

**Oracle Utilities Smart Grid Gateway
MV-90 Adapter for Itron**

Configuration Guide

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Chapter 1

Overview

This chapter provides an overview of this configuration guide and an introduction to the Oracle Utilities Smart Grid Gateway MV-90 Adapter for Itron including the following:

- **What Is This Book?**
- **Other Documentation**
- **Oracle Utilities Application Framework Configuration Tools**

What Is This Book?

This guide describes how to configure the Oracle Utilities Smart Grid Gateway MV-90 Adapter for Itron. It is intended for implementers and system administrators responsible for configuration and initial setup of the application.

The Oracle Utilities Smart Grid Gateway MV-90 Adapter for Itron is based on the Oracle Utilities Application Framework (OUAF). For information about using and configuring basic Framework functions, see the Oracle Utilities Application Framework documentation. This guide only covers configuration of functions specific to the Oracle Utilities Smart Grid Gateway MV-90 Adapter for Itron.

The body of this guide presents conceptual information to help you understand how the system works as well as how the various configuration options affect system functionality. Once you have an understanding of the system's capabilities, you can plan your data setup and design any customizations you want to implement.

When you are ready to implement your design, use **Chapter 2: General Configuration** to guide you through the setup process of admin data. This section lists each object that can be configured, defines any prerequisites for configuration.

This guide includes the following chapters:

- **Chapter 1: Overview** (this chapter) provides an overview of the Oracle Utilities Smart Grid Gateway MV-90 Adapter for Itron architecture and of the configuration tools and process used in implementing the product.
- **Chapter 2: General Configuration** provides an overview of some general configuration options used by the Oracle Utilities Smart Grid Gateway MV-90 Adapter for Itron.

Other Documentation

This section describes other documentation provided with the Oracle Utilities Smart Grid Gateway MV-90 Adapter for Itron.

Installation Documentation

Installation documentation describes the steps involved in the installation and initial set up of the system, and includes the following documents:

- Oracle Utilities Smart Grid Gateway Quick Install Guide
- Oracle Utilities Smart Grid Gateway DBA Guide
- Oracle Utilities Smart Grid Gateway Installation Guide

User Documentation

User documentation provides conceptual information and procedures related to working with the various objects used in the system, and includes the following documents:

- Oracle Utilities Application Framework Business Process Guide
- Oracle Utilities Application Framework Administration Guide
- Oracle Utilities Meter Data Framework User's Guide
- Oracle Utilities Smart Grid Gateway User's Guide

Supplemental Documentation

Supplemental documentation provides technical information related to system administration tasks and include the following documents:

- Oracle Utilities Smart Grid Gateway Server Administration Guide

- Oracle Utilities Smart Grid Gateway Batch Server Administration Guide
- Oracle Utilities Smart Grid Gateway Configuration Guide

The Oracle Utilities Smart Grid Gateway MV-90 Adapter for Itron uses Oracle Service Bus (OSB) as middleware components. This tool is part of the Oracle SOA Suite. See the Oracle SOA Suite Documentation library (<http://www.oracle.com/technetwork/middleware/soasuite/documentation/index.html>) for more information about using these tools.

Embedded Help

Oracle Utilities Smart Grid Gateway, like all Oracle Utilities Application Framework applications, provides extensive internal documentation. For example, detailed descriptions of system objects are included in the objects' maintenance portals. The lifecycle of each business object is described on the Lifecycle tab and depicted in flow diagrams on the Summary tab. This information is extremely useful for implementers and system administrators.

Embedded help is provided for all non-obvious fields in most portals and zones. If a field has associated help text, a ? icon appears next to the field when the zone is displayed.

Online Help

Oracle Utilities Smart Grid Gateway also includes context-sensitive help for all the user interface screens users will typically work with as they use the system. Online help contains conceptual information and procedures related to working with the various objects used in the system.

