



The bridge to possible

Cisco Community Meet The Authors

Meet the Authors Event- Cisco's Digital Network Architecture:
Intent-based Networking for the Enterprise

Tim Szigeti, Matthias Falkner, Dave Zacks & Simone Arena.
World-class Networking experts.

March 25th, 2021



Welcome to the new “Meet Authors event”

Learn from the IT expert that literally wrote the books & content
“Learn more about the latest trends in cybersecurity and the alternatives to enhance your security career”



Meet
Author



Learn the
Story behind



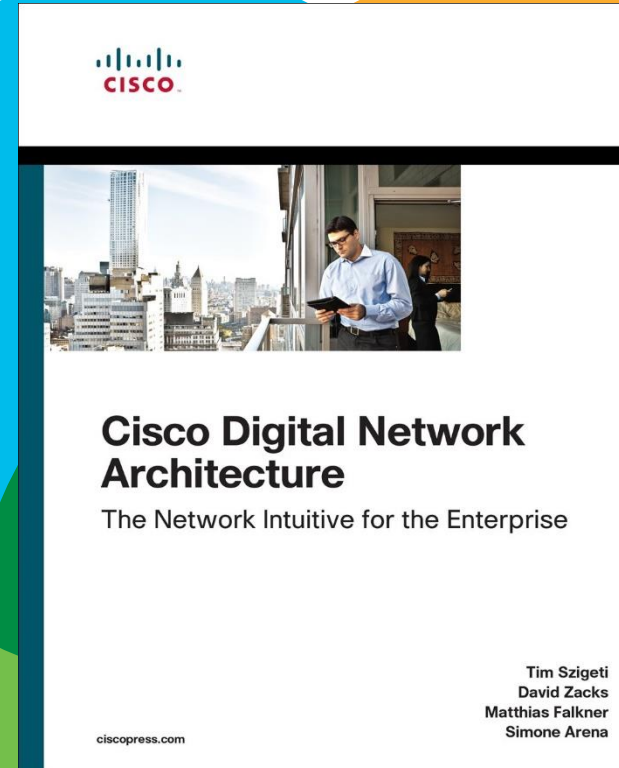
Trends &
Key Content



Clarify
Questions

Win a free signed copy!

Signed by the authors



2 free copies

Meet the Authors



Tim Szigeti

Principal Engineer
CCIE #9794



Dr. Matthias Falkner

Distinguished Technical
Marketing Engineer



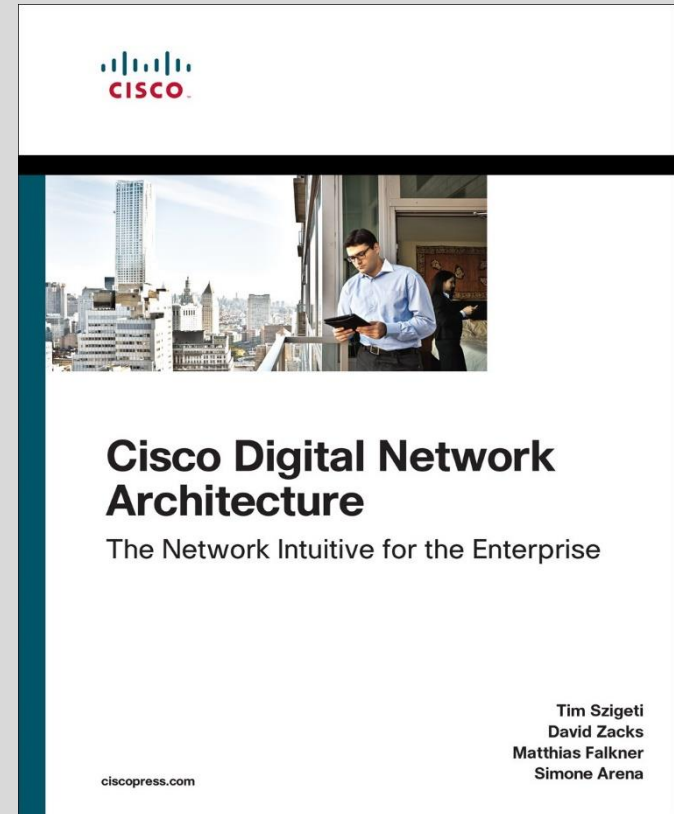
Dave Zacks

Director in Cisco's
Customer Experience



Simone Arena

Principal Technical
Marketing Engineer



Meet the world-class Networking experts
and their stories



The bridge to possible

Cisco Digital Network Architecture

Intent-Based Networking
for the Enterprise

MEET THE AUTHORS



Cisco Digital Network Architecture

Intent-Based Networking for the Enterprise

Rogue's Gallery



Mark



Dave



Matt



Tim



Simone

How to Stress a Friendship!

