



## SmartGrid: Cloud Computing & Protocols

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ConnectivityWeek 2010

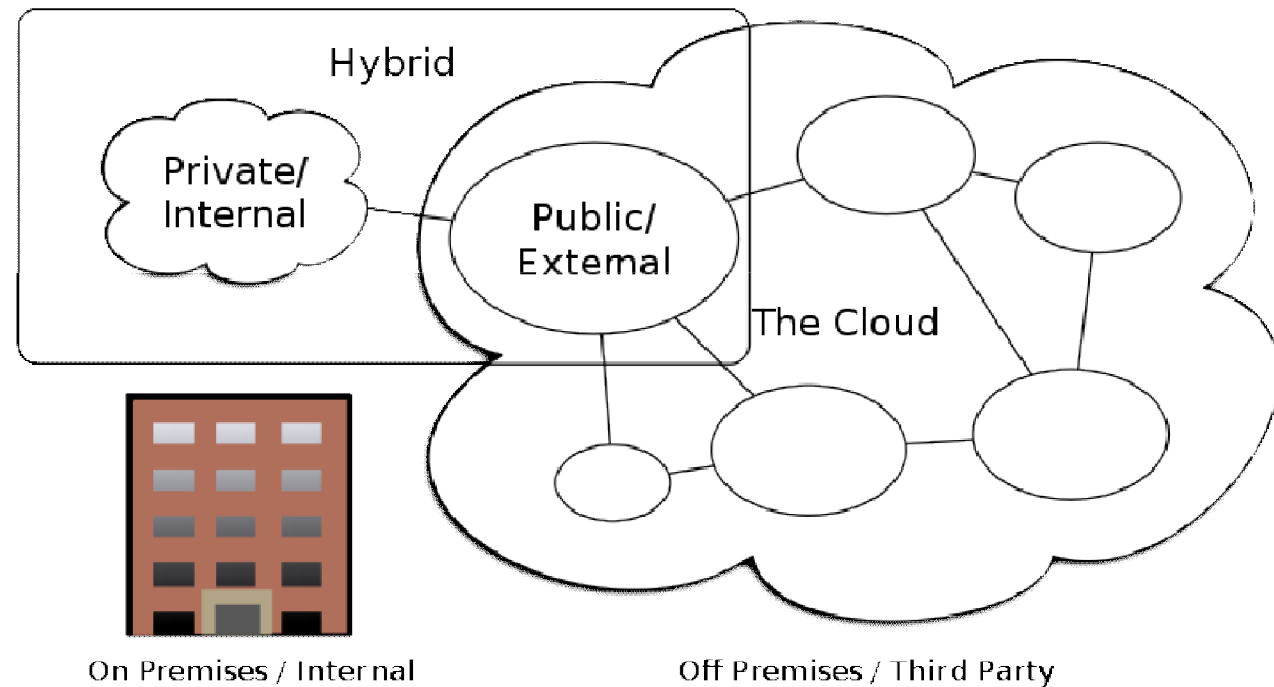
# What is Cloud Computing?

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- Key Tenets of Cloud Computing:
  - *Thinner client Thicker network* resource usage
  - Dynamically scalable
  - Virtualized
  - 'XXX As a Service' concept
  - Multi-tenancy
  - Security
- Cloud Computing is a HORIZONTAL concept. Many industries are trying to leverage it

