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UP
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The bridge to possible

Future State of Cloud Networking

Transforming Through This New Normal

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BRKCOC-2000

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Agenda

- Introduction & trends
- Our Journey
  - Cloud optimized network core
  - Branch edge
  - Remote home user edge
  - Secure Access Service Edge (SASE)
- Conclusion

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Cisco at a Glance

6,243
Routers

8,415
LAN Switches

10,690
UCS Servers

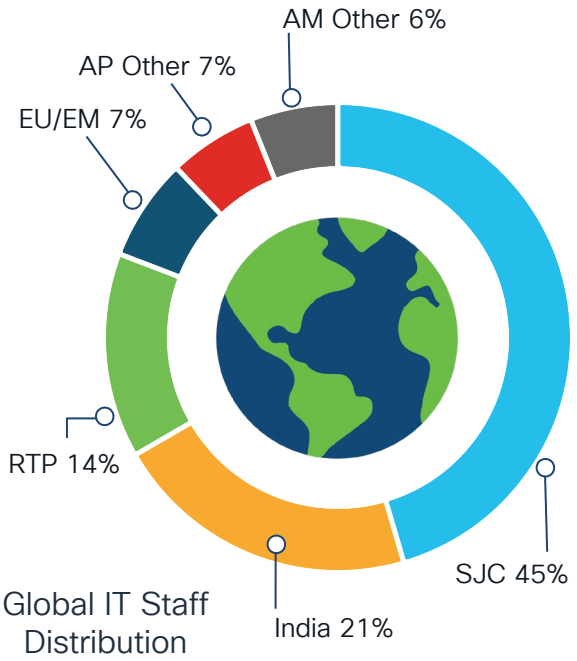
7.6
Billion DNS requests per day

72,357
Employees

133,361
Connected Stakeholders

94
Countries

434
Offices



100
Services

76,136
Virtual Machines

192,770

87 PB

28.1 MW

6.4M

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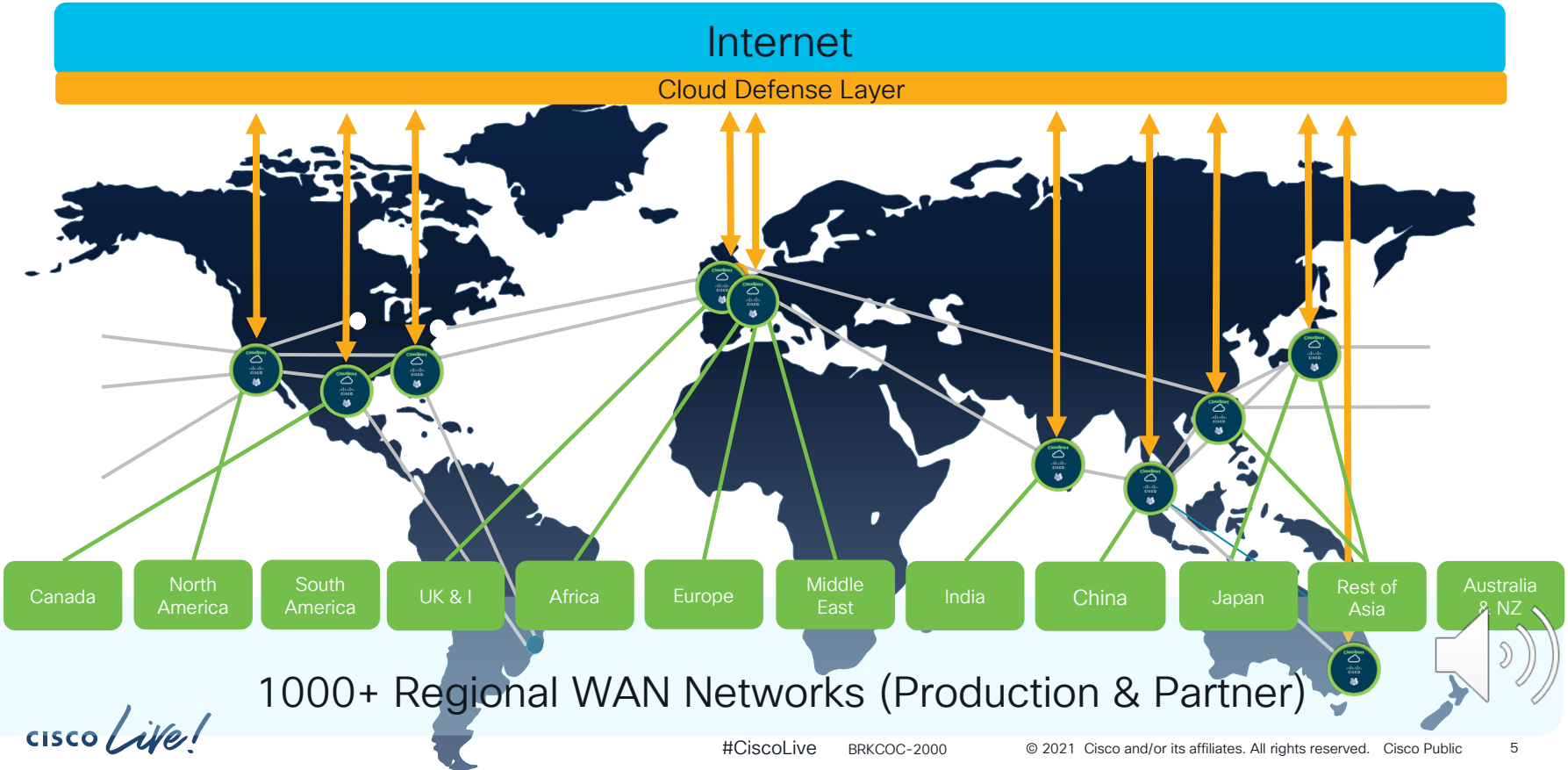
Global Enterprise Network



1000+ Regional WAN Networks (Production & Partner)

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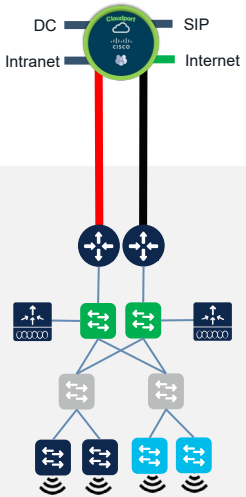
Campus, Branch, Home & Mobile

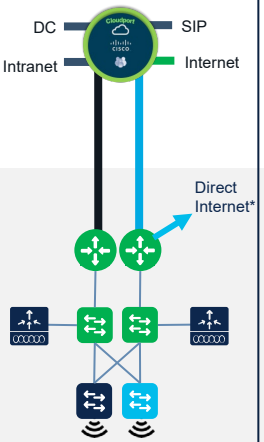
Private line circuit
MPLS L2VPN
Dedicated Internet Access
Landlord Internet Access
Home broadband

High Cost/High SLA ⟵ ⟶ Low Cost/Low SLA

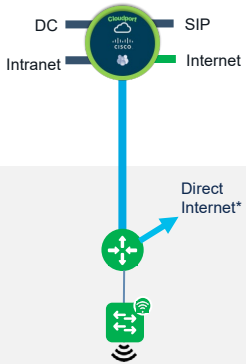
Priority / Campus "Platinum"
TAC/24x7 Contact Centre/CCIE Lab/IT DC/CBC/Campus



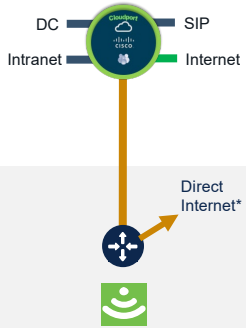
General Business "Gold"
Regional TAC/Regional head office/Eng. DC/Innovation center



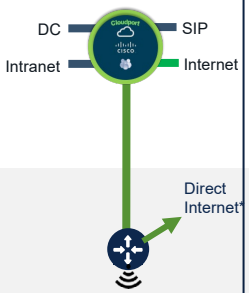
Small Office "Silver"
Non-critical functions Occasional customer visit



