



KIVI – Cisco

Intent-based networking | SDN | SD-WAN



Ernest Pronk – Solutions Specialist

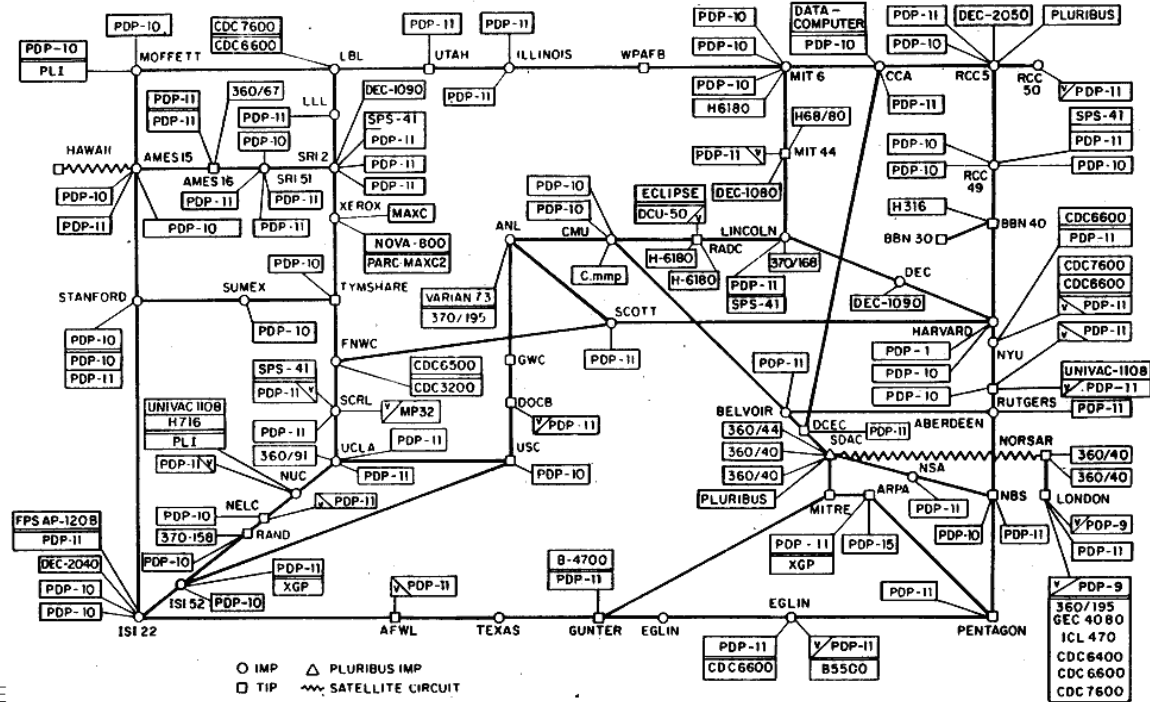
Fred Rabouw – Sr. System Engineer

12 Feb 2019

Inventing Networking

ARPANET '60 & 70s*

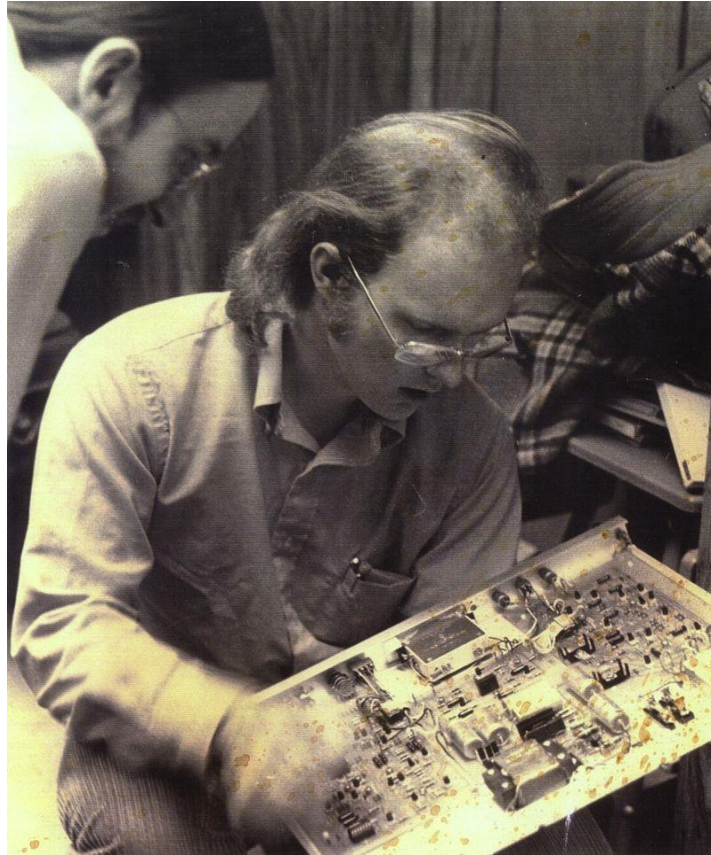
ARPANET LOGICAL MAP, MARCH 1977



*<https://en.wikipedia.org/wiki/ARPANET>
T <https://www.networkcomputing.com/>

Inventing Networking

'75 ETHERNET BY XEROX - IEEE 802.3x - DATA PLANE



Inventing Networking

'89 BGP - "2 NAPKIN PROTOCOL" - CONTROL PLANE

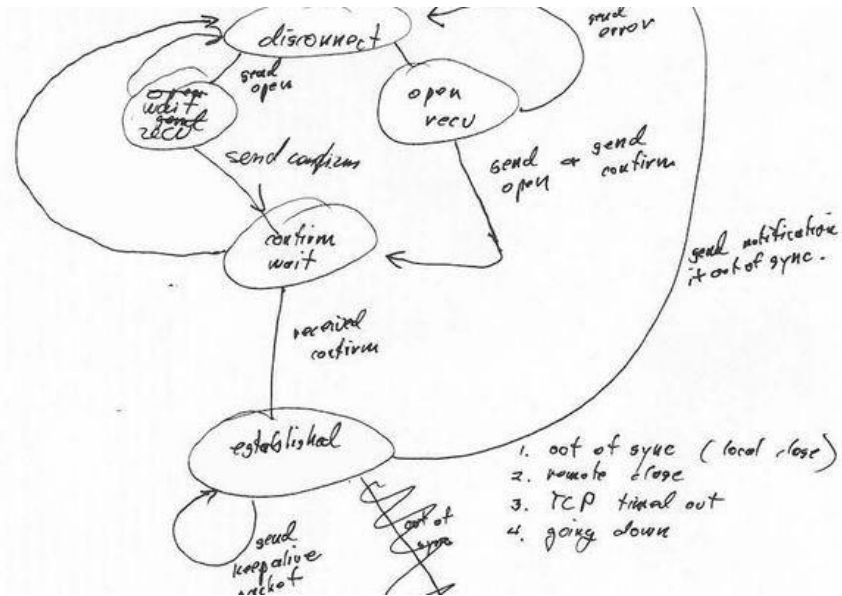
open:

my AS #	2 byte								
link type	1 byte								
<table border="0"> <tr><td>up</td><td>- 1</td></tr> <tr><td>down</td><td>- 2</td></tr> <tr><td>internal</td><td>- 4</td></tr> <tr><td>H-link</td><td>- 8</td></tr> </table>	up	- 1	down	- 2	internal	- 4	H-link	- 8	(not used in update direction field)
up	- 1								
down	- 2								
internal	- 4								
H-link	- 8								
auth type code	1 byte								
<table border="0"> <tr><td>o</td><td>- none</td></tr> </table>	o	- none							
o	- none								
authentication	variable								

update:

