MetrixIDR™ System Operations

Automated Forecasting System

MANY NEEDS – ONE SOLUTION

Timely delivery of accurate forecasts is essential for making the critical decisions required by today's energy markets. Itron is at the forefront of delivering short-term load forecasting systems that deliver accurate forecasts fast, giving you the timely knowledge and support to make the right decisions for your business.

MetrixIDR, Itron's short-term load forecasting solution, provides the most flexible and accurate forecasting system available on the market.Typical retail forecasting applications include:

MetrixIDR Delivers

» Unparalleled forecast accuracy
» Custom archiving and reporting
» Real-time review and editing of forecast inputs and results
» Seamless integration with existing business processes

Leading energy forecasters employ MetrixIDR's short-term forecasting capabilities for:

» Day-ahead forecasting of electric loads for generation scheduling
» Same-day electric forecasting for unit dispatch
» Daily or hourly gas send-out forecasting
» Short-term market price forecasting

knowledge to **shape your future**

THE SOLUTION FOR ALL YOUR NEEDS

MetrixIDR System Operations forecasts loads and generation at the 5, 10, 15, 30 or 60-minute level.

The system is designed for the following high-level forecasting tasks.

> Forecasting Problem Configuration

Manages the list of regions, areas, zones,MILs, generation end points, weather stations and exogenous forecast drivers that define the forecast problem.

> Forecast Data Gathering and Storage

Imports load, generation, weather, calendar, and exogenous forecast driver data and stores these data for data analysis, model estimation, forecast generation and performance evaluation.

> Forecast Model Development and Maintenance

Enables data analysis, model variable construction, model specification, model estimation and model evaluation.
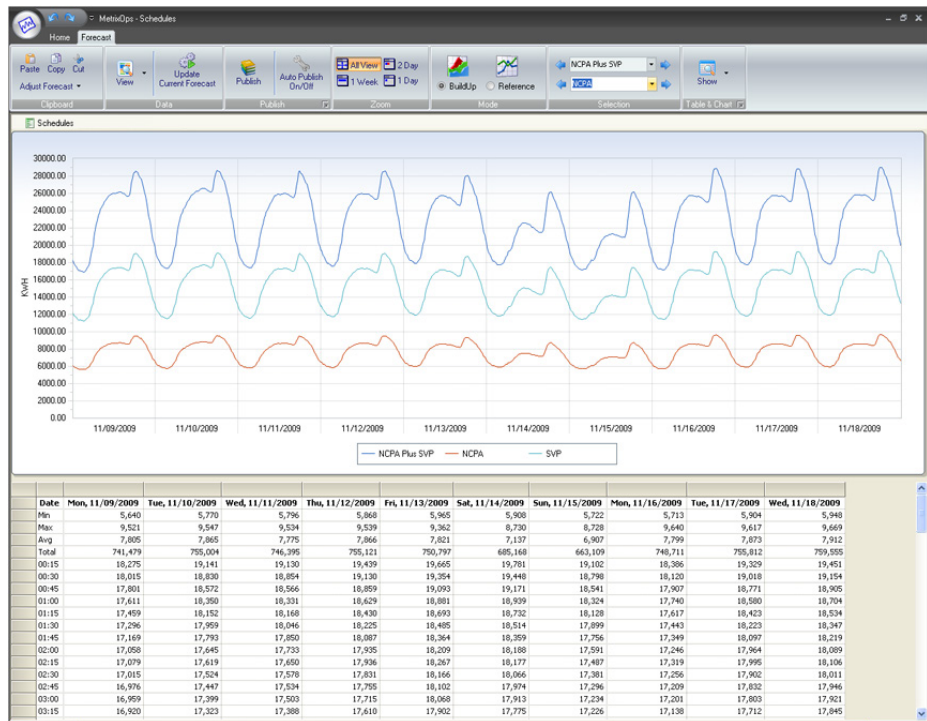
> Forecast Generation

Supports automatic computation of load and generation forecasts that define the forecast problem.

