Choosing the right connectivity solution is crucial for your IoT deployment

For IoT products, based on cellular connectivity (LTE, LTE-M, NB-IoT and 5G), are deployed it is important to choose the right connectivity partner especially when you deploy globally to avoid high bills and issues that stop your application from operating due to permanent roaming restriction (PRR) which are potentially impossible to fix remotely or only against very high cost locally.

P. de Leng - AVE BV

Schedule

- What is a SIM card?
- Which physical formats are available?
- Paying for your data?
- What are the benefits of selling connectivity with your IoT?
- Prepaid or subscription?
- MNO or MVNO?
- Connectivity Managent Platform?
- What are E-SIM, UICC and Multi-IMSI?
- Is price important?

What is a SIM?

Subscriber Identity Module

So literally an IC with which it is checked if you have a valid subscription that allows acces to a cellular network.

On the IC are:

Unique Number

IMSI (International Mobile Subscriber Identity)

Security, Authorisation and encyption

Temporary information about the network

Processor ?! → 32 bit risc core

Some Hardware features of typical SIM.

- Up to 250kB for MNO profiles and OEM data
- 32-bit ARM® CPU in 40 nm CMOS technology
- 20 kB RAM
- Crypto engine for PKI, RSA & ECC
- Crypto engine for 3DES, AES (up to 256-bit)
- True Random Generator
- SW & HW Countermeasures Timing Attack SPA/DPA/DFA
- Extended Temperature Range
- ESD protection >4KV
- Card and SMD form factors 2FF/3FF/4FF/SimFit/MFF2
- Interfaces: ISO
- IC EAL5+ certification
- ROHS & REACH compliance

eSIM

Mini SIM   Micro SIM   Nano SIM   MFF2
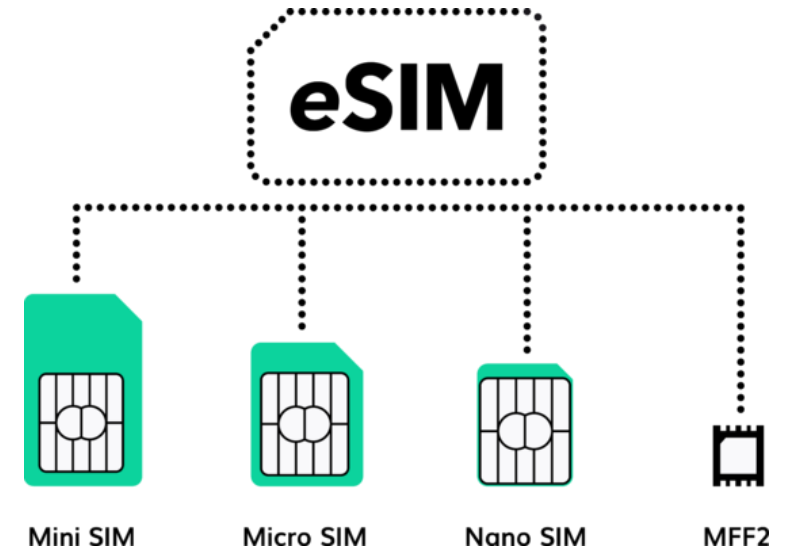
Some software features of typical (SIM 1)

- GSMA SGP.02 v4.0 compliance
- SIMalliance: eUICC Profile Package v2.2
- Emergency and Test Profile support
- GP certified test tool report
- GSMA EUM certificate
- Global Platform 2.2.1 (A/B/D/E) support
- Java CardTM 3.0.5 Classic
- javacard.security
- javacardx.crypto
- uicc.*, uicc.usim.*
- org.globalplaform
- uicc.usim.geolocation

Some software features of typical (SIM 2)

- NAA algorithms (with OTA switch):
- Milenage
- TUAK
- Value Added Applets
- eUICC AUTO Applet (eCALL/ERA-GLONASS)
- eUICC Notification Applet
- Local Management
- OS Maintenance
- OS Update (option)
- High Stress Memory
- Dedicated memory area for frequent updated files

Types of Connectivity Providers

Why choose for an MVNO?

