

# Business Services

**Fundamentals for modernizing  
service management and enabling  
industrial Internet of Things services**

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# Business Services Overview

## Part 1

### Modernizing Service Management

- Evolution of business services
- Key challenges
- Optimal approach
- Customer case studies
- Best practices

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# Business Services Overview

## Part 2

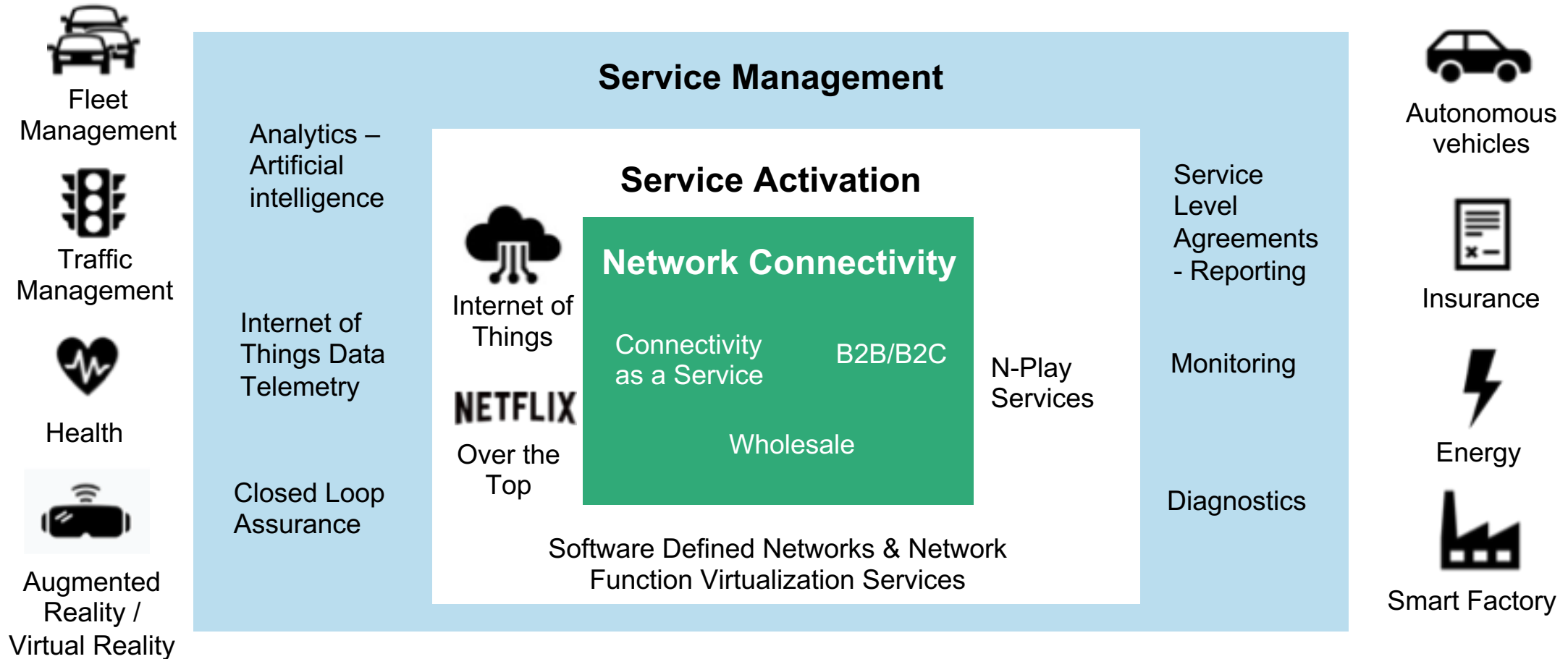
### Industrial Internet of Things (IIoT)

- Market opportunity and CSP Momentum
- Internet of Things business models
- Incognito approach
- Best practices

Jeevithan Muttu



# Explosion of Business-to-Business use cases highlights new monetization opportunities





# Service Management Challenges



**Increased competition**  
*90% of wireline operators offering B2B services*

Time to market and rapid innovation become Hypercritical in Business to Business (B2B) services



**Multiple services offerings—different customer needs**

Needs flexible service packaging and provisioning



**Escalating operational complexity and cost**

Risk of creating “provisioning” silos—different vendor equipment, processes



**Service continuity**

How to meet and report on multiple Service Level Agreements



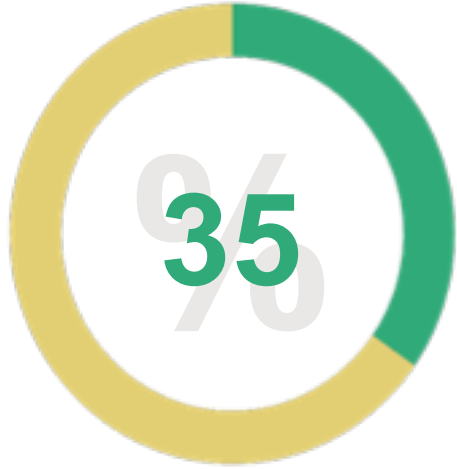
**Drive for autonomous operations**

Where to introduce automation, zero-touch processes first...

