Connecting and Securing your IoT Devices

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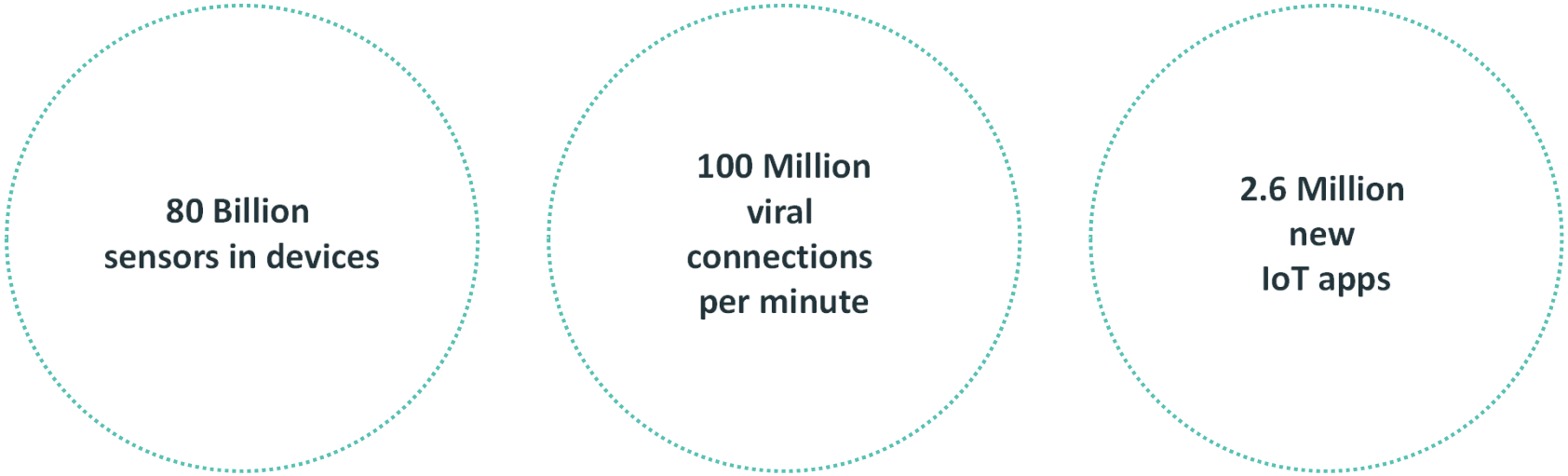
By 2020…



Data and content explosion is exponential. How will you create value?

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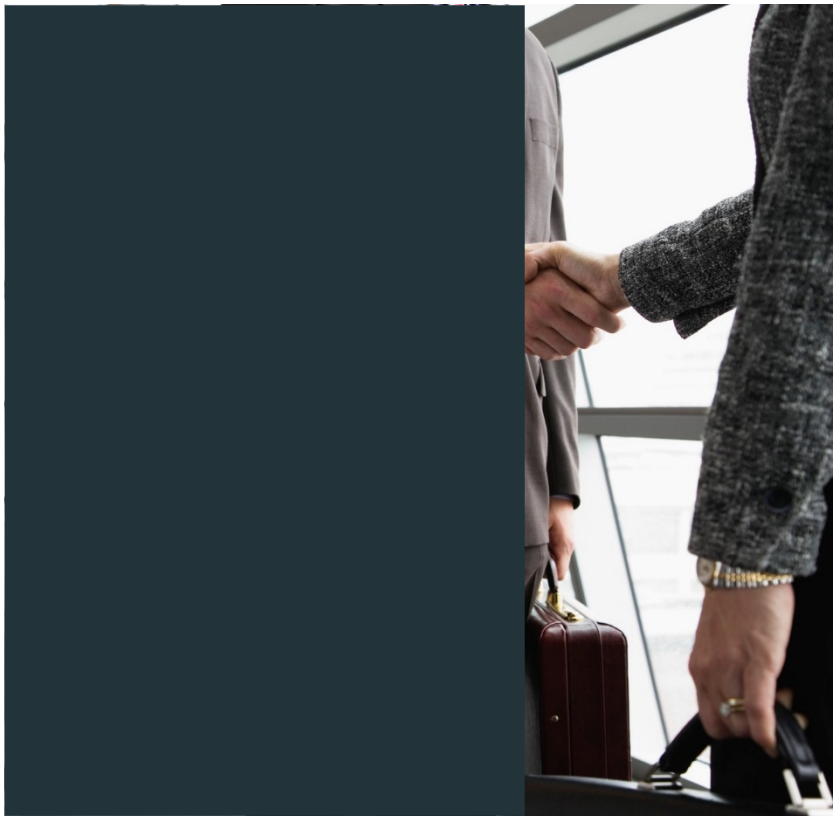
Opportunity