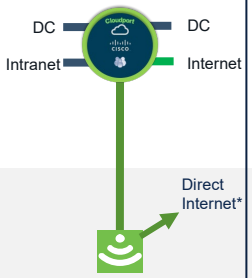
Business-Ready "Bronze"
Light weight/Service Office



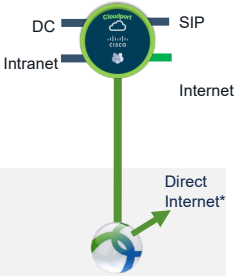
Home / CVO
Power home user OR 100% remote



Home / MVO
Regular home user



AnyConnect
Mobile Software VPN service



*Direct Internet for Infosec approved Cloud apps

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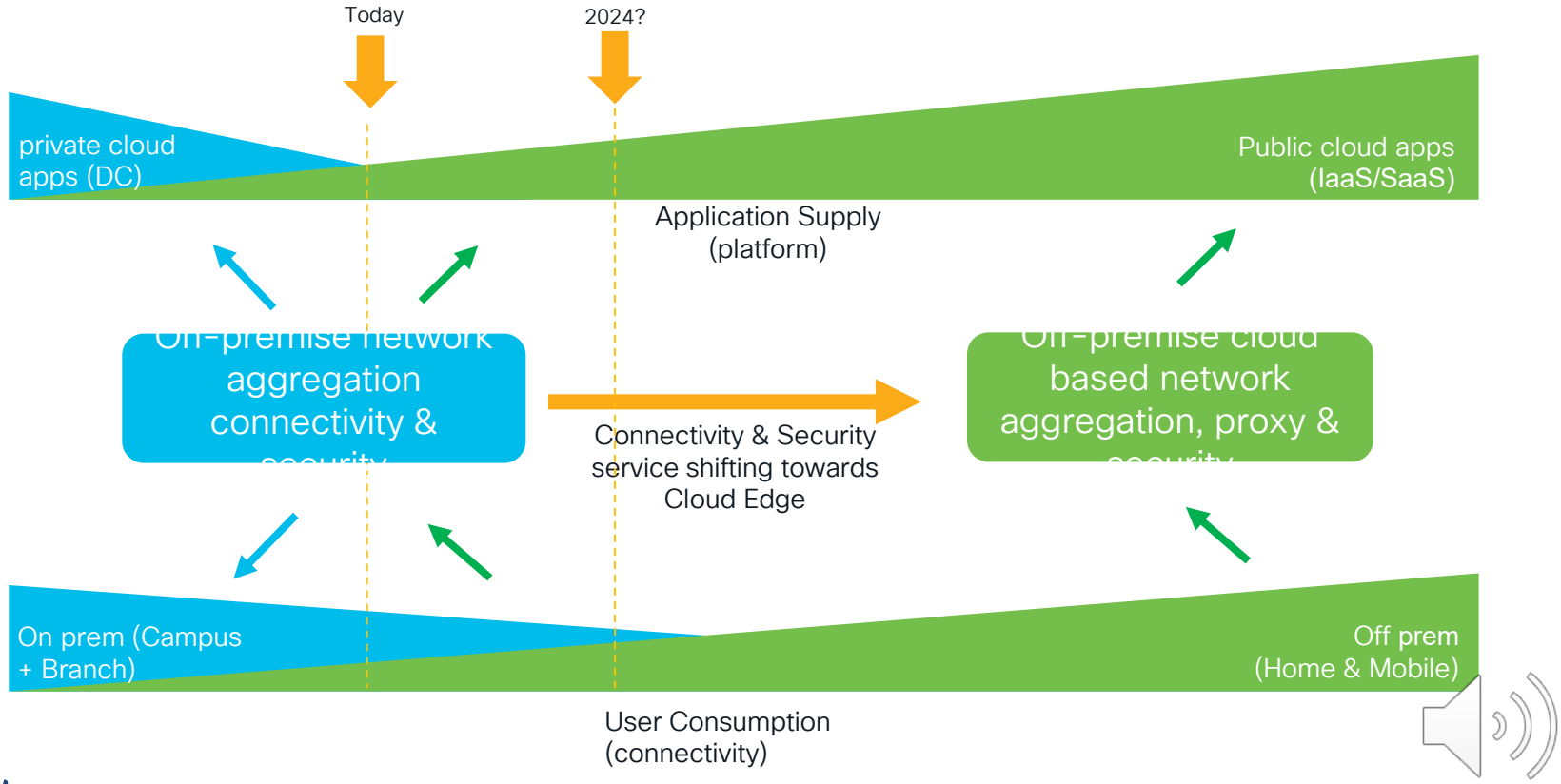
Trend for traffic flow



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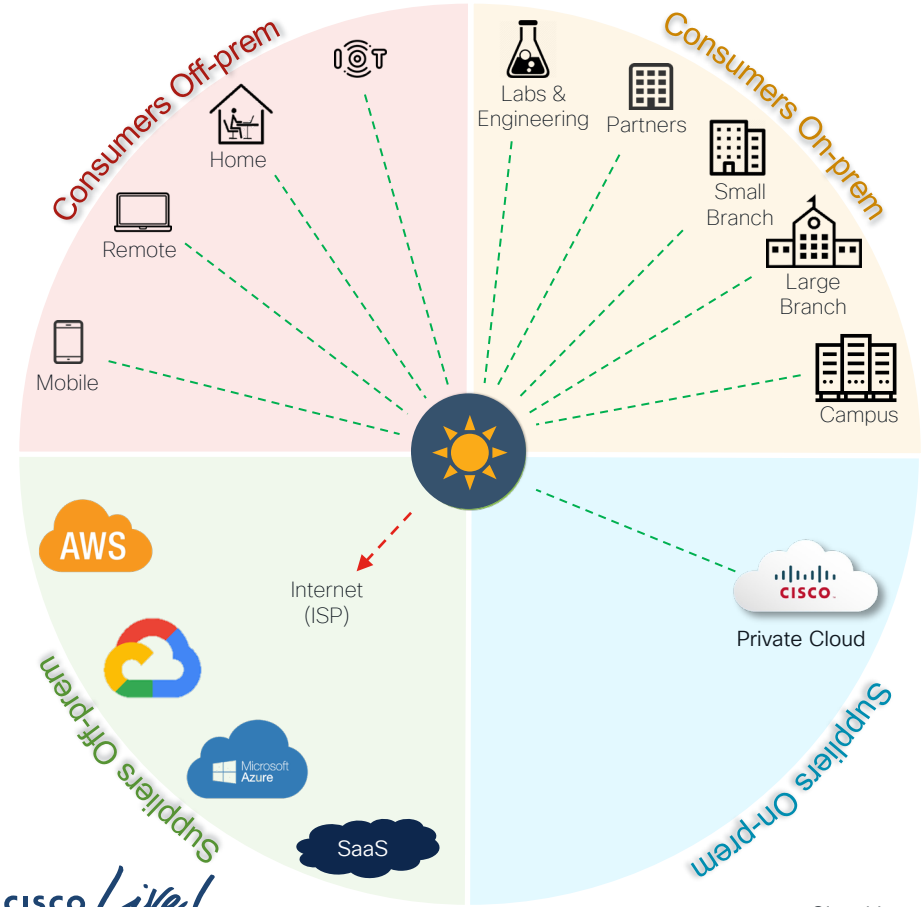
Traditional connectivity model



Traditional State (pre 2011-12)

- All consumer connections anchored & secured through central aggregation point
- Traffic profiles: Internet bound via ISP, Private DC bound via private global network
- Security services such as Firewall, Intrusion Detection & Prevention services are centralised
- Policy management is relatively easy
- Is it ready for the world of cloud?