The online help is divided into the following three sections:

- Oracle Utilities Application Framework: Describes the features and functions of the application framework (F1)
- Oracle Utilities Meter Data Framework: Describes the features and functions provided in the meter data framework (D1)
- Oracle Utilities Smart Grid Gateway: Describes the features and functions provided in the meter data management application (D2)

Oracle Utilities Application Framework Configuration Tools

Please refer to the general configuration guide for information on the Oracle Utilities Application Framework (OUAF) configuration tools that can be used to create and customize system entities, such as business objects, portals, zones, and UI maps. Refer to the Oracle Utilities Application Framework configuration tools documentation for instructions on using tools such as:

- **Configuration Process Overview**
- **Data Areas**
- **Algorithms**
- **Entity Naming Conventions**

This configuration guide does not duplicate the concepts and procedures presented in the Oracle Utilities Application Framework configuration tools documentation; rather, it will identify the specific objects used by the Oracle Utilities Smart Grid Gateway MV-90 Adapter for Itron that can be configured and customized using the configuration tools, as well as application parameters and objects that can be managed within the application components themselves.

This guide assumes that all individuals responsible for system configuration and implementation will be familiar with the Oracle Utilities Application Framework and will have completed training on the Oracle Utilities Application Framework Configuration Tools.

Chapter 2

General Configuration

This chapter provides details on the components and configurations required for the Smart Grid Gateway MV-90 Adapter for Itron including the following:

- **Understanding the Adapter**
- **Understanding the Adapter Processing**
- **Configuring an MV-90 Head-End System**
- **Configuring MV-90 Extendable Lookups**

Understanding the Adapter

The Oracle Utilities Smart Grid Gateway MV-90 Adapter for Itron the parsing, transformation, and loading of MV-90 binary format measurement data for use in Oracle Utilities applications.

The adapter uses Oracle Service Bus (OSB) to facilitate communication between Oracle Utilities Smart Grid Gateway and MV-90.

The following functionality is included:

- **Measurement Data Loading** - data parsing and transformation from MV-90 binary format into the Oracle Utilities Meter Data Framework unified format.
- **Measurement Data Processing** - configurable mapping for MV-90 status codes to Oracle Utilities Meter Data Framework standard values, along with configurable device event creation based on MV-90 status codes.

Understanding the Adapter Processing

This section provides details concerning the OSB processing, BPEL Processes, OUAF objects supplied as part of the base package. This information illustrates how the base package objects were designed, and can serve as the basis for any customizations you create as part of your implementation.

This section includes:

- **Initial Measurement Data Load**
- **Base Package Business Objects**

Initial Measurement Data Load

The initial measurement data load and subsequent device event processing use OSB to poll for, parse, and transform the head-payloads into the Oracle Utilities Smart Grid Gateway service format. Payloads contain measurements in a head-end specific format OSB then places each service call into a JMS queue within the Oracle Utilities applications. The JMS client consumes the entries and invokes the respective services in parallel then a service creates initial measurements with data in a common format with head-end-specific processing as needed. A second service creates device events with data in a common format

Initial Measurement

The usage data exported from the AMI head-end system as a file in MV-90 format is loaded into Oracle Utilities as Initial measurement data. You can customize the usage processing by configuring the following base product OSB projects:

1. SGG-D5-USAGE-BASE - contains components responsible for the actual processing of incoming data. This can be upgraded without affecting the customization and environment settings in the SGG-D5-USAGE-CM project.
2. SGG-D5-USAGE-CM allows for customization and simplifies future upgrades.

Base Package Business Objects

The MV-90 Adapter for Itron base package includes the following business objects which are used for mapping and lookups:

Business Object Name	Description
D5 - ChanelStatusCodeLookup	MV-90 Channel Status Code Lookup
D5-InitialLoadIMDInterval	MV-90 Initial Load IMD
D5-IntStsCdToCndMapPrLookup	Condition Mapping with Priority
D5-IntStsCodeToEvtMapLookup	Interval Status Code to Event Mapping
D5-UOMtoStdUOMCodeMapLookup	MV-90 UOM Code to Standard UOM Code Mapping

Configuring an MV-90 Head-End System

This section outlines the configuration required for the Oracle Utilities Smart Grid Gateway MV-90 Adapter for Itron to receive usage from an MV-90 system. This includes:

- **XAI Inbound Services**
- **External System**
- **Service Provider**
- **Processing Methods for Service Provider**

XAI Inbound Services

XAI inbound services define the details of how messages are received from an external system, including incoming usage.

The following XAI Inbound Services must be configured in your system. If these are not present in your configuration, add them. Refer to the Oracle Utilities Application Framework documentation for more information about creating XAI inbound services.