Redundancy :

Use one of the available native MNO's to get always a connection.

Good MVNO:

Almost no steering. Connection based on strongest signal not the lowest cost for the MVNO. Network re-registration time stays low.

Strongest signal means less power consumption and more online presence for better user experience. Due to less reconnection and broken data transfers and retries lower data usage and cost.

Some MVNO's are also modem manufacturer enabling secure low level remote diagnostics beyond your application level.

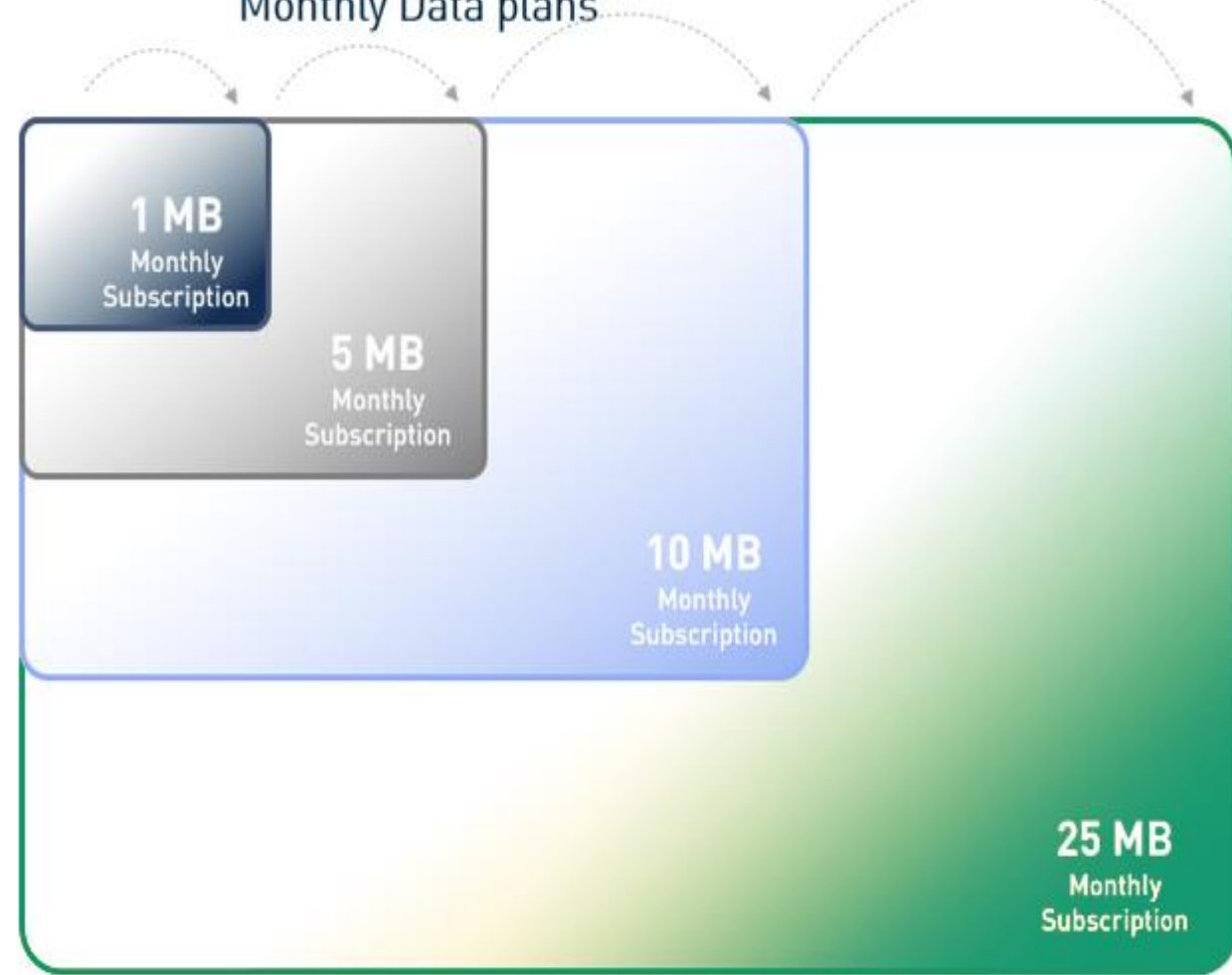Only one point of contact to negogiate pricing for european and global deployment

