Fluentgrid UHES™

Product Feature Guide

Version 5.0

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Contents

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Overview

UHES can support millions of endpoints across multiple device vendors, types, models, firmware versions, protocols, and communication methods. UHES provides a secure management platform that acts as a control and data plane for all device interactions and complies with device network monitoring systems.

Application is suitable to support the collection and storage of data for smart meters through different communication technologies. Fluentgrid UHES™ is based on a platform that can be deployed in a distributed architecture for scalability to enable utility to deliver on its vision for AMI with the technology flexibility required to handle all possible deployment regional topologies – high density, medium density, and low density.

Maintain complete meter/consumer history through the entire life cycle.

Featured with system level configurations and Meter/Device level configurations.

Client mode communication to Meters to pull data. Listener is enabled to receives alarms from Meters.

Master Data Management

Configurations

Communication Module

UHES

Reporting

Protocol Management

Exhaustive reporting system meets with business needs.

Featured with different protocol adaptors to integrate different meter makes with respective protocols.

Dashboards

Network Monitoring System

Service/ Business Layer

Rich UI/UX with multiple dashboards for communication statistics and KPI monitoring.

Monitor the devices such as NIC/RF nodes and DCU and the login/logout status.

A complete service-based layer having interoperability with other platforms to exchange data with other applications like MDMS.

Master Data Management

Maintains the Complete life cycle of Consumer-Meter relation form Meter installation/ Replacement to Dismantle/Removal of the meter. The complete process of replacement of the meter, installation of new meters and allocation of meters streamlined with the integration of internal and external systems (Asset Management, CIS, etc.)

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Add Meter  →  Install/ Replace  →  Assign with IP Address  →  Remove/Dismantle
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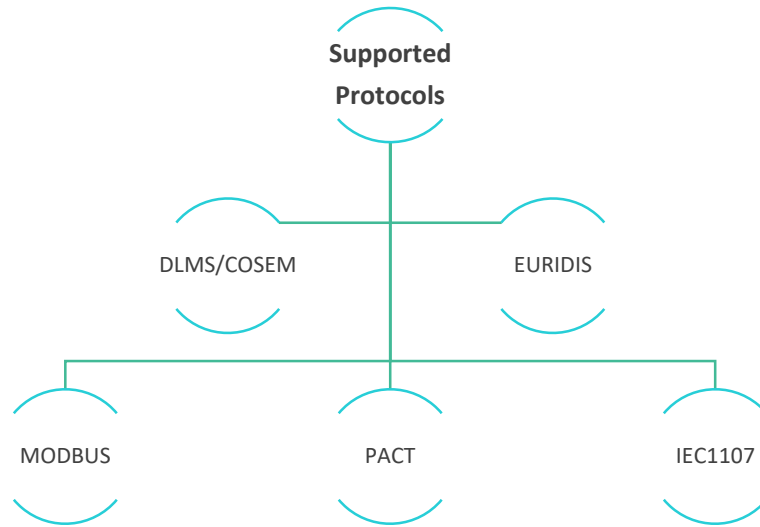|	
Meter Make Details	Provision to add new Meter Make Details and update /delete existing configured Meter Make Details.
Meter Details	Meter Types along with the required details, their connections, meter capacity, meter stock and supplier details are configurable in the system either with/without the integration.
Meter Attributes	Maintain meter attributes which are changeable Ex: LP Capture Period, Demand Integration Period, Billing date, Metering Mode, Payment Mode, Relay Status, Lat-Longs, Meter Seals, etc.
Field Device Details	Maintain Field Device details like NIC/Node ID, Meter assigned to, SIM No. IP Address to communicate with and other required details.
Consumer Details	Configuring new Meter Current & Potential Transformer details and updating/Deleting available Meter Current & Potential Transformer details.
Meter Replacements	Replacement of a damaged, defective, or tampered meter after proper approval and authorizations. The system also supports replacements of meters from Prepaid to Post-paid and vice versa.
Meter Removal	Replacement of a damaged, defective, or tampered meter after proper approval and authorizations. The system also supports replacements of meters from Prepaid to Post-paid and vice versa.
Office Hierarchy	Defining the Hierarchy like DISCOM, Circle, Division, Sub-Division, and their parameters required for proper mapping or creation the relation.
Network Hierarchy	Defining the Hierarchy for Network elements and their relation such as Sub-station to Feeder to DTR mapping and other details like Element capacity, Element Codes would also be maintained in sync with GIS system.
User and Role Masters	Provision to add Users and their Roles, configuring the necessary user details and permitting the respective access to the user based on RBAC. The system allows the admin to update or modify user details including removal of access.
Forgot password	The system is well integrated with SMS and Email facilities, and so the recovery of password and username is made easier with necessary predefined functionalities by sending and confirming user details to the registered mobile no. Or email id.