XAI Inbound Service Name	Description	Schema Type	Schema Name
D1-InitialLoadIMD	IMD Seeder	Business Object	D1-IMDSeeder
D1-PayloadErrorNotif	Payload Error Notification	Business Object	D1-PayloadErrorNotif
D1-PayloadStatistics	Payload Statistics	Business Object	D1-PayloadStatistics
D1-PayloadSummary	Payload Summary	Business Object	D1-PayloadSummary

External System

External systems represent external applications with which the Smart Grid Gateway will exchange messages or data. In the case of the Smart Grid Gateway adapters, external systems represent the head-end systems with which the adapters communicate.

An external system that represents the MV-90 system must be present in your system. If this are not present in your configuration, add it. Refer to the Oracle Utilities Application Framework documentation for more information about creating external systems.

External System - MV-90:

- **External System:** MV90
- **Description:** MV90 - Mainframe File Format

Service Provider

Service providers represent external entities that serve various roles relative to the application, including head-end systems, billing systems to which the application sends bill determinant data, market participants in a deregulated environment, outage management systems that receive meter event data from the application, or other parties that require or provide information to the system. The head-end systems that collect and send measurement data and meter events to the application are defined as service providers.

A service provider that represents the MV-90 system must be present in your system. If this are not present in your configuration, add it. Refer to the Oracle Utilities Meter Data Framework documentation for more information about creating service providers.

Service Provider - MV-90:

- **Service Provider:** MV90

- **Description:** Head-End System for MV90
- **External Reference ID:** MV90
- **External System:** MV90 - Mainframe File Format
- **Out Name/ID in Their System:** MV90
- **AMI Device ID Type:** Serial Number
- **AMI Measuring Component ID Type:**

Processing Methods for Service Provider

Processing methods define the format or means by which a service provider receives and/or sends data from and/or to the application, including as bill determinants, usage data, or device events. Processing methods are also used to define how to create information internal to the application such as initial measurement data and device events. Processing methods can also be used to define how command requests are sent to the L+G Command Center.

The following types of processing methods must be configured for the L+G service provider. Refer to the Oracle Utilities Meter Data Framework documentation for more information about configuring processing methods.

Initial Measurement Creation

Initial measurement creation processing methods define the business objects used to create initial measurements. The IMD Seeder XAI Inbound Service uses this processing method to determine which type of initial measurement business object to instantiate when receiving usage from the MV-90 system.

Processing Method - Initial Measurement Creation

- **Service Provider:** Head-End System for MV90
- **Processing Role:** Initial Measurement Creation
- **Description:** How to create Initial Load IMD - MV90
- **Status:** Active
- **Default Processing Method:**
 - **Business Object:** D5-InitialLoadIMDInterval (MV90 Initial Load IMD)
- **Override Processing Method:** based on implementation-specific requirements

Device Event Mapping

Device event mapping processing methods define how head-end-specific device events are mapped to standard device event names. The Device Event Seeder XAI Inbound Service uses this processing method to determine which type of device event business object to instantiate when creating device events based on interval status codes received with usage from the MV-90 system.

Processing Method - Device Event Mapping

- **Service Provider:** Head-End System for MV90
- **Processing Role:** Device Event Mapping
- **Description:** How to map device events - MV90
- **Status:** Active
- **Default Processing Method:**
 - **Business Object:** D5-IntStsCodeToEvtMapLookup (Interval Status Code to Event Mapping)

- **Override Processing Method:** based on implementation-specific requirements

UOM Mapping

UOM mapping processing methods define how head-end-specific unit of measure (UOM) codes are mapped to standard UOM codes. This processing method is used to determine how to map MV90 UOM codes to standard UOM codes when receiving usage from the MV-90 system.

Processing Method - UOM Mapping

- **Service Provider:** Head-End System for MV90
- **Processing Role:** UOM Mapping
- **Description:** How to map UOMs from MV90 when creating IMDs
- **Status:** Active
- **Default Processing Method:**
 - **Business Object:** D5-UOMtoStdUOMCodeMapLookup (MV90 UOM Code to Standard UOM Code Mapping)
- **Override Processing Method:** based on implementation-specific requirements

Configuring MV-90 Extendable Lookups

This section outlines some of the extendable lookups that must be configured for use with the MV-90 Adapter for Itron. These include:

- **Interval Status Code to Event Mapping**
- **MV90 UOM Code to Standard UOM Code Mapping**

Refer to the Oracle Utilities Application Framework documentation for more information about working with extendable lookups.