IDC sees the following opportunities in the IoT Market place today.

- IoT will grow from $655.8 billion in 2014 to $1.7 trillion in 2020 with a compound annual growth rate (CAGR) of 16.9%.
- Devices, connectivity, and IT services will account for over two-thirds of the worldwide IoT market in 2020, with devices (modules / sensors) alone representing 31.8% of the total.
- IDC expects that ***IoT purpose-built platforms***, application software, and "as a service" offerings will capture a larger percentage of revenue.



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IoT is an Enabler Across Industries

World of connected things

Transportation	Healthcare	Data center	Consumer	Manufacturing	Telco
Shipping	MRI	Asset tags	TVs	Operations	Towers
Logistics	PDAs	Temperature	Thermostats	Conveyors	Hot spots
Fleet mgmt	Surgical equip	Humidity	Appliances	Inventory	Consumer devices
Planes	Patient devices	PDU / UPS	Home security	Logistics	Business & industrial
Signs	Pumps	CRAC / CRAH	Cars	Robots	New services
Tolls	Monitors	Servers	Accessories	Production equip	
Status		Chillers	Clothing		
Location		Generators			

More…

Systems Integrators

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Use cases

Retail

- Enhanced shopper experience
- Refrigerated Trucks

Healthcare

- Biometric sensors for patient monitoring
- Personalized hospital experience

Energy / Utility

- Smart Grids (AMI, Smart Meters, Smart Plugs, Smart Switches etc)
- Connected homes

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So, what is the problem then?

Onboarding	Connectivity	Governance	Too much data	Security
• Device self-registration • Updates / fixes	• Integration with enterprise • Exchange data back and forth	• Device management / ownership • Rogue devices	• Data streams • Millions of data points • Real-time analysis • Pattern recognition	• Device-level security • Open APIs • Client SDKs

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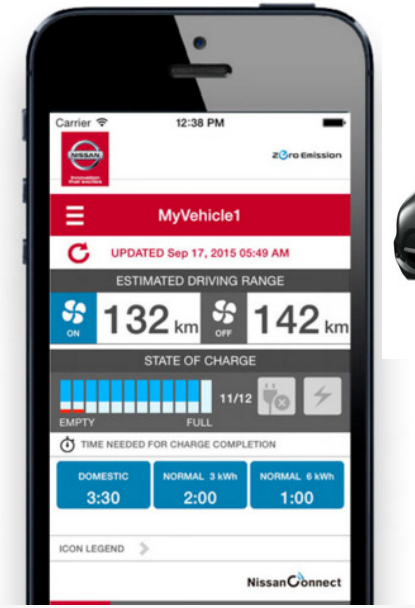
Nissan Leaf - Hacked



```
GET https://[redacted].com/orchestration_1111/gdc/ACRemoteRequest.
php?RegionCode=NE&lg=no-NO&DCMID=&VIN=SJNFAAZE0U60XXXXX&tz=Europe/
Paris
```

- Communication between the Nissan mobile app, Nissan servers, and Nissan Leaf electric vehicles took place over completely unencrypted, unauthenticated APIs.
- Breach allowed a hacker, using only a web browser, to remotely control the car's climate functions, and read private data including userID, battery status, range, charging information, and driving history