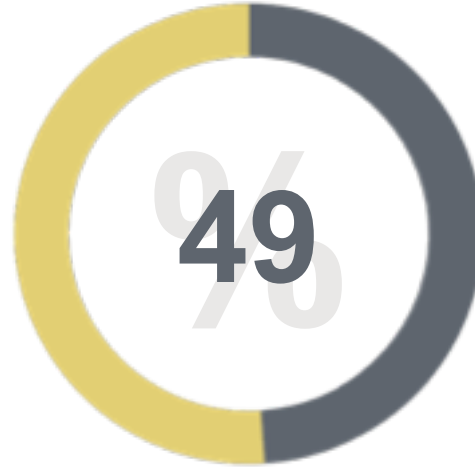
Opportunity—synergy and convergence of operational stacks has started



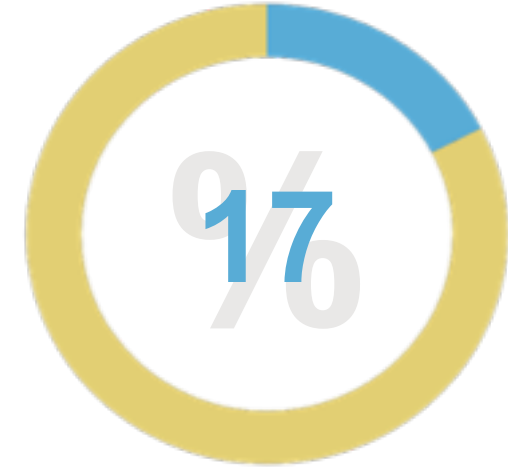
# Operators have already started to converge residential and business services stacks



Single Operational Support System stack  
- have converged residential and business service provisioning and operations



Internet Service converged  
**but**  
New/advanced services (Software Defined WAN)  
still in different Operational Support Systems stack



Service complexity prevents convergence - maintaining separate stacks

# Optimal Approach

## **Automation**

Fulfillment, diagnostics and operational closed-loop processes—assuring complex IP services

## **Converged Service Management Platform**

Extend residential Operational Support Systems (OSS) footprint to business services—Single OSS Stack