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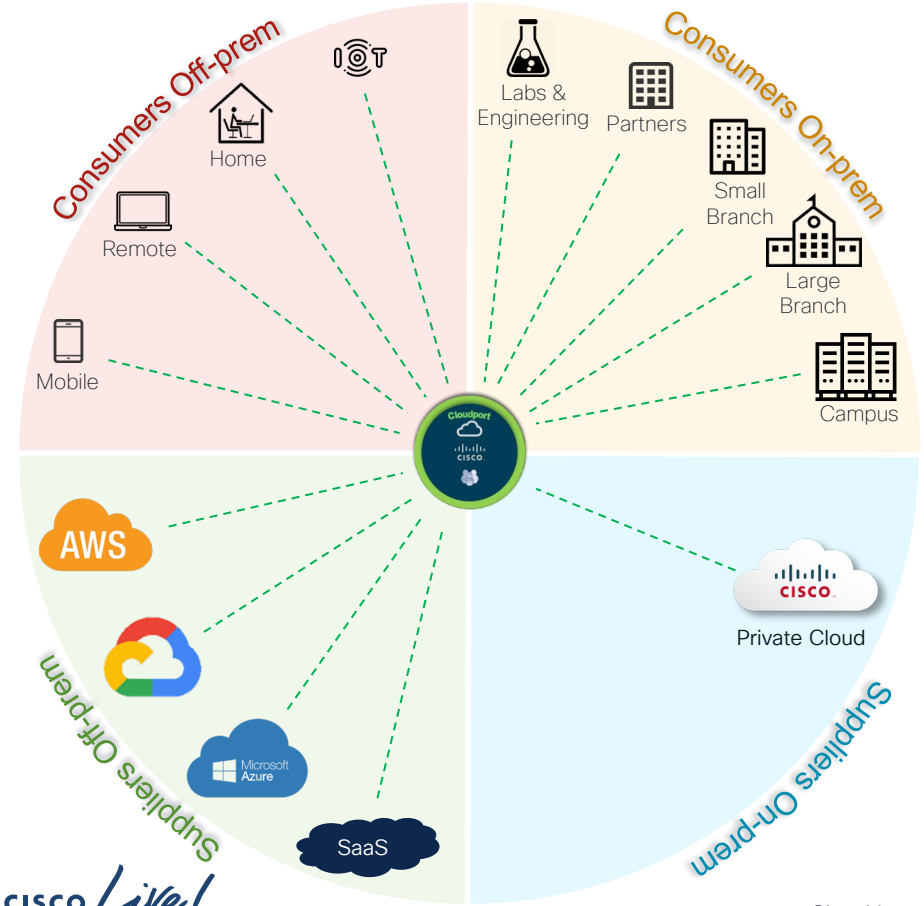
Transforming cloud connectivity: Cloudport

Public Internet path (Application VPN)
Private Intranet path (Full VPN)



2012-18: transition to Cloudport

- Cisco IT invests hosting our aggregation & security services in a number of Carrier Neutral Facilities round the world which we brand internally as Cloudport
- Network team starts establishing direct peering (IX) connections with major cloud providers
- Direct Internet peering with major IaaS, SaaS providers means we have offloaded around 30% of Internet bound traffic

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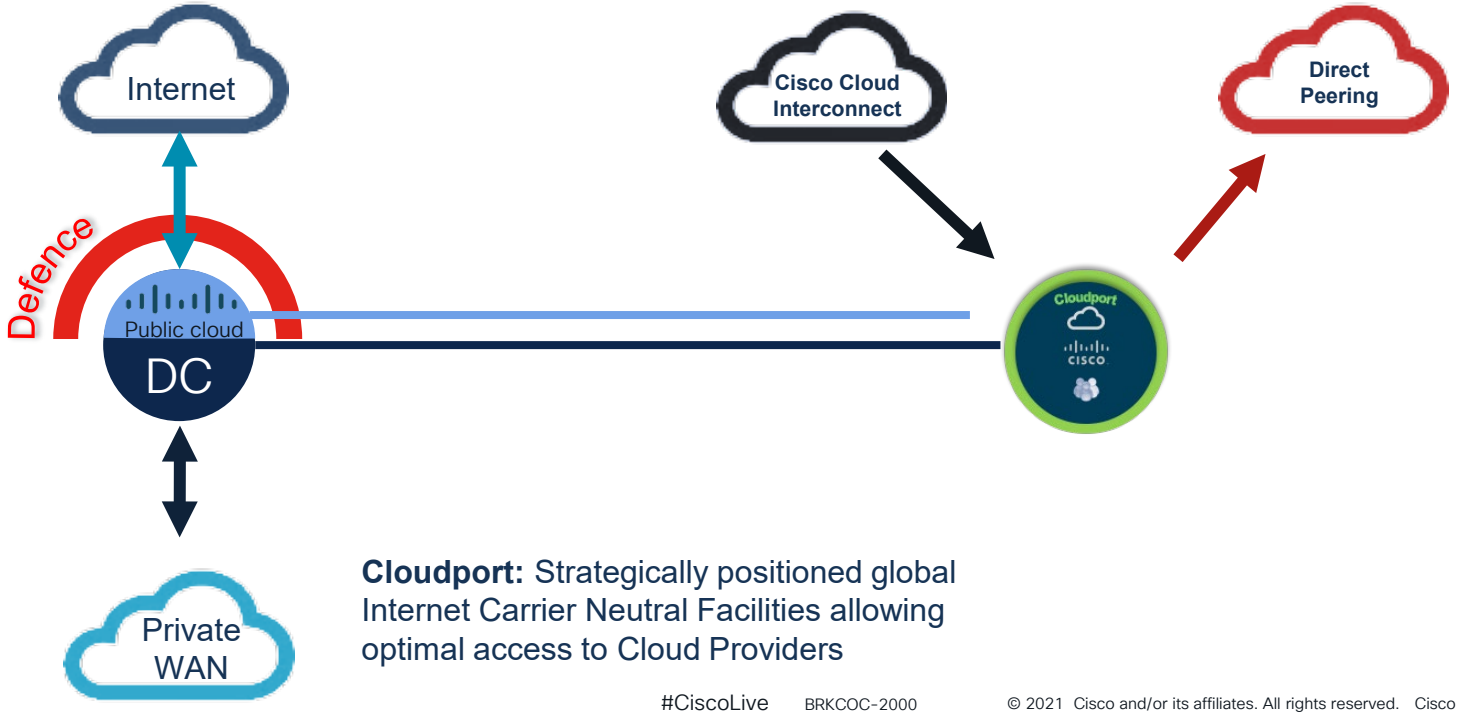
Internet Applications

Inbound Cloud Connectivity

Outbound SaaS Connectivity



Cloudport: Strategically positioned global Internet Carrier Neutral Facilities allowing optimal access to Cloud Providers