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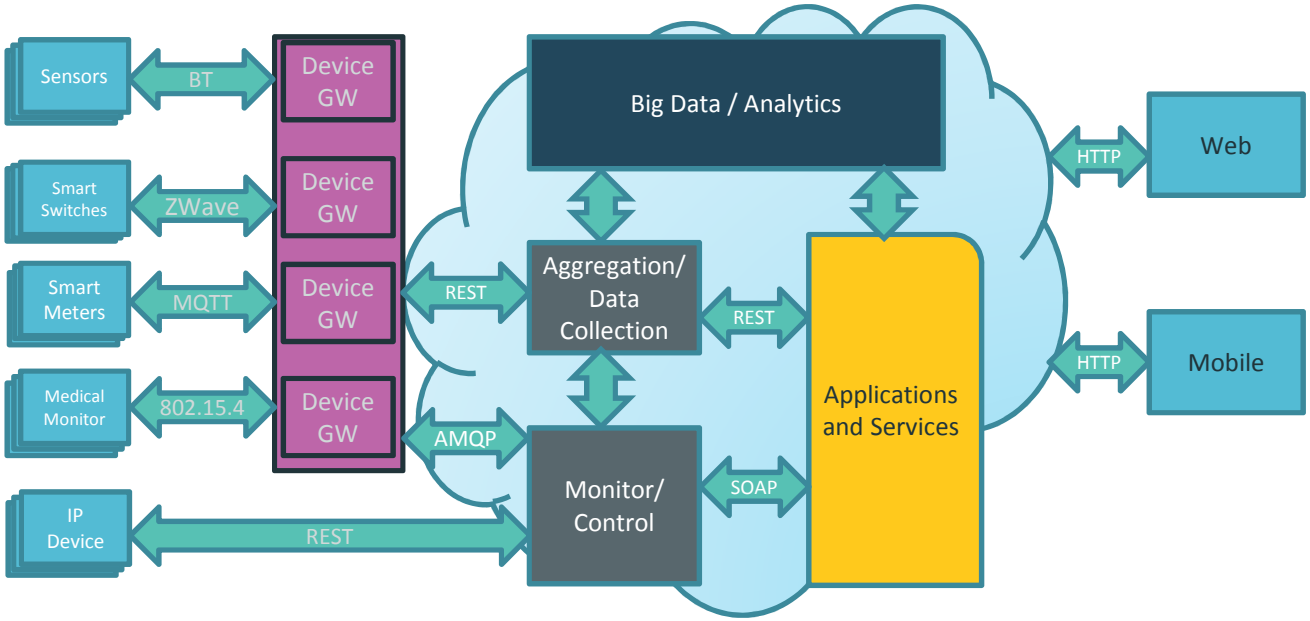
IoT Development Challenges



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IoT Architectural Overview

END USERS / CUSTOMERS

Browser | Apps | Mobile device | ... | Mobile device

Apps, SDK, APIs
(IoT API, Google API, etc.)

IP Network
(LTE, Wireless, Fixed, WPAN)

Local / Sensor Network
(e.g., Zigbee, Z-Wave, Bluetooth,WiFi, MQTT, XMPP, DDS, AMQP, BACnet, CoAP, 6lowPAN,, 802.15.4)

Communication Services

Communication Services

Communication Services

Communication Services

IoT Core Services

- Scaling and orchestration
- Security and Administration
  - Identity and Access Management
- Management and Control
  - Things (Devices, Servers, People, Processes)
  - Business Logic (analytics, configuration, scale)
  - CA IOT Platform
- Provisioning
  - Users
  - Associated Services
  - Edge Nodes / scale
  - Services

IoT Consumer Services

- Data Acquisition , Management and Privacy
- Reporting
- Analytics
- Financials
- Auditing / compliance
- Designer / Visualizations
- Workflow
- User defined

