



TURN IT UP

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The bridge to possible

Next Generation of Operational Management for OT & IT



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Agenda

- IT/OT Challenges
- IoT Operations Dashboard
 - Managing Devices
 - Other Applications
- Demo



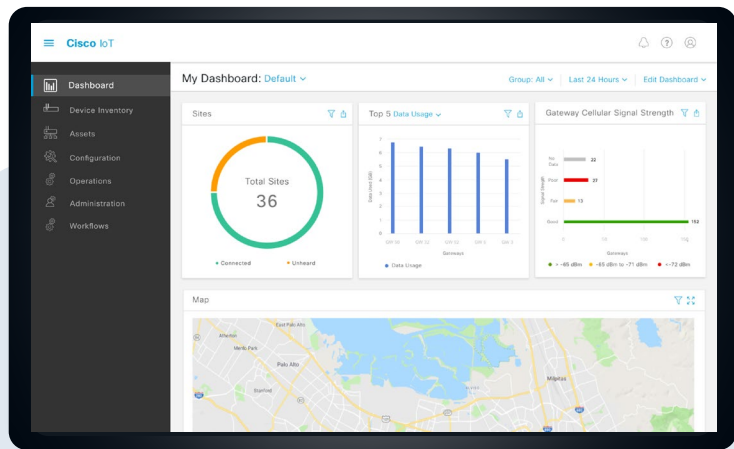
Connecting industrial assets
creates challenges for both
IT and OT

Information Technology (IT)

Operational Technology (OT)

Cisco IoT Operations Dashboard

Enables operational workflows for OT and IT to
Deploy, Monitor and **Gain Insights**.



