Simplify and Automate Your Network with Cisco DNA

Brink Sanders

Managing Director, Software and Network Transformation

12 May 2017

Agenda

- Software-Defined Networking (SDN) Market Drivers

- Cisco® APIC-EM
    Automate Network Configuration & Setup

- APIC-EM Applications

- Network Function Virtualization for Enterprise
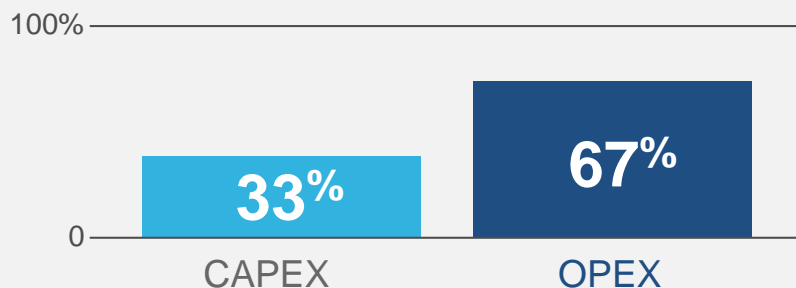
- Customer Use Case

- Summary

SDN Market Drivers

Digital Business Demands Operational Agility

"…While other components of IT infrastructure have become more programmable and allow for faster, automated provisioning, installing network circuits is still a painstakingly manual process..."
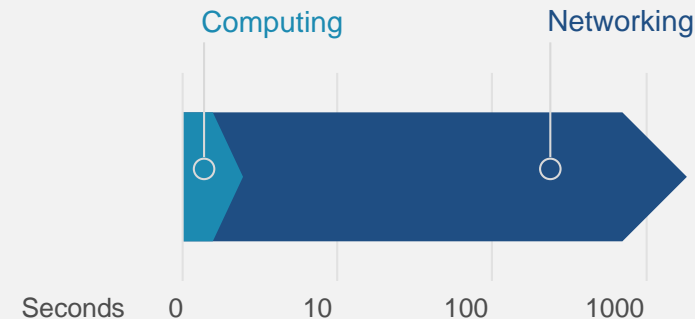
— Andrew Lerner, Gartner Research

Network Expenses

100%

67%

33%

0

CAPEX   OPEX

Source: Forrester

Deployment Speed

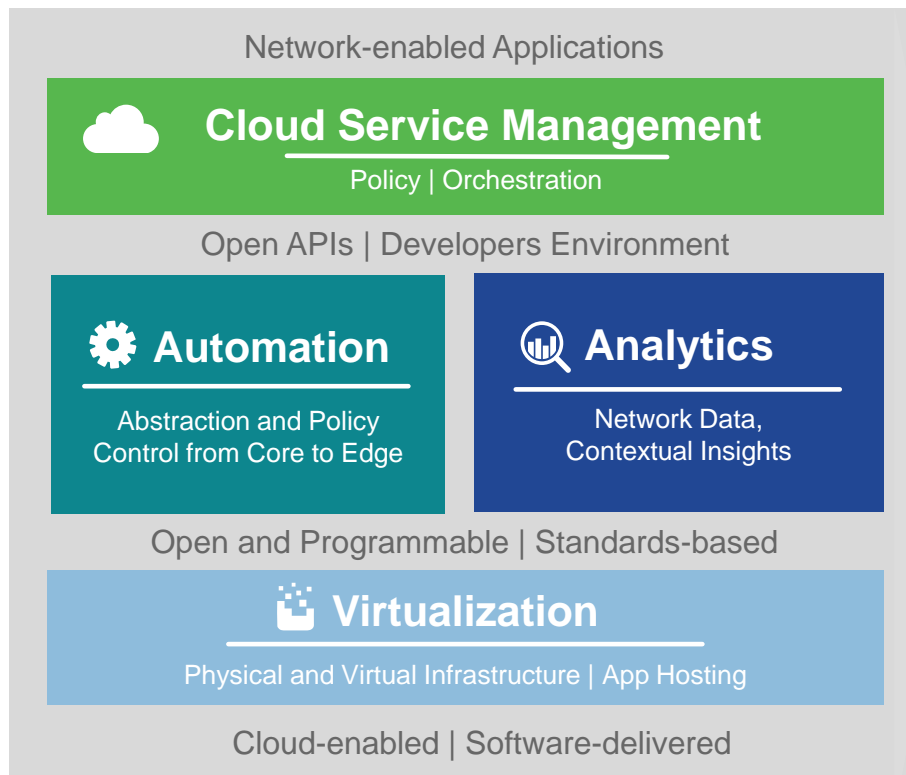Computing   Networking
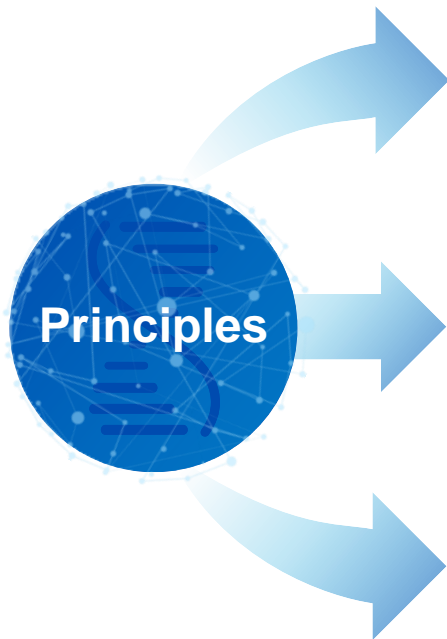
Seconds   0   10   100   1000