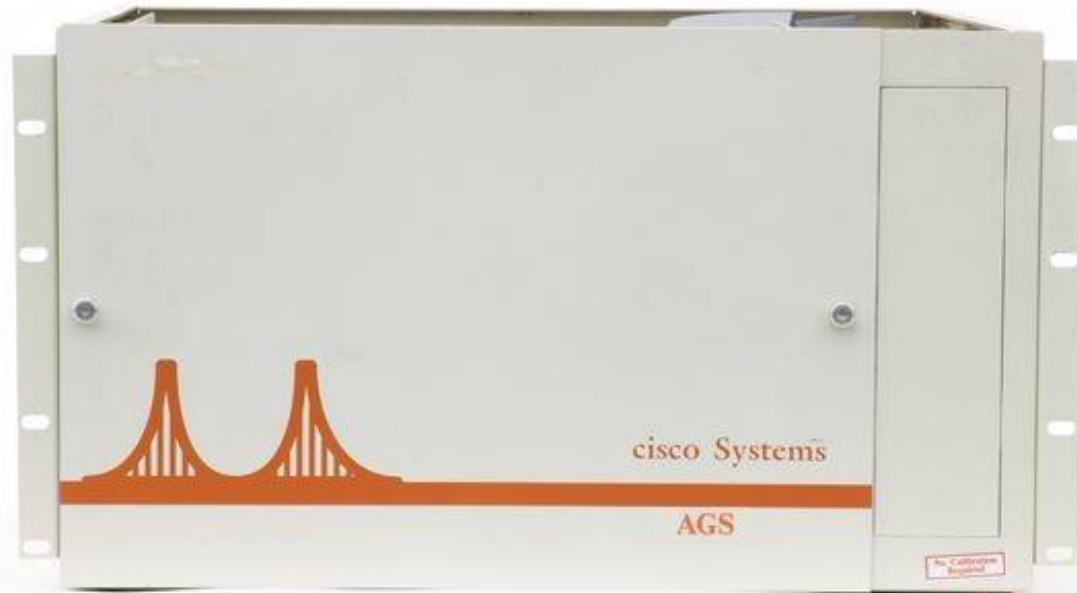
network #	4 bytes
first hop gateway	4 bytes
metric	2 bytes

repeat structure to #



Inventing Networking

'84 MULTI PROTOCOL ROUTING - STANFORD UNIVERSITY



The Cloud Evangelist

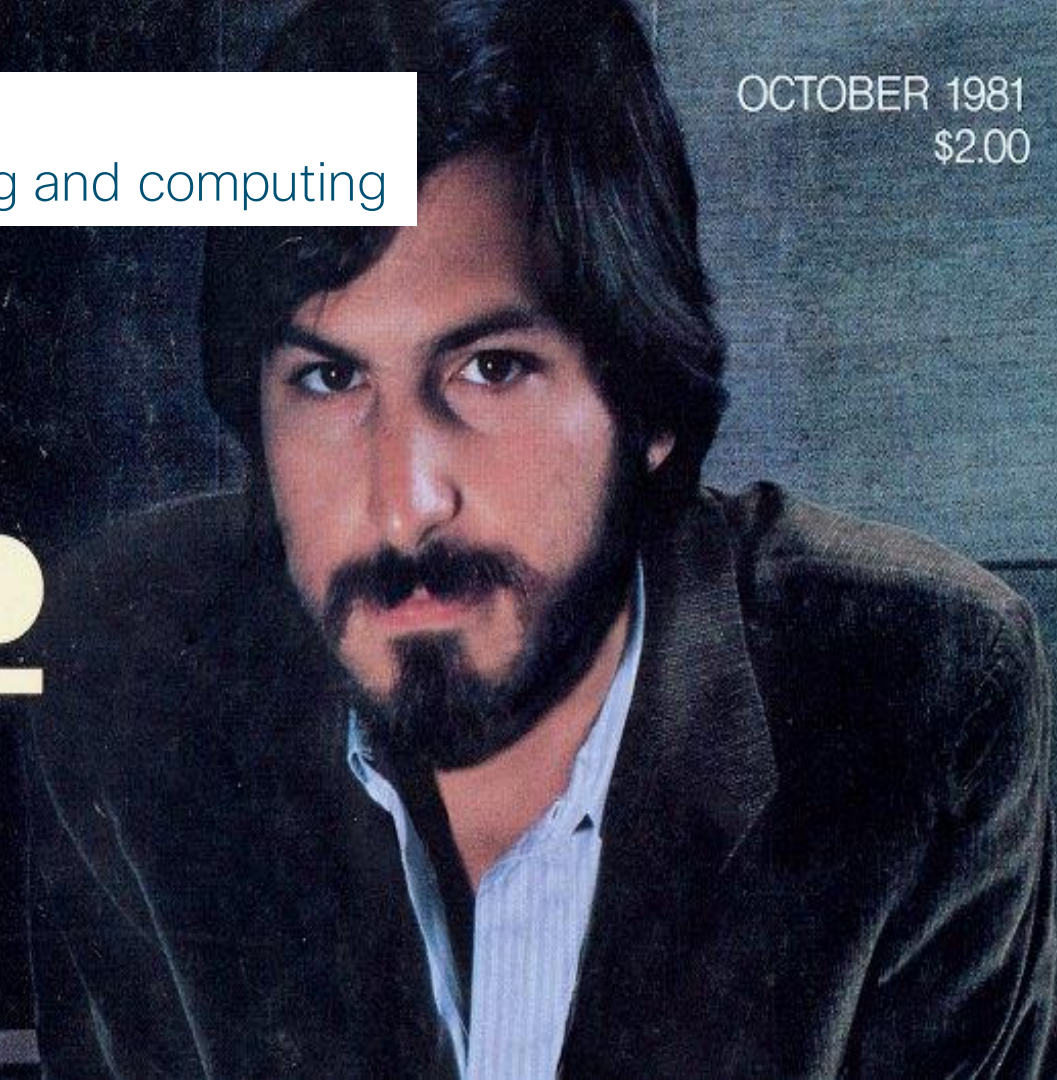
'97 Different view on networking and computing

OCTOBER 1981

\$2.00

Inc.

**THIS MAN
HAS CHANGED**



Controversial Quotes

'It's faster in every case to talk to the server now than it is my local hard disk... Carrying around these non-connected computers -- with tons of data and state in them -- is byzantine by comparison'

'You've got to start with the customer experience and work backwards to the technology'

Consumer driven adoption
>'10



DISRUPT, or GO HOME!



Causes Digital Transformation >'10

salesforce

slack

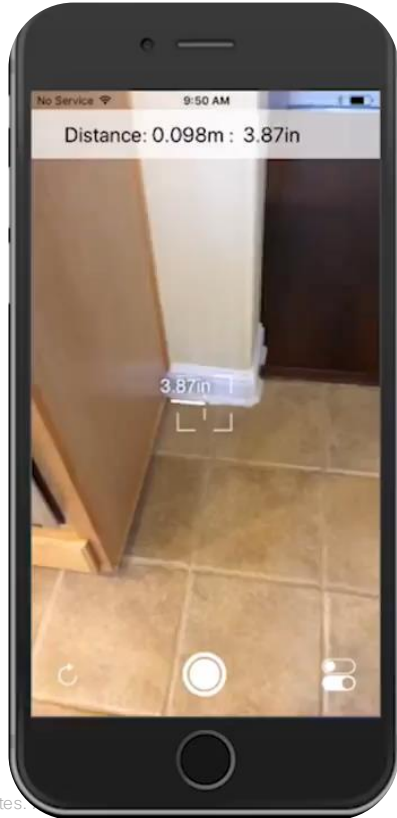
Consumption models (OPEX)