IoT Operations Dashboard

Connectivity



Industrial Assets



Edge Intelligence



Industrial Asset Vision



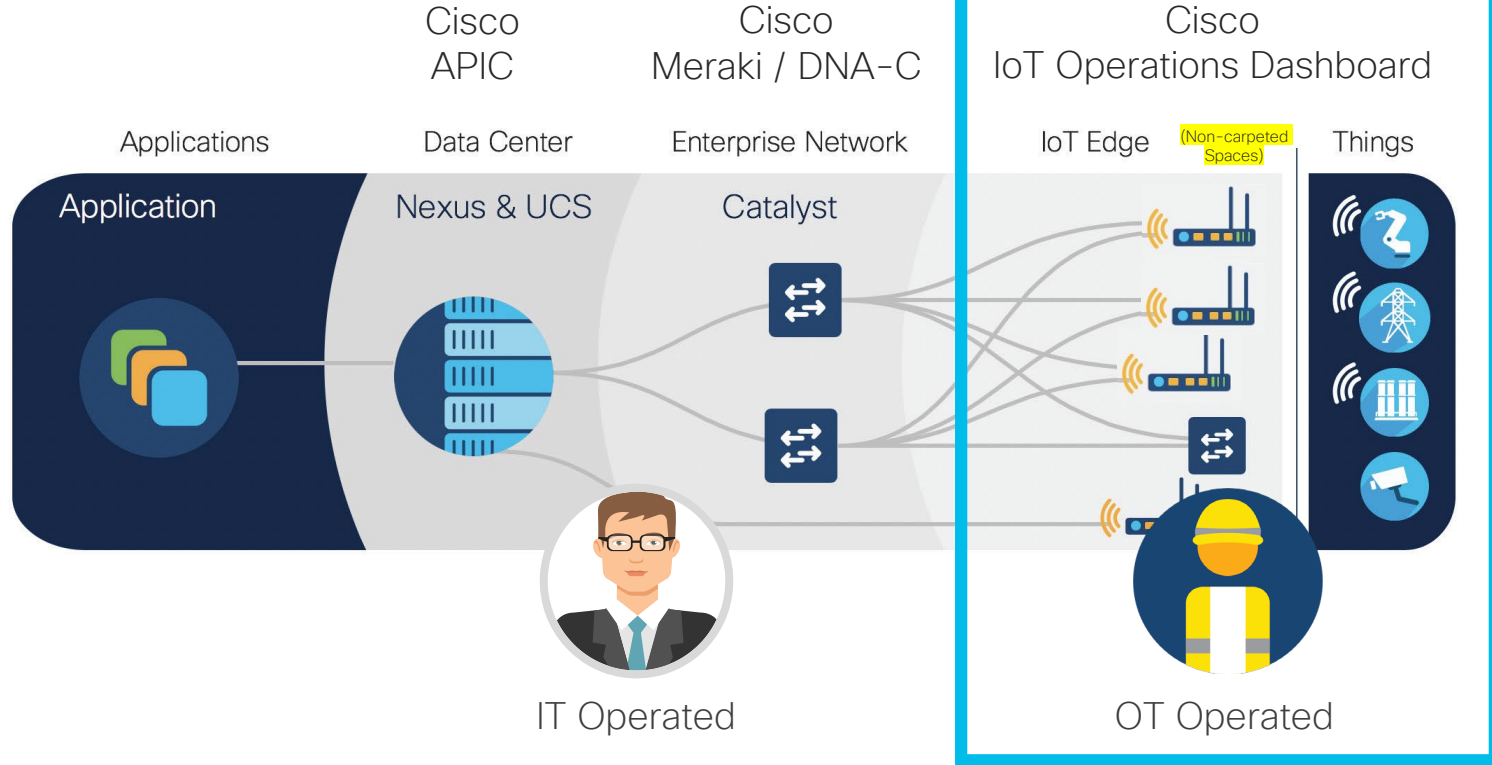
Motivations

- OT customers have unique priorities
- Today Cisco answered OT needs with:
 - **Cisco Field Network Director (FND)** for on-premise deployments only
 - **Cisco Kinetic Gateway Management Module (GMM)** for cloud deployments only
- Different user experience, different capabilities, separate development teams but a single use case.



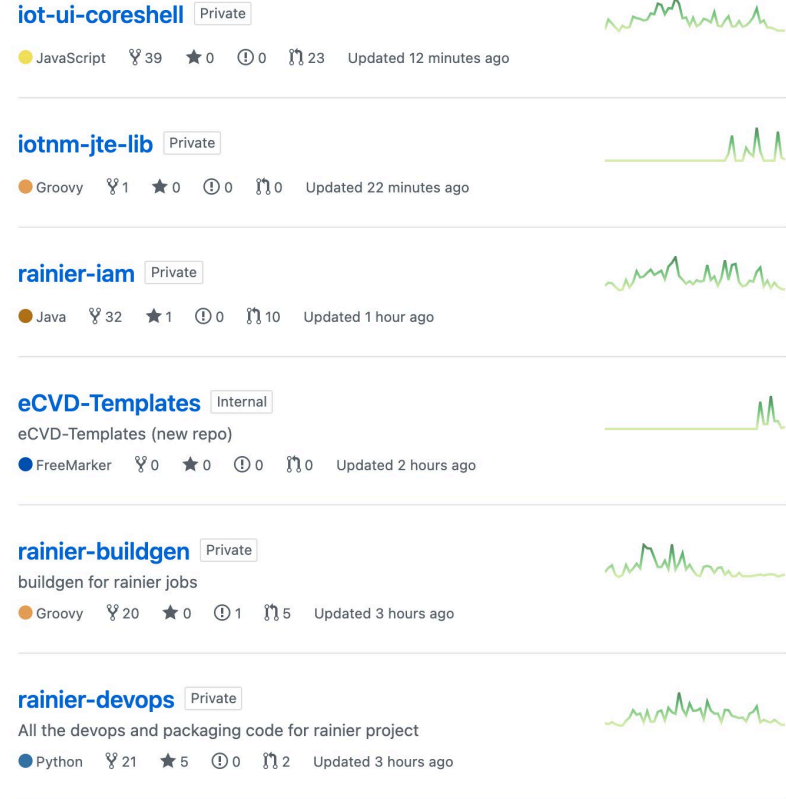
Let's do a platform where IT can prepare “workflows” that OT can deploy.

Cisco Tools



What's different?