Write a book together! 😊

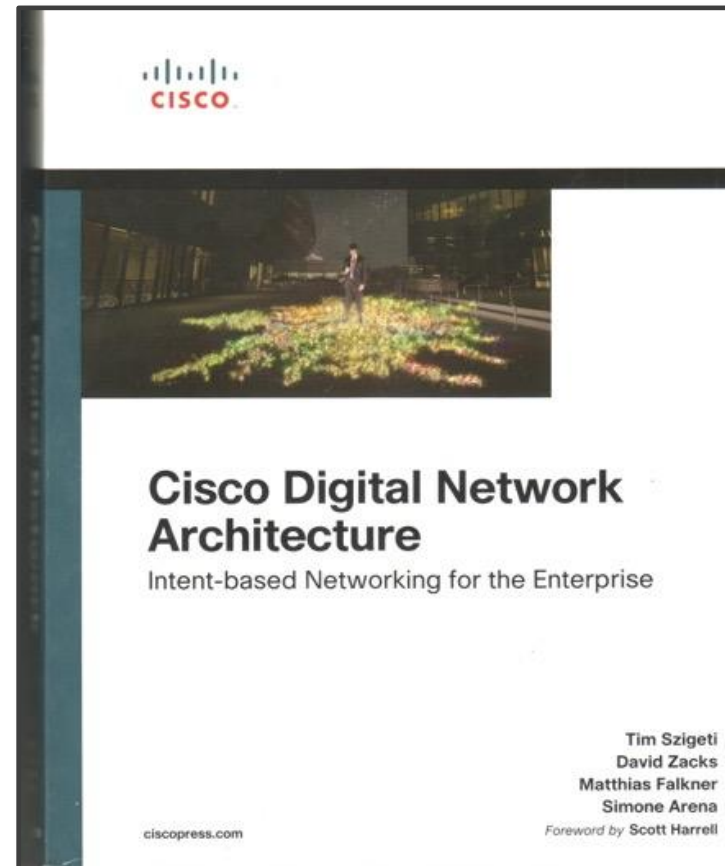


Dave Zacks
Director

Dr. Matthias Falkner
Distinguished Engineer

Simone Arena
Principal Engineer

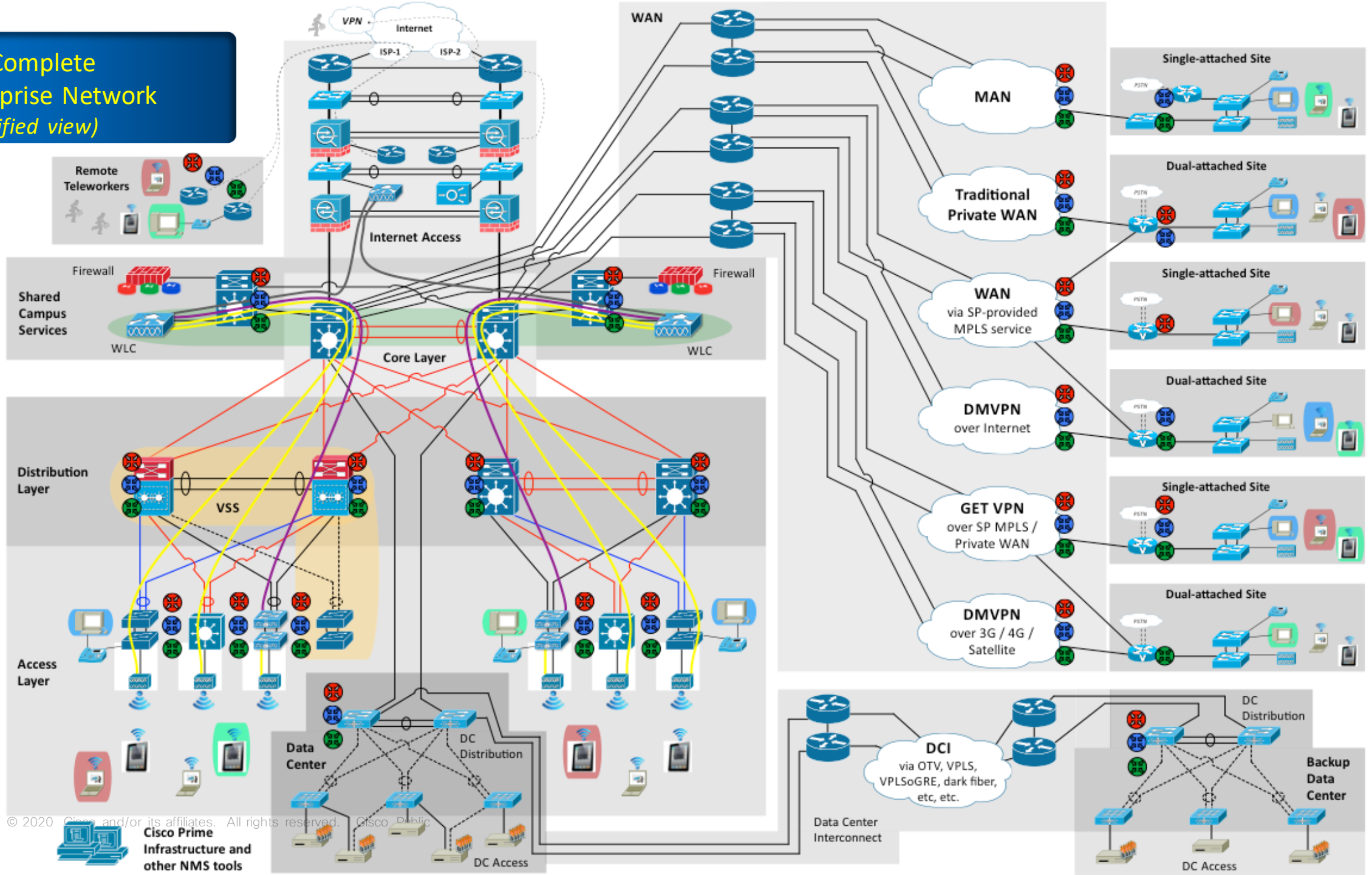
Tim Szigeti
Principal Engineer



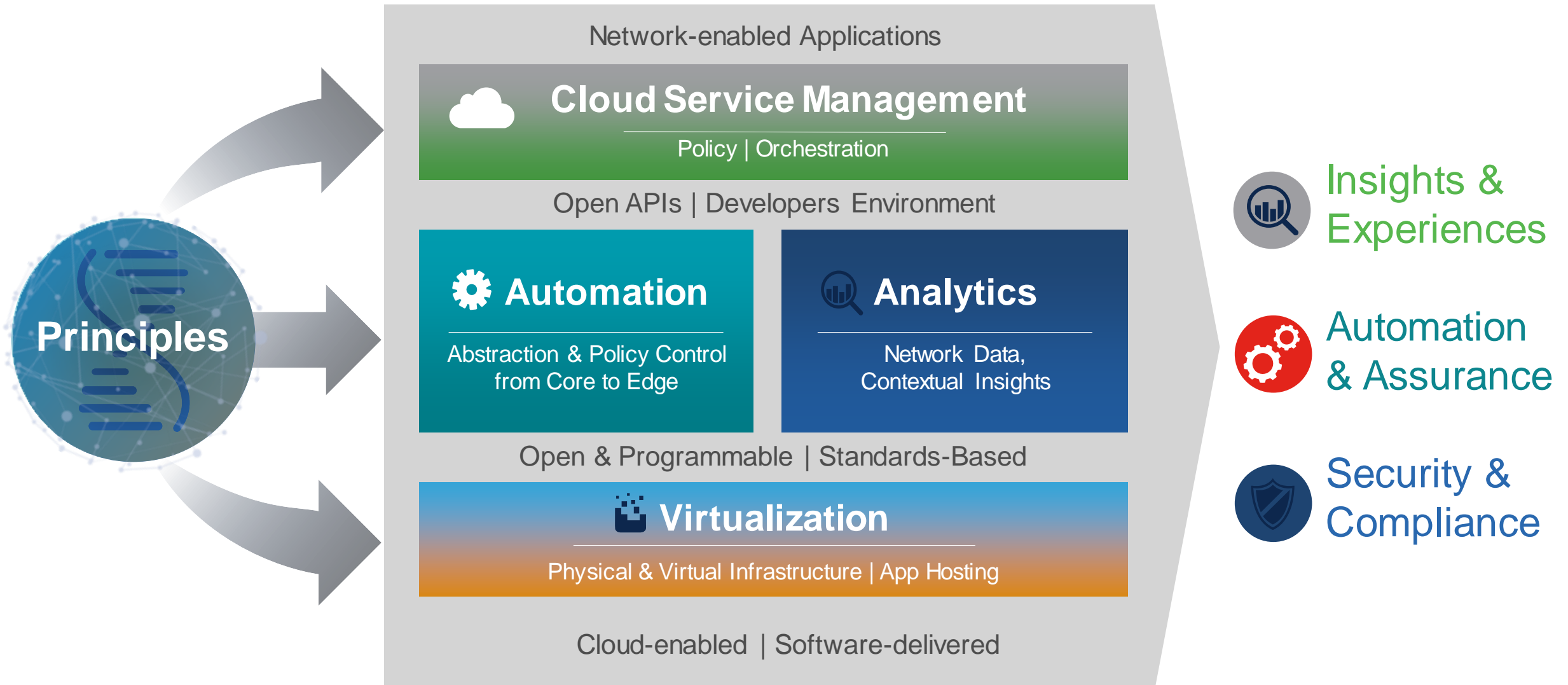
On a big, complex topic ... you will all have different ideas on “how to do it” – which leads to LOTS of spirited discussions!

- Apps, ML / AI ...
- APIs, Telemetry
- Domain Controllers
- Powered by Cisco IOS® XE
- Physical and Virtual infrastructure
- Hardware & ASICs

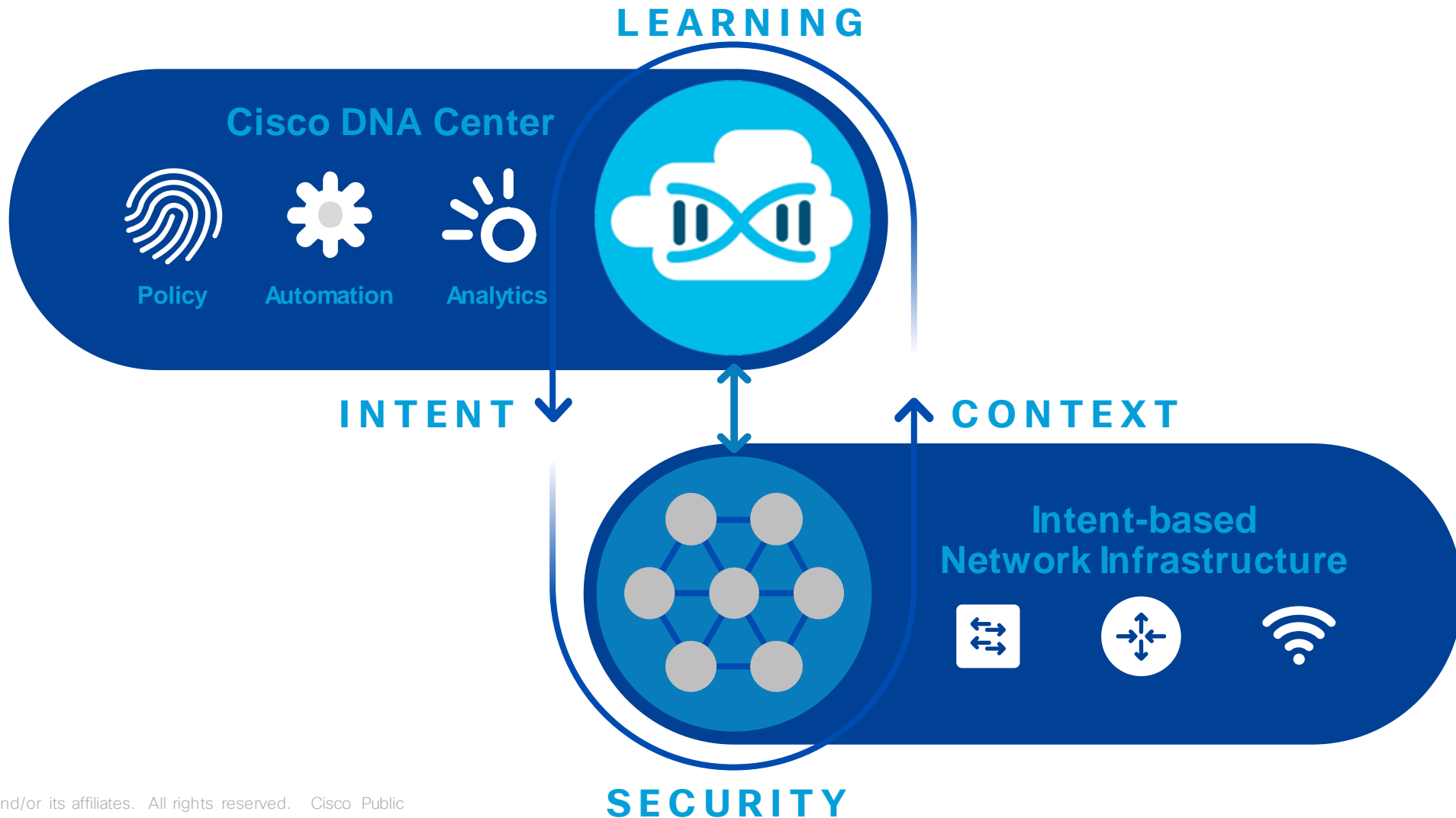
The Complete Enterprise Network (simplified view)



Cisco Digital Network Architecture



The Network. Intuitive - Powered by Intent. Informed by Context.



