Smart electricity metering with LoRaWAN® - ready to scale in India

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The LoRa Alliance®

- Global open non-profit alliance launched in 2015
- Develops and maintains LoRaWAN® standards
  - Recognized by ITU as an international standard
- Educates the market about LoRaWAN technology, the latest advancements and deployments
- Develops and maintains the LoRa Alliance certification program

LoRa Alliance® members

LoRa Alliance® Ecosystem — present in ISUW exhibition (booth 4&5)

SEMTECH

enthutech

TATA COMMUNICATIONS

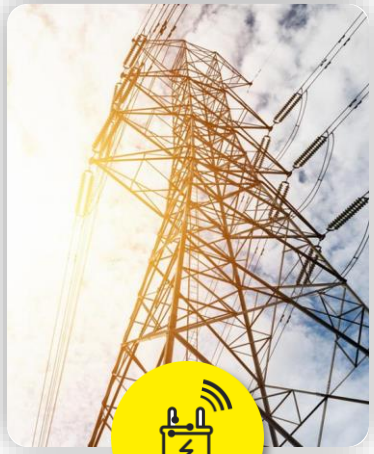
kerlink
communication is everything

ripple™

Actility

Chipsets | Modules | Devices | Gateways | Servers | Network Operators | Cloud Platforms/ Data Management | Solutions | System Integrators

LoRaWAN® is Deployed in Many IoT Vertical Markets

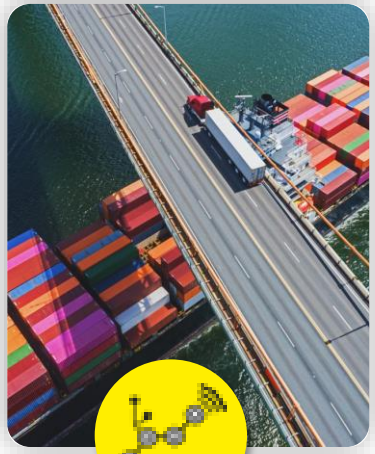


WATER & ENERGIES

Water Metering
Electricity Metering
Gas Metering
Solar Energy
Heating
Grids
Sustainable Resources

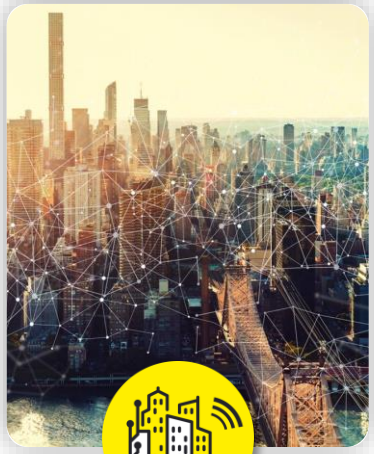
BUILDING AUTOMATION

Space Optimization
Energy Optimization
Automated Cleaning
Safety
Environmental Monitoring



SUPPLY CHAIN

Asset Tracking
Fleet Management
Cold Chain Monitoring
Supply Chain Monitoring
Intralogistics
Precision Location ID



CITIES

Lighting
Waste Management
Parking
Water Management
Traffic Management

AGRICULTURE

Precision Irrigation
Soil Monitoring
Asset Tracking
Animal Husbandry
Environment Monitoring

INDUSTRIAL IOT

Oil & Gas
Mining
Smart & Safe Factories
Production & Manufacturing
Predictive Maintenance
Valve Monitoring

LoRaWAN® key benefits for smart metering

Open network communication technology

- Appropriate for low power consumption devices => long battery life
- Long range communications
- Automated mechanism to adapt the data rates/TX power to the best radio conditions

Embedded two-layer security based on AES 128 bit encryption

Three possible communication classes allowing trade-off between communications latency and power consumption