Persistence / Big Data

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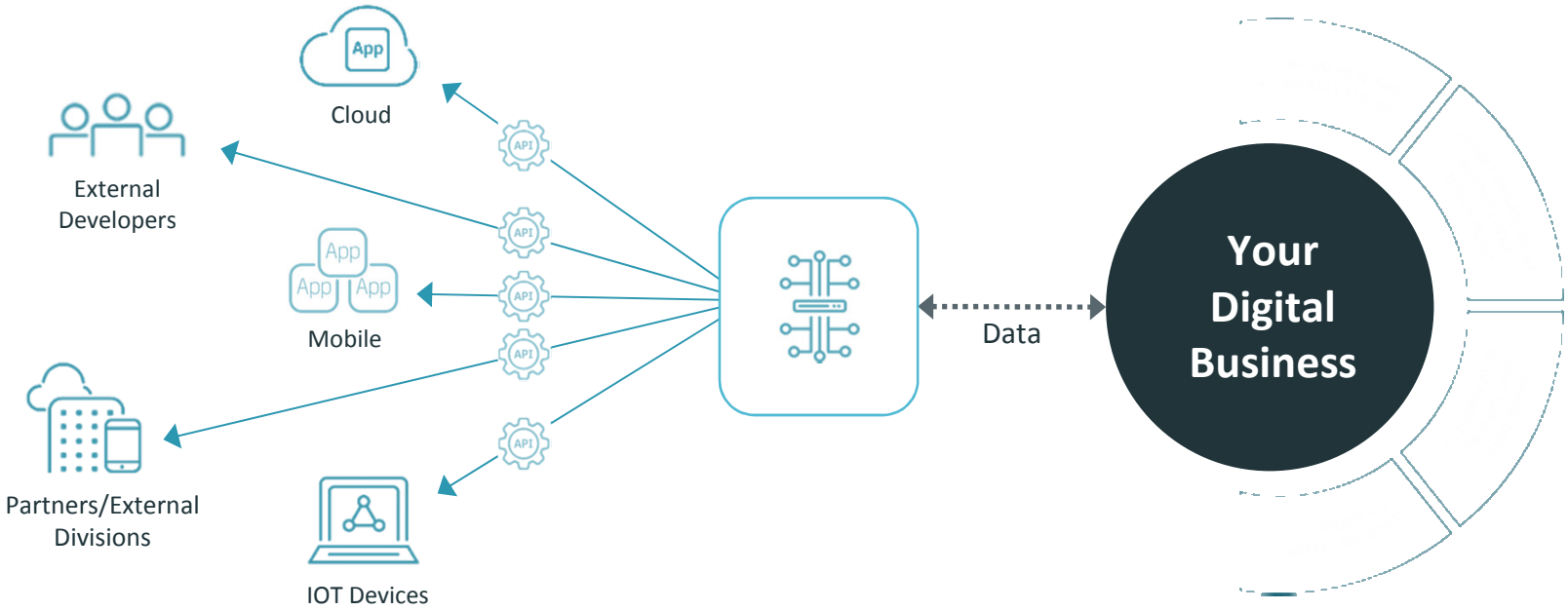
CA API Management

APIs are the building blocks of digital transformation



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Roadblocks to digital transformation

