



# Architecting Private 5G

For Resiliency, Security, and Enterprise Network  
Convergence

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BRKSPM-2042


CISCO *Live!*

# Agenda

- Cisco Private 5G Introduction
- Architecture Deep-Dive
- Enterprise Integration
- Summary

# What's in it for me?

1. Understand what is private 5G and why it is important?
2. How to build resilient and secured P5G service?
3. Unified tools across Wi-Fi & P5G
  - P5G becomes access technology adjacent to Wi-Fi



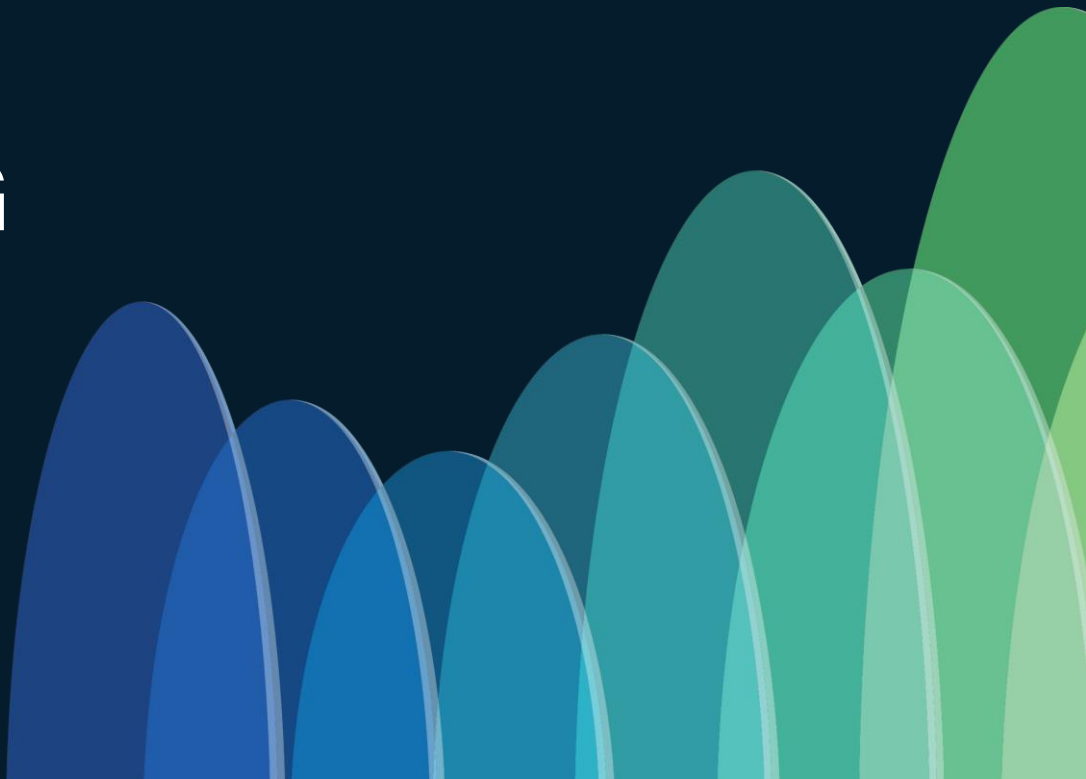
# Continue your education

This presentation  
assumes knowledge about:

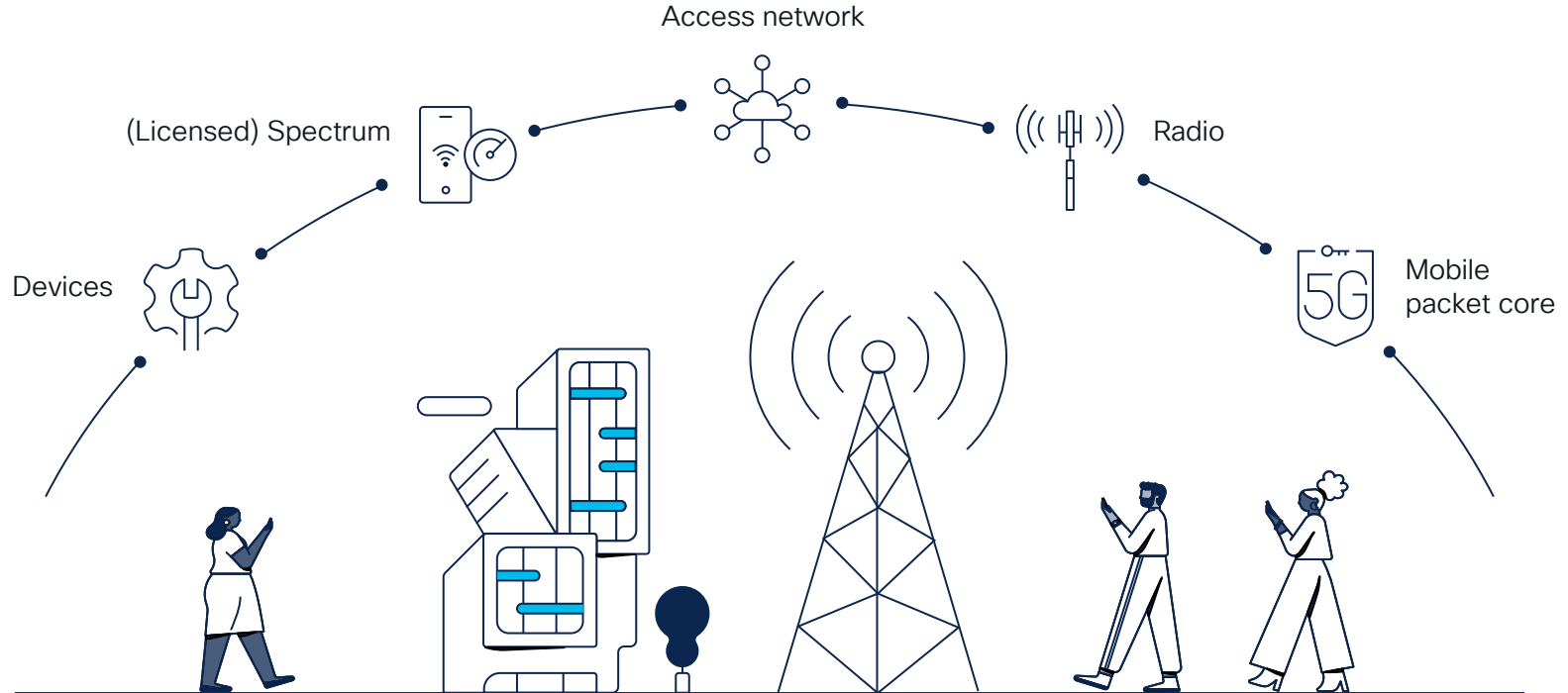
- Introductory knowledge of Private or Public 5G
- Introductory knowledge about Cisco Enterprise Portfolio primarily ISE, Umbrella, ThousandEyes, QoS.

# Cisco Private 5G

## Introduction

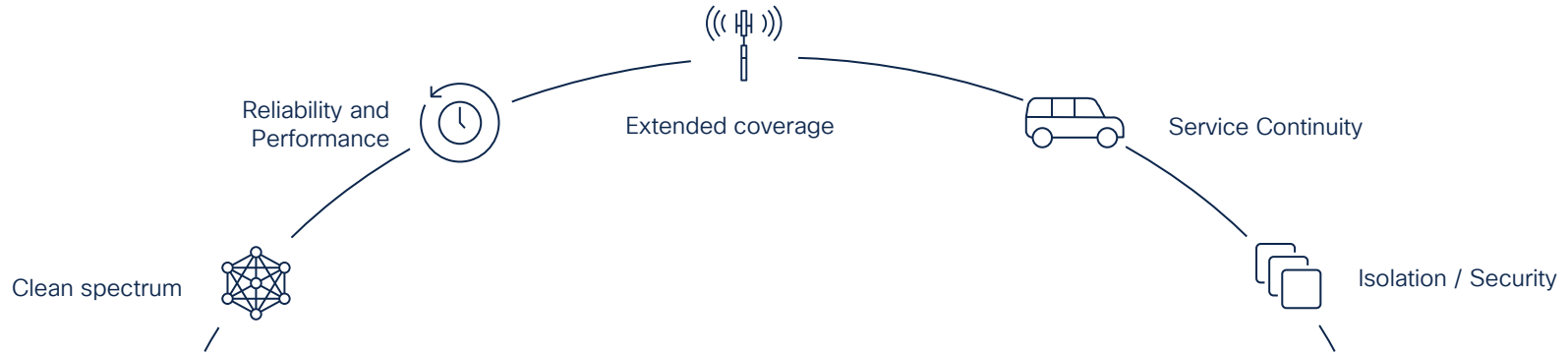


# What is Private 5G?



A private cellular network that is built using 3GPP 5G technology, dedicated to carrying traffic from a specific entity (e.g., an enterprise) in licensed radio spectrum

# Customer needs and use case sweet spots



## Industrial and manufacturing

- Precision robotic control
- High speed SW downloads
- Smart tools
- Industrial Connectivity (Profinet)



## Distribution and warehouses

- AGVs and driverless vehicles
- Automated conveyance
- Distribution line automation



## Ports, hubs and energy

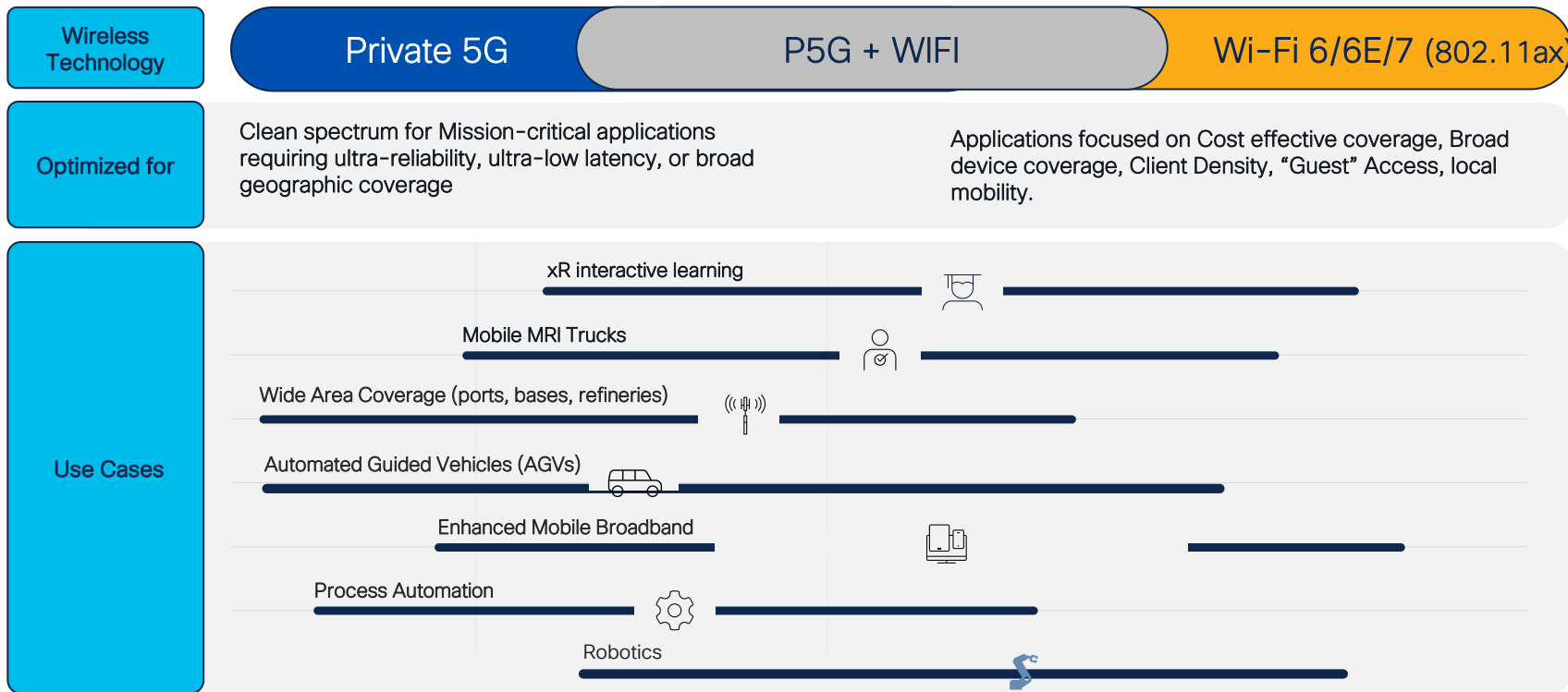
- Video surveillance
- Push-to-talk
- Unmanned autonomous vehicles
- Data offload
- Remote Expert



## Venues

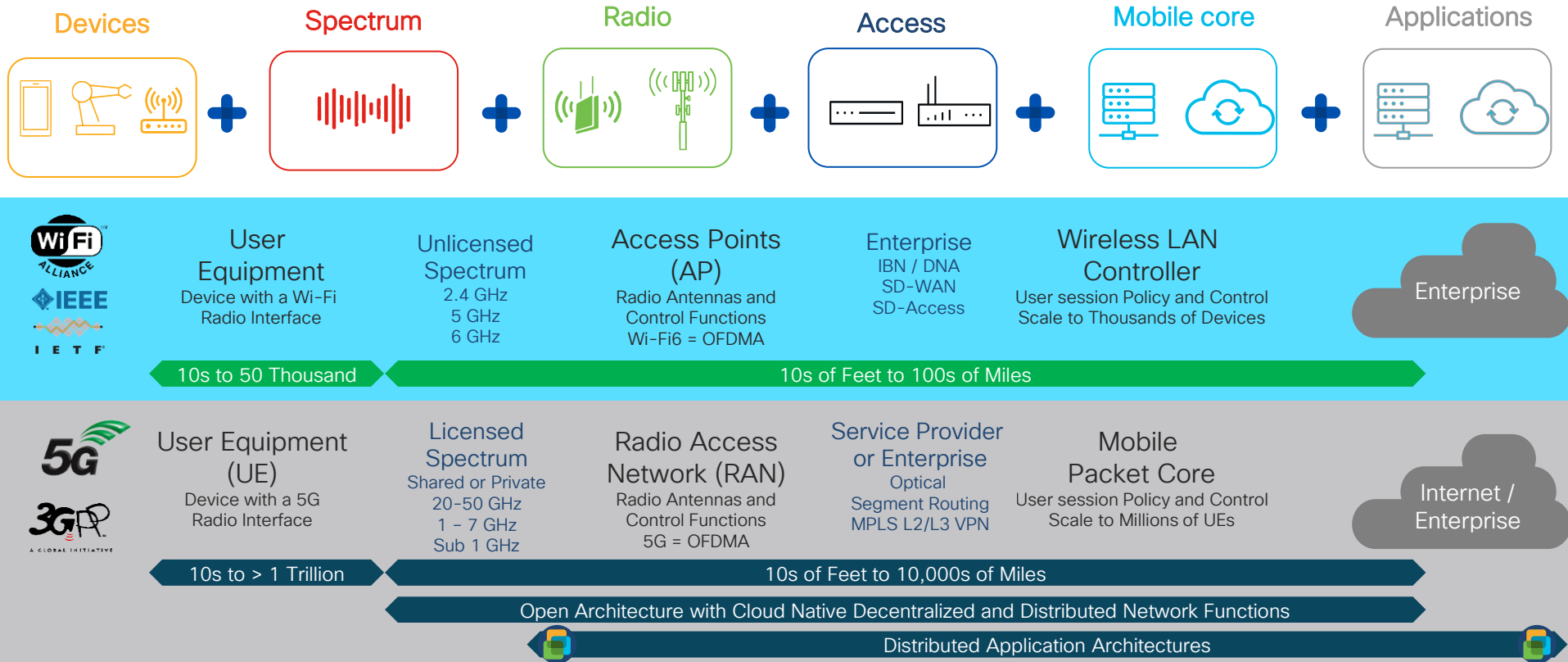
- Efficient and reliable backhaul for Wi-Fi-connected endpoints
- Clean spectrum for venue operators
- Mission-critical broadcasts
- Security & Video surveillance

