

The background is a vibrant, abstract graphic. It features a central bright white light source from which numerous colorful rays emanate, creating a sunburst or starburst effect. The rays transition through a spectrum of colors including yellow, orange, red, and various shades of blue and green. Overlaid on this are several large, semi-transparent, wavy shapes in similar color tones, giving the overall image a sense of motion and energy.

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The bridge to possible

Cisco P5G

A Robust and Secure Architecture

Rajneesh Geer, Technical Solutions Architect,
Partner Managed and as-a-Service Sales

BRKGEN-2001

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Cisco Webex App

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Agenda

- Introduction & P5G reality check
- Cisco Private 5G (P5G) deployment model
- Cisco P5G robustness
- Cisco P5G security
- Key Takeaways

Introduction



Reality check on 5G



No more a Hype

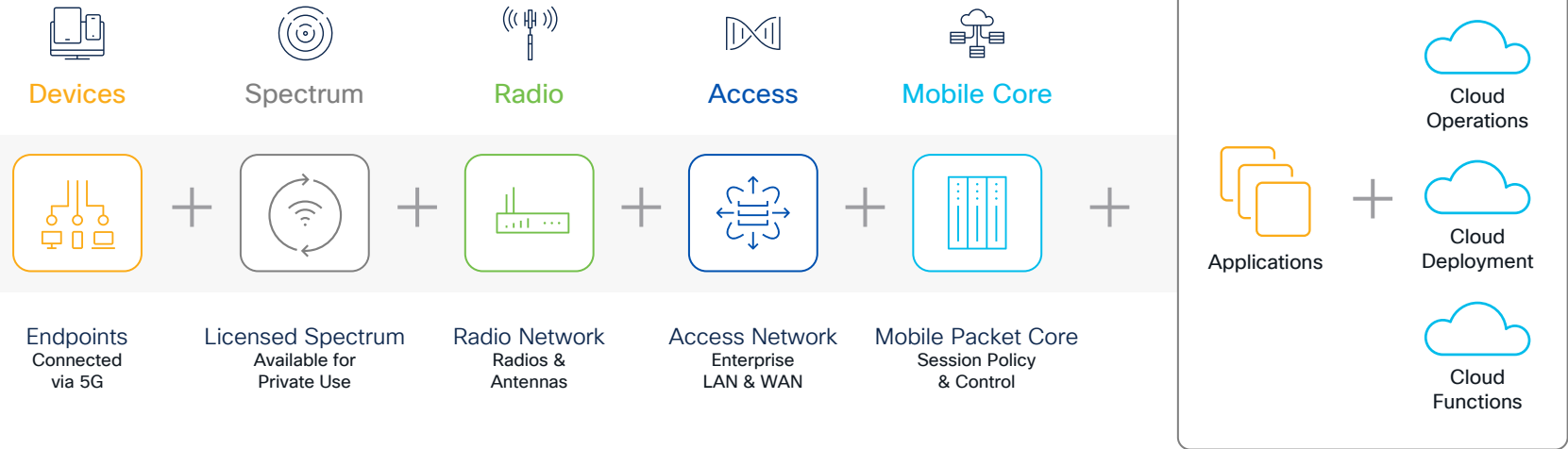
"Private LTE/5G network spend will reach USD7.7 billion in 2027, of which 35% will be generated by the manufacturing sector and 32% by the mining, oil and gas sector."

"39,000 installations by 2027."