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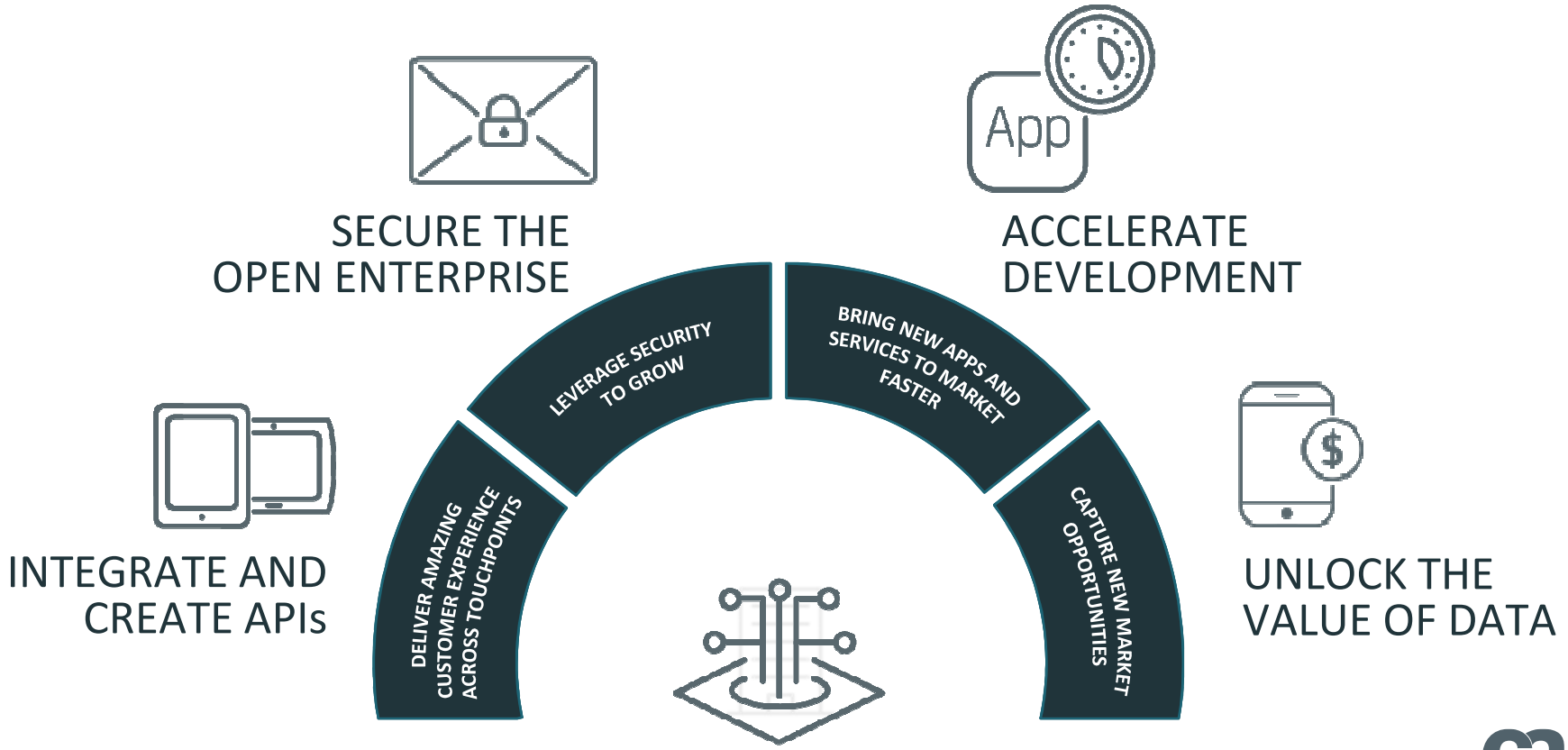
API Management enables digital transformation



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CA API Management

The Building Blocks of Digital Transformation

Outside the Enterprise

Internet of Things

Mobile

SaaS/Cloud Solutions
AWS, Google, SFDC …

Partner Ecosystems

External Developers

Integrate and **Create APIs**

- ✓ Easily connect SOA, ESB, and legacy applications
- ✓ Aggregate data including NoSQL up to 10x faster
- ✓ Build scalable connections to cloud solutions
- ✓ Automatically create data APIs with live business logic

Secure the Open Enterprise

- ✓ Protect against threats and OWASP vulnerabilities
- ✓ Control access with SSO and identity management
- ✓ Provide end-to-end security for apps, mobile, and IoT

Accelerate Mobile/IoT Development

- ✓ Simplify and control developer access to data
- ✓ Build a wider partner or public developer ecosystem
- ✓ Leverage tools that reduce mobile app delivery time

Unlock the Value of Data

- ✓ Monetize APIs to generate revenue
- ✓ Build digital ecosystems to enhance business value
- ✓ Create efficiencies through analytics and optimization

