Outage Detection

Distributed Intelligence

Take a leap forward by leveraging Outage Detection with the Itron Network and Distributed Intelligence

Power outages in the U.S. are occurring more frequently, lasting longer and costing more than just a decade ago. The 2018 Eaton Blackout tracker annual report estimates the economic cost of these outages at anywhere from $85 to $150 billion annually.

This steady increase in outages is due to the combination of underinvestment in modernizing the grid, increasing peak demand for electricity, and more severe weather and storms. This comes at a time when customer expectations for reliable service are higher than ever.

Smart meters, with their ability to send a signal to the utility when they lose power, have been deployed widely as a tool to help utilities detect and restore outages more quickly. Yet, while current-generation metering technology has added a valuable data stream to the outage management equation, there is still considerable room for improvement in translating those capabilities into reliable, timely and actionable data for grid operators.

DETECTION CAN BE SMARTER

The current state of outage detection and analysis with a smart metering network is still an intuitive exercise based on how many affected meters can successfully transmit "last gasp" messages over the network, how many of those messages successfully reach the utility over a network that may be losing power, and how well back office models and human judgement can infer outage scope from this subset of information.

While different vendors make varying claims regarding the number of outage messages that successfully reach the collection system during an outage, that they all rely on the same basic approach. The meters generate a tsunami of outage notification data on the network. Grid operators use the subset of data that makes it through the network, along with SCADA data and customer phone calls, to determine location and extent of the outage's possible causes. Finding the location can be hampered by lack of accurate and updated connectivity models of utility distribution assets.

The situation is better than before smart meters entered the equation, but it's still not as good as it can or should be.

PARTNER WITH ITRON TO REALIZE VALUE

The Itron Network and Distributed Intelligence platforms deliver a fundamentally different and better approach to outage detection and analysis. By combining location awareness on the grid with peer-to-peer communications at the edge of the network, the Itron Network solution systematically and continuously evaluates the status of all meters on the network to quickly model and localize outage events and report summary information back to the utility in near real time.

When an outage takes place, regardless of the scale or location, the Itron Network automatically initiates an analysis mode among meters and devices on the network to examine outage data and conditions at the edge. The meters that still have power quickly go into a progressive outage analysis mode. When using peer-to-peer communications with other meters, the energized meters quickly determine if their 'buddy' meters are energized or not.

No other system combines distributed intelligence and peer-to-peer communications to process and analyze data in this manner during an outage.

By initially analyzing the bulk of the data at the edge of the network, many of the difficulties and deficiencies currently encountered by smart metering networks during outages–including tremendous volumes of unfiltered outage data congesting the network–are eliminated.

SHORTEN OUTAGES WITH ACTIONABLE RESULTS

So, instead of a system that delivers a tsunami of unfiltered, raw data, utilities receive concise, accurate and actionable information on outage conditions, including location and scale, affected customers, affected transformers and other equipment–all in a shortened timeframe–and all with Itron Outage Detection. The Itron Network, coupled with Distributed Intelligence detects the outage–usually before the first customer can even report it. Analysis determines the extent and probable cause of the outage so that appropriate resources can be dispatched efficiently to exactly where they are needed to begin restoration efforts.

The Value of Outage Detection

» Eliminates need to manage "tsunami" of smart meter outage notifications to try to infer outage conditions

» Location awareness and peer-to-peer communications yields much more timely and accurate detection

» Peer-to-peer communications enables massive parallel communications and processing not possible with a point-to-point or traditional mesh network

» Accelerates outage detection and analysis speed by 2X or more

» Provides continual verification of outage and restoration state, including pinpointing 'nested' outages during restoration

» Adds more than $3 million in annual business case value compared to current AMI systems for a utility with 1 million customers

This all results in improved customer satisfaction and utility reliability indices.

This distributed approach to outage analysis is effective for both large-scale and small-scale outages, including "nested" and individual outages, resulting in a dramatic improvement in outage detection and analysis. This innovative combination of intelligence at the endpoint and improvements in communication methods ensure outage detection information from smart meters adds business value, not just additional data to manage.

CONFIGURATION

All Distributed Intelligence applications have extensive configurations, allowing Itron personnel to make environmental adjustments as well as algorithm adjustments via a Configuration Change Request SaaS workflow including the utility. Some configuration parameters are exposed to the utility as needed to allow self-management.

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