- IoT OD is a **Dashboard** to run various Cisco **applications**
- Cloud native
- Based on Docker microservices with Kubernetes orchestration
- Keeps the same template engine as GMM and FND for easier migration
- One single platform for all IoT switches, routers, gateways, compute, current and upcoming.



Cloud Architectural Building Blocks

Use Cases

Asset Tracking

Connected Roadways

Mass Transit

Street Lighting

First Responders

Foundation Services

Role Based Access Control

GUI Core

PNP

Device Access

Multitenancy

Events

Logging

Inventory

Identify & Access Management

Alerting

Auditing

Template

Cloud Services

Monitoring



Logging



Security



Data Stores



kubernetes



docker



Terraform



HELM



ANSIBLE



GitHub



Jenkins



IoT Operations Dashboard

Managing Devices

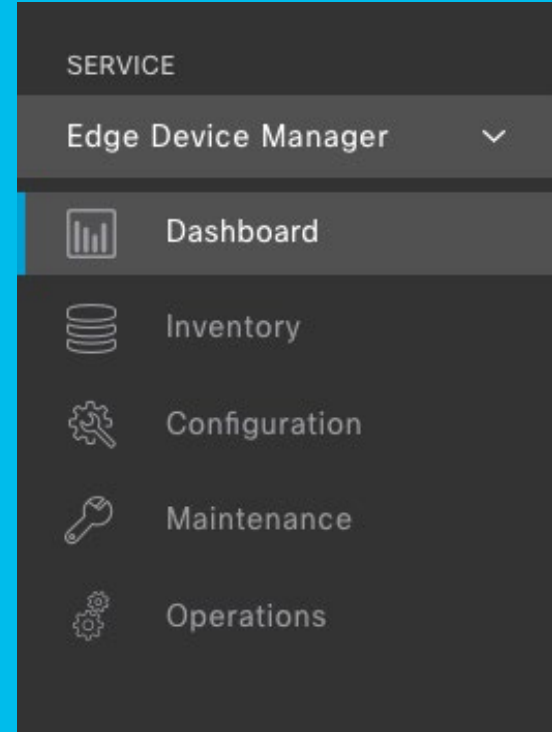


Device Management

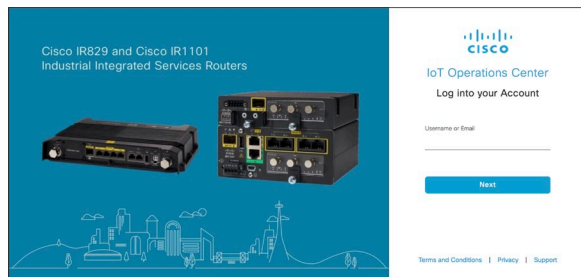
This is the “network management” component of IoT Operations Dashboard.

- ✓ Onboards
- ✓ Configure
- ✓ Manage
- ✓ Upgrade devices

- Use APIs with other services such as Edge Intelligence, or Asset Vision.