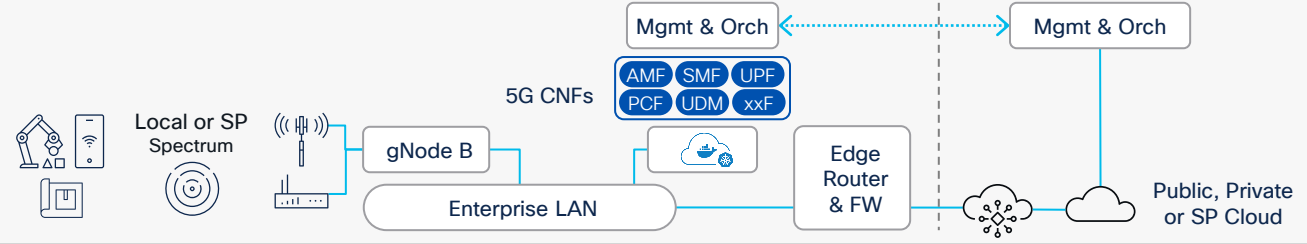
Source-Analysys Mason

P5G Architecture components



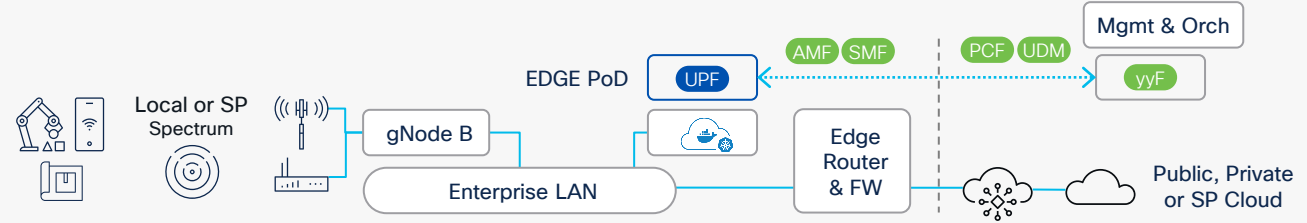
5G Deployment options

Full Private Deployment

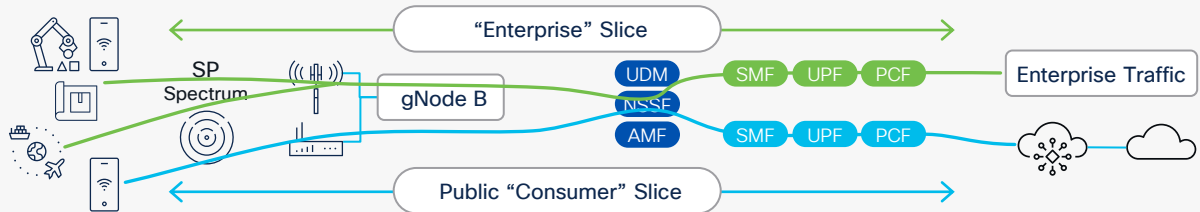


P1

Hybrid Cloud Private Deployment

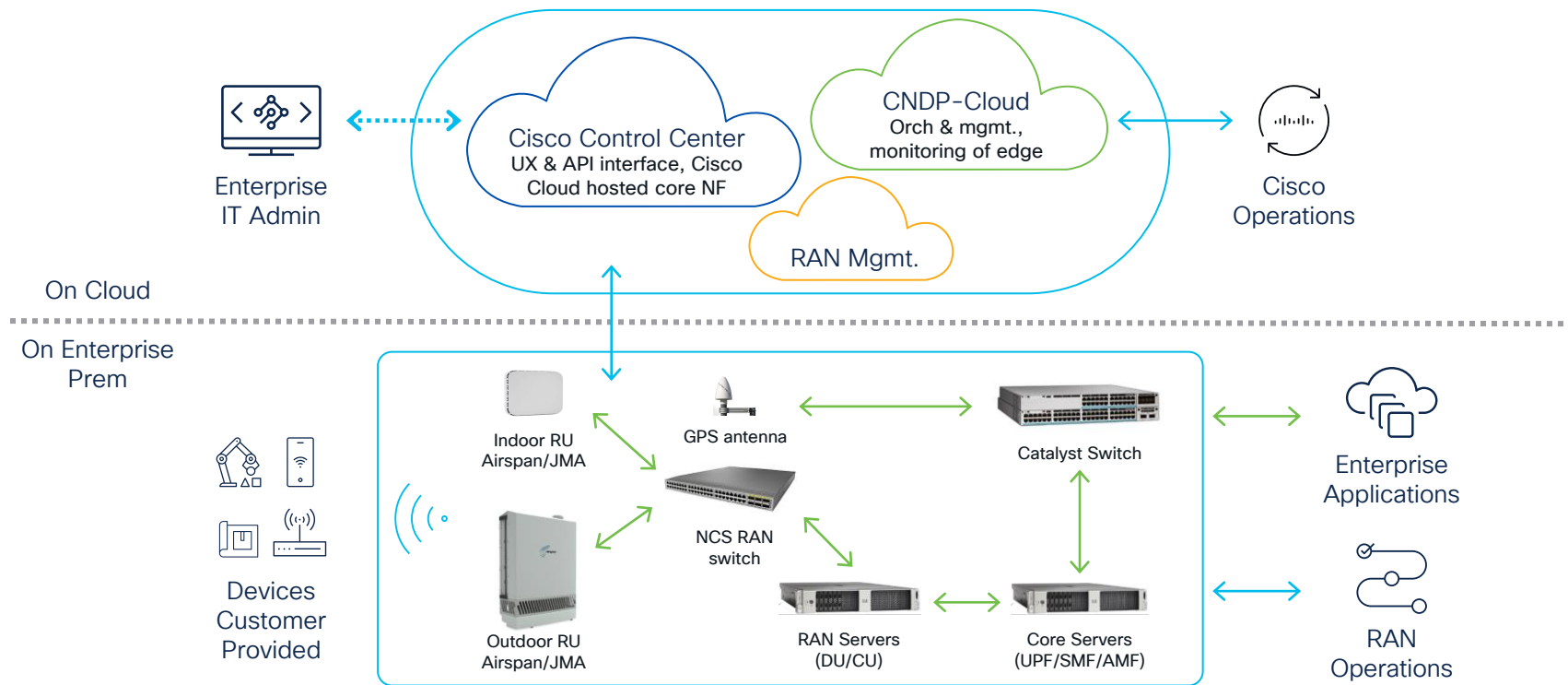


Macros Slice Deployment



Cisco Private 5G

Architecture



Cisco Solution Robustness



Attributes defining robustness



Reliability

- Improving network observability
- Network function performance dashboards

#1

Cellular Experience



Availability

- Inservice upgrades and updates, Microservices/SBA
- HA based solutions

#2

Rigid Platform



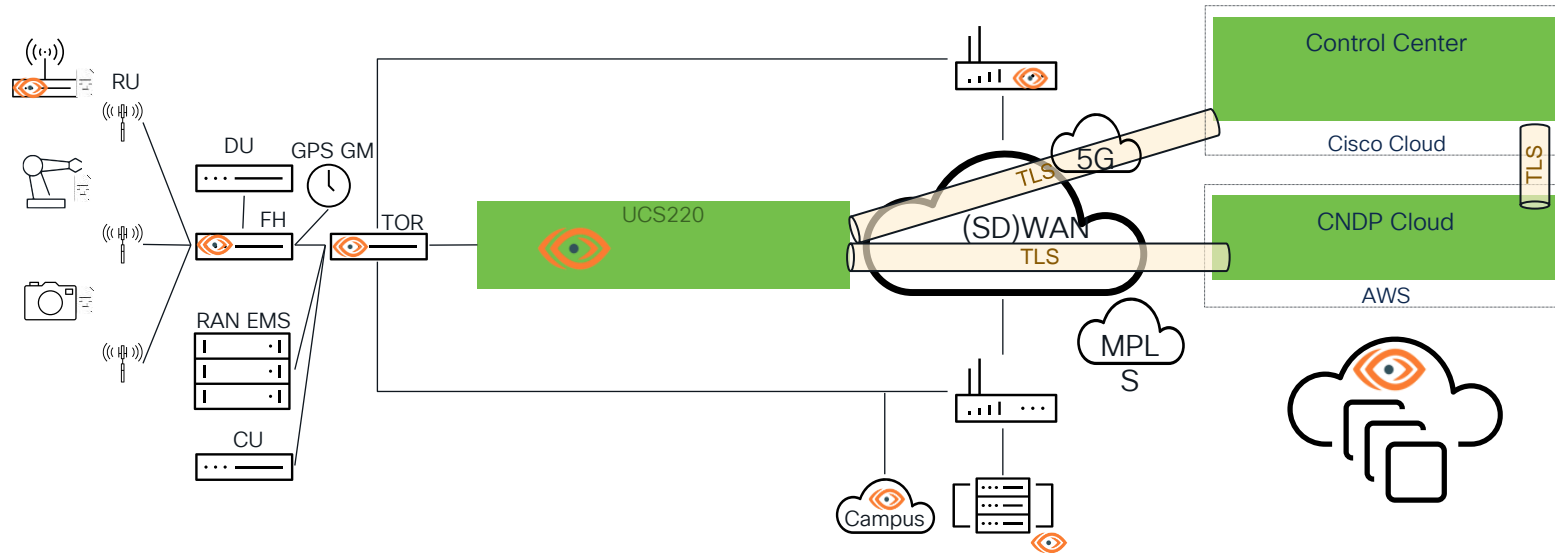
Resiliency

- Automation and orchestration
- E2E network visibility

#3

Embedded security

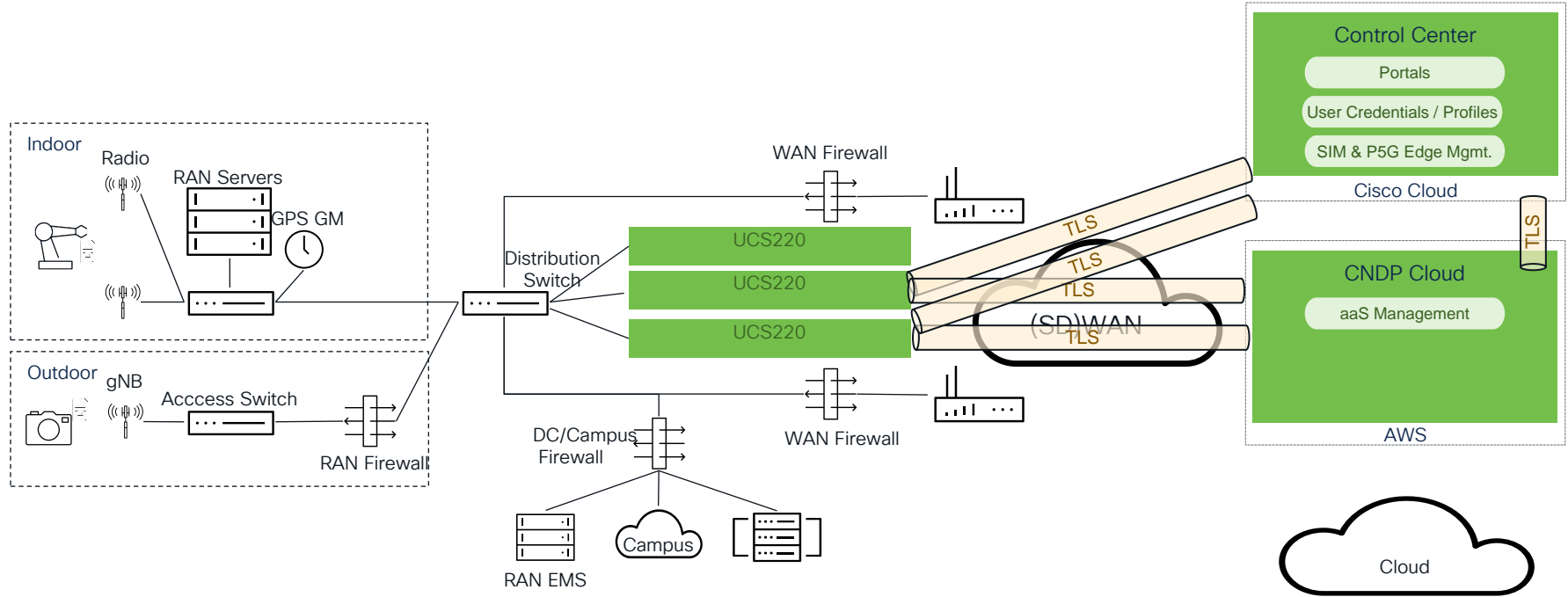
Network Visibility Architecture-TE *



* Subject to availability

CISCO *Live!*

P5G HA Architecture*



* Subject to availability

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Building on a strong foundation of cellular networking experience

#1 IP network share



For over 20 years,
Cisco has delivered leadership,
expertise, and innovations
in cellular mobile wireless
infrastructure and services



World's first 5G network
dedicated specifically to
aviation (Gogo)

#1 Mobile IoT share

#1

Implemented the world's
first and largest nationwide
5G Standalone Core

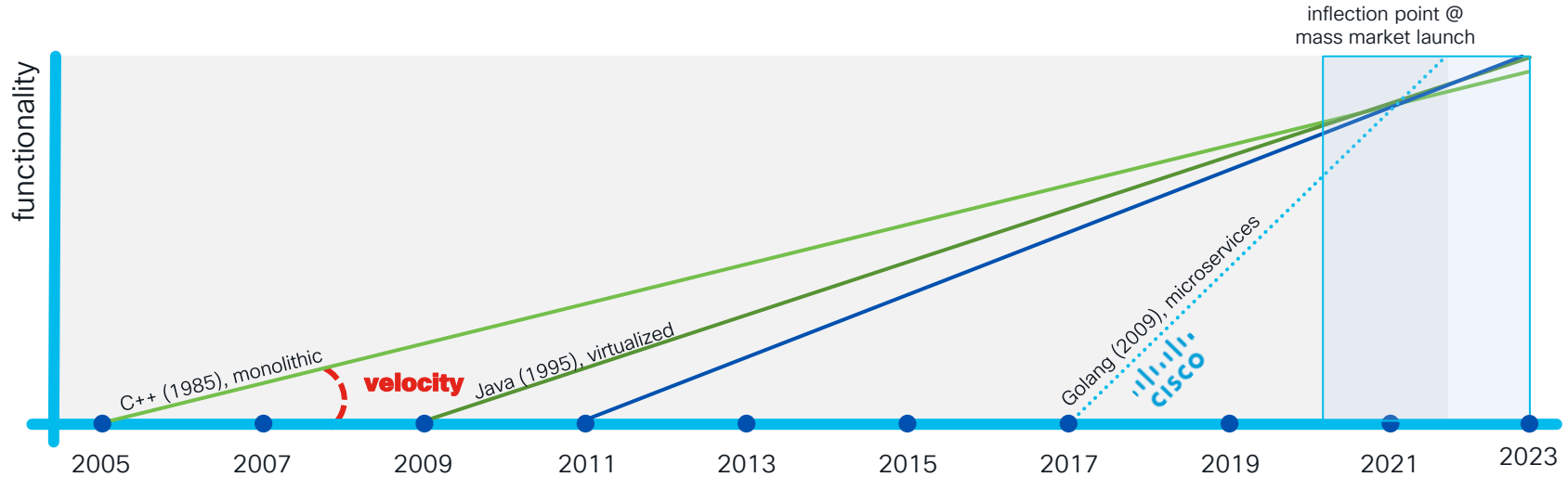
1st US-wide 5G IoT and
consumer deployment

1.5B Daily subscribers over
Cisco Packet Core



More than 50 mobile