## **Network and Vendor Abstraction**

Business Services over Passive Optical Networks and Data over Cable



# Reference Architecture

## *Converged Service Management - Business & Residential*

### Business Support Systems

### Operational Support Systems

**Incognito**

Service  
Activation

Diagnostics

DHCP, DNS,  
IP Addressing

Auto  
Configuration  
Server

Firmware  
Management

Lease  
History

Service  
Inventory

Data over Cable,  
PacketCable

EMS/NMS

Fiber

Authentication  
Authorization,  
Accounting

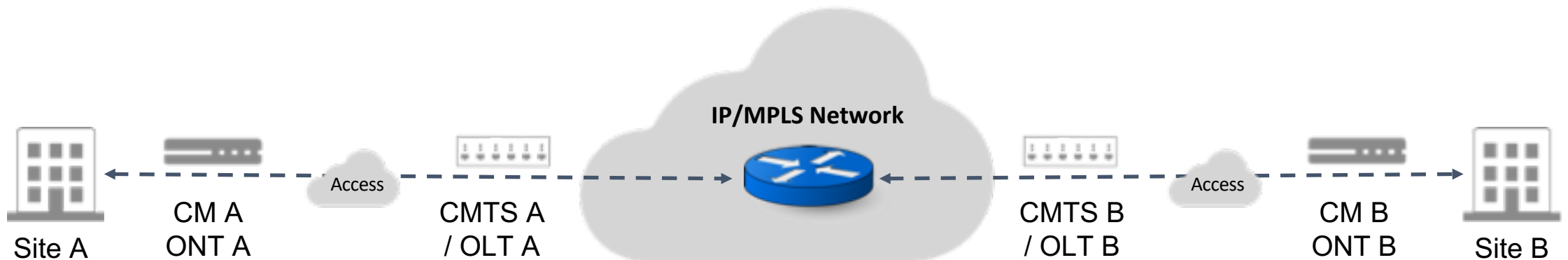
Conditional  
Access System

Voice over IP  
Softswitch

IP Television  
Platform

Over the Top  
Platform

Internet of  
Things  
Platform

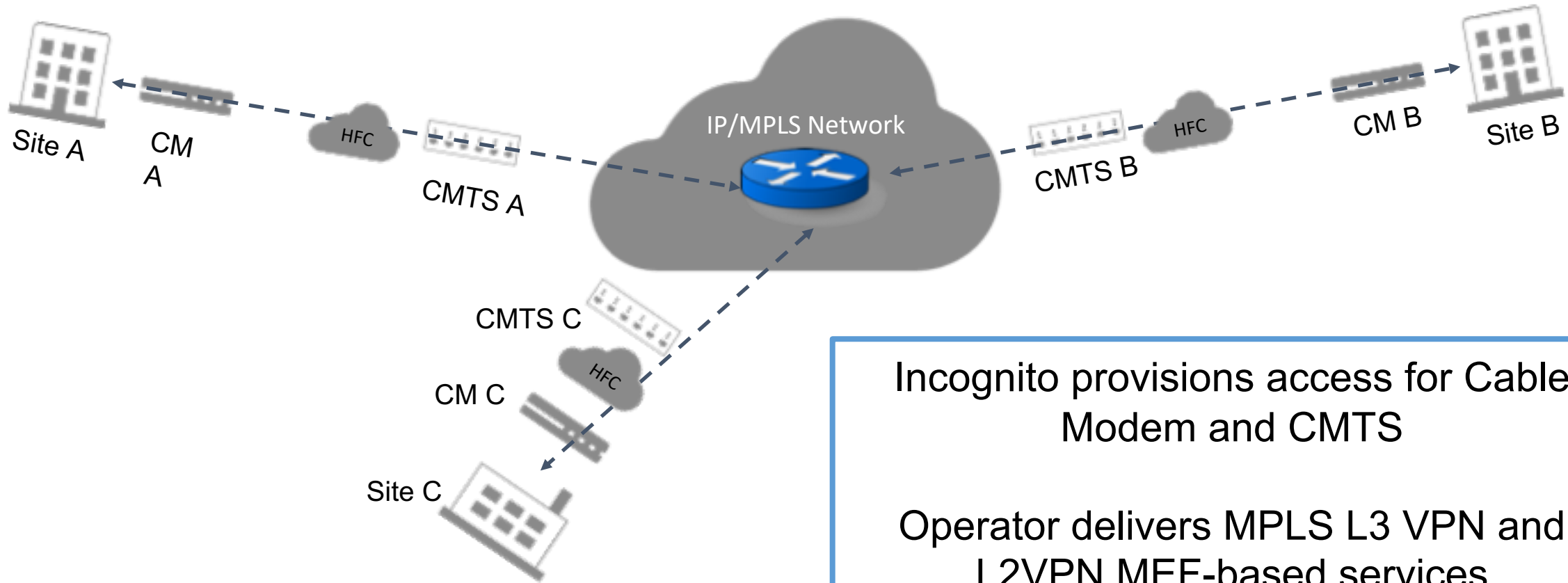


CM = cable modem, ONT = optical network terminal, CMTS = cable modem termination system, OLT = optical line terminal