Device Management Architecture

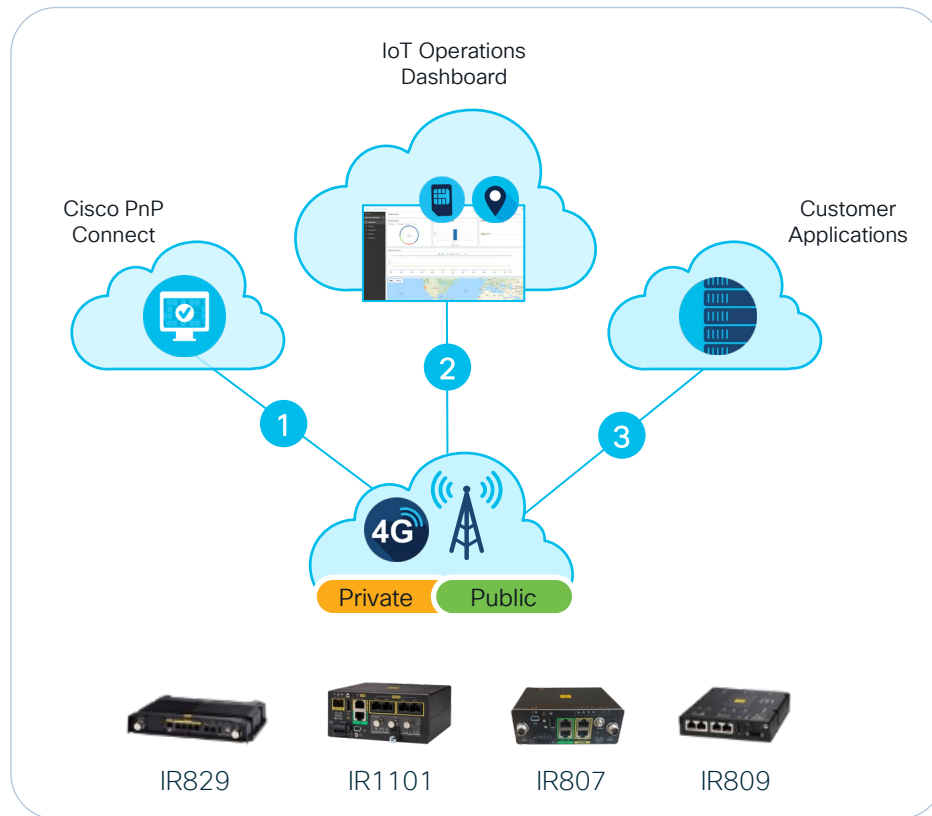


Two public clusters:

- Portland, Oregon
- Dublin, Ireland

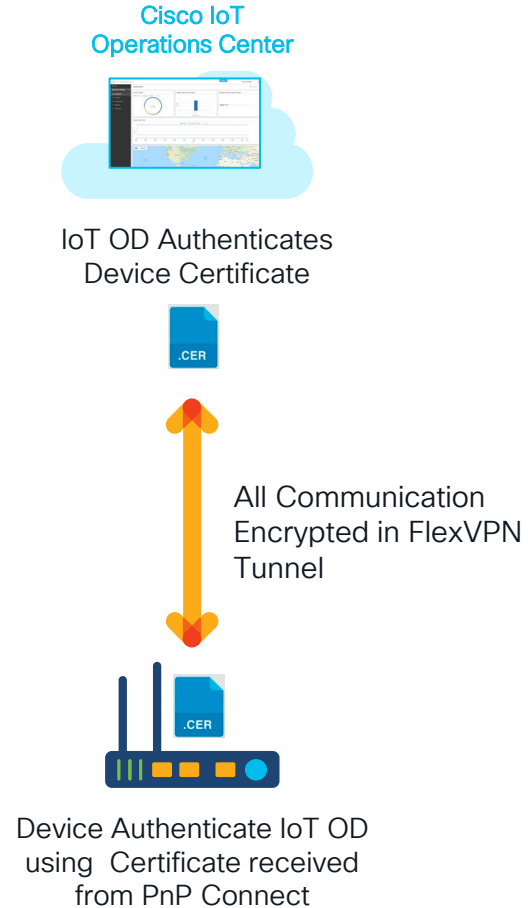
How does device management fit?

- 1 PnP Connect Connection
- 2 Management Connection
- 3 Customer Data Connection

