



The bridge to possible

Managing IOT Connectivity in a 5G World

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Agenda

- Scale IoT with cellular connectivity
- Deploy globally with eSIM
- Drive down costs with AI/ML
- Deliver mission-critical applications with 5G

IoT Drivers



Key growth drivers for IOT

Enterprise Customers are modernizing their infrastructure, transitioning autonomous environments, and creating new service models.



Transportation



Smart Cities



Oil & Gas, Mining



Manufacturing



Utilities

Current global IoT market dynamics



Autonomous &
Remote Operations



Advent of 5G &
extended use cases

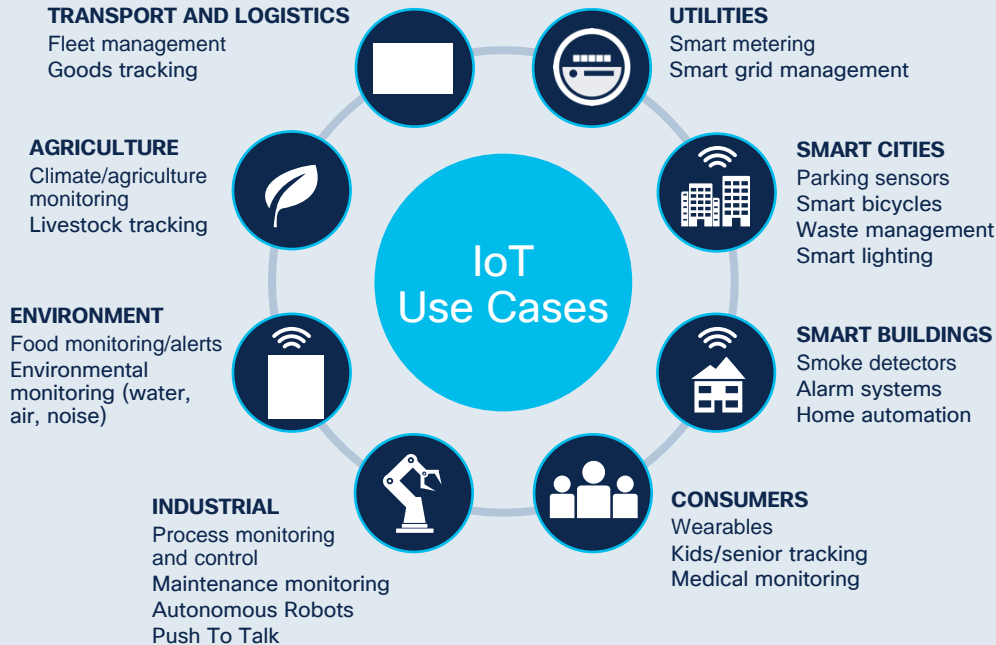


Critical infrastructure
investments



Cyber security &
visibility

The complexity of the IoT market



- Massive IoT requiring low cost / low power devices for small data volumes
- Industrial applications requiring low latency and extra security
- Mission Critical apps requiring high bandwidth and low latency
- Consumer and Enterprise
- Different vertical industries
- Variety of infrastructure and business requirements

IoT Wireless Connectivity Options

Cellular IoT

4G, 5G



- Variable to high bandwidth, easy to deploy
- Variable monthly cost, dependent on Service Provider

2G, NB-IoT, LTE-M



- Long range, low power, relatively low bandwidth
- Variable coverage and monthly cost, dependent on Service Provider

Non-Cellular IoT

NoN-Cellular
LPWA



- Long range, low power, very low bandwidth
- Great for sensors with small data payload

802.11 Wi-Fi



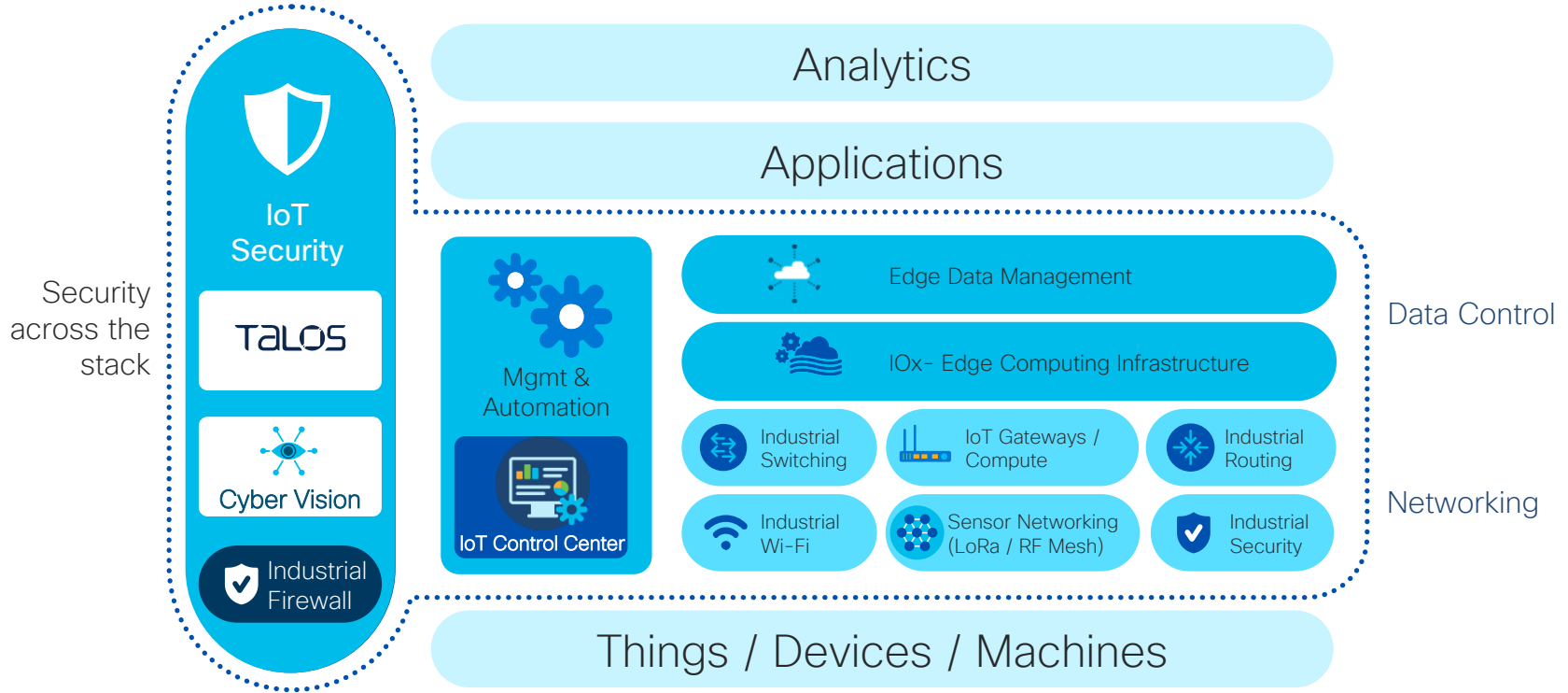
- High bandwidth, broadly supported
- Public spectrum, prone to interference

Cisco URWB
(aka Fluidmesh)



