

“Lab & Field alliance” for technology optimisation

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G3-PLC Alliance General assembly

Agenda

- G3-PLC field experience and installations (Landis + Gyr)
 - Landis+Gyr portfolio
 - Overview of G3 PLC installations
 - Benefits from field experience
 - Going further: adding hybrid
- G3 evolution (Renesas)
 - Technology Optimization Environment
 - CSMA, Trickle & Clusterhead optimizations
 - Evolution => Hybrid solution

125 Years of Excellence



Global Reach & Local Presence
Swiss HQ with Locations
in over 30 countries
worldwide



Frost & Sullivan
**Global AMI Company
of the Year 2019** –
for 5th consecutive year



Worldwide largest
IoT Utility Network
1.3 billion reads per day
with 99.99% accuracy



Smart Infrastructure
Partnership with
Google



Largest installed base
300+ million
devices globally



Over 125 million
Connected intelligent
devices deployed



More than **15 million**
meter points under
managed services



of services to
3,500+ customers
as a trusted partner

Over 8 million tons of CO₂ saved by Landis+Gyr devices each year

Communication technologies generate work and cost for utilities

CHALLENGES UTILITIES FACE



To understand, select and specify



To tender, evaluate, and select



To implement and test



To operate and maintain

Communication is a necessary constraint to manage smart infrastructures

Communication technology serves our customers use cases and TCO expectations



Landis+Gyr G3 PLC Smart Grid product portfolio



Linky



Smart meters for residential and commercial applications



Concentrators for Ethernet, Cellular and Fibre



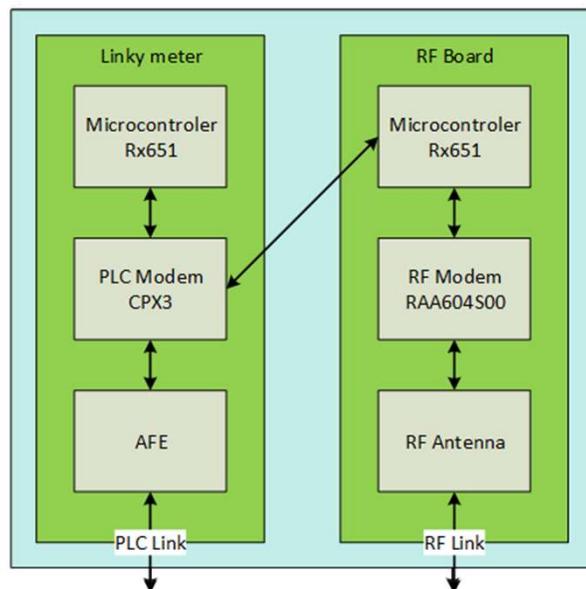
Smart meters and customer displays for Pre Payment



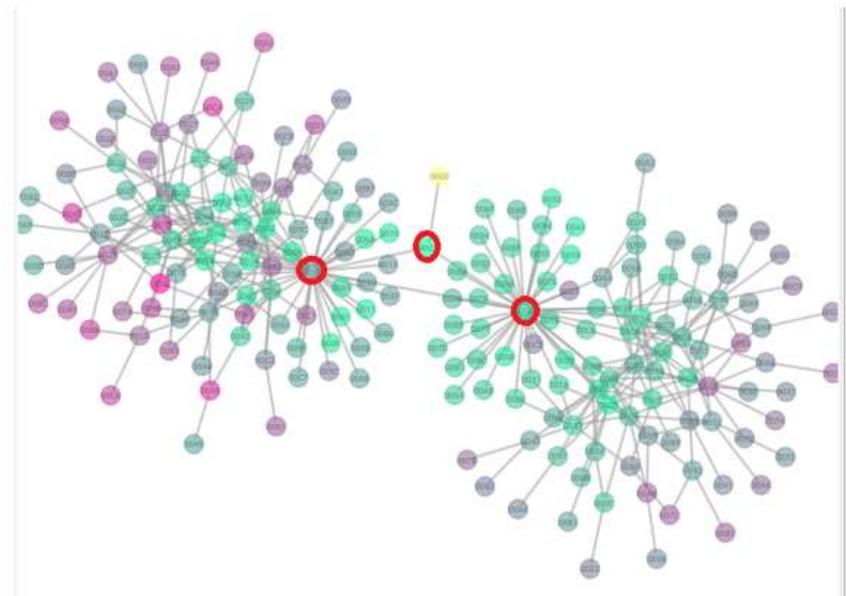
Load switching for flexibility management applications