operators and 30K+
Enterprises managing over
180M SIM-based end points
using IoT Control Center

Cisco 5G and the history of software



Cisco products provide a fundamental competitive advantage in a software-only future

Angle represents “[software development velocity](#)”. It is a result of fundamental choices made at product inception ([programming language](#), [development tooling](#), [architecture](#), software modularity & application services, use of open source, [code sharing](#)).

Built on a strong foundation of mobile SaaS

Enterprise policy and management



across Service Provider networks

Mobile operators

Cisco IoT Control Center

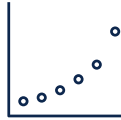
Enterprise backend integration



Deep Network Integrations



Lifecycle automation



Analytics and diagnostics



Comprehensive security



Cellular cost management



Backend integration

Global API



CRM
Traditional IT



MDM
Traditional IT



ERP
Traditional IT

Intuitive UI



R&D



Operations



Finance



Partners

50+ Service Providers

220M Devices

30K+ Enterprises
120 Countries
20+ Industries

Cisco P5G Security



Key Challenges in 5G

IoT & M2M



1

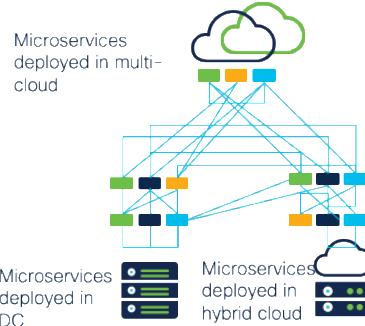
Weak inbuilt security in IoT devices, peer to peer attacks, V2X use cases

Perimeter less deployments



Traditional

VS

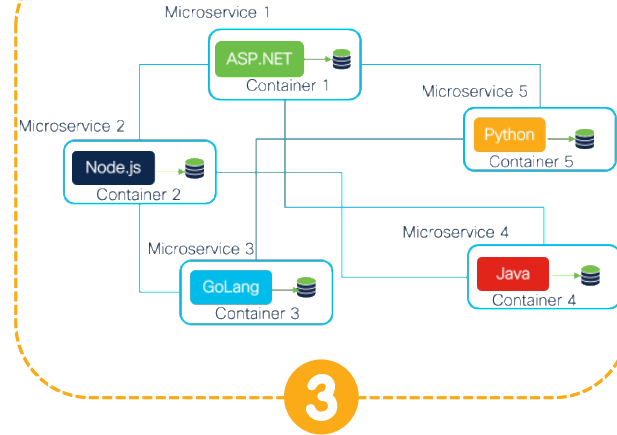


Microservices

2

5G components can be deployed on-premises and in the cloud, this breaks the concept of perimeter-based deployments. We didn't have to worry about this in 4G

