



Engineering a robust Field Area Network for critical industry infrastructure

Salt River Project
Phoenix, Arizona, USA



Servicing over a million end-users in an approximately 2900 square mile area, Salt River Project is one of the USA's largest public power utilities. In addition to electricity, SRP also delivers over 800,000 acre-feet of water to customers annually.

CHALLENGE

Aiming to build a new communications network which would allow for centralized monitoring and control of their distributed power and water systems, Salt River Project acquired 2 MHz of spectrum in the 700 MHz Upper A Block. With spectrum being both scarce and valuable, the biggest challenge for the utility was to find a solutions provider who could optimize data throughput in the narrowband channel they now had available. SRP then

began the search for a partner to provide the communications infrastructure for a new 1300 square mile Field Area Network (FAN) which would encompass three Arizona counties, including the metropolitan Phoenix area. In addition to monitoring and controlling power flows into and out of the grid from numerous advanced solar installations, the FAN was also required to connect Distribution Automation applications and provide AMI backhaul.

SOLUTION

Requiring coverage for a geographically large network incorporating a multitude of endpoints across the Phoenix basin, the Mimomax team worked closely with SRP's engineers to create a customized design which would provide the coverage and functionality required.

The Mimomax solution was engineered to:

- Ensure ease of deployment in order to save costs and reduce reliance on specialist radio engineers to deploy endpoints;
- Incorporate a sophisticated Network Management System solution with which to monitor and report on such a large number of devices;
- Offer very low latency to allow for ultra-rapid feedback on the state of SRP's large-scale network of industrial infrastructure;
- Provide saturation coverage over the operational area to a wide variety of devices with a complex set of functionality via the design of a high power, dense network with multiple frequency re-use;

- Comply with stringent US Homeland Security requirements relating to Critical Infrastructure, including encryption, authentication and traceability;
- Incorporate detailed propagation modelling and drive testing to validate predictions from the models;
- Deliver a customized network design where data relating to separate internal business units at SRP could remain secure and isolated.

The resulting multi-tier solution designed by Mimomax combined higher functionality, higher capacity radios at the center of SRP's network (where large amounts of data are aggregated) with lower cost, lower capacity radios at network endpoints. This approach provided SRP with appropriate levels of coverage across their network and a lower total cost of ownership for the Field Area Network.

“The Mimomax team has done an outstanding job meeting SRP’s needs. Their technical expertise, innovative approach and customer service have been very much appreciated. It is clear that SRP made the right choice to partner with Mimomax and we are very excited for the future.”

CHRIS CAMPBELL | SENIOR DIRECTOR OF GRID MODERNIZATION SERVICES - SALT RIVER PROJECT

THE PILOT

Following a robust pilot process where a live network was created to test the NMS and auto-discovery features of the radios, SRP provided Mimomax with a Notice to Proceed and the deployment phase began.

Key highlights of the project at this point include:

- Mimomax’s Tier I Tornado radios have been successfully deployed to connect a variety of endpoint devices across the FAN.
- The new Tier II radio, Pyxis, was also developed as part of the 2017 Pilot and was successfully tested on a range of devices including DER, Meters and Volt/VAR controllers;
- Advancements made during the project have also included the development of new antennas and pole mount technology and the incorporation of a GPIO controller driven directly by DNP3. This is now fully accessible via a new feature rich command line interface;
- New IP networking advancements include router-on-a-stick, enhanced port security, advanced tunneling and mixed mode routing.



KEY BENEFITS

- Private, secure, scalable network
- Multi-tier approach for appropriate levels of coverage across their network
- Lower total cost of ownership for the FAN
- Saturation coverage via multiple channels and greater frequency re-use
- Connectivity to multiple SCADA, DER and DA devices
- Replacement for carrier-based AMI backhaul

ABOUT SALT RIVER PROJECT

Location: Phoenix, Arizona

Industry: Power & Water Utility

Services: Serving central Arizona since 1903, SRP is one of the USA's largest public power utilities. An integrated utility providing generation, transmission and distribution, SRP delivers electricity to 1 million retail customers in three Arizona counties including most of metropolitan Phoenix and provides 800,000 acre-feet of water annually to Arizona customers.

An aerial night view of a city, likely Phoenix, Arizona, with its lights glowing against the dark sky. A network of glowing lines and nodes is overlaid on the city, suggesting a communication or data network. The image is used as a background for the document.

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About Mimomax

Mimomax develops wireless communications solutions for narrowband channels which enhance visibility and control - right to the edge of our customer's networks.

Our award-winning radios utilize Multiple Input, Multiple Output (MIMO) technology combined with full duplex communications and ultra-low latency to provide our customers with communications solutions which optimize data throughput and provide rapid feedback and control of their mission-critical assets.

Winner of the 2018 UTC IMPACT Award for Mimomax Tornado Radio.

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