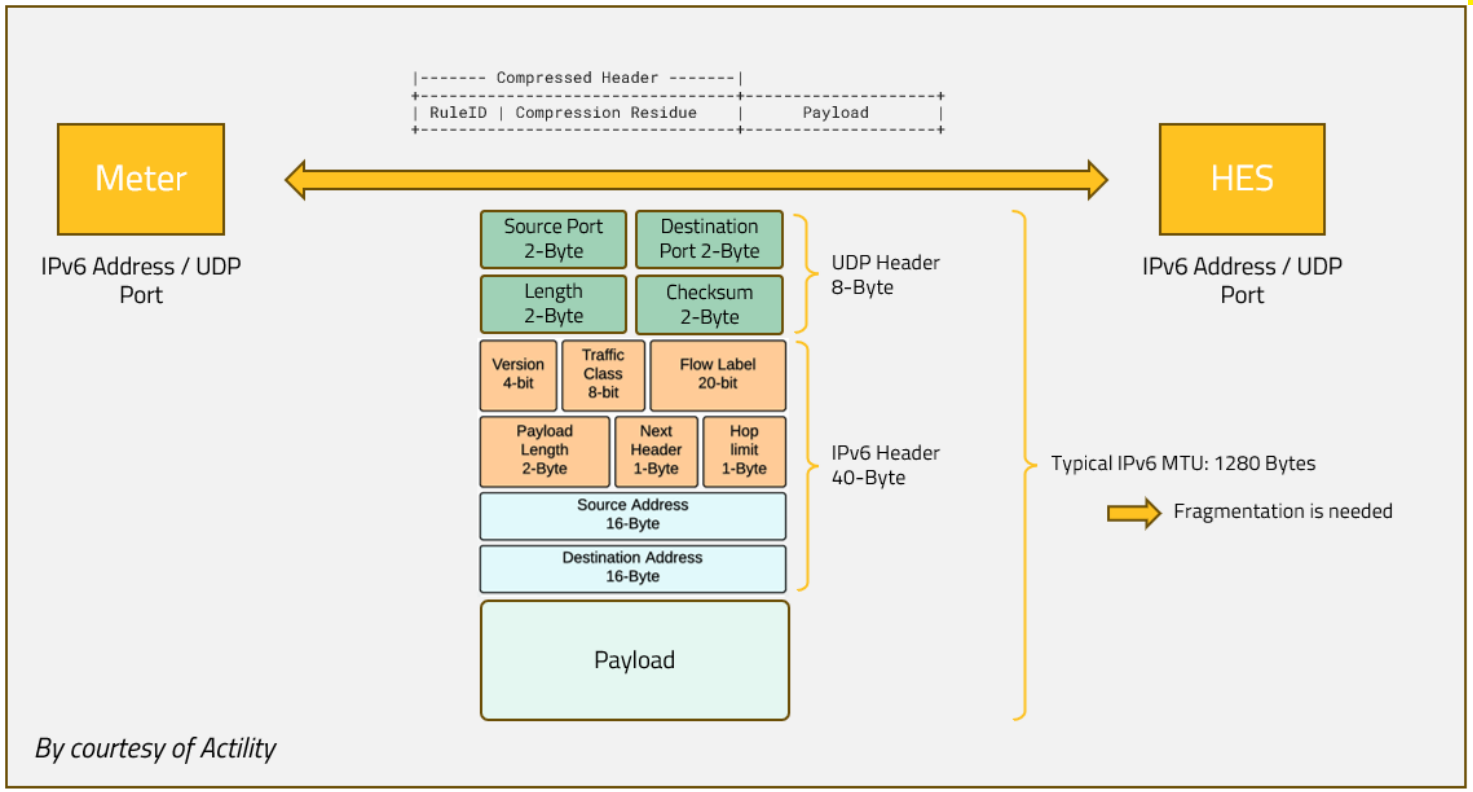
Large flexibility in the network model between public, private or hybrid networks

Interoperability of devices ensured by unique certification defined by the LoRa Alliance®

