# Distributed Intelligence

Intelligence that Empowers

The utility industry is undergoing a transformation. The future of our modern grid is dependent on leveraging more distributed intelligence (DI) at the grid edge to help manage growth, stability and safety.

WHAT IS DISTRIBUTED INTELLIGENCE?

Distributed intelligence (DI) is the ability to solve value-based use cases at the grid edge through a secure, open enterprise application platform with edge computing capability. Gain unprecedented insights while detecting impedance intolerances, right sizing transformers, discovering theft and enabling power quality in order to address and solve challenges with edge intelligence.

INTELLIGENT DEVICES + INDUSTRIAL IoT NETWORK + APPLICATIONS, SOFTWARE & SERVICES = DISTRIBUTED INTELLIGENCE
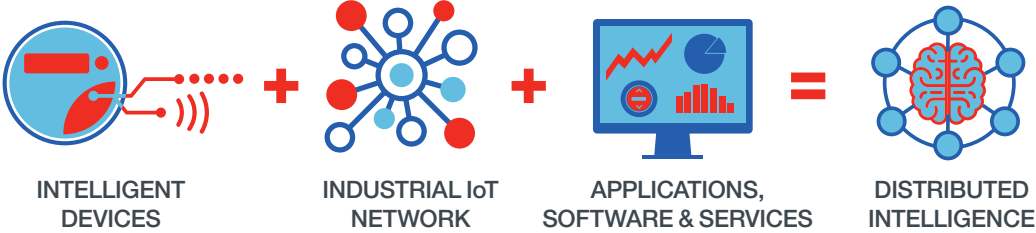
Using smart endpoints (meters, devices and other sensors) with peer-to-peer connectivity, leveraging a secure and resilient industrial IoT (IIoT) network, applications can be downloaded to devices in the field to solve challenges and upgrade functionality. The concept is similar to a consumer-based mobile phone or tablet device that uses an operating environment and runs various applications.

But unlike consumer-owned devices, Itron's DI platform focuses on utility customers and their management of the electric grid, with applications for **grid optimization, asset management,** **distributed energy resource (DER) integration** and **consumer engagement**. Additionally, DI leverages an open platform that supports third-party innovation with an API development kit, enabling an ever-increasing ecosystem of partners to create their own value-driven, custom applications.

Distributed intelligence effectively moves grid analysis, decision-making and control to the grid's edge, resulting in a significant reduction in latency of action, greatly improved situational awareness, more accurate analysis and advanced event detection.

SITUATIONAL AWARENESS
Gain the information you need before you need it. DI delivers real-time, edge intelligence to help you anticipate potential breakdowns across the grid.

A NEW APPROACH
Leverage new insights to operate more efficiently, increase ROI through better asset management and maintenance, and improve CAIDI and SAIDI metrics.

UNPRECEDENTED INSIGHT
Proactively plan and deploy critical infrastructure to ensure a highly reliable, resilient distribution grid with sophisticated control capabilities.

THE APPLICATION ADVANTAGE

Itron's distributed intelligence platform leverages applications to address common utility challenges or use cases. Each app has its own value proposition and is purpose-built to solve a specific market problem—such as **improving customer safety, reducing operating expenses, increasing capital asset lifetime and enhancing operational efficiency**. And when combined, they can greatly increase the overall value stack of your DI investment.

DI applications can be downloaded by utilities from our Enterprise Application Center to devices in the field to enable new functionality and new value.

GRID MANAGEMENT DI APPS

Active Premise Load Shedding

DI Premise Load Shedding provides you the ability to do targeted load shedding without the need to load shed entire feeders. It decreases the chances of you accidentally disconnecting critical customers such as hospitals, medical services and those on hospice care.

Active Temperature Monitoring

Active Temperature Monitoring finds potential meter jaw problems before they create a safety hazard or cause an unplanned outage. By using temperature readings from the meter correlated with load, weather, meter location, meter orientation and radio usage (all of which generate heat), Active Temperature Monitoring can accurately predict meter jaw problems, micro-arcing and other potential safety issues with customers' meter sockets.

Active Transformer Load Management

Active Transformer Load Management provides protection and extended life for distribution transformers by continuously monitoring total load on the distribution transformer in both directions and actively controlling consumer loads and distributed generation to maintain loads within safe operating limits. Total transformer load is computed through continual data sharing among all meters on the transformer.

