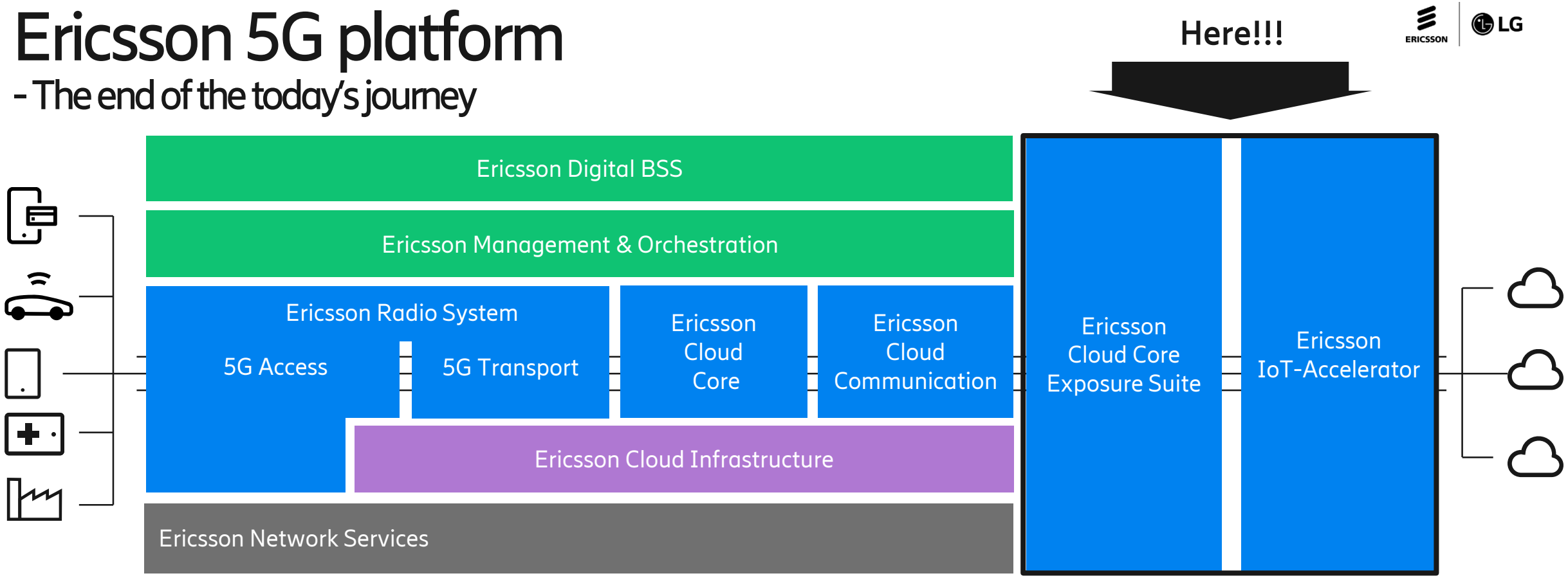
5G 생태계를 위한 서비스 연동 솔루션

강지훈 수석 컨설턴트

Ericsson 5G platform

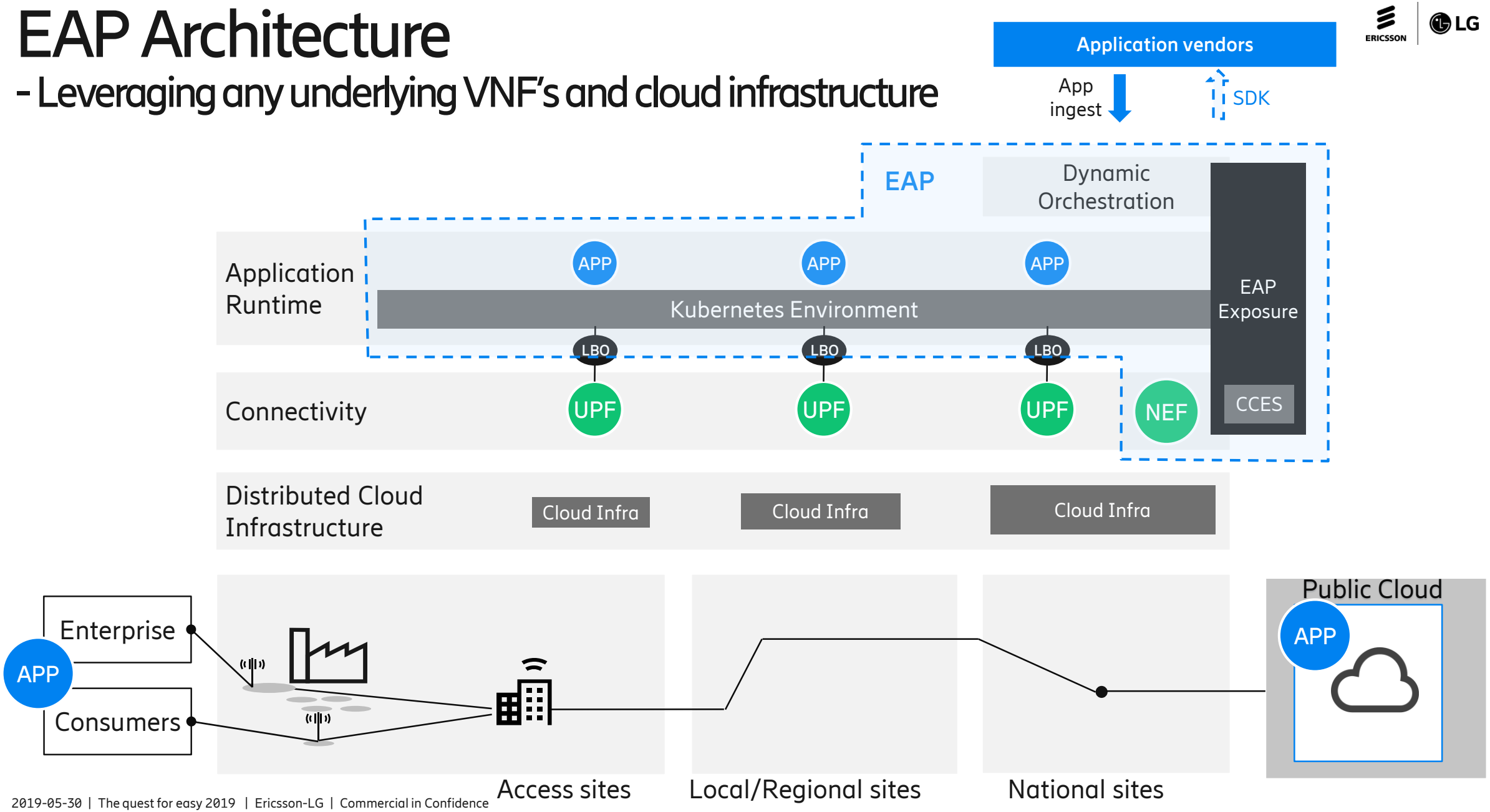
- The end of the today's journey



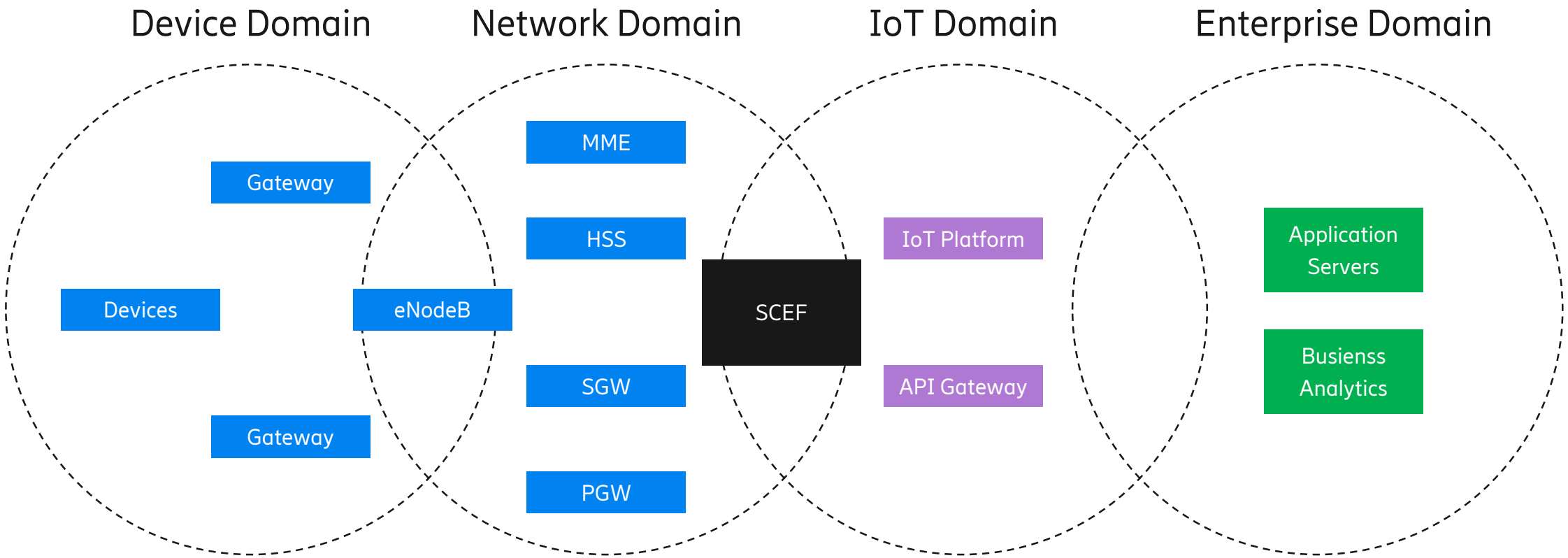
- **Digital BSS:** Real-time charging and billing, digital customer engagement
- **Management & Orchestration:** Network Management, Automation and Orchestration of Nodes, Networks and Capabilities
- **5G Access** RAN Compute and baseband, radio, and site
- **5G Transport:** Fronthaul, backhaul, edge, core
- **Cloud Core:** Packet Core, Unified Data Management & Policy
- **Cloud Communication:** Communication Services such as voice, video and messaging
- **Cloud Infrastructure:** NFV Infrastructure for Distributed Cloud Environments
- **Network Services** Network Design, Network Build and Customer Support

EAP Architecture

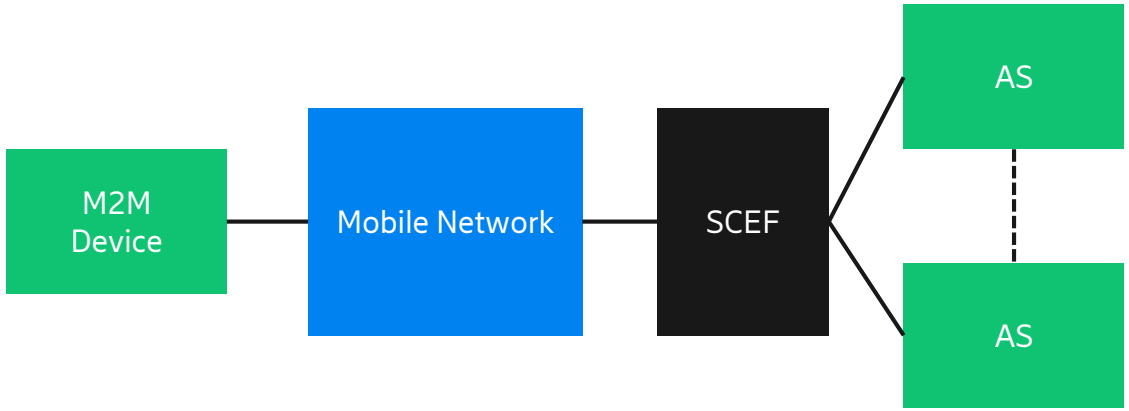
- Leveraging any underlying VNF's and cloud infrastructure



3GPP SCEF Domains



Why a Service Capability Exposure Function?



Without SCEF	With SCEF
Limited control by operator on the traffic generated by and towards M2M devices (threat of congestion!)	Control over the M2M traffic generated by partners/customers (e.g. Authentication, Authorization, Throttling)
No communication between network and AS	Network informs SCEF about the location, reachability, status, etc., SCEF informs AS
Complex communication and protocols	Easy to integrate for partners/customer applications by means of RESTful interface, short TTM for application developers, no need to understand network complexity. Add new RESTful interfaces.
Only single point-to-point connection between device and application server	Possibility to connect devices to multiple application servers
No added value by operator apart from being a bitpipe	Offering additional functionality in order to become part of the value chain (e.g. monitoring, high latency comm., ID/IMSI mapping, grouping, etc.)