- Ultra reliable, high bandwidth
- Unlicensed spectrum

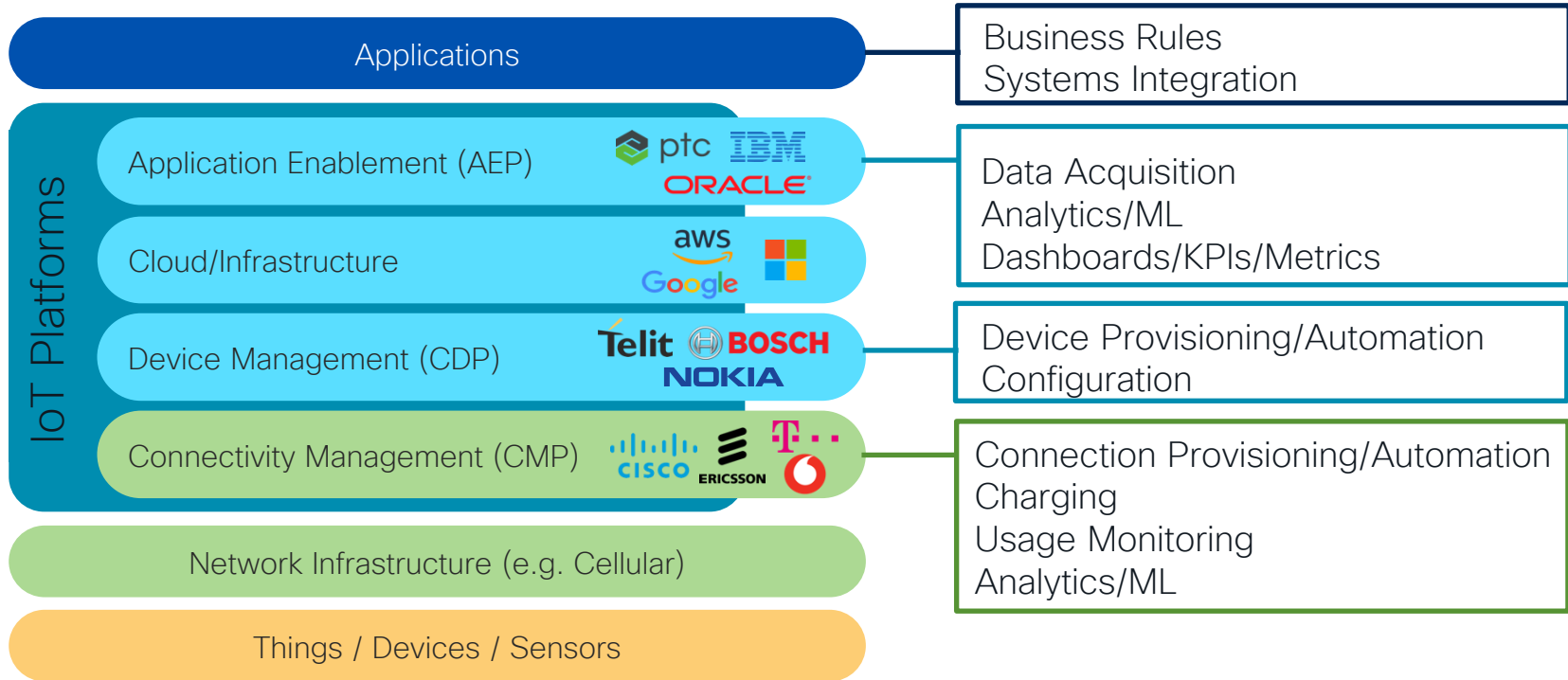
Cisco's industry-leading IoT portfolio



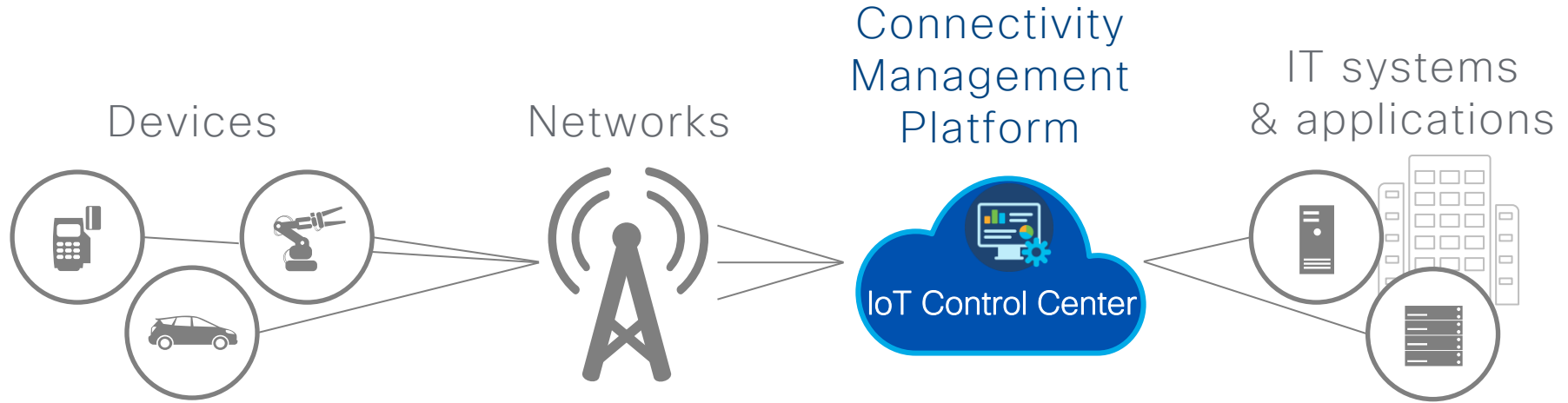
Cisco IOT Control Center



IoT Solutions address many different layers



Cisco Connectivity Management Platform



Automated connectivity
management for all your
devices globally

IoT CC meets customer needs across verticals



Connected Car

Auto makers are making driving safer through vehicle telematics

IoT CC ensures reliable cellular connectivity and helps save data costs for millions of cars on one platform.

High data usage, low latency, complex SIM lifecycle management



Financial Services

Financial organizations are getting scale and reliable service for Point of Sales and ATM systems

IoT CC enables businesses to remotely identify and resolve usage and connectivity issues at scale with analytics-based diagnostic tools.

Mission-critical connectivity, low data usage, low latency



Smart Meters

Utilities are saving costs and improving customer service with smart electric meters

IoT CC provides fine-grain visibility and control for millions of devices so organizations can manage issues themselves – day or night – without a call to their service provider.