> Forecast Monitoring, Editing and Publishing

Provides real-time monitoring, editing and publishing of the load and generation forecasts that are produced by the system.

In many organizations, these distinct tasks are handled by different analysts and even different groups within an organization. The skills required to build and maintain forecast models are not necessarily the same skills required to monitor the real-time forecasts and make appropriate operating decisions. To Itron, this means that a software tool designed to make building accurate forecast models easy is not necessarily the right tool for forecast monitoring and problem configuration. As a result, MetrixIDR is composed of four software components. These components, described below, communicate with each other through a common application database.

> MetrixIDR System Operations

> MetrixIDR Client

Allows the forecast administrator to configure the forecasting system and model properties, review and analyze data, assign model templates and estimate models, review weather and load forecasts, and monitor overall forecast and system performance. MetrixIDR is a two-tier client application that uses Oracle or SQL Server as the application database. MetrixIDR Client handles the tasks of forecast problem configuration, data gathering and storage and forecast generation.

> MetrixIDR Server

Provides services to the MetrixIDR and Forecast Monitor Clients, including authorization and authentication, forecast processing, forecast publishing, and monitor catalog services. In addition, MetrixIDR Server, which can be deployed on one or more application servers, contains a task scheduler and batch processor which enables the automation of tasks including meter and weather data import, forecast generation and forecast export/publishing. MetrixIDR Server includes a configuration applet which allows an administrator to manage and load balance application servers, services and scheduled tasks. Support for automatic server failover is provided when MetrixIDR Server is deployed on multiple application servers.

> MetrixND®

The statistical engine used to configure model specifications and to execute forecast calculations. MetrixND handles the task of forecast modeld evelopment and maintenance. MetrixND is a flexible modeling tool, widely used by energy forecasters at leading utilities and energy providers throughout the world. As part of the system implementation, Itron creates the best models possible with your data using the most advanced modeling techniques that are available in MetrixND.

MetrixND modeling techniques include:

-Exponential Smoothing

Ideal for projecting customer growth trends that support monthly sales and peak forecasting applications.

-ARIMA

For seasoned time series professionals who want to visualize how historical data patterns extend into the future.
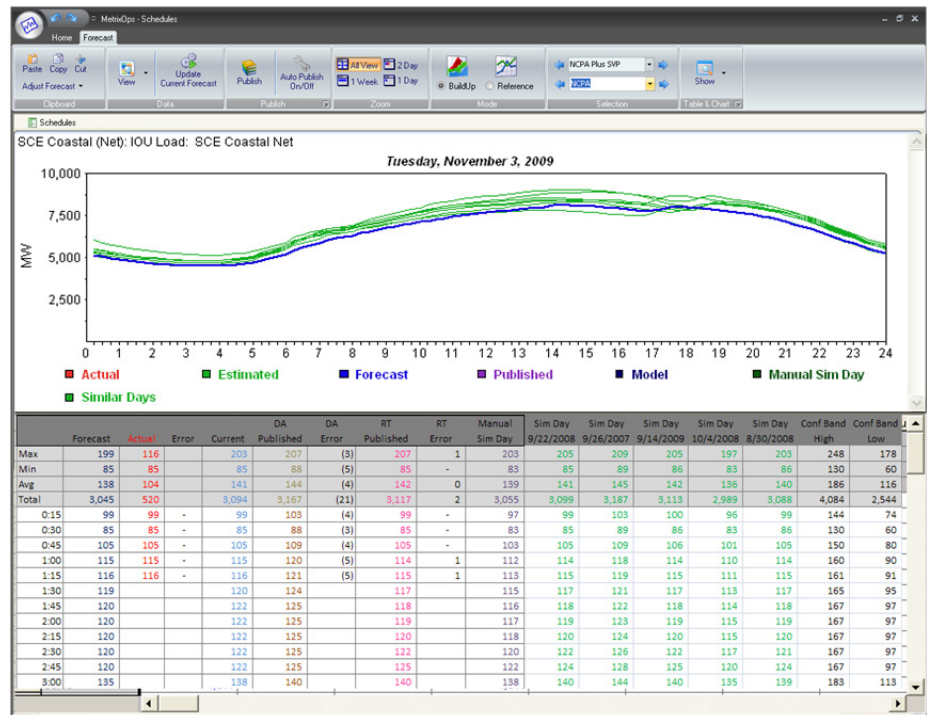
-Regression

Regression is the workhorse of the energy forecasting professional. No other tool lets you build multi-variate models faster.