Welcome to Vancouver!

September, 2016



WINE LIST

ITALIAN REDS

- 54 Giusti 2013, Marlot - Veneto IGT
- 58 Bersano Costalunga 2011 - Barbera d'Asti DOCG
- 58 Carpineto 2013, Chianti Classico - Tuscany
- 60 Luigi Einaudi 2013, Dolcetto - Dogliani DOCG
- 60 Pio Cesare 2014 - Barbera d'Alba
- 62 Poggio al Tesoro Mediterra 2011 - Bolgheri
- 65 La Valentina Spelt 2010, Montepulciano D'Abruzzo
- 65 Arnaldo Caprai 2011, Montefalco Rosso
- 68 Carpineto Famito 2010, Cabernet Sauvignon - Tuscany
- 69 Castello di Meleto Vigna Cusi Riserva 2011 - Chianti Classico DOCG
- 75 Domini Veneti Verjago 2009, Classica Superiore - Valpolicella DOC
- 78 Pertimali, Livio Sassetti Fili di Seta 2012 - Tuscany IGT
- 80 Giusti 2012, Valpolicella Ripasso Superiore, DOC
- 82 Querciabella 2012, Chianti Classico - Tuscany
- 5 Batasiolo Riserva 2006 - Barolo DOCG
- Vietti Perbacco 2012, Nebbiolo - Piedmont
- Carpineto Molin Vecchio 2006 - Tuscany IGT
- Tommasi 2012, Amarone della Valpolicella - Veneto
- Matteo Correggia Riserva 2010, Nebbiolo - Roero DOCG
- Castiglione del Bosco Campo del Drago 2010 - Brunello di Montalcino DOCG
- Gaja Pieve Santa Restituta 2011 - Brunello di Montalcino DOCG
- Pio Cesare 2011, Nebbiolo - Barbaresco DOCG

90

SECTION 1 BDM

INTRO/OVERVIEW TO DNA

WHY DNA?
HOW DNA?

CN1 - WHY TRANSFORM YOUR BUSINESS?
(TS) [15]

Security + Compliance - HIPAA, FIS, etc.

CN2 - HOW TO TRANSFORM YOUR BUSINESS? (renewal)
(TS) [15]

- Customer/user expectations
- Cisco Vision
- Strategy
- (MCI) (eg. customer pain points that need to be addressed)

CN3 - INTRODUCING THE DIGITAL NETWORK ARCHITECTURE
(MF) [30]

- DNA Overview
- Outcomes
- Components
- Principles

CN4 - DNA BLUEPRINT (TENETS PARAG)
(MF) [30]

PROGRAMMABLE HW? MINIMUM requirements of DNA

- * CONTROLLER * (ARC-EM)
- * ANALYTICS ENGINE? / CLOUD? (monitoring)

+ mention decoupling / actor function from policy-function in IP

145

SECTION 2 INFRA

CN5 INTRO (GAPS TO GUI) (WHY)
(DE) [10]

DELEGATES TO GUI

- HW → PROGRAMMABLE HW
- SW → VIRTUALIZATION CONV!
- GUI

CN6: HW (DE) [40]

- UAOP
- QFP

CN7: SW (DE) [30]

CONVERGENCE MODULARITY

CN8: NETWORK (DE) [30]

PROTOCOLS (VXLAN, GROUPING SETS)

EVOLUTION OF DATA PLANE (NETWORK FUNCTIONS)

CN9: VIRTUALIZATION (MF) [30]

TRANSIENT 10T

FUNCTIONAL V: NFVIS concept (WLC)

SERVICE-CHAIN

INFRASTRUCTURE:

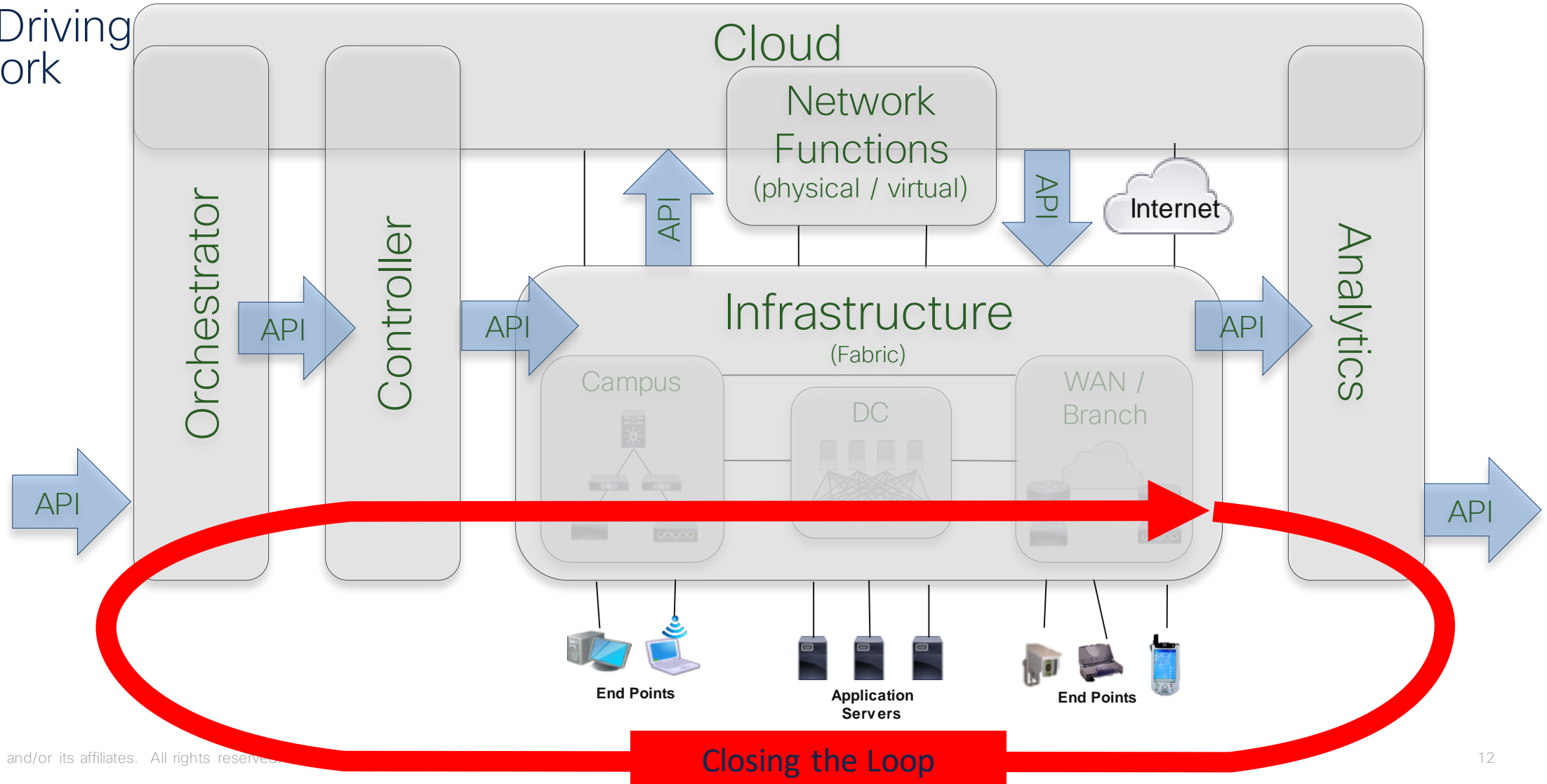
CN10: 'THING IT ALL TOGETHER' (DE) [5]