Large availability of different and certified LoRaWAN® devices

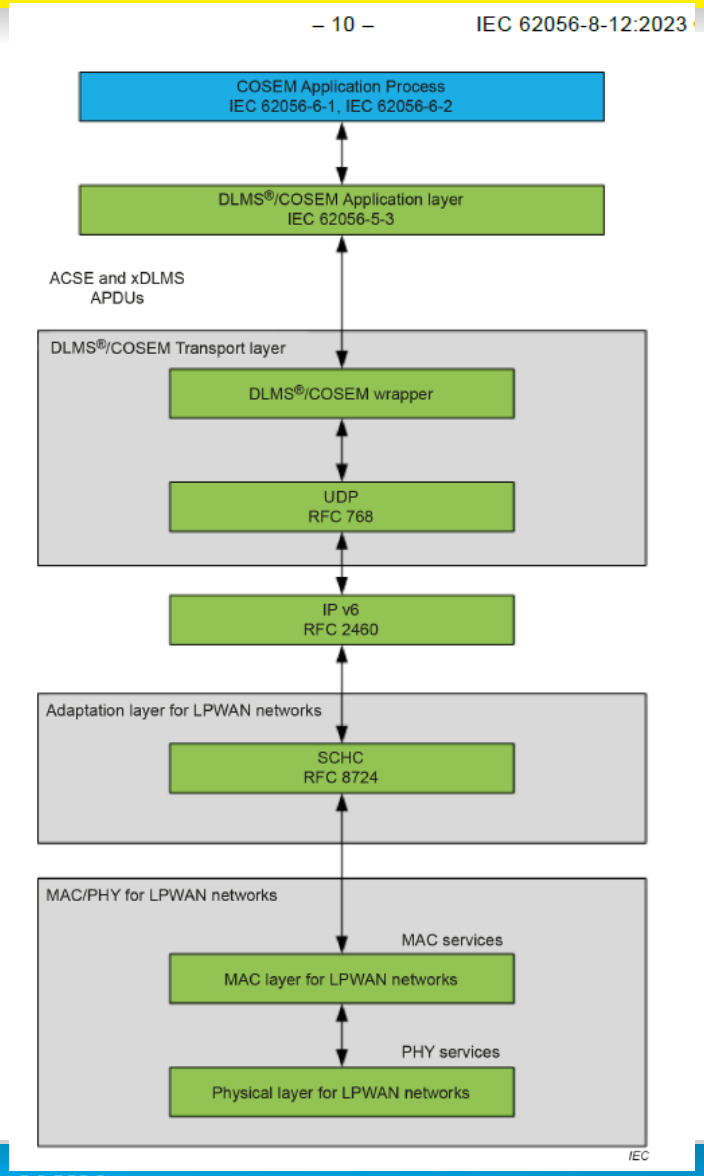
Challenges of DLMS over LPWAN

Large IPv6 headers
Heavy payload vs MTU



Use standard SCHC for compression of IPv6/UDP headers (90%)
and dynamic fragmentation for handling large payload over LoRaWAN constrained MTU
and with error acknowledgment to ensure reliable and bi-directional communication
Use DLMS in push mode and with pre-association to reduce traffic by 7 times