-Neural Networks

Essential for short-term forecasting where modeling the nonlinear response between loads and weather matters the most.

> Forecast Monitor

Allows the forecast operator to view, modify and publish, in real-time, the load and generation forecasts generated by MetrixIDR. The Forecast Monitor dashboard provides the forecast operator with key alerts and messages, making the forecaster aware of current and future events that will require action. The Forecast Monitor dashboard handles the task of forecast monitoring, editing and publishing.

> MetrixIDR System Operations

UNPARALLELED CAPABILITIES

Customized Configurations

MetrixIDR can be configured to forecast loads, generation and prices from minutes ahead to several months or even years out for a list of regions, areas, zones, major industrial loads and end points. With MetrixIDR, the forecast model is tailored to your needs, allowing you to use the most accurate methods to meet your specific requirements.

Integrated 5-Minute Data Filtering & Forecast Engine

MetrixIDR's 5-Minute Modeling Engine integrates Itron's Two-Stage Modified Kalman Filter with an industry leading forecast engine that builds 5-minute level load forecasts. The forecasts are built from a combination of load level models that launch off real-time SCADA data and ramp rate models that capture systematic patterns in the 5-minute load deltas. The near-term 5-minute forecasts blend seamlessly into day-ahead forecasts providing a single continuous forecast from 5-minutes ahead out seven days or longer.

Weather Forecasts

MetrixIDR can import, via the Internet, weather forecasts from one or more weather stations and one or more weather service providers. All weather concepts are supported, including temperature, humidity, dew point, cloud cover, wind speed and precipitation.

Prior-Hour Loads

MetrixIDR can be configured to use prior-hour loads to drive the forecast. This capability is useful for very short-term forecasting.

Error Trapping

Built-in validation routines flag errors in weather and load data.

Multiple Regions

Multiple-region forecasts can be calibrated to tie out to a forecast for the system total, or they can be aggregated to give the forecast for the system total.

UNPARALLELED CAPABILITIES

Major Industrial Loads

Forecasts for large customers can be treated separately.

Forecast Uncertainty

High and low forecasts that account for weather forecast and model uncertainties are available.

Similar-Day Module

The forecast operator can use the similar-day results to compare forecasted loads to days with similar weather and calendar conditions, as well as to modify the forecast if necessary.

Online Review and Editing

A variety of online Quick Edit tools are available for refining the model forecasts.

Publishing

Forecast results and corresponding weather data can be published by the forecast operator to a variety of file formats, including custom formats to support downstream applications.

Advanced Security

The system administrator can define an unlimited number of user roles. Each user can be defined with a very detailed level of functionality relevant to their needs, including visibility and access to specific data elements.

Services Management and Failover

A Service Management module of the system is used to add, configure and monitor MetrixIDR application servers and services, manage work flows and task priorities, and manage the server failover priority list.

Integration with Existing Databases

MetrixIDR can be tailored to work with your existing databases, including Itron EE Meter Data Management, MV-90xi, ORACLE and Microsoft SQL Server. Accurate forecasts provide a quick payback on your investment, so why wait? Act now and have a system in place before your peak season.

A Knowledgeable User Community

Hundreds of utilities, ISOs, municipals, cooperatives and other energy service providers use Itron's MetrixND. Licensed users have unique access to industry experts in energy forecasting. Additional benefits include a newsletter that keeps you abreast of the latest forecasting techniques, and an annual meeting that covers the latest trends in energy forecasting and brings you together to network with industry peers.

For additional information or to view a demo, visit www.itron.com/forecasting, call 1-800-755-9585 or email forecasting@itron.com.