Communication Module

HES communication layer acts in both server and client mode. Continuous server mode is enabled to receive the data pushed from the smart meters. Whenever commands are initiated from HES in pull mode HES communicates through client mode to fetch the data.

| On-demand Client Mode	This mode of operation is used to fetch the meter data on-demand for a Single or a group of meters.
Scheduler Client Mode	This mode of operation is used to fetch the meter data at triggered schedules for a group of meters.
Control Operations client Mode	This mode of operation is used to process the control commands such as connect/disconnect for meters. This mode is defined as high Priority Mode.
Configurations Client Mode	This mode of operation is used to process the configuration commands such as configuring Payment mode, Metering mode, Reset date, etc., for meters. This mode is defined as next Priority after control Mode.
Data listener Mode	This mode is a continuous process to receive the data pushed by meters through DCU, NIC, Gateways.
Alarm Listener Mode	This mode is a continuous process to receive the Alarms pushed by meters through DCU, NIC, Gateways.

Protocol Manager

HES is featured with different protocol adaptors to read or to parse the data fetched or received from different meter makes with respective protocols. Each meter protocol is identified based on the master data available in CMDS module against meter details. HES is flexible to develop and integrate different protocol adaptors independently as per the customization requirements.

```
                        Supported
                        Protocols
                            │
         ┌──────────────────┼──────────────────┐
     DLMS/COSEM                             EURIDIS
         │                                      │
    ┌────────────────────────┼────────────────────────┐
  MODBUS                    PACT                     IEC1107
```

DLMS/COSEM	Featured with complete DLMS Engine with COSEM layer. Feasible to frame commands based on configured obis codes. Compatible with IS 15959 Part I, II, III standards and IS16444 standards.
EURIDIS	Support EURIDIS protocol Engine. Can add any new parameter on the fly and can read the meter.
MODBUS	Support MODBUS protocol for network meters through AMR metering based on RS485 communication.
PACT	Support PACT protocol for HT consumers through AMR metering based on RS232/optical communication.
IEC1107	Support IEC1107 protocol for HT/LT consumers through AMR metering based on RS232/optical communication.