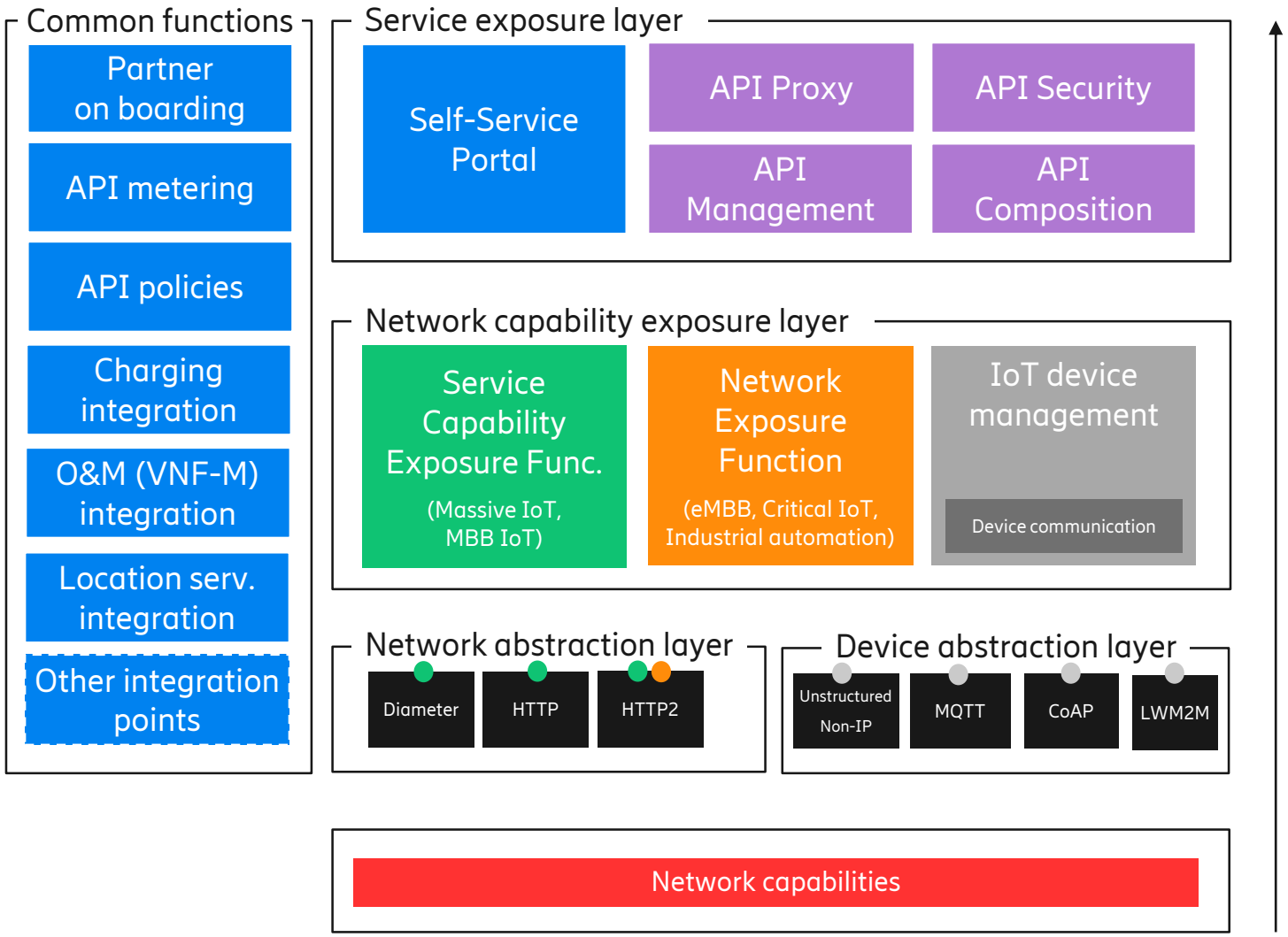
Ericsson Service Capability Exposure Function

Cellular-IoT key characteristics

- **100-200** bytes uplink — Online small data transmissions
- **10Y** — Long battery life
- Monitoring & Location trigger
- Device-ID, Device Group, MSISDN — Mobile ID -> Device ID