Google Cloud



More trends, more data, more bandwidth



Top 10 Strategic Technology Trends for 2019

Intelligent



Autonomous Things



Augmented Analytics



AI-Driven Development

Digital



Digital Twin



Empowered Edge



Immersive Experience

Mesh



Blockchain



Smart Spaces



Privacy and Ethics



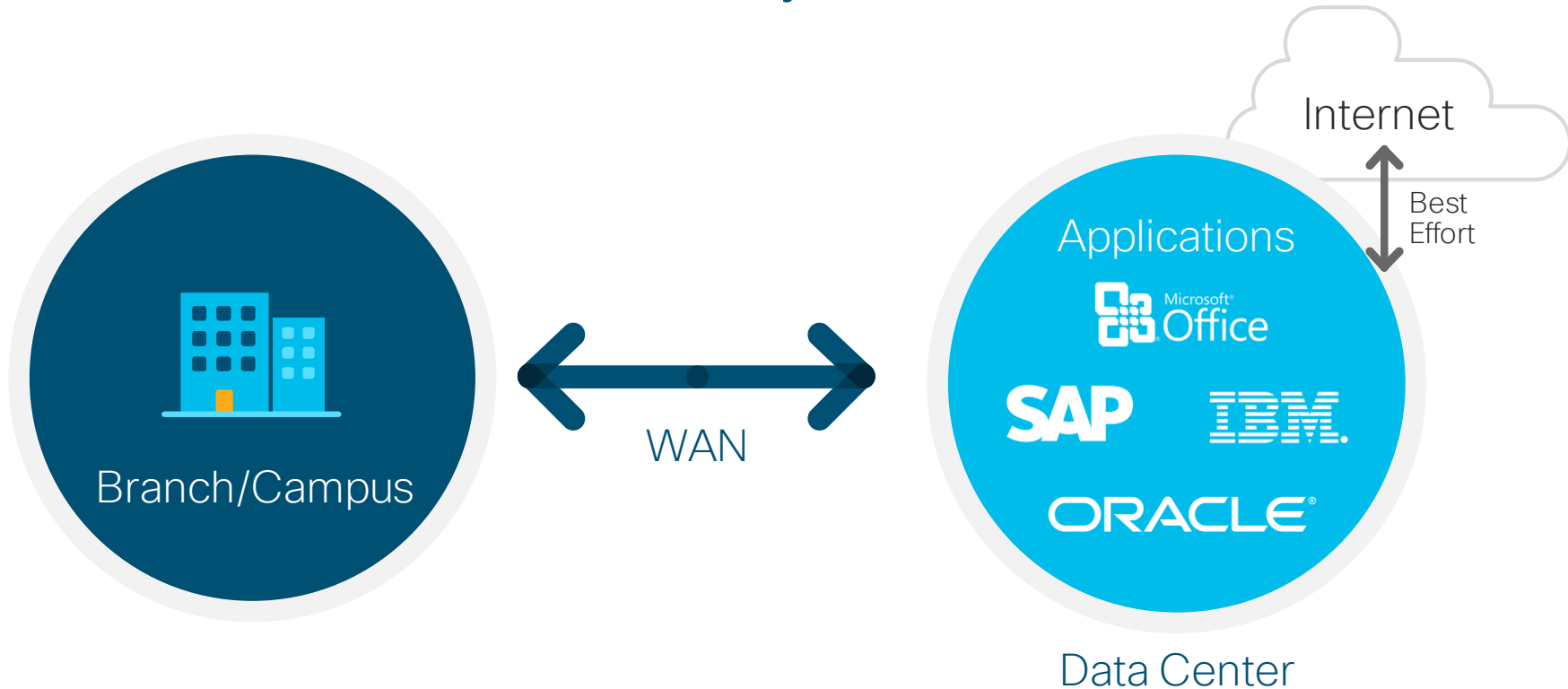
Quantum Computing

[gartner.com/SmarterWithGartner](https://www.gartner.com/SmarterWithGartner)

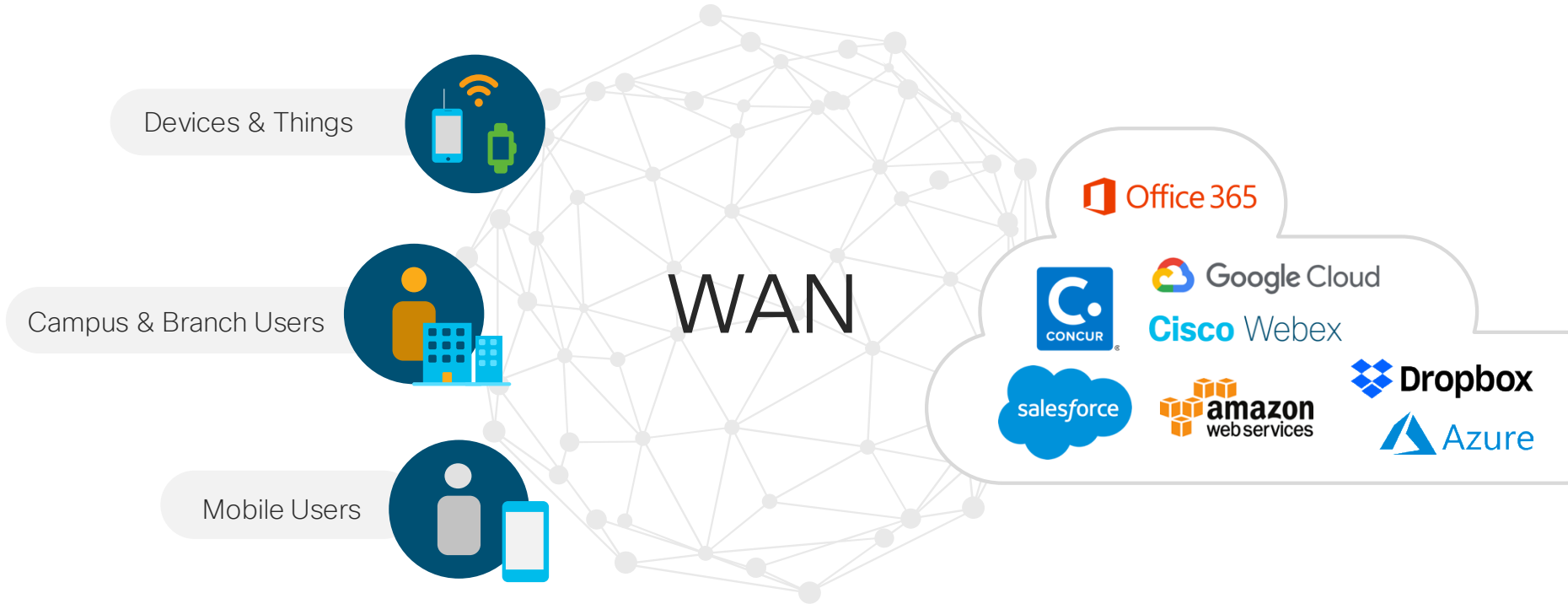
Source: Gartner
© 2018 Gartner, Inc. and/or its affiliates. All rights reserved.
Gartner is a registered trademark of Gartner, Inc. or its affiliates. FL499238

Gartner.

Before connecting Users to the Data Center was the Priority



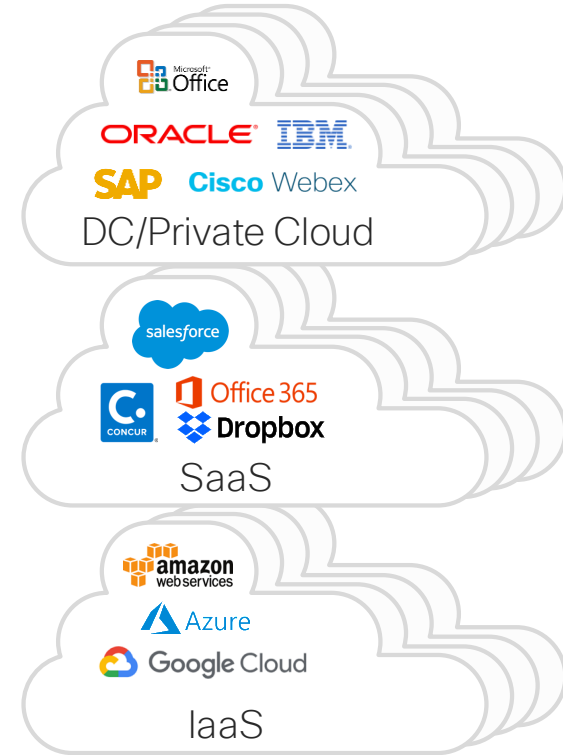
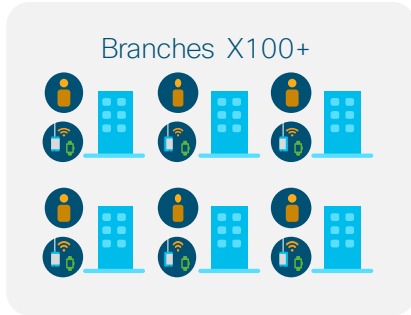
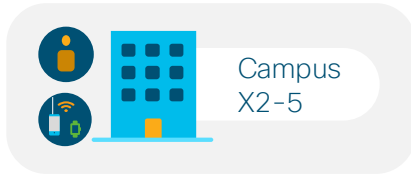
Then the Way We Worked Changed



