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manage energy better

Landis+Gyr supports open standards

- Currently L+G is involved in a number of protocol and standards groups, not limited to:
  - ZigBee
  - ANSI
  - IEEE
  - OPEN SmartGrid, AMI-SEC
- L+G is member of IPSO, HomePlug, and joint Zigbee/HomePlug efforts.
- L+G is ***not*** opposed to IP
  - L+G wants to ensure standards and protocols truly achieve complete openness and interoperability

Interoperability is key

- Interoperability is key for Smart Grid, multiple applications will depend upon Smart Grid being interoperable.
- **But, standards and interoperability are not the same thing**
  - We can have standards and no interoperability, if we are not careful.
- IP is a good standard for networking and transport and usually bridges networks with multiple physical and MAC layers
- IP on layers 3 and 4 only, is neither the necessary nor sufficient level of interoperability that is required by Smart Grid Applications
  - Multiple meters, HAN devices and DA equipment from different vendors
  - Interoperability should allow a utility to seamlessly communicate data on voltage from or IHD devices and meters to transformers to capacitor banks.
  - This is not possible with **only** layer 3 and 4 standards.
- **Simply adopting "IP" will not enable interoperability. We will need standards throughout the stack.**

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Addressing the Gaps

- IP for Smart Grid must include standard mesh protocol to the networking protocols for wireless communications.
- In addition to IP, the SG must standardize a PHY and a MAC layer for fully interoperable devices.
- IEEE and IETF already have efforts going on to address this and L+G is actively involved.
  - 802.15.4.g effort by IEEE, for MAC and PHY.
  - ROLL effort by IETF for mesh routing.

L+G Position

- **Problem**: We will need standards throughout the stack.
  - IP needs to be complemented with a *standard mesh protocol* underneath the transport and networking protocols and also adopt a standard for the PHY and the MAC layer for Smart Grid devices.
  - IEEE and IETF already have efforts going on to address this. 802.15.4.g effort by IEEE and ROLL effort by IETF.
- **Solution**: Identify these two issues as gaps for Smart Grid adoption of IP and let the IEEE and the IETF complete their gap filling work already started .
  - Resolution of these gaps lays the foundation for application standards to be developed.

L+G Position (continued)

- **In the meantime**: L+G alone, has 27 Million meters deployed or deploying that deliver Smart Grid functionality today.
  - Stalling the market is bad for the environment and economy and our industry.
  - Putting Utilities and Vendors currently deployed/deploying in limbo is untenable

- **Solution:** All these solutions can provide above scenarios via the use of gateways/interfaces
- Most vendors use IP gateways to use internet or private IP networks for data backhaul.
  - Landis+Gyr has over 1M Smart Meters interoperating at the higher layers of the protocol stack with and over 200,000 smart distribution automation devices IP using IP gateways.

In conclusion…

- All gaps noted above can resolved via the use of gateways/interfaces.
- Networking of Systems and Sub-Systems is 1st Step
  - It is the ability to flow the application data that we want
- Smart Grid will continue to get smarter.
- We should close gaps in standards adoption by supporting the work on ROLL and 802.15.4g.
- Solutions should allow for IP gateways to interoperate with any IP network to continue Smart Grid momentum

Thank you

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