# The Myth of Security

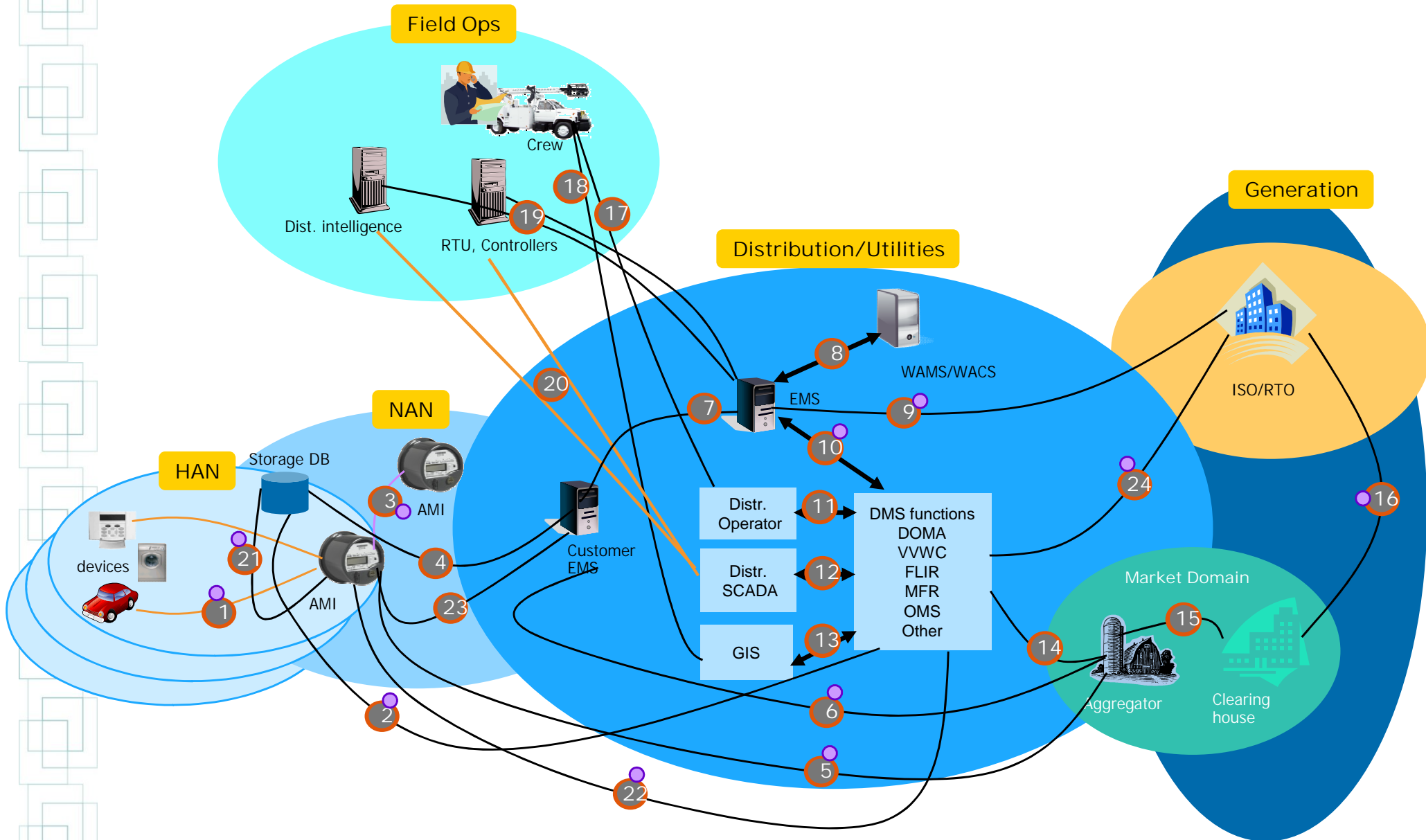
- Public, Private Hybrid



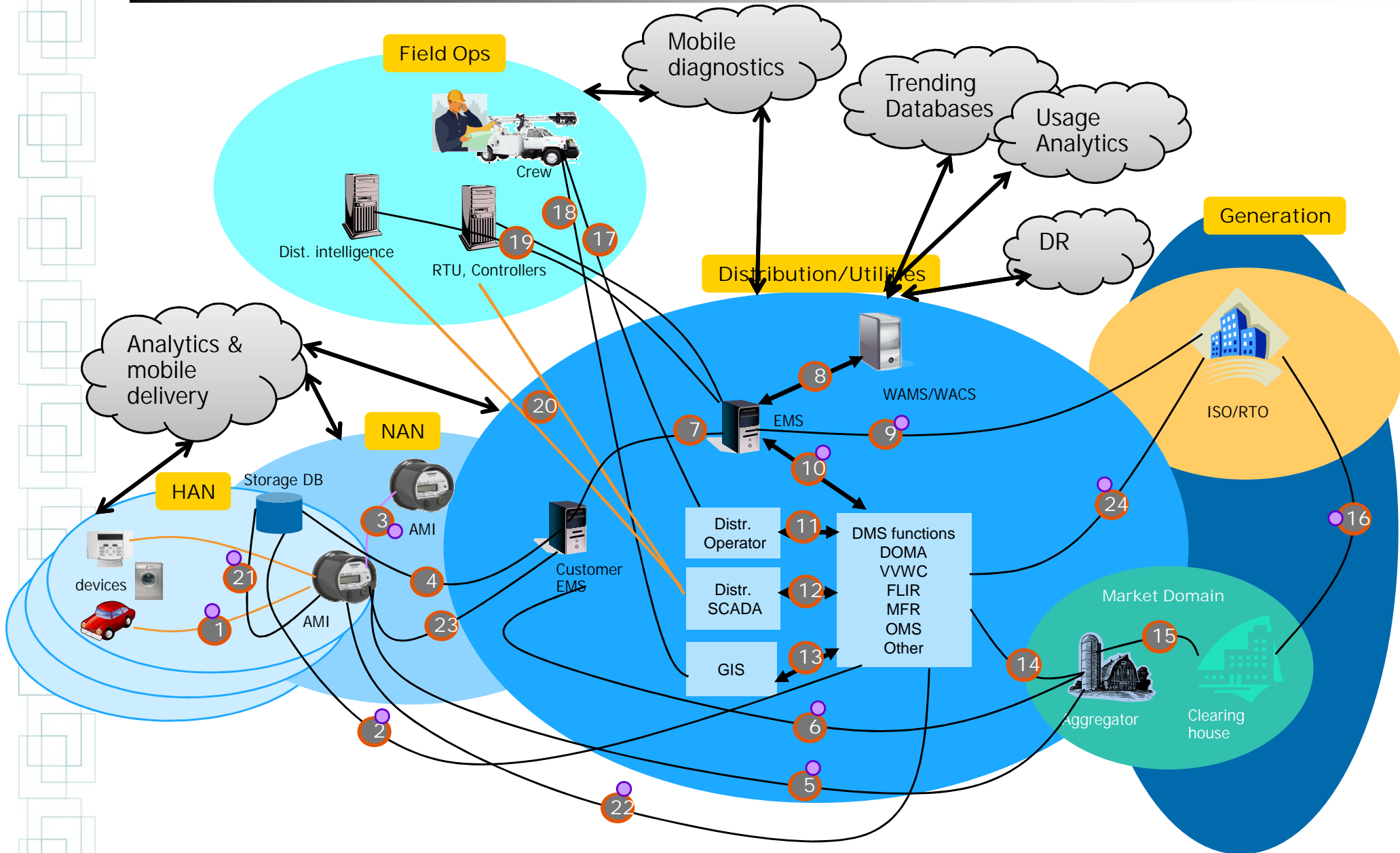
## Cloud Computing Types

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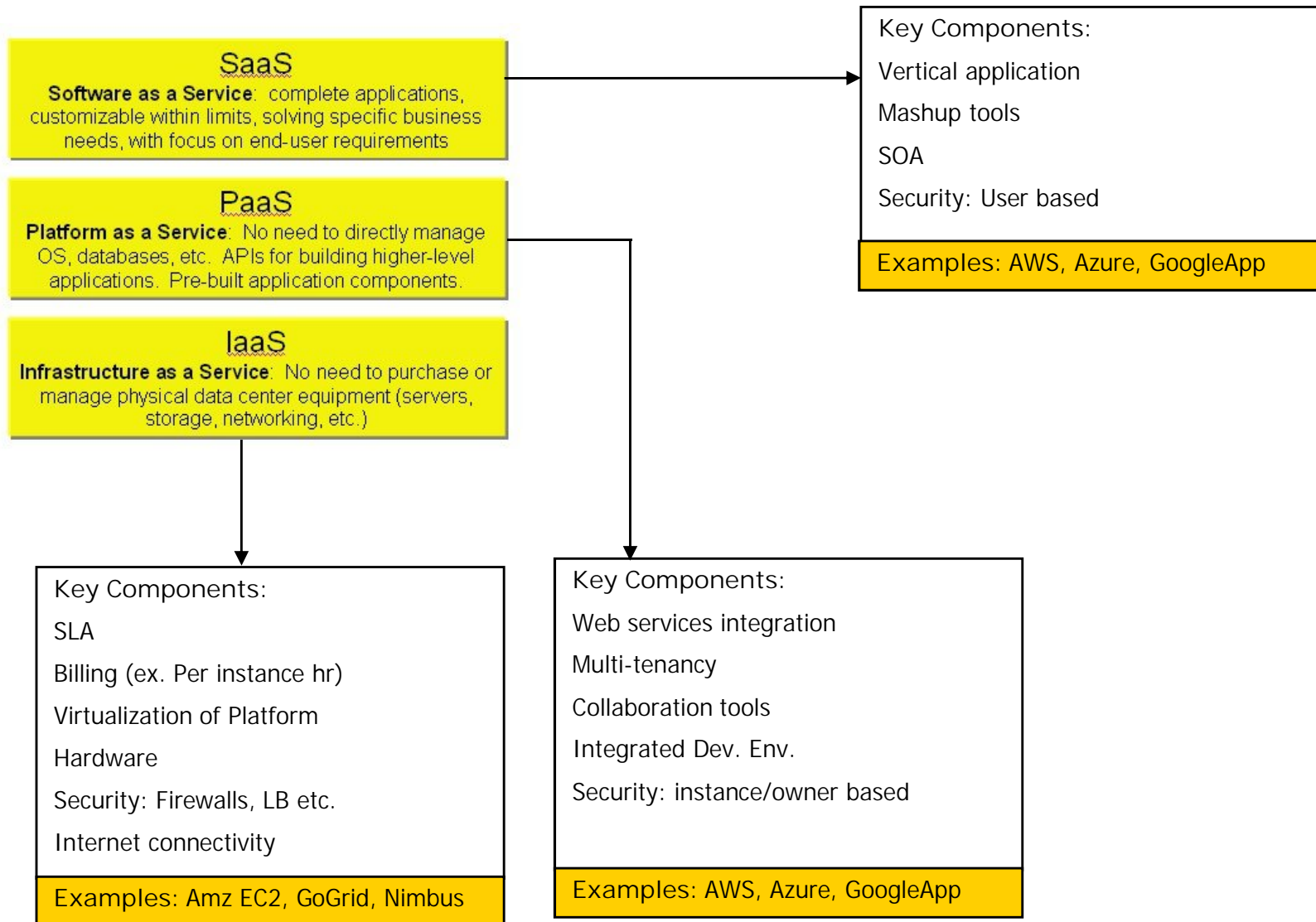
# Smart Grid Architecture



# Smart Grid Architecture: Cloud



# Layers of Cloud Computing



# SmartGrid Goals: How does cloud help?



## Better Demand-Response management

- Simple Meaning: Utility Companies should be able to better analyze and manage electricity demands

## Active participation by consumers in Demand-Response

- Simple Meaning: Give consumers more control, including options of generating their own energy, selling extra energy back to the grid, more fine tuned control of energy consumption at home, etc.