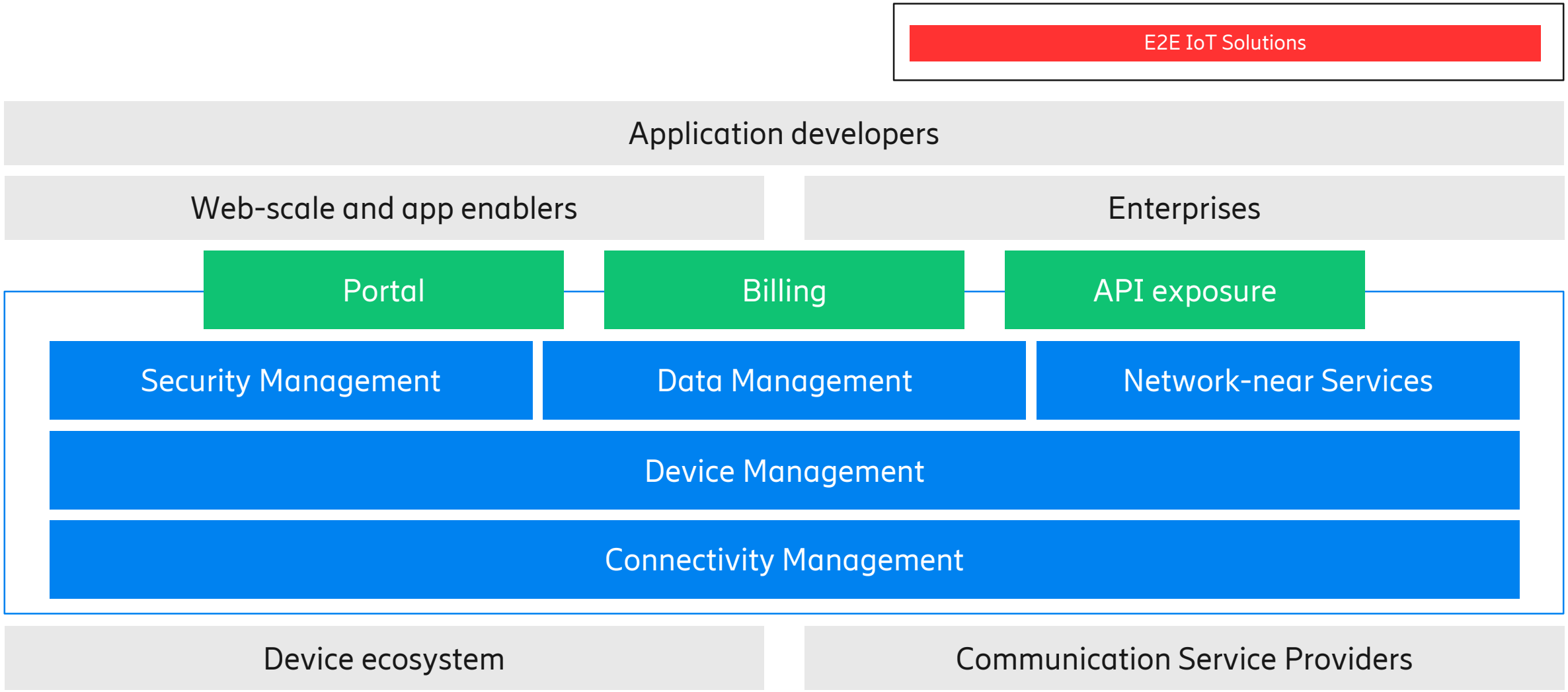
LTE-M NB-IoT	— Data Over NAS	— UE power saving mode, extended DRX	— Monitoring enhancement (MONTE)	— MSISDN-less Packet Switch
3GPP SCEF	— Non-IP Data Delivery (NIDD) — NIDD charging trigger function	— Event Triggering — Buffering (store & Forward) — High Latency Communication Pattern (NIDD)	— Event monitoring via HSS, MME/SGSN and PCRF — MONTE charging trigger function	— External ID and IMSI mapping, group message, device registration/ triggering — IWK-SCEF
Ericsson Additional Functionality	— IP Data Delivery — Developer Portal	— High latency communication IP Data (NB-IoT, CAT-M1)	— Geo fencing — Partner Management — API GW & Management	— Device management

Ericsson Exposure Server

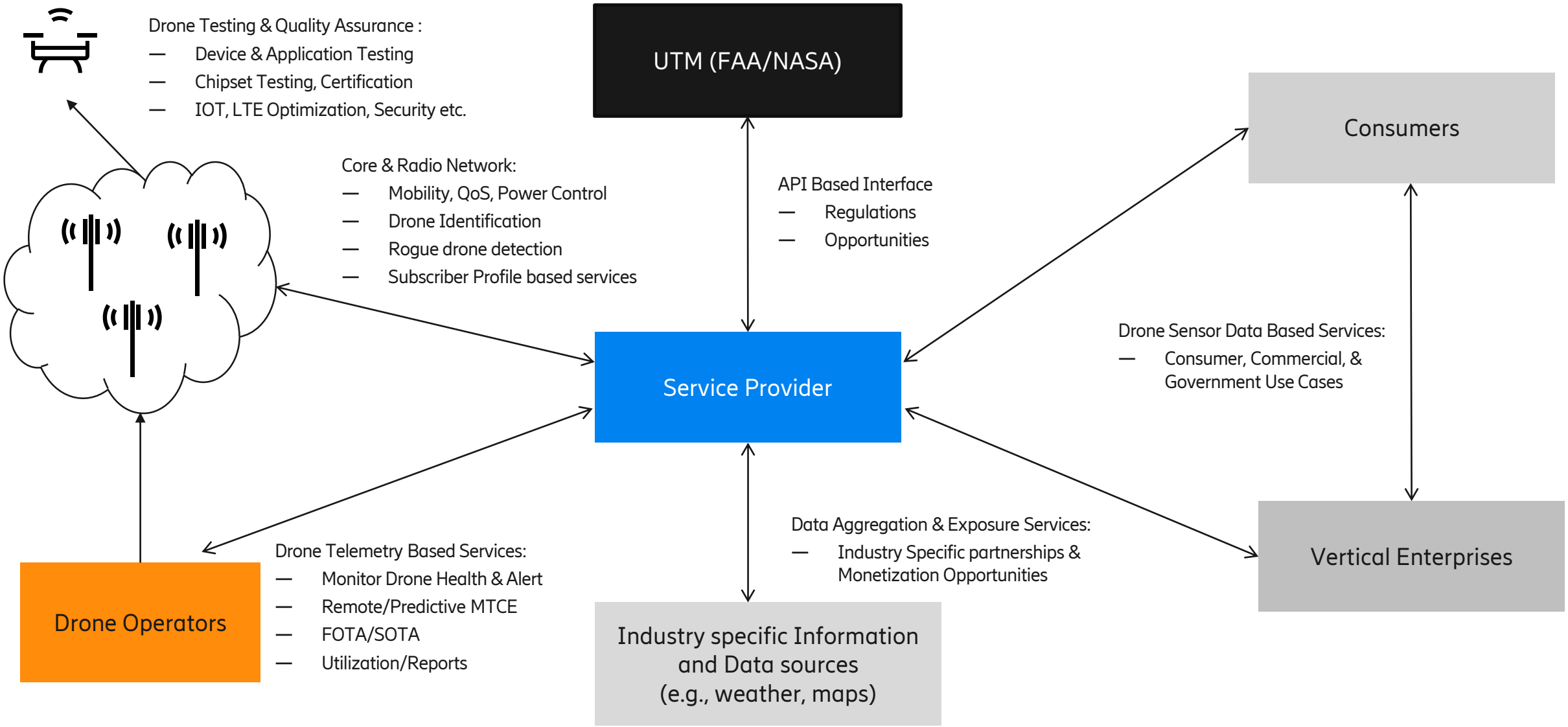


- **Expose** Service APIs, Network Capability APIs and Device Management & Communication APIs towards Application Developers and Enterprises in a secure and flexible way
- **Compose** Network Capability APIs, Device Management & Communication APIs and Web APIs to create new Service APIs, able to address more complex capabilities tailored around specific Use Cases
- **Activate** the internal exposure of 4G/5G network capabilities through standard/customized Network APIs for:
  - Network/Device monitoring (detect)
  - Network /Device insight (analyse and deduct)
  - Network /Device enforcement (take action)
  - Device Management and Communication