Source: Open Compute Project

80% Time IT spends on operations

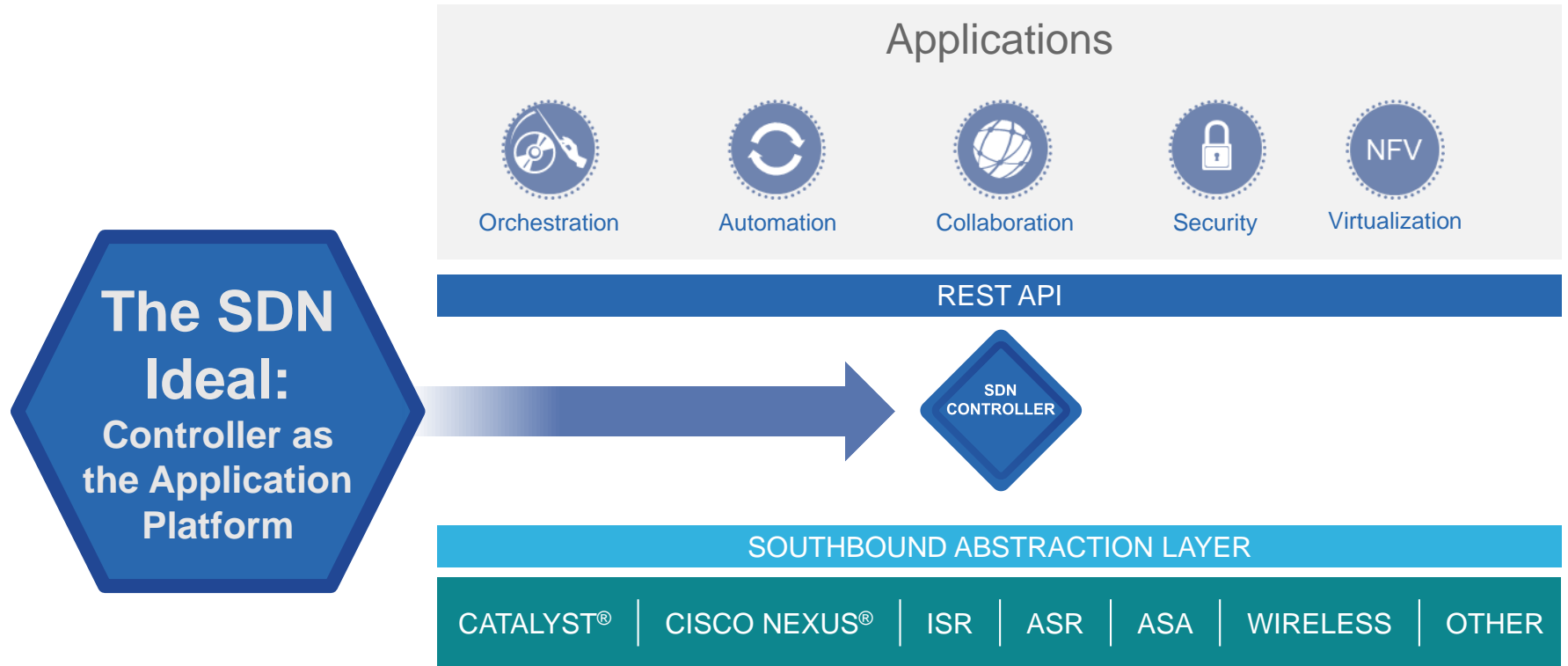**57%** CEOs are worried about IT strategy not supporting business growth

