



# Performance Manager

## AMI Operations Management

In order to support utility business processes that are now dependent on timely meter data, AMI systems must achieve and maintain high data collection success rates. Maintaining such rates across millions of endpoints deployed in a dynamic and harsh field environment poses new and difficult challenges to AMI operations teams.

Performance Manager provides the fundamental components and functional capabilities needed to more efficiently manage and operate an AMI system at scale. These capabilities include operational reporting with integrated visualization, SLA tracking, and automated fault detection and exception management.

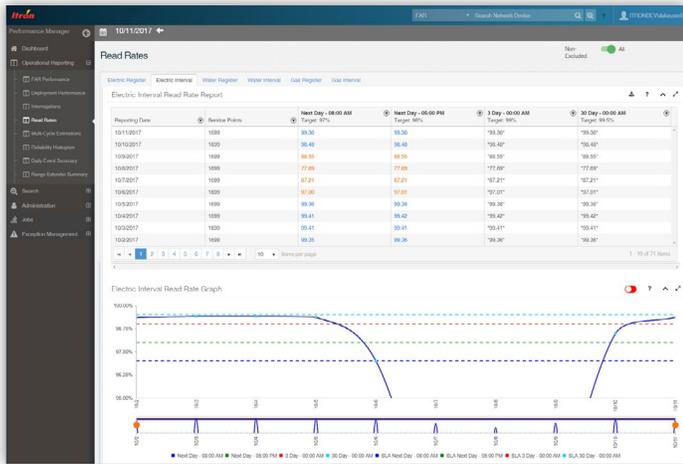
With AMI deployments, often times it's the one percent of exceptions that can take most of the team's effort to manage and fix. Performance Manager helps replace the excess of spreadsheets, customized tools and ad hoc reporting with a purpose-built application to facilitate solving those problems. Whether utilities are in mass

deployment or steady-state operations, running an OpenWay® Riva, RFLAN, IPv6 RF Mesh, cellular network or any combination of the four, Performance Manager provides the tools and framework to ensure smooth system operations.



#### **WITH PERFORMANCE MANAGER, UTILITIES BENEFIT BY:**

- » **Realizing operational savings:** Alleviate the steep operational resource ramp up that typically accompanies an AMI deployment by solving more problems with fewer people. Convert customers from read-on-foot to over-the-air billing reads faster through better monitoring and informative performance metrics.
- » **Reducing unnecessary truck rolls:** When inefficient back-office investigations fail to yield timely resolutions, premature or unnecessary field work orders can be initiated which results in costly truck rolls. In extreme cases, poorly tracked investigation history and resolution monitoring can result in duplicate truck rolls. By tracking exception history and providing a clear understanding of endpoint state across an operations team, utilities can cut down on unnecessary truck rolls.
- » **Quickly identifying AMI faults:** Let the system detect faults instead of expecting an operations team to rummage through the haystacks to find the needles. Through software automation and analysis of meter data, Performance Manager perpetually monitors the state of deployed endpoints and triggers exceptions based on pre-configured thresholds and criteria.
- » **Intelligently prioritizing issues:** Using rate class, proximity-to-bill cycle, mesh importance and a host of other factors, an operations team can put a higher priority on more impactful issues and shift their focus and effort accordingly.
- » **Analyzing trends in network and operational data:** Unfortunately, many systems and reporting tools are focused on the “here and now” and only show data representing the current state of the system. Many key AMI data points are not truly useful until you view them within a broader historical context. Seeing and understanding the historical data trends puts key data points in a useable context.
- » **Managing business SLAs:** Operations teams are graded on how well and how consistently the AMI system delivers data to meet the business’s expectations. Performance Manager provides flexible service level agreement (SLA) reporting that measures register and interval read rates, tracks the progress according to configurable SLA targets and presents the data both at the aggregate system level as well as at more granular levels (route, sector).
- » **Understanding the state of the system:** Interactive performance-based mapping, endpoint reliability metrics and meter exception indicators all based on the most current AMI data available give operators the current state of both the system and the individual endpoints that make up the system.
- » **Facilitating billing certification and system acceptance:** During mass deployment, service points are typically not converted to over-the-air billing or accepted by the operations team until they pass a set of performance criteria. Performance Manager maintains performance metrics for each service point and also tracks billing certification and acceptance as standard, out-of-box service point attributes.