Applications Moved to Not One Cloud, But Many



Resulting in a complex and dynamic network

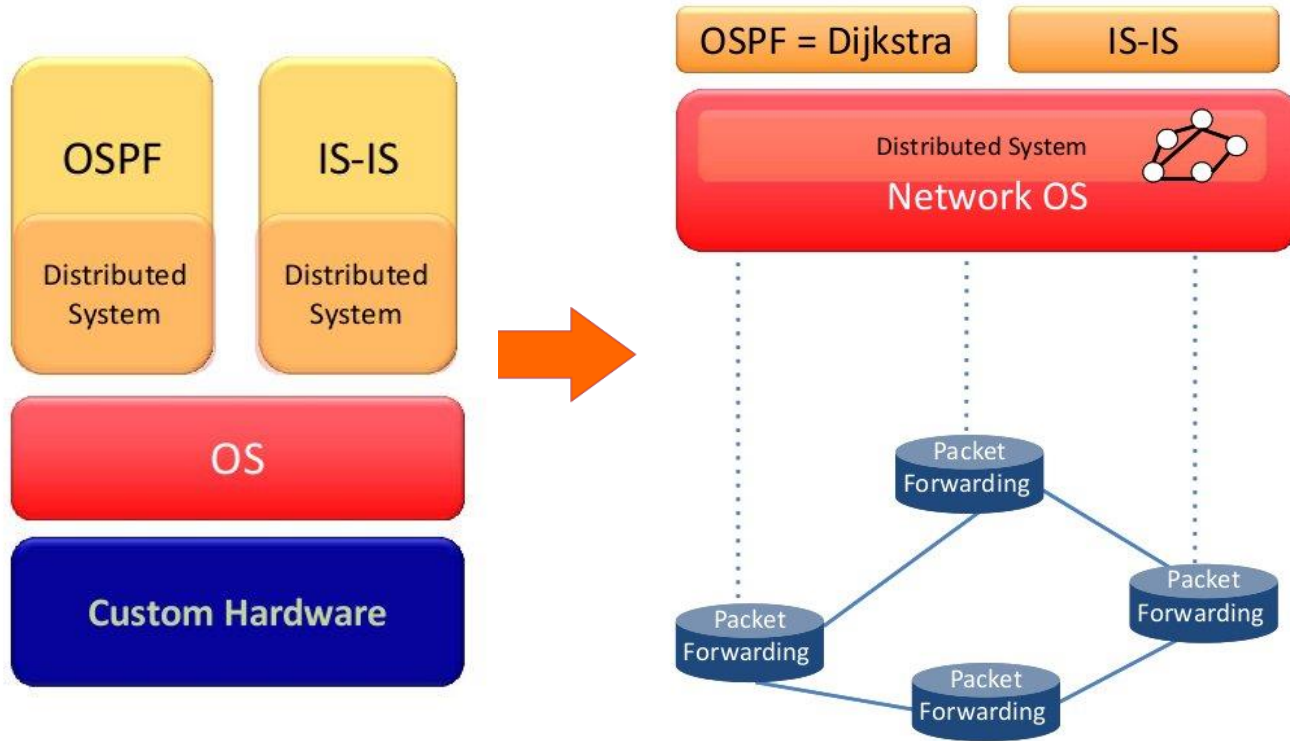


More user, things and applications, everywhere

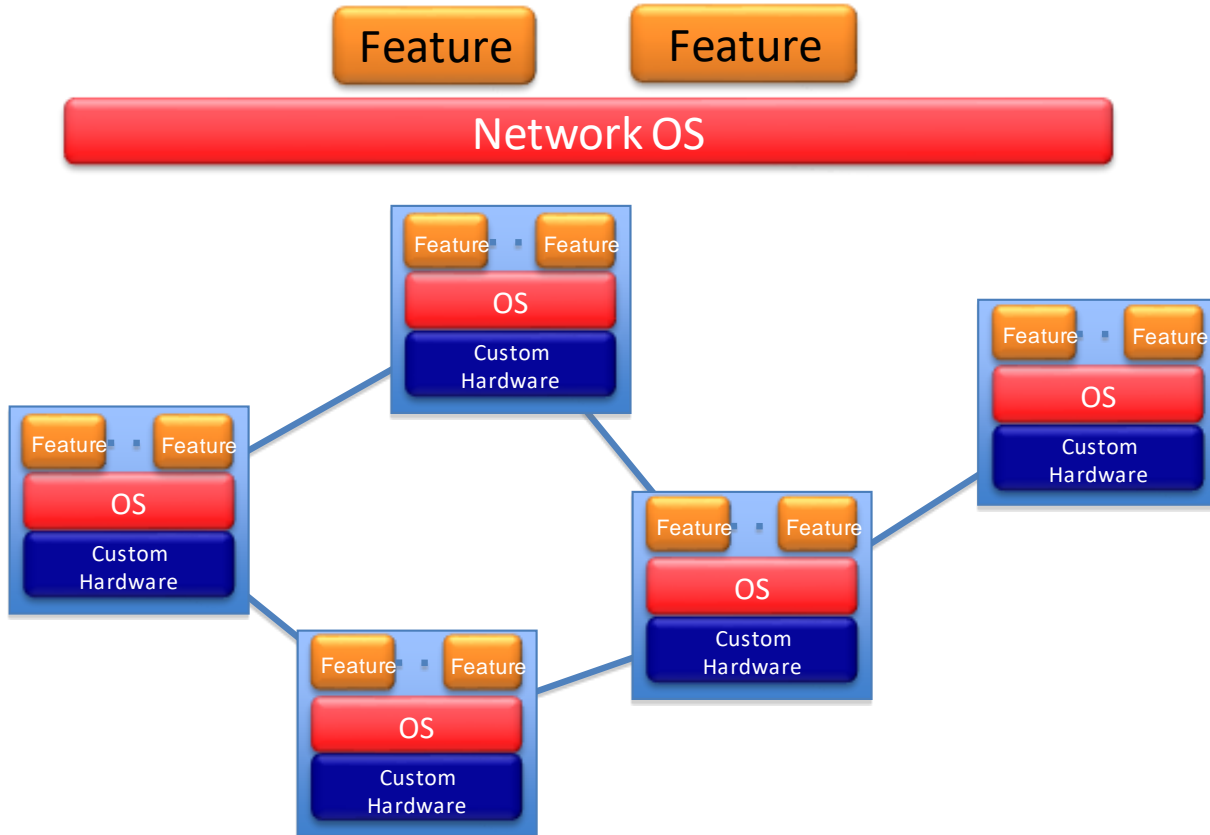
Too many control-plane mechanisms

- Variety of goals:
 - **Routing:** distributed routing algorithms i.e. OSPF (Dijkstra algorithm), BGP, etc
 - **Isolation:** ACLs, VLANs, Firewalls,...
 - **Traffic engineering:** adjusting weights, MPLS,...
- No modularity, limited functionality
- Control Plane: mechanism without abstraction
 - ***Too many mechanisms, not enough functionality***

Example: Dijkstra algorithm (OSPF)



