From Catalog of Standards to Interoperable Deployments

A Field Area Network Perspective

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The NIST/SGIP Standards Pool

- NIST SP 1108 (Framework for SG Interoperability) identifies 75 specification candidates.
- SGIP (CSWG, SGAC, etc) has so far recommended 41 standards for CoS
- CoS will continue to grow.
- This just North America.
- Plenty of guidance is available from GWAC, SGAC etc re: conceptual workings of a Smart Grid architecture.
- How does all this come together re: production of an actual, interoperable, deployable, secure Field Area Network?

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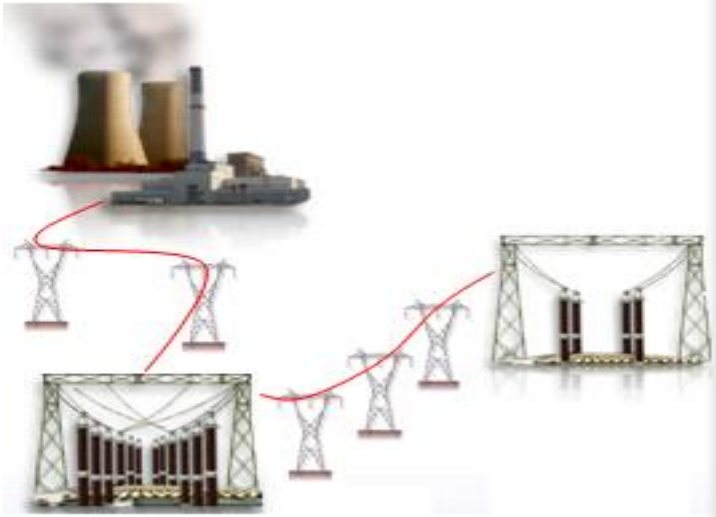
Multi Service FAN (GridBlocks™ Reference Model)



Transmission and Distribution Substations

Substation Automation

Distribution Automation:

- Volt/Var control
- Fault Isolation/Restoration
- Transformer Monitoring
- Etc

Distributed Generation

PEV Charging Station

BANs and HANs:

- Metering
- Outage Management
- Demand Response
- Pricing
- Etc

Field / Neighborhood Area Network (FAN / NAN) Use Cases

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Field Area Network Use Cases

- Obvious first step is to define the operational requirements of the FAN
- Cisco Field Area Network Solution and its use cases.
- Technology choices are made to fulfill those requirements.
- Applicable standards are selected as appropriate.
- We have many utility use case references…
  - SCE
  - Intelligrid
  - OpenSG's SG-Network Effort.
  - Utility RFPs

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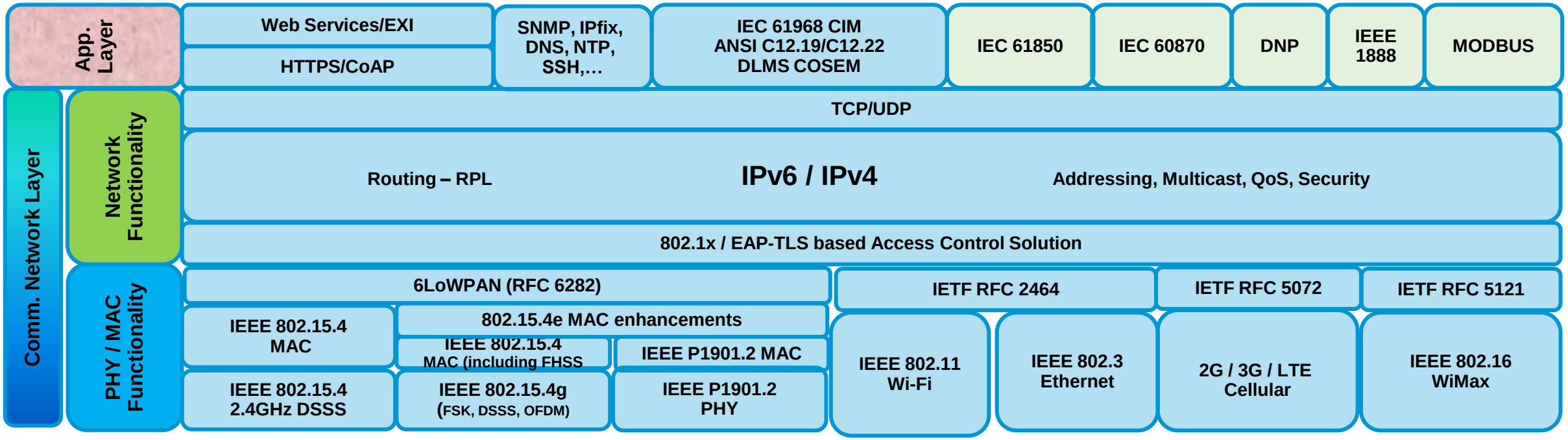
Cisco Open Standards Reference Model for FAN



- Use cases drive requirements. Requirements + recommended Standards = Implementation.
- Standardization at all levels to ensure interoperability and reduce technology risk for utilities
- IP enables common application layer services over various wired and wireless communication technologies

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Interoperability “Are We There Yet?”