Ericsson IoT Accelerator



Commercial drone operations ecosystem



Smart Metering (Gas, Water & Electricity)

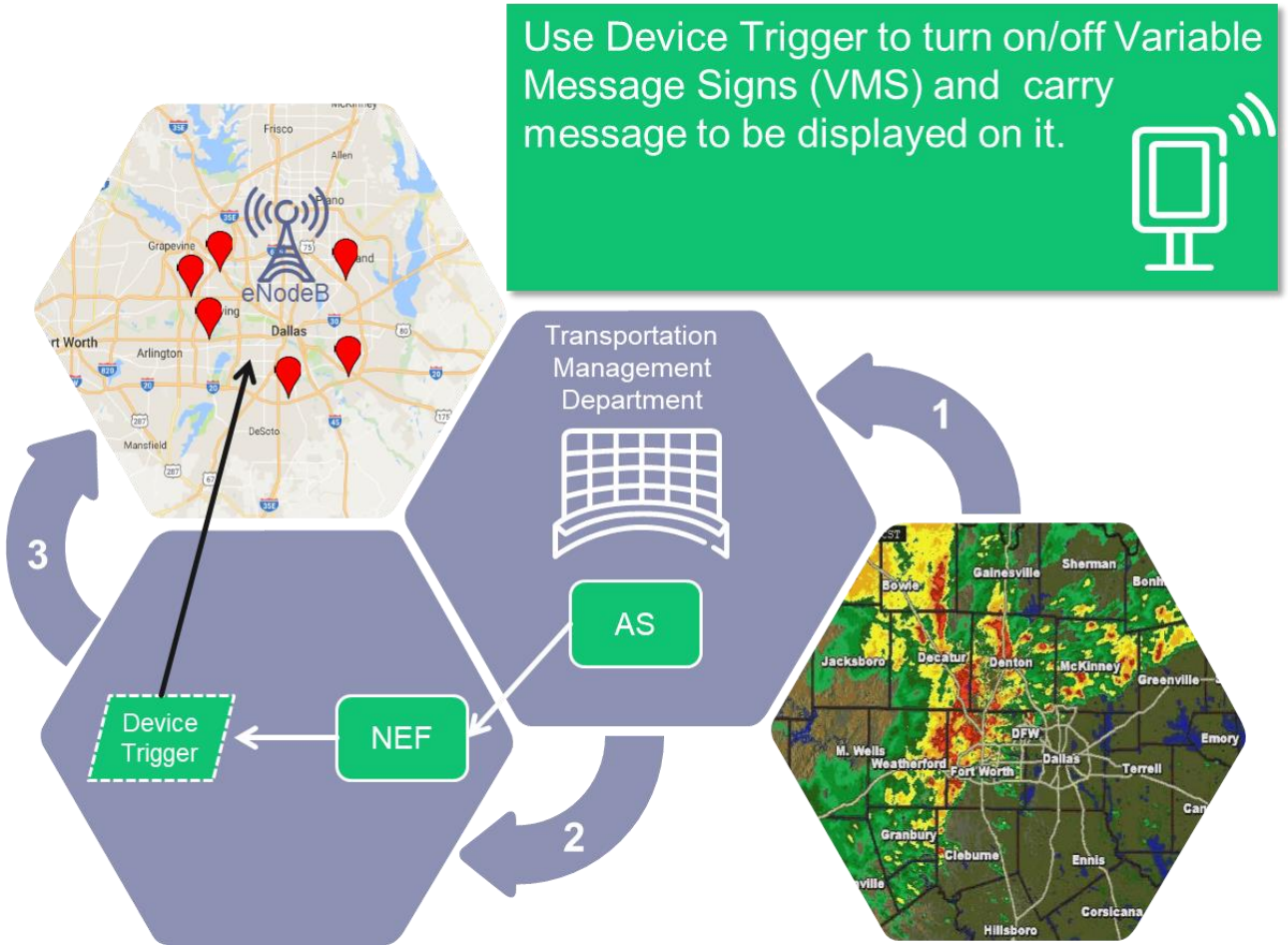
Smart Metering Scenario

- Massive number of Smart Meter devices will require onboarding into Telco network
- Majority (more than 95%) of these devices will belong to Enterprises/Partners e.g. Electricity/Gas/Water supplying companies owning the meters, different Fleet owner companies, expansive assets producers e.g. Samsonite who provide asset (e.g. suitcase) tracking options etc.

Benefits

- Provides Partner Companies to purchase different subscriptions from the Telco depending upon the data volumes or on connections (Massive IoT Portal).
- Data in terms of the meter reading and other parameters can be **provided by the Device at defined intervals (Non IP Data Delivery)**
- Utilization Dashboard for
  - Partner Companies to view the number of messages processed through the system
  - Data Consumption at an individual Device level