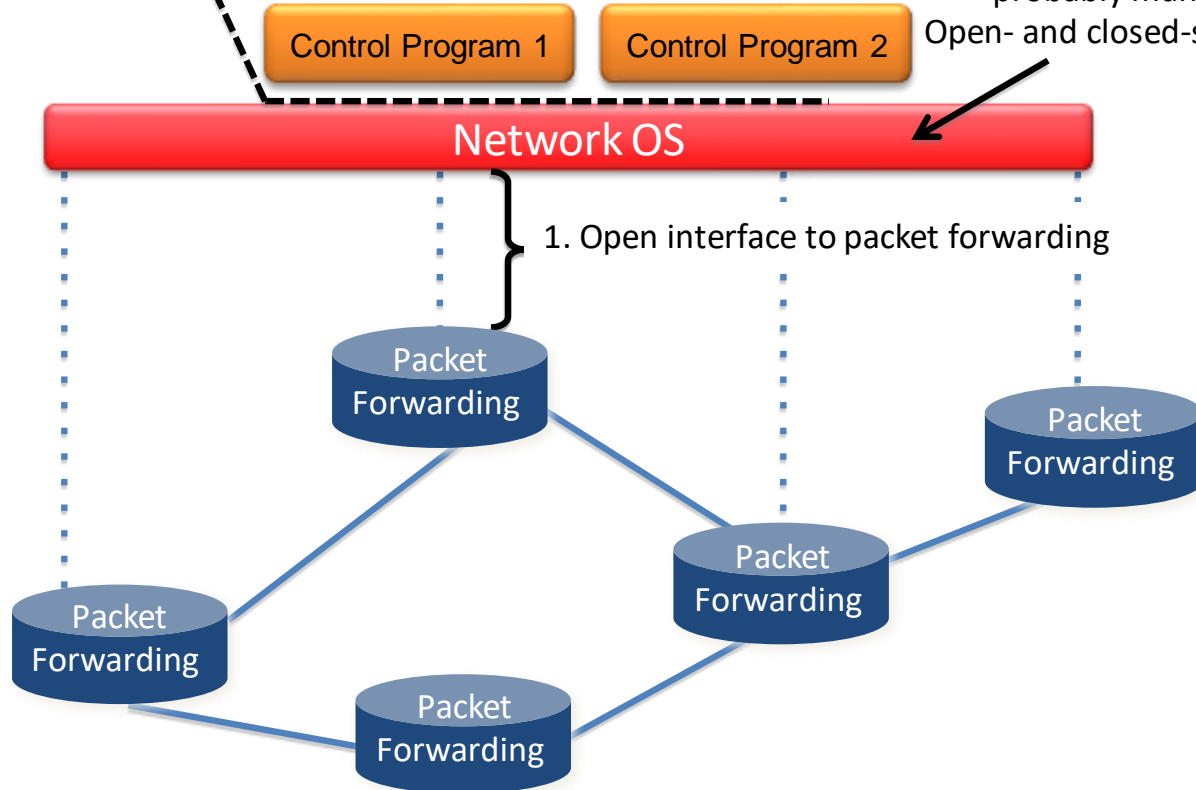
The network is changing



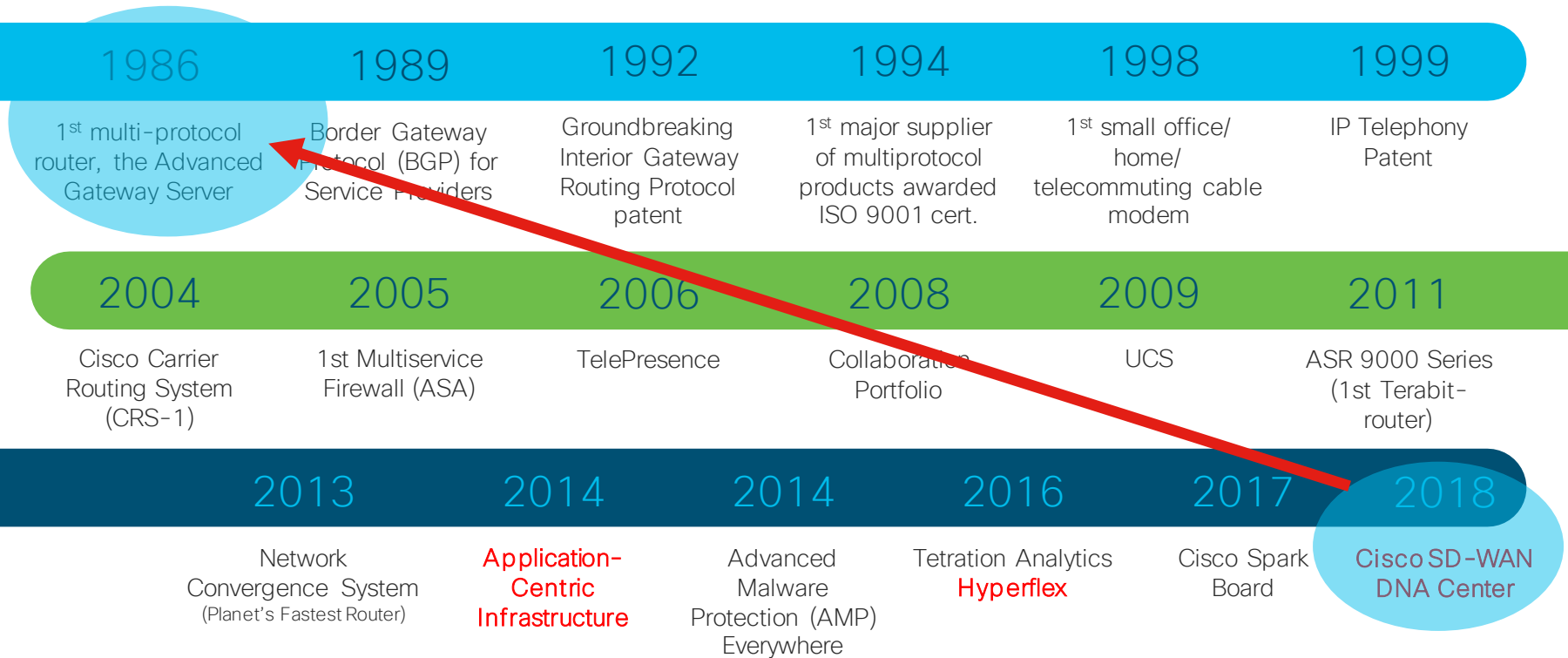
The network is changing

3. Consistent, up-to-date global network view

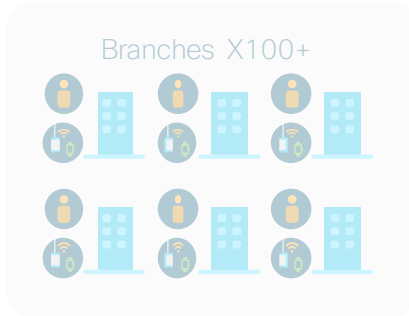
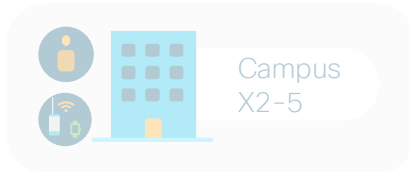
2. At least one Network OS probably many.
Open- and closed-source