Cisco Digital Network Architecture

Principles

Network-enabled Applications

☁ Cloud Service Management

Policy | Orchestration

Open APIs | Developers Environment

⚙ Automation

Abstraction and Policy Control from Core to Edge

🔍 Analytics

Network Data, Contextual Insights

Open and Programmable | Standards-based

⊞ Virtualization

Physical and Virtual Infrastructure | App Hosting

Cloud-enabled | Software-delivered

Benefits

Automation and Assurance

Security and Compliance

Insights and Experiences

Network-Wide Abstractions Simplify the Network

Applications

Orchestration Automation Collaboration Security Virtualization

NFV

The SDN Ideal:
Controller as the Application Platform

REST API

SDN CONTROLLER

SOUTHBOUND ABSTRACTION LAYER

CATALYST® | CISCO NEXUS® | ISR | ASR | ASA | WIRELESS | OTHER

APIC-EM
Automate Network Configuration and Setup

APIC-EM

Resolves declarative business intent

Renders into domain-specific language

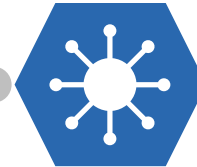Application, User, and
Business-Driven Policies

Network-Specific
Control

"Only corporate-owned devices in
Group:FinExec can access quarterly
results DB"

Cisco® ISE + TrustSec + ACL
Configuration Commands

APIC-EM Delivers IT Flexibility

SIMPLE

A → **B**
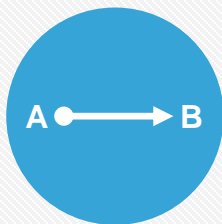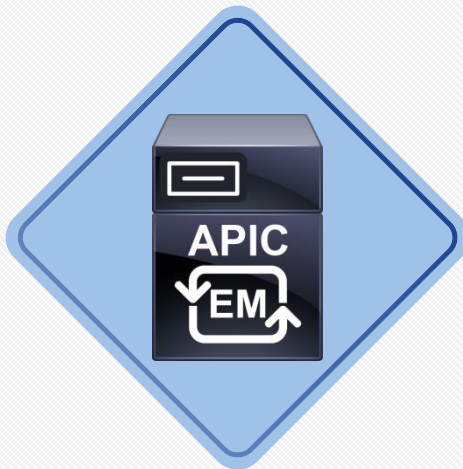
Manual	→	Automated
Box-Centric	→	Network-wide
Provision in Months	→	Hours

OPEN

Static	→	Programmable
Greenfield	→	Brownfield + Greenfield
Expert CLI	→	Policy + GUI