Optimized Billing System

Automated IoT data plan management solution

Assigning each individual **SIM** to the **most cost-effective plan**

Removes operational overhead
on rate plan management

Avoid **Bill Shock**

Future-Proofing Global IoT Connectivity

The Challenges of Global IoT Coverage

$ Cost Instability

⚠ Mission Critical Needs

Roaming Restrictions

Evolving Cellular Technologies

Anything, Anywhere.

Device Management
iSIM
Multi-IMSI
Localization (eUICC)
Embedded eSIM
IMSI Translation
Bring Your Own Connectivity
Secured E2E
Advanced CMP

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ELECTRONICS

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ELECTRONICS'23
&APPLICATIONS

CMP
Connectivity Management
Platform

Location
device location and history to ensure fleets stay on route or be notified when a vehicle is close by

Complete visibility
granular control from one intuitive dashboard

Data and diagnostics
real-time diagnostics, data and analytics to optimize your deployment

API Integration
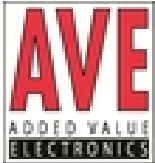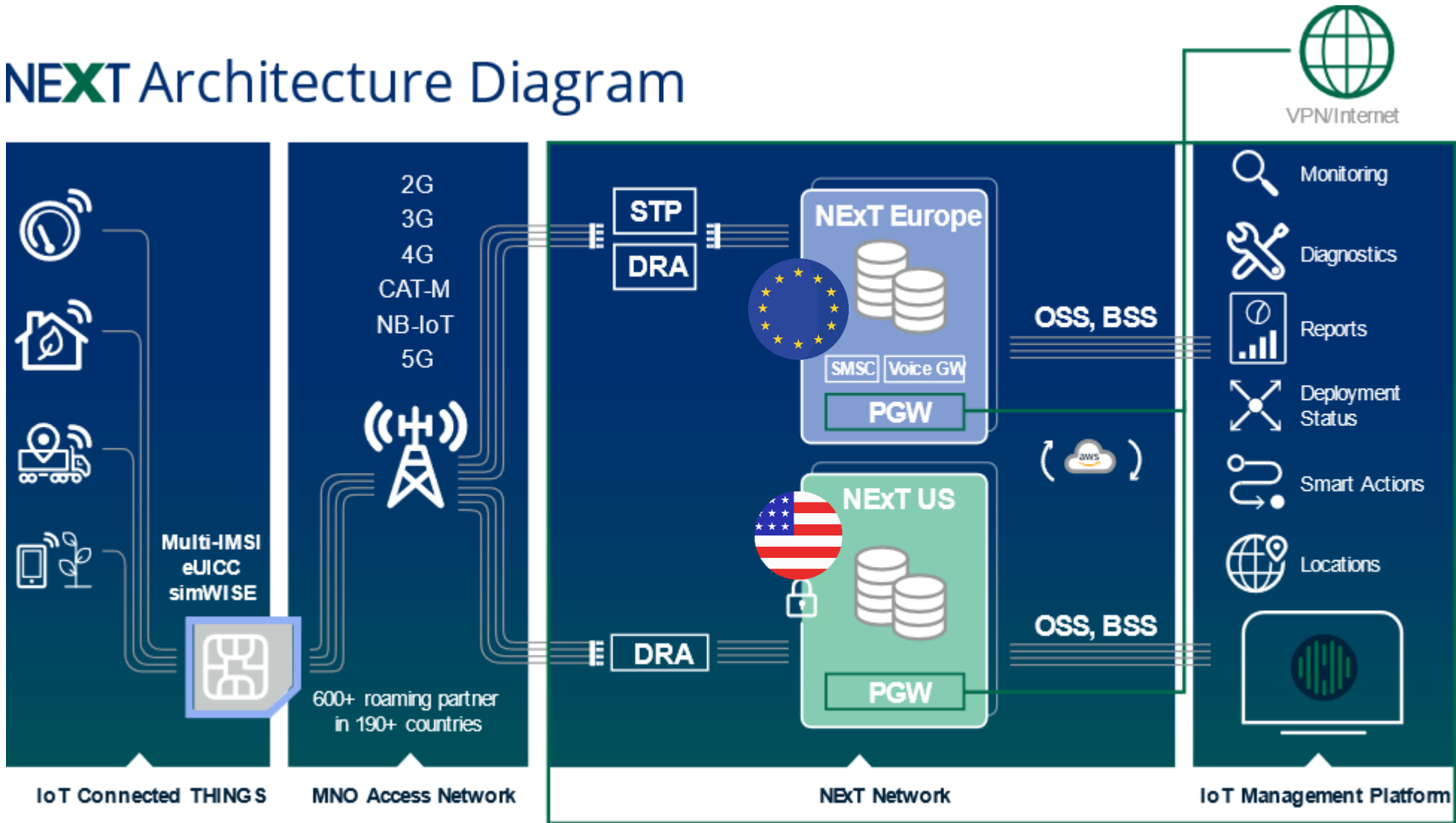use our robust API library to integrate into Telit's developer-friendly platform