Re-inventing the network



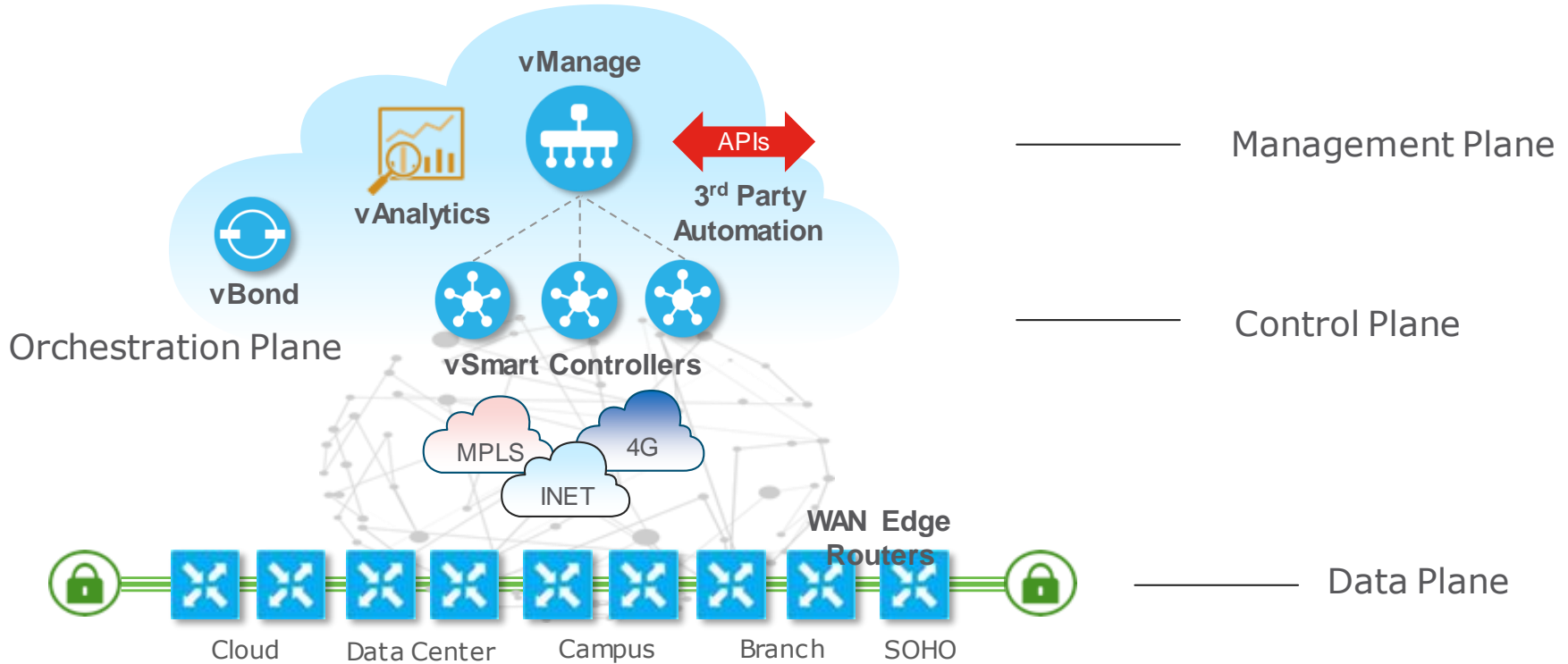
Opening up the new Cloud Edge



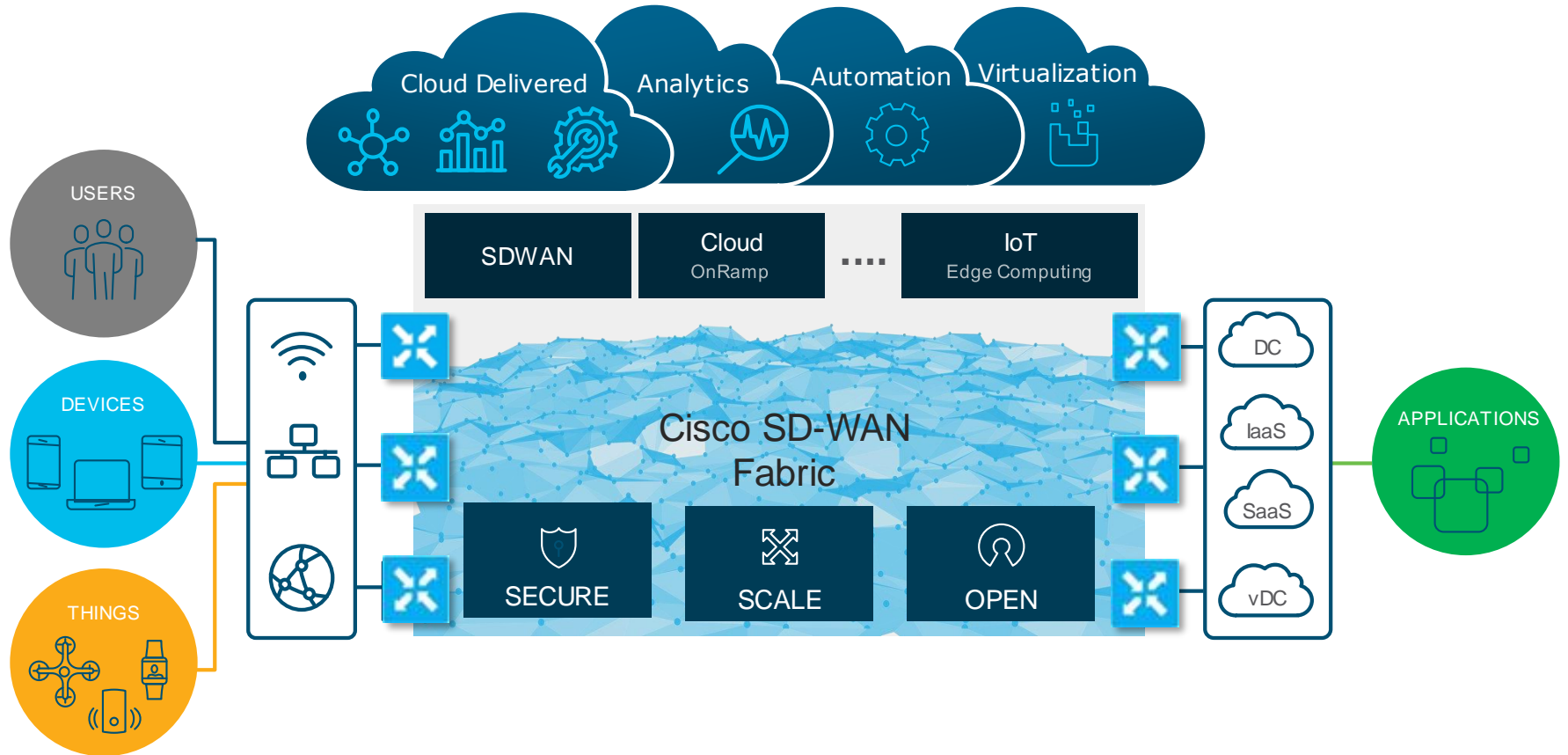
Every WAN device must become software defined and secure