## Optimize assets and Operating efficiently

- Simple Meaning: Put an architecture in place that helps the electric grid players to reduce waste like excess generation, more distribution of power generation, micro control of D&R etc.



## Self-Healing

- Simple Meaning: If something goes wrong at one place, network should be able to route through other sources (similar to, say, what happens when an IP router goes down in the path of routing IP packets across the internet)



## Resiliency during attacks (Cyber/physical)

- Simple Meaning: make it as hacker-proof as possible



## Enable new products, services and markets

- Simple Meaning: Opening up network attributes always brings in innovation.

# Protocols and Cloud Computing

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- Protocols and Interfaces that ride the cloud need to adapt:
  - Asynchronous operations
  - Adaptive discovery of resources
  - Per transaction/session security
  - Dynamic routability
  - ... and more
  
- Other desirable features
  - Multi-modal
  - Extensible
  - Efficient

# An introduction to the SIPForum SmartGrid SIG

**SIPFORUM**

[SIPFORUM.ORG](http://SIPFORUM.ORG)

## **SIP Forum Forms New Smart Grid Special Interest Group (SIG)**

The SIP Forum recently formed a new Smart Grid Special Interest Group (SIG) with the focus of evaluating the appropriateness of using SIP as a protocol for a number of Smart Grid areas, including the Home Area Network (HAN), Utilities' Operational Network, and PEV (Plug-In Vehicle) deployments.