Drive down costs
monitoring can save you money by stopping unwanted usage or alerting you to behaviors

NEXT Architecture Diagram

Typical IoT MVNO Connectivity Offerings

Mostly local MNO's	IoT MVNOs FORTE

Single IMSI Roaming

Limited Global Roaming Solution/Consumer

Limited Local Solution

Fixed IMSI predefined

Per coverage / price list

No ability to switch IMSI

Multi-IMSI Roaming

Global Roaming Solution

Multi IMSI capabilities

Switch between IMSI

Mission critical / avoid outage

eUICC / Localization

Global SIM with Local Profile where needed

Ability to do provider switch

Bring Your Own Connectivity

NEXTPlus

PRR - Permanent Roaming Restriction

AVE
ADDED VALUE
ELECTRONICS

E&A
ELECTRONICS '23
APPLICATIONS

Why eUICC?

If your sim is eUICC capable it is possible to upload over the air a new SIM Profile which could represent a local SIM to avoid permanent roaming restriction if not known before or simply reduce connectivity cost.

With Multi IMSI you can have the same result if all things are known before.

Please realize especially with global deployment the permanent roaming does not bring the Native MNO as much money as they would have from native customers so many MNO's do not allow permanent roaming at all and this landscape seems to get more and more dynamic.

This is a very complex situation and you should select a connectivity partner that is able to offer flexible optimized solutions for your situation. Imagine if you have soldered down chipsims and no external sim card alternatives.