# What is Business Services Over DOCSIS (BSOD)?

**BSOD defines way to use Data over Cable Service Flows for VPN Pipes**



DOCSIS = data over cable service interface specification

CM = cable modem

CMTS = cable modem termination system

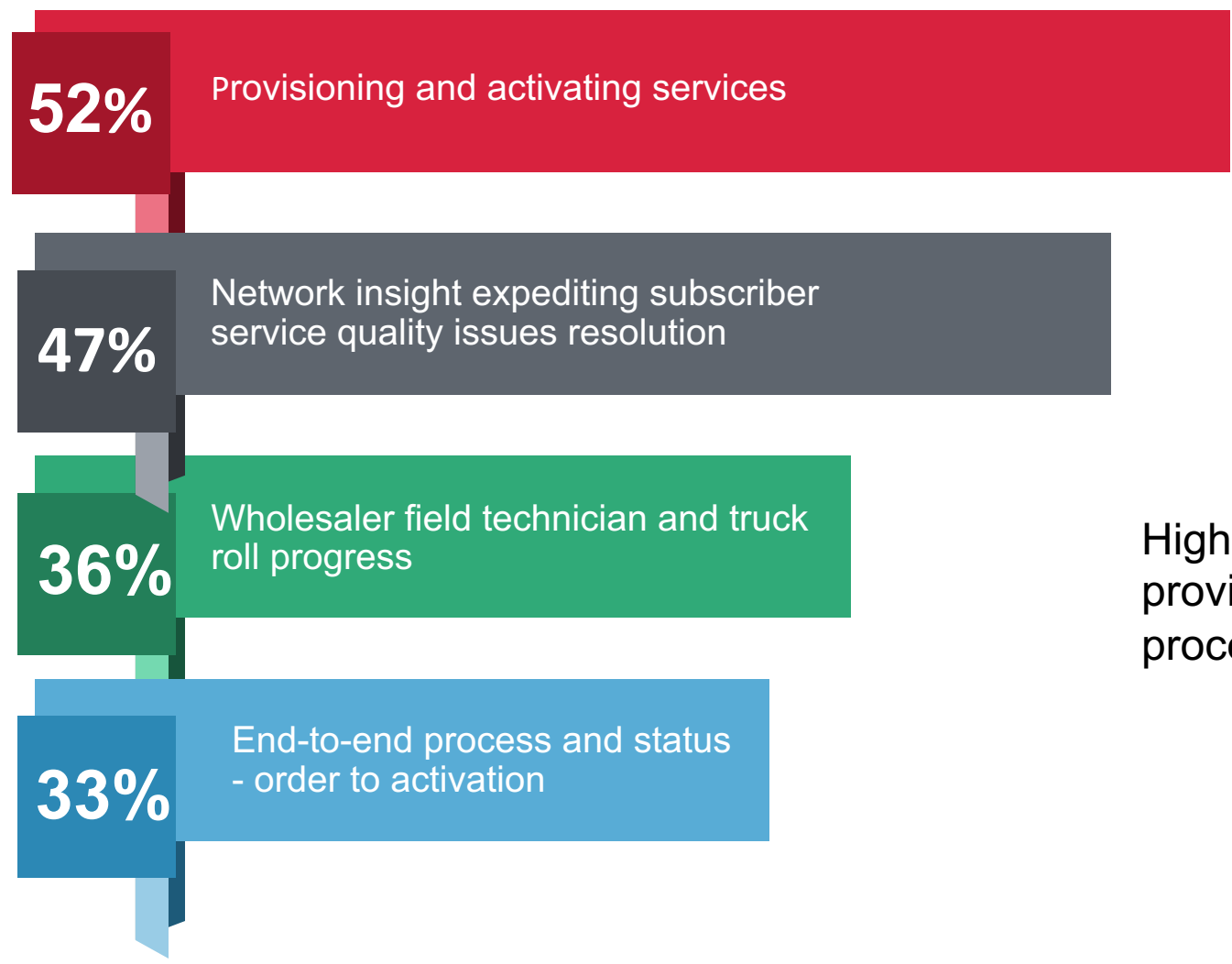
VPN = virtual private network

# Incognito Customer Examples

Enterprise Metro Ethernet	Business Services over DOCSIS	Wholesale
Automated Metro Ethernet network configuration & diagnostics	Provisioning Business Services over DOCSIS on access network cable modem & CMTS	Automated end-to-end fulfillment connecting retail cable operators Eliminated provisioning silos
<b>Tier 1 Latin American Operator</b>	<b>Tier 1 Asian Operator</b>	<b>Tier 1 Oceania Operator</b>

B2B = Business to Business, B2C = Business to Consumer, DOCSIS = data over cable service interface specification, CM = cable modem, CMTS = cable modem termination system



# What wholesalers need to provide to retail operators...



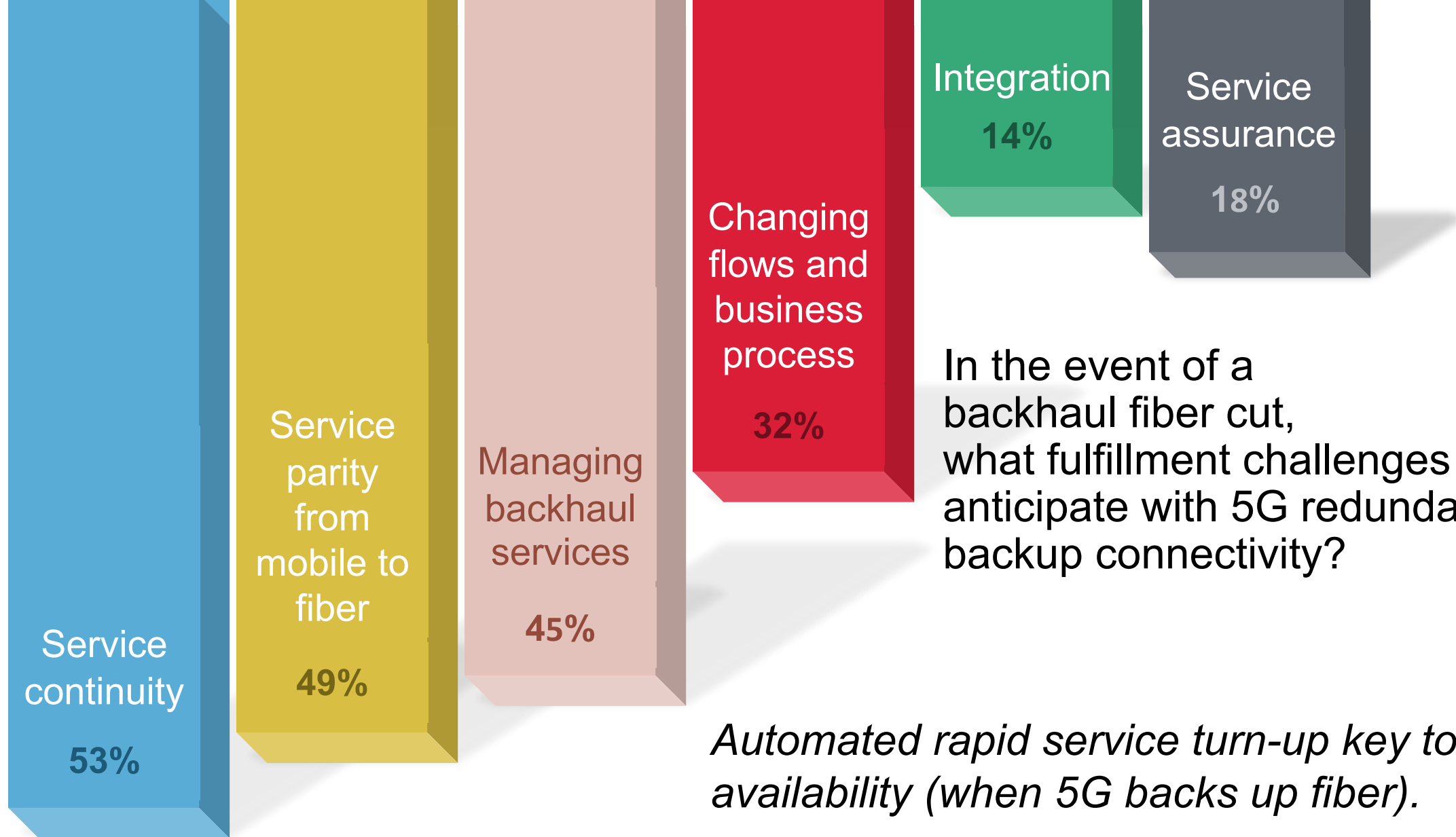
Highlights importance of common portal providing end to end visibility of key processes