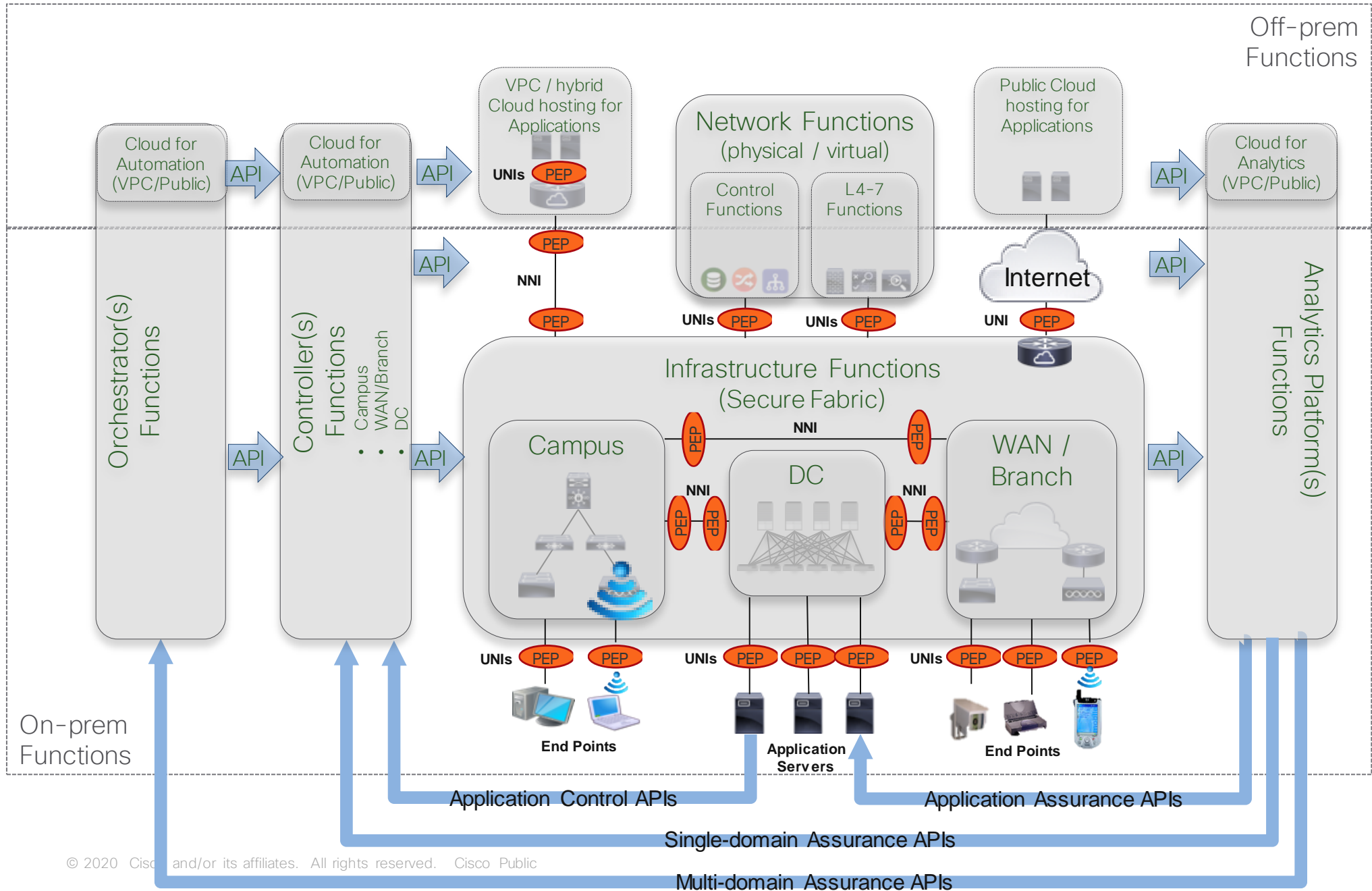
+ mention eNFV + Fabric

+ endpoint integration (eg. NBAR, DNK, etc.)

Cisco Digital Network Architecture

Towards a
Self-Driving
Network





- DNA Functional Components
- DNA APIs
- Data Plane connections
- Security & Policy Enforcement Points
- NNI** Network Network Interface
- UNI** User Network Interface



#HighBitRate



From
Innovations
in
Silicon
and
Software

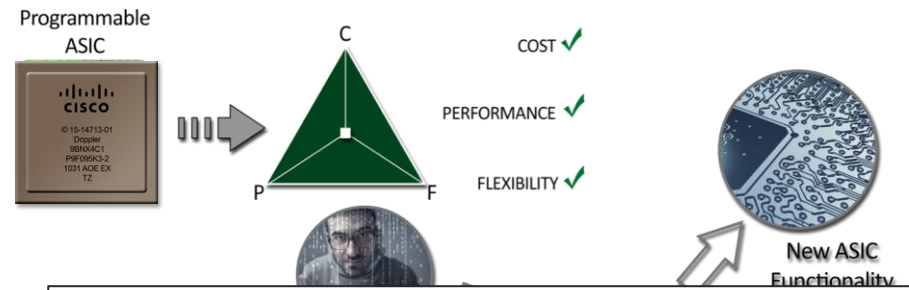


... to
Innovations
in **Platforms**
and **Solutions**

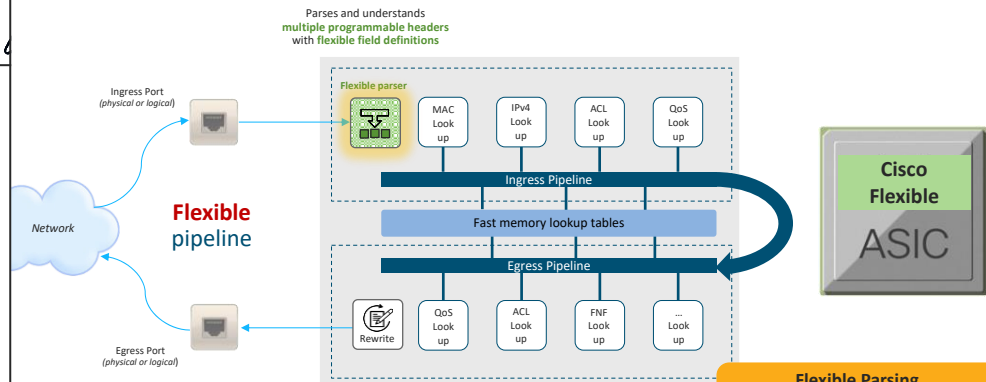


DATA
cisco *Live!*

Cisco DNA Flexible Infrastructure
Programmable ASIC Silicon



Cisco DNA Flexible Infrastructure
Programmable ASIC Silicon



Flexible Parsing
Looking deep into the packet header, with programmable field parsing

David Goeckeler

Former Cisco EVP / GM,
Networking and Security
Cisco Live Las Vegas 2016



**Innovation in
the network** is going to
be more important than
it has ever been.”

#WednesdayWisdom

Chuck Robbins
CEO
Cisco



**ASICs are a
pillar of Cisco
innovation ...**



Functional – Fast – but **FIXED** in nature

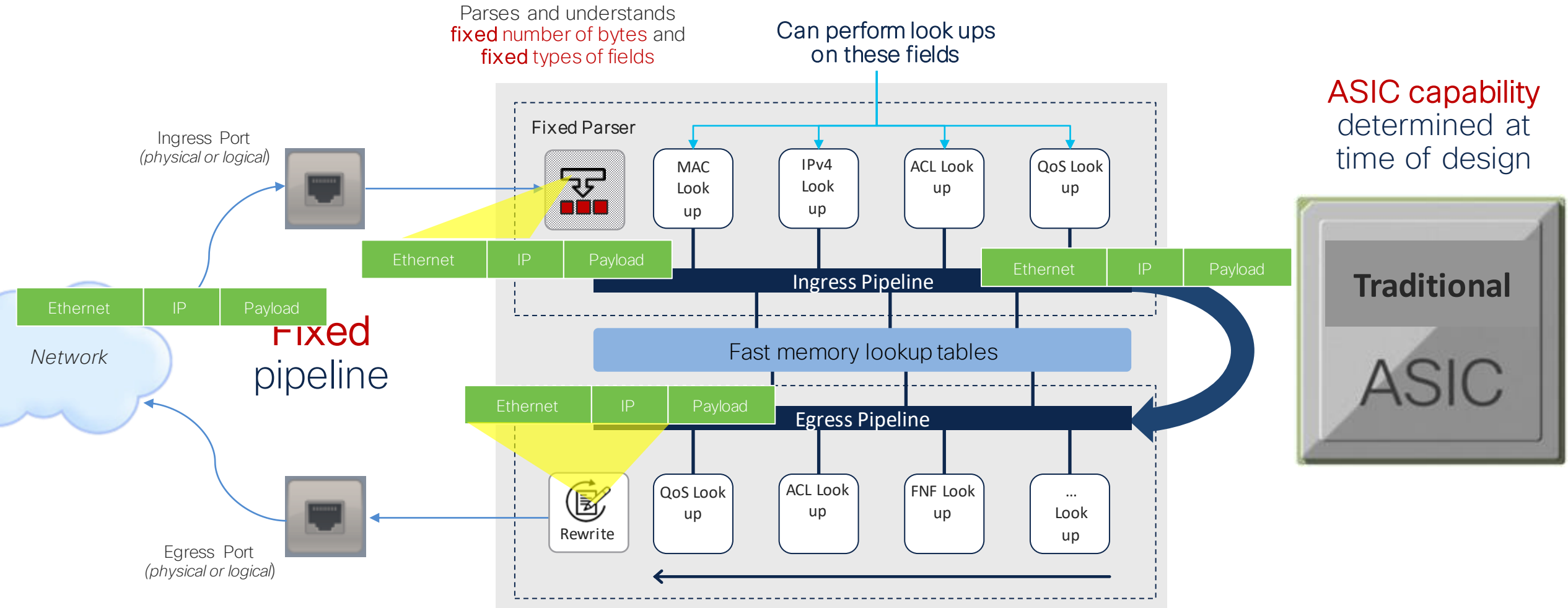
May not handle new protocols and encapsulations