Network Monitoring System

Application is enriched with Dashboards with summarized statistics of all the network devices and display of Alarms from devices. This system is featured with configuring the thresholds to trigger the alarms and to notify the user based on the configurations at each event level.
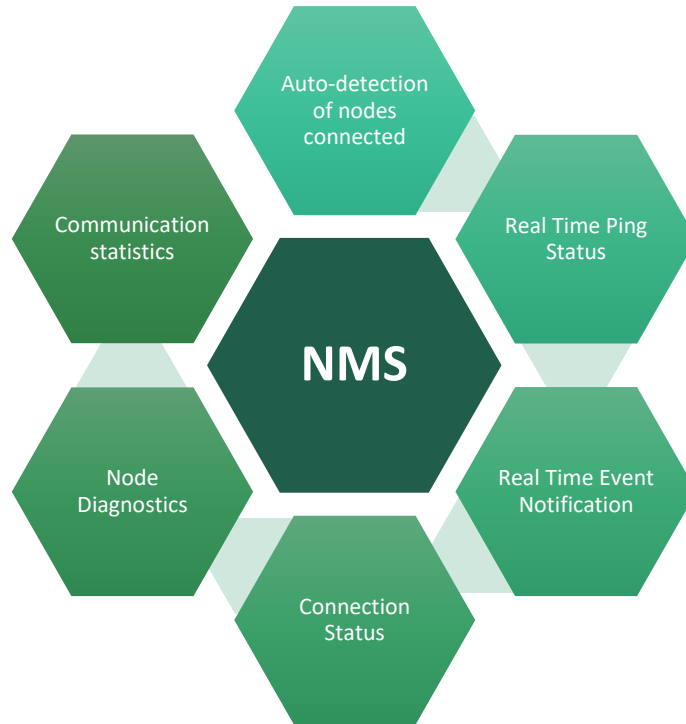
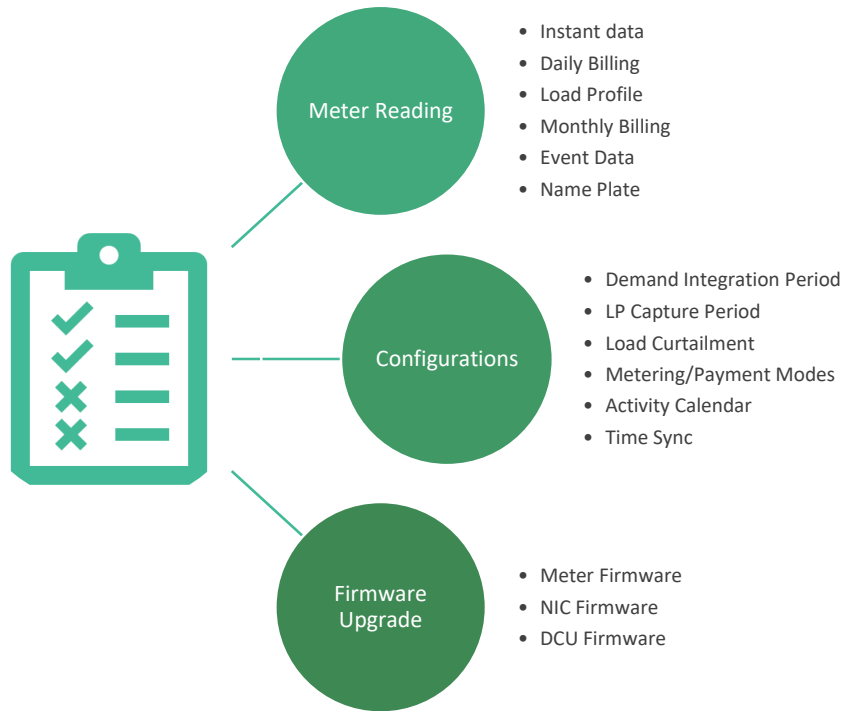|	
Auto-detection	Application is featured to detect any unidentified node/Meters communicating to the system based on Alarms received and will be flagged for further action to be taken.
Connection Status	Maintains the real time status on Nodes Logging in/out from network.
Dynamic Network Discovery	Detects the nodes that changes the route of their communication from one DCU through another and marks them as Route change and update to system.
Node Diagnostics	Maintain complete diagnostics of the Node/NIC module on pulling the data from them in scheduled intervals.
Communication statistics	Provides overall insight of Communication status at different time and to identify the nodes not communicating based on aging of non-communication date.
Real time Ping Status	Provide real time ping status of a node or group of nodes. A Map view is provided to verify the real time status of the network.

Service/Business Layer

HES is featured with a complete service-based layer with SOA web services, Restful services, and message queues. Service layers provide highest level of interoperability by its CIM / XML based interfacing complying to IEC- 61968 standards and standard JSON with DLMS protocol with different MDMS.

Meter Reading
- Instant data
- Daily Billing
- Load Profile
- Monthly Billing
- Event Data
- Name Plate

Configurations
- Demand Integration Period
- LP Capture Period
- Load Curtailment
- Metering/Payment Modes
- Activity Calendar
- Time Sync

Firmware Upgrade
- Meter Firmware
- NIC Firmware
- DCU Firmware

On demand meter reads	Requesting instantaneous, interval and events data from the meters and acquiring the meter data in same connection.
Scheduled meter reads	Requesting instantaneous, interval and events data from the meters at scheduled frequency and acquiring the meter data in same connection.
Remote Disconnection/ Re-Connection	Sending meter connect/ disconnect command to meter and receiving status in same connection.
Meter configuration	Configuration Commands: Change tariff parameters, synchronize clock, Registers reset (status, maximum, tampering…) and receives response from same connection.
Firmware Up-gradation	Remotely programming the system parameters, upgrading the system with new firmware
Time synchronization	Sync up of meters in case of installation of new meters or during any time drift cases in RTC.

