SIP Inside of Smart Grid Networks

Managing a Smart Grid with Operational Efficiency

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Rationale for IP-based Smart Grid Networks

❖ IP-based networks will serve as a key element for Smart Grid information networks

❖ Benefits of using IP-based networks include:

- ➢ maturity of a large number of IP standards

- ➢ availability of tools and applications that can be applied to Smart Grid environments

- ➢ widespread use of IP technologies in both private and public networks

- ➢ allow applications to be developed independent of the communication infrastructure and technologies used

- ➢ enable bandwidth sharing among applications and increased reliability with dynamic routing capabilities

What IP Protocols to use inside of the Smart Grid?

- ❖ NIST asked IETF for a document that identifies:
  - ➢ the structure of the Internet Protocol suite
  - ➢ the key protocols that should be considered as critical in integrating Smart Grid devices into an IP-based infrastructure.
- ❖ IETF responded with the following informational Internet-Draft
  - ➢ http://tools.ietf.org/html/draft-baker-ietf-core
- ❖ In it Session Initiation Protocol (SIP) is identified as the protocol for multi-media session management in the Internet

What is SIP?

- ❖ SIP is an application layer control (signaling) protocol for creating, modifying and terminating multi-media sessions on the Internet

- ❖ Multi-media sessions can be voice, video, instant messaging, shared data and subscriptions of events

- ❖ SIP is independent of the transport layer and independent of the underlying IPv4/v6 version

- ❖ Defined in RFC 3261, RFC 3265, RFC 3853, RFC 4320, RFC 4916, RFC 5393, RFC 5621

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Why use SIP in the Smart Grid?

❖ Mature protocol, yet easily extensible

❖ Proven to be secure, inter-operable, reliable and scalable

❖ Independent of underlying physical transport network, media type and end devices

❖ Ability to inter-work with other protocols

❖ Devices are addressed using a flexible URI based scheme (independent of IP address)

❖ Supports offer/answer and subscribe/notify models

❖ Existing body of products that can be re-purposed for use in Smart Grids

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Common Misconceptions about SIP

❖ **SIP is a telephony/VoIP protocol**

➢ Supports multi-media sessions which can be voice, video, instant messaging, shared data, and/or subscriptions of events
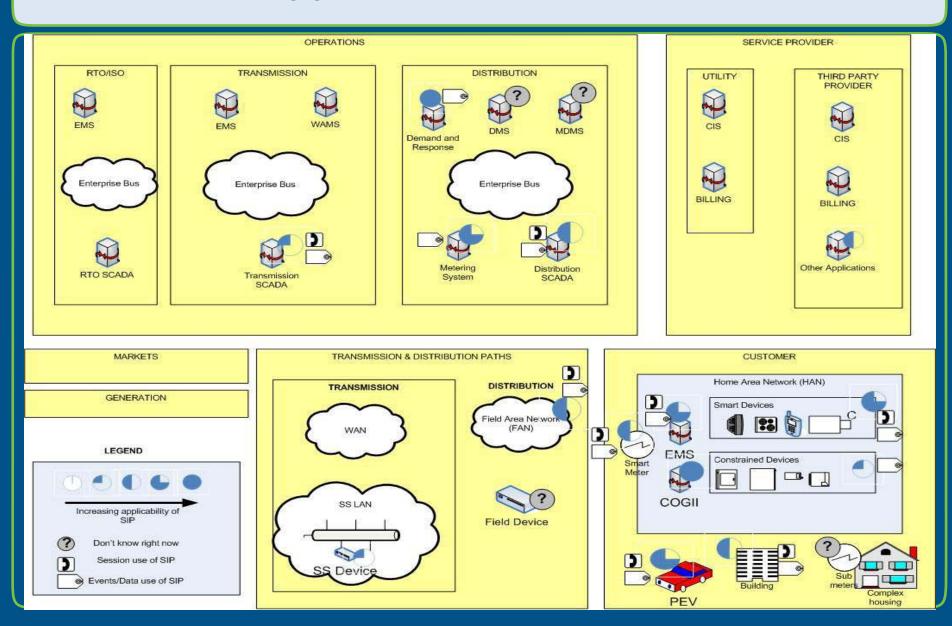
❖ **SIP has problems with NATs and Firewalls**

➢ NAT issues primarily occur when IP address are embedded in SDP

➢ Session Traversal Utilities for NAT (STUN) [RFC 5389] can be used to overcome these issues

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Smart Grid Applications and SIP

What is the SIP Forum?

❖ **The SIP Forum's mission is to advance the adoption of products and services based on SIP**

❖ **To accomplish its mission, the Forum:**

➢ Advances product interoperability by holding live interoperability test events

➢ Develops industry-wide technical recommendations and best-practice implementation guides

➢ Creates white papers and other documents that cover essential aspects of developing and deploying SIP-related IP communications technology, products and services

➢ Builds awareness about what existing and emerging SIP-compliant technologies can do for users and customers

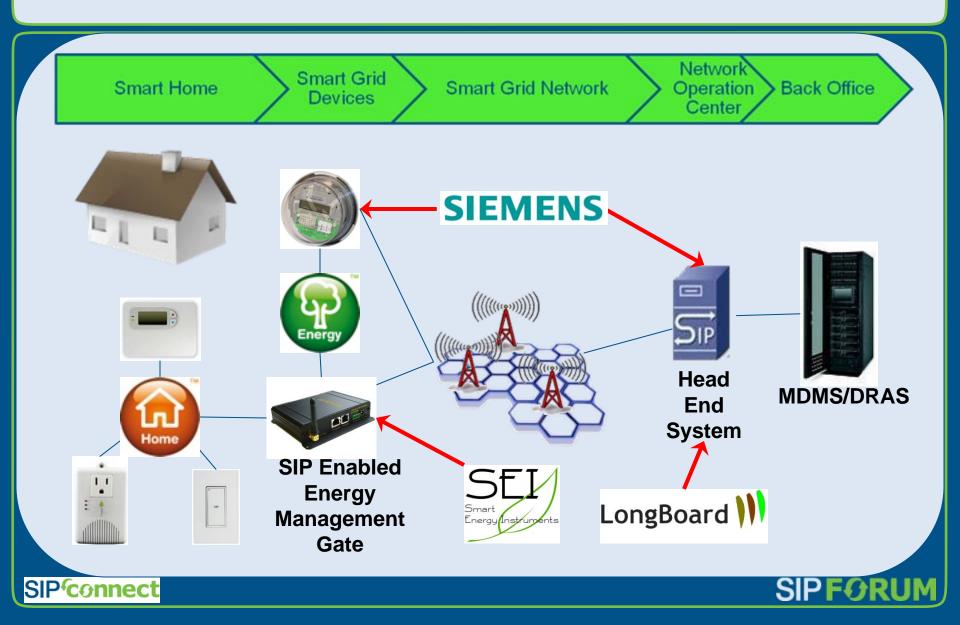➢ Maintains a growing community of IP Communications industry professionals interested in SIP

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SIP Forum Member Activities for Smart Grid

- ❖ Smart Grid Special Interest Group formed
  - ➢ http://www.sipforum.org/content/view/351/266/
  - ➢ Weekly conference calls held
- ❖ Developing whitepapers
  - ➢ Applicability of SIP in Smart Grid Demand & Response Communication
  - ➢ The Role of SIP in the Smart Grid HAN
- ❖ Authoring articles and speaking at events
- ❖ SIP Forum member companies are working on SIP products for the Smart Grid

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SIP Enabled Smart Grid Products

Thank You!

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