APIC EM

Enabling Automation Through Innovative Management Principles

Common Policy Model from Branch to Data Center

POLICY

DATA CENTER

Application Network Flow Profile

SLA, Security, QoS, Load Balancing

Cloud

Data Center

WAN AND ACCESS

User and Things Network Profile

QoS, Security, SLA, Device, Location, Role

WAN

Access
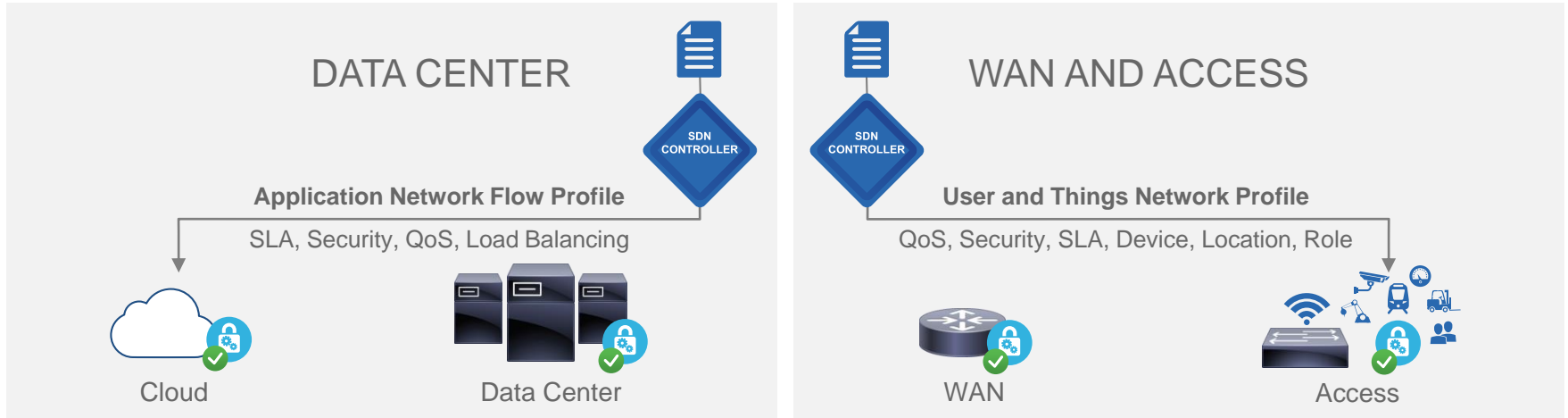
CISCO® ADVANTAGE

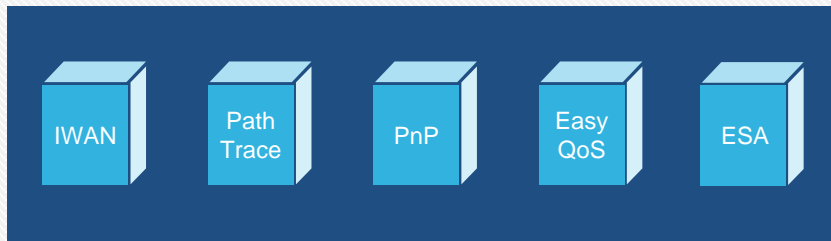BROWNFIELD AND GREENFIELD

END TO END

POLICY FRAMEWORK: FOCUS ON APPLICATION AND USER ENABLEMENT

Cisco APIC-EM Applications

Application Ecosystem Using Open APIs

CISCO® Applications

IWAN   Path Trace   PnP   Easy QoS   ESA
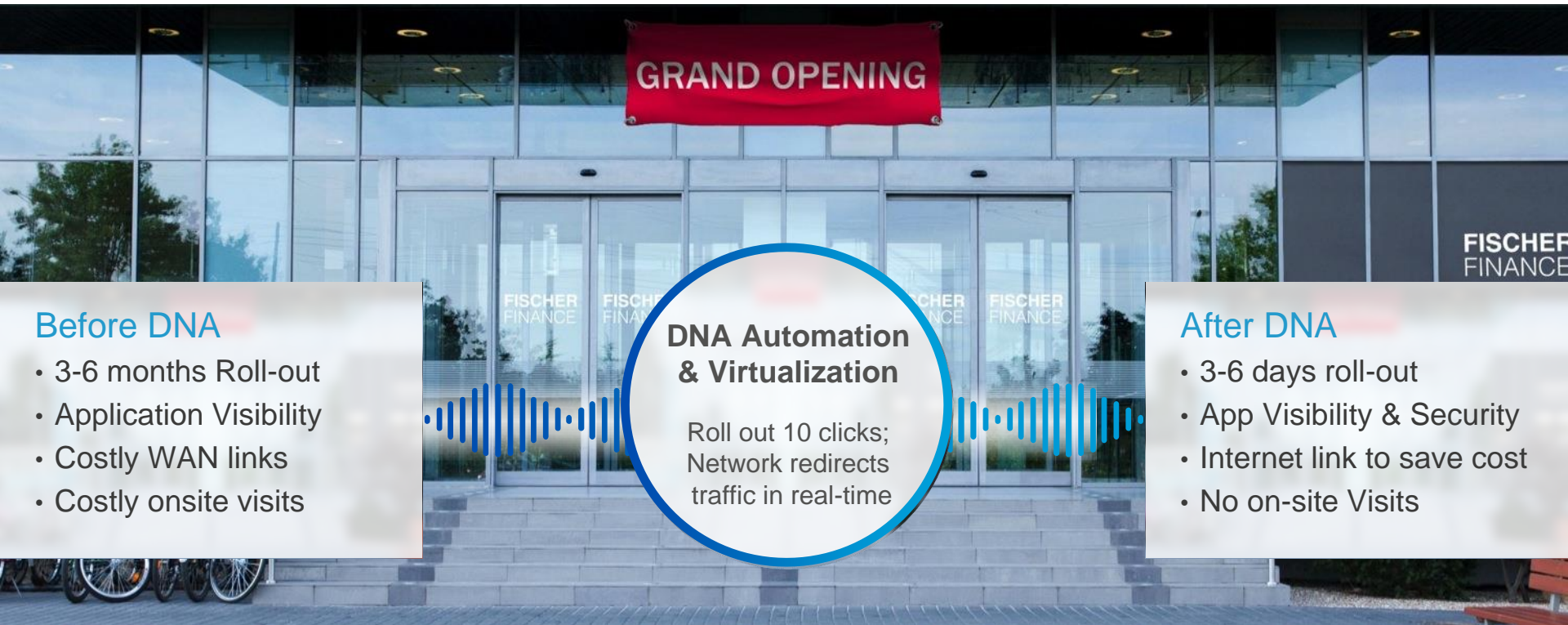
Third-Party Applications