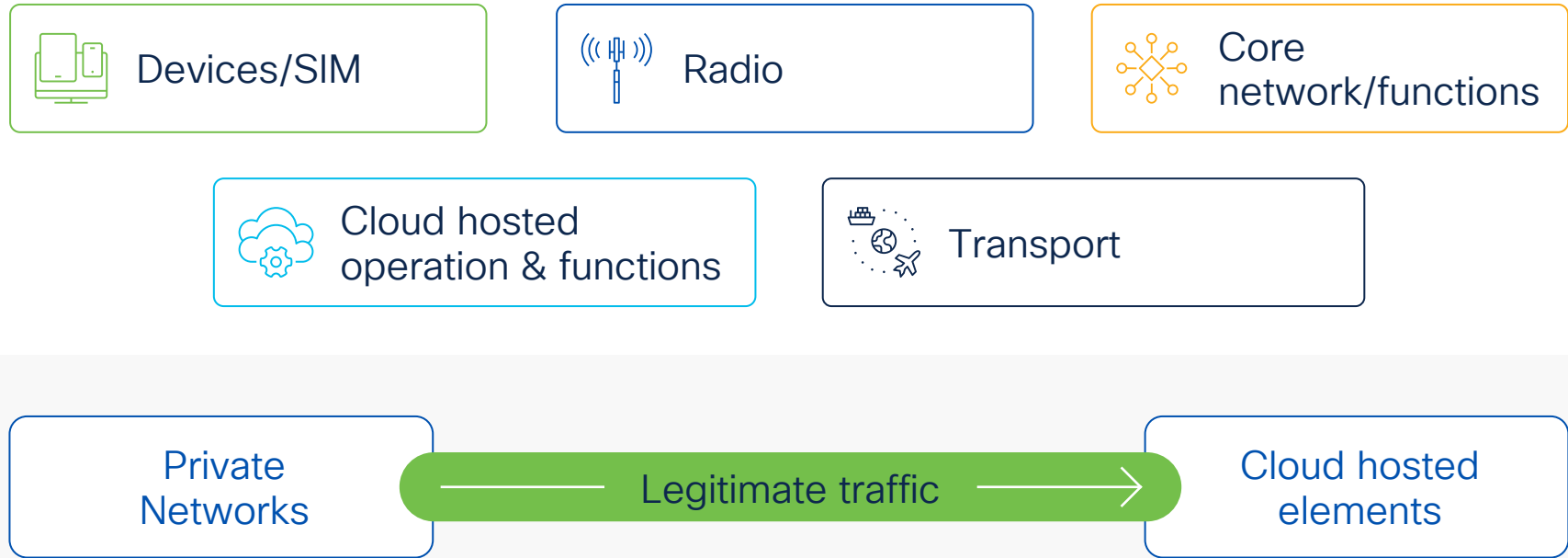
Polyglot architecture



3

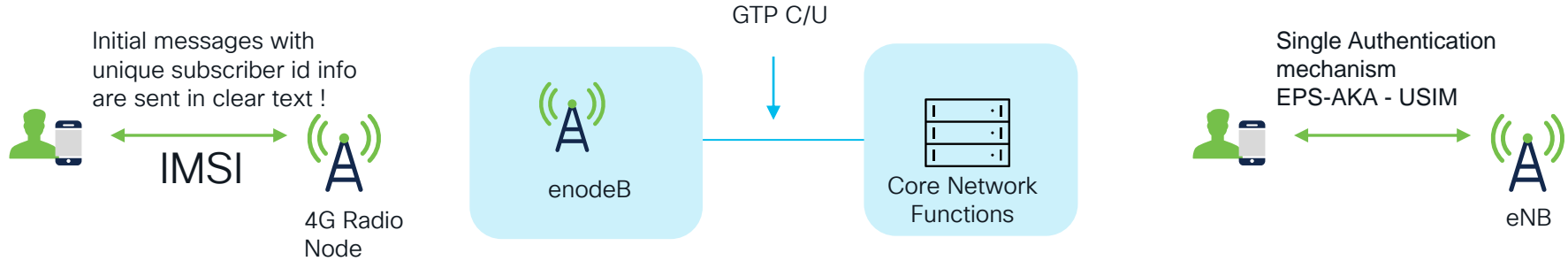
Virtualized 5G components use open-source programs which introduce vulnerabilities. We didn't have to worry about this in 4G.

What must be secured ?