Low data usage, lower reliability requirements, high latency

#1 Cellular IoT Connectivity Management Platform

50+ Service Providers

30K+ Enterprises

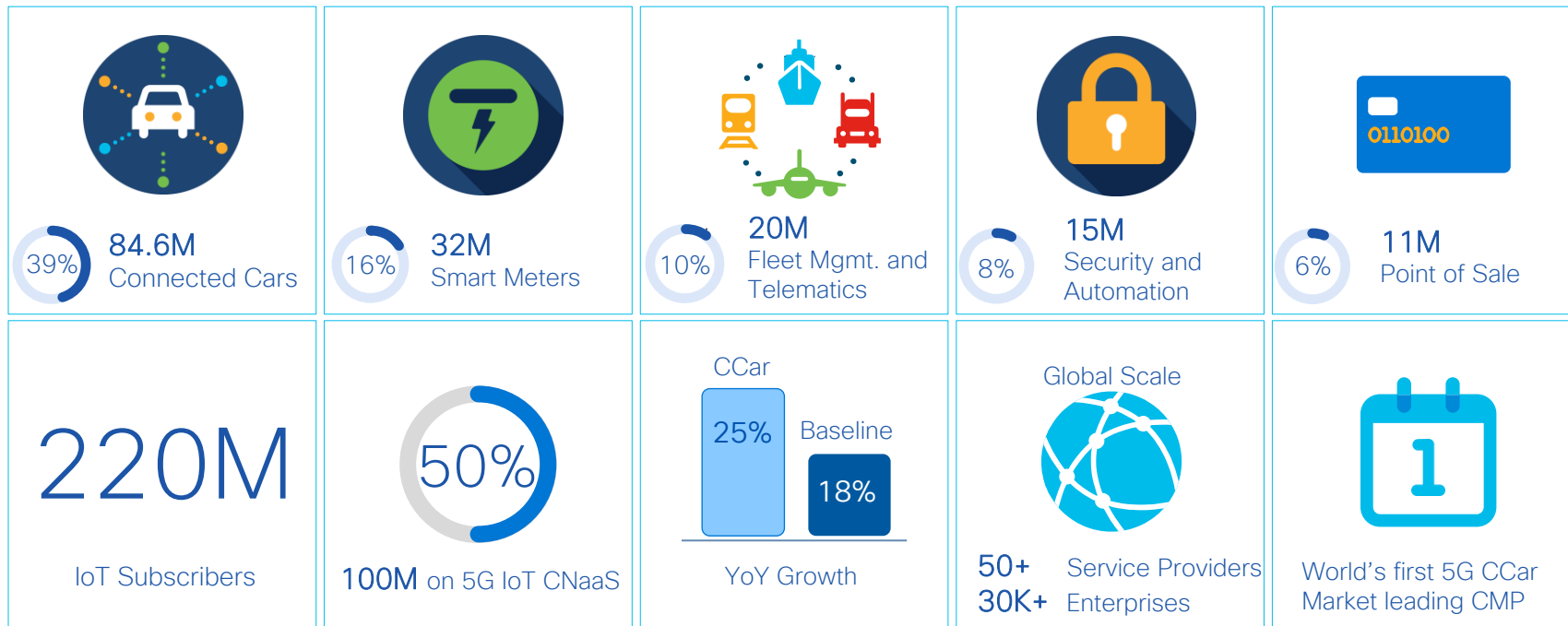
220M
Connected Devices

20+ Industries

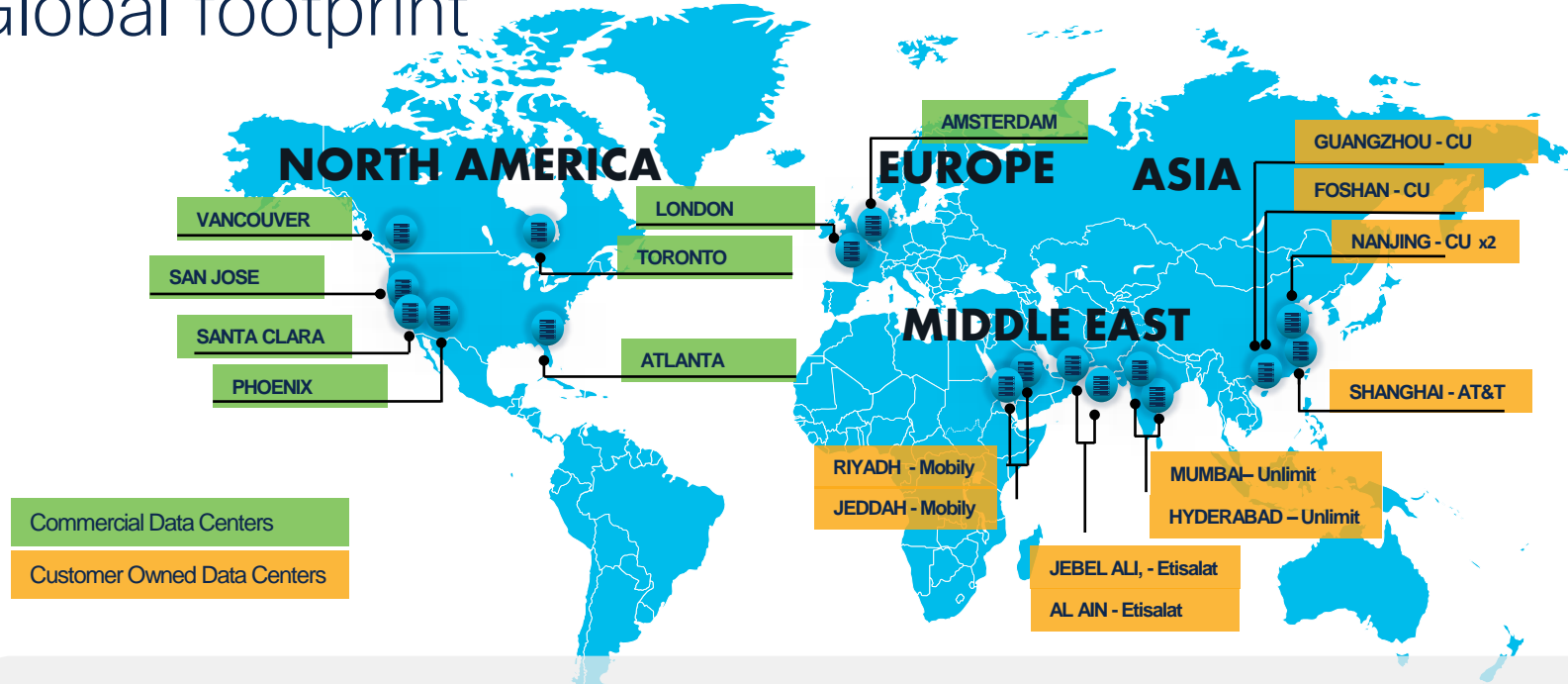


Leading IoT use cases and business snapshot

Driving real world impact at scale



Global footprint



14K+
Virtual Machines

2K+
Servers

19
Data Centers

1K+
Network Devices

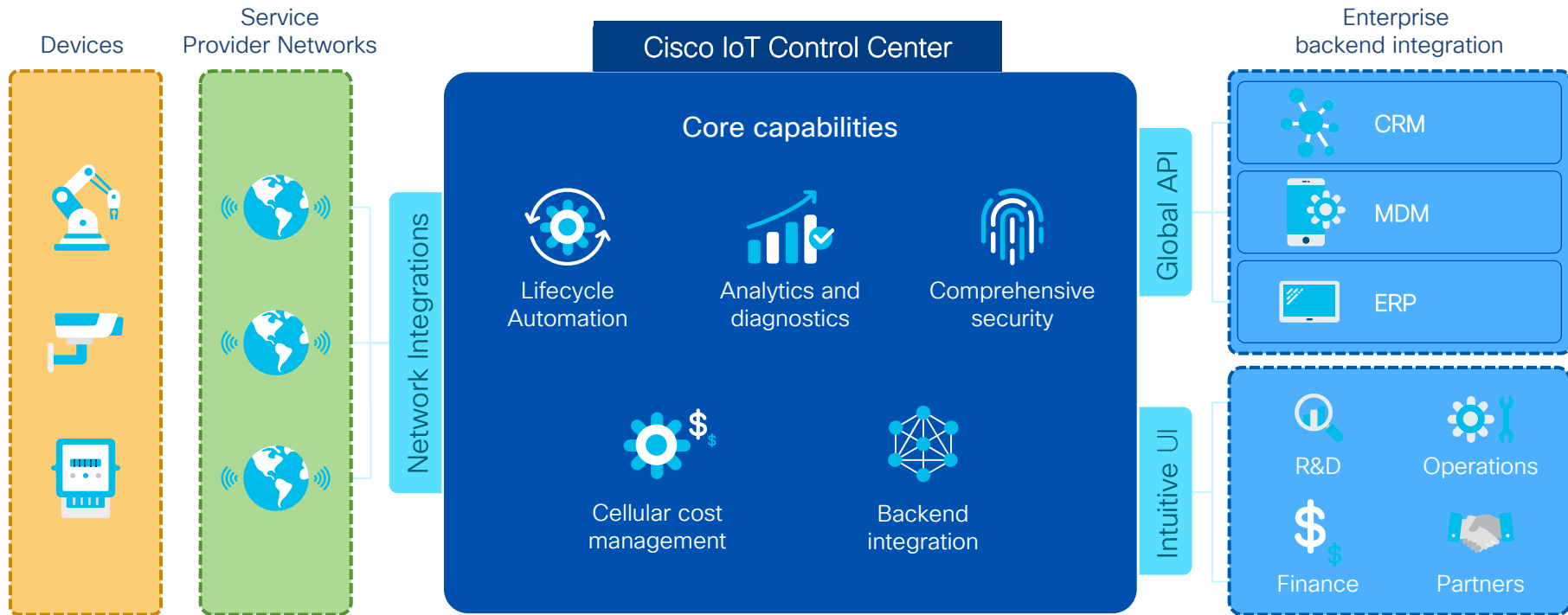
12PB+
Storage

IOT Control Center Detailed Capabilities



Automated connectivity management

Removing the complexity from the equation



IoT Control Center Platform Applications

Same platform but different views

IoT Control Center for Service Providers

- Onboard new Enterprise accounts
- Setup rate plans and services
- Integrate with internal systems
- Manage and view all their Enterprise accounts



Service Providers

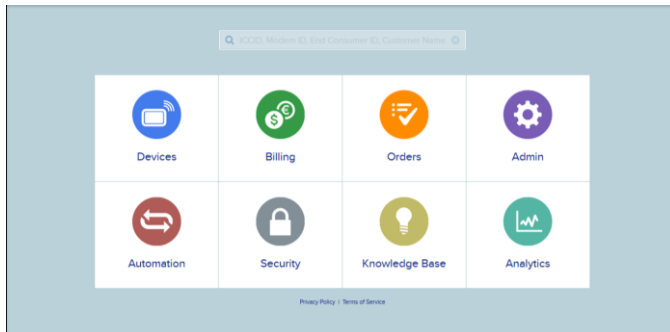
CISCO *Live!*

IoT Control Center for Enterprises

- Monitor device statuses and usage
- Diagnose connectivity issues in a timely manner
- Automate business rules to streamline processes
- Track costs to ensure proper budgeting