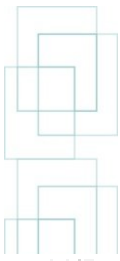


This new group will also evaluate the appropriateness of SIP in the list of priorities identified by the Federal Energy Regulatory Commission (FERC) identified in the document "NIST Framework and Roadmap for Smart Grid Interoperability Standards Release 1.0."

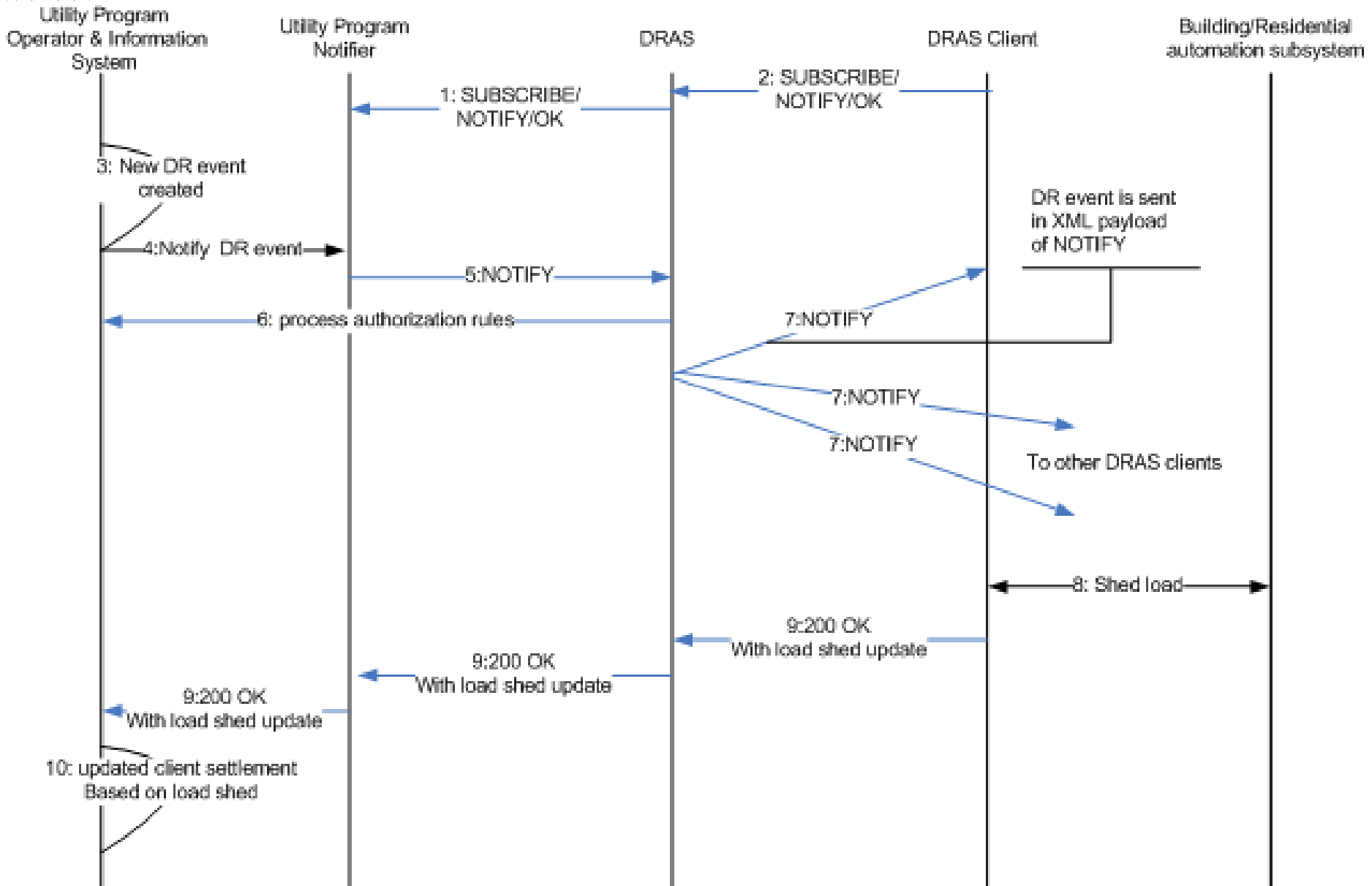
## Why SIP?