# Incognito Customer Examples

<b>Enterprise Metro Ethernet</b>	<b>Business Services over DOCSIS</b>	<b>Wholesale</b>
Automated Metro Ethernet network configuration & diagnostics  Tier 1 Latin American Operator	Provisioning BSOD on access network cable modem & CMTS Converged B2B and B2C platform  Tier 1 Asian Operator	Automated end-to-end fulfillment connecting retail cable operators Eliminated provisioning silos  Tier 1 Oceania Operator
<b>Converged B2C and B2B</b>	<b>xPON Service</b>	<b>Provisioning 5G Network Slices</b>
Multiple tenants support 40 activations per second 2 million per day  Tier 1 Latin American Operator	Reduced FTTH provisioning silos for FTTH residential and business operations with process automation  Tier 1 Latin American Operator	Service orchestration to 5G systems enabling service continuity post fiber cut   

B2B = Business to Business, B2C = Business to Consumer, DOCSIS = data over cable service interface specification, CM = cable modem, CMTS = cable modem termination system, FTTH = fiber to the home/business, PON = Passive Optical Networks, BSOD = Business Services over DOCSIS



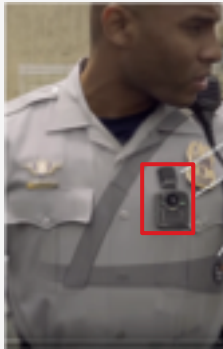
# Different Classes of Users have Different Needs...

## 5G Network Slicing

### First Responders



Push2talk,  
BodyCam



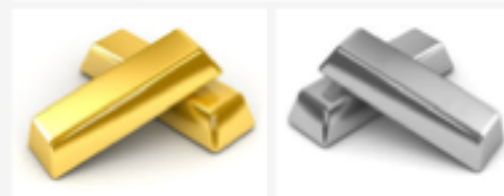
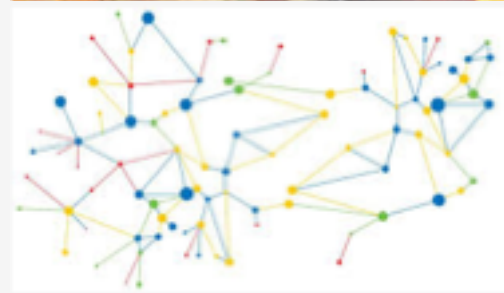
Health/Location  
Sensors

### Cities



Smart-City Sensors

### Enterprise Customers



Enterprise-Gold

Enterprise-Silver

### Media



Weather Reports Met Office

...Different network characteristics



# Business Services Operations Modernization

## *Best Practices*



1

### **Converge residential and business services platforms**

- Single Operational Support Systems stack garners operational efficiencies

2

### **Service assurance**

- Paramount to Business-to-Business services to support stringent Service Level Agreements

3

### **Keep service agility top of mind**

- Use modular reusable components to expedite deployment and improve time to market