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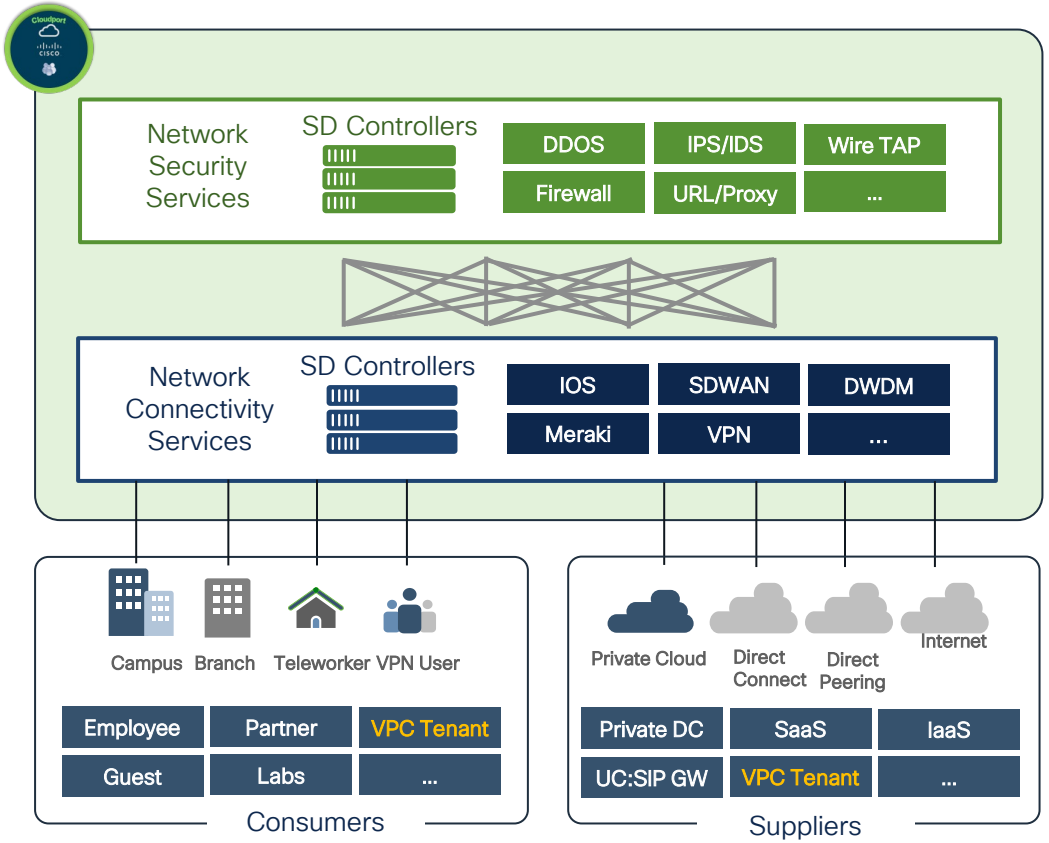
Cisco IT – CloudPort



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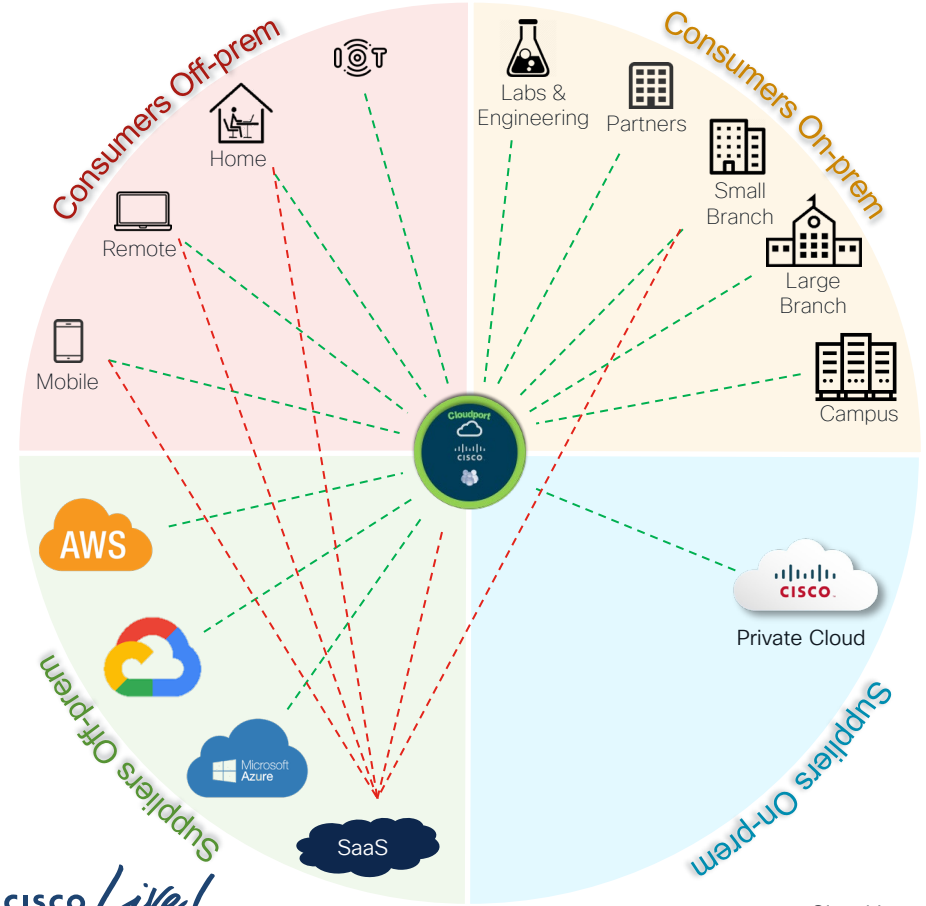
Maturing towards direct internet access

Public Internet path (Application VPN)
Private Intranet path (Full VPN)



2020: Current state

- End user device management & improved posture checking means trusted users/devices are able to reach some SaaS applications without pivoting through Cloudport facility
- Use of split-tunnelling technologies to access SaaS apps such as MS O365 on home and remote devices accelerates through pandemic
- SDWAN technologies have enabled offload of some SaaS applications directly from branch office

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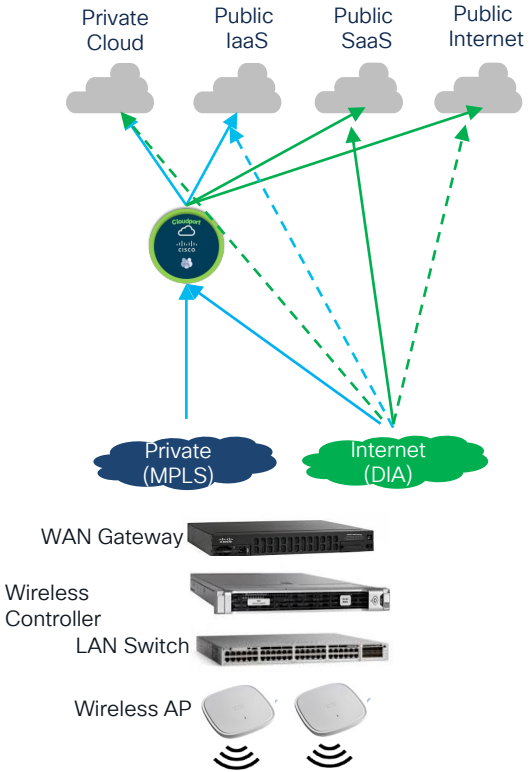
Network Private Line/VPN
No Network VPN
Anticipated flow in future

Business drivers and technology



- Private Cloud fronted by reverse proxy (Duo Gateway)
- Trusted Cloud Applications (SaaS)
- VPC tenant access (Labs/Engineering moving to Cloud)
- Public Internet (Endpoint security)

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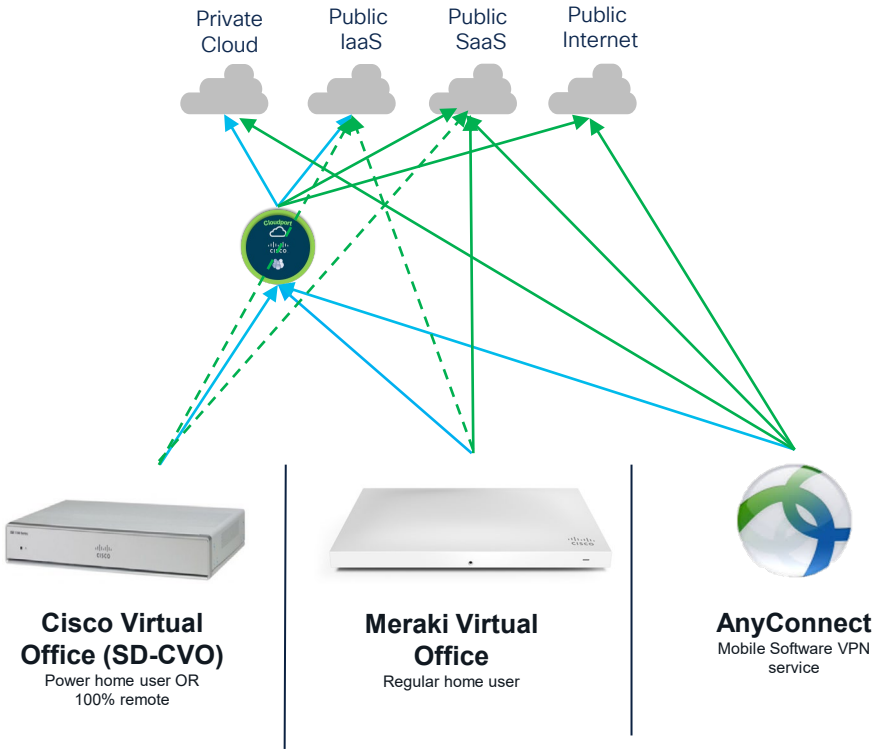
Same story for remote users