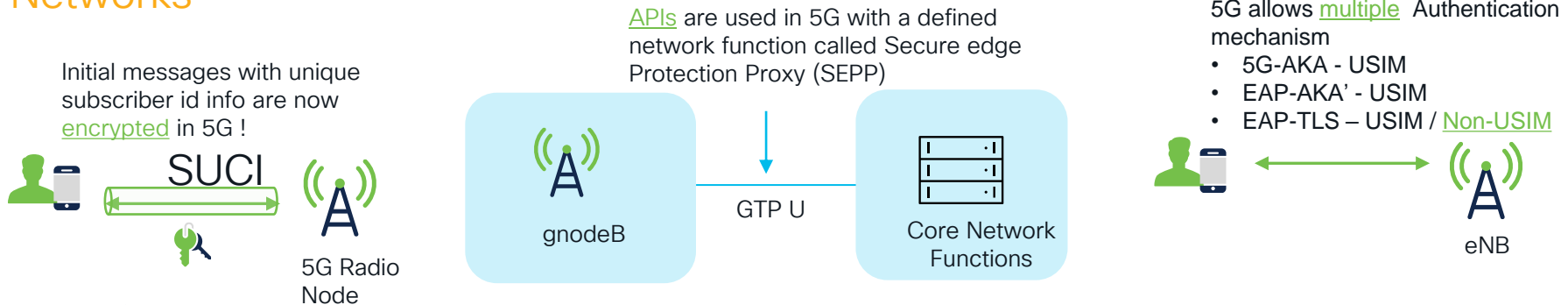


What comes from standards

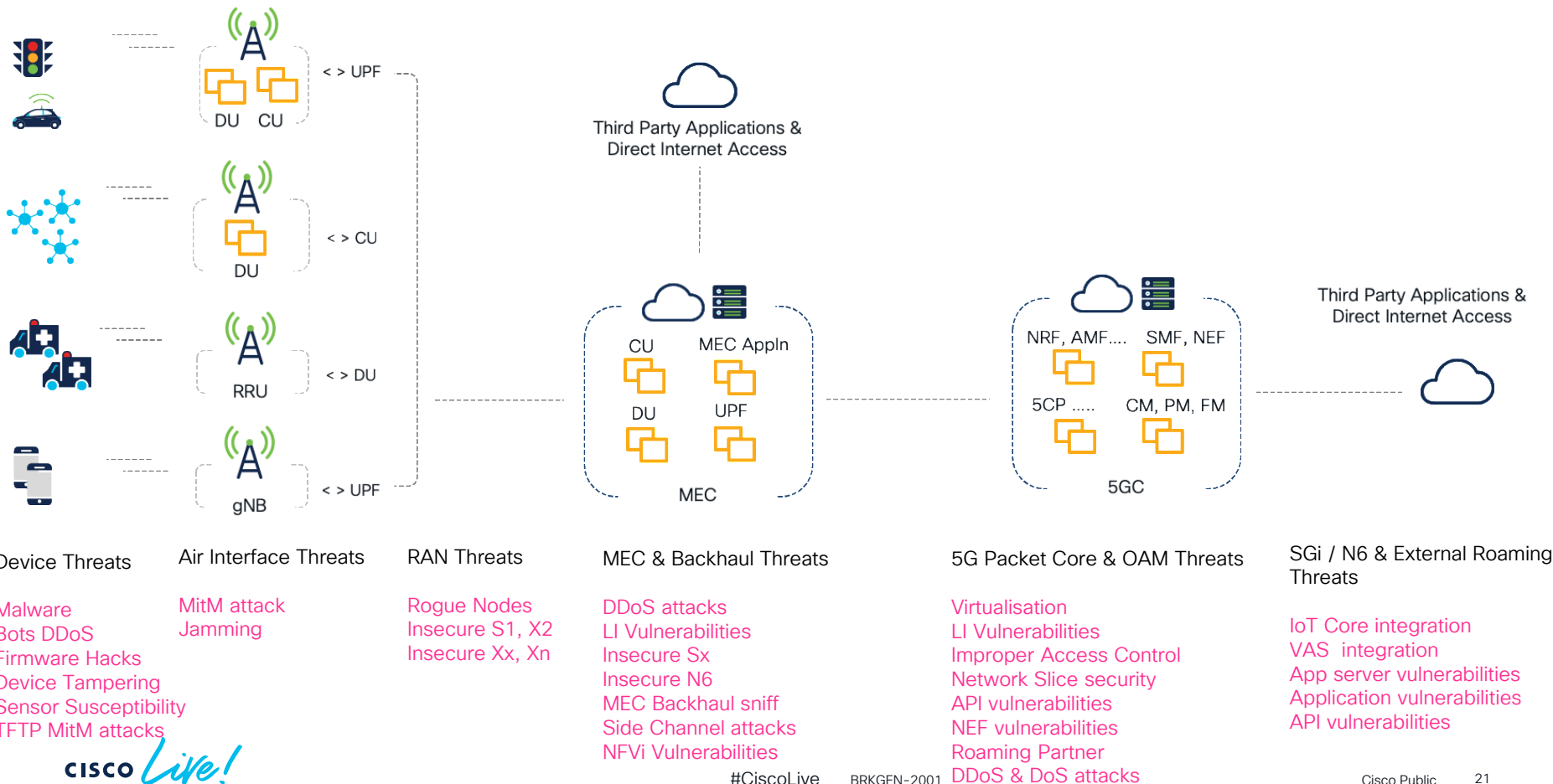
4G Networks



5G Networks



Threats in 5G architecture



Typical P5G Threats

Device/SIM

- Malware
- Bots DDoS
- Firmware Hacks
- Device Tampering
- Sensor Susceptibility
- TFTP MitM attacks

Ran Threats

- MitM attack
- Jamming
- Rogue Nodes
- Insecure N1, N2 & N3
- Encryption

Attack on Network Functions

- Virtualization vulnerabilities
- Improper Access Control
- API vulnerabilities
- Malware
- IoT Core integration
- DDoS & DoS attacks

External Threats

- IoT Core integration
- App server vulnerabilities
- Application vulnerabilities
- API vulnerabilities