Active Transformer Load Monitoring

Active Transformer Load Monitoring provides information and insight that can extend the service life of distribution transformers by continuously monitoring their bi-directional loads. Using information provided by Active Transformer Load Monitoring, you can activate load control programs to keep your distribution transformer loads within the rated operating limits. Total transformer load is computed through continual data sharing among all meters on the transformer.

Active Transformer Voltage Monitoring

Active Transformer Voltage Monitoring provides highly configurable, threshold-based voltage monitoring at the transformer. It provides events and alarms based on actual measured voltage as well as self-determination of applicability as a transformer voltage spokesmeter, based on historical voltage trends, feeder reliability and communication network connectivity.

Bellwether Voltage Monitoring

Active Voltage Monitoring provides highly configurable, threshold-based voltage monitoring, events and alarming based on actual measured voltage and locally computed primary (MV) voltage, as well as self-determination of applicability as a voltage bellwether, based on historical voltage trends and communication network connectivity.

GRID MANAGEMENT DI APPS (CONTINUED)

DNP3 Client

DNP3 Client provides network connectivity between a GenX spokesmeter and an ADMS system. DNP3 client is intended to translate low voltage network information into a DNP3 native format, pushing that information to your ADMS system. This enables the ADMS to have visibility of events and activities on the low voltage network behind the "spokesmeter".

High Impedance Detection

High Impedance Detection provides detection of high-impedance connections (poor electrical connections) in your low voltage (LV) secondary distribution. High-impedance connections cause customer voltage flickers, interruptions and potential fire risks. Early detection allows maintenance work to be scheduled rather than corrected through one-off trouble calls and for the condition often to be resolved before impacting your customers.

Location Awareness

Location Awareness provides the electrical location of every meter on the distribution grid, including transformer, phase and feeder. This information is used by multiple DI Apps and is also delivered to the back office for update and validation of GIS connectivity, improved outage response, feeder phase balancing and multiple other grid applications.

Meter Bypass Detection

Meter Bypass Detection provides detection of bypass tampering at the electricity revenue meter where jumpers are placed around the meter to bypass collection of some consumption so that the consumer's bill is reduced.

Storm Mode

Storm Mode provides more rapid and accurate identification and location of major outages by optimizing the use of the communication network for outage messages during storm conditions. Communication network statistics and Location Awareness are used on each meter to select optimal bellwether meters for outage notification and detection. During storm mode, only bellwether meters will report outages, maximizing the likelihood that highest priority outage messages will be received.

CONSUMER ENGAGEMENT DI APPS

Smart Payment

Smart Payment enables prepay consumers to customize timing of alerts that provide real-time insight into the remaining balance on a consumer's pre-paid account. It also delivers estimated projections for how long it will take the consumer to hit their balance at the current consumption rate.

DISTRIBUTED ENERGY RESOURCES DI APPS

EV Awareness

EV Awareness provides detection of electrical vehicle charging at a premise and calculation of time-series usage profiles. This can be used for multiple consumer marketing programs aimed at providing the best possible experience for electric vehicle owners.