Cisco SD-WAN Architecture

The Power of Abstraction



Cisco SD-WAN Platform for Digital Transformation



Introducing new Cisco SD-WAN software

Security is foundational

Full-Stack
Security



Integrated Firewall, IPS
and URL-Filtering on
SD-WAN platform

Simplified Cloud
Security



Cisco
Umbrella

Faster deployment and
greater visibility with
Cisco Umbrella

40% Faster O365
performance



Contextual awareness
for O365 optimization

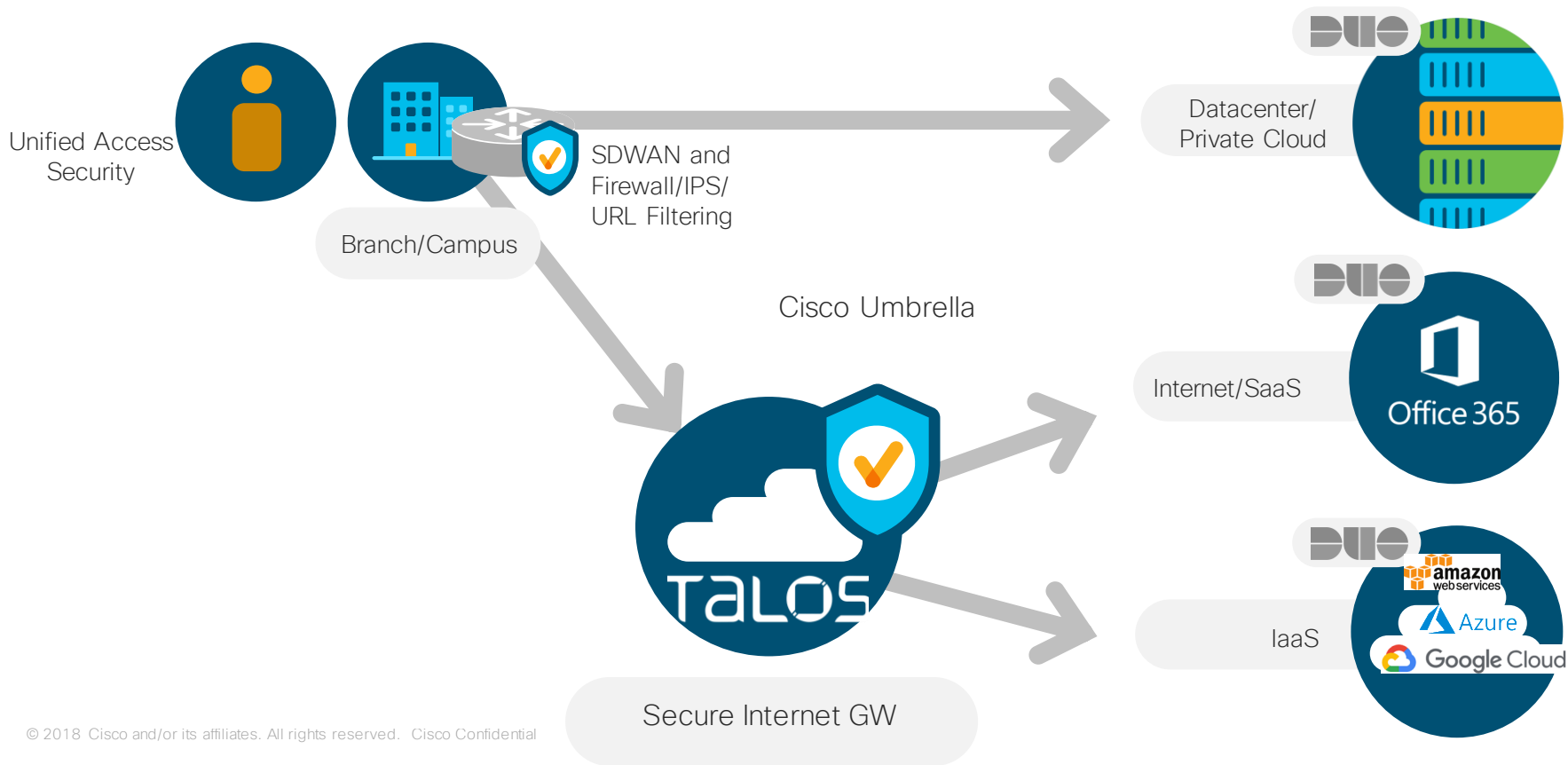
One console for SD-WAN and network security simplifies management

Right security, right place. Simplified

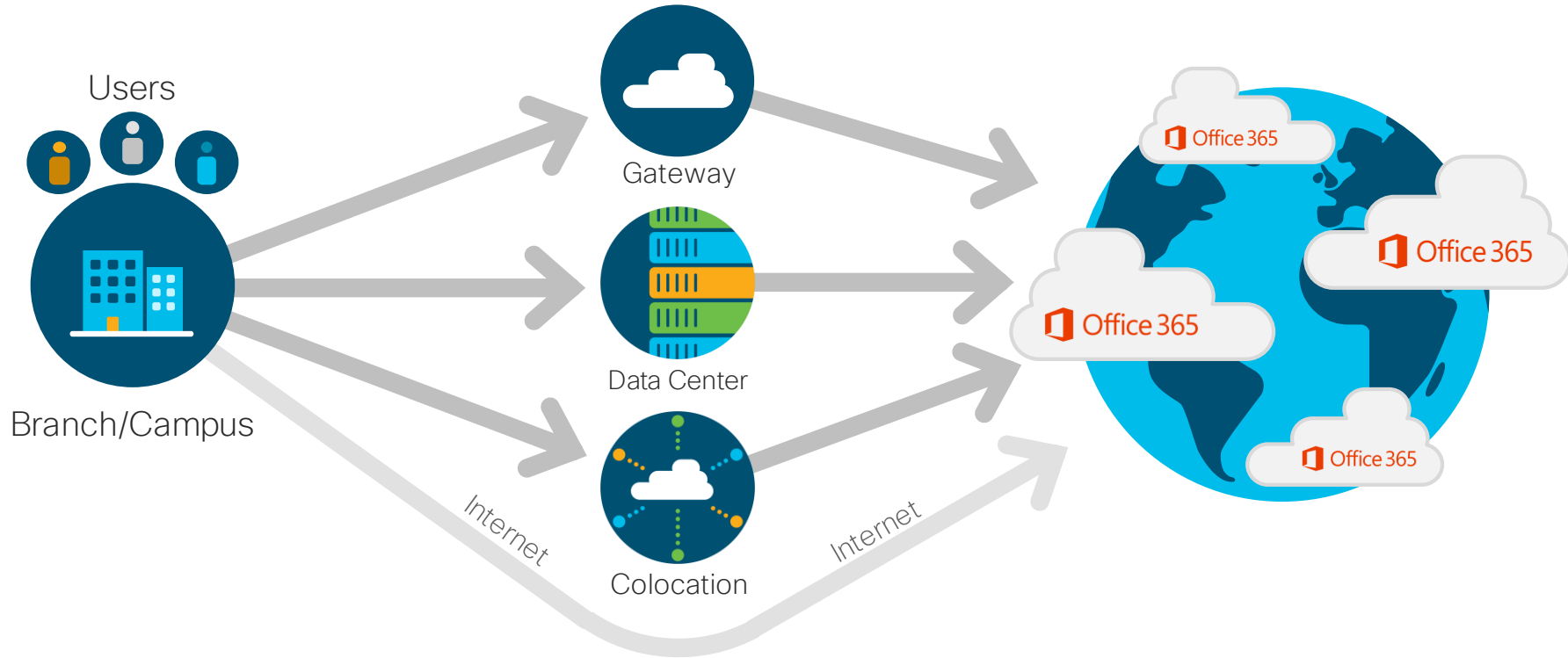
- Firewall
- IPS
- DNS Security
- URL Filtering
- MFA (Duo)



Protecting workers wherever they are...



40% Faster O365 Performance



Greater visibility with utilization of all available paths to O365

SDN throughout of the network



The network is the cornerstone
of digital success or failure

Our vision for the new network

Constantly learning

Support 100x more devices, apps, users



Constantly adapting

Respond instantly to business demands with limited staff and budget

Constantly protecting

See and predict issues and threats and respond fast

A man wearing a headset is shown in profile, focused on a network switch panel. He is wearing a dark sweater over a light-colored collared shirt. The background is a server room with various network equipment. The image has a blue tint.

Rewriting the networking playbook with intent-based networking

“Intent-based networking systems monitor, identify, and react in real time to changing network conditions.”