Within the Enterprise

Secure Data

Application Portfolio

ID/Authentication

Reporting & Analytics

Internal Teams

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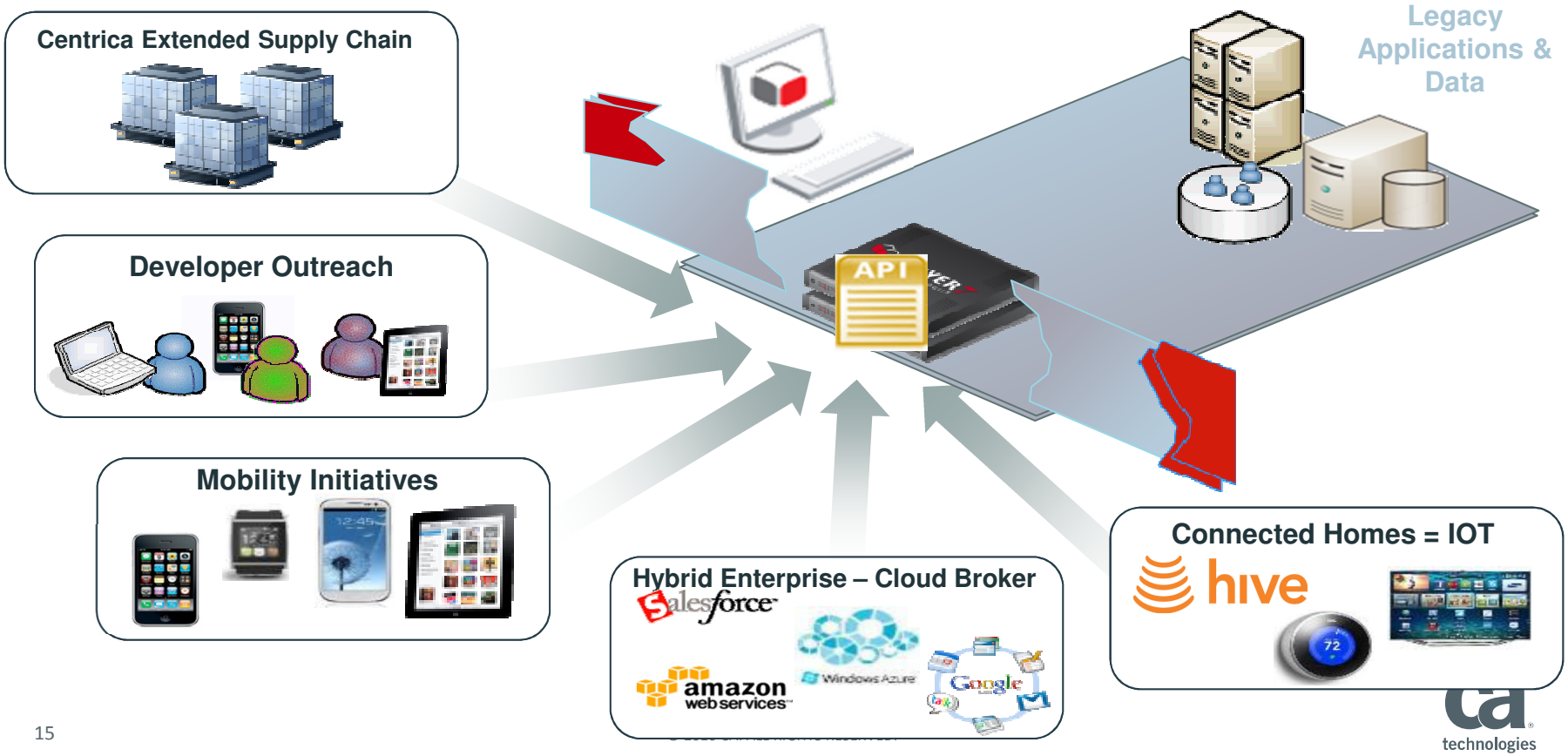
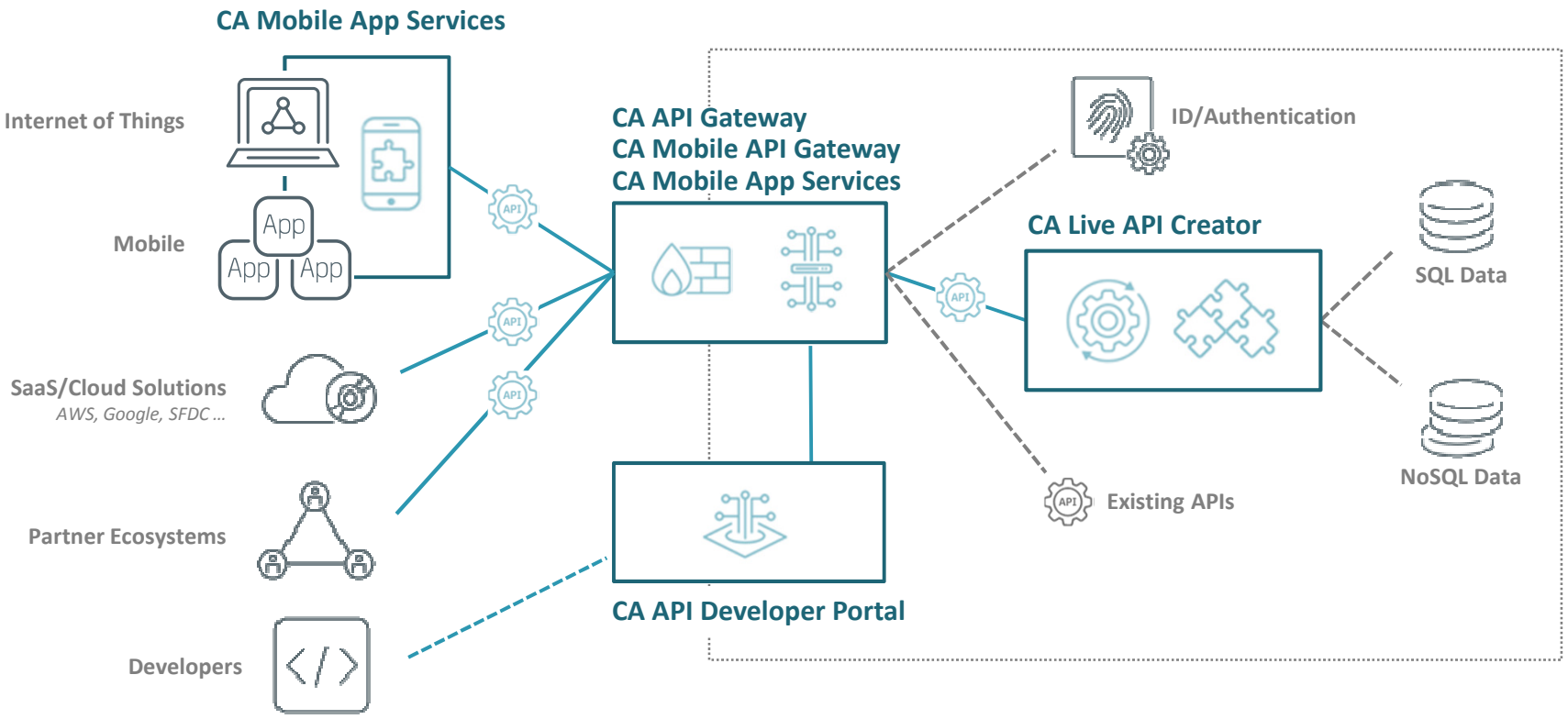
CA API Gateway Provides API Access Control for the New "Open" Enterprise