Going further: Adding Hybrid RF

- Proof of concept for G3-PLC / Hybrid
 - Linky meter is used as a basis
 - An external board is added to handle RF part(Note: Next generations will be fully integrated)



- Operation of hybrid meter tested in the lab
 - Several test walls with no physical connection
 - One unique hybrid meter installed on different test walls
 - Data traffic goes through RF: all meters can be reached



G3-PLC EVOLUTION

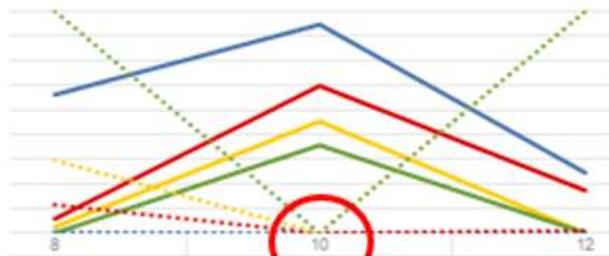


PARAMETER OPTIMISATIONS AND ENHANCEMENTS

CSMA

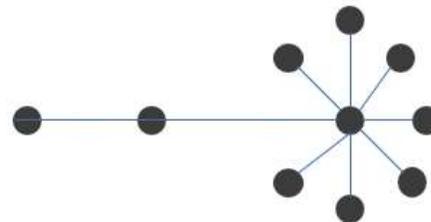
- Dense networks “fail” with default parameters
- Flooding in alarm conditions
- By altering the channel access fairness both problems are resolved.

Unicast Full Routing Table



Clusterhead

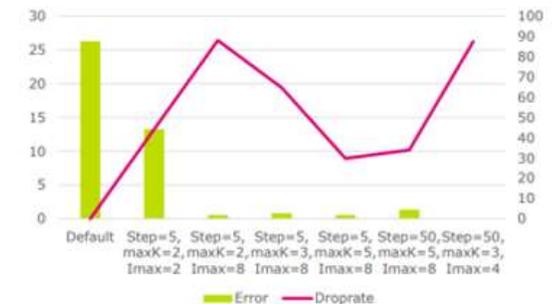
- In Dense not all nodes need to be routers
- One node serves as repeater for his neighbourhood
- Automatic rules for each node to become or stay a clusterhead apply..



Trickle

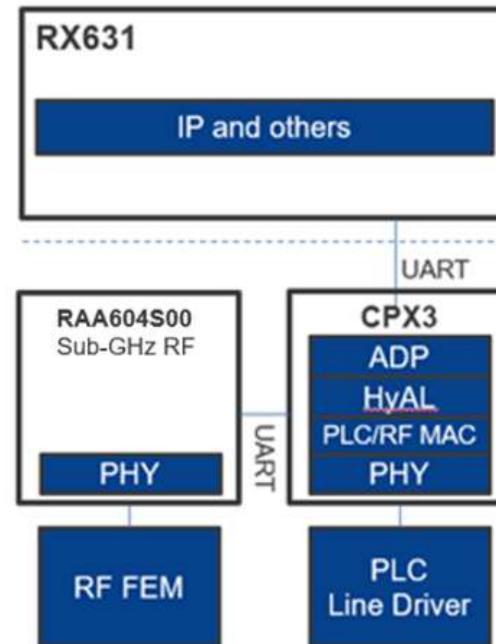
- Broadcast → all nodes retransmit → flooding → collisions
- With trickle nodes repeat messages only a specified count of times within a given timeframe

Test results from a ~330 node test network:



RENESAS HYBRID SOLUTION – PLC + RF

- A single design for all PLC standards, all PLC frequency bands, and all RF frequency bands
- Architecture supports multiple hybrid specification.
- All building blocks available and in MP
- G3-PLC Hybrid software is implemented and CERTIFIED
- Evaluation and development tool (Y-G-HYBRID-PLC –RF)
 - Features multiple mode support
 - PLC only
 - Wi-SUN only (RX651 + Tsurugi)
 - Hybrid
- Integrated into existing test environment for hybrid optimization



[Renesas.com](https://www.renesas.com)