Solar Awareness

Solar Awareness provides detection of solar generation at a premise and calculation of time-series profile of solar generation behind the revenue meter. This can be used for detecting illegally connected generation, offering of marketing programs associated with generation, estimating generation standby requirements for cloud cover, etc. and multiple other programs.
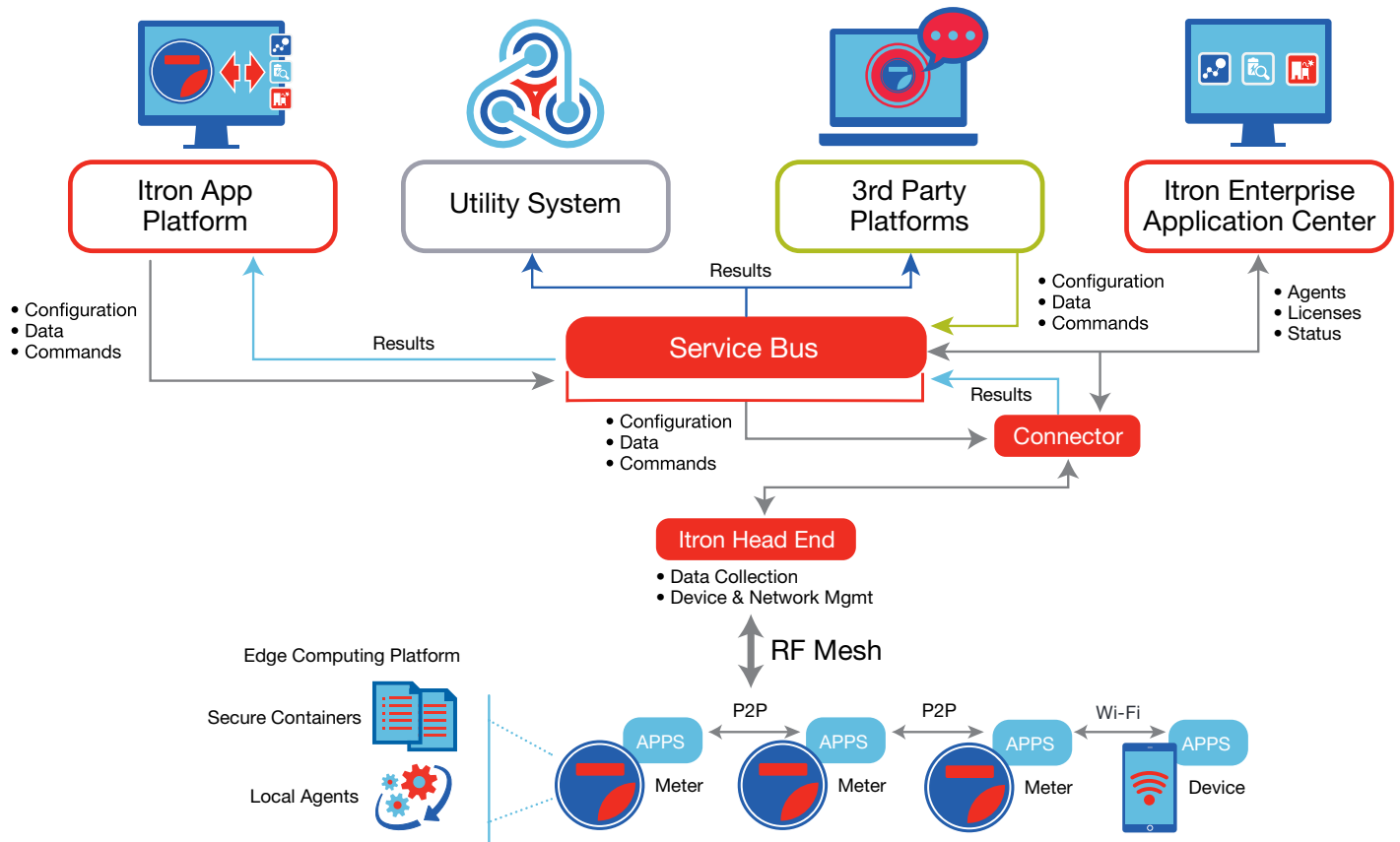
The Right Technology for Tomorrow—Ready Today
Learn what it takes to deploy distributed intelligence in the field, today.

Deploying Itron's Distributed intelligence platform requires components that are a part of every next-generation AMI upgrade.

Using an Itron Riva DI-enabled or third-party meter with a Riva network interface card (NIC), connected to a Gen5 router, provides local area connectivity, while the Gen5 router creates a backhaul to the utility back office.

The Itron DI platform, coupled with the Itron Enterprise Application Center, allows you to access numerous applications and benefit from new insights, increase operational efficiency and ensure reliability of your electric grid.

Itron App Platform

Utility System

3rd Party Platforms

Itron Enterprise Application Center

Results

- Configuration
- Data
- Commands

Results

Service Bus

- Configuration
- Data
- Commands

- Configuration
- Data
- Commands

- Agents
- Licenses
- Status

Results

Connector

Itron Head End

- Data Collection
- Device & Network Mgmt

RF Mesh

Edge Computing Platform

Secure Containers

Local Agents

P2P

APPS
Meter

P2P

APPS
Meter

APPS
Meter

Wi-Fi

APPS
Device

Unlock Innovation through an Ecosystem of Partners

With IIoT expertise and an open DI platform, innovators around the world are joining the Itron Partner Ecosystem to deliver best-in-class solutions to today's challenges. You can realize proven value today with smart grid applications that allow innovators to build open, interoperable, value-driven outcomes—including smart home and distributed energy resource management (DERMS) offerings—that evolve with market and consumer demands.

DI DEVELOPER PROGRAM MEMBERS

Join us in creating a more **resourceful world**.
To learn more visit **itron.com**

CORPORATE HQ

2111 North Molter Road
Liberty Lake, WA 99019 USA

Phone: 1.800.635.5461
Fax: 1.509.891.3355