4

### **Abstraction of provisioning flows**

- Minimize training
- Implement change control
- Service repository

5

### **Automation = scale**

- Eliminate swivel chair
- Reduce errors



# Business Services Overview

## Part 2

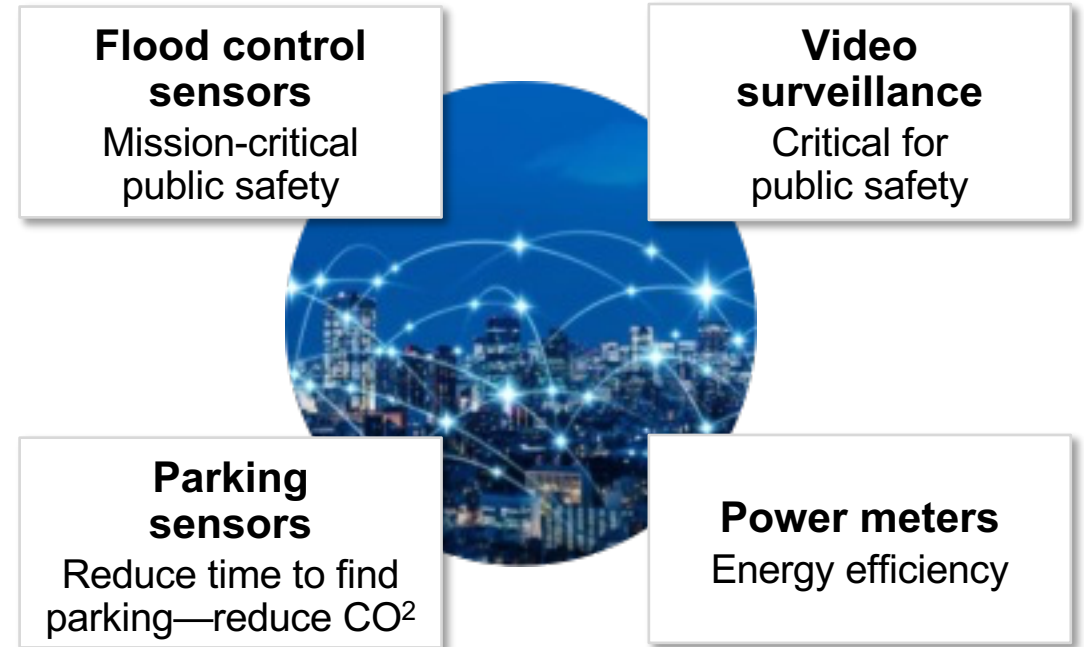
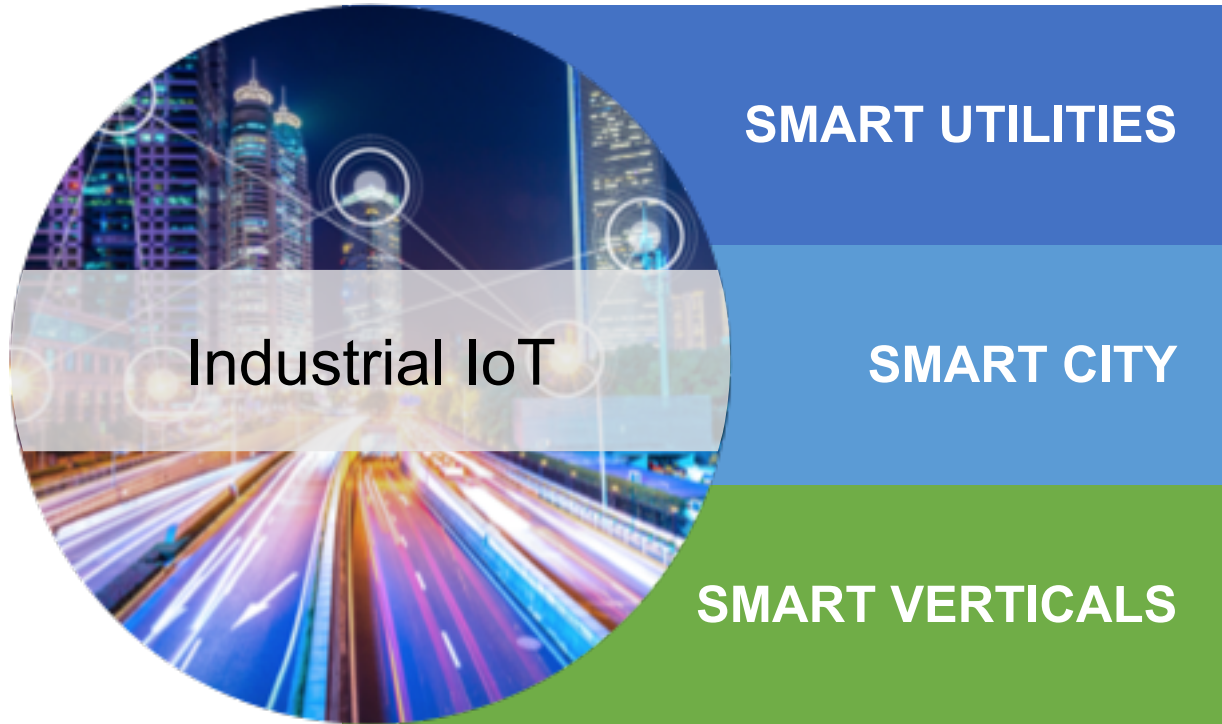
### Industrial Internet of Things

- Market opportunity and CSP momentum
- Internet of Things business models
- Customer case study
- “Verticalization”
- Best practices

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# Industrial Internet of Things is opportunity for global operators



~4B non-Smart Home Machine-to-Machine connections by 2022 (Cisco)  
**80% could be manageable by operators**

# Operators Perspectives on Internet of Things Access Technologies



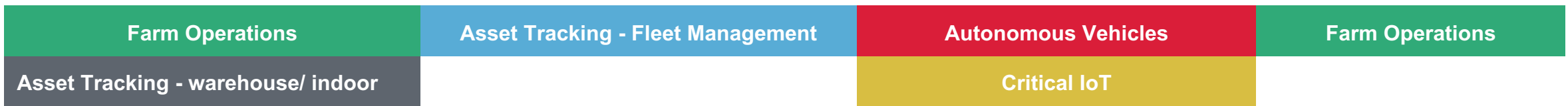
LoRa = Long Range, low-power wide area network technology

- Unlicensed spectrum - attractive to fixed operators
- Battery efficient - useful for sensors, telemetry
- Best suited to non-mobile devices - power meters

- Extends existing LTE specifications
- Attractive to mobile operators with LTE spectrum
- Higher bandwidth
- Suited to “mobility” services - fleet management, connected cars

- URLLC - Ultra Reliable, Low Latency Communication
- Higher bandwidth – mission critical applications

- Good example is Smart Farms
- Higher bandwidth within point to point locations - ie. buildings on a farm or within a specific “campus”



# Operator Internet of Things Business Models



## Connectivity *Logical starting point*

- Optimize pipe
- Offer only Subscriber Identity Modules (SIMs)
- Other players (OTT - Over the Top) offer solutions that ride the pipe