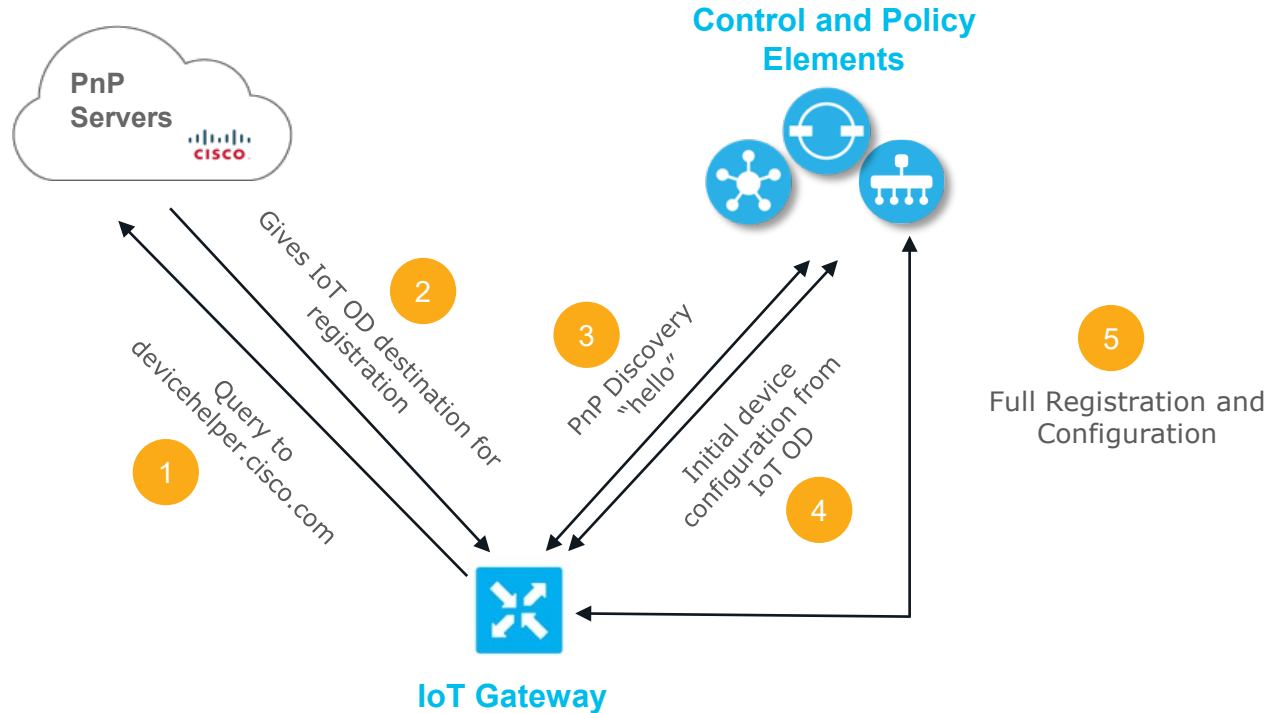


Security

- Integrity of the connection is verified using Certificates.
- Gateway validates this is IoT OD by challenging a certificate received during PnP.
- IoT OD validates this is the right gateway by challenging the device SUDI crypto cert.
- Communication between IoT OD and Devices are encrypted across a VPN tunnel or secure WebSocket.



On Boarding Gateway with PnP



Supported Devices Today



IR807



IR809



IR1101



IR829 Single LTE



IR829 Dual LTE

GPS	✓	✓	✓	✓ With pluggable cellular module	✓
Ruggedized Operations	+60° -40°	+60° -40°	+60° -40°	+60° -40°	+60° -40°
LTE	✓	✓	✓	✓	✓
2X LTE			✓ With pluggable cellular module		
Modular			✓ With expansion module		
Wi-Fi				✓	✓
Edge Computing		✓	✓	✓	✓
Gyroscope & Accelerometer		✓		✓	✓
Availability	North America and Europe EOS July 2021	Globally EOS July 2021	Globally	Globally	North America and Europe

Template-based Configuration

- Leveraging template language
Apache FreeMarker
- Write your own configuration from scratch
- Or use Cisco-provided eCVD templates
- Examples:
<https://github.com/etychon/eCVD-Templates>

```
!  
parameter-map type regex dns_bypass  
pattern .*\.cisco\.*  
<#if far.umbrellaDnsBypassList?has_content>  
  <#list far.umbrellaDnsBypassList as patterns>  
    pattern ${patterns['umbrellaDnsBypassDomain']}  
  </#list>  
</#if>  
!  
parameter-map type umbrella global  
<#if UmbrellaToken?has_content>  
  token ${UmbrellaToken}  
</#if>  
  
local-domain dns_bypass  
dnscrypt  
udp-timeout 5  
!  
no ip dns server  
!  
interface Vlan1  
  ip nbar protocol-discovery  
!  
</#if>
```

Leverage Templates for IT/OT separation

- IT prepares a router configuration like usual
- Configuration contains all **invariable** parameters.