CA API Management



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IoT Demo: Refrigerated Truck Monitoring

Demo Premise

Temperature Controlled Shipping Containers

- Temperature Controlled Shipping Containers
  - 2 Temperature Sensors (for simplicity for this demo)
  - Localized RFID readers near temp sensors (to look at acceptable temperature range for items)

- Need to understand climate inside container as it relates to items in container.
- Need visualization for driver or operations to manage possible issues.
- Wireless systems for retrofit ability (so we don't need new containers)
- Secure connections and access needed to data and systems.

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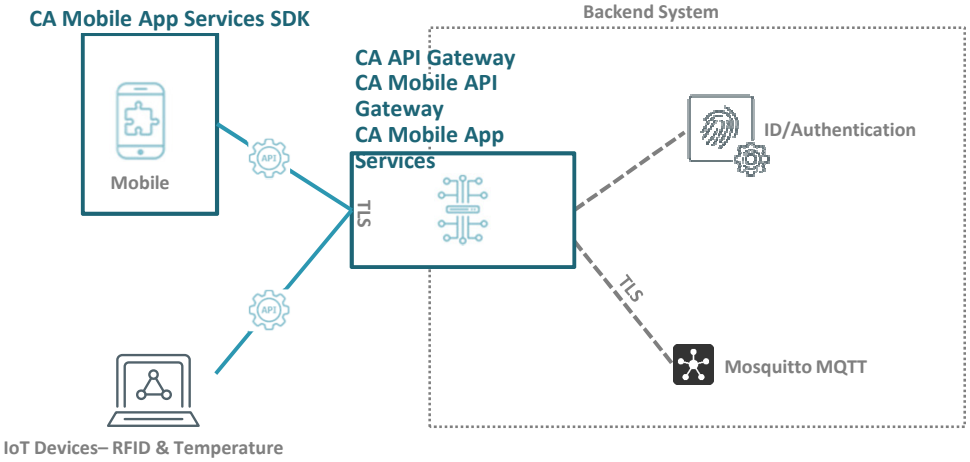
Demo Architecture



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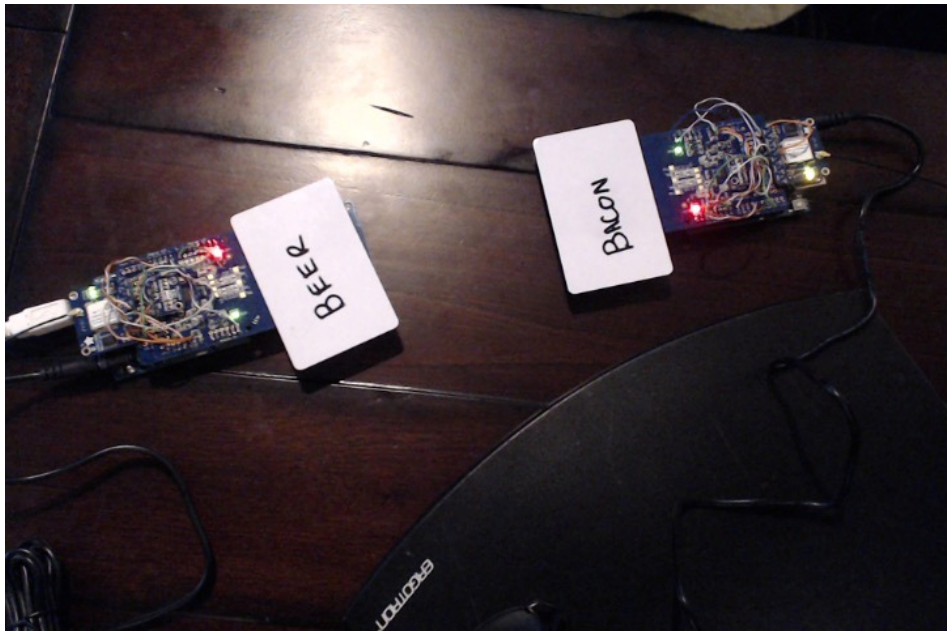
Demo Hardware

2 Arduino-based devices scanning for RFID & collecting Temperature

Device 1 & 2 Simulated Data Collected and Sent via WiFi to the API Gateway



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IoT Demo

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Questions

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