Weather Aware Message



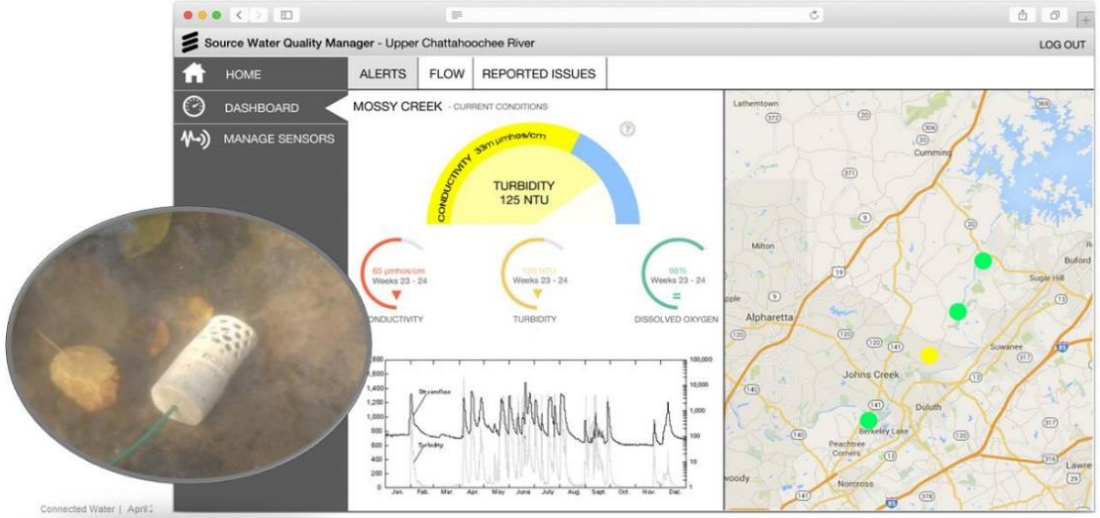
Device Triggering Scenario

- In extreme weather conditions for e.g. tornado, hail or tsunami, alarm is raised.
- Transportation Department (TD) receives this alarm and decides to close some segment of highways and send warning information to the message signs around the affected areas.
- Such alarm messages are send to affected VMS by the Network Exposure Function.

Benefits

- TD AS doesn't need to send thousands of message to VMSs. Instead, AS only needs to send one message to Network Exposure Function, NEF can launch **location based device triggering (GROUPE)** to all VMSs in specific location area.
- There is no need to reserve hundred thousands of MSISDN for VMS using **MSISDN-less service.**

Connected Water



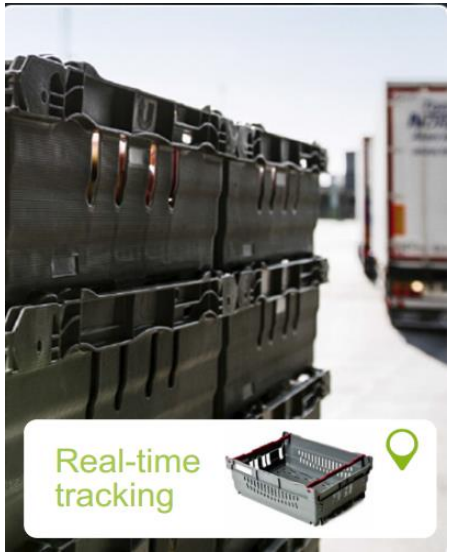
Connected Water Scenario

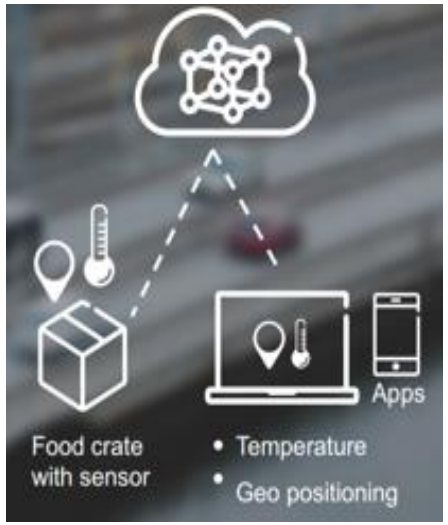
- Measurement and management of water for cleanliness on a perpetual basis is expensive, time consuming, and inefficient
- Hundreds of locations are to be monitored perpetually
- Battery life is very important, normally need 5-10 years

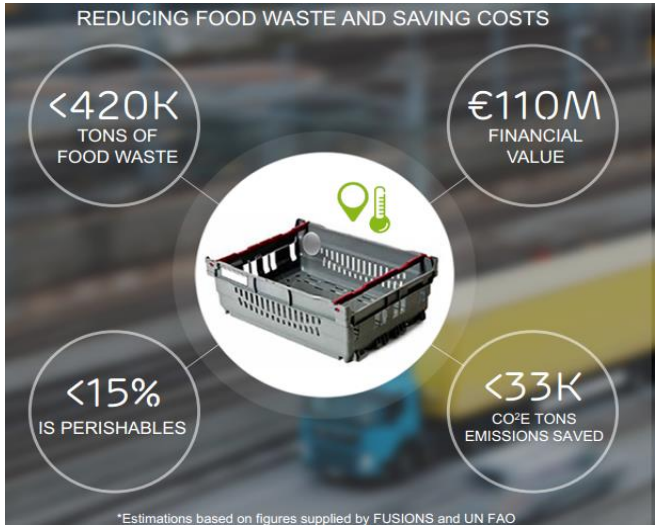
Benefits

- Data in terms of the water level, water quality and other parameters can be provided by the UE at defined intervals in a day.
- Connected Water Device can be monitored based on its location change or any other event by using **MONTE (monitoring event) feature.**
- It can also help in **geo-fencing** use cases where the location of the connected Water device has moved outside the boundary
- During the flood period, in case more frequent data is required from the Device, communication pattern can be changed by the Application to a new time period e.g. 1 time/hour (UE **Communication Pattern provisioning)**