Track Read Rates According to Configurable SLA Targets

## FEATURES AND BENEFITS

### Operational Reporting

Performance Manager introduces the next generation of reporting with adjustable graphs, interactive maps and flexible filters all working in concert to provide AMI operators with quick answers to questions on the current and historical state of the system. With Performance Manager, utilities can:

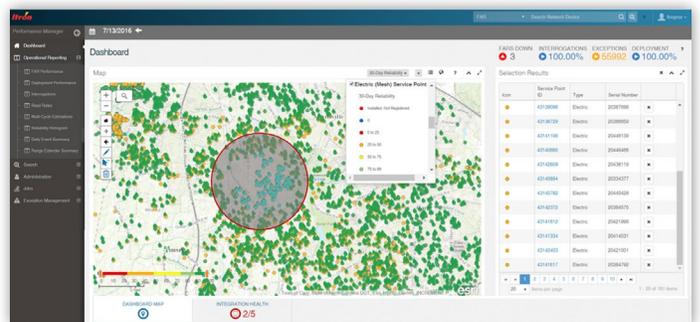
- » Build processes around useful out-of-box reporting that includes data tables, adjustable graphs, interactive maps and multiple export formats. Reports include:
  - **Field Area Router Performance Report:** Represents the current performance and state of routers in the field both geospatially and in a sortable/filterable table
  - **Deployment Performance Report:** Displays by route or other geographic designation the progress of mass meter deployment and the performance of the endpoints in designated areas
  - **Interrogation Report:** Shows past interrogation job success rates, separates multicast from point-to-point response counts and provides a map of the failed endpoints
  - **Read Rate Report:** Presents the register and interval read rates for electric, gas and water service points for tracking against configurable checkpoints and predefined SLAs
  - **Multi-Cycle Estimation Report:** Displays lists of service points that are receiving estimated bills ordered by the number of consecutive billing cycles estimated
  - **Reliability Histogram:** Shows the aggregated endpoint reliability metrics for the entire population grouped by performance range
  - **Event Summary Report:** Displays the number of endpoint events received by day and event type with visibility into trending from day to day and rolling average
  - **Range Extender Report:** Represents the current performance and state of range extenders in the field both geospatially and in a sortable/filterable table
  - **Exception Report:** Defines the work load for an operations team by tracking and presenting the open exceptions in the system by type and by recent performance

- » Create and save custom data queries and reports using Advanced Search, the customizable query writing and reporting tool
- » Divide up a large service territory into a configurable set of logical, hierarchical groups for use in operational reporting
- » Monitor real-time system state through key performance indicators (KPIs) for deployment status, active exception count, interrogation success rates and unreachable Field Area Routers

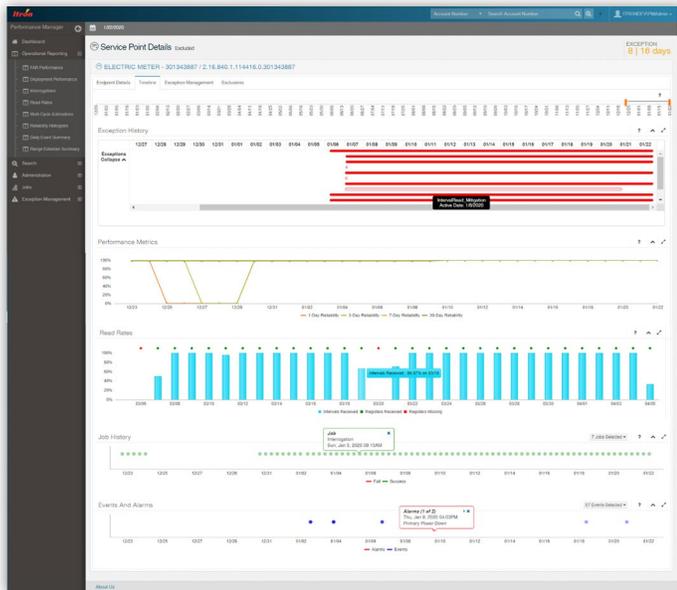
### Interactive Mapping

Understanding the state of the AMI network requires geospatial awareness of the deployed endpoints. Performance Manager not only provides geospatial awareness of endpoints through integrated mapping, but it also offers a number of interactive mapping features that empower operators to mold maps to meet the investigative needs of the moment. Performance Manager integrates directly with ESRI™ ArcGIS Server and incorporates maps into nearly every view to provide geospatial awareness and a rich user experience. Performance Manager mapping features include:

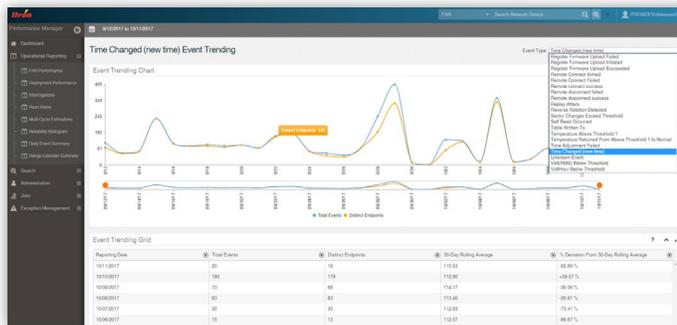
- » Service point representation on a map with configurable performance-based coloring and informative data popups
- » Support for all three commodities (electric, gas and water) in a single head-end system
- » Relationships between service points are depicted using network connectivity lines
- » Using the lasso selection tool, an operator can highlight service points on a map, build a list of endpoints, perform actions upon that list or export the results for additional back-office investigation
- » Interactive map buttons, display layers and slider controls allow operators to modify how the data is filtered and represented geospatially
- » Intelligent in-map search allows operators to immediately zoom in on a location using address, meter number, router, service point ID or account number
- » Swappable base maps let utilities and AMI operators pick the mapping imagery that makes the most sense for them financially and operationally



Select Endpoints Directly from a Map Using Lasso Tools to Generate an Exception List



Service Point Timeline



View History and Day-to-Day Trending of Aggregated Events Received from Devices in the Field

## Exception Management

Exception management in AMI means handling cases where the system and endpoints exhibit behavior that deviates from the expected norms. These deviations can disrupt the consistent delivery of data to the business and thus negatively affect SLAs. It is in the area of exception management where operations teams spend a majority of their time and effort, therefore it is important

that they quickly identify, prioritize and resolve problems in an efficient manner. Performance Manager not only identifies the problems, but it also correlates like issues together and assigns higher priority to the more important problems. Using Performance Manager, an operator can investigate and solve the problem at the right level of the solution chain. Performance Manager offers the following exception management features:

- » Automated exception detection allows an operations team to define their own set of exceptions which are automatically created and cleared using configurable conditions. Automated conditions available in the application include:
  - Reliability metric-driven exceptions
  - Read rate metric-driven exceptions
  - Fatal Error exceptions
  - Configuration Synchronization exceptions
  - Interrogation final result code-based exceptions
  - Advanced Search result-driven exceptions
  - Interrogation targeting exceptions
- » Exception indicators, in the form of map halos and alert tiles, give operators a quick signal that service points are in an exception state.
- » Exceptions may be set manually by an operator in single or bulk fashion using utility-defined exception reasons codes.
- » History of exceptions are tracked at the service point level, allowing the past records to be maintained through meter replacements.
- » Using a set of configurable weight factors, a utility can assign a higher priority to more impactful issues, allowing an operations team to shift their focus and resources accordingly.
- » Following the detection of an exception, the application tracks the aging of the exception along with its past history so that an operations team can apply focus to the lingering issues and repeat offenders.
- » Seamless integration with the OpenWay headend allows for performing two-way commands to meters and modules for troubleshooting purposes.
- » Awareness of non-OpenWay, third-party vendor devices deployed as part of a hybrid AMI system gives operators the ability to make better decisions during deployment and network mitigation.
- » Performance Manager supports direct integration with Action Manager so that workflows can be applied to exceptions in order to facilitate effective back office investigations and issuance of field work orders.



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