– Gartner

Intent-based networking with Cisco

Digital business



Mobile



Security



IoT



Multicloud

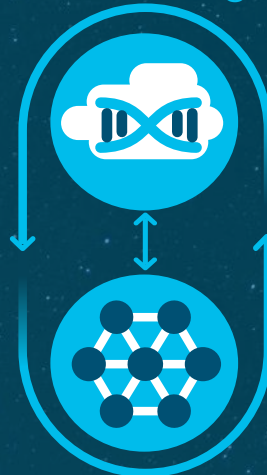
Business goals



Insights

Network

Learning



Intent

Context

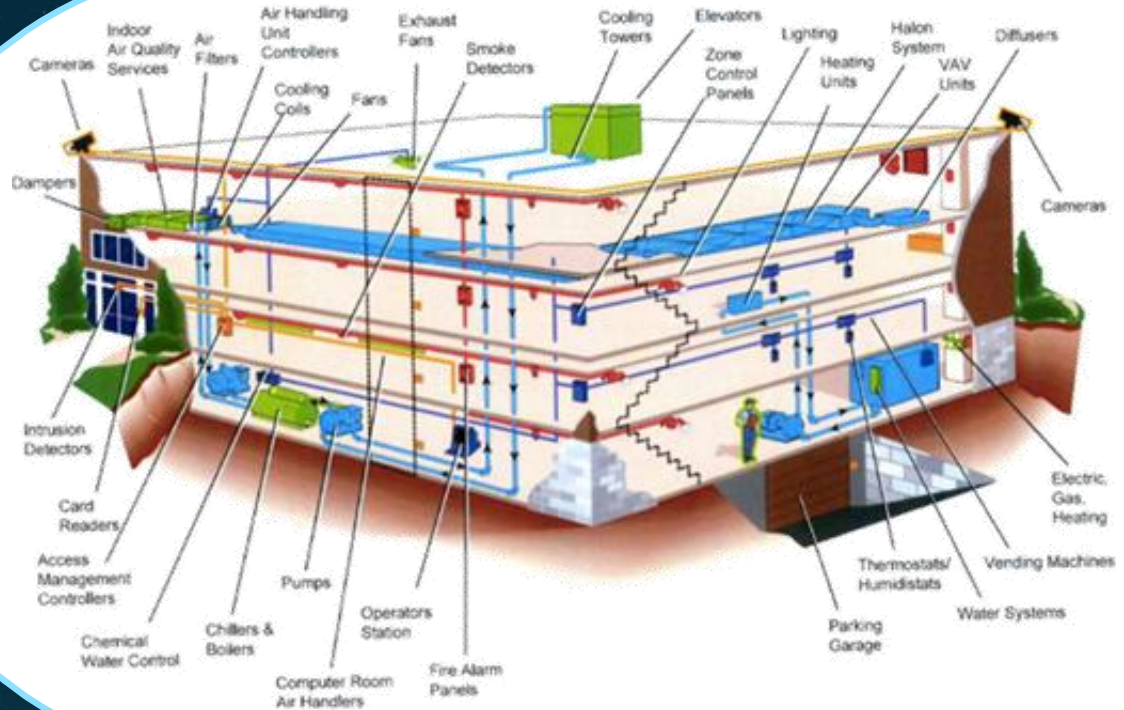
Security

Powered by intent. Informed by context.

IoT | SD Access

“Shadow” Internet of Things coming to every business

63M network connections per second by 2020



Automate IoT deployments at scale

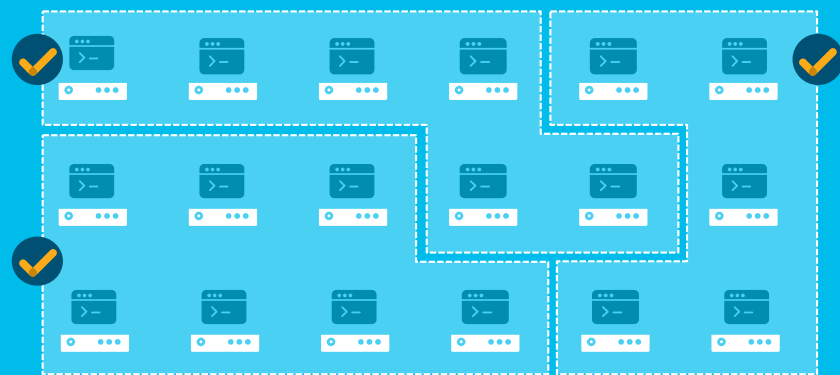
Software-Defined Access

Box by box

Manual | Error prone

Automation

Scalable | Simple



Design

2 → 15
hours minutes

Policy

4 → 5
hours minutes

Provision

5 → 5
hours minutes

Mass scalability | User, device, and IoT segmentation | Policy-based automation

Comparison of total workflow time

The old method

The new method

50  days

25  minutes









Total workflow for

Fifty devices

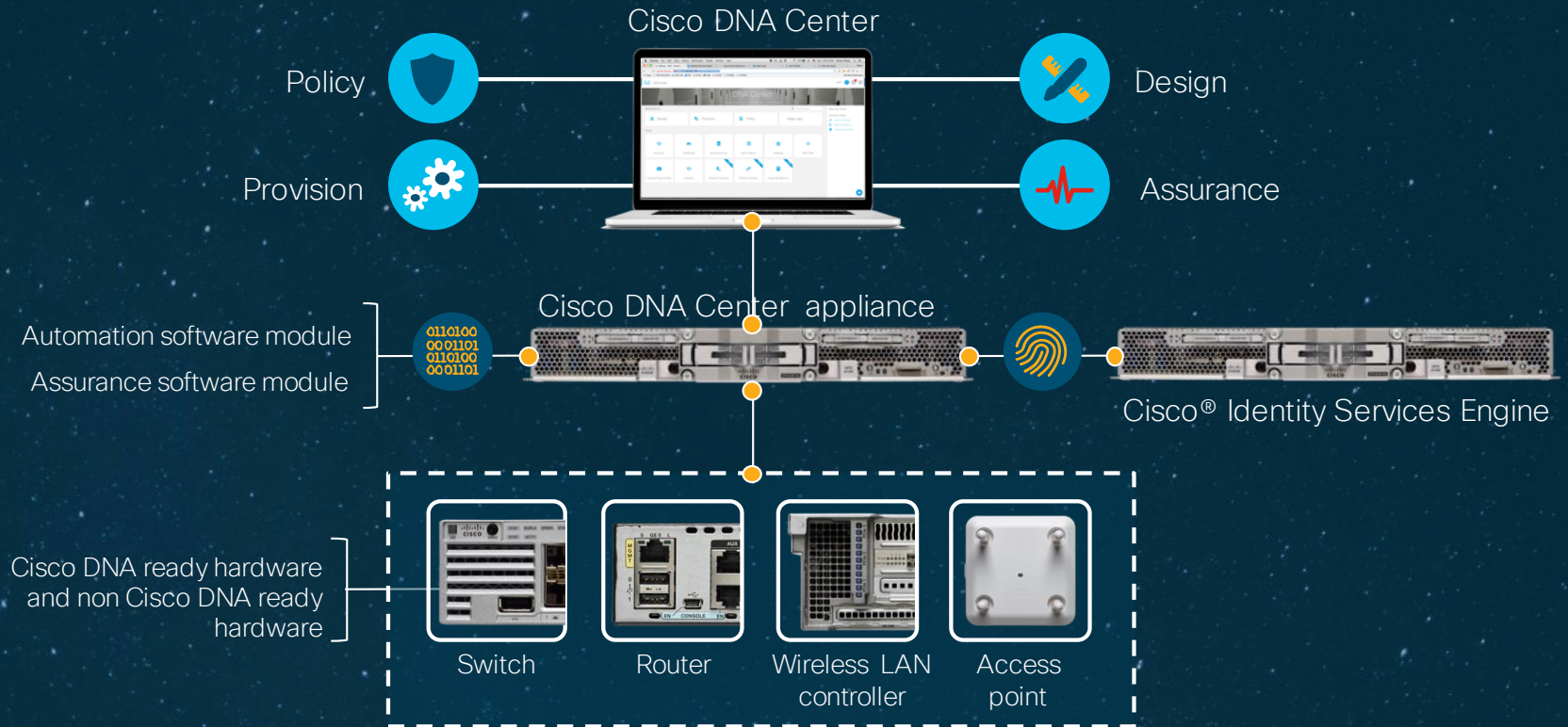
IoT networking for the extended enterprise



Use cases

-  Warehouse
-  Distribution centers
-  ATMs, kiosks
- Outdoor deployments**
-  Roadways
-  Airports
-  Ports
-  Rail yard
-  Public safety, first responders

Intent-based network – Cisco DNA components







**KEEP
CALM
IT IS
DEMO
TIME**