Enterprises



Connected Devices

Scale faster

Zero touch provisioning

Speed time to revenue with near zero touch SIM onboarding



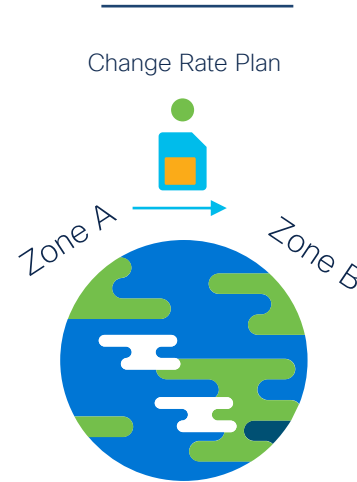
SIM State & Rate plan changes

Empower your team to easily manage SIM status and rate plans themselves



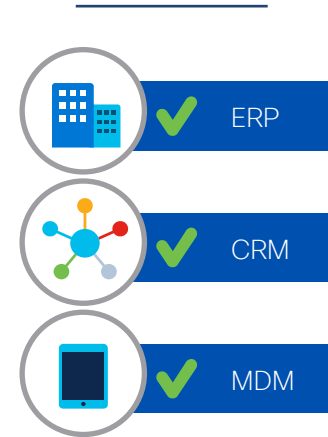
SIM Lifecycle Automation

Run more efficiently with fewer resources by automating SIM changes



API Integrations

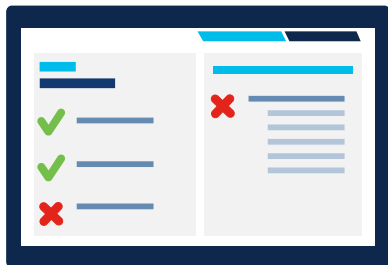
Connect to the rest of your enterprise systems with comprehensive APIs



Operate smarter

SIM level diagnostics

Resolve issues quickly
using intuitive diagnostic
tools



SIM level insights

Spotlight historical analysis

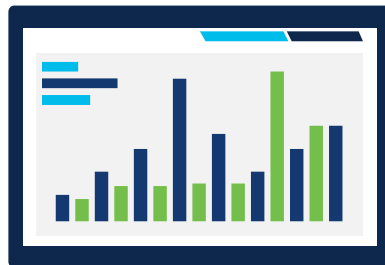
Uncover business insights
through historical
connectivity analytics



Connectivity insights

Call Detail Record (CDR) Analytics

Track month-to-date
business-wide voice, data,
and SMS usage



Usage insights

Advanced Analytics & Traffic Segmentation

Achieve business KPIs with
insights from the usage,
service, and deployment
dashboards



Business level insights

Protect better

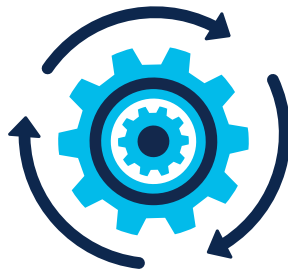
IMEI Allow & Deny Lists

Restrict SIM behavior to prevent unauthorized activity & access



Rules Automation Engine

Customize security rules to your unique business needs



Fraudulent activity-triggered deactivation
Team notifications

2-Factor authentication
User security profiles
Audit trails & IP Restrictions

Trust world-class SaaS platform security & user management



Continual industry-defining innovation

Machine Learning Anomaly Detection

Be alerted to anomalies
based on your business'
ever-changing norms



Machine Learning Cost Optimization

Automatically optimize
device rate plans for the
most efficient bill



5G Standalone Support

Start incorporating 5G into
your strategy



eSIM Flex

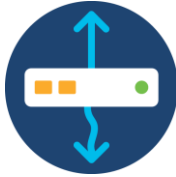
The fastest easiest SIM
portability solution on the
market



IOT Control Center Innovations



Evolving the platform with new functionalities



Build once, deploy globally
with eSIM Flex



IoT at massive scale
With AI/ML based Proactive IoT



Time sensitive applications
with 5G Network Slicing and Edge



TTV (Time to value)