Standard stack for DLMS over LoRaWAN®

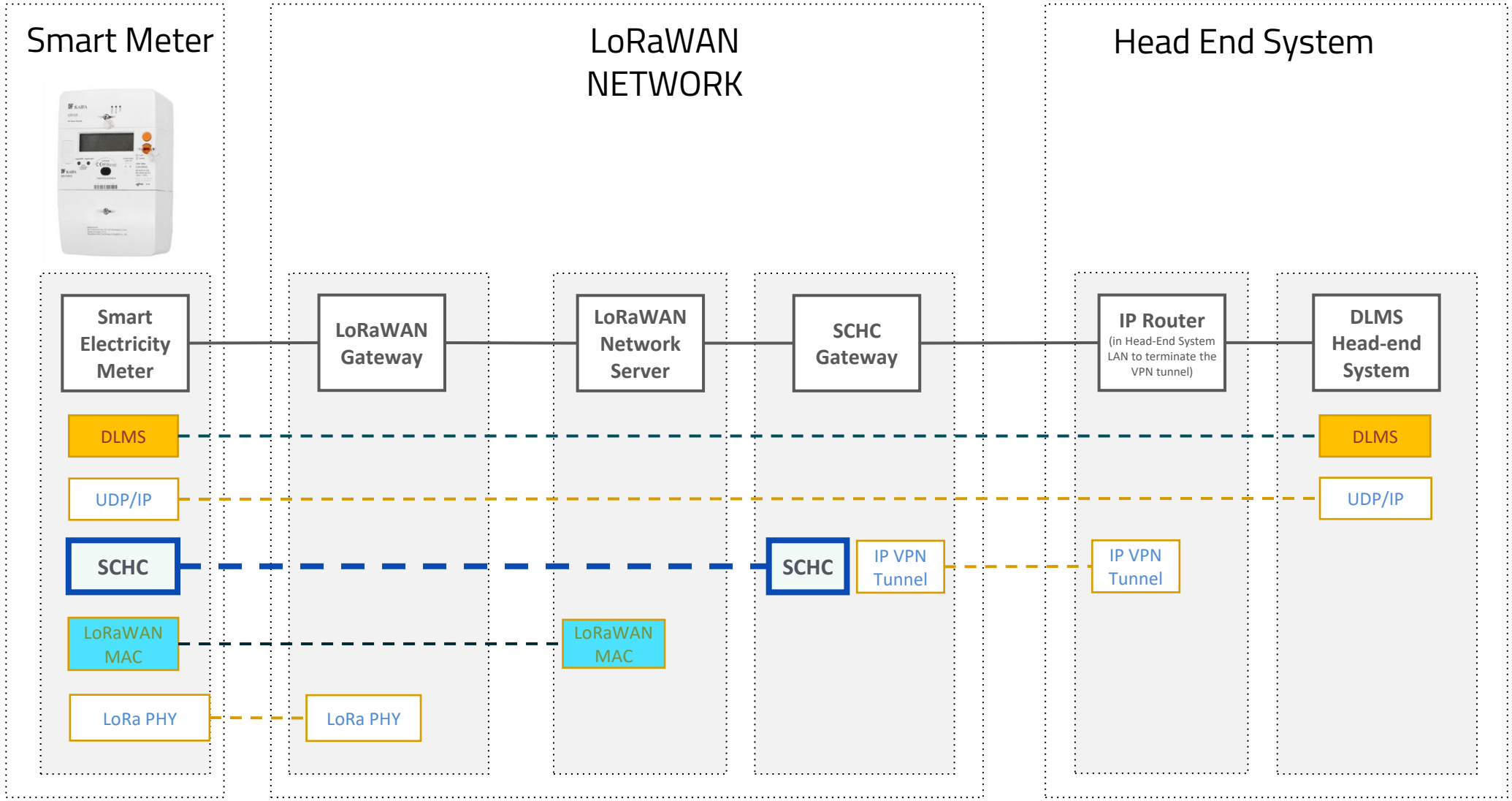


DLMS Profile for LoRaWAN is specified by the DLMS User Association and standardized by IEC
(IEC 62056:8:12)

SCHC, for Static Context Header Compression, is an open internet standard for compression and fragmentation specified by the IETF
(RFC 9011 and 8724)

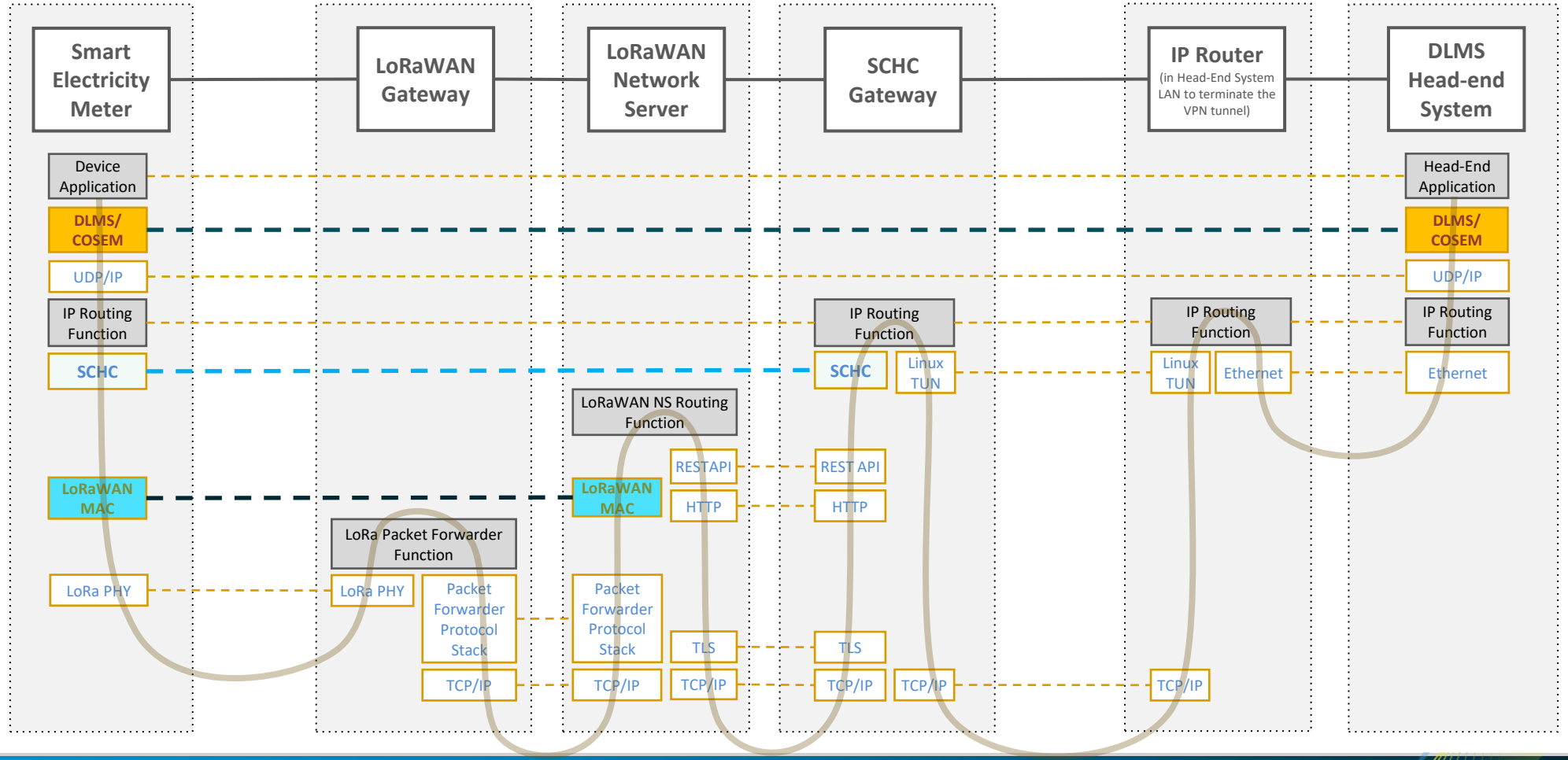
LoRaWAN is a network protocol standard maintained by LoRa Alliance and recognized by ITU-T