Tier 1 Global IoT MVNO

All on a Single SIM

Coverage Unavailable   NExT   NExT w/PRR   NExT/NExTPlus
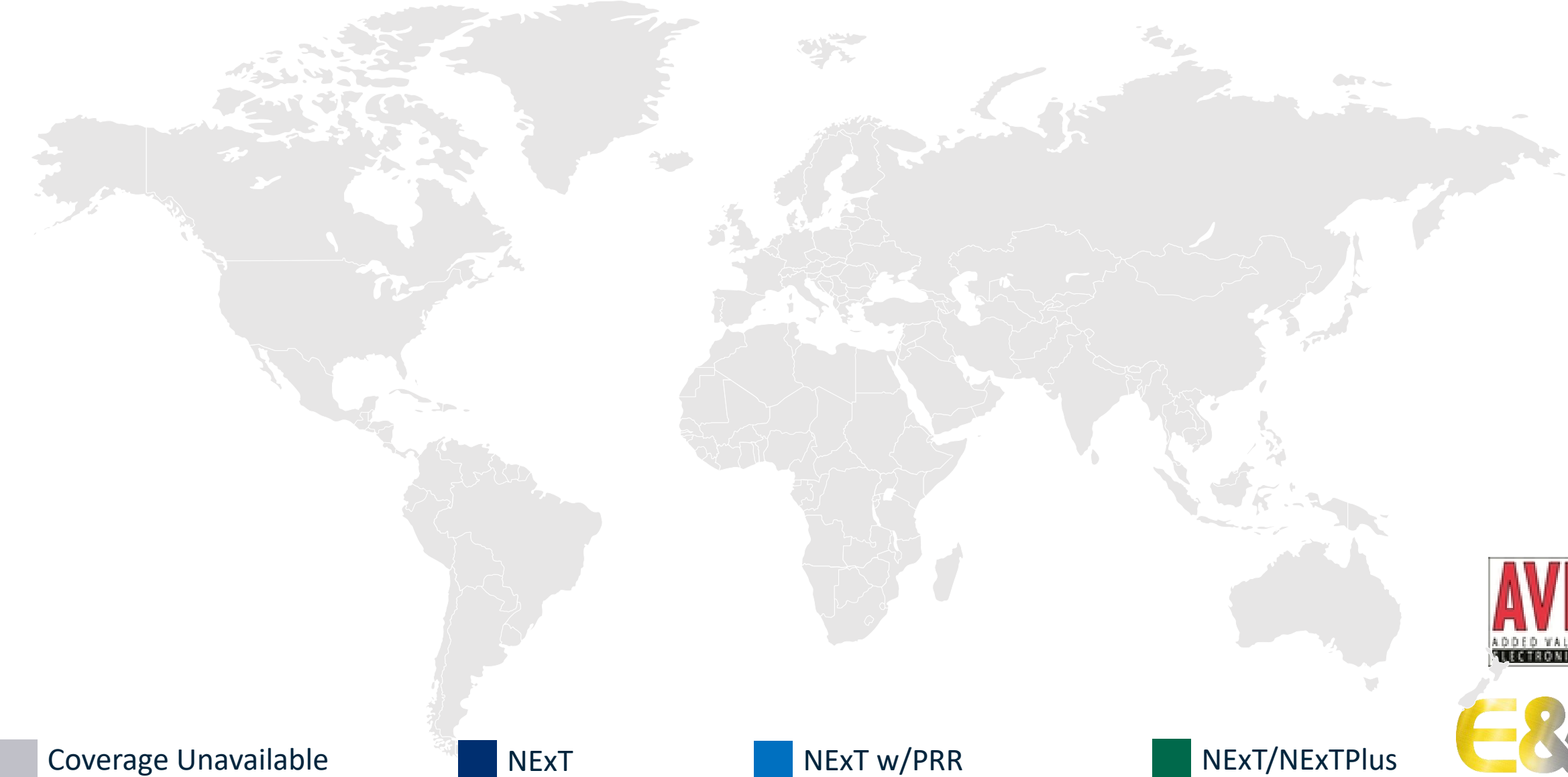
World Class Customer Service

First-in-class **support**

24/7/365 US & EU based time zone

Regional presence

trusted IoT experts

In-depth **support**

complete value chain

Comprehensive **CMP**

Superior monitoring and alerting tools

Simplified **billing**

**Optimus - optimized billing service**

Please visit booth 7D021 to see the demonstration of our CMP or send me an email peter@ave-nl.com

With the leverage of the biggest supplier in the western hemisphere Telit Cinterion now offers the biggest portfolio of IoT modules with reliable worldwide connectivity solutions enabling indepth remote diagnositics and unprecedented end to end security.

Beyond connectivity Telit Cinterion supports over the air firmware update of their own IoT module which it important for evolving networks and with OneEdge can offer you complete application and fast time to market with almost no programming and end to end security.
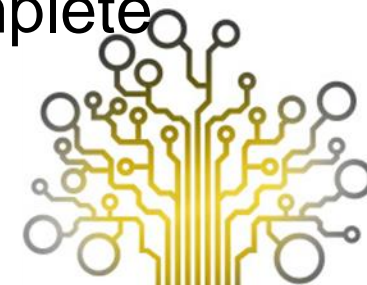
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