Itron’s Transaction Management System (TMS) is a highly scalable enterprise-grade software application that manages two-way data transactions over multiple advanced communication networks for multiple meter models, both residential and commercial and industrial (C&I). The software provides the energy industry the ability to monitor millions of electric meters for register and interval data, real-time usage during load curtailment events, and real-time meter alarms and events. Now utilities can wirelessly monitor all meter points with a single tool, which seamlessly integrates with their existing billing and meter data management systems and provides easy-to-use and flexible automation not available with any other data acquisition package.

**AUTOMATED DATA COLLECTION**
TMS utilizes the following mechanisms to provide the highest level of data acquisition automation.

**SmartMeter Managed Schedules**
Each SmartMeter knows what data to collect and when to automatically transfer the data to TMS.

**Automated Data Recovery**
TMS is aware of all data that is scheduled to be transmitted by the SmartMeter. If a SmartMeter does not return its data on schedule, TMS can automatically re-request the data.

**Automated Reconciliation**
TMS is aware of all expected responses from requests and automatically retrieves data that has not been returned as expected.

**ADVANCED COMMUNICATION INTELLIGENCE**
TMS utilizes the following methods to ensure the lowest-cost solution to utilities.

**Optimized Data Transmission**
SmartMeters configured with TMS utilize push technology to allow the SmartMeters to track and automatically initiate the scheduled transmission of data to TMS. This ensures that all data may be collected without requiring the additional processing, time, and data burden used by systems that must send an outbound request from the head-end software to the meters in order to collect the data. Additionally, the intelligence built in to TMS and the Itron SmartMeters ensures that only the specific data...
bits absolutely required to fulfill a request are sent over the air, thus minimizing over-the-air data usage.

**Compression**

All wireless messages are converted to binary and are optimally compressed before transmission to ensure the most economical data processing rates. The compression ratio can be as high as 50% and overall data usage can be as little as 5% of the total usage of other wireless systems. This allows Itron to provide the most cost-effective data plans to customers.

**Ease of Use**

- Browser-based User Interface
- Alarm and Meter Event Notification via E-mail
- Flexible Searching Capability
- Comprehensive Online Help System
- Import Tool for SmartMeter and Billing Cycle Information
- SmartMeter Grouping for Easy Management
- Billing Cycle and Customer Event Scheduling
- Automated Meter Registration

**WIRELESS NETWORK OPTIMIZATION**

As a pioneer in wireless smart metering technology, Itron built TMS specifically for wireless networks. Many other systems were originally built for hardwired, drive-by or hand-held systems.

**Packet Switched Data**

TMS has always supported Packet Switched Data, which has proven to be more robust, reliable, scalable and cost-effective than circuit-switched data. Consequently, all of the major public network carriers are eliminating their circuit-switched data network in favor of packet switched networks.

**Asynchronous Messaging**

TMS supports the asynchronous nature of wireless networks and handles any latency gracefully.

**SECURED AND ENCRYPTED DATA TRANSMISSIONS**

256-bit encryption is applied to all messages exchanged between the TMS and the SmartMeter module, utilizing a unique meter-specific encryption key.

**AUTOMATED INTERFACES TO BILLING AND EXTERNAL SYSTEMS**

TMS seamlessly and automatically interfaces with external systems using industry standard formats as well as custom tailored formats meeting each utility’s specific needs. These export interfaces provide a simple mechanism for transferring register and interval data from TMS to other systems used for consumer billing, web presentment, outage management, load analysis and customer support. All exports may be run on a scheduled or on-demand basis.

**SOFTWARE ENVIRONMENT OPTIONS**

**Operating Systems**
- Microsoft Windows
- Sun Solaris
- IBM AIX

**Application Servers**
- BEA WebLogic

**Database System**
- Microsoft SQL Server
- Oracle

**DATA MANAGEMENT**

- 5, 15, 30 and 60 Minute Interval Lengths
- 32 Channel Interval and Instrumentation Profiling
- Data Purge, Archival and Restoration

- Meter Data Editor and Export Data Validation
- Load Profile Trending Chart/Graph Tool
- Report Generation in CSV format
- SmartMeter Event Monitoring and Notification

**SCALABLE ARCHITECTURE**

- Java 2 Enterprise Edition (J2EE) Standards
- XML
- Multi-Tiered Development Architecture
- Standards Based Open Architecture

**SECURITY**

- User Authentication
- Multi-level User Authorization
- Security Violations and Logon Tracking
- Database Record Auditing and Change Tracking
- System Auditing
- System Activity Logging

**INTERVAL AND REGISTER DATA INTERFACES**

**S-XML**

The S-XML format has been created by Itron to transport all register and interval data in a standard XML format.

**Delimited Format (IDF)**

The IDF format has been created by Itron to serve as a standard interface of register and interval data between TMS and multiple Itron applications (MRAS/IEE, Integrator, P4, etc.).

**Hand-Held Reader File Format (HHF) – Version 2.8**

Itron designed the HHF format to provide a mechanism to upload meter data from various vendors’ hand-held readers into the MV-90 translation system but has been adopted for transferring data between non-handheld systems as well.
**PRODUCT FUNCTIONALITY MATRIX**

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<th>FUNCTIONALITY AND FEATURES</th>
<th>A3</th>
<th>SENTINEL</th>
<th>kV2c</th>
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**MV-90 Mainframe Format**

Itron originally designed the MV-90 Mainframe File Format to upload meter data to mainframe computers. This format has been adopted for interfaces to non-mainframe systems as well.

**Real-Time Export (RTE)**

The Real-Time Export format provides near real-time availability to meter data by supporting the export data at high frequencies as data is returned to TMS via the Real-Time Interval Retrieval interface.

**INTERVAL DATA ONLY INTERFACES**

**California Metering Exchange Protocol (CMEP) – Version 1.20**

The California Metering Exchange Protocol (CMEP) is an industry standard intended to transmit gas and electric utility metering, billing and administrative information between companies. TMS supports the transfer of Electricity Interval Data via the MEPMD01 (version 1.20) record type.

**LodeStar Enhanced Format**

The TMS LodeStar Enhanced export contains load interval data in a format compatible with C/S LodeStar, a load research system used by many utilities to collect, manage, analyze and store load profile data.

**REGISTER DATA ONLY INTERFACES**

**Register Data Export (RDE)**

The Register Data Export format has been created by Itron to serve as the standard output of all Register Read and Time-Of-Use (TOU) Data from TMS.

**Billing Transfer File (BTF)**

The Billing Transfer File format exports all register information, including totals, maximum demand and TOU rates.

**CUSTOM INTERFACES**

Itron can create custom export interfaces to best meet each customer’s specific requirements.
At Itron, we're dedicated to delivering end-to-end smart grid and smart distribution solutions to electric, gas and water utilities around the globe. Our company is the world's leading provider of smart metering, data collection and utility software systems, with over 8,000 utilities worldwide relying on our technology to optimize the delivery and use of energy and water.

To realize your smarter energy and water future, start here: www.itron.com