# Private 5G and Wi-Fi 7 are complementary

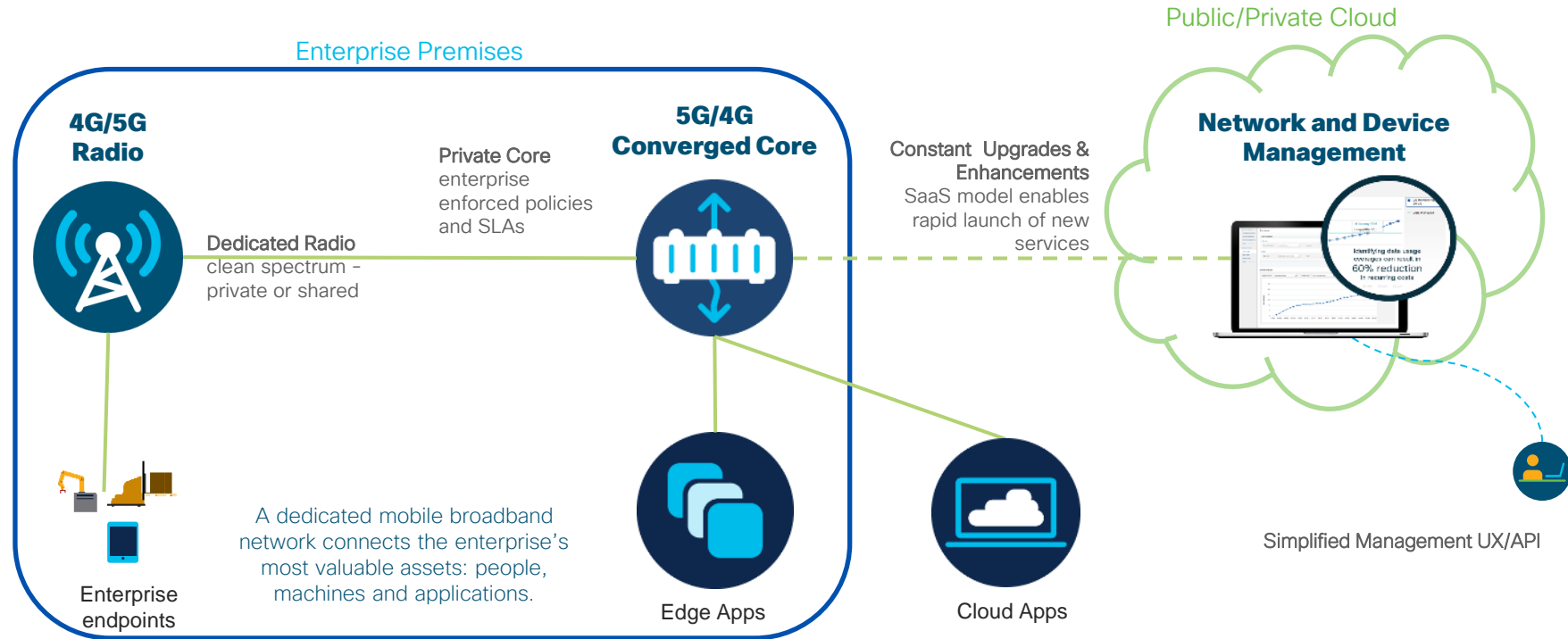




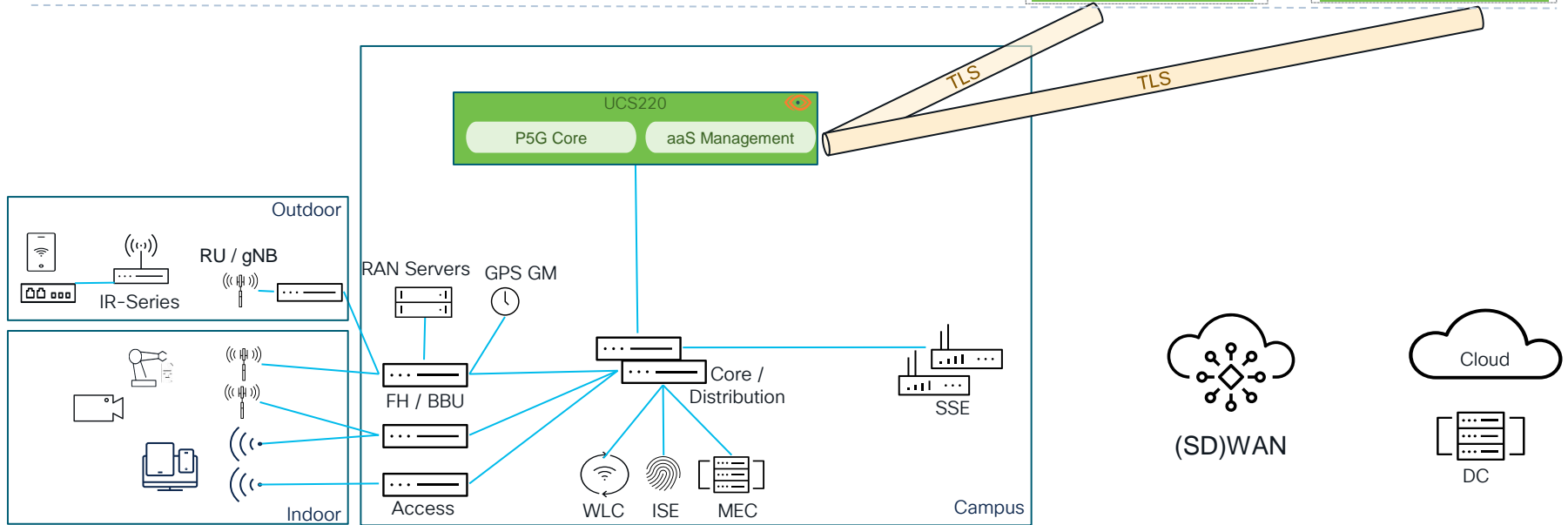
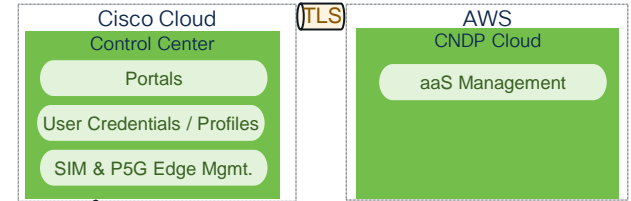
# Wi-Fi and 5G Comparable Architectures



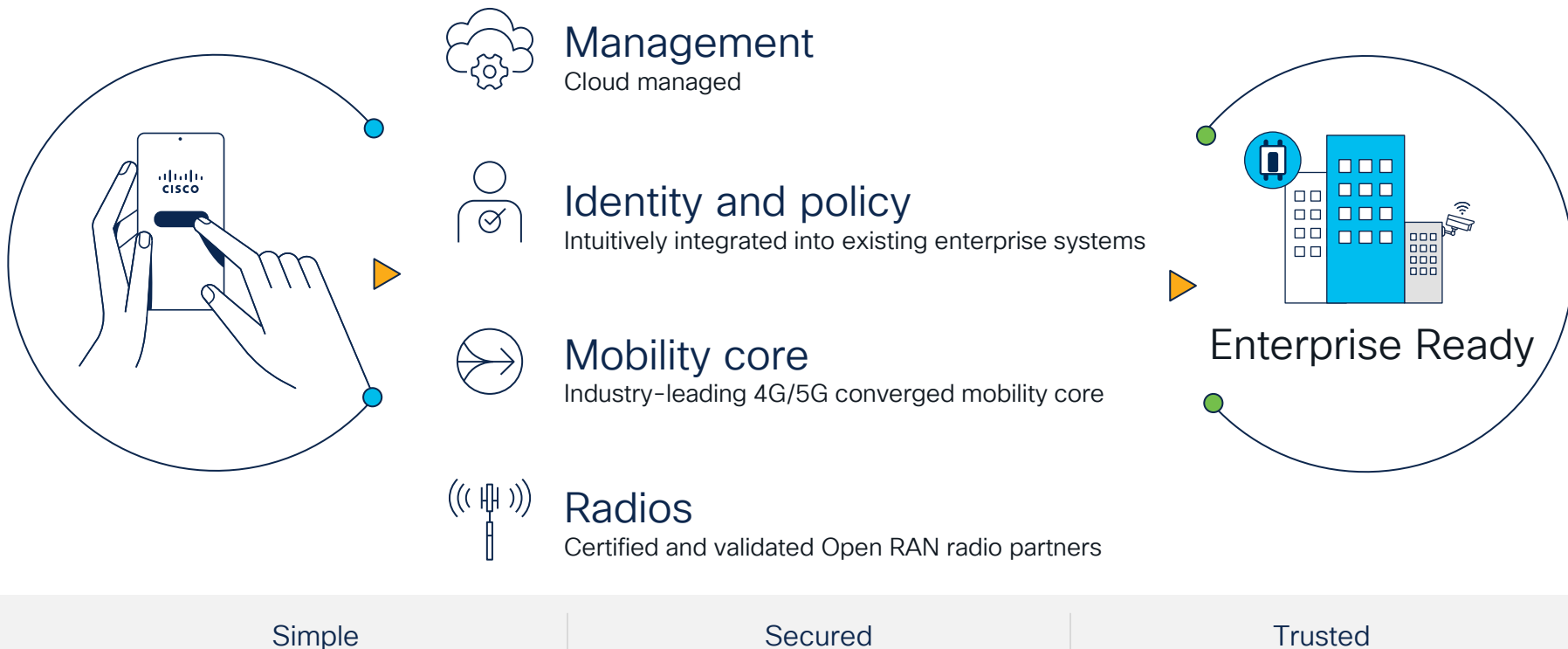
# Cisco's Private 5G Architecture



# The Cisco P5G High-Level Architecture



# Private 5G solution



# Cisco Private 5G

## What's included

### High-performance edge



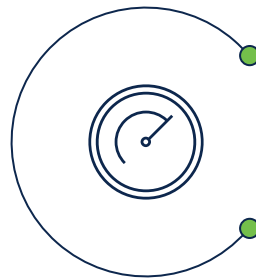
- Compact mobile core
- Fully integrated with enterprise switches and routers
- Integrated identity and security
- 3GPP release support

### Enterprise dashboard



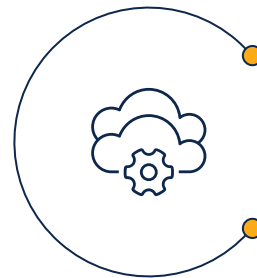
- UX for customer onboarding and for management by customer or partner
- APIs for automation and enhanced services

### Reliable operations



- 24x7 support
- SLA assurance
- Software and firmware for edge equipment
- New feature content

### Cloud-managed service



- Packet core management
- Subscriber (SIM) management and authentication
- Monitoring and alerting of service/solution

Comprehensive 5G solution delivered with enterprise simplicity

# P5G is part of one platform for Mobile services

powered by cloud and SaaS

## Markets

Enterprise

SoHo/SMB

Self Service Digital Enablement



Things/IoT ●  
(cars, assets, sensors)



Places/Business ●  
(remote/mobile workplace)



People/Workforce ●  
(business users on the go)

## Technology



Public Mobile Networks

- Data Core: 2G-5G
- Remote edge
- Voice core



Private Mobile Networks

- Private 5G edge

On-prem mobile core Packet core (SMF, UPF, PCF; 4G, 5G)

## Ecosystem, Architecture & Operation



API and Ecosystem  
● developers ● partner



Distributed Architecture



Digital Operation  
● AI/ML/Analytics  
Enterprise integrations



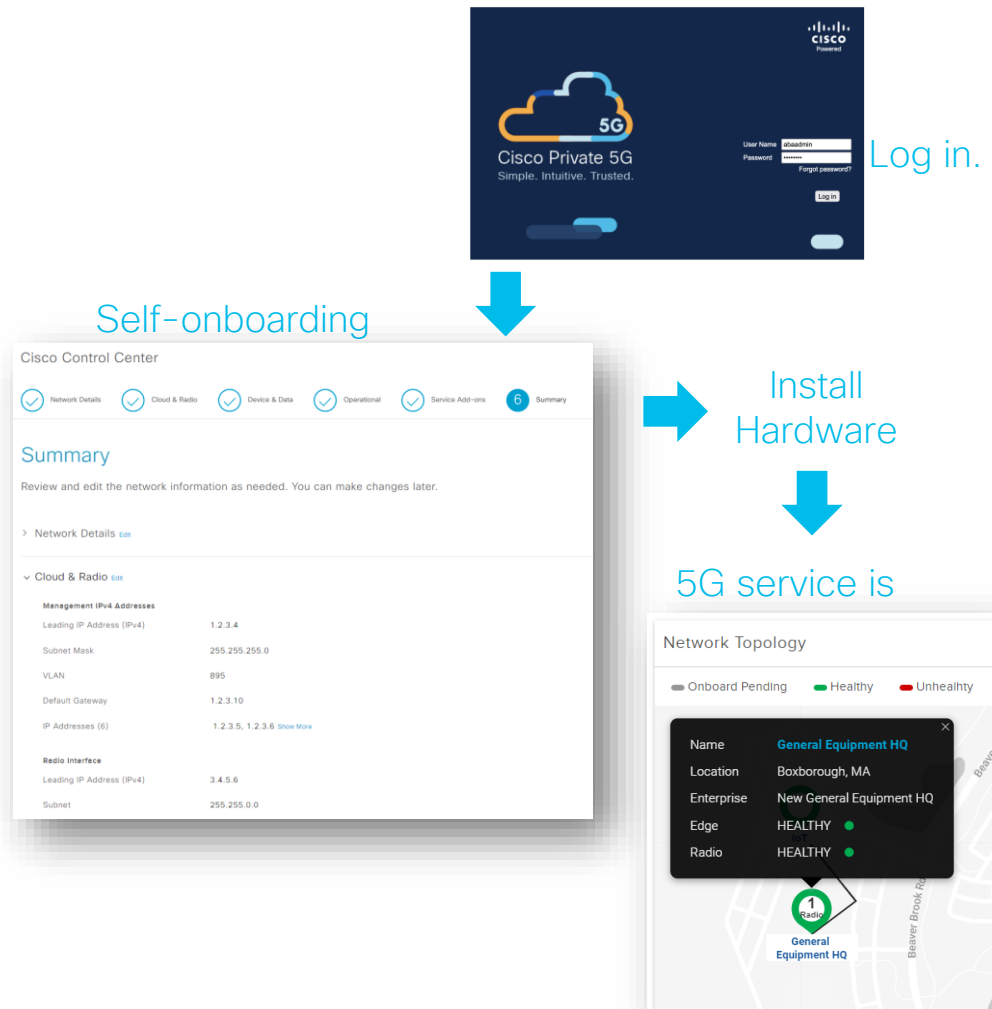
# Easy to Deploy



# Easy to Deploy


- Step-by-step Onboarding Wizard
  - Simplified configuration → Enterprise friendly
- Automated instantiation
  - Complete core network configuration → hours not days

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# Cisco Control Center – Edge Appliance Installation 1/5



Powered

Cisco Control Center

1

Network Details

2

Cloud & Radio

3

Device & Data

4

Operational

5

Service Add-ons

6

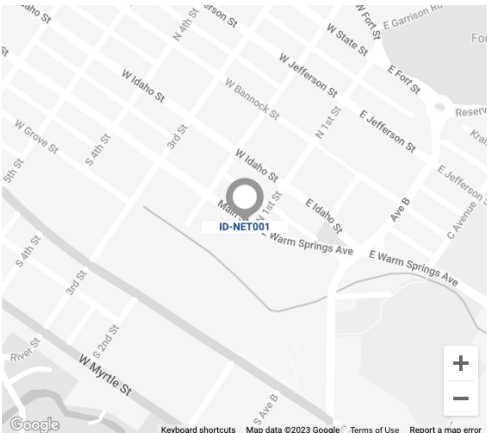
Summary

Dashboard

## Onboard Your Private 5G Network

Please confirm site name , location and choose deployment preference

Site Name* ID-NET001	Choose your deployment model* Standard (high availability)
Country* United States	Choose your hardware platform* Cisco UCS Server
Street Address 100 W Main St	
City* Boise	
State* Idaho	
Zip Code* 83702	



Keyboard shortcuts Map data ©2023 Google Terms of Use Report a map error


Exit


Save for later

Back

Next

# Cisco Control Center – Edge Appliance Installation 2/5

  
Powered



Dashboard

Cisco Control Center

✓ Network Details

2 Cloud & Radio

3 Device & Data

4 Operational

5 Service Add-ons

6 Summary

Configure connection between your core network, radios, and Control Center (cloud).

Management IPv4 ⓘ

First / Leading IP Address\*

1.2.3.4

Subnet Mask\*

255.255.255.0

VLAN\*

895

Default Gateway\*

1.2.3.10

> IP Addresses (6) [Copy](#)

Radio Interface ⓘ

First / Leading IP Address\*

3.4.5.6

Subnet Mask\*

255.255.0.0

VLAN\*

123

Default Gateway\*

3.4.5.10

> IP Addresses (7) [Copy](#)

PLMN ⓘ

MCC\*

999

MNC\*

40


Exit

Save for later

Back

Next

# Cisco Control Center – Edge Appliance Installation 3/5

  
Powered

Dashboard

Cisco Control Center

✓ Network Details

✓ Cloud & Radio

3 Device & Data

4 Operational

5 Service Add-ons

6 Summary

Configure connected devices to connect to your data networks.

APN/DNN Name\*  
Cisco\_P5G ⓘ

☒ IPv4 ☐ IPv6 ☐ Both

✓ Device Addresses

✓ Data Network Address

✓ DNS Address

Device Addresses ⓘ

Leading IP Address (IPv4)\*  
100.100.11

Terminating IP Address (IPv4)\*  
100.100.1.255

Subnet Mask (IPv4)\*  
255.255.0.0

This IP range provides for a maximum of 255 cellular device deployments at your premise.

+ Add Another Range


Exit


Save for later

Back

Next

# Cisco Control Center – Edge Appliance Installation 4/5

  
Powered

  
Dashboard

Cisco Control Center

✓ Network Details

✓ Cloud & Radio

✓ Device & Data

**4** Operational

5 Service Add-ons

6 Summary

Make sure your P5G network knows what time it is and won't interfere with the rest of your network.

