AMI and the Smart Grid

John Horn

National Director

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Architecture of Private and Public Networks

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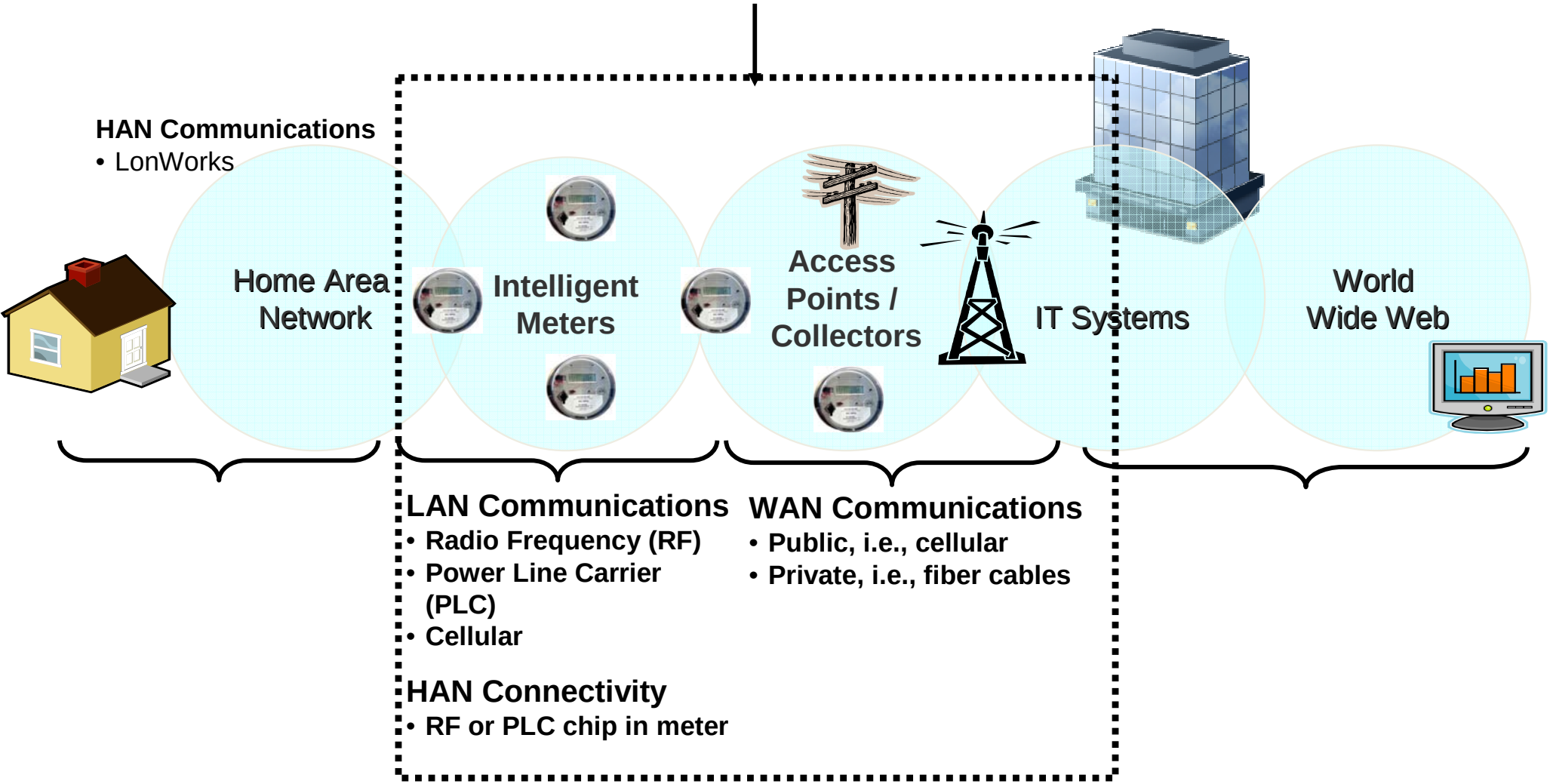
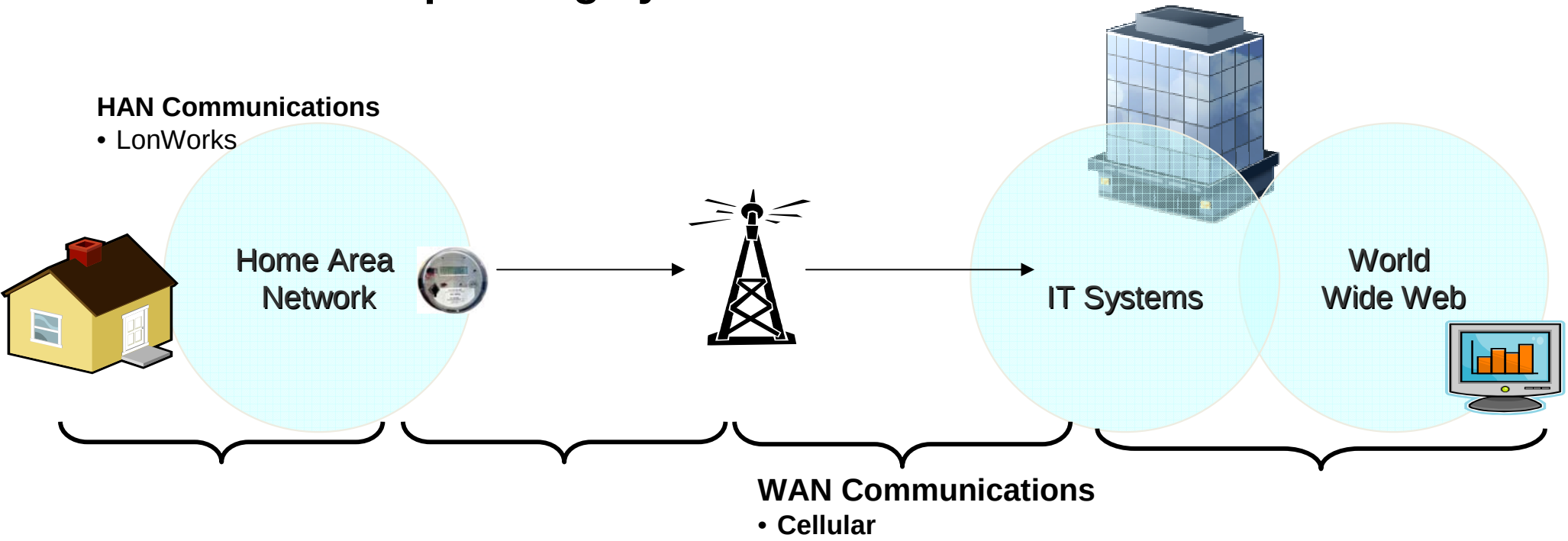
Architecture of Private Network