IBM   nectar *Every Conversation Matters*   ITALTEL

hyperglance   CITRIX®

RESTful APIs

APIC EM

153 APIC-EM DevNet Companies

20 ↗ Average Growth per Month

cisco

Accelerate Branch
Faster Time to Market at Remote Sites

GRAND OPENING

FISCHER FINANCE

Before DNA
- 3-6 months Roll-out
- Application Visibility
- Costly WAN links
- Costly onsite visits

DNA Automation & Virtualization

Roll out 10 clicks; Network redirects traffic in real-time

After DNA
- 3-6 days roll-out
- App Visibility & Security
- Internet link to save cost
- No on-site Visits

Cisco APIC-EM with Plug and Play | Cisco Intelligent WAN | Meraki SD-WAN

Mobilize the Workforce
Employee Productivity for Collaboration and Training

Before DNA

- Up to 4 months for manual changes on QoS
- Varied user experience

DNA Automation

Simplified and consistent application policy management

After DNA

- 250 milliseconds for dynamic network update
- 300% lower jitter
- 50% improved video

Cisco Lab Testing Results

Cisco APIC EM with Easy QoS | Meraki MR

Network Functions Virtualization for Enterprise

What Enterprise NFV Can Do for You

Simplify day-to-day operations

Quickly roll out new services and locations

Gives you flexible deployment options

Simple and easy to design, provision, and manage the trusted services that are critical to your business

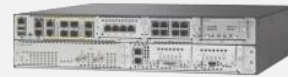# Customized Network Services for Your Network

IT Agility

① Select your network functions

- ☑ vRouter
- ☑ vFirewall
- ☐ vWAN optimization
- ☐ vWLAN controller
- ☑ Third-party services

② Select your preferred platform

- ☐ Cisco® ISR, UCS® E-Series
- ☑ Cisco ENCS
- ☐ Cisco® UCS C-Series
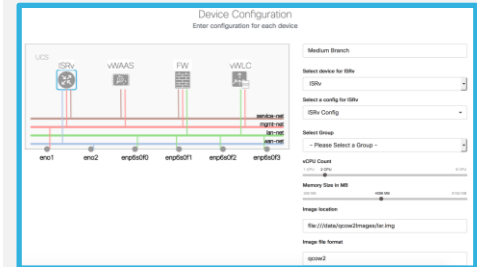
Cisco® 4000 Series ISR

ENCS, UCS C or E Series

③ Orchestrate and automate services

APIC EM

APIC-EM with Enterprise Service Automation

Device Configuration
Enter configuration for each device

Elastic Services   **Run on Any Platform**   **Deploy in Minutes**

Cisco Enterprise NFV Architecture
Network services in minutes, on any platform

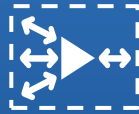| **Enterprise Service Automation (ESA) \|** **Network Services Orchestrator (NSO)** | Orchestration, Provisioning & Management |

Virtual Router (ISRv)

Virtual Firewall (ASAv & NGFWv)

Virtual WAN Optimization (vWAAS)

Virtual Wireless LAN Controller (vWLC)

3rd Party VNFs

VNFs and Apps

Network Functions Virtualization Infrastructure Software (NFVIS)

Virtualization Layer

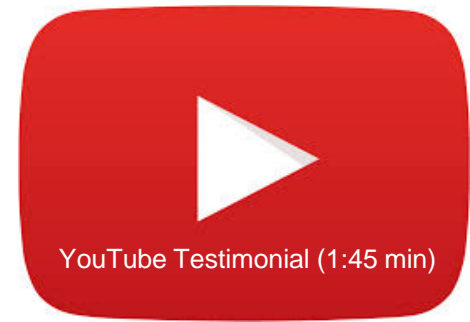| **ISR 4000 + UCS E-Series** | **UCS C-Series** | **Enterprise Network Compute System** | Host Platform |

New!

Customer Success Story

Symantec Network Automation Saves Time and Money

HOW DID AUTOMATION TURN A 6 MONTH PROCESS INTO MINUTES?

YouTube Testimonial (1:45 min)

"QoS rollouts were once 6-month projects costing over $200,000. With Cisco APIC-EM EasyQoS, we will go from months to minutes with minimal costs."