NTP ⓘ

☒ FQDN ☐ Address ☐ Both

NTP FQDN\*

ntp.lab.test

INTERNAL ROUTING ⓘ

Non-routable Subnet (IPv4)\*

10.0.0.0/21

VLAN\*

900


Exit

Save for later

Back

Next

# Cisco Control Center – Edge Appliance Installation 5/5

  
Powered

Dashboard

Cisco Control Center

✓ Network Details

✓ Cloud & Radio

✓ Device & Data

✓ Operational

5 Service Add-ons

6 Summary

Service Add-ons

Do you want to enable service add-ons? ☐

Exit

Save for later

Back

Next

# Easy to Operate

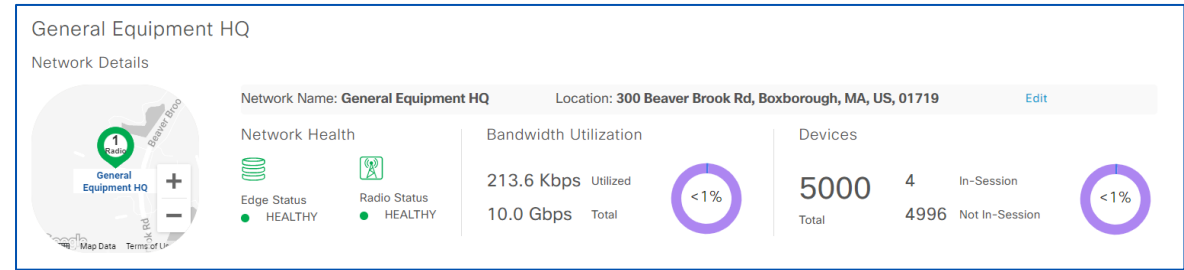


# Easy to Operate

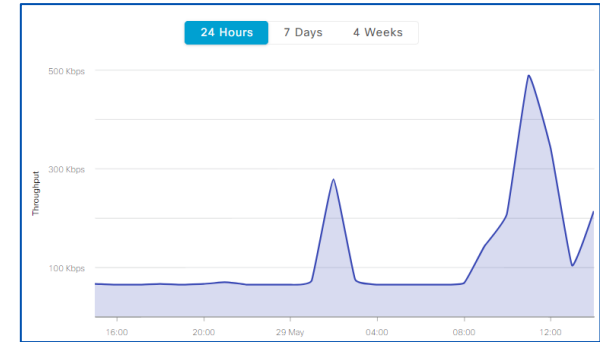
- Simple Device Management
  - Control SIM inventory
  - Create Device Groups
- Real Time Service Visibility
  - Core, Radio, Device views
  - Single and multi-tenant options

cisco *Live!*

## Holistic service visibility



## Time series views



ICCID, Modem ID, End Consumer ID, Cust

Filters

Actions	Date Added	ICCID	Device ID	Cycle to D
<input type="checkbox"/>	Jan 20, 2022 2:2...	8988216710013457264		
<input type="checkbox"/>		16710013457256		
<input type="checkbox"/>		16710013417185		
<input type="checkbox"/>		16710013457223		
<input type="checkbox"/>		16710013417177		

Performance

- View In Spotlight
- Run Diagnostics

SIM Management

- Change SIM Status
- Change Rate Plan

Inventory

- Activation Ready
- Activated
- Deactivated
- Retired

Service control and visibility at the SIM level

Diagnostics Run Test Again

Device Status	Congratulations! This device has successfully connected.		Passed	Provisioning	SIM state permits passing traffic.
ICCID	89525001019000021278		Passed	SIM / Device	SIM is allowed to use wireless network resources.
In Session	5G		Passed	Network Connection	Successfully connected to wireless network.
SIM Status	Activated		Passed	IP / Internet	Device has an IP Address and is currently connected.
SIM Barred	No				
Usage Limit Reached	No				
Rate Plan	BRK DMZ RP				
Cycle to Date Data (MB)	617038				

# SIM





# Easy to order :

New SIM Order

Requester Information

Contact Name  
(Required)

Email for Order Status Updates  
(Required)

filrodri@cisco.com

Contact Phone  
(Required)

Contact Fax

Order Information

Account Name

Cisco Sales Inventory Account

Account ID

100997913

SIM Type  
(Required)

Standard

OPN  
(Required)

Cisco-P5Gs-315010

Quantity  
(Required)

50

Shipping Information

☐ Account Default Shipping Address

Address Line 1

Address Line 2

City

State/Region

Country

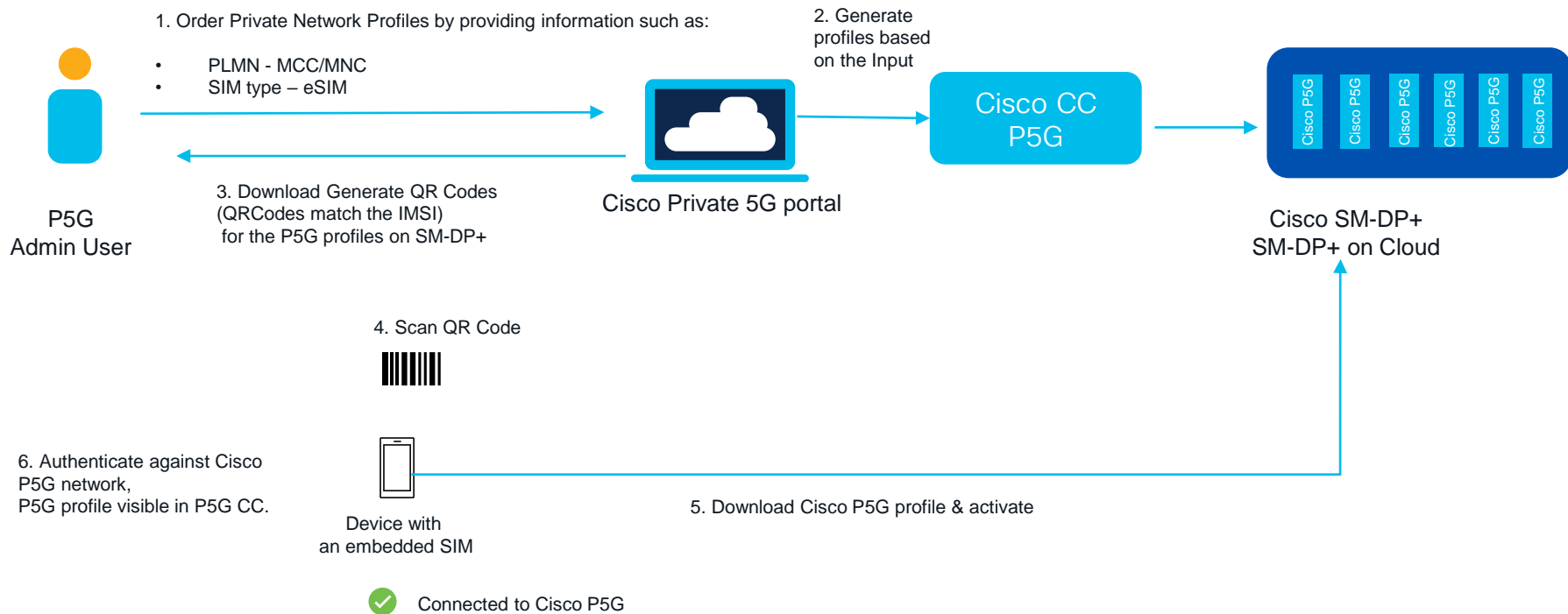
United States

Postal Code

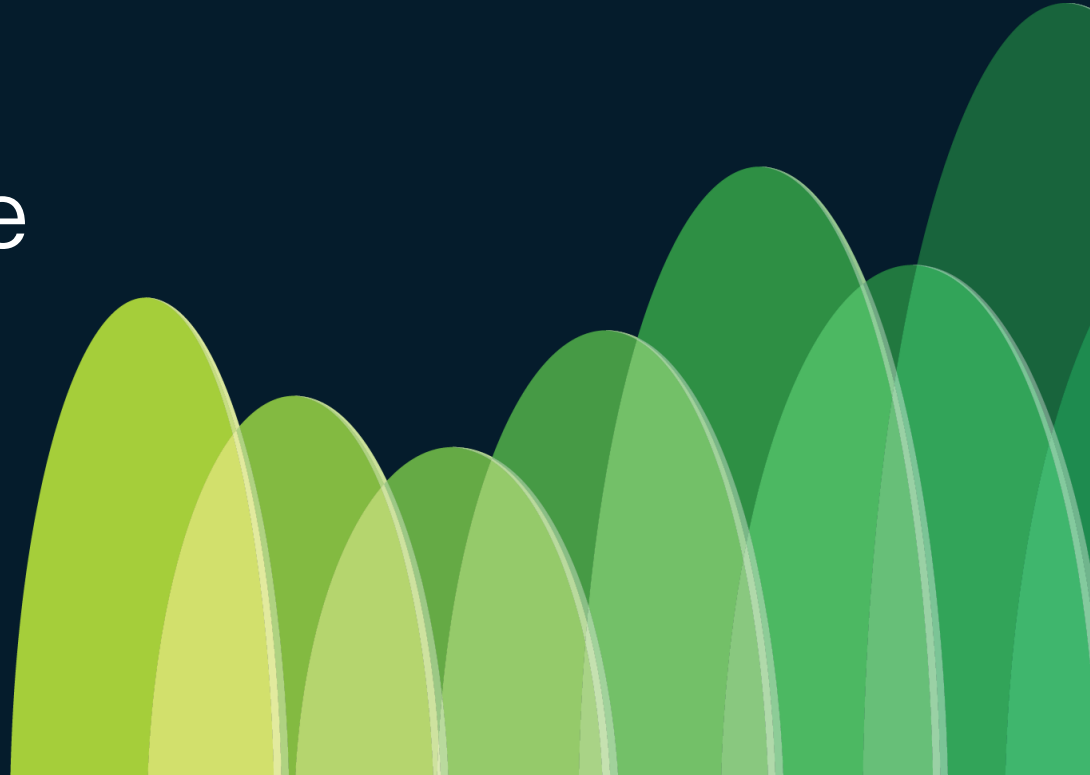
Ok

Cancel

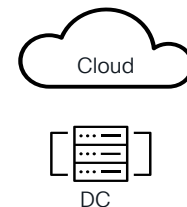
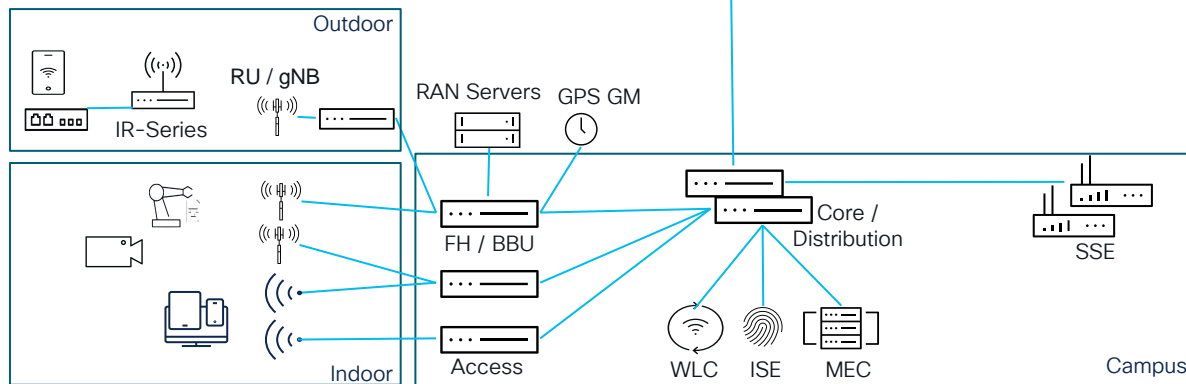
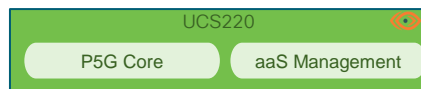
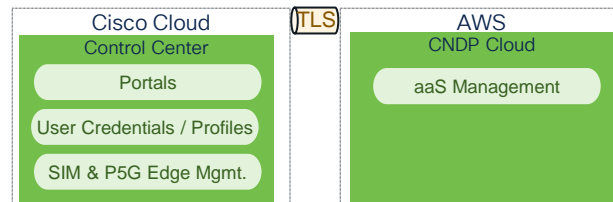
# Cisco P5G eSIM:



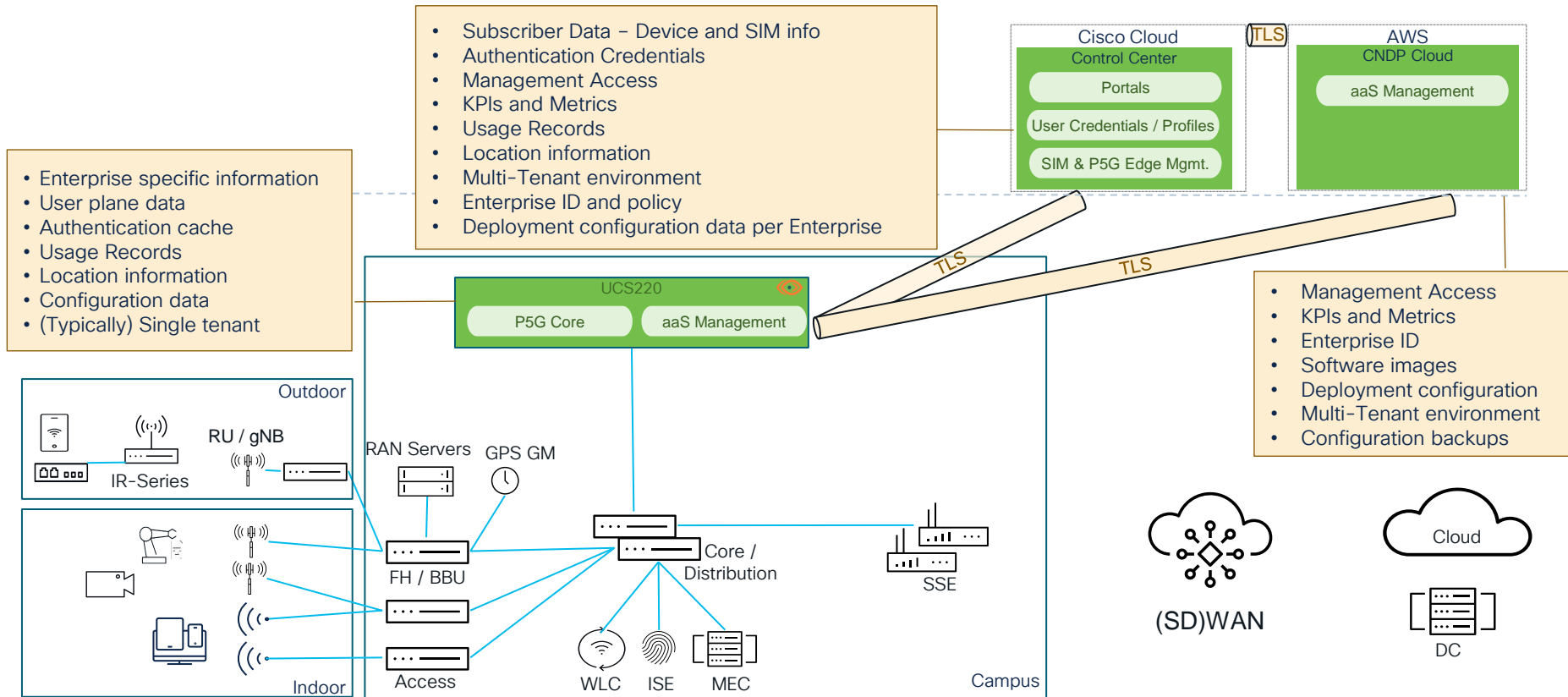
# P5G Architecture Deep Dive



# The Cisco P5G High-Level Architecture



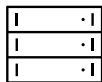
# The Cisco P5G High-Level Architecture



# Cisco Private 5G Core Network Function Hosting

## Local traffic Breakout & Cloud Managed

RAN EMS



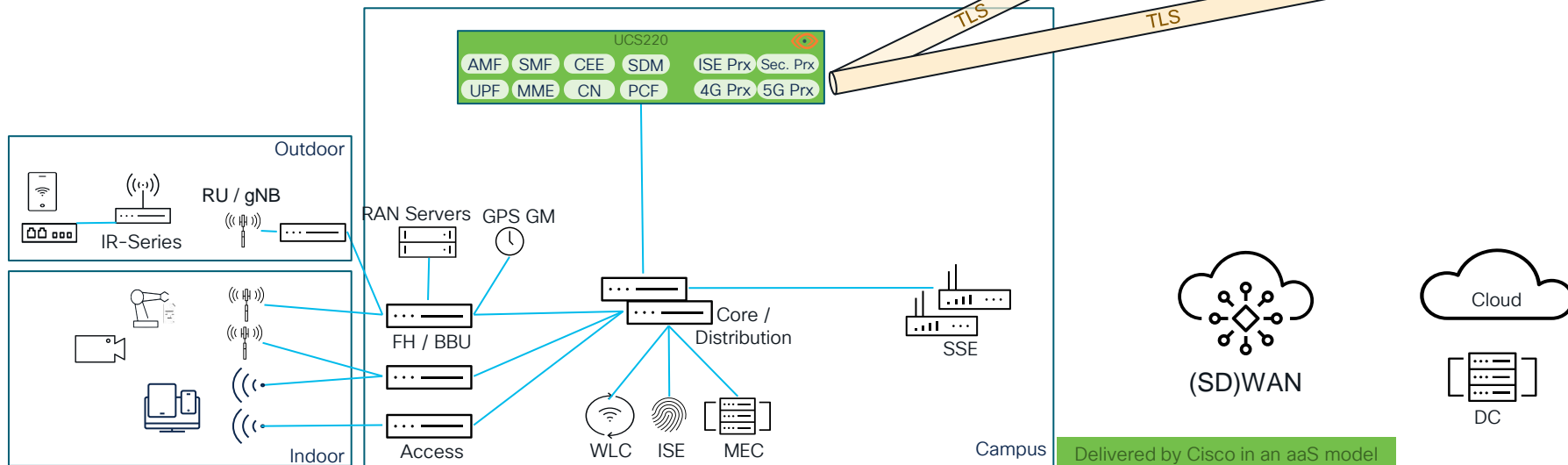
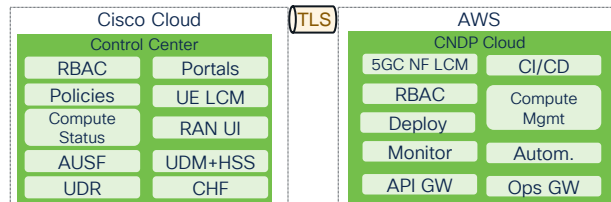
Cisco ISE