Maximize Revenue &
Reduce TCO



Visibility and Control



Enhanced Safety



Enhanced Security

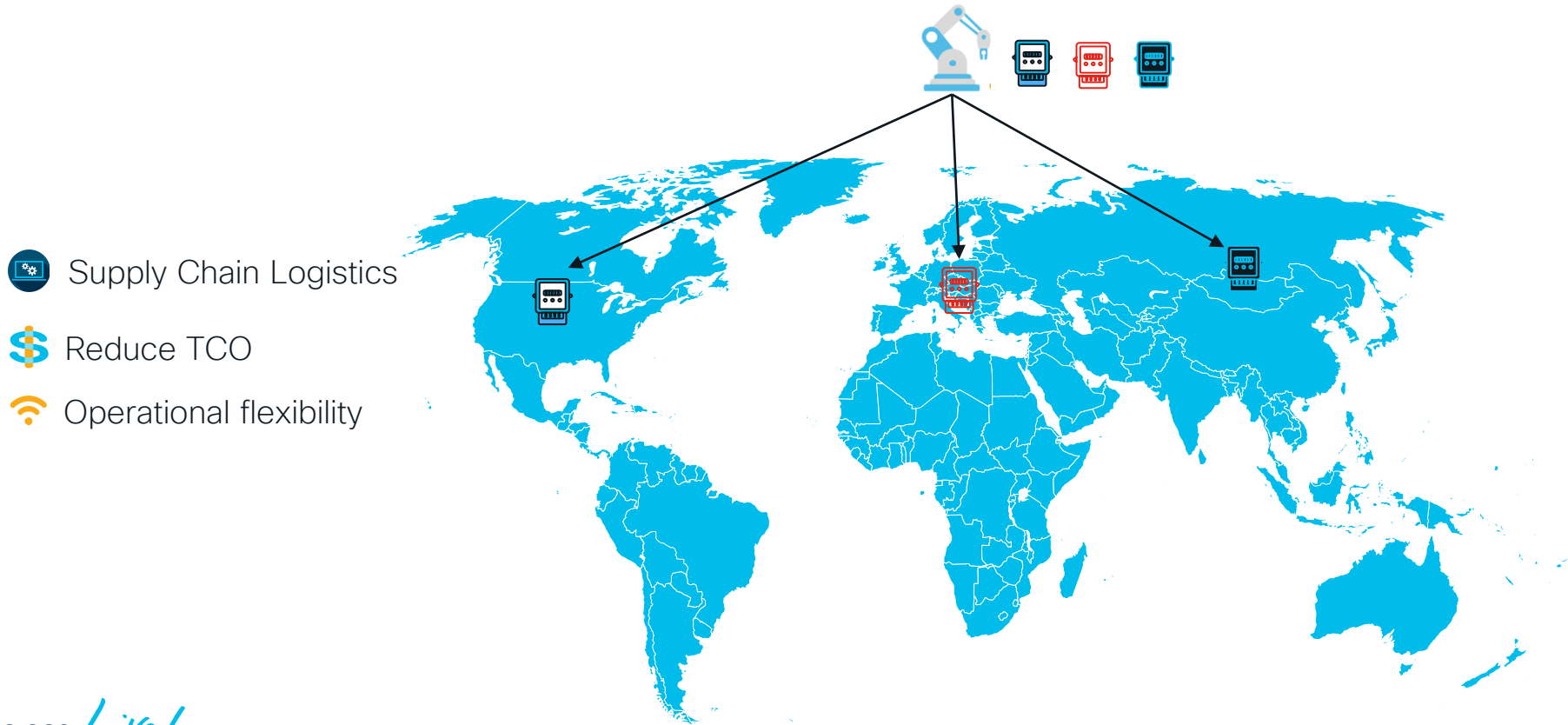


Mitigate
Operational Risk

Deploy globally with eSIM Flex



Build once, deploy globally with eSIM

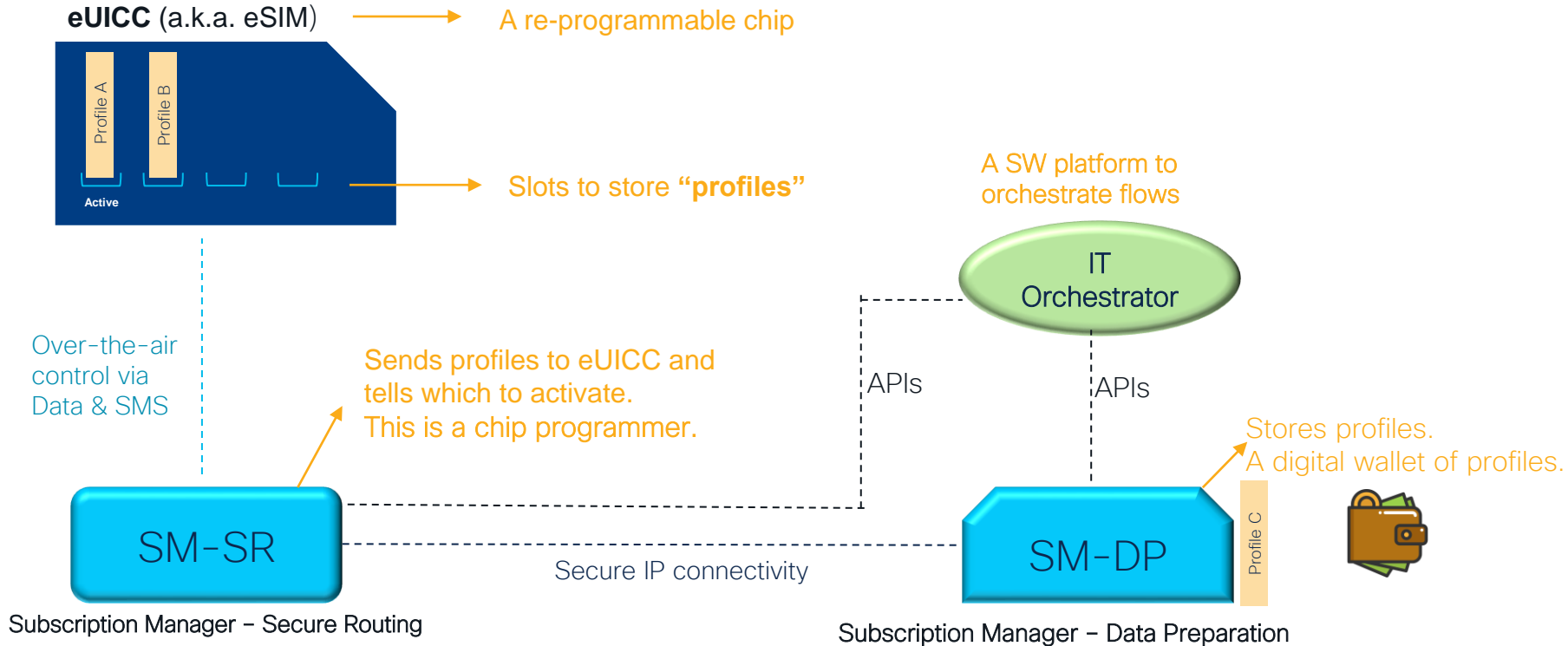


 Supply Chain Logistics

 Reduce TCO

 Operational flexibility

eSIM Technology Introduction



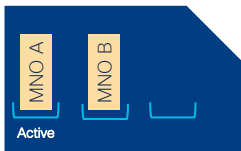
Swap carriers with a single click

Cut months off new carrier integration

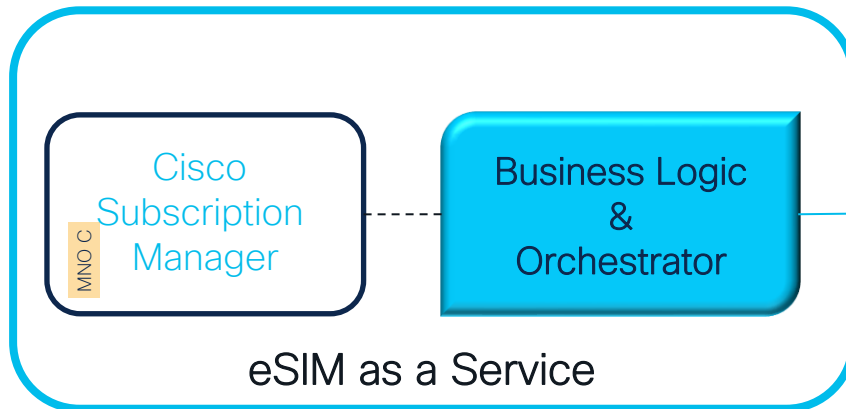
Cellular
IoT Devices



eUICC



eSIM Flex



Turnkey eSIM solution



Eliminate IT integrations



Unlock carrier ecosystem

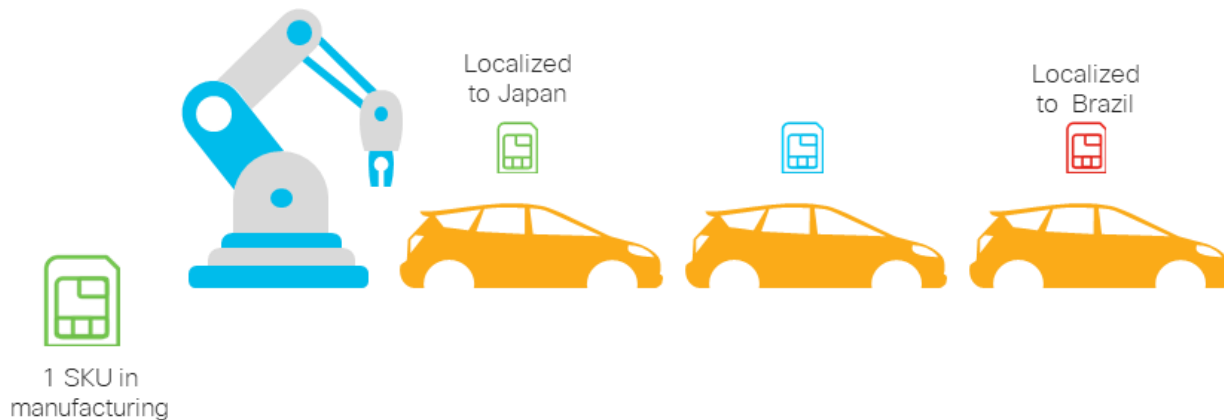


Cisco managed service

Connected Car Opportunity

eSIM is required to play in Ccar ecosystem

Use-case: **Localization**: Use one SIM SKU for manufacturing. Localize later over the air.



Gartner, Dec 2019:

"By 2023, over 60% of all connected vehicles produced will feature an eSIM for cellular connectivity, up from less than 5% in 2019"

Secure Device Onboarding for Cisco GWs/Routers

1. Customer orders a Cellular GW



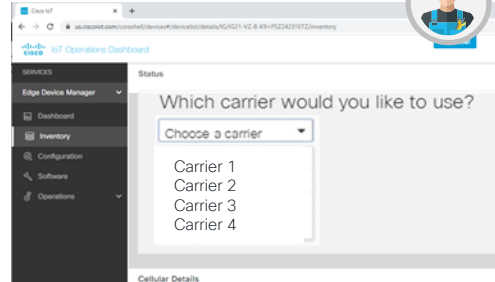
2. GW shipped, received and unpacked



3. First Power On – Already connected via Cisco Bootstrap. Automatic SW update etc.



4. Enterprise goes to Portal, and chooses a Carrier



5. Localized to desired carrier over-the-air.



Local IMSI moved into customer's account with carrier.

Carrier bills customer directly

Drive down costs with AI/ML



Drive down costs with AI/ML and automation

Harness massive amounts of IoT data with the Proactive IOT feature

IoT deployments at massive scale

Control Centre Dataset



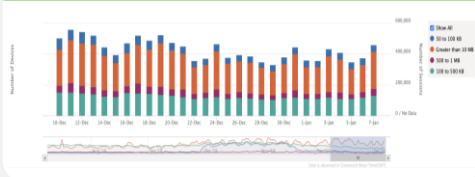
50+ SPs WW

| 10+ Major Vertical

| 3B events / day

| 15TB data / day

1. Analyze



2. Detect Anomalies



3. Action

Insights	
Voice Usage on Nov 2, 2019	
Voice Usage	121,000 Minutes
Device Count	40
Avg. Usage/Device	3,000 Minutes
Export	
Top 100 Devices by Usage	
ICCID	Usage
894011702271031021107	9,000 Minutes
894011702271031021107	1,000 Minutes
894011702271031021107	400 Minutes
894011702271031021107	400 Minutes
894011702271031021107	400 Minutes
894011702271031021107	400 Minutes

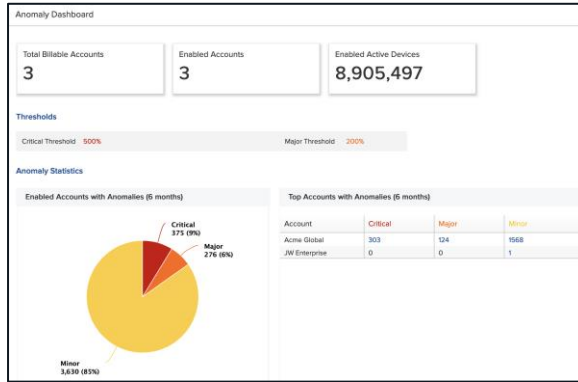
Connectivity Behavior

Session length, frequency, duration etc.