The <u>solutions</u> from the meter to the AMI operating system at Utilities office



Architecture of Public Network (T-Mobile)

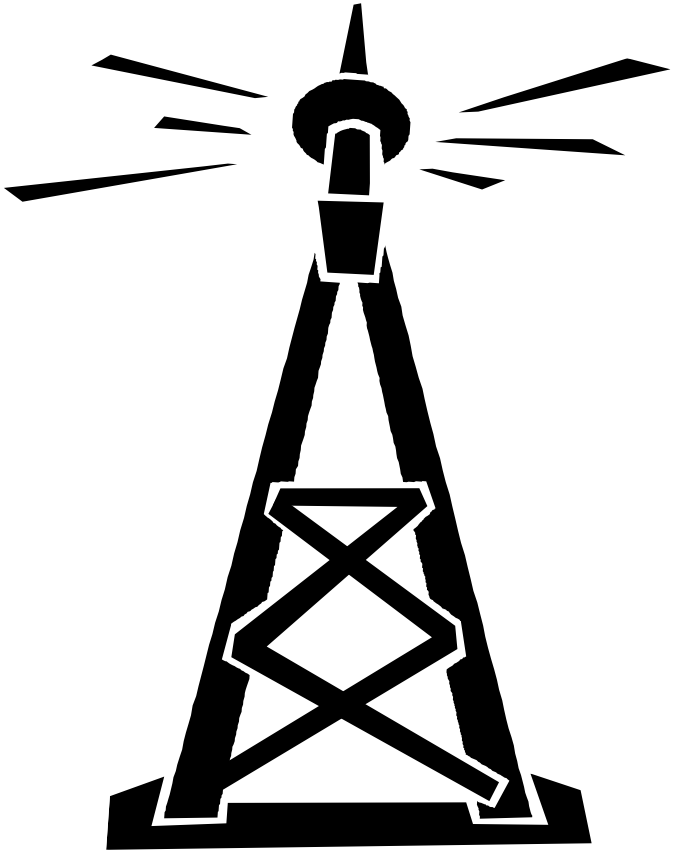
The <u>solutions</u> from the meter to the AMI operating system at Utilities office



Private Network Using Unlicensed RF

Pros:

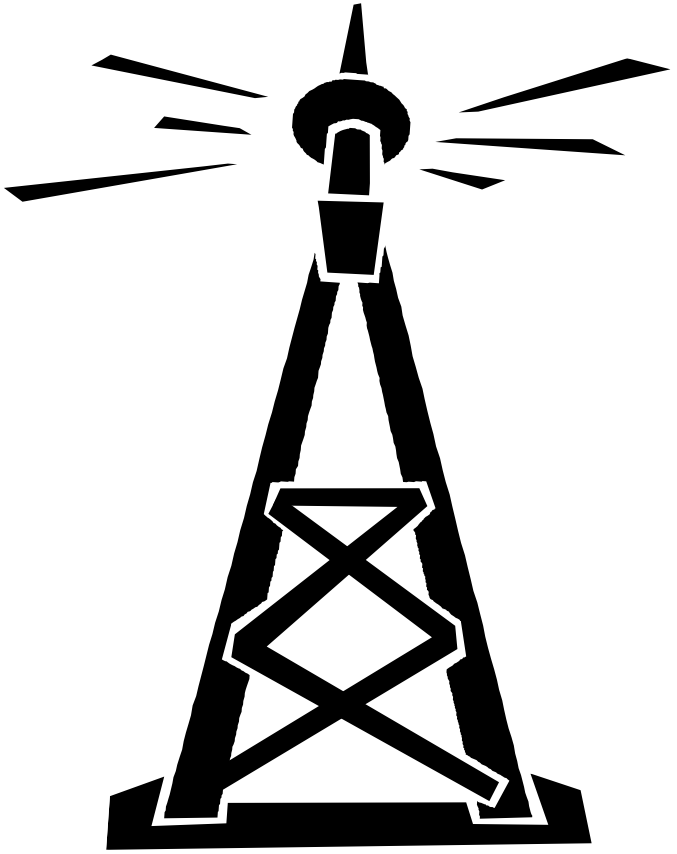
- Avoid substantial upfront licensing cost
- Quickly implement service without waiting for consent for the FCC
- Not limited to any geographic areas



Private Network Using Unlicensed RF

Cons:

- Must avoid interference with other operations
- Must accept any interference received
- Denial of Service Attacks
- Man in the Middle Attacks
- Thousands of pre-written scripts the can be accessed to exploit unlicensed networks.



Benefits of Using Public Network Outweigh Benefits of Using Private Network

Public Network

- Over 99% reliability
- Less than milliseconds of latency
- Proven and Scalable
- Licensed and Encrypted Spectrum
- Cybersecurity

Private Network

- Scalable?
- Reliable over long term?
- Secure?