- Scalable
- Secure
- Rich Presence
- Powerful event architecture
- Firewall friendly (surprise)
- Session + data
- Low-footprint (surprise)
- flexible

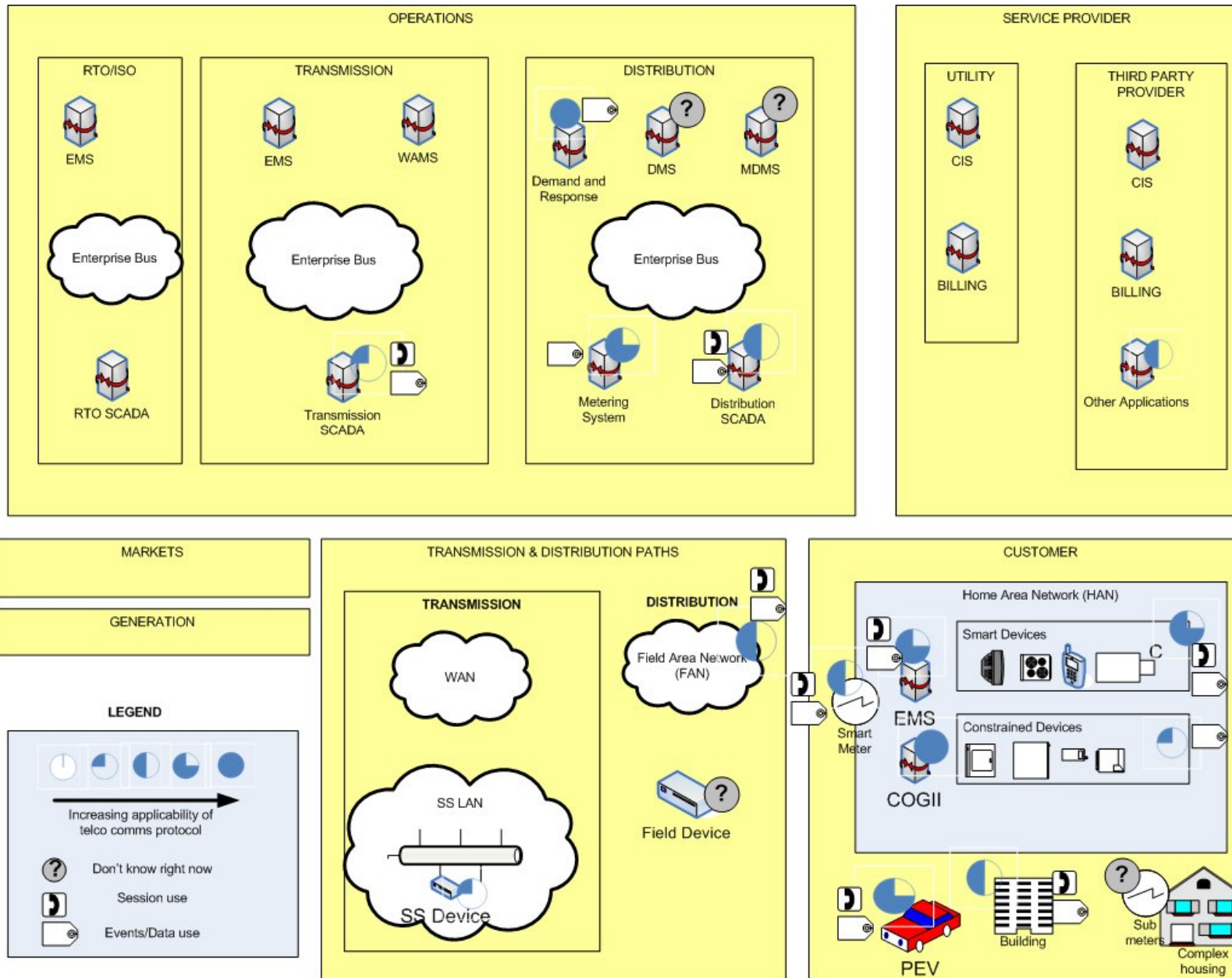




# DRAS Flow with SIP



# The larger picture: our view of the role of SIP in the SmartGrid Space



# Thanks

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