The PRIME1.4 hybrid solution (PLC+RF)

Sponsored by

PRIME Strategy

Services

- Home Services to empower Customers
- GRID Services: Monitoring & Automation of the Grid, reduction of SAIDI, SAIFI, integration of large plants of renewables
- AMI Services: Quantity of services, billing accuracy, reduction of non technical losses, integration of renewables in LV Grid
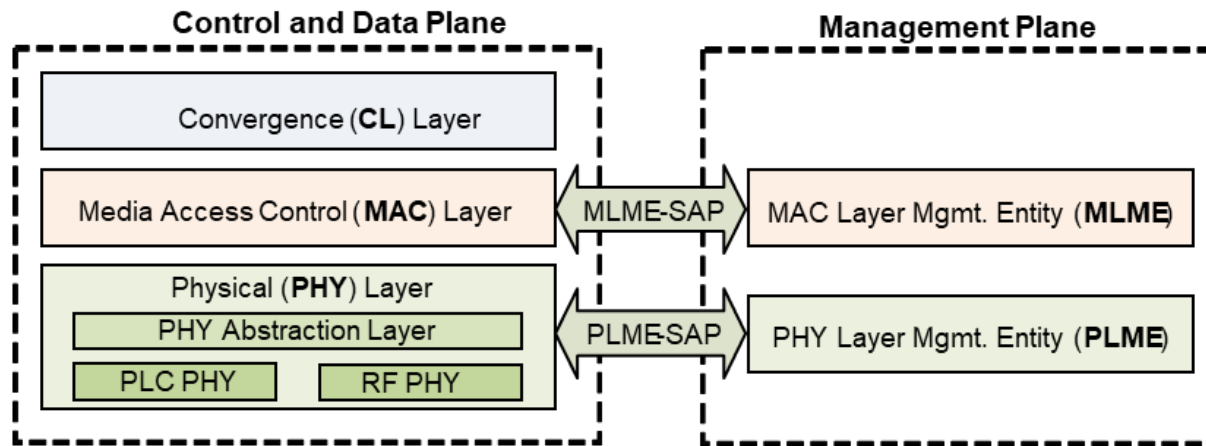
Connectivity

PRIME 1.3 and 1.4 to the Meter, Grid & Home using PLC & Complementary Technologies

PRIME PLC & RF solutions to efficiently enable urban, suburban & rural areas

BPL for future growth of traffic use cases for integration of renewables, grid control & home connectivity

Base Technology

PRIME defined use cases, architecture, application layers, SILICON, certification process and products
(based on the experience with PRIME v1.3 and v1.4)

General description of the architecture

- PRIME network is a **beacon enabled**, with **proactive routing** and topology **tree structure**
- **BN select the best PLC or RF medium** to communicate to SN **in every point-to-point connection**
- MAC layer of PRIME uses selected PLC or RF medium in every point-to-point connection.
- MAC layer uses slotted version of the CSMA-CA defined on IEEE Std 802.15.4-2015 on the SCP
- The PHY Abstraction Layer will provide to MAC Layer all PHY Data plane primitives
- **SUN FSK PHY will be mandatory** and 863–870 MHz frequency band SHALL be supported.
- Frequency Hopping Spread Spectrum is supported according IEEE Std 802.15. 4v-2017 (USA & Brasil)
- All PRIME device comprises at **least one PHY, (PLC or RF)**.
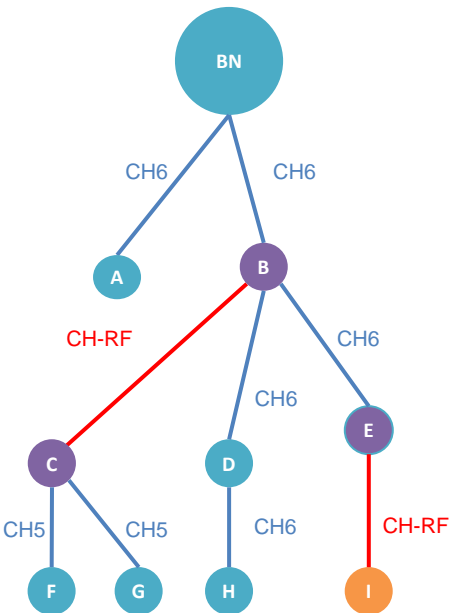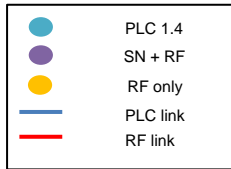
- **Evolution PRIME 1.4 Multi PHY is**
  - **Compatible with all PRIME 1.4 legacy devices**
  - RF PHY based on proved SUN FSK PHY defined on IEEE Std 802.15.4-2015
  - On RF PHY, frequency band defined on IEEE Std 802.15. 4v-2017 will be used.
  - Including independent certification process to assure interoperability
  - BN select the best PLC or RF medium to communicate to SN in every point-to-point connection
- **Evolution now is oriented to efficiently;**
  - **Connecting PLC islands using the RF channel without all nodes having to be PLC+RF.**
  - Use of the various PLC channels available according regional regulation.
  - The use of the RF channel is a particular case of the efficient use of the various PLC channels.
  - Use of the best PLC or RF channel in each point-to-point connection.
- **Evolution in medium term will be oriented to efficiently;**
  - Provides a solution for connectivity of battery powered devices as gas meters, water meters and in-home displays.

Conclusion

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  - **Compatible with all PRIME 1.4 legacy devices**
  - RF PHY based on proved SUN FSK PHY defined on IEEE Std 802.15.4-2015
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  - BN select the best PLC or RF medium to communicate to SN in every point-to-point connection
- **Time to market is critical;**
  - **PRIME 1.4 Multi PHY specification draft document is available from (20Q1).**
  - PRIME 1.4 Multi PHY commercial solution is available from 20Q4 (Microchip on Dec 2020).
  - PRIME 1.4 Multi PHY certification draft document is available from (21Q3).
  - PRIME 1.4 Multi PHY certification tool and independent certification process will be available on 22Q4.
  - PRIME 1.4 Multi PHY field deployments will begin in 2023