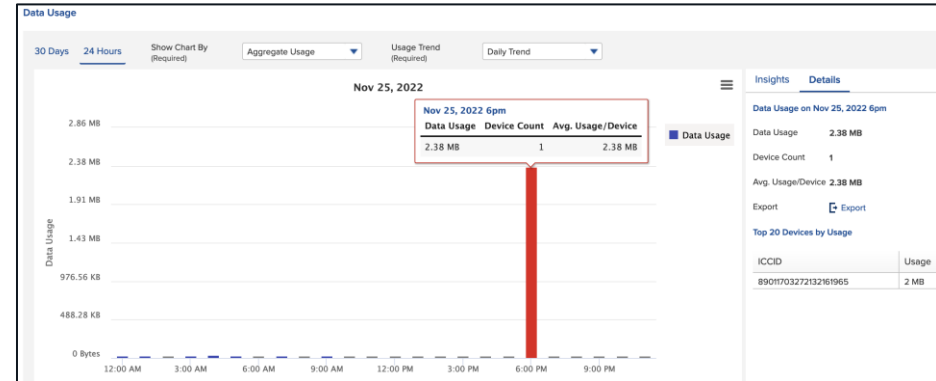
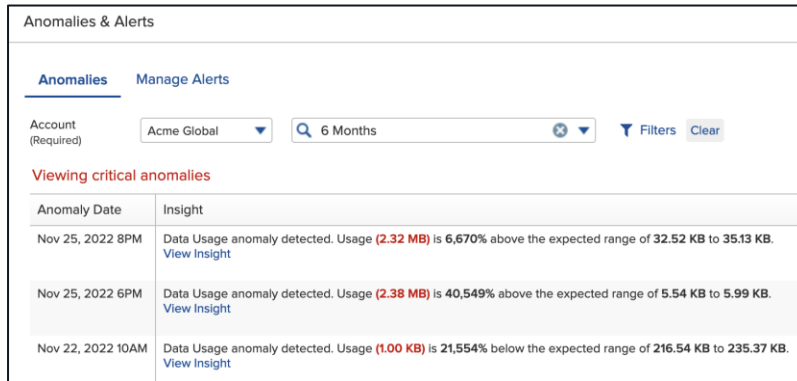
Consumption Behavior

Usage patterns, roaming, excessive usage

Drill down from dashboard to devices



- Anomaly dashboard shows critical, major and minor anomalies detected for each account
- Account summary lists the anomalies and alerts per account
- “Insight” provides detailed analysis such as data usage with top devices



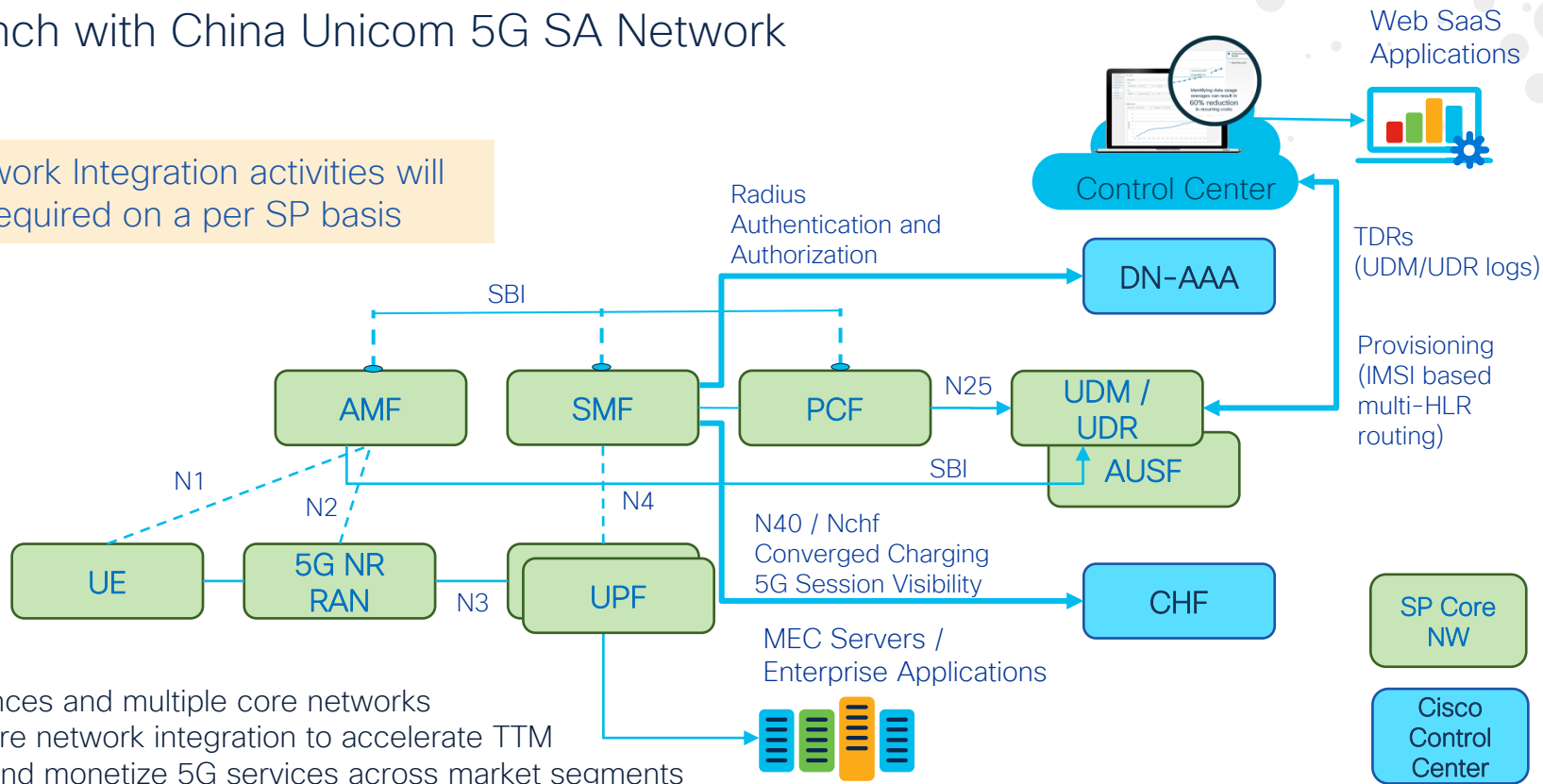
Delivering Mission Critical Applications with 5G



