Utility assets are diverse, complex, and usually spread over large geographical areas. The Internet of Things (IoT) is expanding the boundaries of managing a network of connected grid assets.

Intelligence across the asset network is the key to innovation, customer centricity, and operational efficiency in an era of internet-connected devices

As utilities gradually move away from age-related maintenance schedules and visual inspections, they are investing in new technologies including remote asset tracking and monitoring, preventive maintenance, condition-based monitoring, and predictive maintenance to drive efficiencies and cut costs. In addition to addressing operational efficiency in asset management, utilities are also focusing on value creation through customer-centric operations and new revenue streams.

Utility assets are diverse, complex, and usually spread over large geographical areas. Commissioning a new asset or replacing an old asset before it has reached functional failure is expensive. Failure or the unavailability of critical assets may lead to delayed operations, monetary losses, and poor customer service.

The Internet of Things (IoT) is expanding the boundaries of managing a network of connected grid assets. IoT-enabled asset management enhances areas of asset maintenance, field operations, outage management, and planning through the continuous, real-time monitoring and reporting of critical assets. A single, cloud-based repository to store and analyze data from various operational and business applications, created through the use of IoT sensors and third party sources will significantly change the monitoring and management of mission-critical assets.
An IoT-based solution unlocks hidden potential by tracking mission-critical assets while preventing failures

Capgemini has partnered with Intel to develop an end-to-end solution for tracking the asset lifecycle that will reduce expensive preventive maintenance, offline utility outages, and resource-intensive costs.

The open, XIoT-based solution captures different types of data from different types of sensors, business applications and IoT devices to monitor the globally dispersed asset network. In aggregate, these devices provide instant snapshots of asset health and performance by collecting information such as condition, age, location, vibration, flow rates, pressure, temperature, and other operational characteristics. The integrated system monitors critical assets such as power quality units, static compensators, transformers, and critical mobile units in power plants. Tracking data from “hundreds of conditions” is used to detect deviation from normal conditions to trigger an alert for an investigation. The closer the alert timing is to real time, the quicker an investigation is triggered, preventing potential failures, eliminating workforce hazards, and minimizing physical damage.

This solution provides significant benefits to utilities by:

- Reducing costs in field and plant operations by improving availability and reliability
- Minimizing financial and safety risks by avoiding equipment failure and providing enhanced asset performance
- Enhancing competitiveness by implementing intelligent, long-term asset strategies covering asset planning, asset resilience and asset creation
- Capitalizing on market opportunities while exploring new revenue streams and commercial models through real-time insight into connected, mission-critical assets across the business network

Figure 1: XIoT- World class secured IoT platform
The XIoT is a security
The Intelligent Asset
With our end-to-end IoT
The XIoT platform
Intel Security software is installed on
cloud, which hosts the Capgemini XIoT platform and the critical
connect sensors embedded in critical assets to the public
actions and insights.
This solution analyzes and integrates
the data sent from each asset before recommending precise
actions and insights.

Key components of the end-to-end solution include:

1. **Edge Devices**: IoT sensors monitor and track critical asset health and performance.

2. **Edge Gateways**: Intel® IoT Gateways live at the edge of the network on the end customer’s premises. The Intel IoT Gateways provide pre-integrated, pre-validated hardware and software building blocks that connect and operate with both legacy and new systems, enabling seamless and secure data flow between edge devices and the cloud. This technology offers leading performance and security for intelligence at the edge.

3. **XIoT Edge for Device Connectivity**: The XIoT Edge Agent installed on the Intel® IoT Gateways helps identify and provision sensors for data aggregation and transmission to XIoT Middleware. The XIoT Edge supports a comprehensive set of communication protocols with over 100 plug-ins between heterogeneous devices.

4. **XIoT Middleware for Device Management**: Capgemini XIoT Middleware is installed in the cloud or on site. It manages data flow from multiple gateways to enable device management and provisioning, firmware upgrades, fleet management, message management, health monitoring, and event processing. The connector library in the XIoT middleware drives data synchronization between systems.

5. **Cyber Security**: Intel Security software is installed on each gateway and in the IoT middleware in the cloud. Intel security components implemented in the hardware makes it extremely difficult to tamper with. It handles device attestation, configuration and management, asset information, policies, and metadata. The end-to-end cyber security capabilities embedded across the network from end point devices to the cloud ensure the highest level of cybersecurity preparedness to tackle security breaches of any magnitude.