Brian McEvoy, Senior Network Engineer, Symantec

Summary

Cisco DNA Delivers…

- **Simplicity**
  - Network-wide abstraction that supports both greenfield and brownfield installations

- **Automation**
  - OpEx reduction through adoption of Cisco® best practices

- **Open Programmability**
  - Open, northbound REST APIs with agnostic southbound interfacing

- **Business Outcomes**
  - Dynamic network that adapts to business intent policy

DNA Advisor Program

Helping You Navigate Your Digital Transformation Journey
www.cisco.com/go/dnaadvisor

Where Are Your Peers

Get your network ready for digital

IDC Digital Network **Readiness and Benefits Survey** Research

Where Are You

Map your own network readiness and next steps

Cisco DNA **Readiness Advisor** Brief On-line Self Assessment
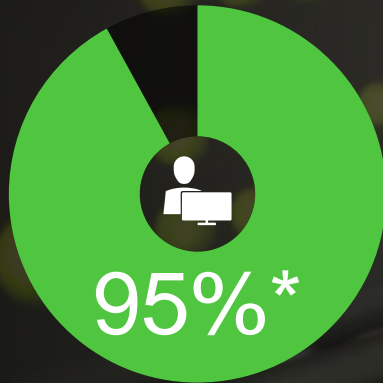
Get Started

Plan your journey

Cisco DNA **Readiness Planner** Assessment and Report

Cisco Digital Network Readiness Model
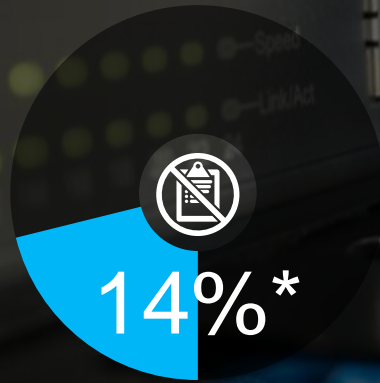5 Stages from Best Effort to Self-Driving

Challenges Facing IT in the Digital World
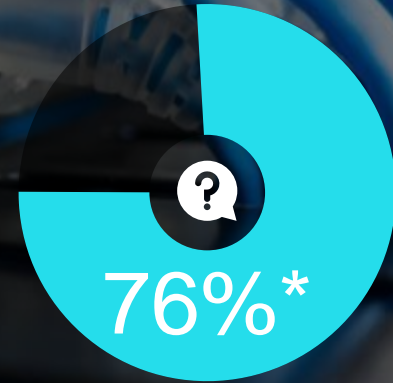
Take too long to change

95%*

Network changes performed manually

Can't measure user and application experience

14%*

Productivity loss due to network errors

Can't stop what you can't see
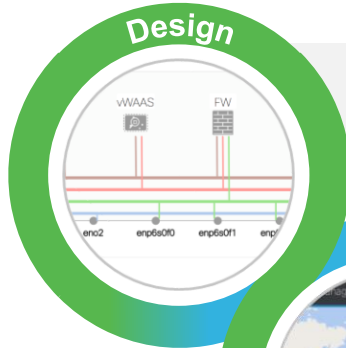
76%*

Lack of visibility is top reason threats are missed

Traditional Networking CANNOT Keep Pace with the Demands of Digital Business

Automated Orchestration, Management, Policy
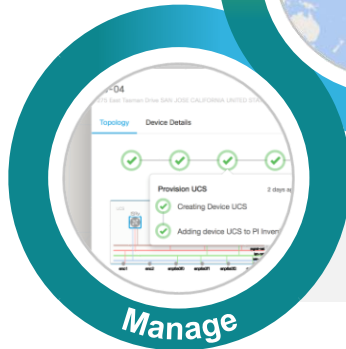## Cisco Enterprise Service Automation (ESA)

Design

- Create standard profiles for different types of branches
- Cisco® tested and validated designs
- Embedded approval process and versioning

Provision

- Zero-touch deployment
- Automated orchestration of platform and VNFs
- Service chaining and licensing

Manage

- Health monitoring
- Dynamic scaling of services
- Operational SLA management

VNF and Application Layer:
Deploy Best-in-Class Services from Cisco & 3rd Party Across Physical and Virtual

ISRv **New**

- High performance
- Rich features
- End-to-end support

NGFWv **New**

- Harden virtual services
- Enable secure access
- On-premises or cloud management

Third-Party VNFs **New**

- VNF program
- Tested and certified
- Streamlined support from Cisco and third party

vWAAS

- ISR WAAS: Leader in Gartner MQ
- Superior caching with Akamai Connect

vWLC

- Survivability and scale
- Built for small and medium-sized branches

ASAv

- Comprehensive protection
- Full DC class Featured functionality
- Designed for NFV

Applications

- Microsoft Windows
- Custom applications

Virtualization Layer: Enterprise NFV Infrastructure Software (NFVIS)
Optimized for Network Services

Network Hypervisor

- Supports segmentation of virtual networks
- Abstract CPU, memory, and storage resources

Zero-Touch Deployment

- Automatic connection to PnP server
- Highly secure connection to the orchestration system
- Easy day-0 provisioning

Lifecycle Management

- Provisioning and launch of VNFs
- Failure and recovery monitoring
- Stop and restart services
- Dynamically add and remove services