Base configuration:

```
1 interface Vlan1
2   ip address 192.168.3.1 255.255.255.0
3   ip nat inside
```

... but I also need to
enable/disable FastEthernet1 on
some gateways

Leverage Templates for IT/OT separation

Example:

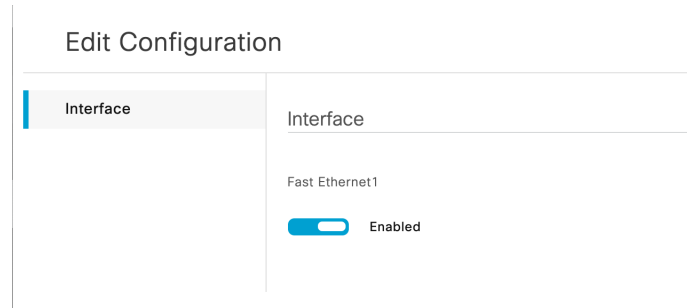
- **Variable** parameters are presented as options to the user
- IT uses Apache FreeMarker template language

```
1 interface Vlan1
2   ip address 192.168.3.1 255.255.255.0
3   ip nat inside
4   !
5   <#assign FastEthernet1_enabled = far.fastEthernet1!"true">
6 interface FastEthernet0/0/1
7   description SUBTENDED NETWORK
8   <#if FastEthernet1_enabled != "true">
9     shutdown
10  <#else>
11    no shutdown
12  </#if>
```

Leverage Templates for IT/OT separation

Example:

- OT users are only presented with parameters relevant to them
- In this case, there is only one parameter reducing the risk of error



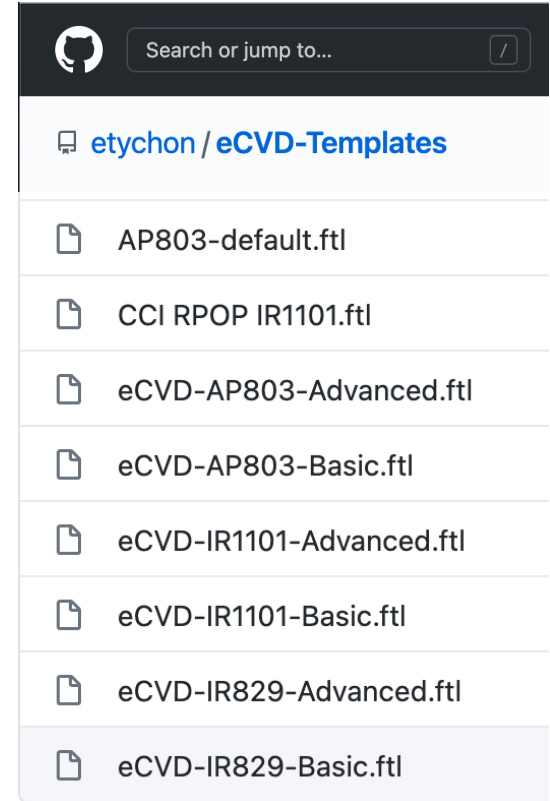
```
interface Vlan1
  ip address 192.168.3.1 255.255.255.0
  ip nat inside
```

```
interface FastEthernet0/0/1
  description SUBTENDED NETWORK
  no shutdown
```

Sample embedded CVD Templates

- Sample templates for IR829 and IR1101 are hosted here:
<https://github.com/etychon/eCVD-Templates>
- For IR1101, IR829 to manage Cellular and APs.

SCAN ME



Using Templates

- Copy and paste FTL templates right in IoT OD
- Use templates as a basis for your own configuration

Edit Configuration

WAN	ICMP
Interface	
LAN	
Security	
VPN	
Device Settings	
Network	
User Management	

First reachable IPv4 address for IP SLA test	Second reachable IPv4 address for IP SLA test
4.2.2.1	4.2.2.2
Third reachable IPv4 address for IP SLA test	Fourth reachable IPv4 address for IP SLA test
9.9.9.10	9.9.9.11

Ethernet	<input checked="" type="checkbox"/> Enabled
Ethernet port WAN priority*	First