## Application Enablement

- Connectivity ++
- Platform to manage devices
- Platform to manage and streamline data
- Environment to build business-specific applications

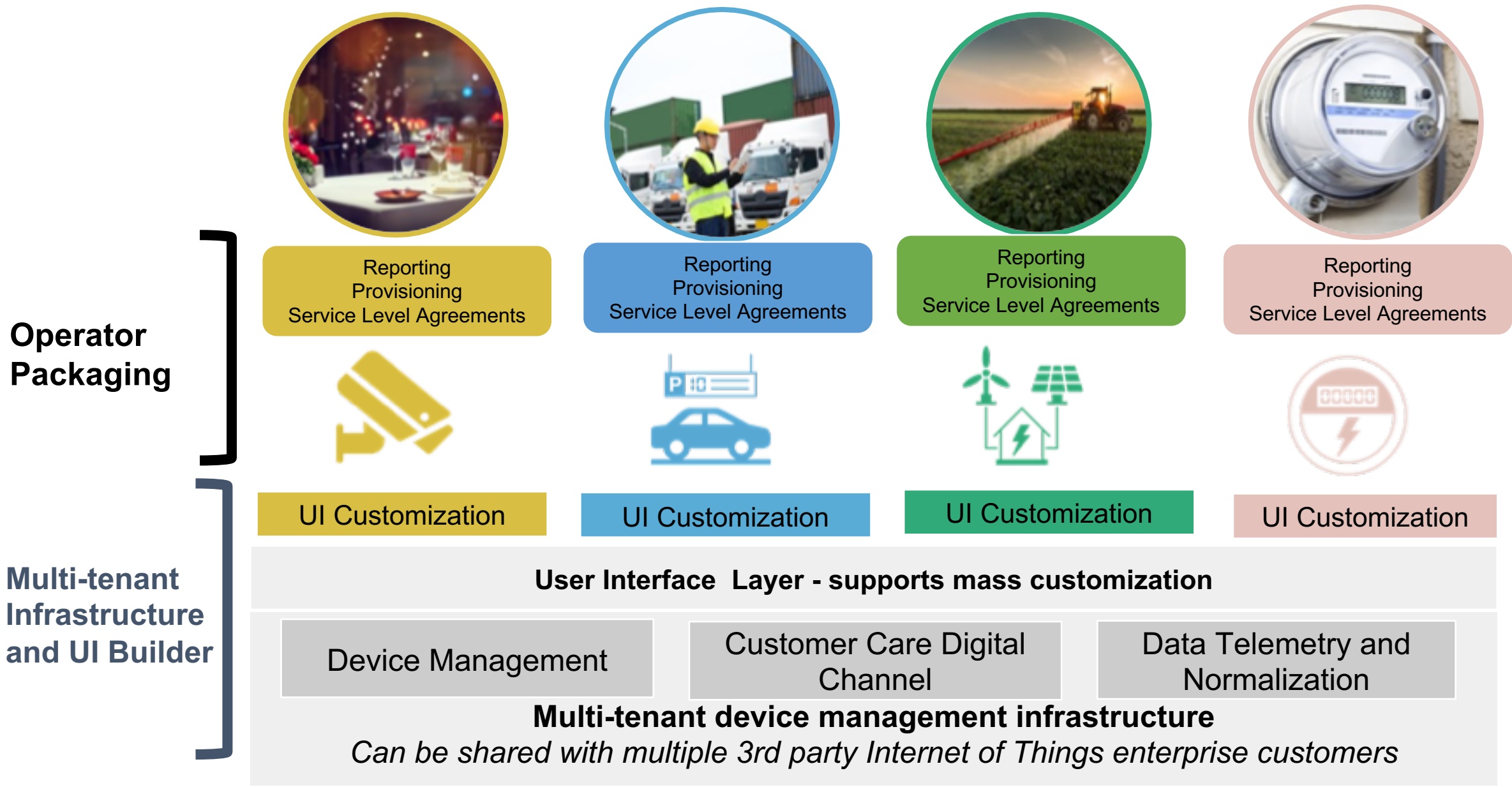


## End to End Solution

- Purpose built solution with vertical focus
- Requires deep domain knowledge
- Connected Car, Fleet Management



# How operators are approaching “verticalization”



UI = User Interface





# Industrial Internet of Things Needs

DEVICE MANAGEMENT

BIG DATA TELEMETRY

BUSINESS APPLICATIONS SUPPORT



## DEVICE MANAGEMENT SUPPORT

### Rapid device onboarding

- Automated discovery
- Extreme scaling
- Zero touch provisioning
- Bulk operations—firmware...
- Securely add device attributes
- Neutrality—vendor, network, device

### Device inventory

- Search
- Groups
- Configuration
- Fault detection



# BIG DATA TELEMETRY

## Telemetry

- Collect higher volumes of high-velocity data
- Normalization and Correlation of data

## Data brokering

- Vertical business applications consumption
- Data slicing

## Fault detection and management

- Device status analytics
- Closed-loop automation



## BUSINESS APPLICATIONS SUPPORT

### **Vertical specific business functions**

- Better operational visibility
- Improve decision making
- New business offerings