Service Chaining

- Elastic service insertion
- Multiple independent service paths based on applications or user profiles

Open API

- Programmable API for service orchestration
- Rest and NETCONF API

Simplification Creates Agility

DO-IT-YOURSELF ASSEMBLY AND INTEGRATION
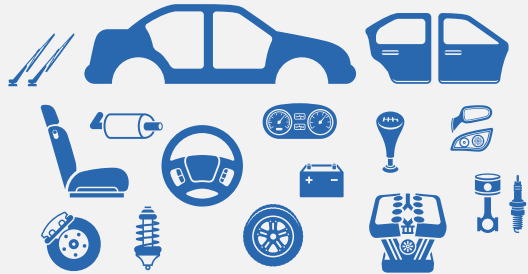
READY TO GO

Faster Time to Market and Lower OpEx

Applications Are the Vehicle for Digital Business

SDN Priorities for Enterprise Customers
Buy or Develop the Apps You Need, at Your Own Pace

BUY

"I need shrink-wrapped applications that solve a business need."

BUILD

"I want to build custom applications and need APIs and open-source components."

Move at Your Own Speed

Reduce OpEx

Vendor Controller
+
Vendor Applications

OpEx and Agility

Vendor Controller
+
Custom Applications

Custom Agility

Open-Source Controller
+
Custom Applications

Cisco APIC-EM

An Application Platform for Enterprise WAN and Access Networks

BENEFITS:
Brownfield support
Ready-to-use-applications
Open, northbound API

- Virtual (ISO VM) or appliance-based
- Provides user policy abstraction and automation
- Simplification of complex network configuration with Cisco® application best practices
- Existing and new installations (Catalyst®, ISR, ASR, WLC)

Ready-to-deploy applications (February 2016):

IWAN (with a license)

Plug-n-Play (free)

Path Trace (free)

EasyQOS *Beta* (free)

Application Overview

BRANCH

Enterprise Network

Public Cloud

Plug-and-Play App

Zero-touch deployment of routers, switches, and access points

Accelerated roll-out: Eliminates tech visits and shrinks deployment from months to minutes

Cisco IWAN App

Guided, fast auto-provisioning of the IWAN solution with Cisco® experts' best practices

From 1000 CLI commands to 10 GUI clicks per branch

Path Trace App

Discover the path between two endpoints based on 5-tuple flow information

Rapidly troubleshoot network issues and lower OpEx for trouble-ticket processing by 98%

EasyQOS App

Provides End-to-End Orchestration of QoS for Enterprise Networks

Simple and Easy to Deploy, Business Intent Driven, Reduces time to onboard new applications

IBM | Lufthansa Systems

- **Business Outcomes**
  - Provide local IT with limited ability to implement dynamic network change
    - 40% customer satisfaction increase
  - Accelerated remote branch configuration from weeks to days

- **Disruptive Technology**
  - Cisco® APIC-EM
  - Performance Routing (PfR)

San Diego Superior Court

- **Business Outcomes**

  - Saved over 65% in circuit costs by implementing a highly secure hybrid SD-WAN with a Cisco® IWAN

  - Total Network Visibility
    - Accelerated troubleshooting
    - Improved cost planning

  - Network configured and maintained by a staff of 3 IT professionals

- **Disruptive Technology**

  - APIC-EM IWAN App

An Oil & Gas Company
Operational Efficiency

Challenge

- Lower cost in IT operations and infrastructure, especially for remote locations
- Slow and expensive service rollout that requires service calls

Solution

- One standard platform for all locations
- Services: Routing, Firewall, Wireless LAN Controller, WAN Optimization

Benefits

- Lower cost by utilizing x86 servers with Cisco® NFVIS
- Keep current operational standards with best-of-breed services
- Agile service deployment and monitoring with Cisco ESA

APIC-EM Plug-and-Play (PnP) Application
Auto-Discovery of Provisioning Template

IT

New Router
New Switch

PnP Application

APIC EM

NETWORK

BENEFITS

Simple Workflow

Zero-Touch Provisioning

SDN

Open Architecture

Zero-touch Deployment
Shortened Deployment Time

No Onsite
Expert Needed

Increased Security
Decreased Chance of
Misconfiguration

APIC-EM IWAN Application
Uses Cisco Best Practices and Knowledge for SD-WAN

IT

Business Policy:
App SLA

IWAN Application

DMVPN
SLA QoS
Security Path Selection

NETWORK

BENEFITS

Simple Workflow

Zero-Touch Provisioning

Network, Applications Monitoring

Business-Level Policies

SDN

Open Architecture

From Weeks to Minutes

Over 1000 CLI Commands Reduced to 10 GUI Clicks

Note: Cisco® IWAN App Release 1 targets less than 500 sites, 2 links per branch with the 4000 Series ISR