May limit adoption of new technologies and solutions



WHAT'S IN A CHIP?

Traditional Networking ASICs – Fixed Pipelines



Network Evolution ...



Automation



Security



Analytics

New CAPABILITIES ...

Network-Wide Assurance ...

SD-Access
Fabric

End-to-End Policy ...

New PROTOCOLS ...

LISP
TrustSec
VXLAN



Not supported
in Hardware

Options: Punt to
CPU (slow) or Drop



Functional – Fast – but **FIXED** in nature
May not handle new protocols and encapsulations
May limit adoption of new technologies and solutions



Functional – Fast – but **FLEXIBLE**
SOFTWARE flex @ *HARDWARE speed*
RAPID tech & solution **ADOPTABILITY**



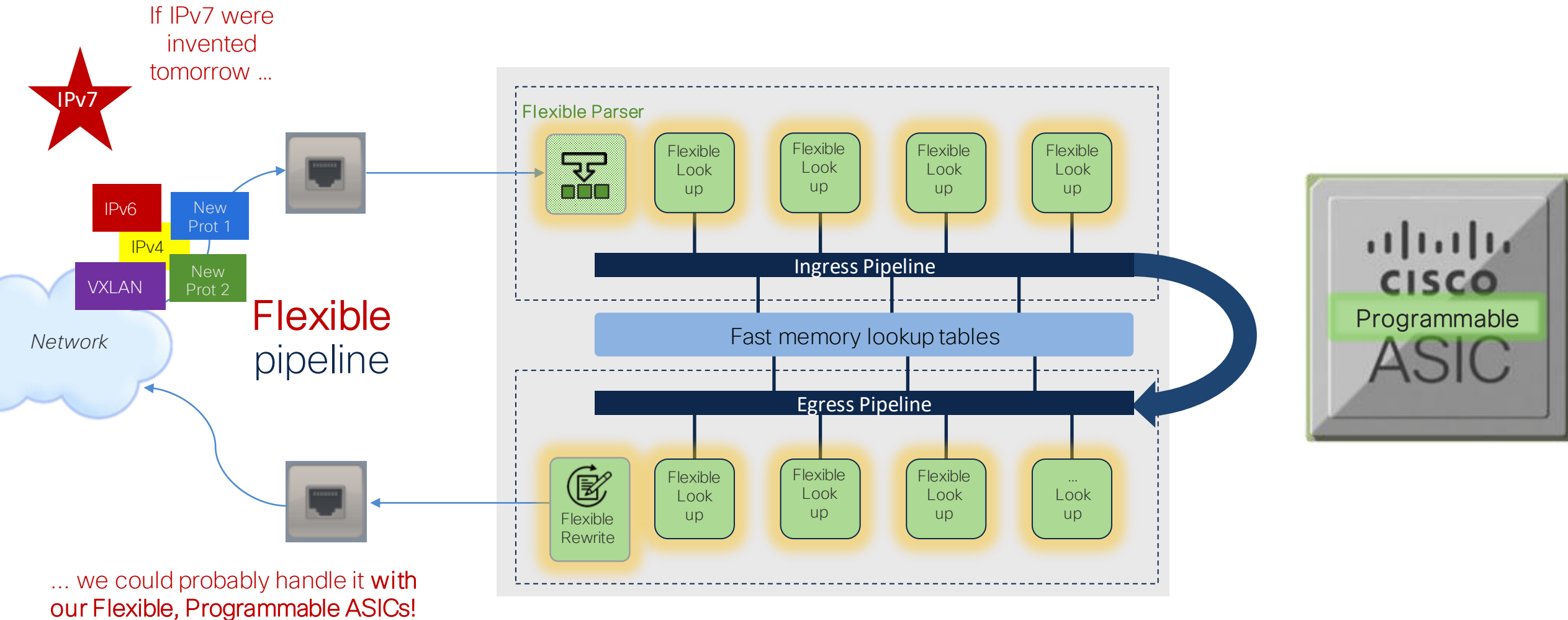
WHAT'S IN A CHIP?

Cisco Programmable ASIC

Flexible Forwarding

Flexibility in Forwarding

Intelligent packet manipulation with ability to handle new protocols over time



Deploying FLEXIBLE SILICON for Switching and Routing

UADP (Unified Access Data Plane) Flexible Switching

Up to 1.6Tbps
19.2B transistors
16nm technology



UADP 2.0 Mini



UADP 2.0



UADP 3.0

The SD-Access Fabric Team



Cisco Software Defined Access The Foundation for Cisco's Intent-Based Network

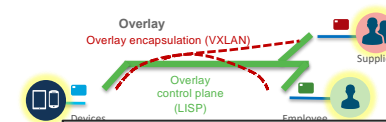


What is Unique about Cisco SD-Access?

Fabric brings Policy Simplification

Fabric breaks the dependency between IP address and Policy.

In Fabric Policies are tied to **User/Device Identity**



Cisco DNA Center – Automation and Assurance

- Single User Interface for Fabric Management & Orchestration
- Policy definition based on User, Device or App Group
- Design, Deploy and Monitoring and Troubleshooting

Fabric Overlay – Services plane

Cisco Software-Defined Access

Key Component Technologies

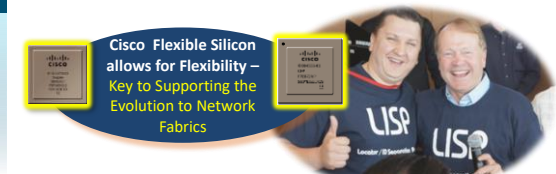
1. Control-Plane based on LISP
2. Data-Plane based on VXLAN
3. Policy-Plane with Cisco TrustSec (CTS)



Key Differences

- L2 + L3 Overlay -vs- L2 or L3 Only
- Host Mobility with Anycast Gateway
- Adds VRF + SGT into Data-Plane
- Virtual Tunnel Endpoints (No Static)
- No Topology Limitations (Basic IP)

Cisco Hardware and Software Innovations



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TECCRS-2700

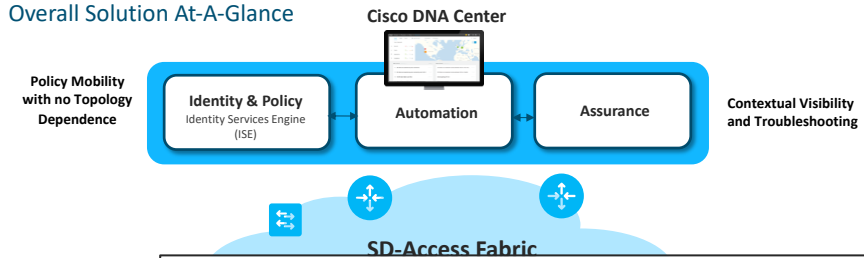
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.. that extends to Wireless (of course!)