Connected Food Crate







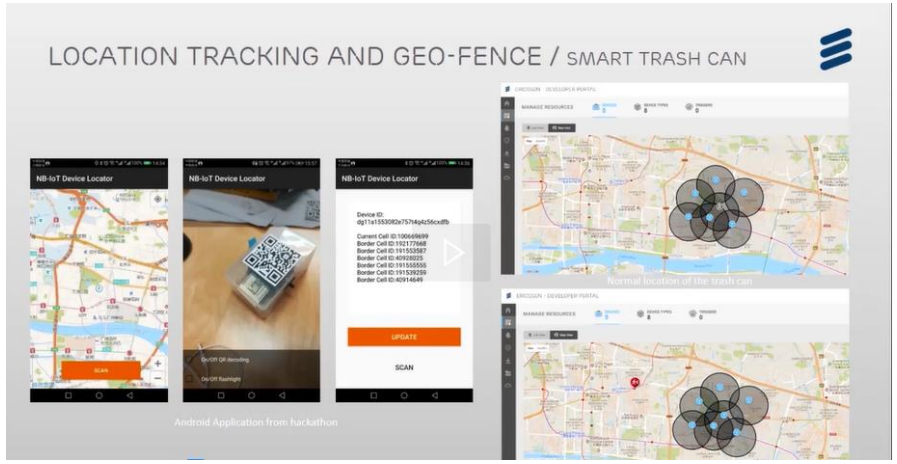
Connected Food Crate

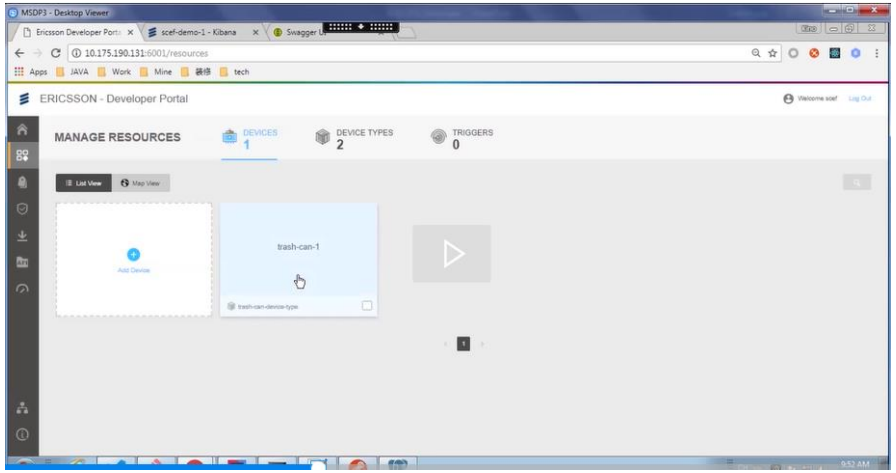
- Connected Food Crate is NB-IoT device without GPS support.
- Food Crate connected with sensor tracking
  - Battery
  - Geo positioning

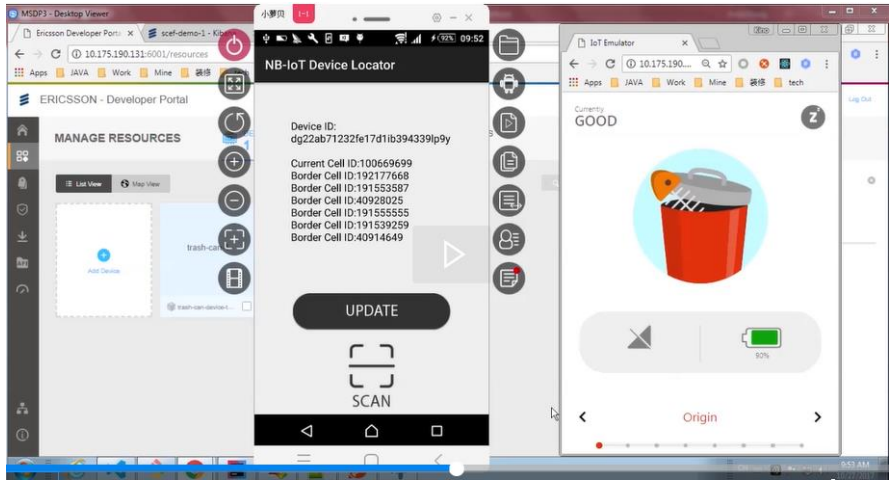
Benefits

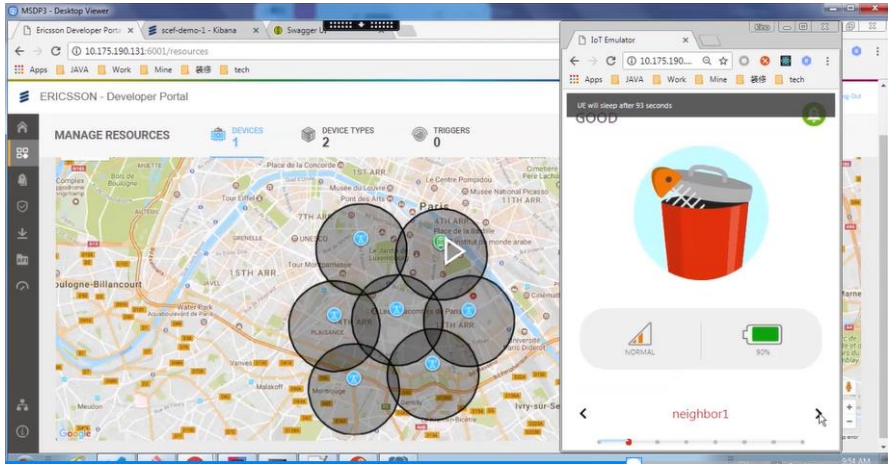
- During food delivery, Food Crate's location , **temperature and status** are monitored.
- **Battery Threshold level** can be configured to trigger monitoring event when battery goes below the threshold level