Network Private Line/VPN
No Network VPN
Anticipated flow in future



AnyConnect inside Cisco today:

- Integrated with Umbrella
- AMP Malware Protection
- Posture detection
- Netflow Security monitoring
- Split-tunnelling

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Bandwidth Optimizations

- Split Tunneled Apps Now
  - Cisco TV
  - Microsoft Updates
  - Microsoft One Drive
  - Apple Download / Updates
  - iCloud
  - Box.com
  - Azure
  - Sharepoint
  - O365

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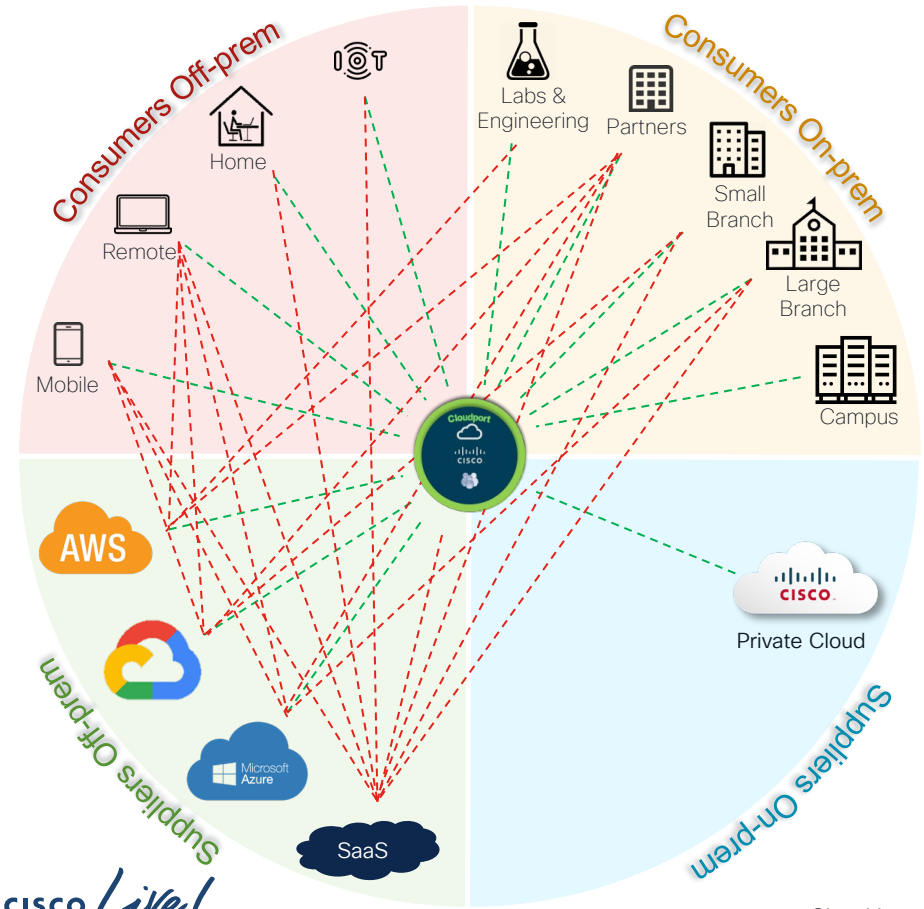
Direct internet access

Public Internet path (Application VPN)
Private Intranet path (Full VPN)



2021-23: Do nothing

- Unchecked we start seeing more & more use of split-tunnelling of Internet bound traffic
- Centralised security model starts to break down as policy needs to be managed on edge/user devices
- Value case for traditional Cloudport model starts to diminish as consumers increasingly use direct internet access to reach Public Cloud applications

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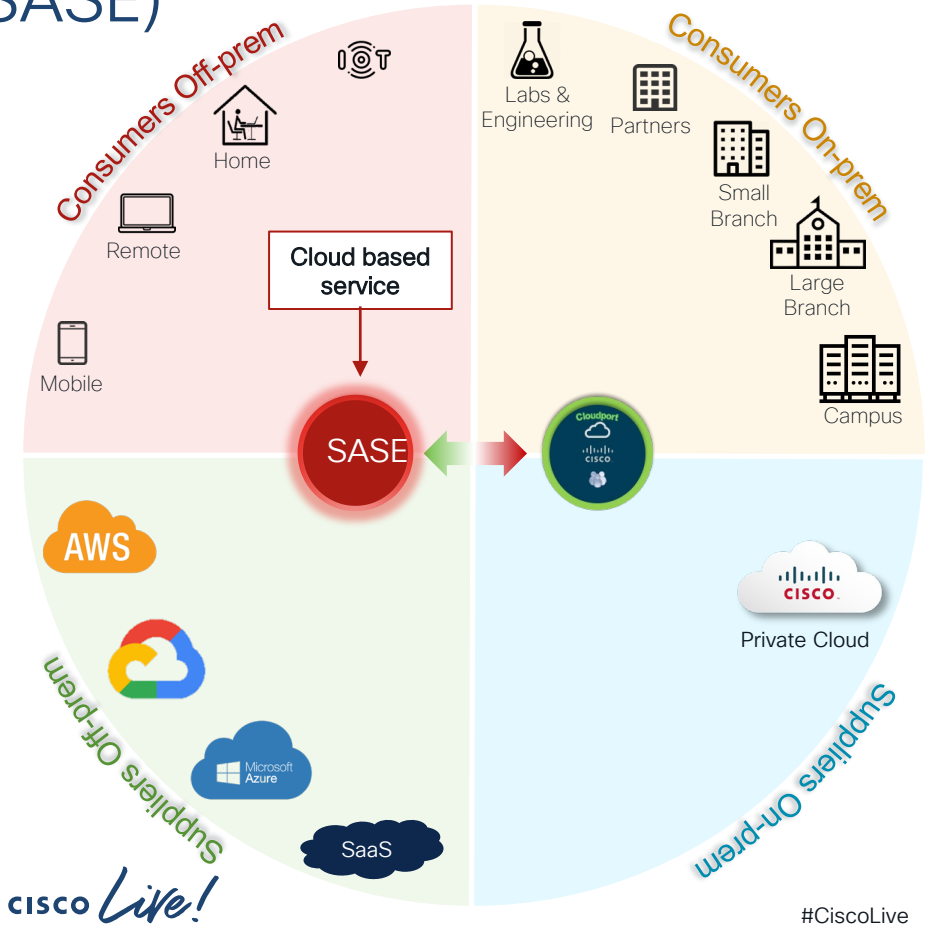
Emergence of Secure Access Service Edge (SASE)

Public Internet path (Application VPN)
Private Intranet path (Full VPN)



2020: Industry re-think

- It's clear that a new Cloud based network edge is required, one that is positioned closer to public IaaS/SaaS applications
- Gartner coins the term SASE (Secure Access Service Edge), which is essence is cloud based aggregation + security IaaS service
- Network vendors position their services to cater for this need. Cisco uses the term NaaS (Network as a Service) to describe this new offering