Control Center evolution to 5G

Launch with China Unicom 5G SA Network

Network Integration activities will be required on a per SP basis

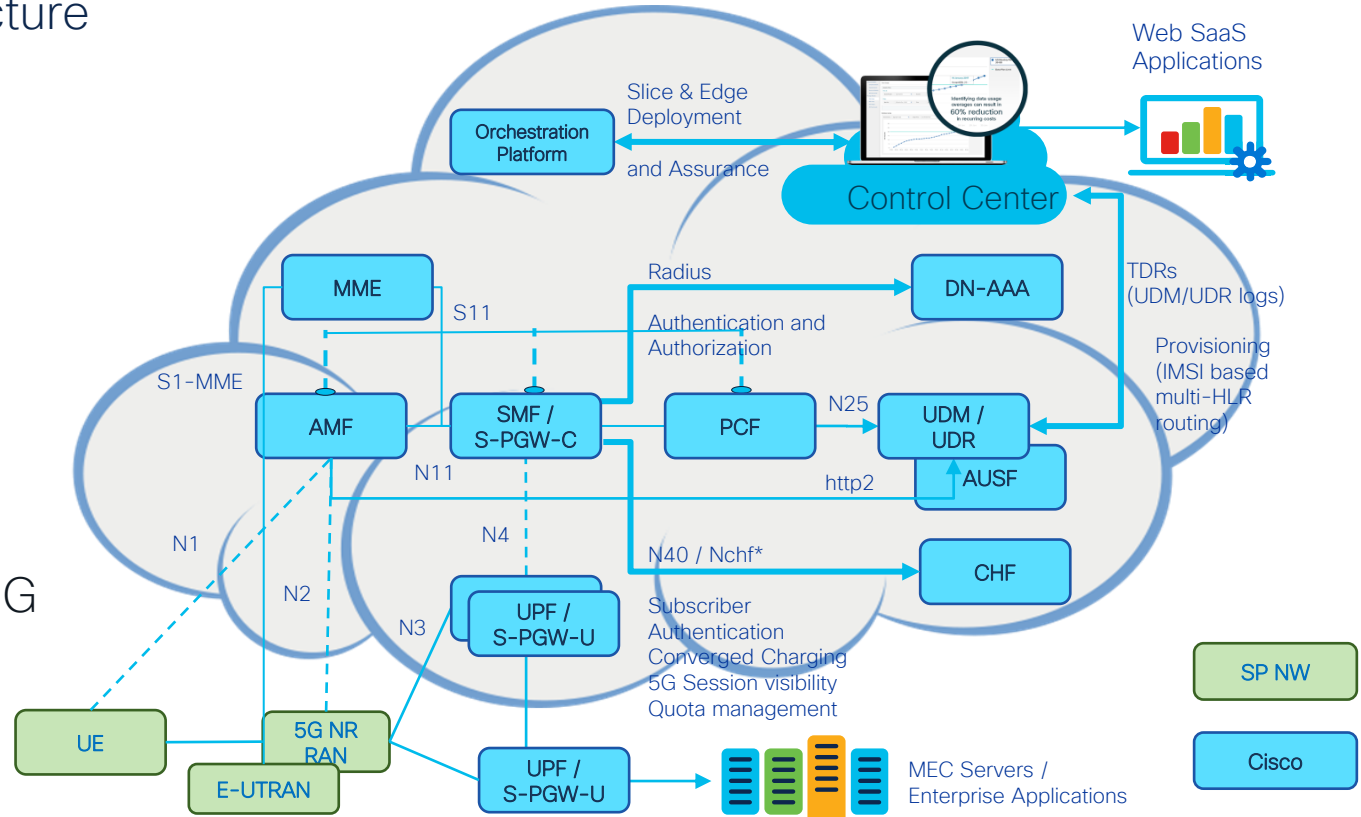


- ✓ 31 provinces and multiple core networks
- ✓ Direct core network integration to accelerate TTM
- ✓ Launch and monetize 5G services across market segments
- ✓ Cisco hosted CHF to enable rapid innovation with session visibility

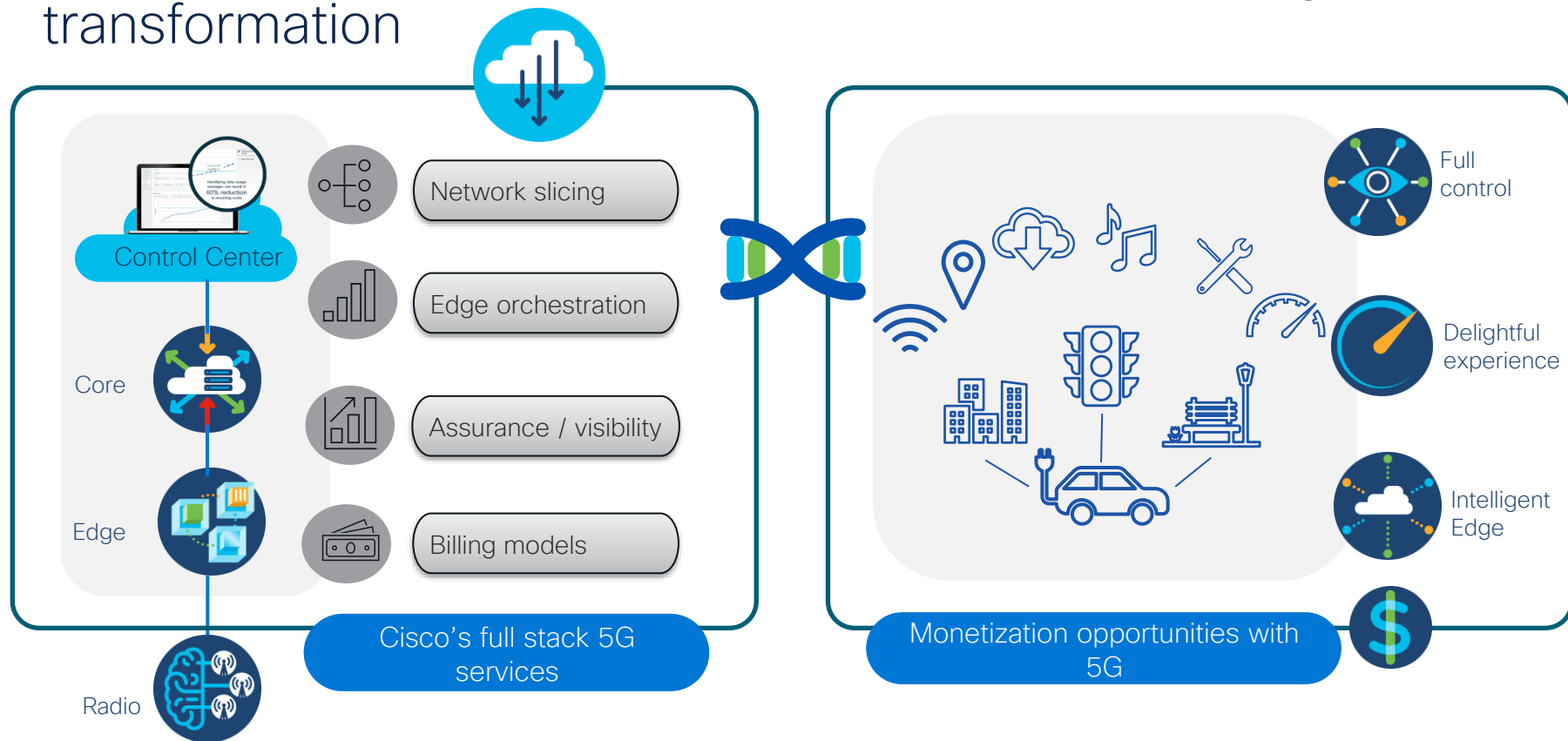
Cisco Core Network as a Service (CNaaS)

Reference architecture

- Hosted and supported by Cisco
- Control Center plus dedicated core
- Support 4G & 5G



Cisco's full stack 5G services enable enterprise digital transformation



Deliver mission-critical applications with network slicing

Ensure connectivity

Assurance
Risky

Geo Location
Zone D

Service Type
eMBB

Avg. Throughput
300 Mbps

Trend: 270 Mbps (Normal)

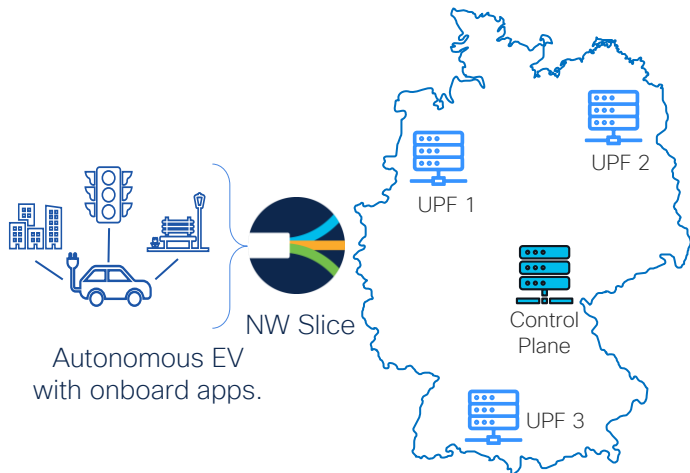
Show Graph

Avg. Latency
25 ms

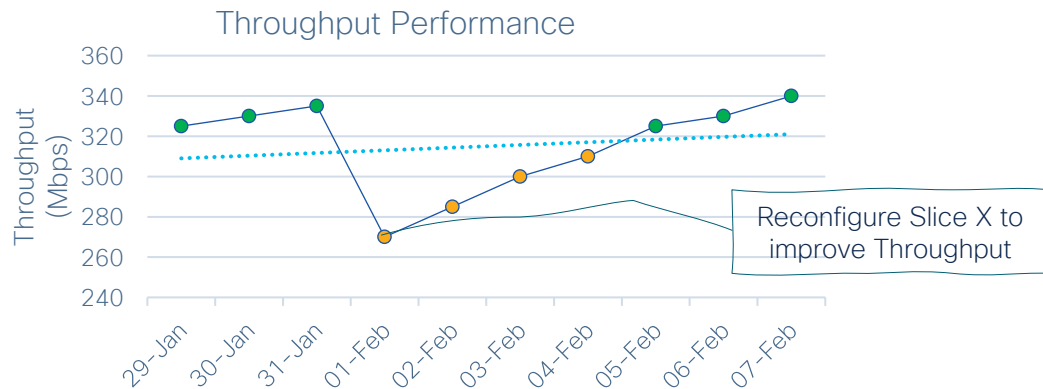
Trend: 19 ms (Normal)

Show Graph

Devices Attached
5



Throughput Anomaly



Assurance
Good

Geo Location
Zone D

Service Type
eMBB

Avg. Throughput
300 Mbps

Trend: 310 Mbps (Normal)

Show Graph

Avg. Latency
25 ms

Trend: 19 ms (Normal)