6. **XIoT Intelligent Asset Monitoring**: XIoT analytics provide a real-time, graphical representation of asset health, utilization, and availability to help utilities implement remote visual monitoring and alarm response management. This application includes an emergency management dashboard using real-time 2D and 3D analysis of geospatial data to gain additional intelligence into the location and health of critical assets including mobile assets.

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**Partner with Capgemini and Intel to create higher value-add potential**

The proven Capgemini XIoT solution with Intel technologies marks a new era in industrialization and innovation, providing organizations with the ability to automatically collect and analyze data from connected devices, sensors, machines, and people as well as take appropriate actions. The fully integrated combination of Intel's hardware, software, and security ecosystem with Capgemini's XIoT middleware and analytics capabilities provides a unique, business-case oriented, and secure end-to-end IoT platform solution, available “as-a-service” and ready for industrial deployment.

1. **Scalability, Agility, and Innovation**: The XIoT platform architecture is based on standardized and open IoT reference architectures. It is capable of connecting millions of assets across the globe. With a defined, repeatable foundation for device connectivity, edge-to-cloud data delivery, and reduced complexity, customers can scale and grow the solution for business agility and continue to innovate on a future-proof platform.

2. **Best-in-Class Data Security**: The XIoT is a security accredited IoT platform that provides end-to-end data security from edge devices to the cloud. Security is managed at each level in the architecture.

3. **Flexibility and Accelerated Time-to-Value**: The XIoT platform can host analytics from any source and provides purpose-built accelerators that overcome the barriers of cost and complexity to decrease the time-to-value. The XIoT platform offers flexibility to integrate third party components and choose from a myriad of major cloud service providers. The platform is modular to easily integrate separate components such as analytics or big data providers. XIoT can be deployed on a private, hybrid or public cloud.

4. **Integrated Pricing Model**: The XIoT platform bundles hardware, IoT applications, and systems integration services and is provided as a service with an end-to-end pricing model. Clients don’t have to pay an up-front fee to access the platform.

5. **Value-added Digital Services**: The Intelligent Asset Monitoring solution features more than just the XIoT platform advantages. It offers end-to-end cloud-connected digital services that help fully integrate disparate systems across IT/OT areas.

6. **End-to-end IoT services**: With our end-to-end IoT services, we guide you through every step of your journey to digital transformation excellence in asset optimization. Our repertoire of services includes IoT strategy, innovation portfolio management, solution design and delivery, rapid concept and design prototyping, and global deployment. With Capgemini and Intel, you can be confident in choosing solutions that are efficient, security-accredited, and focused on driving business outcomes that keep you ahead of your competition.
Key Client Successes

French Nuclear Operator EDF deployed the XIoT platform to enable smarter, safer monitoring and maintenance for two nuclear plants. They are considering extending the solution beyond just reactor maintenance routines to plant-wide tracking for other high value assets and tools. Focused on EDF’s safety and efficiency requirements, Capgemini created an asset tracking system that increases asset availability and operational efficiency. Previously, EDF had no remote system for monitoring the location of essential mobile air supply safety units, and regular maintenance relied on paper-based records or off-line handling systems. These manual methods led to time wasted on sourcing units for work crews. Now, EDF’s maintenance teams can immediately view the location and status of every single unit in an area spanning three floors, with each floor measuring 1000m². Replacing the paper-based record-keeping system has increased the efficiency of daily inspections, as maintenance personnel now know each unit’s exact location and working status.

About Capgemini Utilities Sector

Capgemini is a long-established leader in the energy space. Our 16,000 dedicated utilities consultants leverage the latest in social, mobile, analytics and cloud technology to transform your utility into an energy services company. With our u2es Transformation program and Digital Utilities Transformation framework, we prepare today’s utilities for tomorrow. Our Smart Energy Services practice manages millions of smart meters and has successfully helped deploy hundreds of millions of these meters around the world. We have extensive experience in deploying and managing end to end IoT services globally.

Contact Us:

Interested in learning more about making the Internet of Things work for you? Capgemini and Intel are ready to help you jumpstart the implementation of intelligent asset strategies for lasting competitive advantage. Get started with a workshop or a meeting today!

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