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Gartner: Secure Access Service Edge (

SWG: Secure Web Gateway
CASB: Cloud Access Security Broker
ZTNA: Zero Touch Network Access
FWaaS: Firewall as a Service
RBI: Remote Browser Inspection
WAAPaaS: Web Application and API as a Service

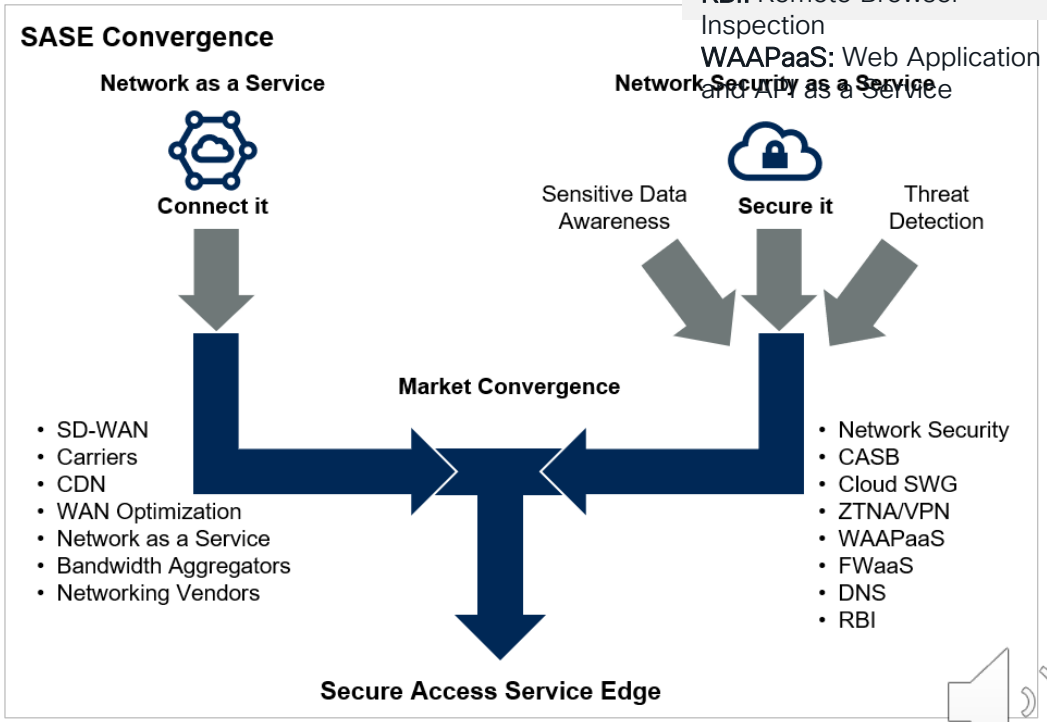
Convergence of networking and security services including SWG, CASB, DNS protection, firewall-as-a-service, SD-WAN, and zero trust network access

Benefit rating:
Transformational

Market penetration:
Less than 1% of target audience

Maturity:
Emerging

Gartner, The Future of Network Security Is in the Cloud, Neil MacDonald, Aug 30, 2019



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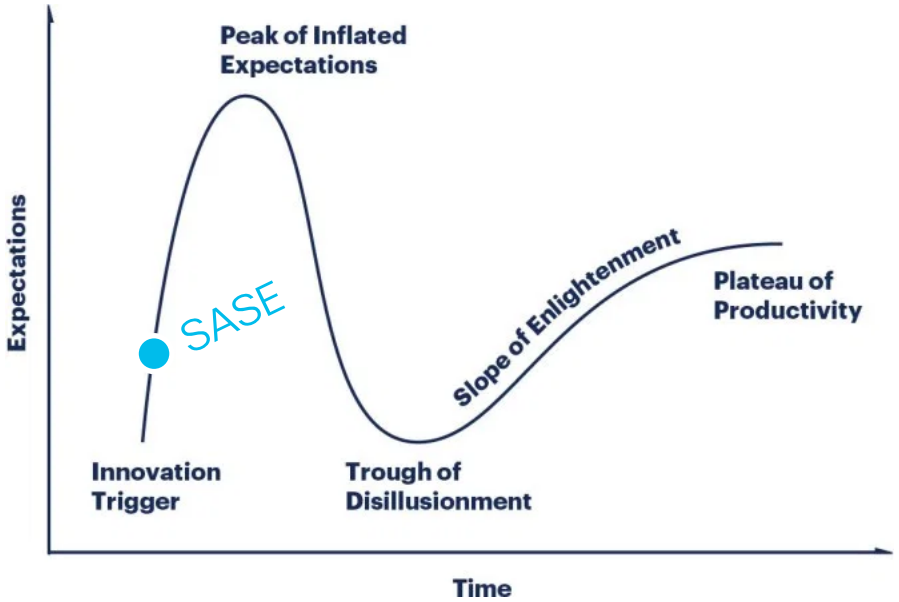
The SASE approach is gaining momentu

SWG: Secure Web Gateway
CASB: Cloud Access Security Broker
ZTNA: Zero Touch Network Access
FWaaS: Firewall as a Service



By 2023

20% of enterprises will have adopted SWG, CASB, ZTNA and branch FWaaS capabilities from the same vendor up from <5% in 2019.

By 2024

At least 40% of enterprises will have explicit strategies to adopt SASE, up from <1% at year-end 2018.

Gartner, Hype Cycle for Enterprise Networking, Andrew Lerner, July 9, 2019

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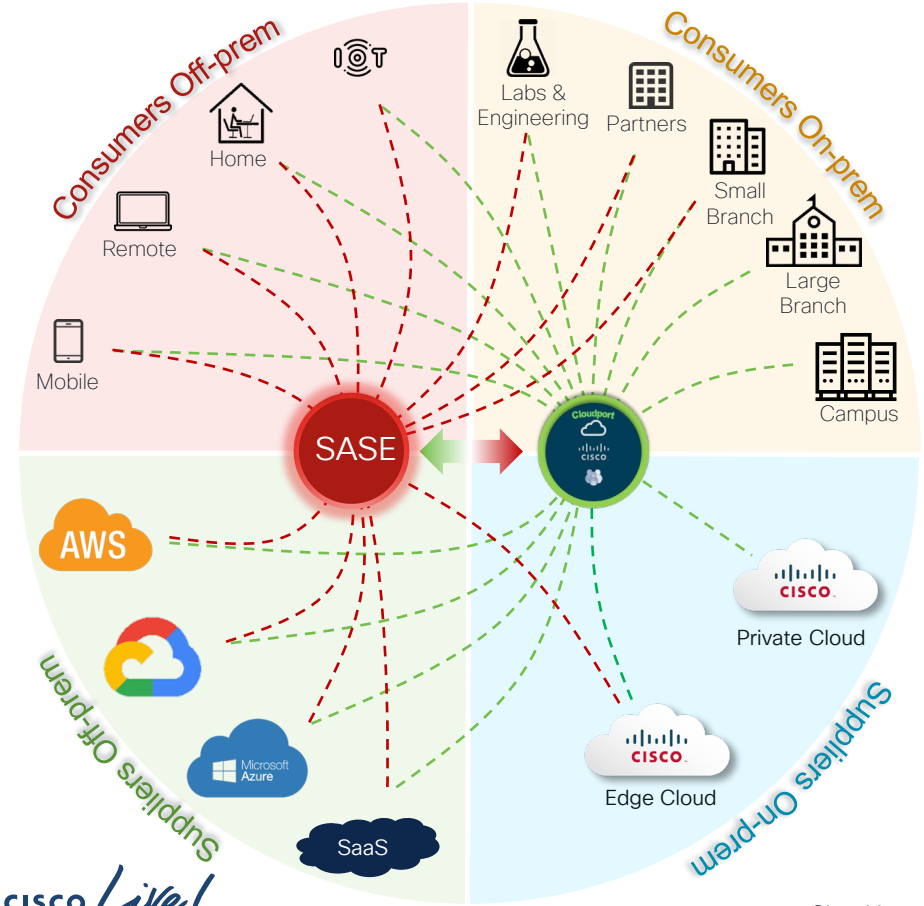
Cloud optimised direct internet access

