

# Smart Networks for Smart Grids

## GridCom™

GREENER, SAFER, SMARTER

Utilities are recognizing the strategic value of the communications network in delivering the applications to make the vision of the Smart Grid a reality. In the past, applications such as smart metering were implemented over a dedicated single purpose network, but the multiple applications of a Smart Grid make leveraging a single multi-application network essential to building a successful business case.

Tropos GridCom is an open standards-based distribution area network architecture for utilities enabling them to build a private communication foundation for aggregation smart grid applications. A broadband network is required for Smart Grids to provide the high bandwidth and low latency needed for many applications such as distribution automation and video security. GridCom incorporates the reliability, scalability, and security features necessary for the mission critical needs of Smart Grids. With GridCom, utilities can deploy one network for multiple Smart Grid applications providing a compelling ROI.

### TROPOS UTILITY CUSTOMERS

#### ❖ Burbank Water & Power (BWP)

The Tropos mesh is deployed as the common network for Smart Grid applications at BWP which include AMI, Demand Response, and Distribution Automation. The driving factor was to flatten demand peaks to avoid building new generating plants and the ability to better absorb the impact of PHEVs in the near future. The utility is also planning on segregating traffic and sharing the network with other city departments.

#### ❖ Electric and Water Utility serving the Middle East

A utility serving a state in the Middle East is deploying a Tropos mesh as a common backhaul for a wide range of applications on their electric and water systems. The primary application drivers are AMI, system automation, security, mobility applications, as well as water leak detection.

#### ❖ Anderson Municipal Power & Light

Anderson deployed a Tropos mesh as the backhaul to their AMI system. In addition to AMI, Anderson uses the mesh for outage management and detection as well as mobile workforce applications to give utility personnel access to applications from the field. The network was installed by an Anderson utility crew and is managed by the utility's IT department.



### Why would a utility want to own a wireless broadband network... couldn't they just use cellular?

Owning and operating a private wireless broadband infrastructure offers utilities many advantages over using public carrier wireless networks.

**Control over coverage area:** Owning a private network provides the utility the ability to ensure that coverage exists where it is needed, throughout the utility's footprint. Cellular data coverage, by contrast, is often spotty and unavailable in many parts of the service territory.

**Control over network capacity:** A privately owned network affords the utility the control over the network to be able to provision capacity where it is needed within the network or as more applications are added.

**Ensuring QoS for mission-critical applications:** A utility that owns its own private network can ensure that its mission-critical applications are prioritized over other less delay-sensitive traffic. By contrast, utility data traffic on a cellular network is only one of many other bandwidth-intensive traffic flows including consumer mobile data transfers. Furthermore, utility application traffic is typically not afforded a higher priority than these other traffic flows. Prioritized access is especially critical during outages or failure scenarios, when the cellular networks are often under extreme loads.

**Higher network capacity:** Private wireless networks using Wi-Fi or WiMAX often provide an order of magnitude higher data capacity than existing 2G or 3G data networks. This is especially important as more data-intensive Smart Grid applications are adopted - these include mobile GIS, distribution automation, and video for substation monitoring.

**Cost:** While leveraging cellular allows a utility to avoid capital expenditure, there are significant ongoing subscription costs associated with this option. This becomes even more significant as the number of endpoints (meters, DA devices, etc.) increases. By contrast, building a private wireless entails up-front capital expenditure as well as some ongoing operational expenditure associated with the upkeep and management of the network. However, the payback period can be fairly short, when compared with the cellular data option, being in some cases less than 5 years.



**What is the Return on Investment (ROI) of this type of network?**

The ROI for GridCom depends on the overall network architecture chosen and the value created by the applications running over the network. For a single application, the breakeven can be in the 5-7 year range, however adding additional applications can reduce ROI to 1-3 years.