Cisco security approach

Secure development objectives



Network as a sensor

You Can't Manage What You Can't See

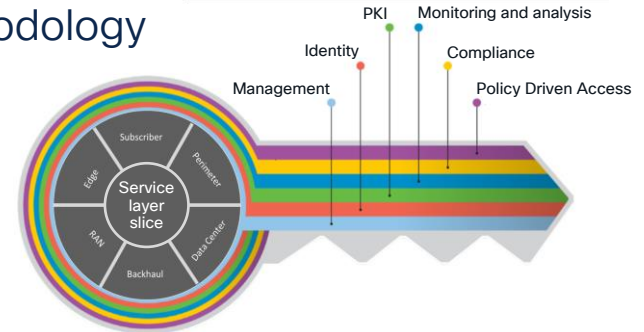
Network telemetry
Contextual data

Complex event
processing

Correlated
Insights

Suggested
remediation

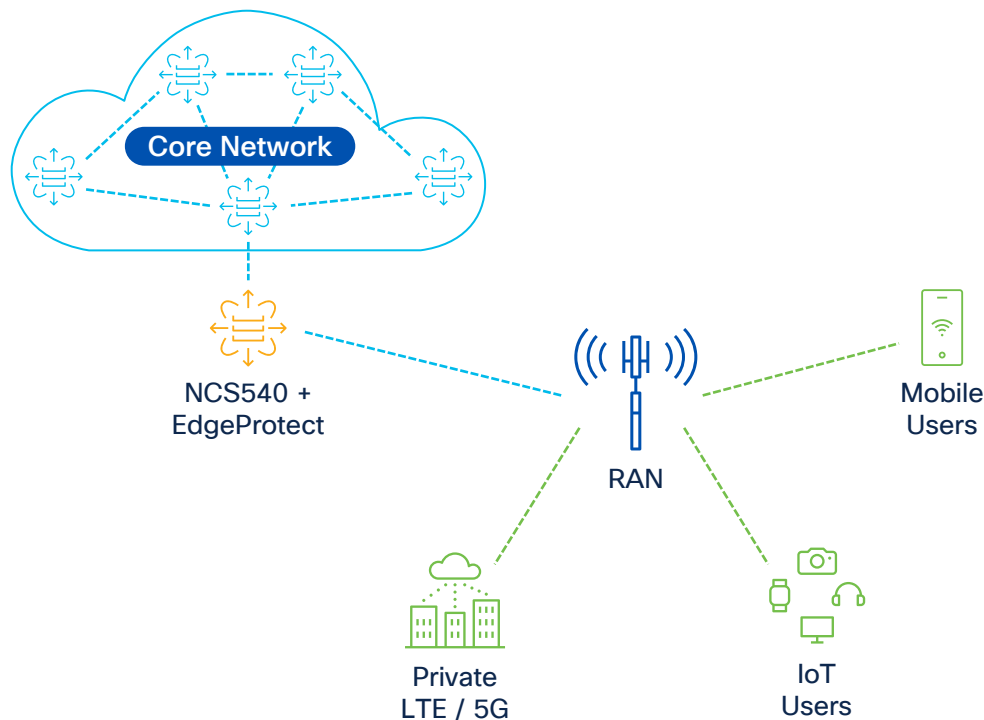
Safe methodology



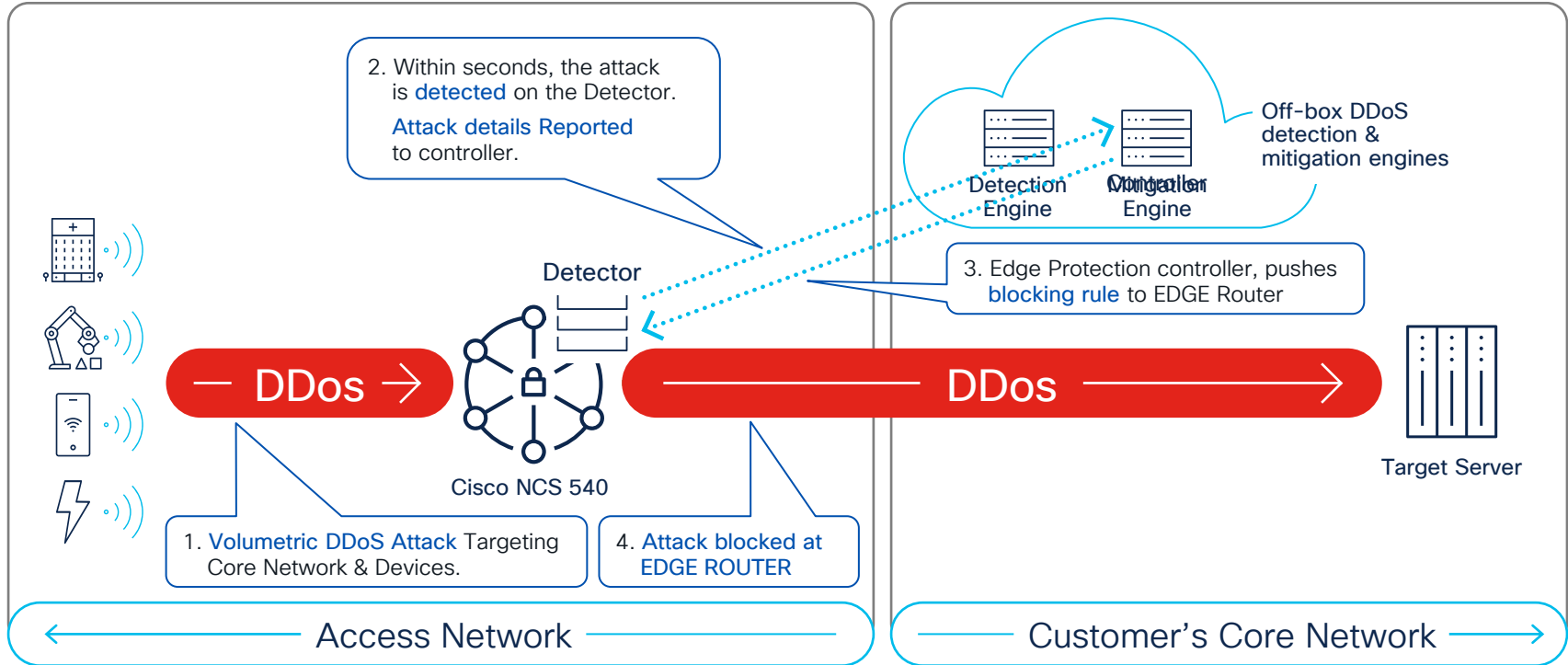
Mobile Access

Edge Protection

- Detect and eliminate DDoS attacks at the network edge
- On router solution – no dedicated scrubbing infrastructure required
- Eliminate attacks originating from user equipment
- Low latency solution for latency sensitive applications



Edge Protection Solution on NCS540



Umbrella

DNS & Endpoint protection

Destinations

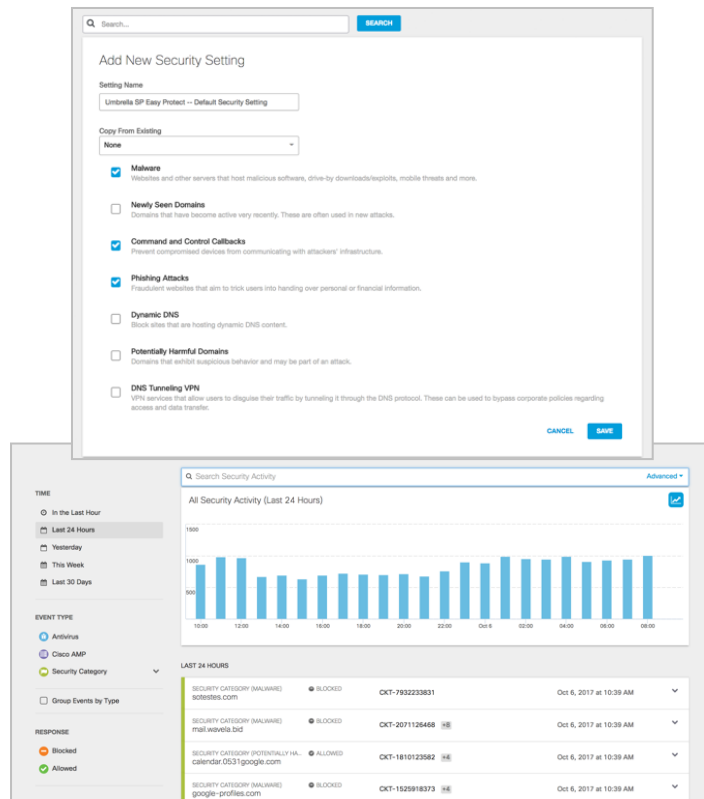
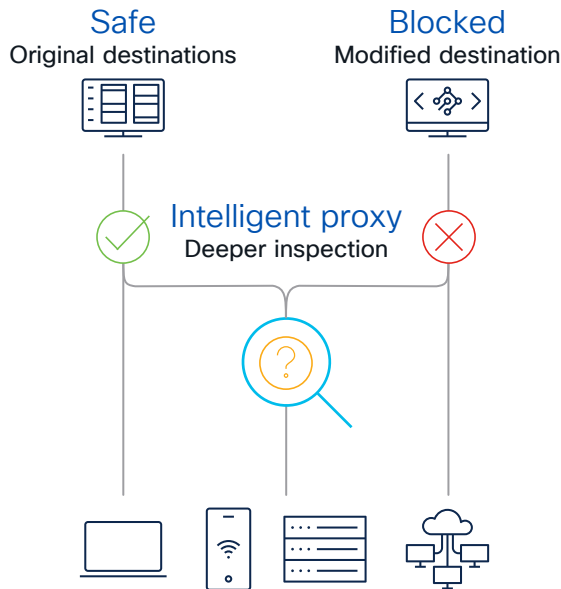
Original destination
or block page

Security controls

- DNS and IP enforcement
- Risky domain inspection through proxy
- SSL decryption available