ThousandEyes



Umbrella



# Key Cisco Solution Blocks



## P5G Edge

Deployed per Enterprise site

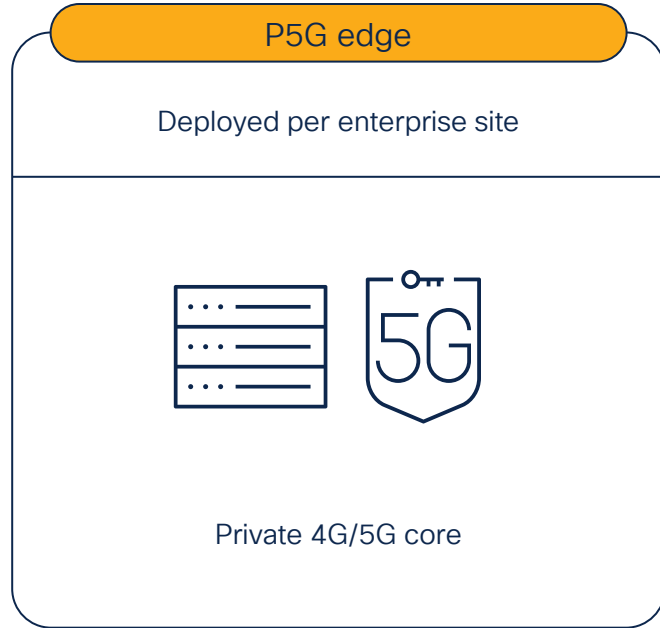
## Cisco Control Center

Geo-redundantly deployed  
across the continents

## Cloud Native Deployment Platform

Deployed at CSP's availability zones

# P5G edge



- Cloud managed single click automated edge deployment
- SP grade 4G and 5G network functions
- 20K sessions and 25Gbps throughput
- Scalable design
- 3GPP release support
- Fully integrated with enterprise switches and routers
- Seamless integration with Cisco ENT portfolio (ISE/Umbrella)

1.5B daily subscribers over  
Cisco packet core NFs

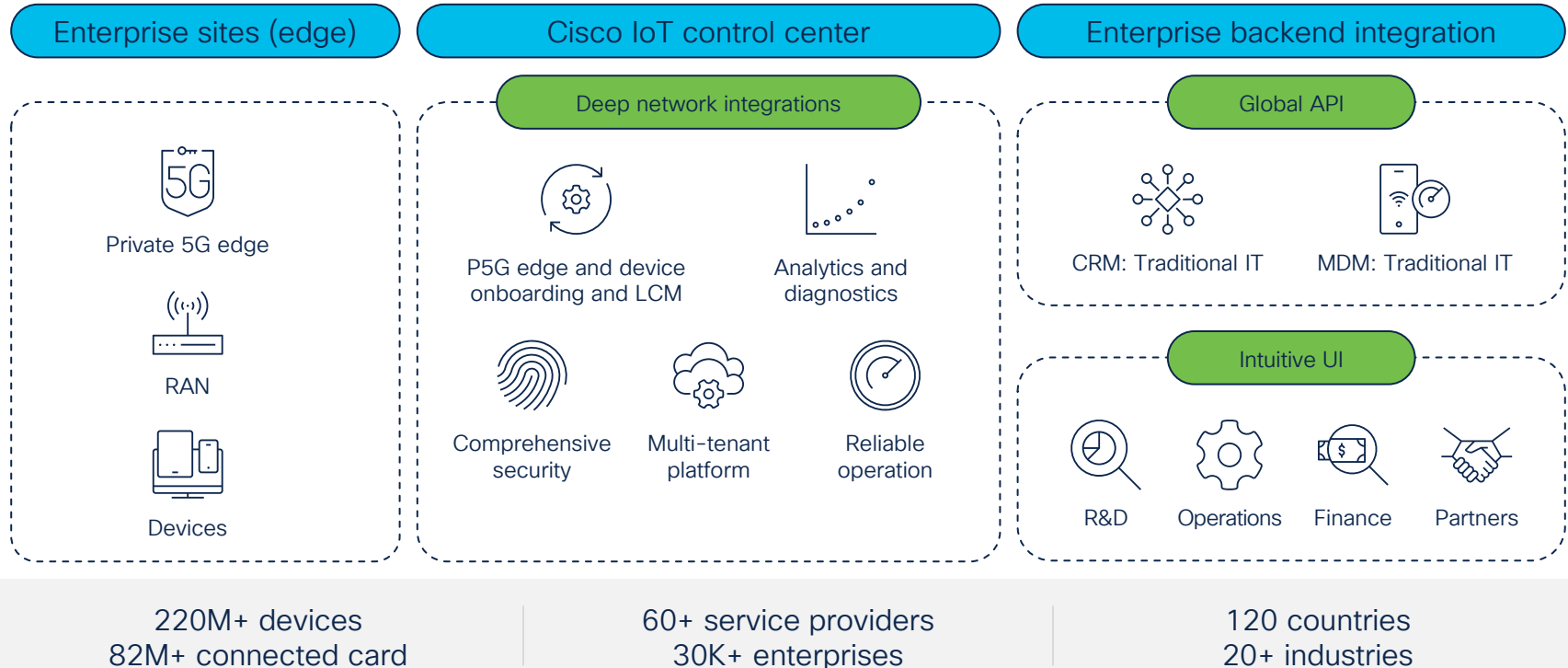
#1 mobile IoT share

First US-wide 5G IoT  
and consumer deployment

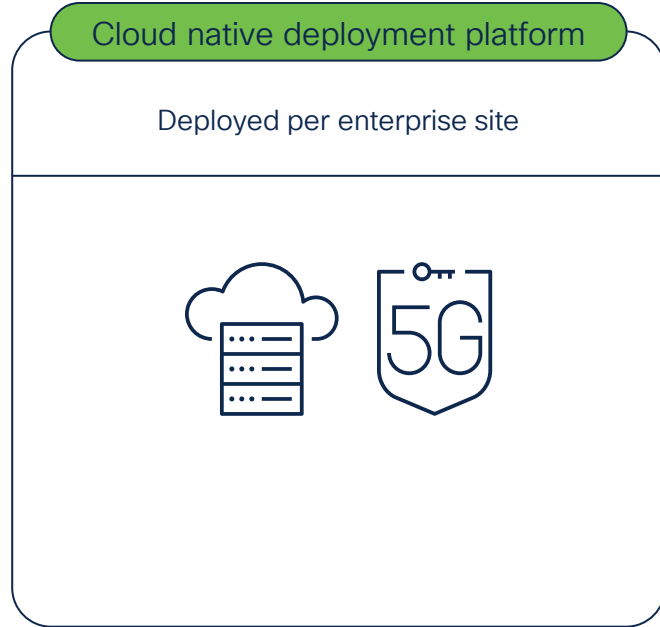


# P5G Management Platform

Built on a strong foundation of mobile SaaS (IoT Control Center)



# CNDP-Cloud



- P5G Edge management
- Leveraging industry best CSP practices
- North and south bound TLS end points
- Scalable design
- Closer to P5G edge to meet industry use cases
- Enables Cisco Cloud integration checkpoints
- Backend to have 24/7 support with SLA assurance

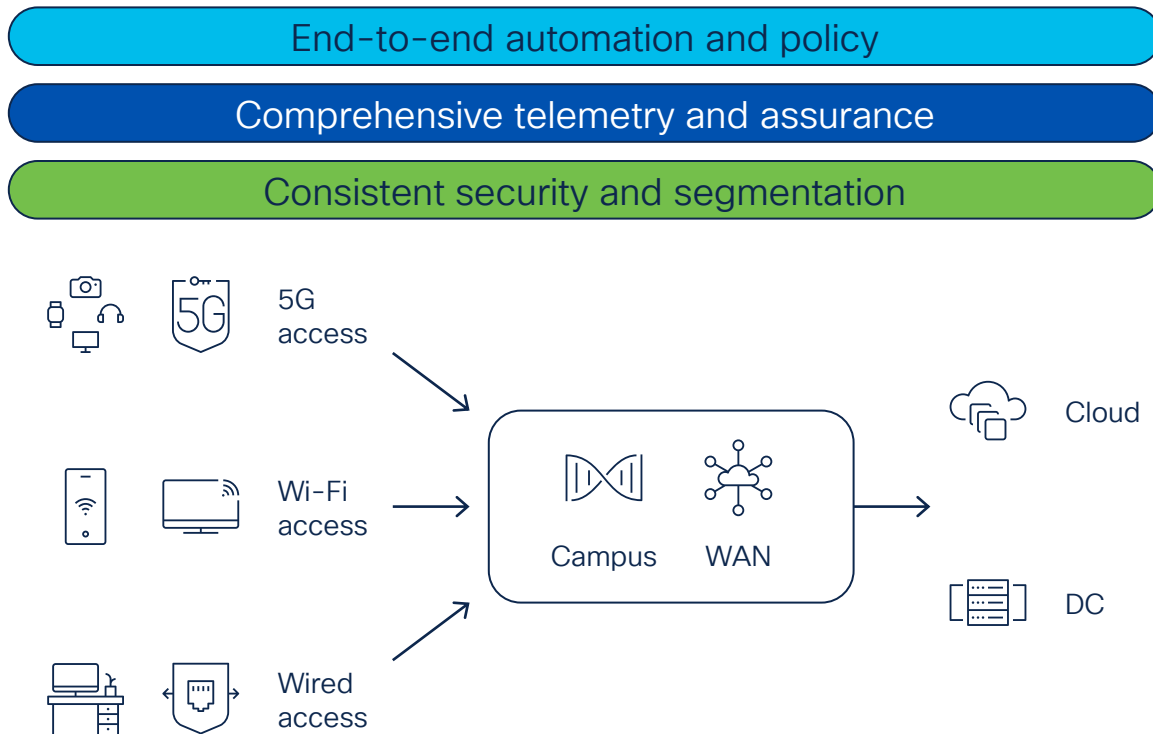
P5G edge LCM  
(CI/CD)

Tool suite for  
Cisco SRE team

APIs for automation  
and enhanced services

# Cisco P5G integrated enterprise architecture vision

- ✓ Common transport
- ✓ Common enterprise policy
- ✓ Enterprise security integration
- ✓ Cisco endpoint/IoT GW integration
- ! Consolidated insights and analytics
- ! Unified identity framework
- ! Private and public mobility
- ! Unified EN operations

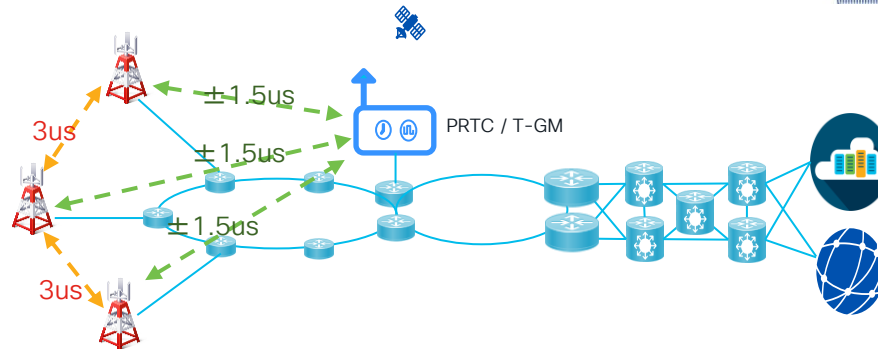
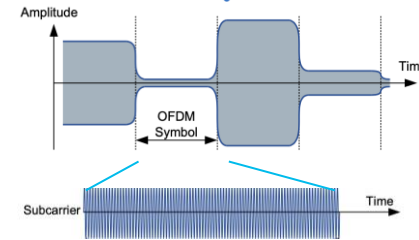
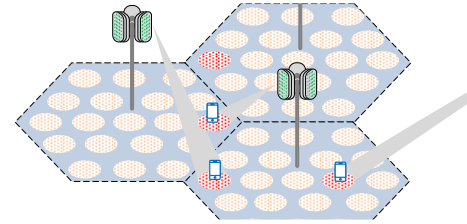


# 5G Frame sync

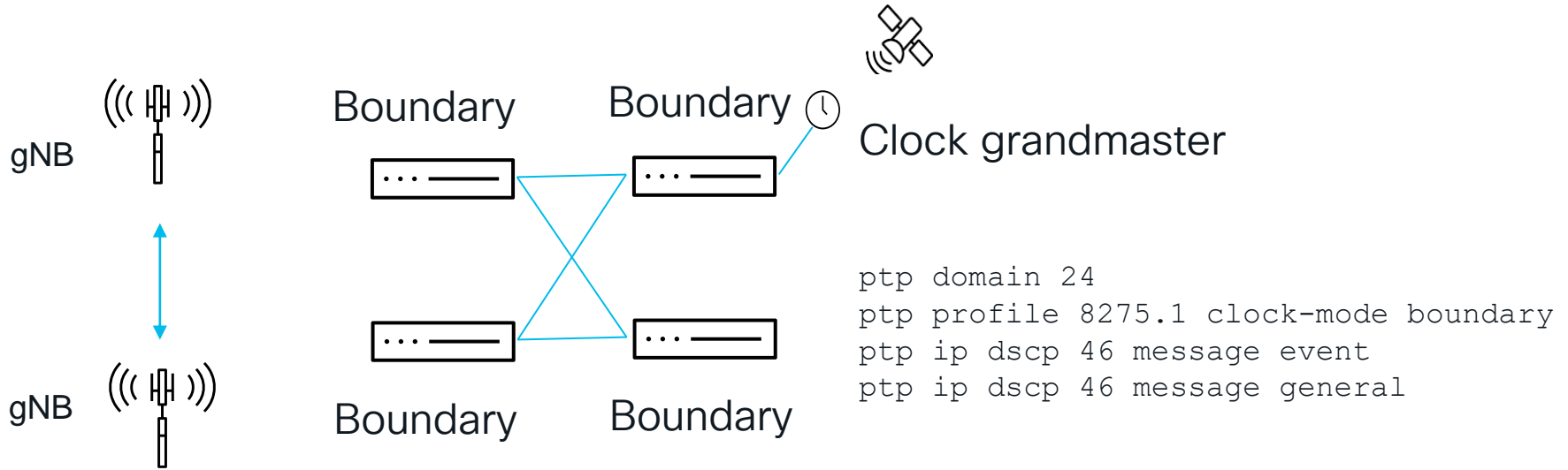
Frame sync is critical in particular in TDD

$>3 \mu\text{s}$  are needed for avoiding inter symbol interferences (UL and DL)

This guarantee also complex operation like MIMO and Coordinated transmission



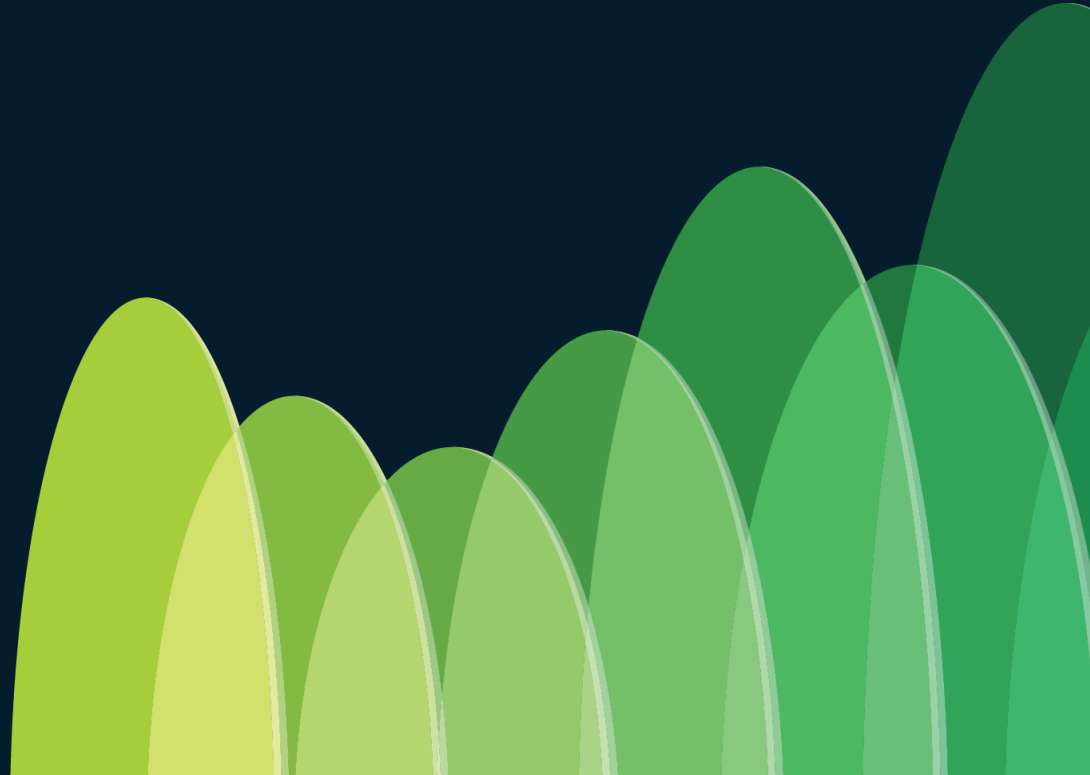
# Integrating PTP in SDA design



PTP configure in a L2 profile in the underlay

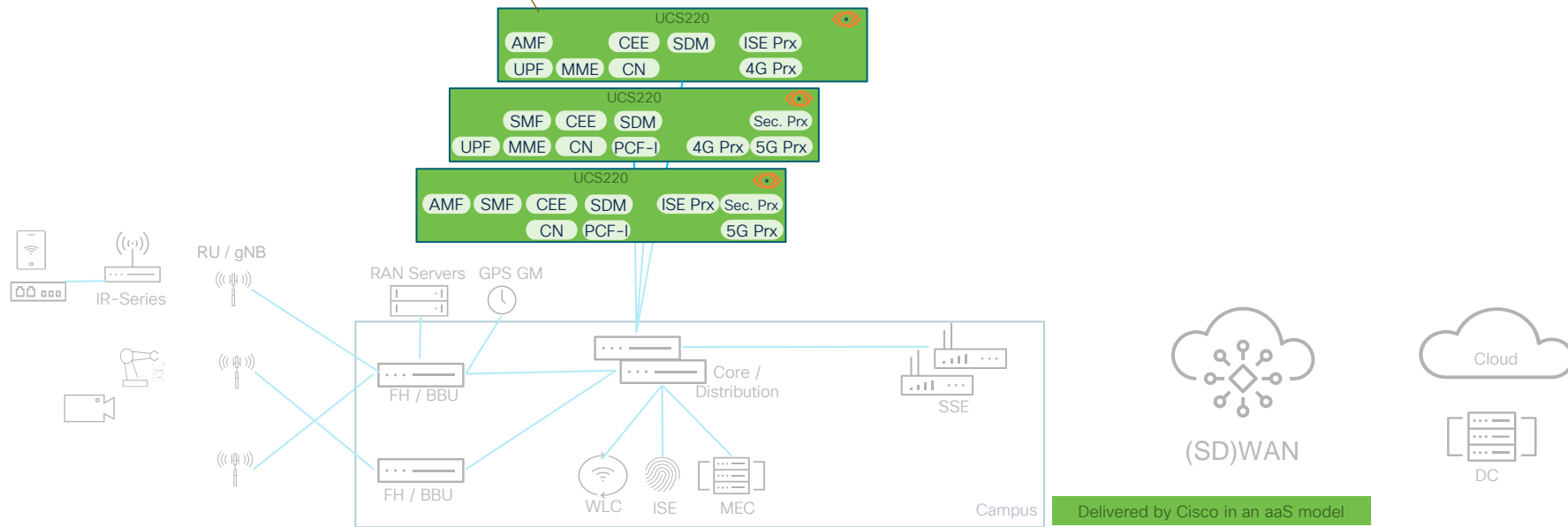
[https://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst9500/software/release/17-15/configuration\\_guide/lyr2/b\\_1715\\_lyr2\\_9500\\_cg/configuring\\_precision\\_time\\_protocol\\_\\_ptp\\_.html](https://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst9500/software/release/17-15/configuration_guide/lyr2/b_1715_lyr2_9500_cg/configuring_precision_time_protocol__ptp_.html)