Interval Status Code to Event Mapping

The MV-90 adapter for does not accept device events from an MV-90 system, but can create device events based on specific interval status codes in an incoming usage reading. The MV-90 Interval Status Code to Event Mapping extendable lookup is used to determine which type of device event business object to instantiate when creating device events based on interval status codes received with usage from the MV-90 system.

Each value defined for the Interval Status Code to Event Mapping extendable lookup should include the following:

- **MV90 Interval Status:** The interval status code used by the MV-90 system
- **Description:** A description of the MV-90 interval status code
- **Event Duration Mode:** The duration type for the event. Can be either “Individual” or “Continuous” (used for events with a duration, such as an outage).
- **Device Event Type:** The Device Event Type for the device event created for this interval status code. For status codes with an Event Duration Mode or “Continuous” this is the start event, or the first of the paired events created for this status code.
- **End Event Type:** The Device Event Type for the “end” device event created for this interval status code. For status codes with an Event Duration Mode or “Continuous” this is the start event, or the last of the paired events created for this status code.

Example: The MV-90 “Low Voltage” status code could be configured to create a “Low Voltage” device event as follows:

- **MV90 Interval Status:** <MV-90 interval status code for low voltage>
- **Description:** Low Voltage detected for meter
- **Event Duration Mode:** “Individual”
- **Device Event Type:** Low Voltage
- **End Event Type:** N/A

Example: The MV-90 “Power Outage” status code could be configured to create a “Last Gasp” device event, and a “Power Restoration” event as follows:

- **MV90 Interval Status:** <MV-90 interval status code for outage>
- **Description:** Outage
- **Event Duration Mode:** “Continuous”
- **Device Event Type:** Last Gasp
- **End Event Type:** Power Restoration

MV90 UOM Code to Standard UOM Code Mapping

Usage received from the MV-90 system may use utility-specific unit of measures (UOMs). These custom UOMs must be mapped to standard UOM codes. The MV90 UOM Code to Standard UOM Code Mapping extendable lookup is used to determine how to map MV90 UOM codes to standard UOM codes when receiving usage from the MV-90 system.

Each value defined for the MV90 UOM Code to Standard UOM Code Mapping extendable lookup should include the following:

- **Head-end UOM:** The unit of measure code used by the MV-90 system
- **Unit of Measure:** The unit of measure defined in the system. See Defining Units of Measure in the *Oracle Utilities Meter Data Framework User's Guide* for more information about creating UOM codes for use with Oracle Utilities Smart Grid Gateway.
- **Description:** A description of the unit of measure code.

Example: The MV-90 “KWH” unit of measure code could be mapped to the “Kilowatt Hours” standard UOM code as follows:

- **Head-end UOM:** KWH
- **Unit of Measure:** Kilowatt Hours
- **Description:** MV90 Kilowatt Hours

Appendix

Glossary

This glossary provides definitions of commonly used terms.

Command Effective Date/Time

The date and time when a device command becomes effective.

Command Expiration Date/Time

The date and time when a device command expires.

Commissioning

A command issued to establish communication between a device and the head-end system. The goal is to ensure connectivity has been established with the device, that any information needed to communicate with the meter has been defined in both Oracle Utilities Smart Grid Gateway and the head end system, and the meter will begin capturing usage and events.

Decommissioning

A command issued to inform the head-end system when a meter needs to be removed from a service point, so that no further reads or events will arrive from the meter. Decommissioning is invoked when a meter must be removed or deactivated. The goal is to stop any communication between the device and the head-end system.

Head-End System

A system that collects measurement data and meter events for eventual submission to the application. Many devices can communicate to the application through a single head-end system. A utility may have numerous head-end systems through which they communicate with devices.

On-Demand Read

A request for the most up-to-date reading from a particular meter. It is not guaranteed to return immediately; it could require a person to manually read the meter. The purposes are to check the meter's operational status and/or obtain a more recent reading than is currently available.

Payload

An upload component which contains measurements and meter events in a format specific to the

head-end. Payloads are part of the initial upload of measurement data.

Remote Connect

A command issued when a meter needs to be connected at a service point.

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