Internet traffic

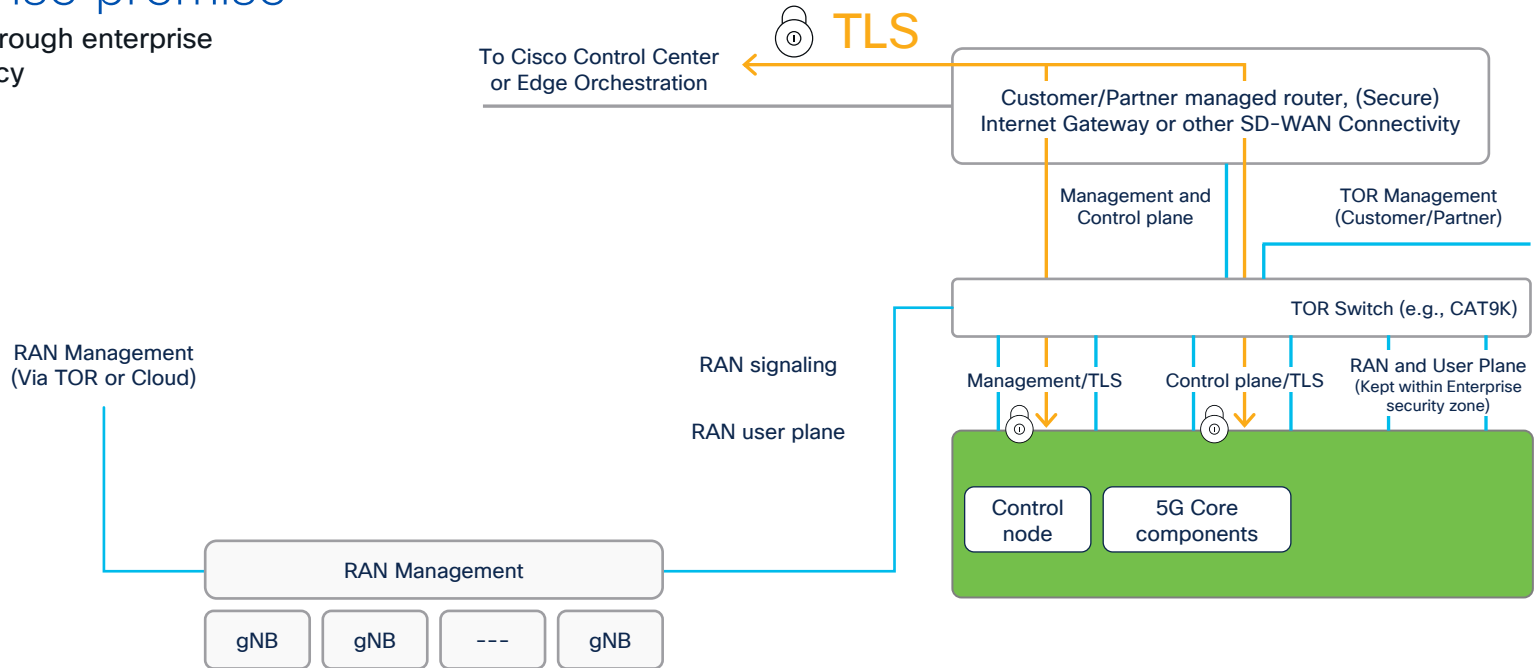
On and off-network



TLS communication

Enterprise premise

Protected through enterprise security policy



Design for the enterprise and ready to integrate

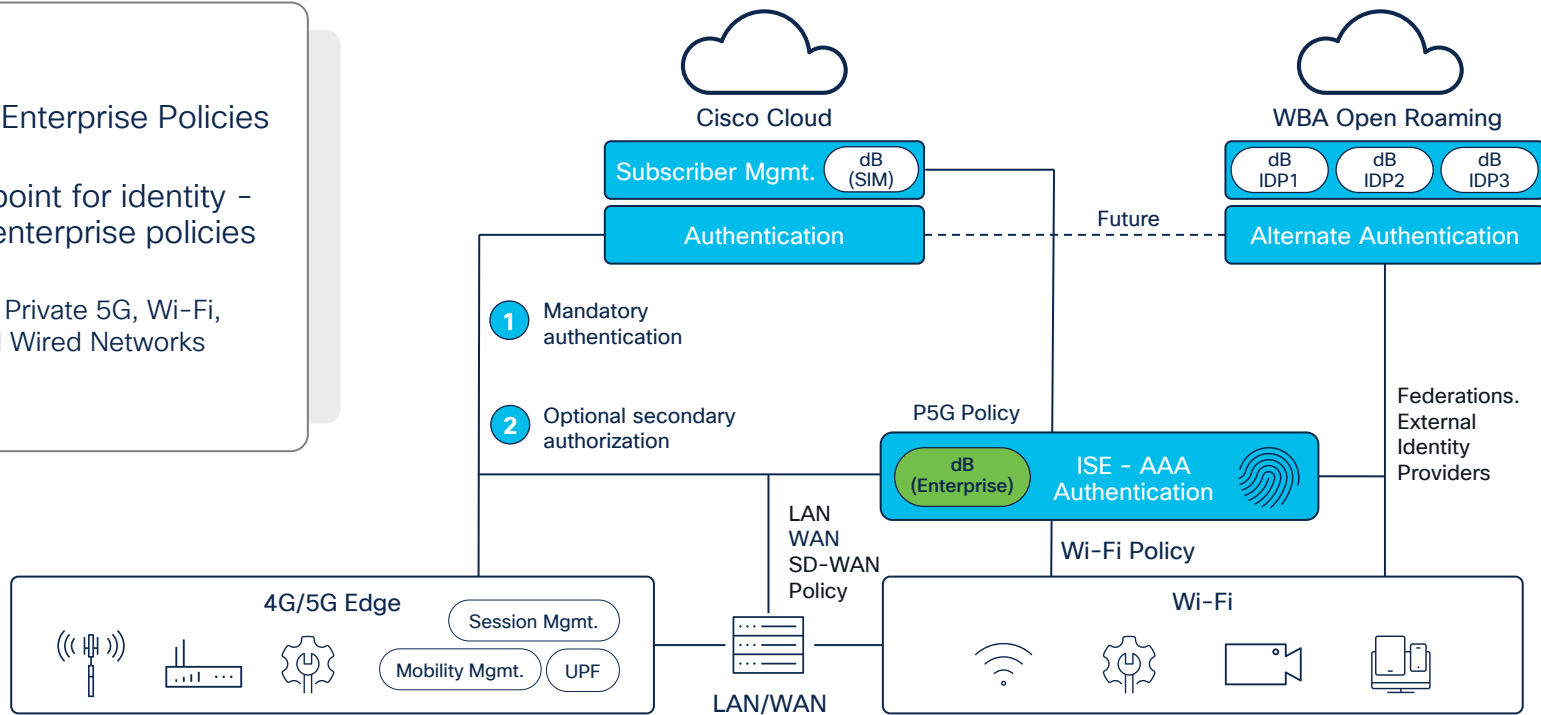
For example: Identity and Policy

Unified Enterprise Policies

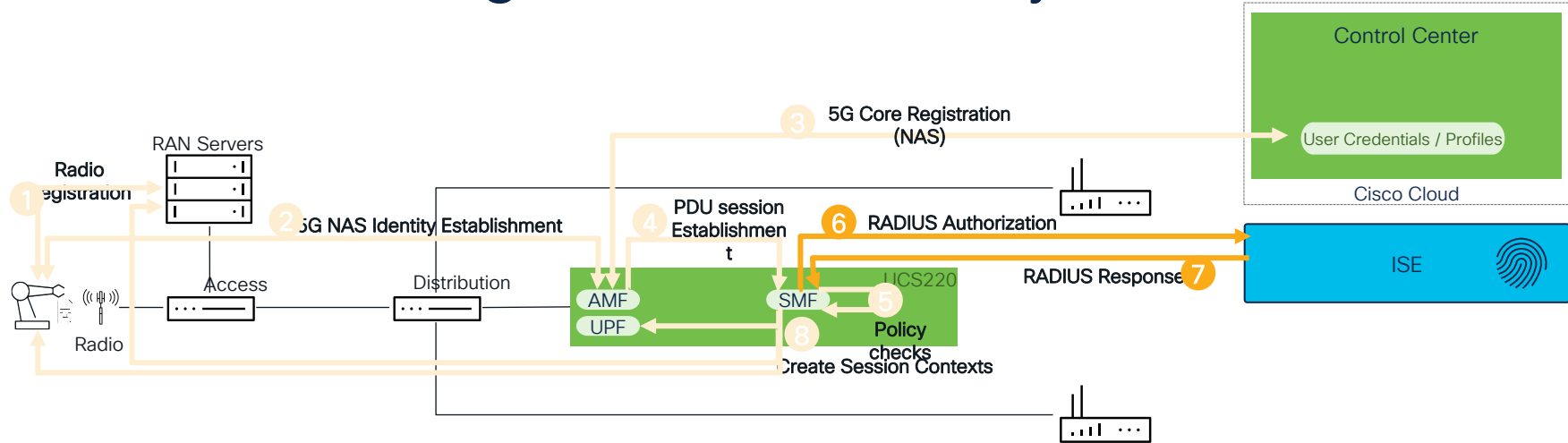
Single point for identity -
based enterprise policies



For Private 5G, Wi-Fi,
and Wired Networks



Cisco ISE Integration: Secondary Authorization



- Cisco ISE Integration adds a secondary RADIUS-based authorization into the Registration process
- RADIUS Access Request: SMF sends IMSI/IMEI
- RADIUS Access Accept: ISE returns VLAN

PSIRT

Cisco Product Security Incident Response Team

A dedicated, global team that manages the receipt, investigation, and public reporting of security vulnerability information that is related to Cisco products and networks.



Over 20 years' experience helping to alert customers about vulnerabilities in Cisco products



The single entity authorized within Cisco to disclose vulnerability information to customers



Global team of incident managers providing 24/7 support



ISO 29147 compliant

PSIRT investigates vulnerabilities across the entire Cisco product portfolio.