### **Stakeholders vary depending on the application**

- Operations/IT heavy for automation
- End users heavy for new business (e.g., connected cars)

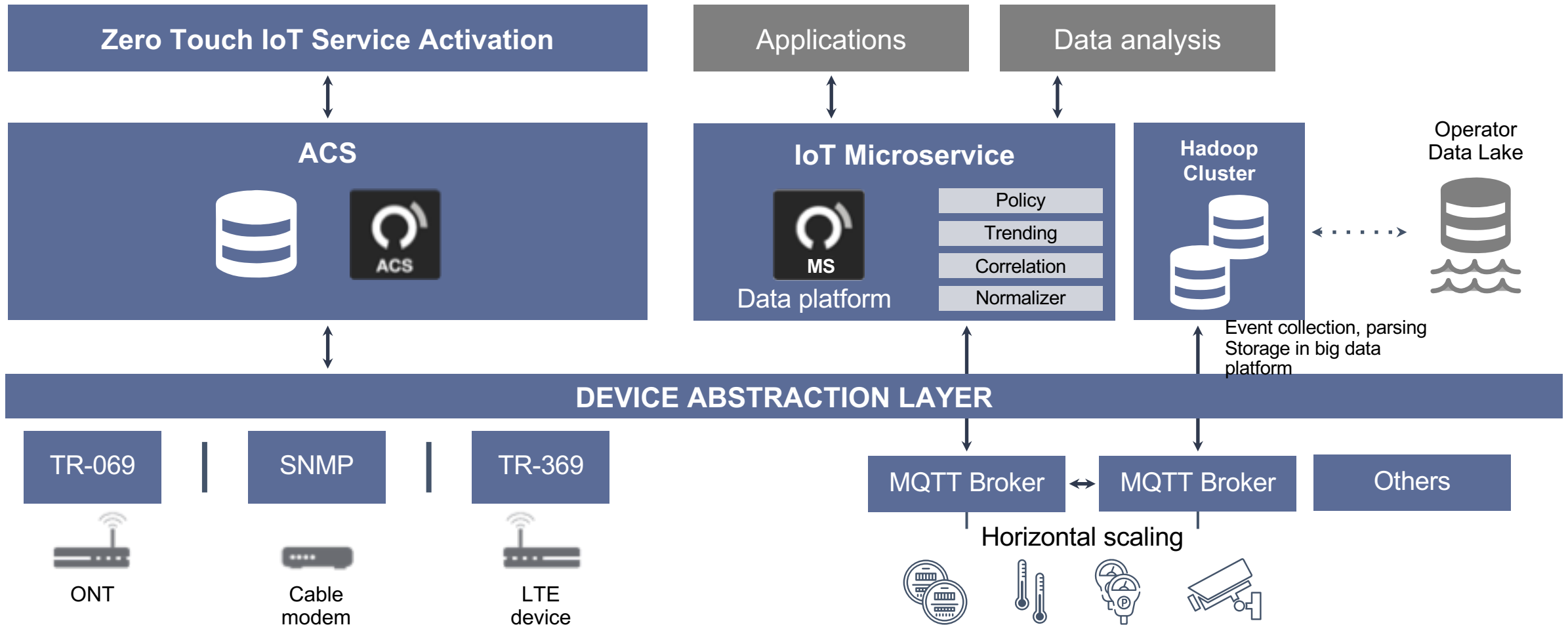
### **Platforms vary as well**

- Web based applications for operations/IT centric functions
- Mobile heavy for end user centric apps



# Reference Internet of Things Solution Architecture

## Unified device management model—residential, IoT



MQTT = message queue telemetry transport, ONT = optical network terminal, IoT = internet of things, ACS = auto-configuration server, MS = microservice



# Case study: Energy Efficiency

Monetize connectivity and transform business

**Industrial  
Internet of  
Things**

**Tier 1  
Galaxy  
LATAM  
Operator**



## **Business Challenges**

- Efficiency project—capture electrical meter power consumption and voltage
- Operational costs & complexity— devices country-wide

## **Incognito Solution**

- Extended beyond residential services to address enterprise
- Pro-active device diagnostics and closed-loop automation
- MQTT integration: device management; telemetry
- Data broker power telemetry to upstream verticals

## **CSP Benefits**

- Unified device management: connectivity; IoT
- ACS re-use, rapid IoT deployment, device scaling
- Flexible big-data and business application NBI



# Industrial Internet of Things

## *Best Practices*



1

### **Assess your deployment approach**

- Unified device management or co-exist with legacy systems

2

### **Auto Configuration Server model provides extensibility**

- Support new lines of business

3

### **Avoid proprietary Internet of Things implementations**

- Use standards-based transport protocols

4

### **Flexible integration to vertical business applications**

- Leverage for telemetry payload for upstream consumption and for device intelligence to drive closed-loop automation

5

### **Scalability paramount**

- As Internet of Things devices proliferate, device management, telemetry retrieval and microservices and northbound integrations must adapt accordingly



# Business Services Summary

B2B services requires multiple capabilities:

1. SLA complexity - QoS, VPN, latency, device geographical density, etc.
2. Platforms - support multiple business models and processes
3. Maximize monetization potential
4. Automation yields scalability

**Service Agility - Future-Proof Operations – Support Business Expansion**





Thank you