# Resilient

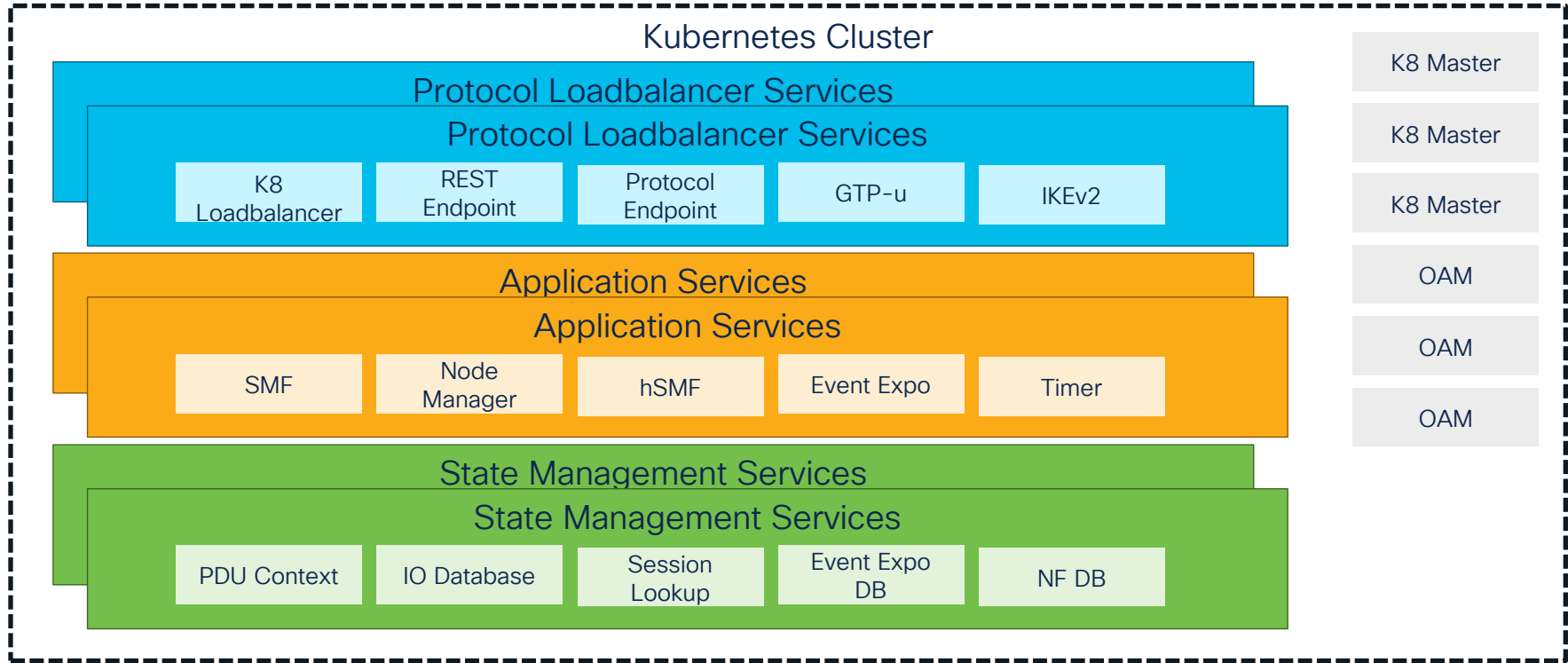


# Cisco Private 5G Resilience Architecture

- 3-node cluster Edge appliance
- Every NF runs twice – no single point of failure
- Redundant Transport
- Redundant Cloud



# Cisco Private 5G Kubernetes Resilience

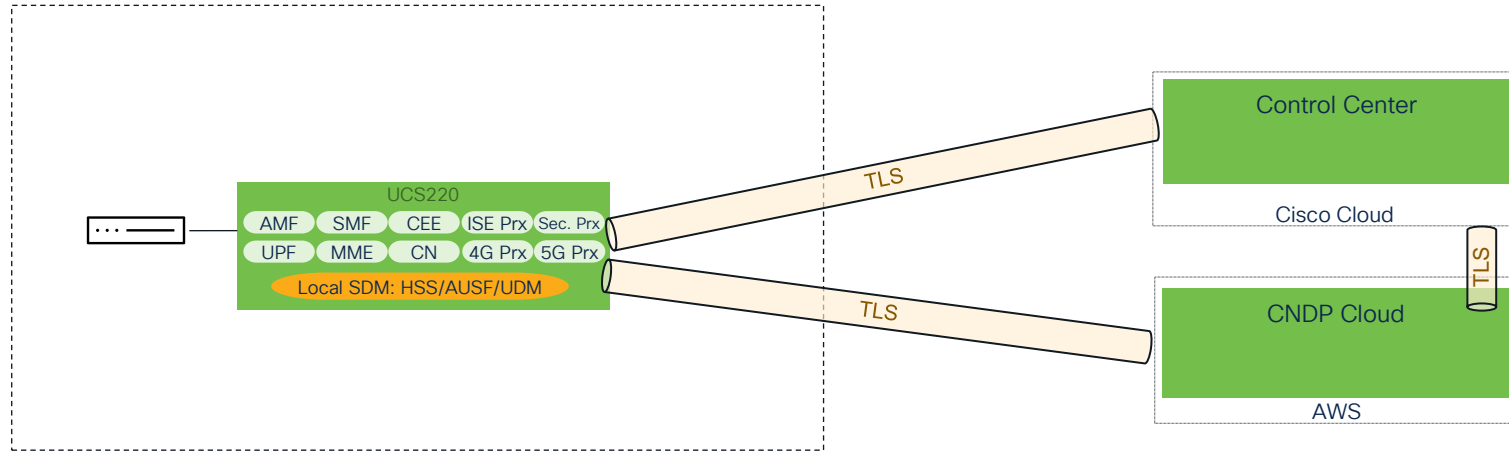




# Cisco Edge Appliance Resilience Behavior

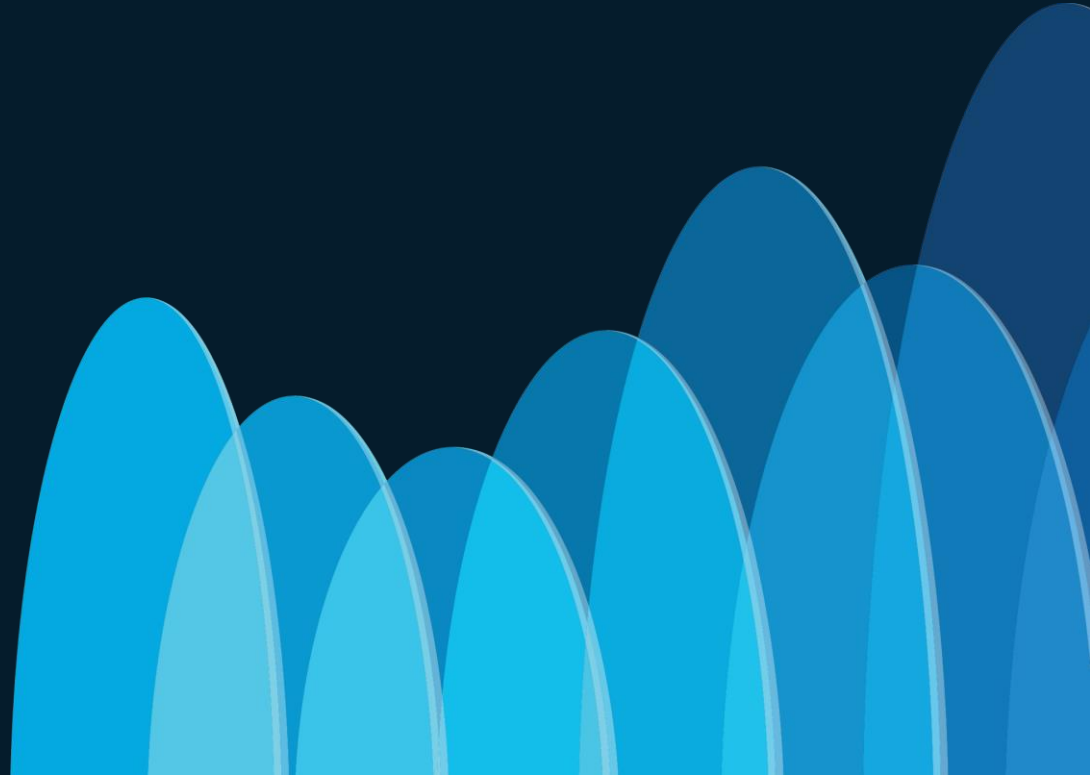
P5G Core Service	Mode	Comment
AMF	Active-Active	Two instances running the various AMF microservices (Figure 68) are instantiated on different hosts. Kubernetes manages the workload distribution.
SMF		
ISE Proxy		
4G Proxy		
5G Proxy		
Security Proxy		
CEE		
SCTP	Active-Standby	Two Stream Control Transmission Protocol (SCTP) microservices for each the AMF instantiated on different hosts. These provide protocol services for the AMF .
UPF	Active-Standby	Two UPF VNFs running in ICSR mode on two hosts, where only 1 instance is active at any point in time.
MME	Active-Active	Two MME VNFs running in an MME Pool instantiated on different hosts. Both MMEs are processing session traffic, but are not exchanging state information.

# Cisco Private 5G Core: Local Caching of Subscriber Details

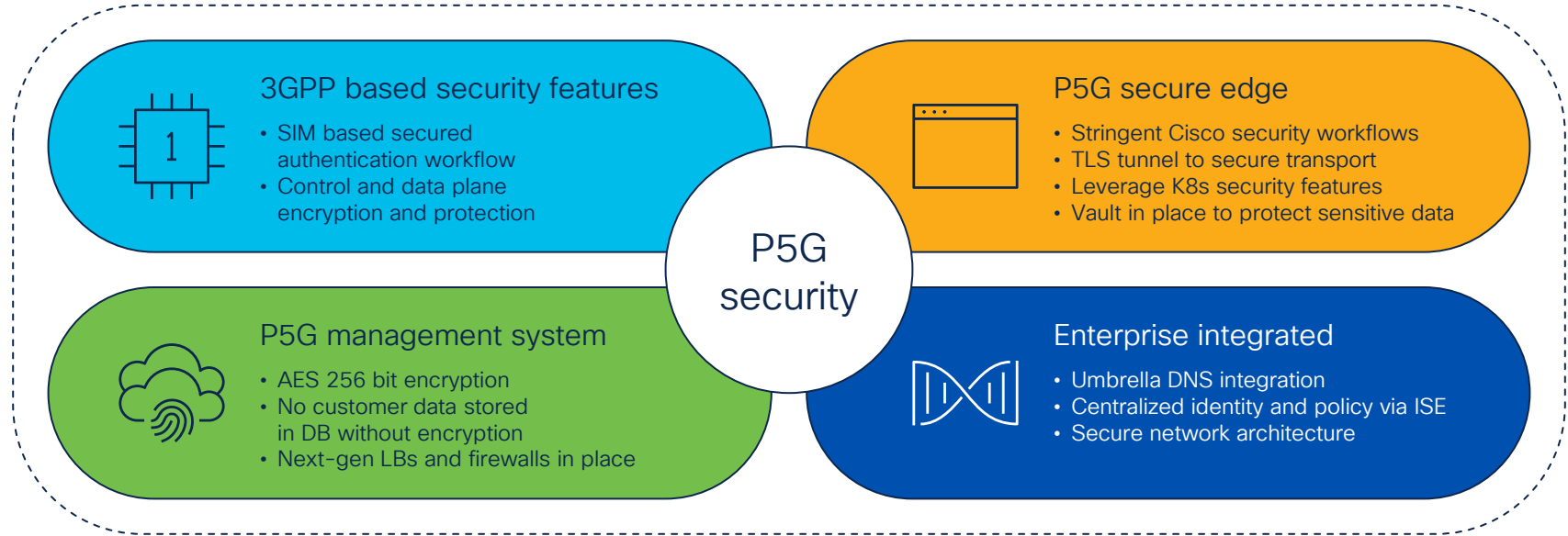


- Continue previously connected sessions on isolated edge (up to 4h)
- Allow net new connections on isolated edge based on locally loaded profile
- Local Subscriber Data Management
  - UE Authentication, registration, subscriber data (DB)
  - Profile syncing with the cloud
  - Initial portion of the traffic handled

# Secured & Trusted



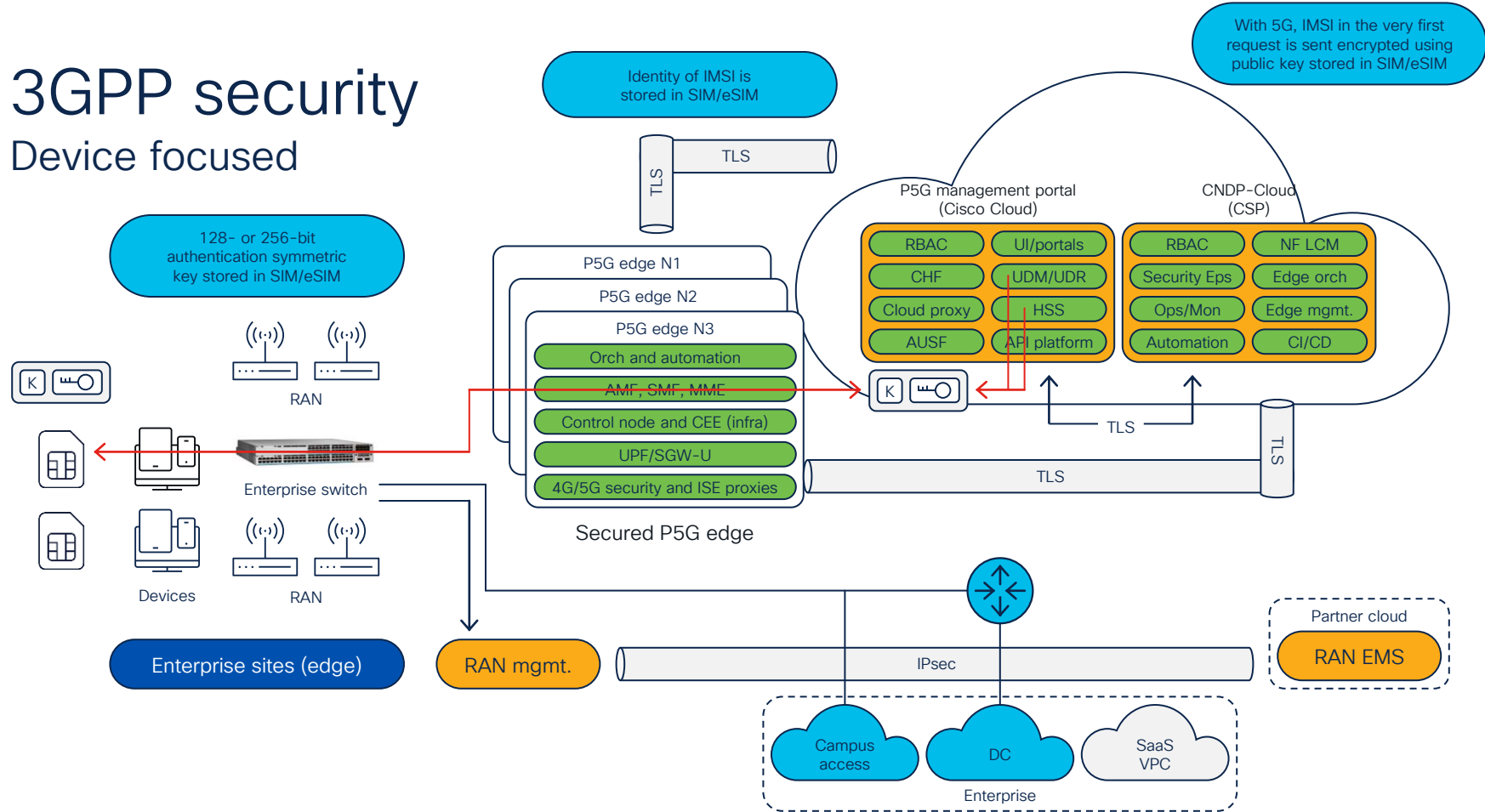
# Security across the portfolio



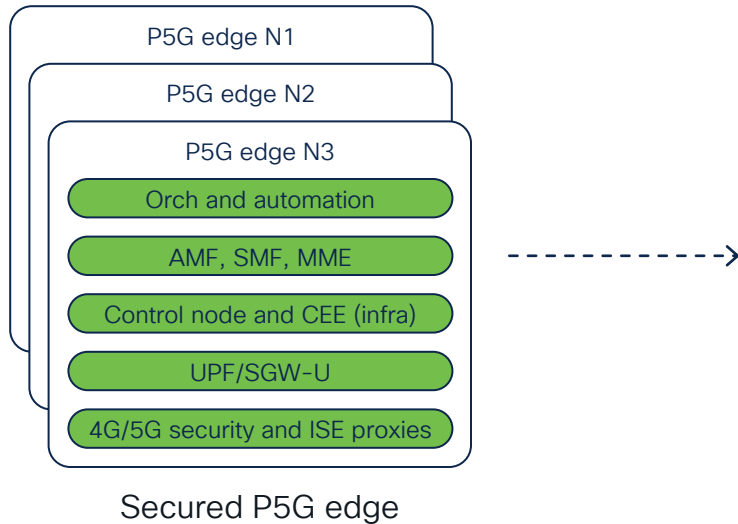
Enterprise grade security across the board

