As Smart Grid devices with communications capabilities proliferate on the distribution network, utility network operators face new challenges managing this large number of smart devices.

As thousands, if not millions, of smart meters and other Smart Grid devices become operational and communicate automatically to the control center, simple databases, or even paper-based spreadsheets, aren’t sufficient to track these grid assets, let alone proactively manage and control these devices. Challenges include:

1. **Tracking networked assets on the grid** – workflows to monitor the networked ecosystem. Utilities are facing challenges in tracking influx of smart meters, grid sensors, communication concentrators and the complex relationship among them.

2. **Fine-tuning and automating smart meter operations** – Ability to manage, report, and confirm tasks is related to smart meter operations such as firmware upgrades and configuration management.

3. **Track/audit any and all changes to these networked, microprocessor-based devices** – Smart Grid devices literally have hundreds of configuration parameters. For auditing/reporting purposes, operators need to record and track any and all changes to all devices, for compliance, security, and auditing purposes.

Advanced Device Management (ADM) is a new EnergyIP 8 platform application focused on managing networked Smart Grid devices. It manages communications to networked devices and AMI network operational workflows such as installation, maintenance, removal, and handling complex tasks such as firmware upgrades and device configuration changes. It fills some feature gaps in today’s headend systems, such as network management, device provisioning, and device topology management. It also serves as the system of record for device knowledge available via the communications network.

ADM continues EnergyIP’s tradition of excellence focusing on automating tedious, error-prone manual tasks. As such, it focuses on networked Smart Grid devices with communications capabilities, including Data Concentrators, Meters, Gateways, and PAN devices, and tracks the complex interrelationships among these devices. It supports certain aspects of asset lifecycle tracking, but primarily focuses on traceable items – e.g., devices with serial numbers – and thru networked lifecycle stages (deployed, communicating, offline, etc.) rather than traditional asset management stages (warehouse/freight location, etc.), which are well handled by enterprise asset management systems. In particular, it automates complex workflows to manage devices through events, communications, and action rules, with auditable records of device configuration history and updates. It can also store meter test results.
The first release of ADM is focused on advanced network management functionality to complement/enhance headend systems, including:

- **Campaign Management**: customizable, template-based means to execute actions to a group of devices using the same business rules, e.g., issuing ODR (On Demand Reads) commands to a group of meters, or a Firmware Upgrade campaign deploying one, unique firmware image to multiple devices of same type, manufacturer, model, version.

- **Firmware Upgrade**: capturing firmware images and associated device attribute requirements from manufacturers; publishing firmware images to devices; and executing the firmware upgrade with proper methods to confirm proper installation or rollback in case of failure.

- **Configuration Management**: device configuration changes can be for billing purposes (typically initiated by CIS) or network management, e.g., setting alarm threshold on meters to report overvoltage conditions (typically initiated by grid management systems).

- **Census Operations**: scheduled census for device configuration, communications topology, and device attributes. It queries for “As found” configuration from devices and compares with “As Expected”, with automated rules to handle exceptions.

Note that ADM features necessarily rely on the corresponding device capabilities, e.g., ADM can’t upgrade firmware to meters without such capability.