- No … still not specific enough to construct a working system.
- The specifications typically contain many optional behaviors (sausage making)
- Three pieces are missing…
  1. A technical “Profile”
     - Which collection of specifications is used.
     - How each of the technologies is used.
     - How each of the technologies is configured.
  2. A test plan and certification program defining how we test for compliance to the profile
  3. A “Plugfest” program to insure multiple vendors implementations do in fact interop

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Enter the Alliances

- Pick up where the standards process leaves off.
- Formed to develop specific profiles, test plans, and certification/interoperability programs.
- Often provide a logo program for compliant devices.
- Many examples.
  - WiFi Alliance(802.11)
  - WiMAX Forum (802.16)
  - CableLabs (DOCSIS etc)
  - CSEP / Zigbee Alliance / Homeplug / WiFi (SEP 2.0)
  - OpenADR
  - Etc.
- Who will perform the Alliance function for Smart Grid Field Area Network?

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For the FAN:

Wi-SUN

Wi-SUN Alliance Expands Global Participation; Adds Several New Members

Cisco Systems, Huawei, Tokyo Gas, and Toshiba Toko Meters Join Alliance.

PR Newswire

TOKYO and SAN JOSE, Calif., Nov. 27, 2012 /PRNewswire/ -- The Wi-SUN Alliance, a global organization leading standards compliance and interoperability testing of Smart Utility Networks, announced today continued rapid growth of its membership with many additional companies and institutions recently joining the Alliance. These new members strongly enhance the Alliance's existing coalition of leading silicon vendors, networking companies and utility equipment providers cooperating to ensure robust, interoperable products for Smart Grid and related utility needs.

From the network industry, key new additions include Cisco Systems joining at the Promoter membership level and Huawei joining at the Contributor level. As a Promoter member, Cisco Systems has additionally been accepted to the Wi-SUN Board of Directors, joining existing directors from Analog Devices, Fuji Electric, Murata Manufacturing, Japan's National Institute of Information and Communications Technology (NICT), Omron Corp., Osaki Electric, Renesas Electronics and Silver Spring Networks.

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For the FAN: HomePlug Netricity

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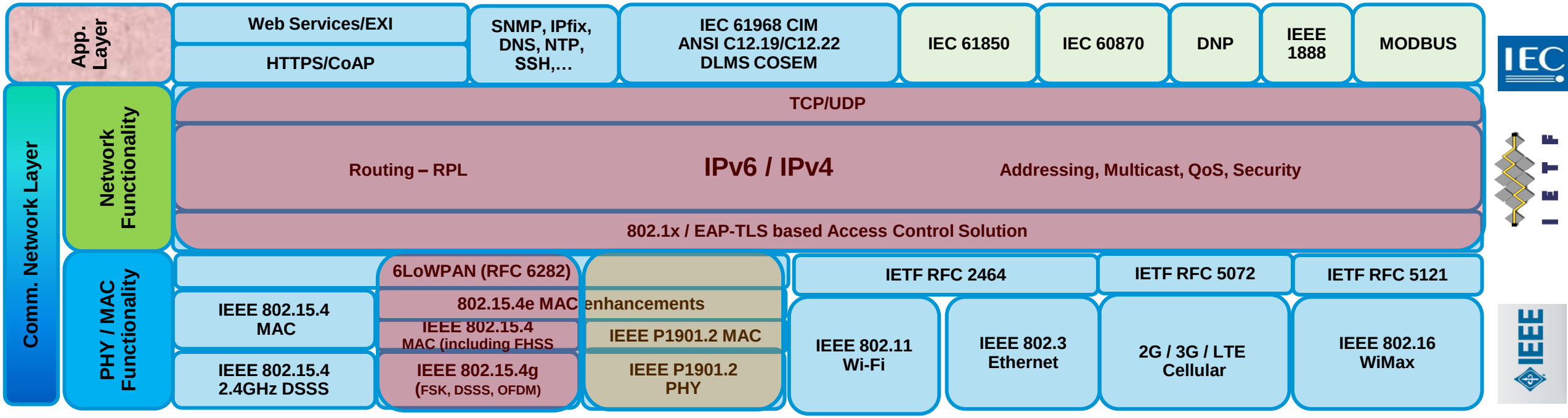
Cisco's FAN Alliance Strategy



- Wi-SUN Smart Utility Network for wireless mesh
- Homeplug Netricity for PLC

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Closing Remarks

- Cisco aims to drive interoperability for Field Area Networks.
- End goal is for interoperable, secured, scalable, multi service FAN.
- Supporting wireless mesh and PLC based Field Area Networks.
- IP based: easy ability to incorporate other PHY/MAC.
- Wi-SUN and Homeplug Netricity are our choice of venue.
- We encourage the Smart Grid community to rally around these programs!

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Thank you.