Cisco proprietary code



Third party software components

Security Reference Architecture

TALOS

Threat Intelligence | Malware Analytics | Actionable Intelligence | Unmatched Visibility | Collective Responses

Security Operations

SECURE X (XDR)

Managed Detection and Response Services

Security, Orchestration, Automation and Response

Incident Response and Remediation Services

Threat Visibility & Hunting

Device Insights

Kenna Vuln Mgmt

Secure Cloud Insights

3rd Party Integrations

User/Device Security

Zero Trust

Adaptive MFA | Passwordless | Trust

Duo Secure Access | Secure E-mail

SASE/Remote Worker

Unified Client | EDR | Cloud Managed



Cisco Secure Client

VPN

Posture

Telemetry

Threat

Query



ThousandEyes
(Visibility)

Device Mgmt



Meraki SM
OS, App Control

Network Security

Cloud Edge

Secure Access Service Edge (SASE)

Zero Trust

Private Cloud Edge (MSP or Customer)

Threat Protection | Secure Access Control | Managed Remote Access

Reliable | Scalable | Flexible



ZTNA



DNS-layer security



Secure web gateway



L7 firewall + IPS



Cloud access security broker/shadow IT



RAaaS



SSL decryption



Remote browser isolation



Data loss prevention



Cloud malware detection

SDWAN



SD-WAN by Viptela



Secure Firewall



ThousandEyes



Cloud DDoS, WAF

On-Premises

SASE/SD-WAN

Zero Trust

Scalable | Flexible | Visibility | Comprehensive Security

Segmentation | Identity and Context | Profiling | Containment | Encrypted Visibility



Network Edge



SD-WAN



SD-WAN by Viptela



Secure Firewall



ThousandEyes

IoT/OT Security

Secure Critical Infrastructure | Unified IT and OT



Industrial Router



Industrial Firewall



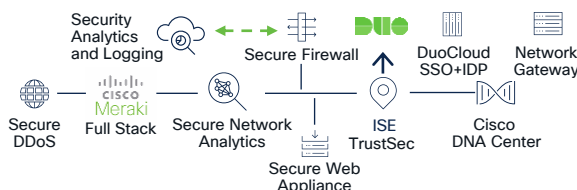
Industrial Switch/AP



Cyber Vision



ISE TrustSec



Application Security

Zero Trust

Policy | API Security
Application Segmentation
Run-time Application Security

Application Security Stack



Cloud Native Security



API



Secure Workload



Secure Application by AppDynamics

App Observability | Detection | Response



Hybrid Private



Public Cloud



Secure Cloud Analytics



Secure Firewall



ThousandEyes



Secure DDoS, WAF/Bot

Key Takeaways

1. Summary on right Deployment options
2. Value props of robust HA solution
3. Methodologies and Enterprise integration to protect
 - Core Functions
 - Devices
 - Transport

What To Do Next!



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Attendees who fill out a minimum of four session surveys and the overall event survey will get **Cisco Live-branded socks** (while supplies last)!

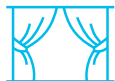


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Talk to one of our **subject matter experts** in our Booth #2217

Meet the Engineer, Sanjit Aiyappa to discuss your P5G digital transformation



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BRKGEN-2001 - Cisco P5G a robust and secure architecture

IBOSPG-2007 - Getting started with Private 5G

PSOSPG-1002 - Leading your digital transformation with Cisco P5G network offer

PSOGEN-1033 - Unlock business outcomes from connectivity with a Private 5G solution

BRKENS-2950 - Is your Enterprise Network Ready for P5G

BRKSPG-2042 - Architecting Private 5G for resiliency, security, and enterprise network/Wi-Fi 6 convergence

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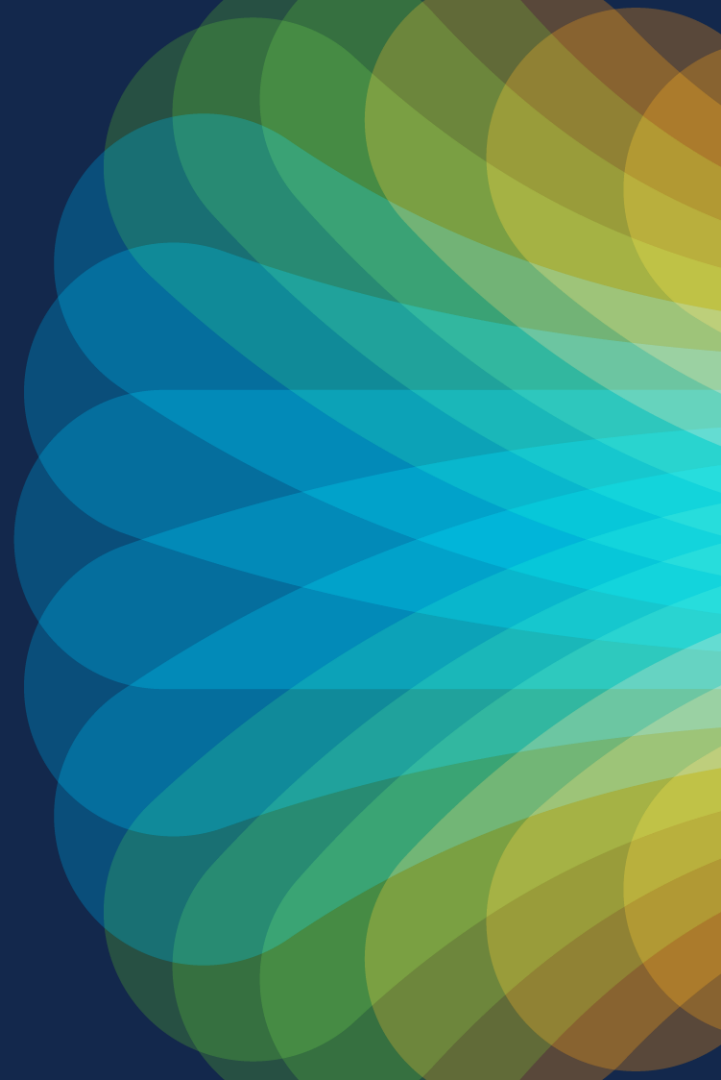


The bridge to possible

Thank you

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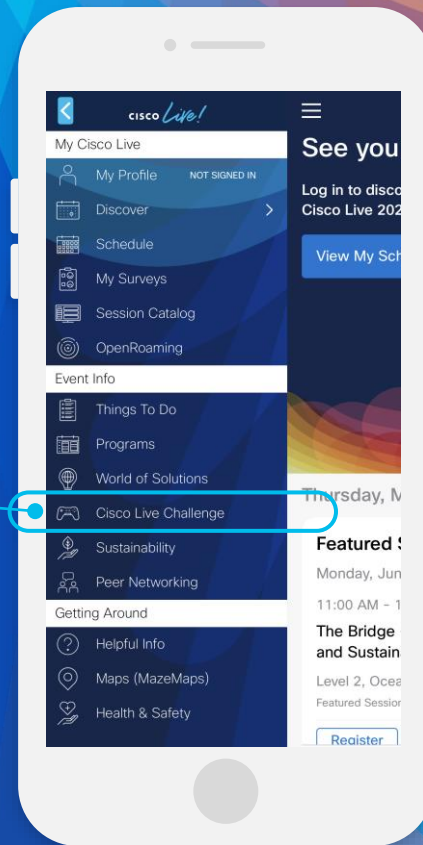


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