APIC-EM Path Trace Application
Accelerate Trouble-Ticket Processing

User   Trouble Ticket   IT   Path Trace

NETWORK

BENEFITS

Simple Workflow

Network, Applications Monitoring

SDN

Open Architecture

Easy Visual Discovery of Trouble Spots in the Communication Path Based on 5-tuple

OpEx for Ticket Processing Decreased by 84% - from 1.4 hours to Approximately 4 minutes
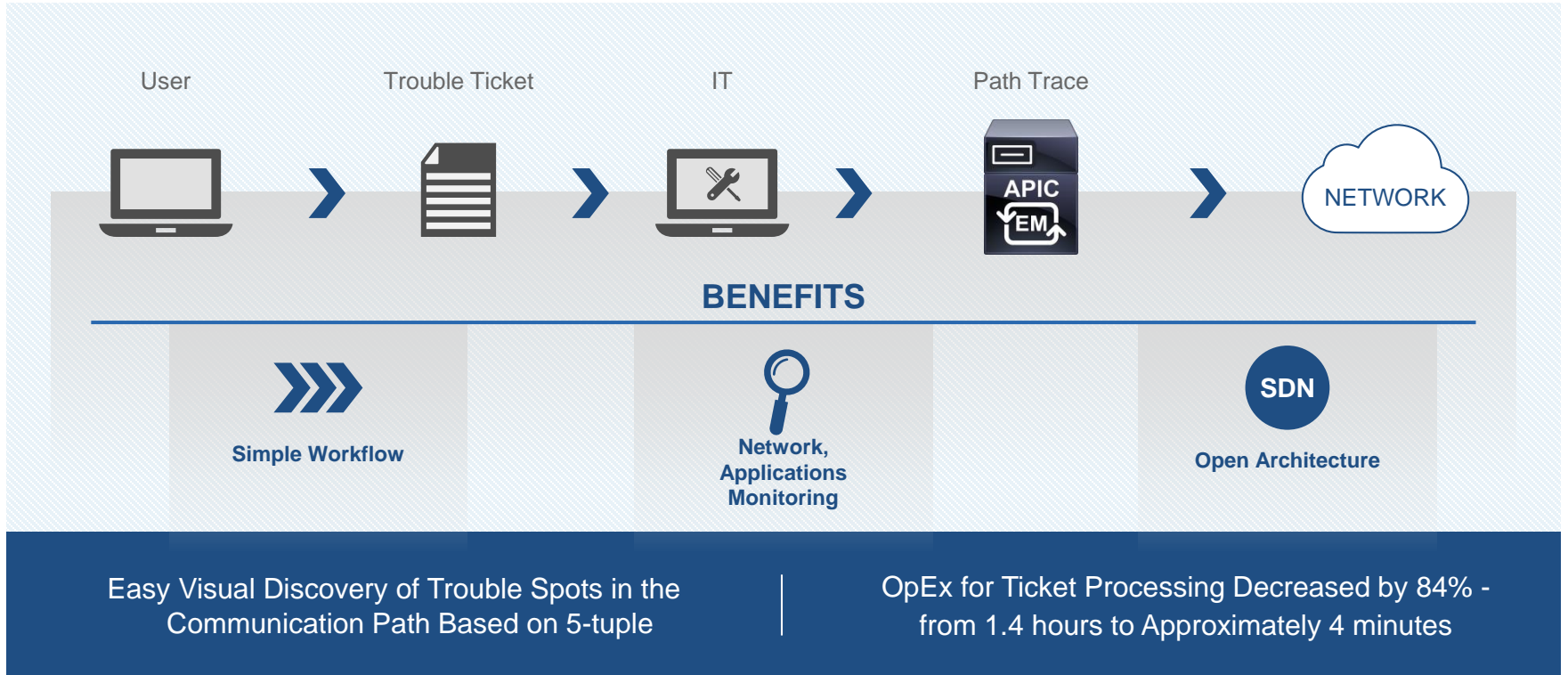
APIC-EM EasyQoS Application
Accelerate and Automate QoS Deployment Network-Wide

IT

Business Policy: App SLA

EasyQoS Application

APIC EM

NETWORK

BENEFITS

Simple Workflow – Select from Predefined Policies

Fast & Automated Deployment of QoS in 250 ms

300% Reduction in Voice Jitter

50% Improvement in Video Quality

Improved Application Experience

"The EasyQoS App reduces deployment times for network-wide QoS dramatically. We can now respond to changing application needs via policy-based automation within minutes or even seconds."

Edeka Group, German's largest supermarket company