Cisco SD-Access

Overall Solution At-A-Glance

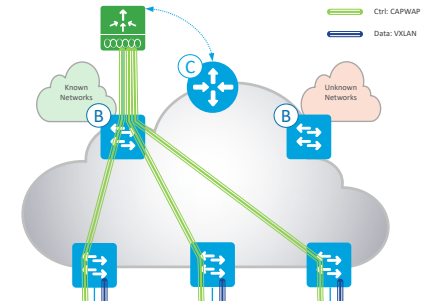


Cisco SD-Access

Fabric-Enabled Wireless – A Closer Look

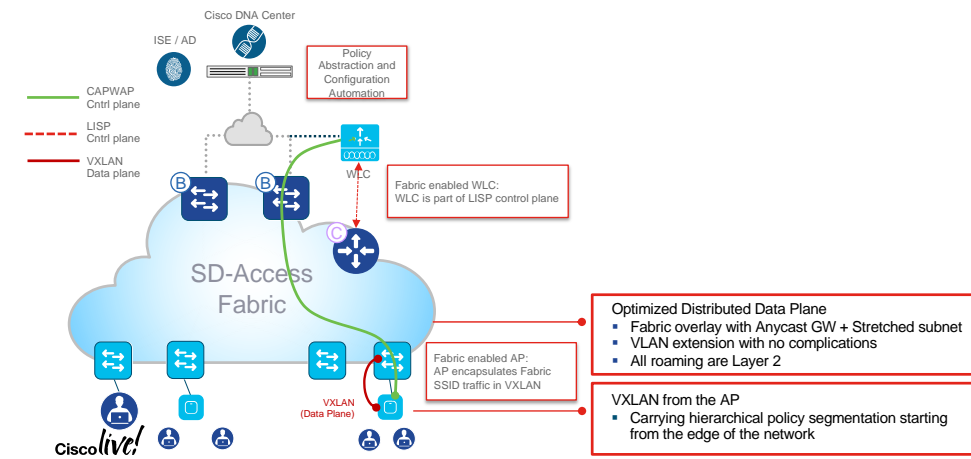
Fabric Enabled WLC is integrated into Fabric for SDA Wireless clients

- Connects to Fabric via Border (Underlay)
- Fabric Enabled APs connect to the WLC (CAPWAP) using a dedicated Host Pool (Overlay)
- Fabric Enabled APs connect to the Edge via VXLAN
- Wireless Clients (SSIDs) use regular Host Pools for data traffic and policy (same as Wired)
- Fabric Enabled WLC registers Clients with the Control-Plane



Cisco SD-Access – Wireless Architecture

Optimized Data Plane

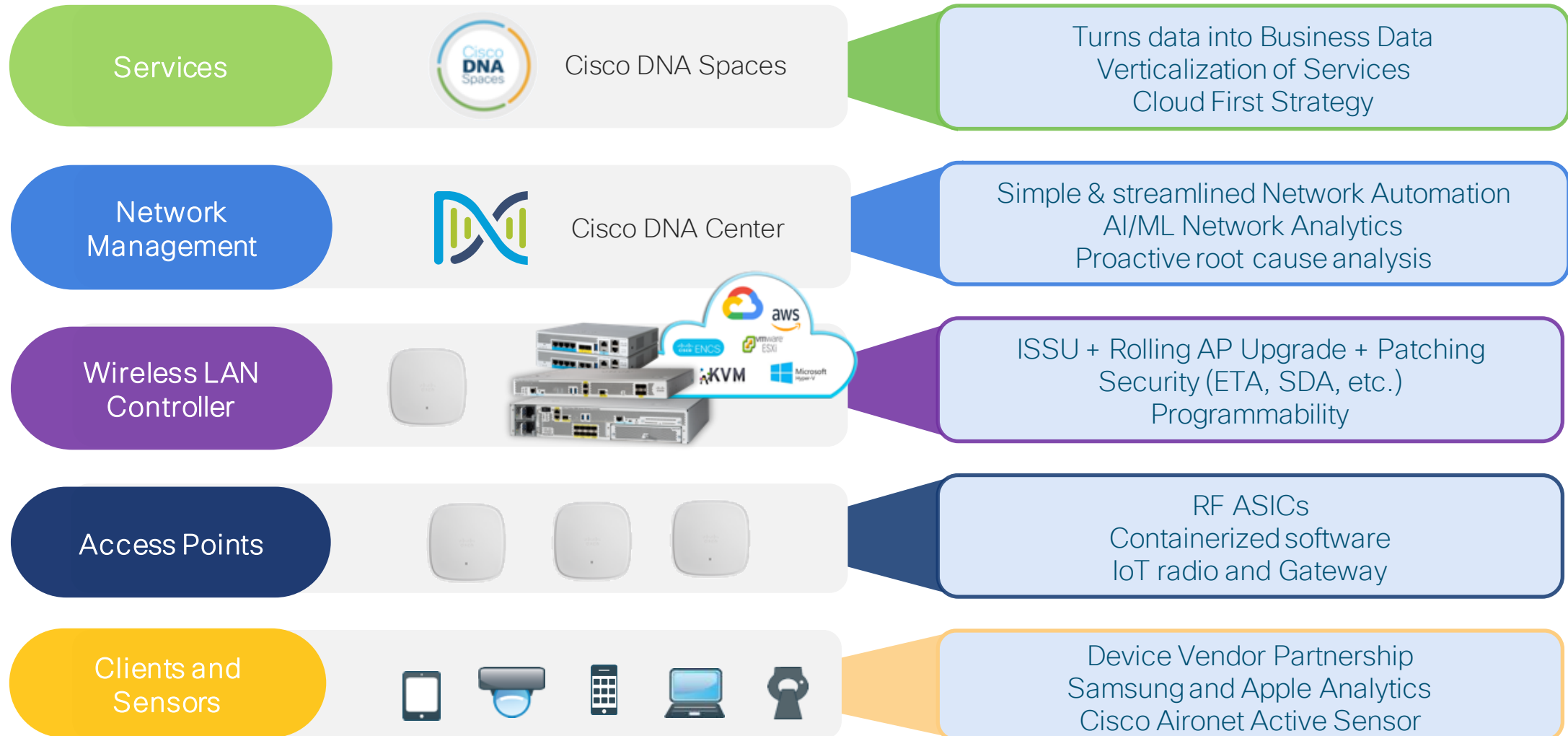


CiscoLive!

