



M2M Conference

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Eka Systems

everywhere

Agenda



- About Eka Systems
- Mesh Network - Building Application
- Key Network Features
- Design and Implementation Challenges
- Examples of Problems Encountered
- Lessons Learned

Eka Highlights



- Founded April 2000
- Device networking company
- Focus is on energy management & building automation
- Over 6,000 nodes operating with customers
- Largest mesh network deployment of 3,600 nodes
- Largest single mesh deployment of 715 nodes to one gateway running for one year

Building Automation



- Energy savings is key driver
 - Monitor meters
 - Sub-metering of large energy consumption devices
- Diverse systems
 - Heating, ventilation, and air conditioning
 - Lighting

Life Starts at the Meter



- Starting point is the meter
 - Business interface
 - Hard data input
- Building converts commodities (electricity, gas, water) into a self-contained environment
- Data and the network needs to be above all else - **reliable and proven**

Key Network Features



- Reliable
- Easy to install (Self-Configuring)
- Robust

Reliability



- Intelligence to reroute must reside with the node without limitations
- The environment cannot be predicted when nodes transmits
- Human intervention not feasible

Self-Configuring



- No provisioning requirements for the nodes
 - No address assignment
 - Nodes self-discover the network
- Efficient route self-determined by the node based upon its environment without intervention

Robust



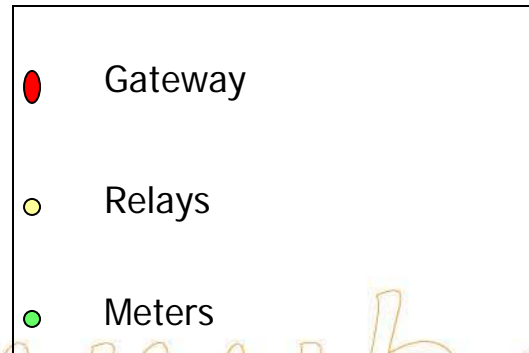
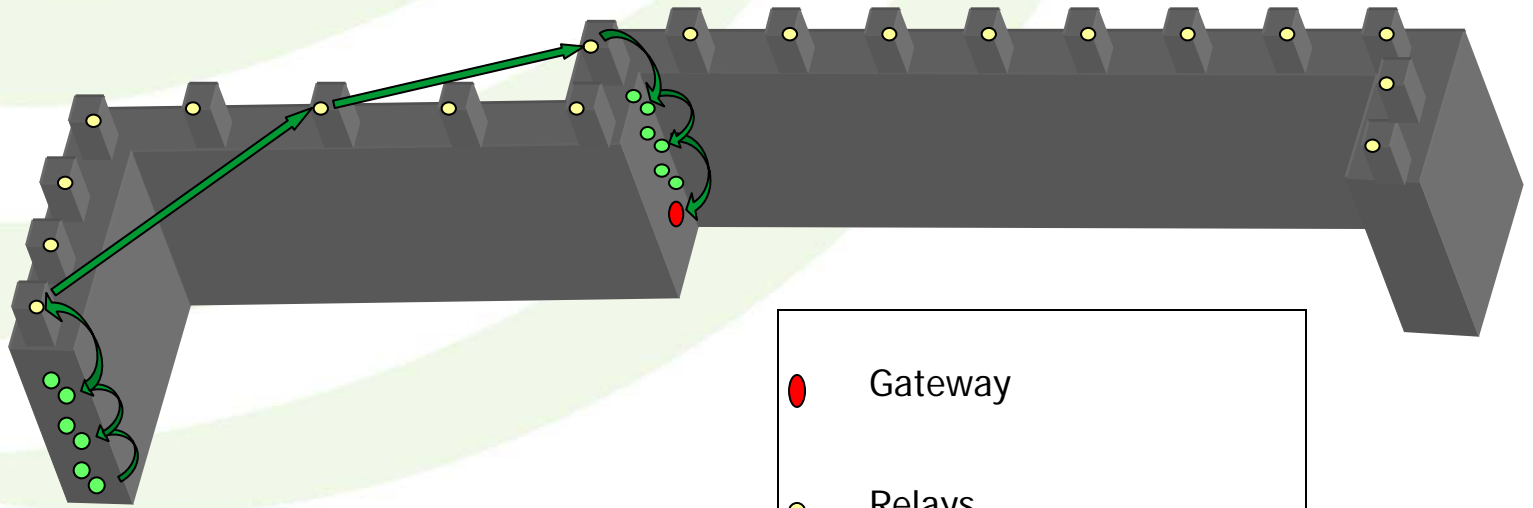
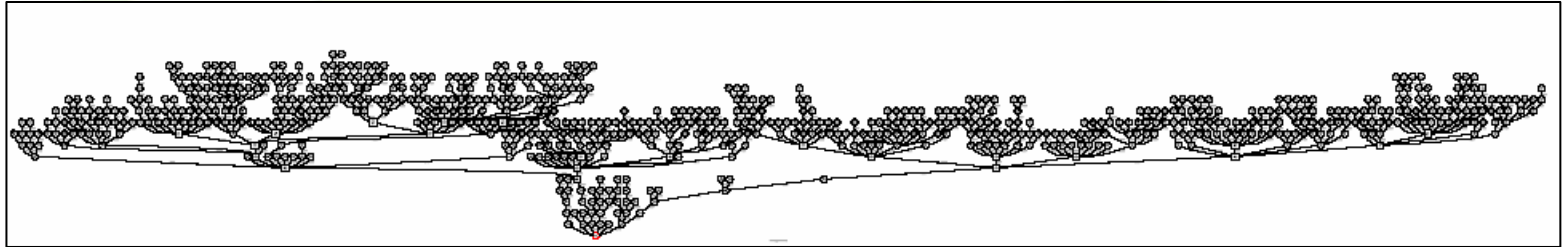
- Bi-directional
- Self-healing
- Nodes transmit to any network gateway
- Priority messaging

Challenges



- Propagation environment
 - Radio range
 - Reliability
- Minimize relays make for easier and simpler installation
- Minimize latency

Field Example



Solutions



- Relays on the roof for the hop
- Antenna engineering to limit the number of relays.

Case Study - Fairfax County



Requirements:

- **Scalable** - 145 facilities from a central location
- **Gas, water, and steam meters** – Integrates various utilities into a single system
- **Electric sub-metering** – Gathers data from sub-elements of a facility
- **Easy to install and manage** – Limited training required to install and operate

*"...using the EkaNet solution in only four buildings, the county realized in excess of \$50,000 in annual energy cost savings."
Brad Melton, Energy Manager for Fairfax County*

Lesson Learned



- Customers are looking for networks that are:
 - Reliable
 - Proven
 - Easy to install (Self-Configuring)
 - Robust
- Network need to be **very** robust to overcome the challenges of a real-world environment
- Mesh networks will only gain acceptance after rigorous field tests and large pilot deployments prove the ability of a mesh network to overcome real-world challenges