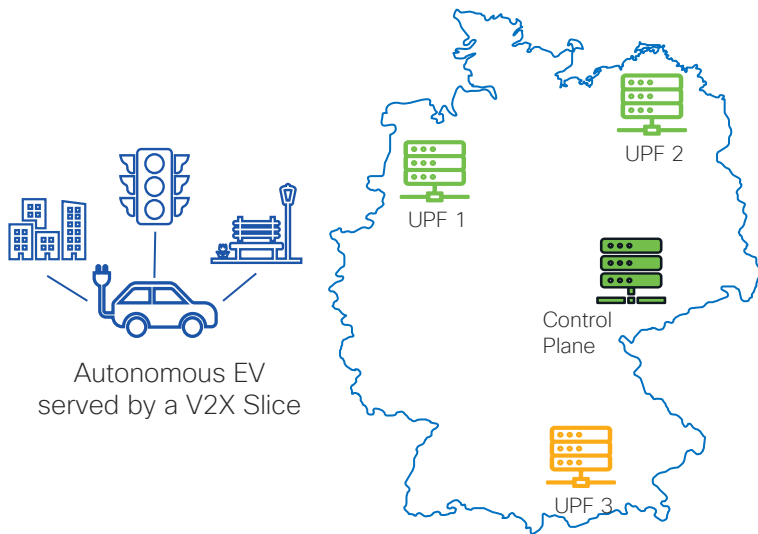
Show Graph

Devices Attached
5

Deliver low latency with distributed edge management

Gain agility for growth

Edge Health	Edge Location	Edge ID	Avg. Throughput	Avg. Latency	Devices Attached
● Risky	Zone D	UPF-3	300 Mbps <small>Trend: 290 Mbps (Normal)</small>	25 ms <small>Trend: 19 ms (Normal)</small>	5
			<small>▽ Show Graph</small>	<small>▽ Show Graph</small>	

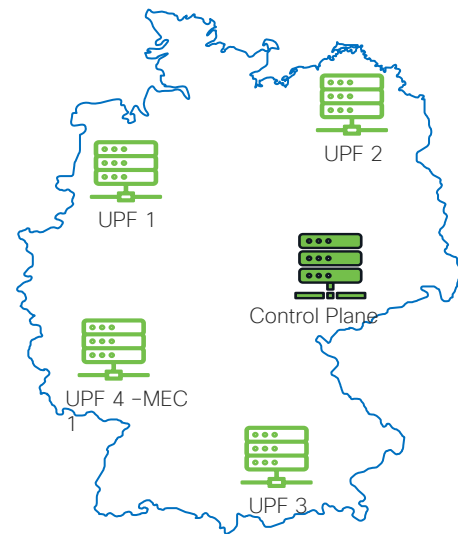


V2X Slice - Distributed Edge Deployment
Latency anomaly observed in a zone

Deploy New Edge Node

Cloud Template	Cisco UCS
Service Type	UPF + MEC Server
Geolocation	West Coast - Zone D
Edge Node Name	V2X-UPF-4-MEC-1
Host IP	1929:6420:f:3001::/57
Capacity	Large

Configure KPIs and deploy an UPF or MEC Server



V2X Slice with a new Edge Node (UPF + MEC)
resulting in performance improvements!

Edge Health	Edge Location	Edge ID	Avg. Throughput	Avg. Latency	Devices Attached
● Good	Zone D	UPF-4 MEC-1	300 Mbps <small>Trend: 290 Mbps (Normal)</small>	12 ms <small>Trend: 10 ms (Normal)</small>	5
			<small>▽ Show Graph</small>	<small>▽ Show Graph</small>	

Summary



Drive IoT success at scale with Cisco

IoT market leaders!



Leveraging our reach with device OEMs, enterprises and SPs to accelerate innovation



Investing heavily and growing fast!



Accelerate Time to Value

Build once and Deploy worldwide with eSIM!



Drive down costs with AI/ML

Curb anomalous behavior, enhance safety and security of your devices with predictive AI/ML capabilities.



Deliver mission critical applications with 5G

Deploy time sensitive applications with NW slicing and edge intelligence. Get full visibility and control for your deployments.

Next steps

As a service provider

Talk to us if you already use the Cisco platform and want to use advanced features, or if you are interested in replacing or supplementing your current IOT CMP solution

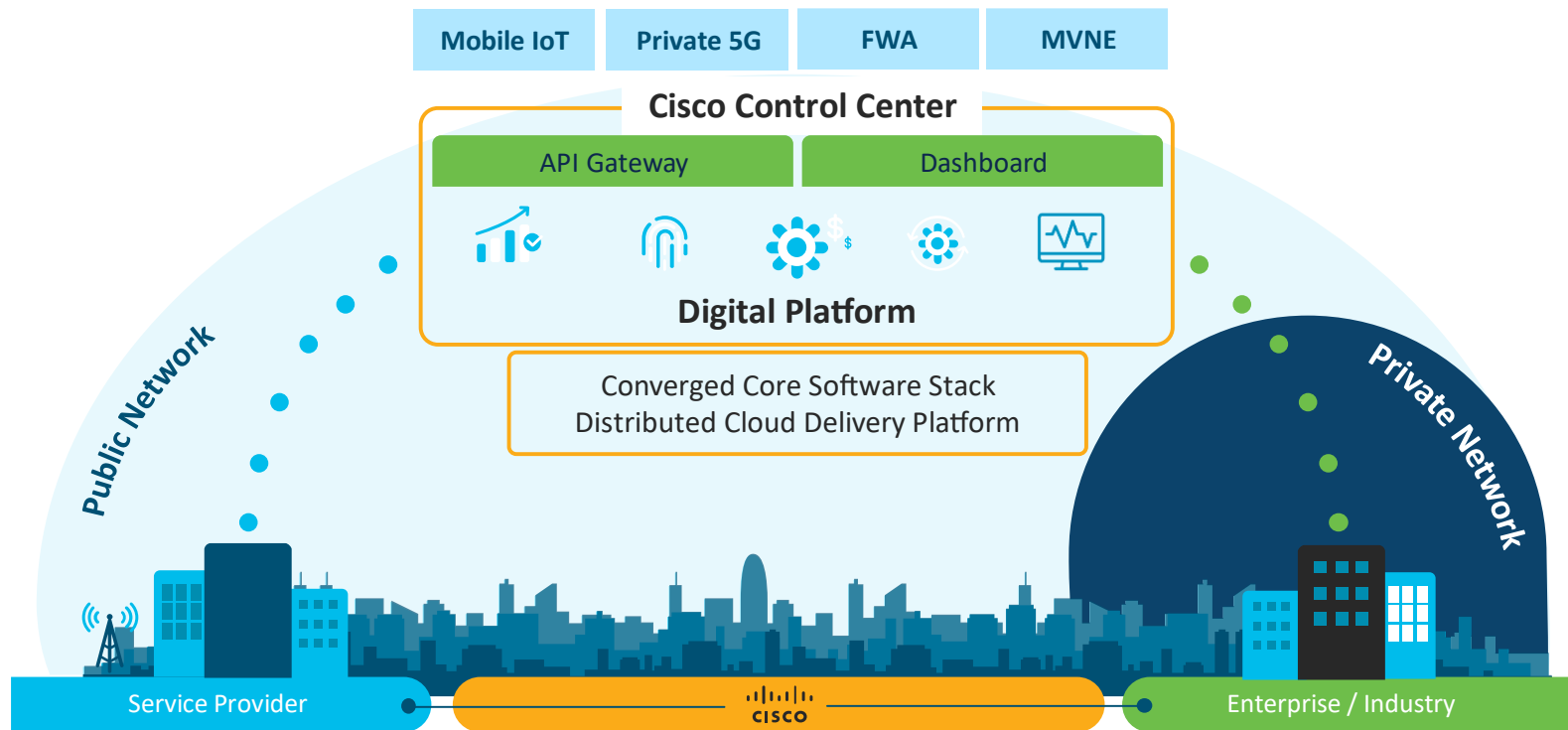
As an enterprise customer or reseller

Talk to one of our existing SP customers to get connected through our platform, or convince your current SP to start offering the Cisco solution



Control Center Evolution

Common platform for public and private networks



Complete your Session Survey

- Please complete your session survey after each session. Your feedback is important.
- Complete a minimum of 4 session surveys and the Overall Conference survey (open from Thursday) to receive your Cisco Live t-shirt.
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Attend any of the related sessions at the DevNet, Capture the Flag, and Walk-in Labs zones.



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The bridge to possible

Thank you

CISCO *Live!*

CISCO *Live!*

ALL IN