True Cost of Network Ownership

True Cost of Network Ownership

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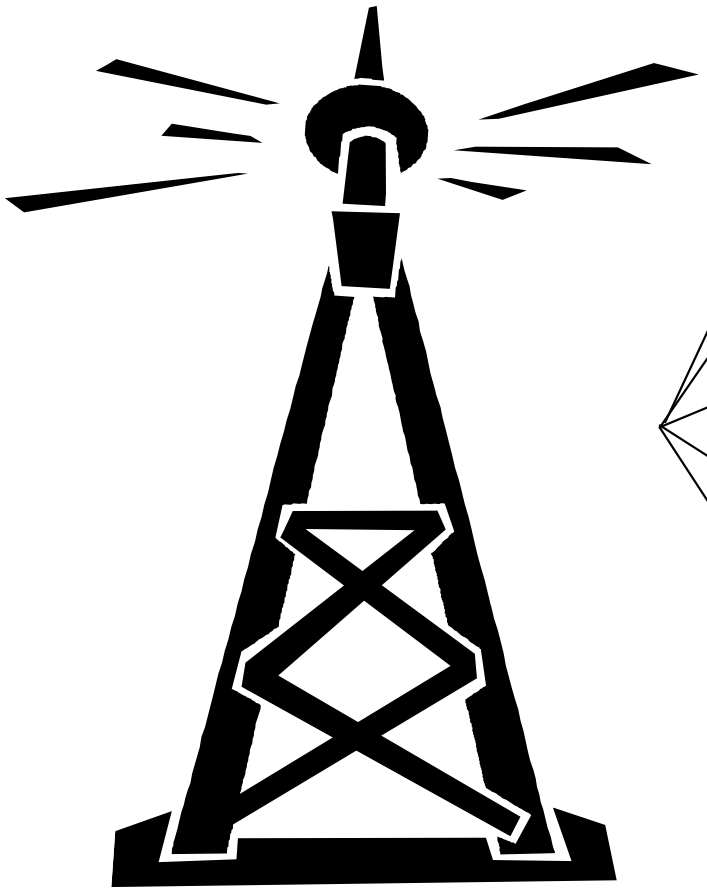
Cost represent 1.5 Million Wireless Connections.