# 3GPP security

## Device focused

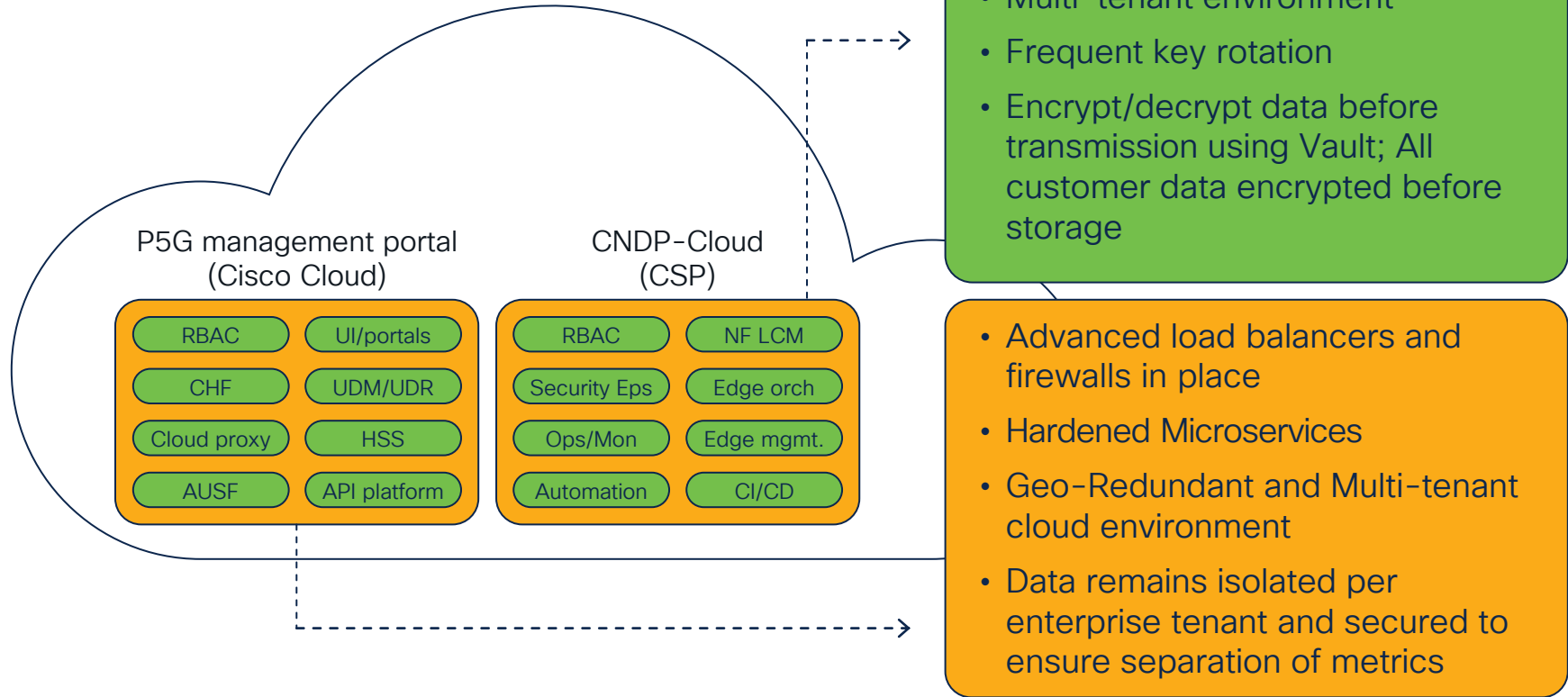


# P5G edge security



- Hardened microservices
- TLS connectivity between components
- No remote connection
- AES 256 volume encryption for data at Rest
- Enhanced app layer security over HTTPS via Secure proxy
- Frequent key rotation

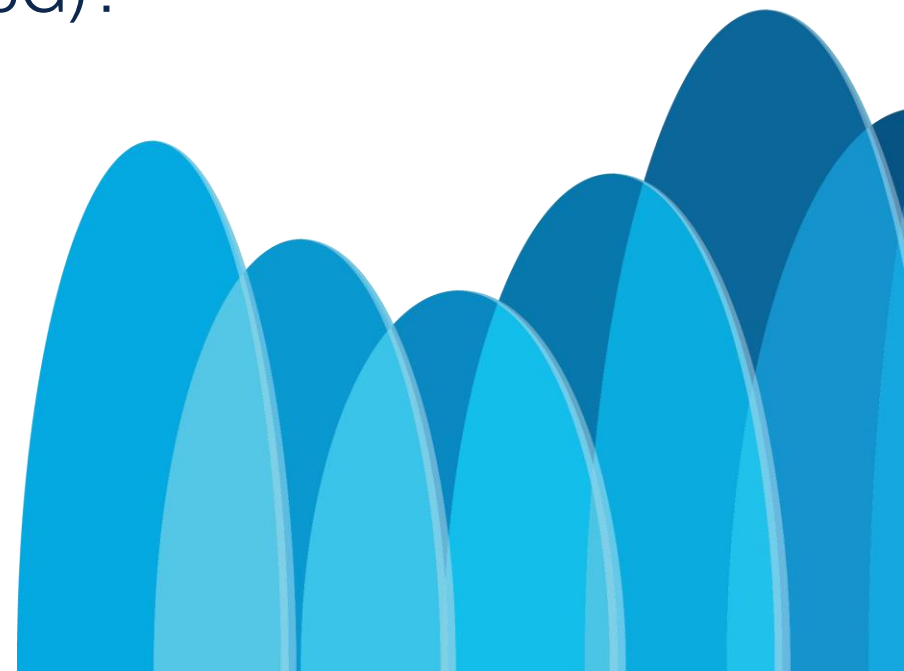
# P5G cloud security



# Trusted Enterprise Integration



“How can enterprise IT/OT admin have common policies and identity across various enterprise domains, such as Wi-Fi, wired, and cellular (4G and 5G)?”



# Unified Identity and Policy across domains

P5G & ISE Integration



# Unified policy and identity are critical



## Intent

Unified business goals across the enterprise domains driven by ISE

## Use cases



Allow wired, wireless, or VPN access to network resources based upon the identity of the user and/or endpoint



Differentiate between corporate and guest users and devices



Classify the endpoints and authorize them appropriately with device profiling



Group-based policy allows for segmentation of the network using access control lists (ACLs)



Identity based policy allows the unified policy to users and devices



VLAN tagging on data plane traffic matching with rest of the campus logic



Security Group Tagging (SGT)



QoS profile

New in P5G



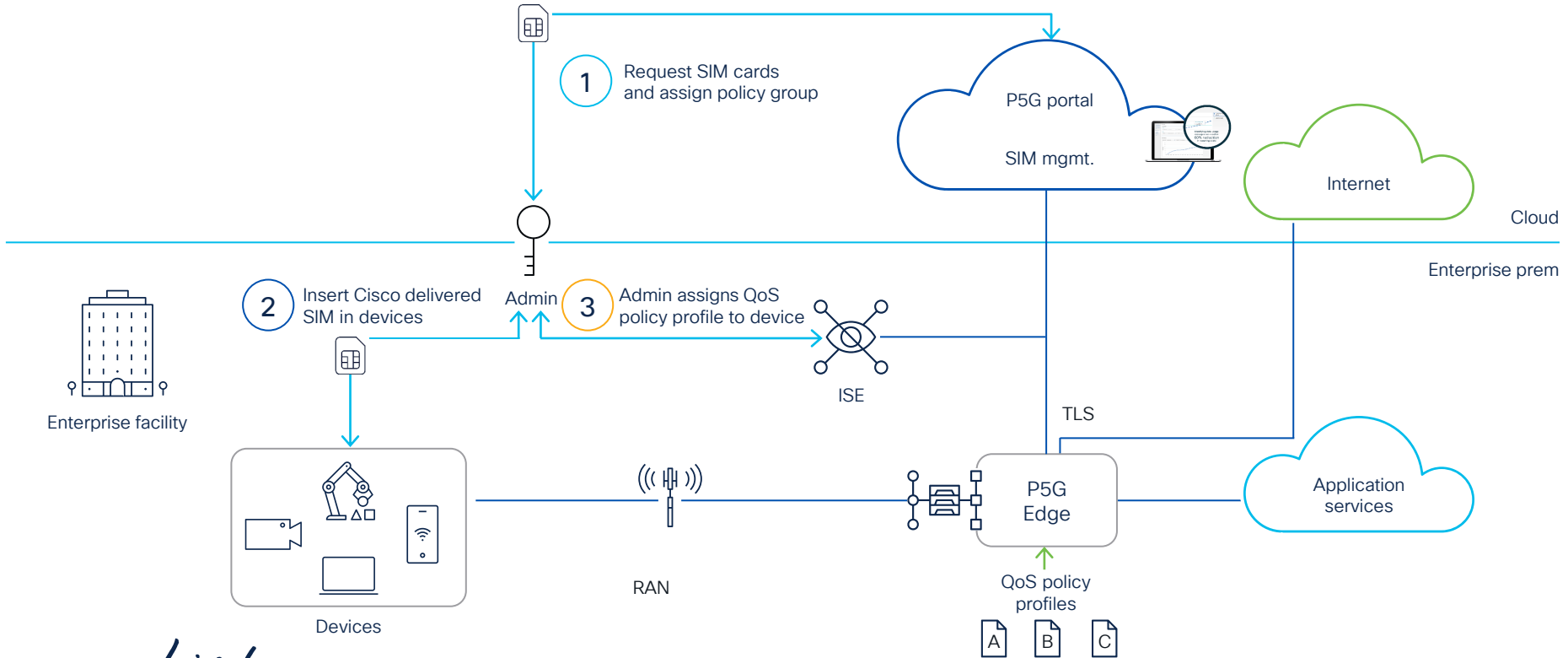
Uplink and downlink Aggregate Maximum Bit Rate (AMBR)