Cellular1	<input type="checkbox"/> Enabled
Primary Cellular Access Point Name	First cellular interface WAN priority*
m2m.tele2.com	Second

Cellular2	<input type="checkbox"/> Enabled
Secondary Cellular Access Point Name	Second cellular interface WAN priority*
	Fourth

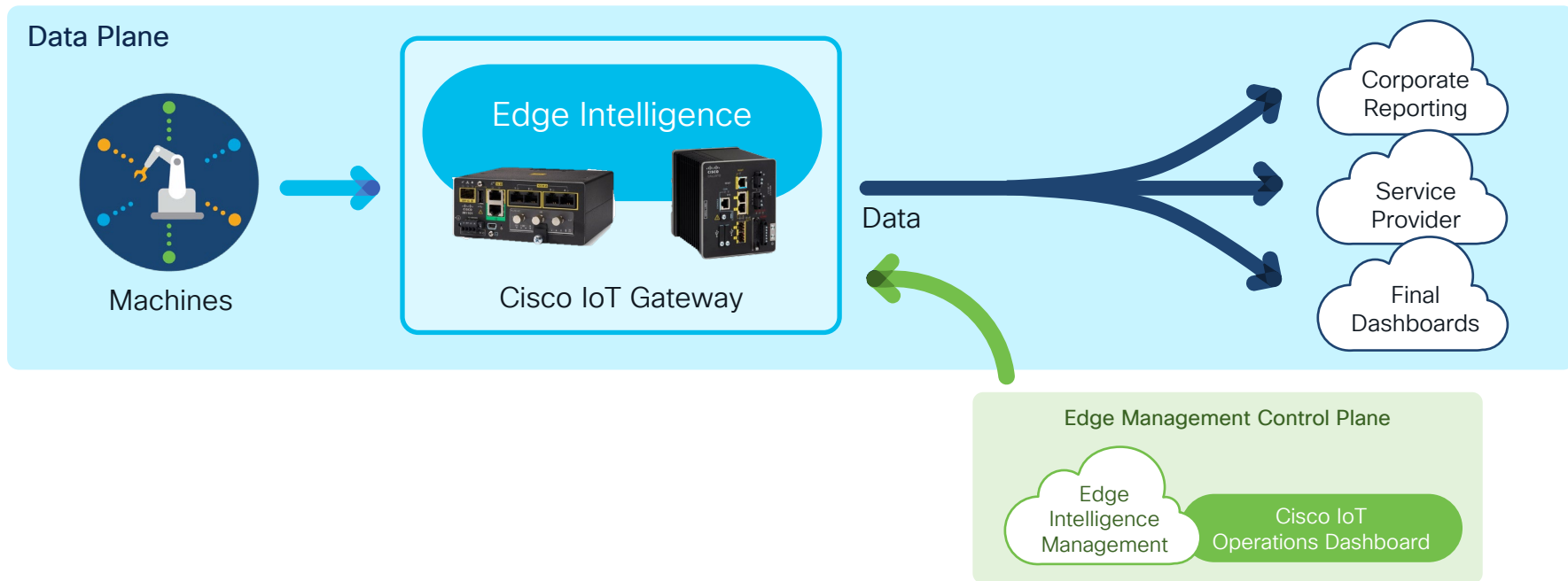
IoT Operations
Dashboard

Other
Applications



Edge Intelligence

Simplified edge to multi-cloud data flow

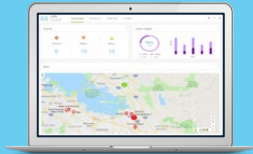


Industrial Asset Vision

SaaS product offering an end-to-end solution for tracking assets and acquiring sensor telemetry



Full Stack Use Case



Dashboard & Management



Gateway



Sensors



Horizontal Capabilities



Asset Location Tracking



Asset Telemetry Monitoring

Simple Customer Experience

Call to Action



- Try out Dashboard, request an account to your Cisco representative.
- Become an EFT user to help us develop next generation features such as secure remote access, IOx application management
- If you are using Kinetic GMM, plan to migrate to Dashboard

Demo

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