$5.1 Million (61 employees)
Field Techs / Switch Personnel / RF Engineers

$3 Million
Repair and Maintenance

$1.5 Million
Employee Benefits

$800K
Vehicle Expenses

$564K
All Other Line Items

Total cost: $10.9 Million Annually

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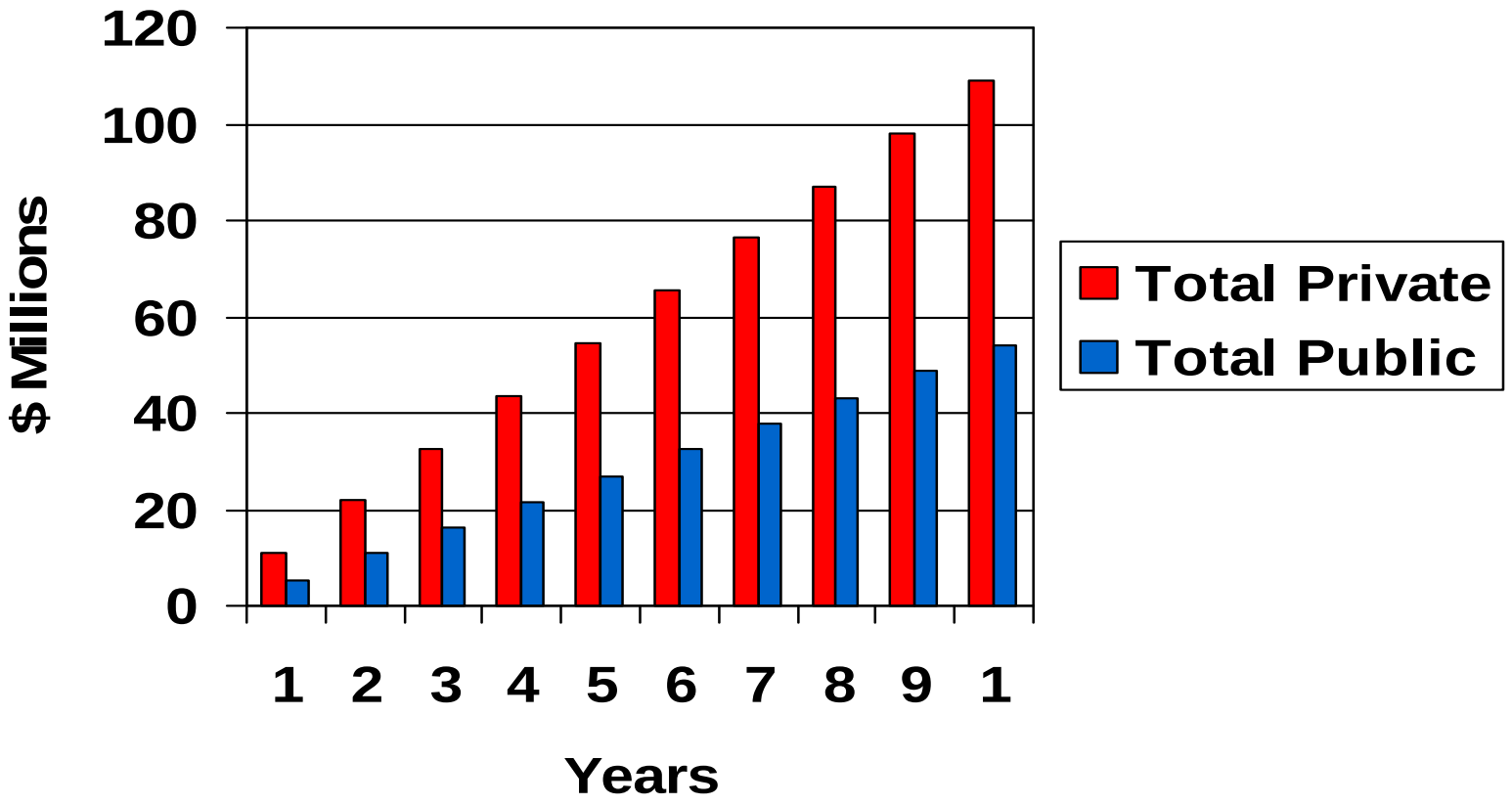
True Cost of Network Ownership over 10 Years

Private Network

$110M over 10 years to manage network

Public Network

$54M over 10 years



AMI Partners

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AMI Partners

Echelon – Meter OEM and NES AMI Platform

- NES Smart Metering System
- Echelon has more than 2 million smart meters at utilities representing over 20 million end points in Europe
- **Maximizes grid intelligence** while minimizing operating costs by embedding communications and monitoring directly into the electricity grid.
- **Creates an open environment** for competitive services to adapt, modify, and extend their energy and metering services, using market-leading software, hardware, and service providers.
- **Eliminates risk** by freeing a utility to focus on its primary network asset — the electricity grid — by leveraging established, IP-based backhaul communications providers regardless of technology.
- **Delivers certainty** that the system will perform to customers' and stakeholders' expectations through a history of reliability, performance, and cost savings provided to tens of millions of homes.

AMI Partners

Smart Synch

- GE Meters – GPRS under the glass
- Commercial Metering
- Mapping energy use trends to optimize power consumption
- Providing demand response programs offering incentives for business owners who curtail their energy use during times of peak demand, helping them reduce their carbon footprints and capture tax benefits
- Supporting large-scale intermittent renewable generation initiatives (e.g., solar panels and wind energy)
- Facilitating real-time notifications of power outages so that dispatch teams can ensure on-site power quality

Thank you!