2

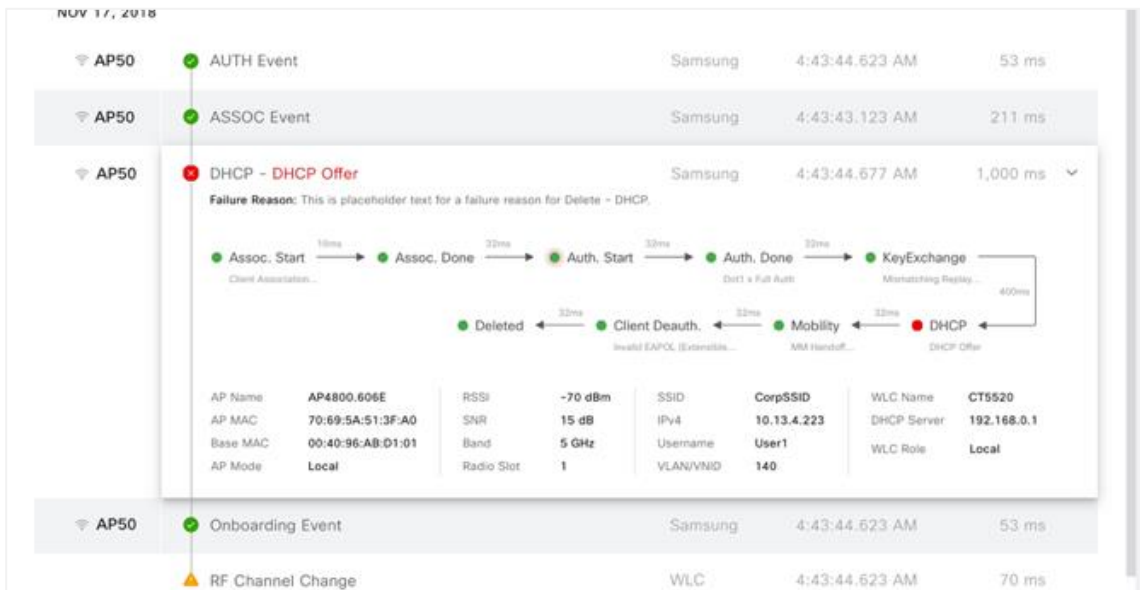


Cisco Innovation at each Layer of the Wireless Stack

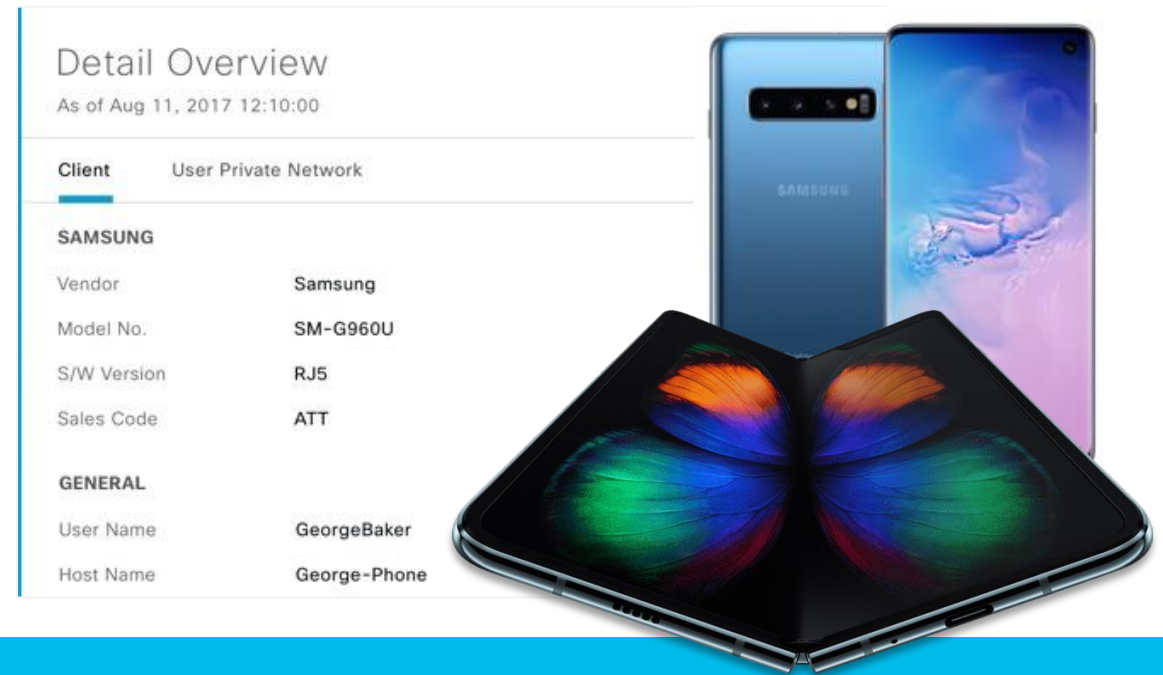


Wireless Client Ecosystem – Samsung Analytics

Get 20+ Wi-Fi Connection Error Root Causes from the Samsung Client



Detail Device classification info from the Samsung Client



- In addition to iOS Analytics, DNAC Wireless Assurance extend support of client perspective to Samsung, starting 802.11ax
- Cisco Adaptive 802.11r support, Client 360 Integration, Event Viewer
- Galaxy S10 Series (S10e/S10/S10+/S10 5G), Note10, Galaxy Fold

SAMSUNG

Random MAC? Not a problem!

Cisco leverages Apple/Samsung Analytics

Cisco DNA Center

Client > Client 360

> Application Experience

Detail Information Oct 6, 2020 12:12 AM

Device Info Connectivity RF iOS Analytics

Information	
Device Type	iPhone 11
Operating System	iOS 14.0.1
User Name	--
Host Name	SarathGasiPhone
MAC Address	A6:4D:24:40:99:E3
IPv4 Address	10.50.0.103
IPv6 Address	fe80:0:0:0:cd6:8bb7:adf9:1611

Device Info directly from Client

Randomized MAC OUI - Does not even match Apple or Samsung

Cisco DNA Center

Client > Client 360

> Application Experience

Detail Information Oct 3, 2020 11:57 AM

Device Info Connectivity RF

Information	
Device Type	Samsung Galaxy S10e
Operating System	Android 10
Build Number	TH7
Origin	VZW
Country Code	US
User Name	--
Host Name	Galaxy-S10e
MAC Address	4E:CE:DD:CC:7D:0E

Catalyst AP: Bringing the Best of Programmable ASIC and Embedded Software



IOx Framework
+
Docker-style
Applications



Programmable ASIC
(Cisco RF ASIC)

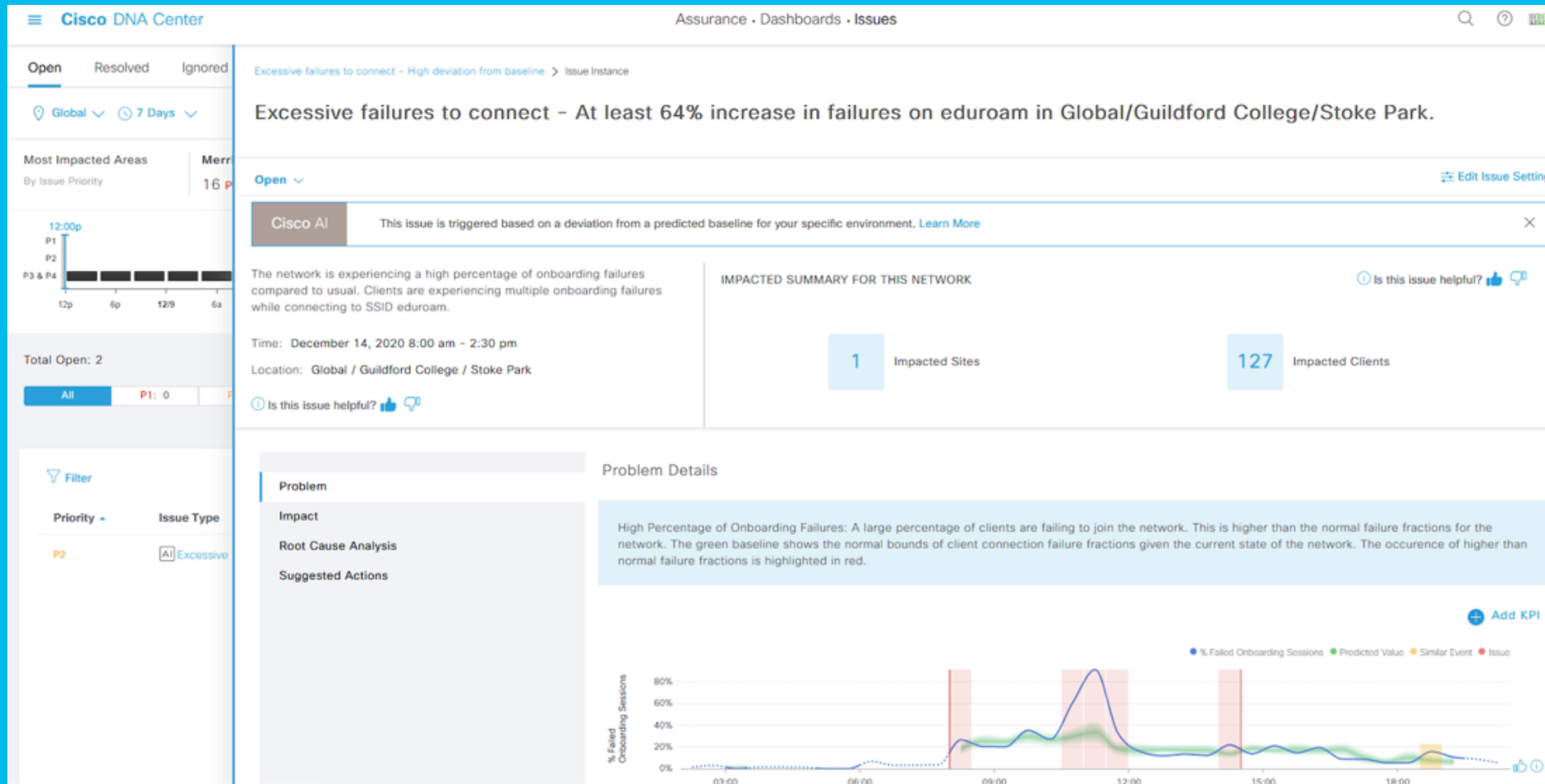
+

IoT Radio
(BLE/ZigBee/Thread)



Catalyst AP as a multi-purpose Platform

“Thanks to Assurance and a major issue in the network is flagged by **AI Analytics** days before the live log debugging in ISE actually showed this...”



... and needs a Controller for Orchestration & Policy

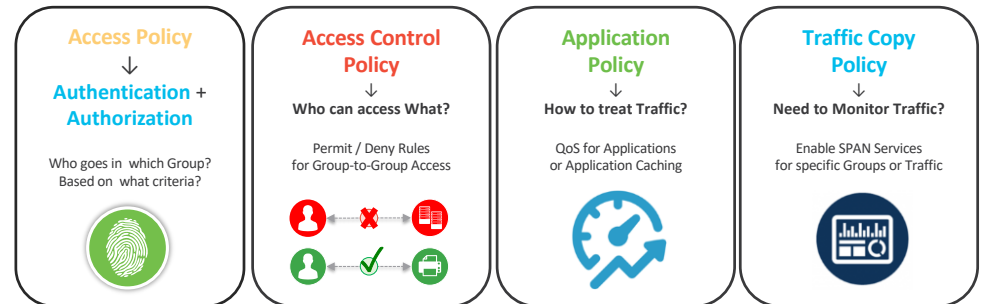


So What is Cisco DNA Center?