Connected Trash Can

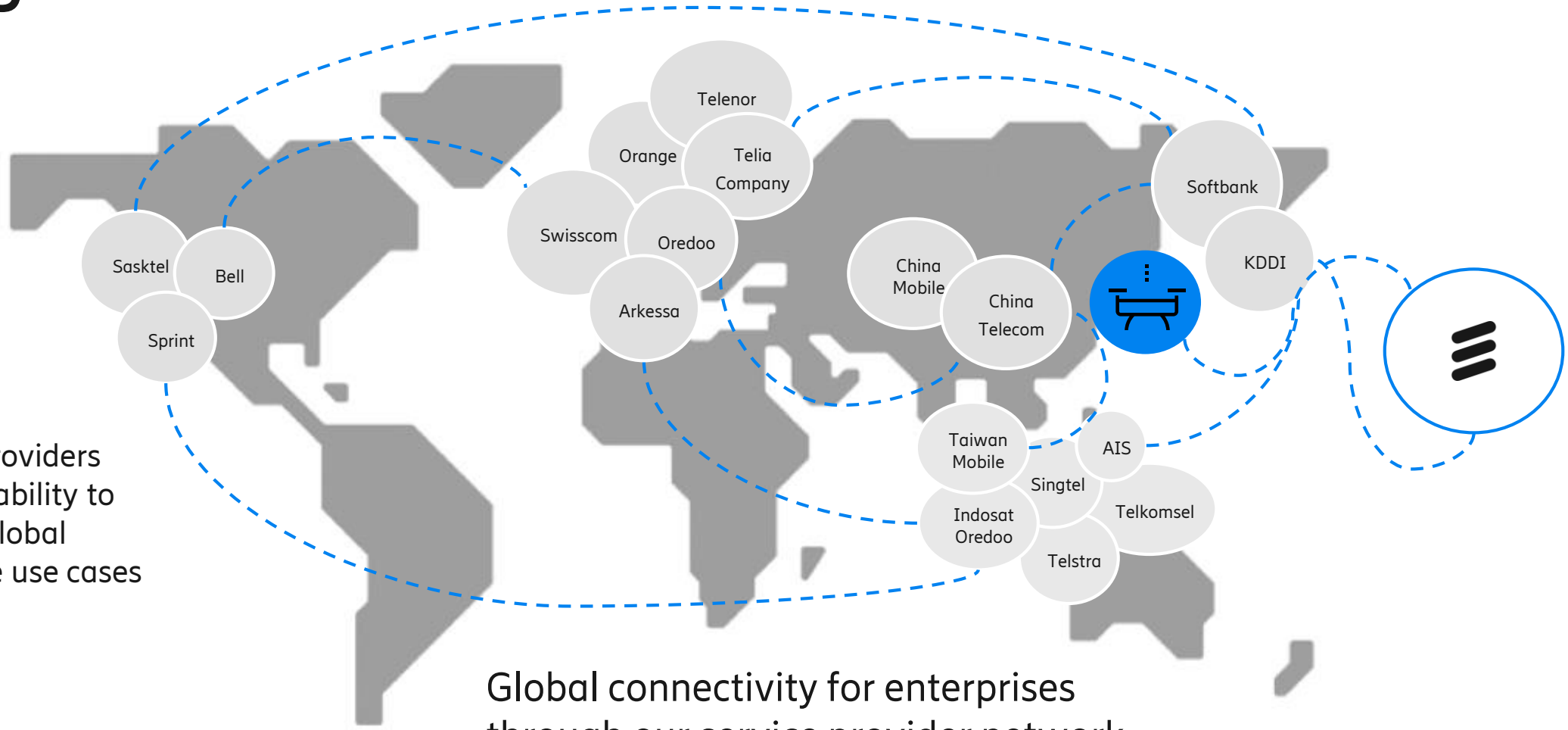








Ericsson IoT Accelerator - One global IoT solution



Service providers have the ability to address global enterprise use cases

Global connectivity for enterprises through our service provider network

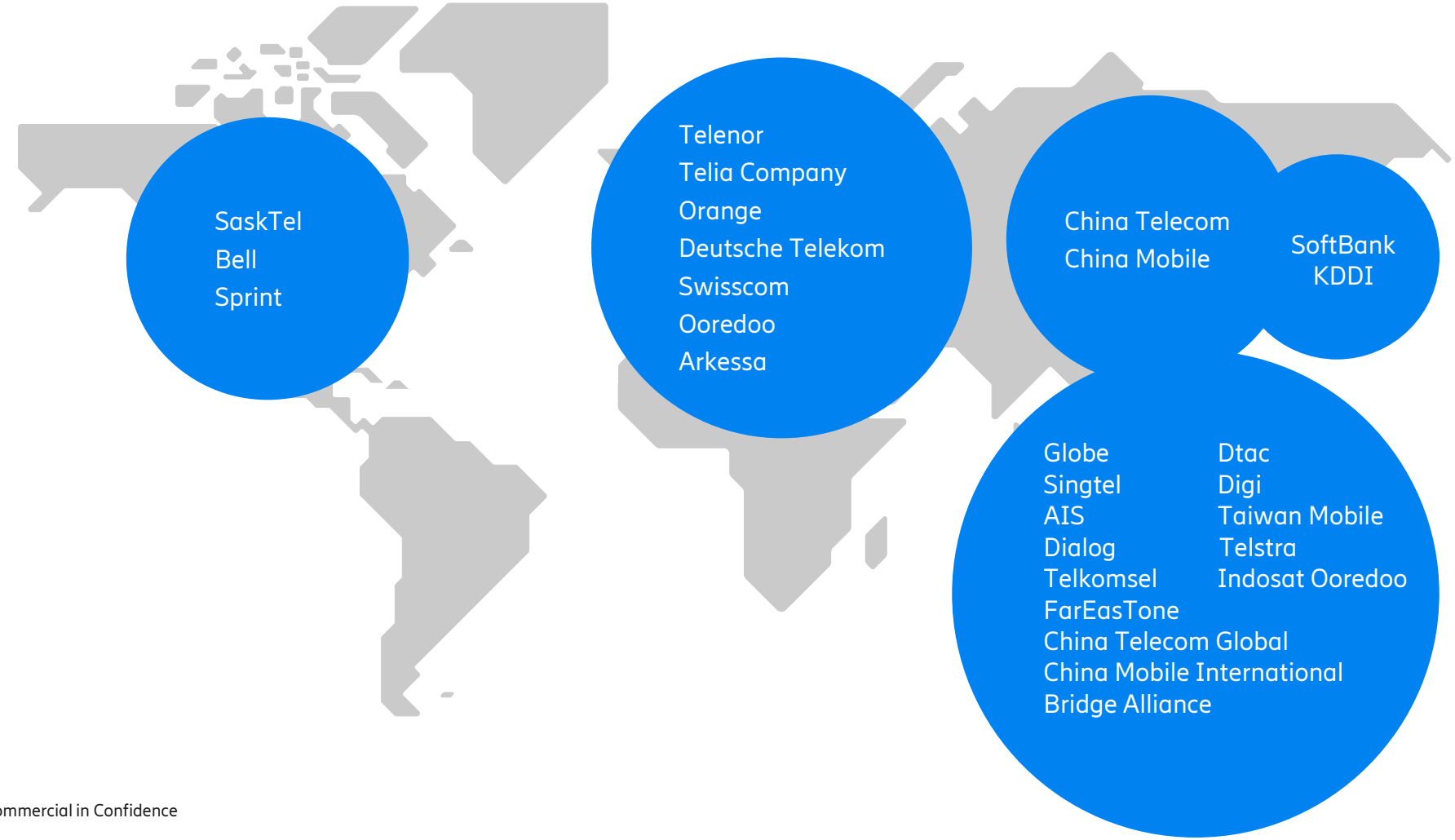
Ericsson IoT Accelerator
Service provider & enterprise references

3500
enterprises

100+
countries

40 %
annual growth of subscriptions

30 %
increase of onboarded enterprises yearly



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Working with ecosystem unlocks the value of 5G

API economy is creating a perfect storm

Join Ericsson to explore 5G business potential

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