PDU type

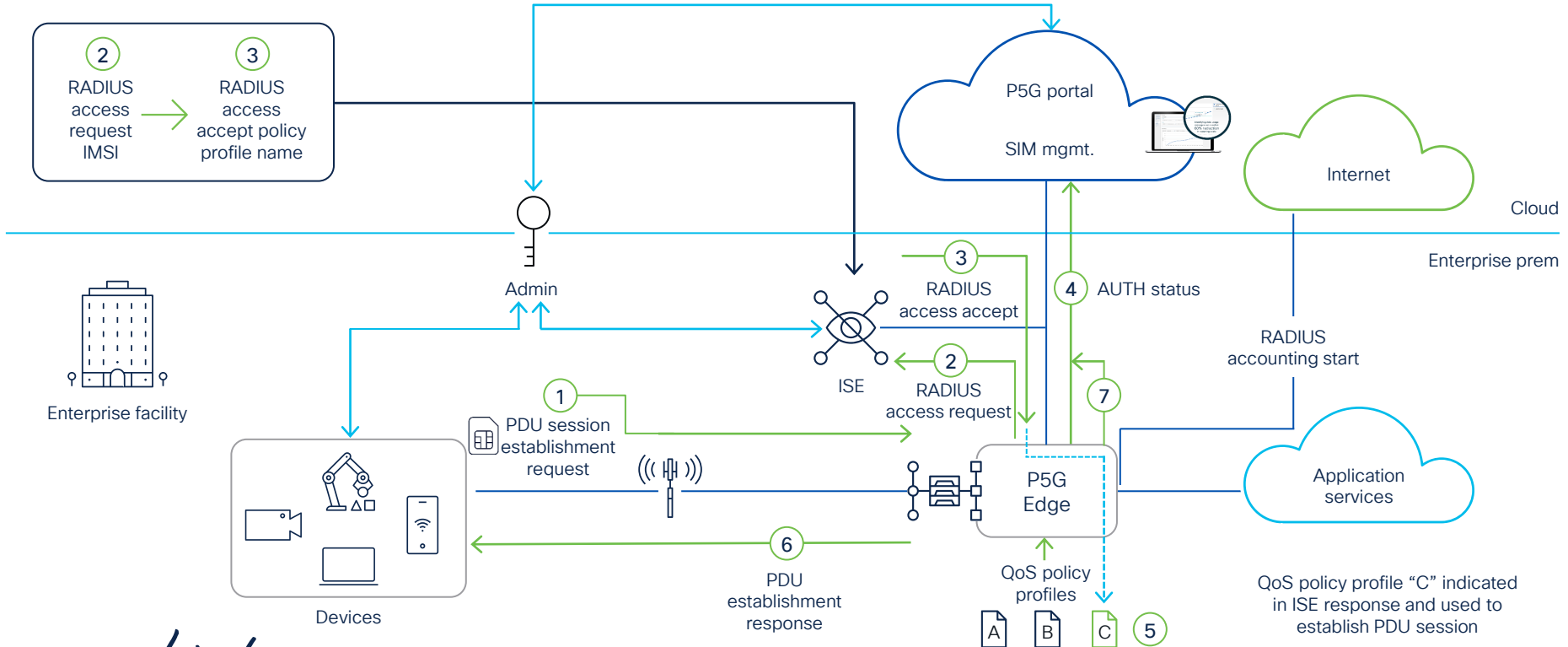
# P5G and ISE integration

## Overview

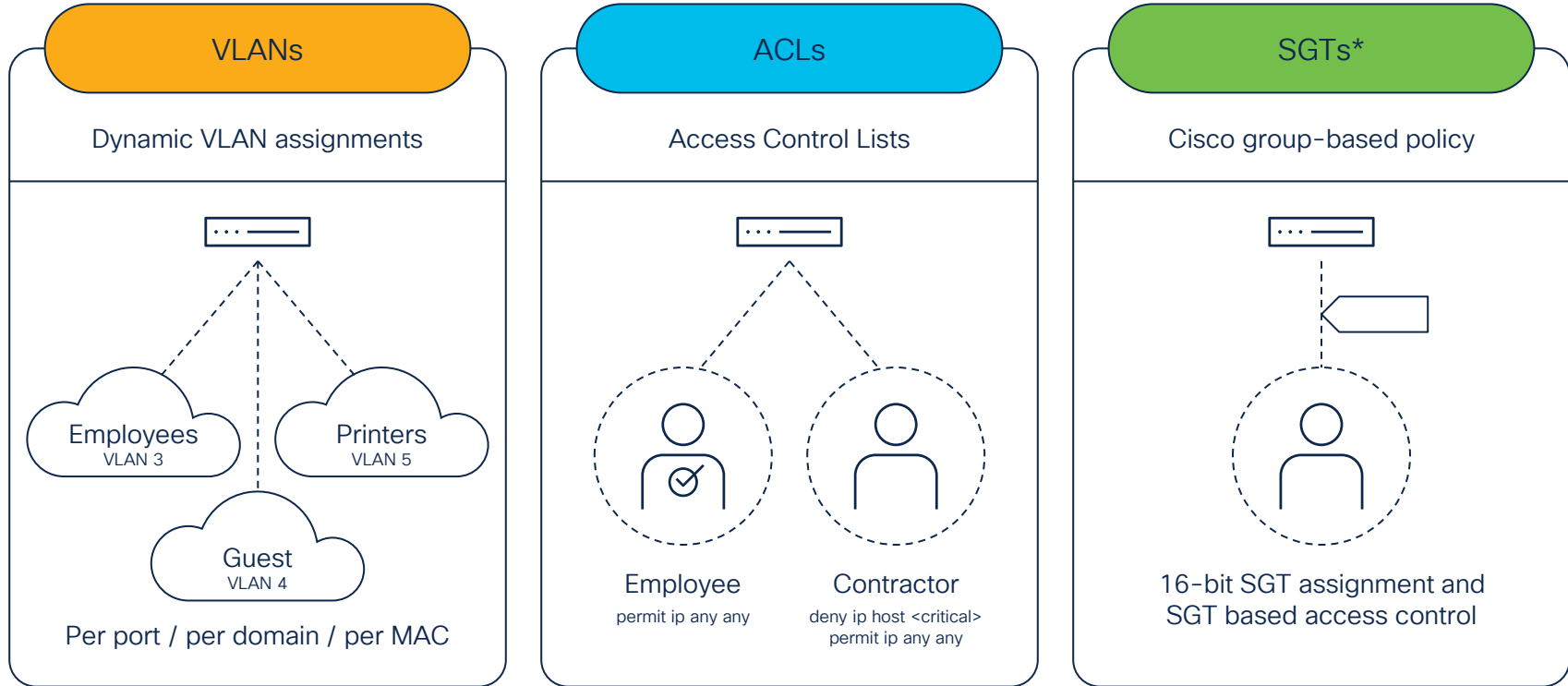


# P5G and ISE integration

## Secondary authorization workflow



# Authorization enforcement options



# ISE enables zero trust in P5G

## Enterprise

## Security

### Endpoints

- Users
- Devices
- Things

### Network devices

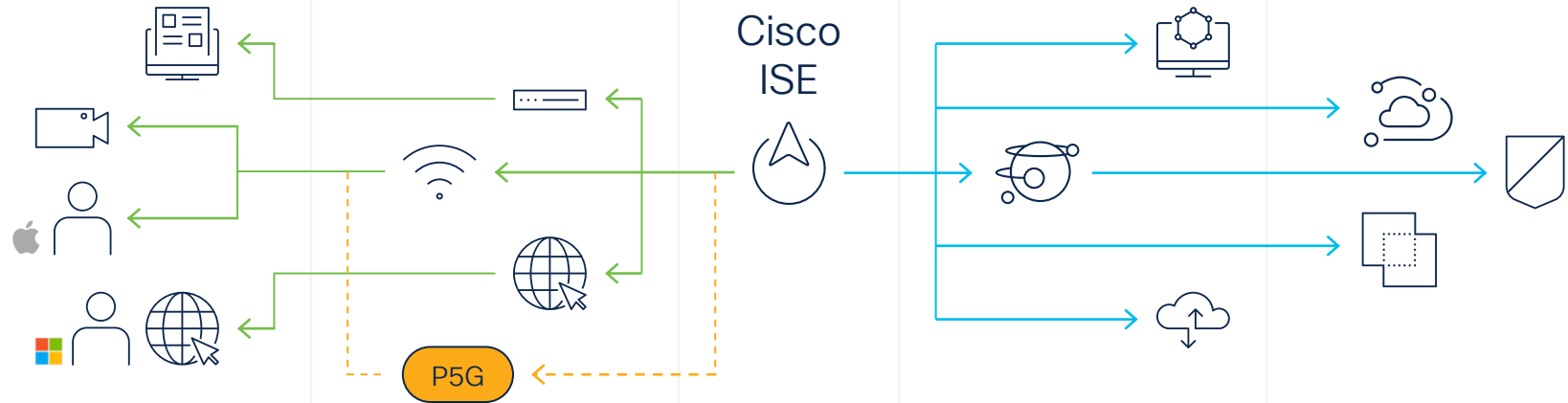
- Switches
- WLCs / APs
- VPN
- P5G

### Identity services

- Azure/AD/LDAP
- MDM
- SAML/MFA

### Security services

- Cloud analytics
- Secure firewall
- Partners



# P5G & ISE Integration

All fields required unless marked otherwise.

Account Name:

Endpoint Name:

Admin Host (Primary):

Admin Host (Secondary):

Authentication:

User Name:

Password:

Radius Host (Primary):

Radius Host (Secondary):

Radius Authentication Port:

Radius Accounting Port:

Radius Shared Secret:

Connect P5G to an ISE Instance

Import Device and User Groups from ISE

☐ Device Group Name ▲

- ☐ 5GDevice\_List\_VLAN\_895
- ☐ 5GDevice\_List\_VLAN\_896
- ☐ 5GDevices\_Allow\_list
- ☐ 5G\_Devices\_Default\_VLAN\_1
- ☐ 5GDevices\_Deny\_list
- ☐ Employee\_Default
- ☐ Guest\_Default

☐ Device Type Name ▲

- ☐ 5GDevices
- ☐ Android
- ☐ Apple-iDevice
- ☐ Cisco-IP-Phone
- ☐ Cisco-Meraki-Device
- ☐ Windows11-Workstation

ICCID	IMSI	Device Profile	Device ID
2001111403110002012	200111112502012	Apple-iDevice_Employee_Default	Employee-Apple-Device
2001111403110002011	200111112502011	Employee_Default	Employee 5
2001111403110002002	200111112502002	5G_Devices_Allow_profile	Michael Shay (Use-Case-1)
2001111403110002004	200111112502004	5G_Devices_Deny_profile	Faulty-Camera
2001111403110002008	200111112502008	Employee_Default	Employee 4
2001111403110002006	200111112502006	Employee_Default	Employee 3
2001111403110002007	200111112502007	5G_Devices_Allow_profile	Employee 2
2001111403110002010	200111112502010	Non-ISE-provisioned-device	Non-ISE-provisioned-device
2001111403110002001	200111112502001	5G_Devices_VLAN_895	John Thompson (Use-Case-3)
2001111403110002003	200111112502003	5G_Devices_VLAN_896	Scarlet Fiero (Use-Case-2)
2001111403110002005	200111112502005	5G_Devices_Allow_profile	Employee 1
2001111403110002009	200111112502009	5G_Devices_Deny_profile	Faulty-Sensor

Create P5G Device Profiles

Assign Device Profiles

Edit

SIM Status (Required):

SIM Barred:

Services

Communication Plan:

Device Profile:

Rating

Device ID:

Rate Plan:

Usage Limit Override:

Device ID:

Rate Plan:

Usage Limit Override:

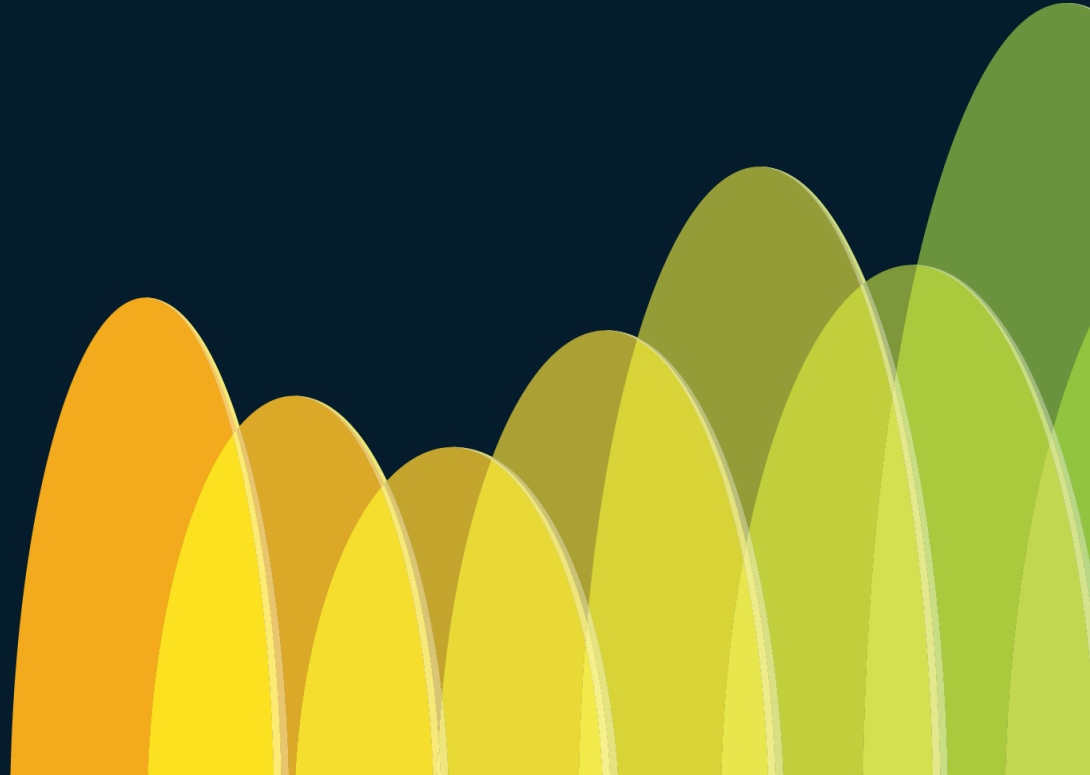
Device ID:

Rate Plan:

Usage Limit Override:



# Umbrella DNS

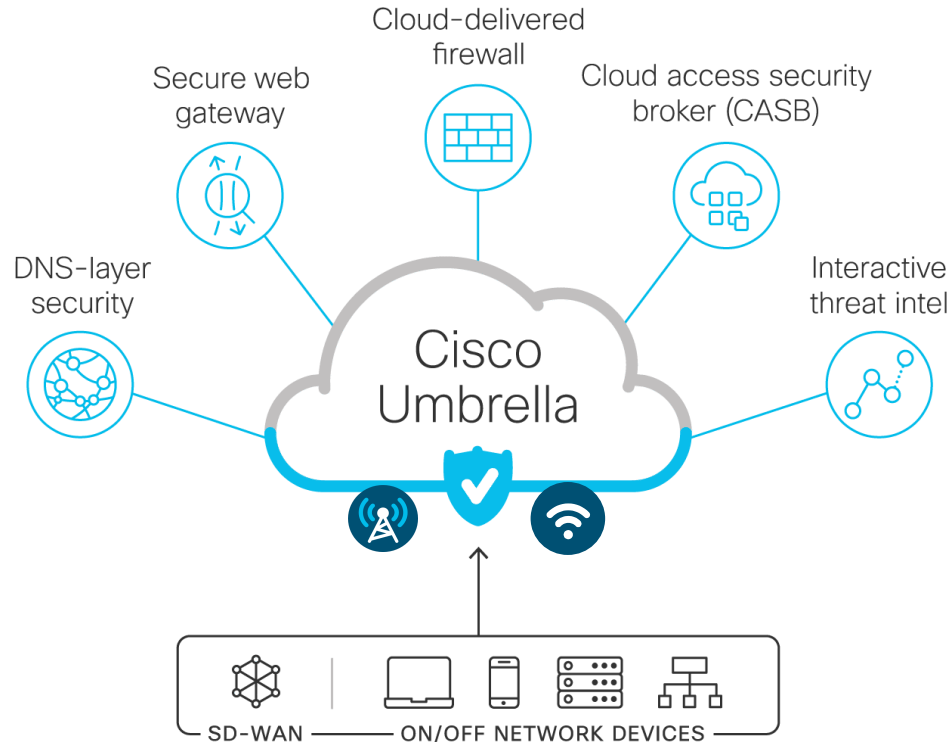




# Enterprise Security

## Bringing Enterprise Access, Edge and App Security to 5G

- Proven Enterprise grade security from access edge to cloud
  - Extends 5G 3GPP SBA and SDA security
- Private 5G SIG and DNS security integration for on/off prem access
- Aligns with Cisco's enterprise security strategy



# Umbrella DNS Integrates with Cisco Private 5G from Day 1

✓ Device Addresses

✓ Data Network Address

✓ DNS Address

RECURSIVE DNS ⓘ

Are you a Cisco Umbrella DNS customer? ⓘ ☒

Primary DNS Server (IPv4)\*

208.67.222.222

Secondary DNS Server (IPv4)\*

208.67.220.220

Primary DNS Server (IPv6)\*

2620:119:35::35

Secondary DNS Server (IPv6)\*

2620:119:53::53

INTERNAL DNS ⓘ

Primary DNS Server (IPv4)\*

1.1.1.1

Primary DNS Server (IPv6)

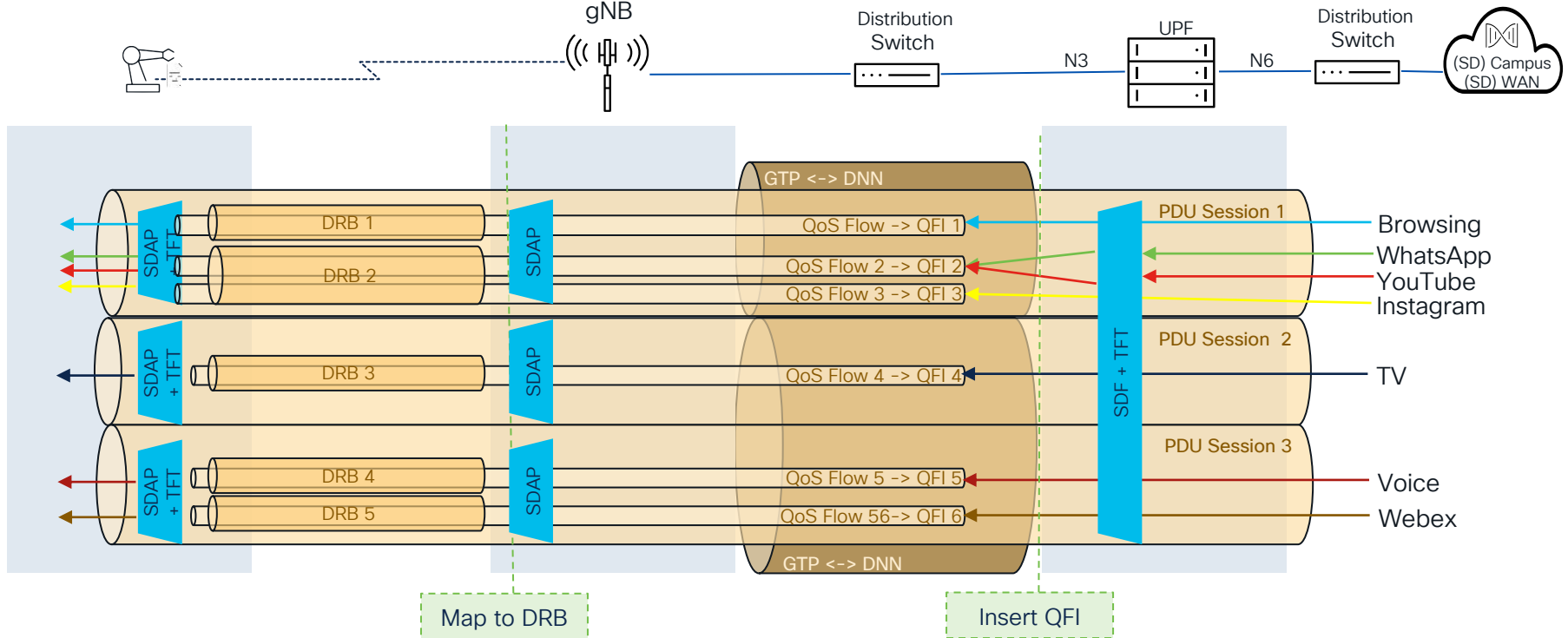
2001:4860:4860::4444

Configuring your recursive DNS to use Umbrella's DNS servers directs traffic from your network to the Cisco Umbrella global network.

# QoS



# Example: triple-play Service to a UE



# 5G QoS Flow Parameters

- Each QoS Flow is associated with a set of parameters in the RAN
- 5G QoS Identifier (5QI) provides a template for the main parameters
  - ARP: priority level, pre-emption capability, pre-emption vulnerability
  - Pre-emption capability: can the flow grab resources from other flows
  - Pre-emption vulnerability: can the flow release resources for other flows
- GBR Flows are associated with additional parameters
  - GFBR, MFBR, Max PLR, Notification Control
- In Addition, a PDU session AND an Endpoint (UE) can be associated with an Aggregate Maximum Bit Rate (AMBR)
  - Uplink and Downlink

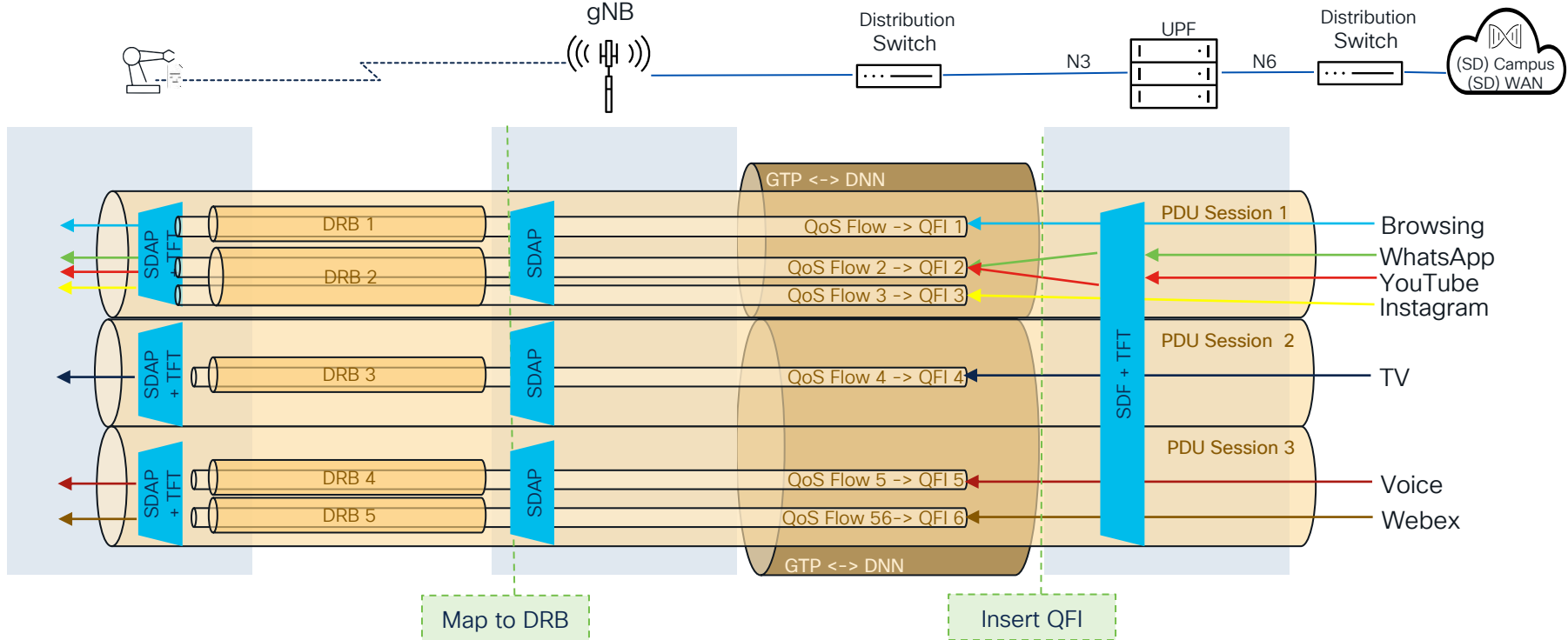
## Non-GBR Flow

- 5QI
  - {GBR, non-GBR, delay-critical GBR}
  - Default Priority Level
  - Packet Delay Budget
  - Packet Error Rate
  - Default Maximum Data Burst Volume
  - Default Averaging Window
- Allocation & retention Policy
- Reflective QoS Attribute (seldom used)