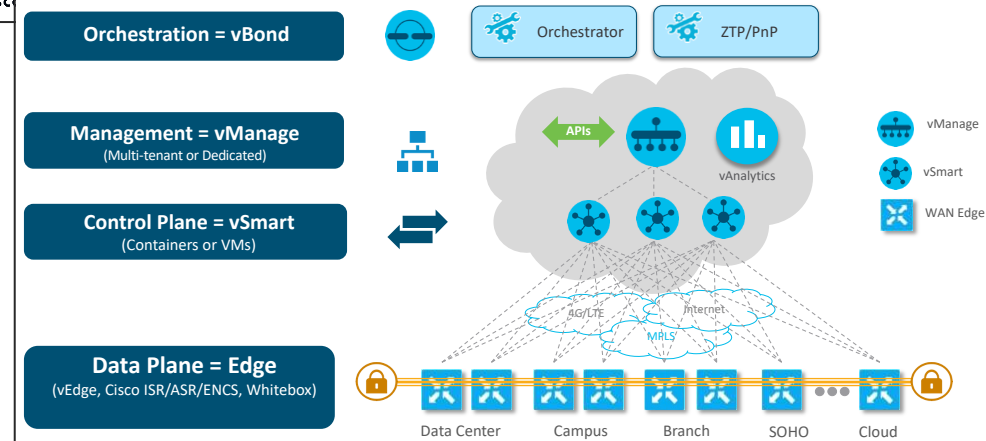
- Network management and command center for intent-based Enterprise Networks
 - A Platform to simplify Enterprise Network operations
 - Focus on campus and branch network sites
- Simplification via
 - Network-wide operations
 - Network-wide insights
 - Abstract
 - Workflow



Cisco SDA Policy Types



Cisco SD-WAN Architecture Overview

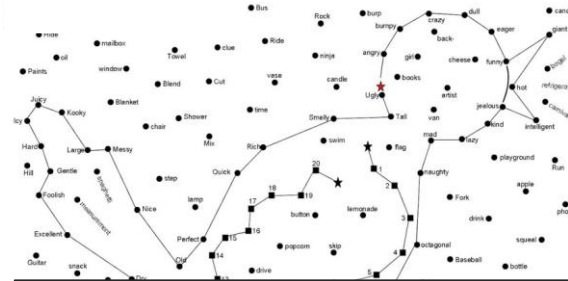


Tim got the Coolest Job – Assurance!
 .. Talking about draw by numbers, pirates, icebergs..



Context Transforms Raw Data into Information

Relationships Between Data Points Can Reveal hidden Insights



Reasons for Data Patterns

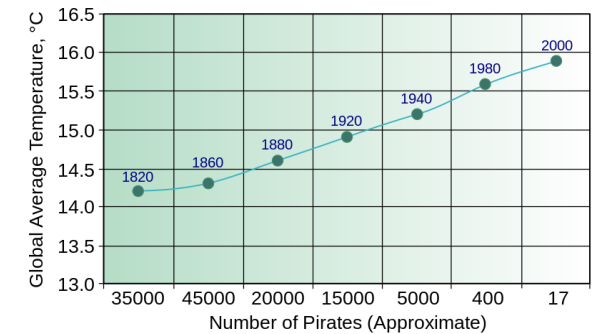
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- Coincidence
- Correlation
- Causation

Statistics 101:

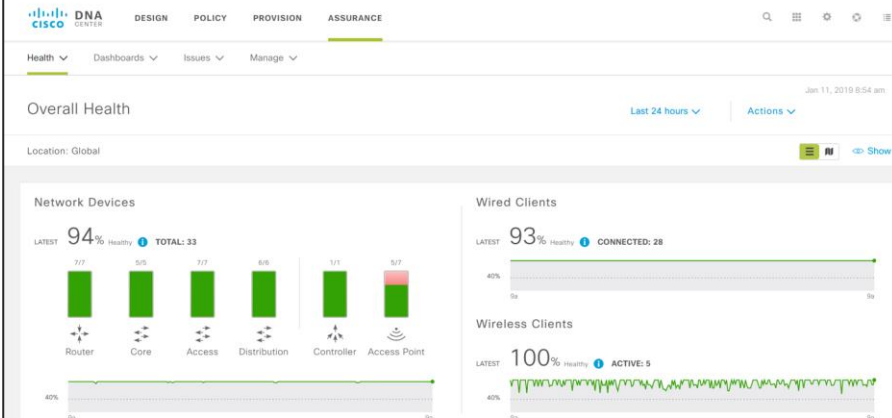
Correlation does not necessary mean Causation

Global Average Temperature vs. Number of Pirates



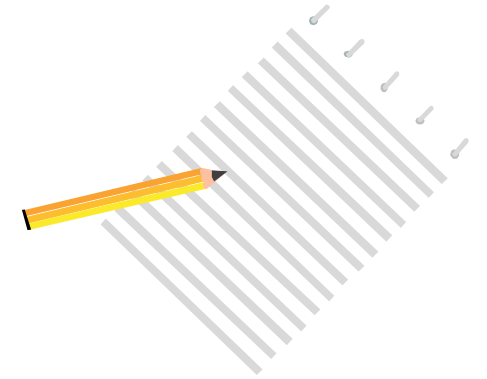
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Cisco DNA Assurance



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The Reward – Our First Book Sale! @ Cisco Live Barcelona



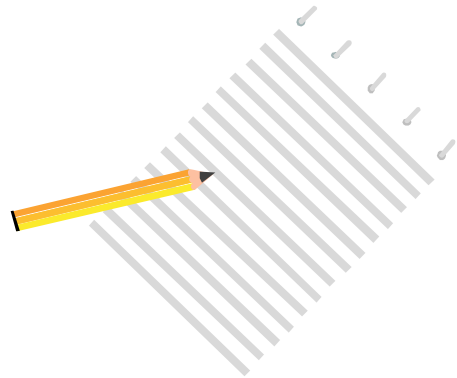
Jan. 29th,
2019



**John
Apostolopoulos**
Cisco Enterprise
Networks CTO

... and Meeting Customers @ Cisco Live

@ Cisco Live 2020,
Meet the Author



Jan. 28th,
2020



What We Learned



Writing a Book is Hard

Time
Writing Styles

1



Architecture Should Come First

but it helps to have a
terrific marketing team

2



Diversity of Characters is Fun

and helps make
the team stronger

3



The Journey was (Still is) Exciting

Cisco Live Techtutorials since 2016



4

and we are still
friends! 😊



The bridge to possible

Submit Your
Questions Now!



Use the Q&A panel to submit your questions, our expert will respond.

Extra Resources and References

Online

Cisco Digital Network Architecture (Cisco DNA) [[Learn more](#)]

Other useful resources:

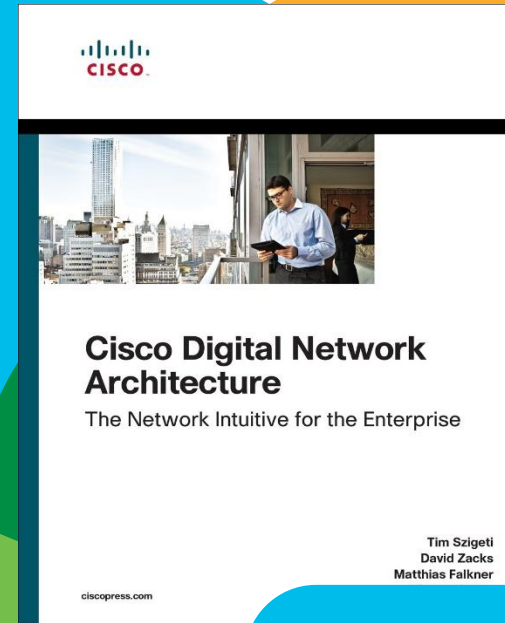
Cisco Software Defined-Access

<https://www.ciscopress.com/store/cisco-software-defined-access-9780136448389>

CCNP and CCIE Enterprise Core ENCOR 350-401 Official Cert Guide

<https://www.ciscopress.com/store/ccnp-and-ccie-enterprise-core-encor-350-401-official-9781587145230>

Congratulations
winners!



2 signed books

We'll contact you via email

Thank you for Your Time!

Please help to complete the survey

Your opinion is important and help us to improve



Thanks For Joining today!



The bridge to possible