Public Internet path (Application VPN)
Private Intranet path (Full VPN)



2021-23+: Future state

- As with the early Cloudport strategy, we start to pivot Consumer connections through a NaaS type service
- Some examples of a SASE service are Cisco Umbrella DNS protection and Secure Internet Gateway
- Cloudport facilities still exist to cater for Consumers and Providers whom have significant on-net traffic profiles
- New architecture provides highest level of flexibility in positioning of Private/Public workloads

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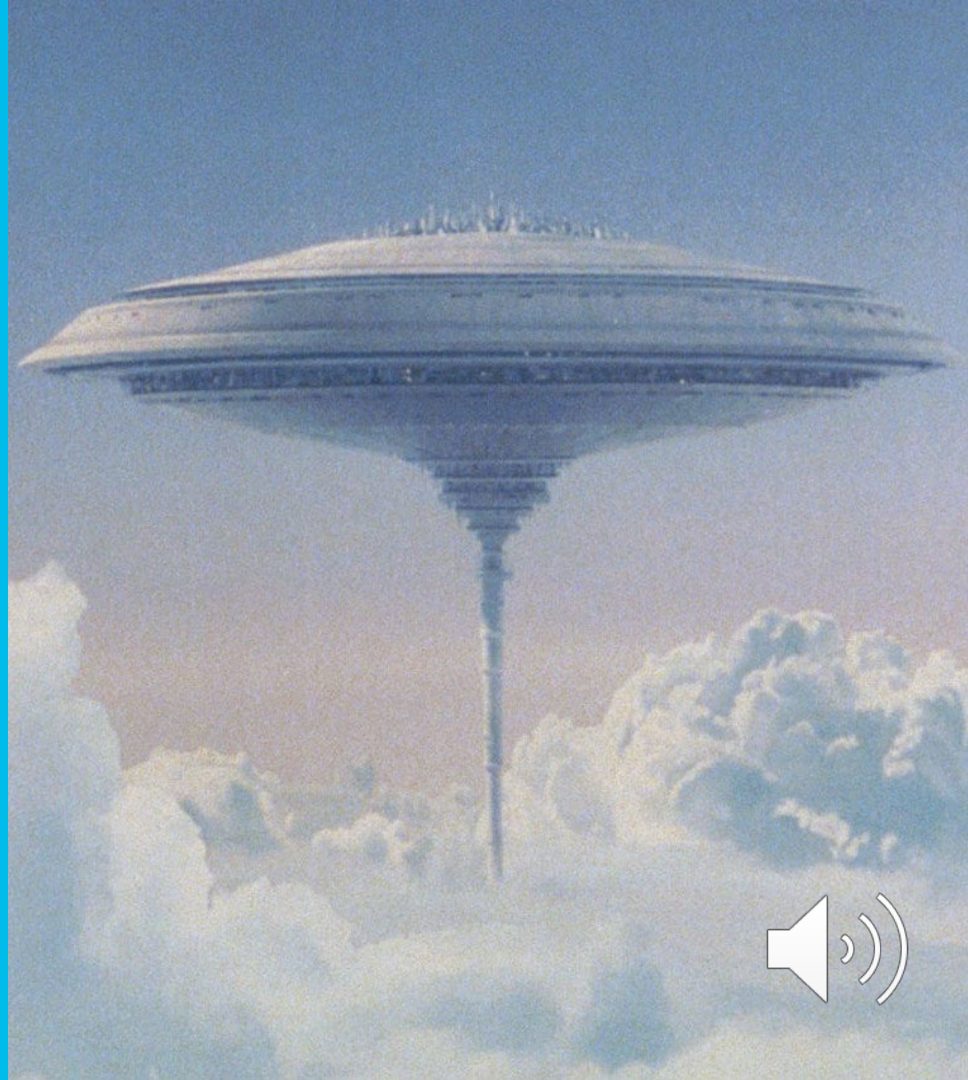
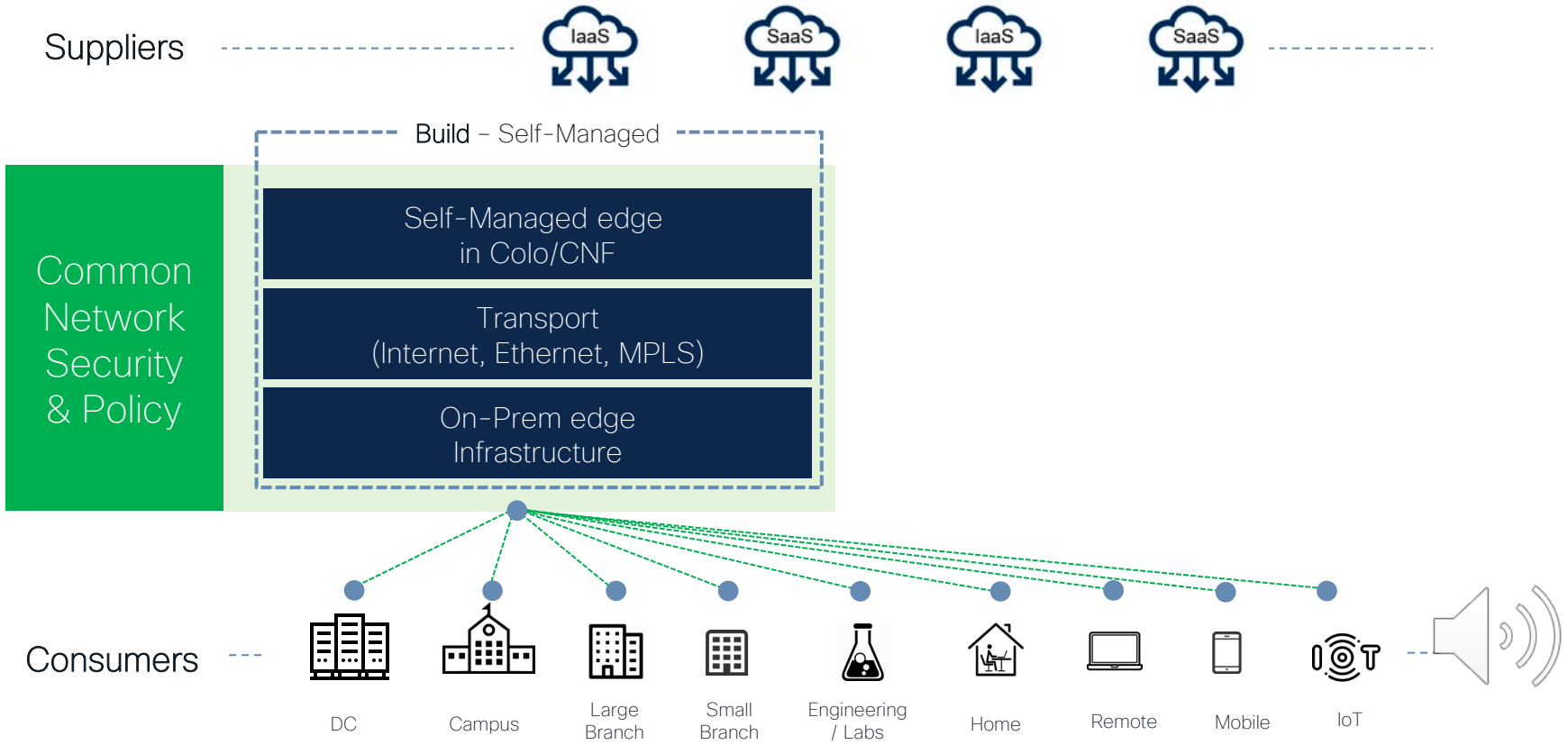
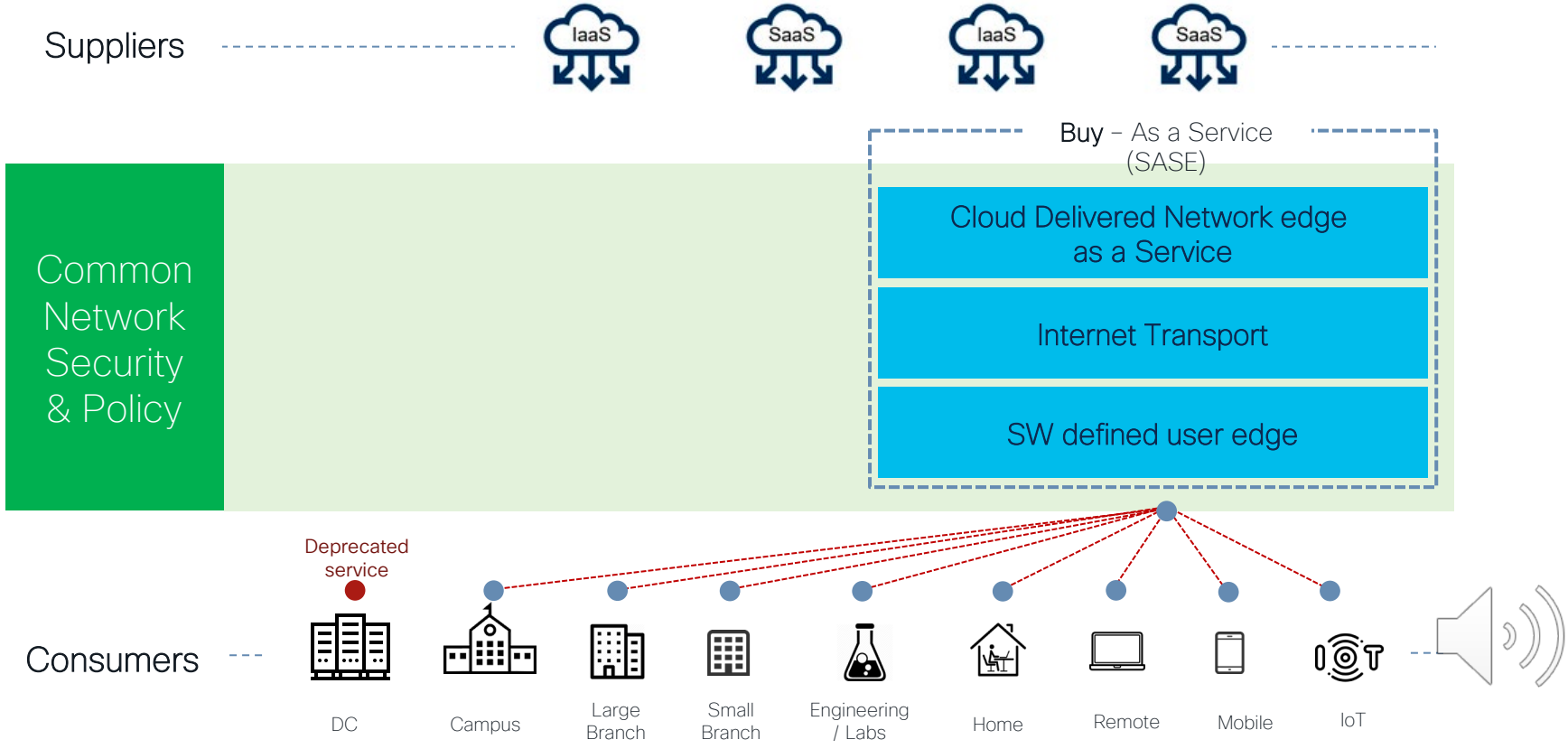
Conclusion