DLMS over LoRaWAN®



Data flow of DLMS over LoRaWAN®

Live demo on LoRa Alliance booth (4&5)



SMART GAS METERING WITH DLMS IN ITALY

- DLMS is required in Italy by regulation of CIG
- Facing obligation to connect all meters and coverage issues with NB-IoT in Italy, for its new generation of smart gas meters Nimbus, **Italgas** looked for dual connectivity to ensure all meters can be connected.
- Itagas has chosen LoRaWAN because of the open standard and support of DLMS profile, and because of LoRaWAN Relay availability.
- After successful pilot of 30K with SCHC solution of **ACTILITY**, Italgas will start in H2 2025 a massive rollout of 8 million new smart gas meters in Italy.

https://www.youtube.com/watch?v=oXSXxtxzR9I

Utility benefits from a smart metering solution featuring DLMS over LoRaWAN and ready for scaling

Certification of smart electricity meter for DLMS over LoRaWAN®

STEP 1:
LoRaWAN certification with IPv6 Adaptation layer using SCHC

STEP 2:
DLMS certification using a LoRaWAN testbed with SCHC

Reference links

DLMS profile for LoRaWAN is IEC standard (**IEC 62056-8-12)** Electricity metering data exchange – The DLMS®/COSEM suite – Part 8-12: Communication profile for Low-Power Wide Area Networks (LPWANs) and in particular LoRaWAN
https://webstore.iec.ch/en/publication/71751

Technical webinar explaining how SCHC works and how it can compress & fragment IPv6 and UDP protocols:
https://resources.lora-alliance.org/youtube-all-videos-2/augmenting-lorawan-devices-with-internet-protocol-support

Technical specifications from the LoRa Alliance:

- TS010 LoRaWAN® IPv6 Adaptation layer specifications:
  https://resources.lora-alliance.org/document/ts010-1-0-0-ipv6-adaptation-layer
- TR006 LoRaWAN® DLMS® End-device Monitoring Guidelines:
  https://lora-alliance.org/resource_hub/tr006-lorawan-dlms-end-device-monitoring-guidelines/
- TR011 requirements for the testbed used for DLMS certification:
  https://resources.lora-alliance.org/document/tr011-1-0-0-architecture-and-requirements-of-lorawan-testbed-with-ipv6-adaptation-for-dlms-ua

About SCHC:

- FAQ https://resources.lora-alliance.org/faq/ipv6-lorawan-adaptation-layer-faq
- Laboratory for SCHC of IMT Atlantique University maintains open software for end device: https://lab-schc.fr/

Questions

Learn more at: lora-alliance.org

Simple. Affordable. Transformative.

LoRaWAN®

LoRa Alliance®