless Concentrator
• ClientVPN
• Cellular Backup

Identity Based Firewall
Automatically assigns firewall and traffic shaping rules, VLAN tags, and bandwidth limits to enforce the right policies for each class of users.

Intrusion Prevention
Protects critical network resources from the latest security threats and vulnerabilities.

AutoVPN
Securely connects branch locations using mesh or hub-and-spoke topologies. Provides simple VPN access into Amazon Web Services and Microsoft Azure.

Content Filtering
Block undesirable web content across 70+ categories, and leverage cloud lookups to filter billions of URLs.

Advanced Malware Protection
Protect your network against malware using the latest threat intelligence, and identify previously unknown malicious files with retrospective detection.

High Availability & Failover
Provides device and connection integrity through multiple uplinks, warm spare failover, and self-healing VPN.

Application Visibility & Control
Identify which applications are being used, and then prioritize critical apps while limiting recreational apps.

Centralized Management
 Seamlessly manage campus-wide WiFi deployments and distributed multi-site networks from a single pane-of-glass.

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Meraki Deployment Modes

**Branch CPE**
MX terminates the WAN links in RJ45 format and provides NAT and security features. It will also create SD-WAN tunnels to a head-end and route traffic based on performance.

**Inspection CPE**
MX deployed inline to offer application visibility and security assessment reflecting customer threats in security center. MX can also create SD-WAN tunnels to a head-end (no VLANs).

**Hub CPE**
High performance MX to terminate all SD-WAN tunnels and provide routing functionality to/from DC and other networks.
Site Profiling

**Small sites**
- Z3 and Z3C (Integrated Cellular)
- Meraki Insight XS license

**Large Sites**
- MX250/MX450 with SFP/SFP+ options
- Meraki Insight L/XL license

**Medium Sites**
- MX64/67/68 with optional built-in wireless and integrated cellular
- Meraki Insight S license

**Medium/Large sites**
- MX84/100
- Meraki Insight M License

**Data Centers**
- MX250/MX450 concentrators
- OSPF/BGP

**Cloud Integration**
- vMX (AWS and Azure)
How It All Looks Together

- **SOHO ~ 50Mbps**
  - Z3C

- **3G/4G**
  - MX67C
  - Small ~ 200Mbps

- **Small/Medium ~ 200Mbps LAN/PoE/WiFi**
  - MX68CW

- **Medium ~ 500Mbps**
  - MX84
  - Medium ~ 500Mbps

- **Medium ~ 500Mbps**
  - MX84

- **Large ~ 1Gbps**
  - MX450
  - Critical ~ 750Mbps
  - MX250
  - Large ~ 1Gbps
Partner Value Journey with Agile Service Creation (ASC)
Developed to help Cisco service provider (SP) partners accelerate their time to revenue when bringing new Cisco solution-based managed services to market.

Agile Service Creation (ASC) will provide recommendations, tools, templates and resources that its consumers can utilize throughout the service creation lifecycle, from concept to launch.
Cisco Agile Service Creation Framework

How It Works

Service creation commences with an interactive workshop that initiates four interdependent workstreams.

Each of the four business entities is represented during the service creation process to produce successful outcomes.
Key Deliverables

- Service Description
- Positioning and Pricing
- Value Propositions
- Service Architecture
- Service Delivery
- Go-To-Market