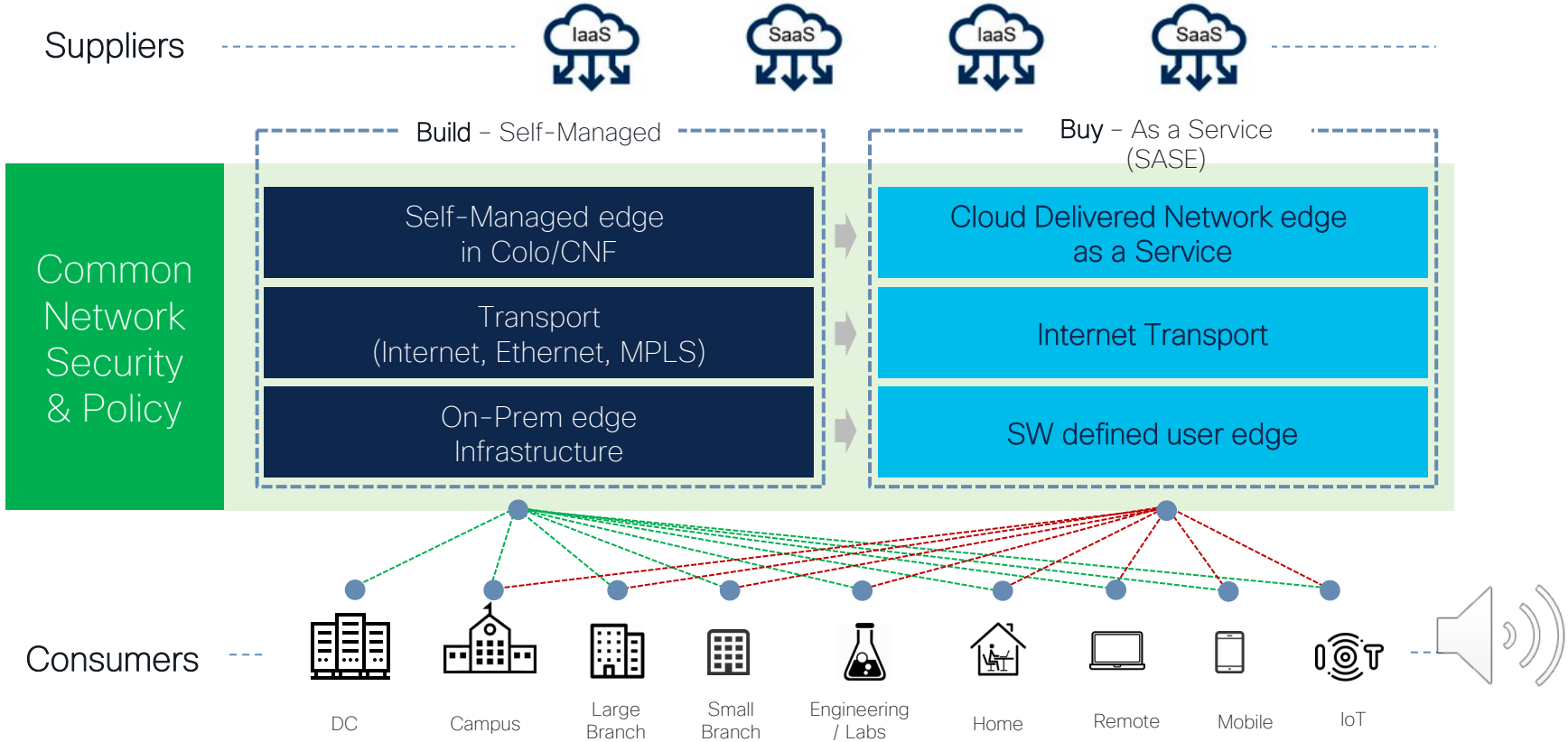
Build it yourself, self managed



Buy as a Service, assumes cloud all in



Choice between build and/or buy



The bridge to possible

Thank you

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