Dashboards

The data is presented as dash boards in various dimensions like Communication statistics, KPI, SLA Adherence, Network Status, etc. provided drill-through features on each dashboard to further understand the statistics.

Peer Comparision

Load Pattern

Area Consumptions

SLA & Data Availability

VEE

Trend Analysis

Home Widget	Provides complete insight of all meter's communication, Data availability, Relay status, Installation/Commissioning status.
Communication Statistics	Provides overall insight of Communication status at different time and to identify the meters not communicating based on aging of non-communication date.
KPI	Provides insight on performance of meter reading, Meter configurations through on-demand /scheduler on daily, weekly/monthly basis.
SLA	Provides insight on the Meter Reading and configurations performance in configured time as per SLA.
Network Performance	Provide insights on Relay status, power failure meters, Node log out/in for RF nodes.

Configurations

Application is featured with multiple user level configurations to make the system work dynamically with a No code/Low code Concept.

Configurations

- Event Configurations
- Obis Code configurations
- Command Configurations
- Scheduler Configurations
- Meter Configurations
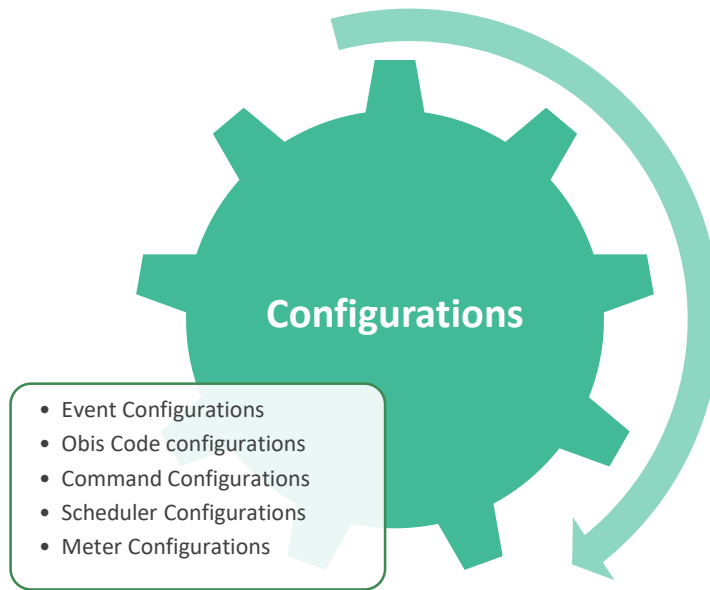
Event Configurations	User can configure all the available events and respective codes at system level.
Obis Code Configurations	User can add the Obis codes at Meter Manufacturer level to get the interoperability while communicating with different meters from same application. Support Manufacturer level Obis codes.
Command Configurations	User can configure different commands by grouping multiple Obis codes or for a single profile obis code.
Scheduler Configurations	User can configure schedules to pull meter data based on the requirement. Schedules can be configured at office level or for any group of meters.
Meter Configurations	User can configure all meter supported configurations at a single meter level or for a group of meters.

Reporting

Report generation for an optimum and immediate overview of the various metering process through in-built and ad-hoc operations. Reports can be exported in different standard formats like PDF, Excel, HTML, CSV, RTF. Each report links mentioned below have multiple sub link for various reports as per the requirement.

Meter Data Reports	Covers the reporting for all meter data at Meter level.

SLA Reports	Covers all the Service level agreement reports based on the utility requirements.

Communication Statistics	Covers Data availability reports, Communication Vs Non-Communicating Meters reports, non-Communication aging reports.

Exception Reports	Covers all communication exception, Meter exceptions and other system related exception reports.

Scheduler Reports	Covers all scheduled Daily data, configurations, firmware upgrade reports.