**Is an open-standards wireless network more vulnerable to attack than a proprietary network?**

Absolutely not. Open standards, especially in the area of security, result in more secure systems through the open processes of peer review and revision. GridCom conforms to several of the toughest security standards including IEEE 802.11i and FIPS 140-2 and has implemented a layered security strategy comprised of strong authentication, access control, encryption and data confidentiality and physical security.

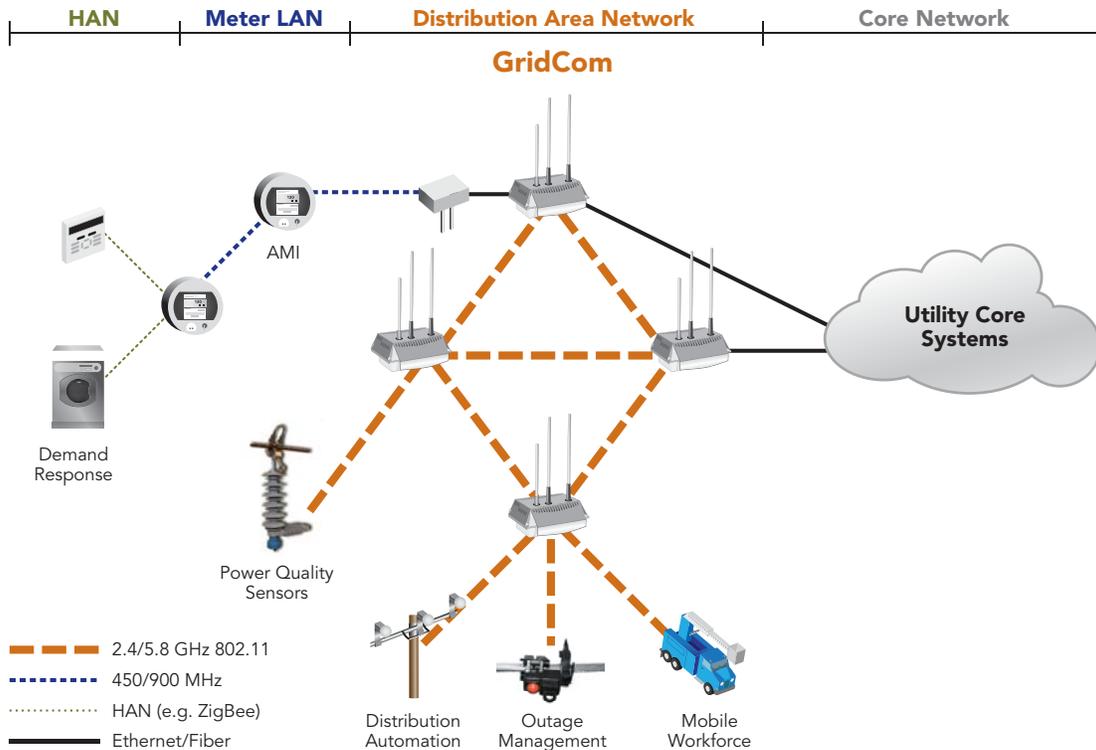
**Why is broadband performance for a utility's AMI network needed?**

AMI is just one of many applications required to fulfill the vision of the Smart Grid. Demand management and response, distribution

automation and control, outage management, and mobile workforce applications will work together to help utilities better leverage assets in the field and make the vision a reality. Deploying and managing separate networks for each application is not cost-effective. Standards-based high bandwidth common network enabling multiple applications is simpler to manage and creates a better ROI. Over the next 2-3 years, additional applications for Smart Grids related to distributed generation, PHEV load management and video security will require much higher bandwidth and low latency that only broadband can provide.

**What types of applications can a GridCom network handle?**

Since the GridCom broadband mesh network is completely standards based, any application that runs over an enterprise IT network or the Internet can be supported. Smart Grid applications include both fixed applications such as smart metering, demand response, outage management, distribution automation and control, as well as mobile or portable applications used in the field such as mobile work order management, remote GIS applications, field asset management, and various personnel security applications. The network can be configured to provide multiple virtual networks which separate and prioritize user group or application traffic as needed.



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