- Guaranteed Frame Bit Rate
- Maximum Frame Bit Rate
- Notification Control
- Maximum Packet Loss Rate

## GBR Flow

# Example: triple-play Service to a UE



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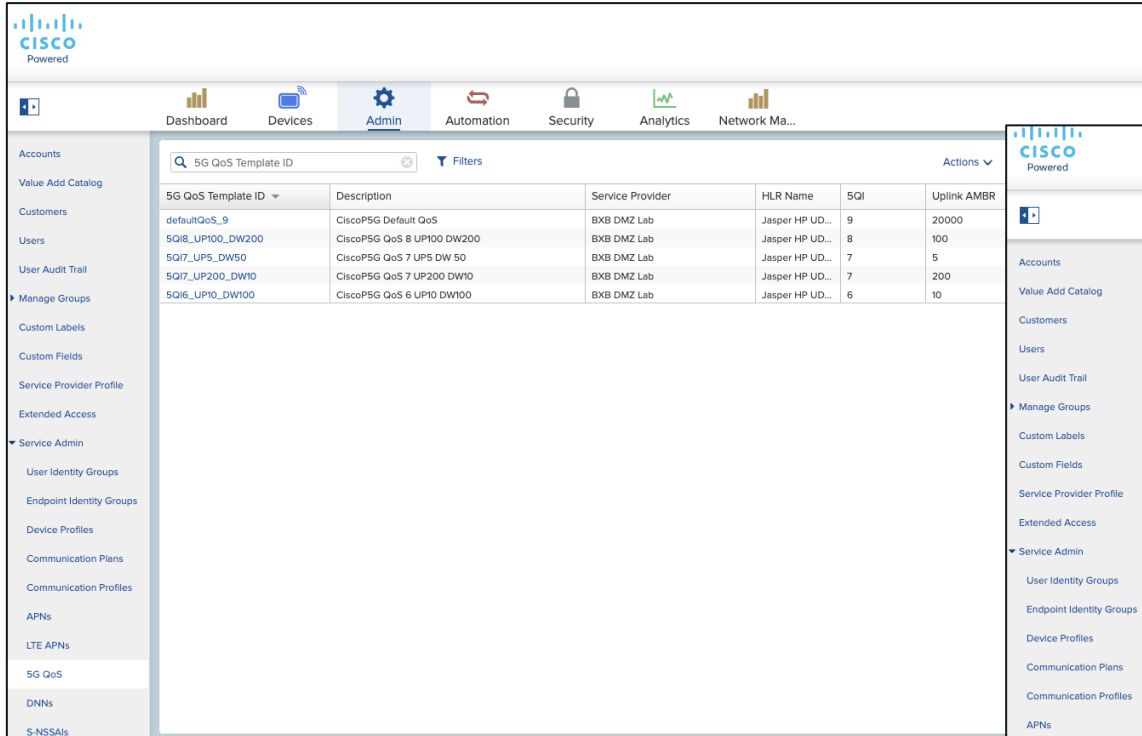
## Non-GBR Flow

- 5QI
    - {GBR, non-GBR, delay-critical GBR}
    - Default Priority Level
    - Packet Delay Budget
    - Packet Error Rate
    - Default Maximum Data Burst Volume
    - Default Averaging Window
  - Allocation & retention Policy
  - Reflective QoS Attribute (seldom used)
- Guaranteed Frame Bit Rate
  - Maximum Frame Bit Rate
  - Notification Control
  - Maximum Packet Loss Rate

## GBR Flow

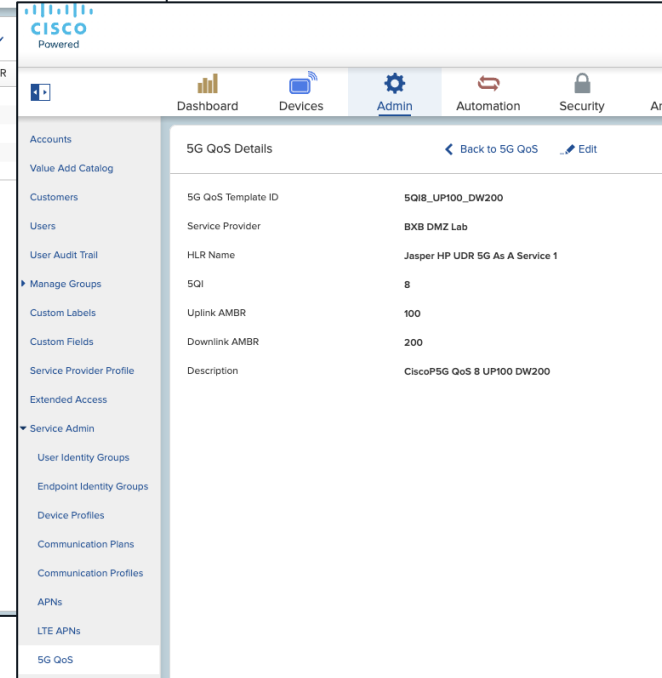


# Cisco Control Center - QoS



The screenshot shows the Cisco Control Center Admin interface. The top navigation bar includes Dashboard, Devices, Admin (selected), Automation, Security, Analytics, and Network Ma... The left sidebar lists various configuration categories. The main content area displays a table of 5G QoS Templates.

5G QoS Template ID	Description	Service Provider	HLR Name	5QI	Uplink AMBR
defaultQoS_9	CiscoP5G Default QoS	BXB DMZ Lab	Jasper HP UD...	9	20000
5QI8_UP100_DW200	CiscoP5G QoS 8 UP100 DW200	BXB DMZ Lab	Jasper HP UD...	8	100
5QI7_UP5_DW50	CiscoP5G QoS 7 UP5 DW 50	BXB DMZ Lab	Jasper HP UD...	7	5
5QI7_UP200_DW10	CiscoP5G QoS 7 UP200 DW10	BXB DMZ Lab	Jasper HP UD...	7	200
5QI6_UP10_DW100	CiscoP5G QoS 6 UP10 DW100	BXB DMZ Lab	Jasper HP UD...	6	10



The screenshot shows the Cisco Control Center Admin interface with the 5G QoS Details page for the template 5QI8\_UP100\_DW200. The page includes a navigation bar and a sidebar. The main content area displays the details for the selected template.

5G QoS Template ID	5QI8_UP100_DW200
Service Provider	BXB DMZ Lab
HLR Name	Jasper HP UDR 5G As A Service 1
5QI	8
Uplink AMBR	100
Downlink AMBR	200
Description	CiscoP5G QoS 8 UP100 DW200

# Cisco Control Center – DNN

The screenshot displays the Cisco Control Center interface for configuring DNNs (Data Network Name). The interface is divided into two main sections: a list view on the left and a detailed view on the right.

**Left Section: DNN List**

The top navigation bar includes icons for Dashboard, Devices, Admin (selected), Automation, Security, Analytics, and Network Management. The left sidebar lists various configuration categories, with 'Service Admin' expanded.

The main content area shows a table of DNNs with the following columns: DNN, PDP Index, QoS Template ID, Description, Service Provider, and HLR. The search bar contains 'DNN' and there are filter options.

DNN	PDP Index	QoS Template ID	Description	Service Provider	HLR
ciscop5g	55555-0315	defaultQoS_9	BXB DMZ Lab	BXB DMZ Lab	Jasper HP UDR 5G As A
ciscop5g-2	55555-0316	5QI7_UP5_D...	ciscop5g-2	BXB DMZ Lab	Jasper HP UDR 5G As A
ciscop5g-3	55555-0317	5QI8_UP100...	qI69d40u10	BXB DMZ Lab	Jasper HP UDR 5G As A
ciscop5g-4	55555-0318	5QI6_UP10_D...	qI69d30u10	BXB DMZ Lab	Jasper HP UDR 5G As A
ciscop5g-5	55555-0319	5QI7_UP200...	ciscop5g-5	BXB DMZ Lab	Jasper HP UDR 5G As A

**Right Section: DNN Details**

The right section shows the 'DNN Details' view for the selected DNN 'ciscop5g-2'. It includes a 'Back to DNN' link and an 'Edit' button. The details are as follows:

Field	Value
DNN	ciscop5g-2
PDP Index	55555-0316
QoS Template ID	5QI7_UP5_DW50
Description	ciscop5g-2
Service Provider	BXB DMZ Lab
HLR	Jasper HP UDR 5G As A Service 1

# Cisco Control Center – Communication Profiles

The screenshot displays the Cisco Control Center interface for managing Communication Profiles. The top navigation bar includes icons for Dashboard, Devices, Admin (selected), Automation, Security, Analytics, and Network Management. The left sidebar shows a tree view of the configuration hierarchy, with 'Communication Profiles' selected under 'Service Admin'.

The main content area is divided into two panels. The left panel shows a list of Communication Profiles with columns for Communication Profile Name, Account Name, and HLR Template. The right panel shows the 'Communication Profile Details' for the 'BXB DMZ Lab Comm Prof ON' profile.

**Communication Profile List:**

Communication Profile Name	Account Name	HLR Template
BXB DMZ Lab Comm Prof OFF		555557100977913
BXB DMZ Lab Comm Prof ON		555557100977613
BXB DMZ Lab Comm Prof ON2		555557101223014
BXB DMZ Lab Default Comm Profile		555557100976713
TEST-BB	New General ...	555557101239914

**Communication Profile Details: BXB DMZ Lab Comm Prof ON**

**General Information:**

- Communication Profile Name: BXB DMZ Lab Comm Prof ON
- Shared: Yes
- Service Provider Name: [Empty]
- Hide from Accounts: No
- HLR Template: 555557100977613
- GPRS: Yes
- SMS MT: No
- SMS MO: No
- Block International SMS MO Except Home Country: No
- Voice MO: No
- International Voice: No

**Restrictions:**

- Created on HLR: Yes
- Roaming Restriction Set ID: 0
- Active: Yes
- Fixed IP Enabled: No
- Block Premium Numbers: No
- Description: BXB DMZ Lab Comm Prof ON
- LTE Data: Yes
- 5G NSA Data: Yes
- 5G SA Data: Yes
- S-NSSAI Index: 1\_000002
- LTE Roaming Restriction Set ID: [Empty]

**APNs, LTE APNs, DNNs**

**DNNs Table:**

DNN	PDP Index	QoS Template ID	Default	Description
ciscop5g	55555-0315	defaultQoS_9	✓	BXB DMZ Lab
ciscop5g-2	55555-0316	5QI7_UP5_D...		ciscop5g-2
ciscop5g-3	55555-0317	5QI8_UP100...		qi69d40u10
ciscop5g-4	55555-0318	5QI6_UP10_D...		qi69d30u10
ciscop5g-5	55555-0319	5QI7_UP200...		ciscop5g-5

# Specific flows can be prioritized by dynamic GBR assignment

## Cisco P5GaaS: Dynamic QoS

In the latest release, Cisco is introducing a Dynamic QoS (Quality of Service) feature, which allows certain types of devices or applications to request a guaranteed bit rate (GBR) from the Private 5G network.

A guaranteed minimum bandwidth significantly reduces the risk of packet loss or burst volumes for mission-critical use cases. Before a device or application connects to the network, Private 5G verifies that the requested minimum bandwidth is available end to end. If it is not, Private 5G denies the connection to ensure a quality user experience.

This feature is a service add-on that users can define in the onboarding wizard. To use the Dynamic QoS feature, the RAN vendor must offer GBR support.

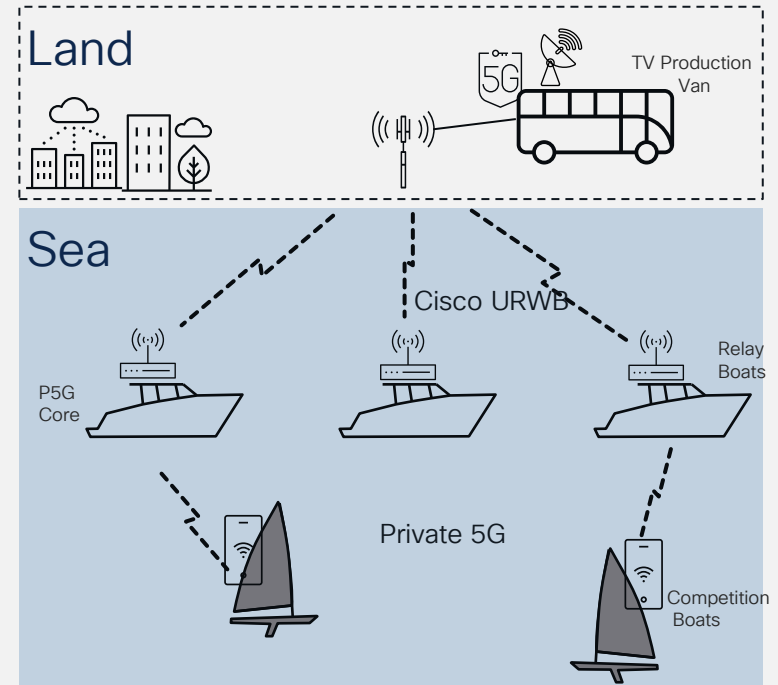
```
1  "addon_services":{
2    "eps_support":true,
3    "eps_support_config":{
4      "eps_templates":{
5        {
6          "apn_dnn":"pvtqa.cisco.com",
7          "default_session_rule":{
8            "uplink":"1010",
9            "downlink":"20",
10           "sqi":9
11         },
12         "pcc_rules":[
13           {
14             "rule_name":"camera",
15             "flow_infos":[
16               {
17                 "flowDescription":"permit out 17 from any to any",
18                 "flowDirection":"UPLINK"
19               },
20               {
21                 "flowDescription":"permit out 17 from any to any",
22                 "flowDirection":"DOWNLINK"
23               }
24             ],
25             "sqi":1,
26             "max_brUl":"70000",
27             "max_brDl":"10000",
28             "gbr_Ul":"60000",
29             "gbr_Dl":"5000"
30           }
31         ]
32       }
33     }
34   }
35 }
```

# Sailing Competition Use-case

## Description

- Sailing Competition: provide live video feeds from competitors
  - Sailboats equipped with mobile phones to provide video feeds
  - Kite / Wind surfers with Helmet cameras
- Wireless combination used to extend the coverage at sea
  - Using boats to relay signals
  - Relay boats host Private 5G Core and Cisco URWB tracking Horn Antenna
- Benefit:
  - P5G endpoint connectivity – dedicated spectrum!
  - Cisco URWB backhaul to extend field of play

## Architecture



# Summary



# Summary



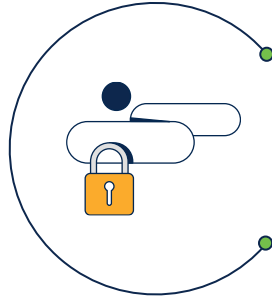
## Cisco Private 5G



Enterprise-ready  
network



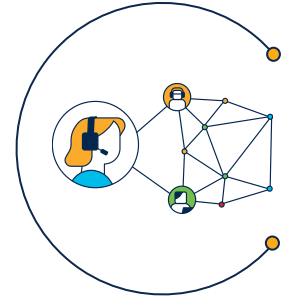
Highly available  
and resilient  
network (edge to  
cloud)



Enterprise-grade  
security across  
the board



Enabling partner  
and enterprise  
observability



Converged access  
network (no island)



Thank you

CISCO *Live!*





# Webex App

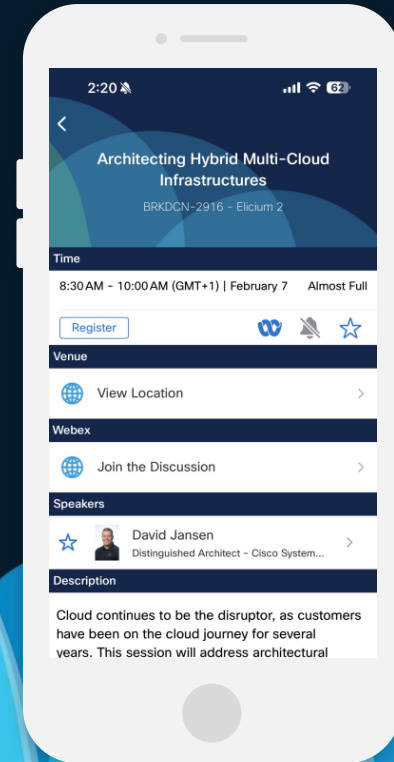
## Questions?

Use the Webex app to chat with the speaker after the session

## How

- 1 Find this session in the Cisco Events mobile app
- 2 Click “Join the Discussion”
- 3 Install the Webex app or go directly to the Webex space
- 4 Enter messages/questions in the Webex space

Webex spaces will be moderated by the speaker until February 28, 2025.



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(from 11:30 on Thursday, while supplies last)



All surveys can be taken in the Cisco Events mobile app or by logging in to the Session Catalog and clicking the 'Participant Dashboard'



Content Catalog

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Contact me at: [filrodri@cisco.com](mailto:filrodri@cisco.com)

CISCO *Live!*

GO BEYOND

The background of the slide features a series of overlapping, teardrop-shaped elements in various shades of blue, ranging from light sky blue to deep navy blue. These shapes are arranged in a way that creates a sense of depth and movement, resembling a stylized mountain range or a series of waves. The overall aesthetic is clean and modern.