Oracle Utilities Meter Solution Cloud Service

Overview Guide

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Oracle Utilities Meter Solution Cloud Service Overview Guide, Release 26.10

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Introduction

Welcome to the Oracle Utilities Meter Solution Cloud Service Overview Guide. This document provides an overview of Oracle Utilities Meter Solution Cloud Service, including:

- Meter Solution Cloud Service Overview
- Implementation Support and Live Operate Services
- Oracle Utilities Cloud Services Third Party Software and Licenses
- Oracle Utilities Cloud Services EU Data Act Reference Guide

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Meter Solution Cloud Service Overview

This chapter provides an overview of the Oracle Utilities Meter Solution Cloud Service, including:

Welcome to Oracle Utilities Meter Solution Cloud Service

Oracle Utilities Meter Solution Cloud Service is used to maintain information about meters and the service points at which they are installed. The solution provides a means of recording measurements and events associated with meters in the field as well as the ability to compute usage for the recorded measurements, and process smart meter commands.

Oracle Utilities Meter Solution Cloud Service comprises the following functional areas:

- Asset Management and Device Management: Repository of physical assets, including meters and components.
- Device Installation: Maintenance of service points and the installation of meters in the field. This includes the means of registering outside systems to Oracle Utilities Meter Data Management for provider/consumer-specific processing of meter events and activities.
- Validation, Editing, and Estimation (VEE): Maintenance of measurement data and the engine used to validate and modify that data as it comes in.
- Usage Management: Calculation of billable usage recorded on devices, applying factors and dividing the usage into configurable time of use periods.
- Aggregation: Summarization of measurement data for reporting and analysis purposes.
- Data Synchronization: Synchronization of data between Oracle Utilities Meter Data Management and other Oracle Utilities applications (including Oracle Utilities Operational Device Management and Oracle Utilities Customer Care and Billing). Note: Separate licenses and middleware tools may be required for these integrations.
- Oracle Utilities DataConnect: Extraction of consumption and master data for use in external systems.
- Smart Grid Gateway: Payload Processing and Smart Meter Commands.

- Service Order Management: Used to manage field service work like start service or disconnect for non-pay.
- Oracle Utilities Cloud Service Foundation: tools used to orchestrate and automate infrastructure related processes, migrate data from legacy applications into the cloud service, and manage batch scheduling and processing using the SaaS Batch Scheduler.
- Oracle Utilities Analytics Visualization: a suite of analytics applications that provides access to data for self service exploration, discovery, visualization, and analysis. It includes rich pre-built analytical data models, metrics, and key performance indicators that allow you to derive strategic insights from your data.

AI Features in Oracle Utilities Meter Solution Cloud Service

This section outlines Artificial Intelligence (AI)-based features in Oracle Utilities Meter Solution Cloud Service.

AI-based features in Oracle Utilities applications are not enabled by default. Unless noted otherwise. customers must opt-in to these features.

Table 2-1 Meter Solution Cloud Service AI Features

Feature Name	Description	Type of AI	Enabling/Disabling
Machine Learning Anomaly Scoring	Machine Learning Anomaly Scoring is a method of processing incoming initial measurement data designed to use Artificial Intelligence and Machine Learning neural network models to recognize "normal" versus anomalous measurement values, and only perform Validation, Editing, and Estimation (VEE) processing for measurements deemed to be anomalous. See Machine Learning Anomaly Scoring and Configuring Machine Learning Anomaly Scoring in the *Oracle Utilities Customer Cloud Service User Guides* for more information.	Machine Learning	Machine Learning Anomaly Scoring is not enabled by default. It relies on machine learning models that must be deployed as part of your cloud service implementation.

Oracle Utilities Meter Solution Cloud Service Applications

Oracle Utilities Meter Solution Cloud Service includes the following applications:

- Oracle Utilities Meter Data Management
- Oracle Utilities Smart Grid Gateway
- Oracle Utilities Smart Grid Gateway Adapter for Itron OpenWay

- Oracle Utilities Smart Grid Gateway Adapter for Landis+Gyr
- Oracle Utilities Smart Grid Gateway Adapter for Sensus RNI
- Oracle Utilities Smart Grid Gateway Adapter for Silver Spring Networks
- Oracle Utilities Smart Grid Gateway MV-90 Adapter for Itron
- Oracle Utilities Service Order Management
- Oracle Utilities Operational Device Management
- Oracle Utilities Cloud Service Foundation
- Oracle Utilities Analytics Visualization
- Oracle Utilities Testing Accelerator
- Oracle Analytics Publisher
- Oracle REST Data Services

Oracle Utilities Meter Solution Cloud Service Documentation

Configuration and use of Oracle Utilities Meter Solution Cloud Service is described in the following documentation:

- Oracle Utilities Meter Solution Cloud Service User Guides, comprising:
  - Oracle Utilities Meter Solution v26.10 Business User Guide
  - Oracle Utilities Meter Solution v26.10 Administrative User Guide
- Oracle Utilities Cloud Services 26.10 documentation, including:
  - Oracle Utilities Cloud Service Foundation Administrative User Guide
  - Oracle Utilities Cloud Services Administration Guide
  - Oracle Utilities Cloud Services Database Changes Guide
  - Oracle Utilities Cloud Services Frequently Asked Questions Guide
  - Oracle Utilities Cloud Services Implementation Guide
  - Oracle Utilities Cloud Services Live Operations Guide
  - Oracle Utilities Cloud Services Security Guide
- Oracle Utilities Cloud Services Activation Guide
- Oracle Utilities Cloud Service Platform What's New
- Oracle Utilities Cloud Services Cloud Operations Guide
- Oracle Utilities Cloud Services Cloud Service Console User Guide
- Oracle Utilities Cloud Service Update Policy Guide
- Oracle Utilities Testing Accelerator documentation
- Oracle Utilities Analytics Visualization User Guide

Regional Availability and Dedicated Region Cloud @ Customer Validation

Oracle Utilities cloud services are supported in specific geographic and Oracle Cloud Infrastructure (OCI) regions

In addition, several Oracle Utilities cloud services have been validated on Oracle Dedicated Region Cloud @ Customer (DRCC).

Oracle Cloud Infrastructure Region Availability

Oracle Utilities cloud services are supported in the following Oracle Cloud Infrastructure regions:

Geographical Region	OCI Region Name	OCI Region Identifier	OCI Region Location	OCI Region Key	Realm Key	Availability Domains	Disaster Recovery Role* (where applicable)
APAC SG001 (OC1)	Australia East (Sydney)	ap-sydney-1	Sydney, Australia	SYD	OC1	1	Primary
APAC SG001 (OC1)	Australia Southeast (Melbourne)	ap-melbourne-1	Melbourne, Australia	MEL	OC1	1	Secondary
APAC SG001 (OC1)	Singapore (Singapore)	ap-singapore-1	Singapore, Singapore	SIN	OC1	1	Primary
APAC SG001 (OC1)	Japan East (Tokyo)	ap-tokyo-1	Tokyo, Japan	NRT	OC1	1	Secondary
North America US001 (OC1)	Canada Southeast (Toronto)	ca-toronto-1	Toronto, Canada	YYZ	OC1	1	Primary
North America US001 (OC1)	Canada Southeast (Montreal)	ca-montreal-1	Montreal, Canada	YUL	OC1	1	Secondary
North America US001 (OC1)	US East (Ashburn)	us-ashburn-1	Ashburn, VA	IAD	OC1	3	Primary/ Secondary
North America US001 (OC1)	US West (Phoenix)	us-phoenix-1	Phoenix, AZ	PHX	OC1	3	Primary/ Secondary
EURA EU001 (OC1)	Germany Central (Frankfurt)	eu-frankfurt-1	Frankfurt, Germany	FRA	OC1	3	Primary/ Secondary
Europe UK001 (OC1)	UK South (London)	uk-london-1	London, United Kingdom	LHR	OC1	3	Primary/ Secondary

* Disaster Recovery roles are not currently configurable.

Oracle Dedicated Region Cloud @ Customer Validation

The following Oracle Utilities cloud services have been validated on Oracle Dedicated Region Cloud @ Customer (DRCC).

Cloud Service	Status
Oracle Utilities Billing Cloud Service (BCS)	Validated
Oracle Utilities Customer Care and Billing Cloud Service (CCBCS)	Validated
Oracle Utilities Customer Cloud Service (CCS)	Validated
Oracle Utilities Customer Cloud Service for Retail (CCS-R)	Validated
Oracle Utilities Customer Program Management Cloud Service (CPMCS)	Validated
Oracle Utilities Market Settlements Management Cloud Service (MSMCS)	Validated
Oracle Utilities Meter Solution Cloud Service (MSCS)	Validated
Oracle Utilities Rate Cloud Service (RCS)	Validated
Oracle Utilities Work and Asset Cloud Service (WACS)	Validated
Customer Experience for Utilities – Fusion Agent Service Cloud Service	Validated
Customer Experience for Utilities – Fusion Sales Cloud Service	Validated

Supported Client Platforms and Browsers

Users access Oracle Utilities cloud services via a supported web browser.

Oracle Utilities cloud services support the following operating system & web browser combinations:

Operating System	Web Browser
Windows 11	Mozilla Firefox ESR 140+ Google Chrome for Enterprise 151+ Microsoft Edge (Chromium-based) 151+ (see the Microsoft Edge Release Schedule for more information)
iPad2 iOS 10.x (Work and Asset Cloud Service ONLY)	Apple Safari 17 (selected flows and portals only)

The recommended monitor resolution is 1920 X 1080 or higher with the browser zoom level set at 100%. The application can be used with lower resolution monitors and/or at a greater than 100% browser zoom level, but users may need to use horizontal scrolling on some pages.

Supported Integrations

Oracle Utilities Meter Solution Cloud Service supports integration with a number of other products. See the following section for details:

Application Integrations

The table below lists Oracle products and applications that can be integrated with Oracle Utilities Meter Solution Cloud Service, and provides the product name and version, cloud service version(s), and the integration platform that enables the integration.

Oracle Product	Cloud Service Version(s)	Integration Platform
Oracle Utilities Customer Care and Billing v25.4*	MSCS 26.10	Oracle SOA Suite v14.1.2.0.0 or higher**
Oracle Utilities Customer Care and Billing v2.9.0.0/v2.9.0.2*	MSCS 26.10	Oracle SOA Suite v14.1.2.0.0 or higher**
Oracle Utilities Customer Care and Billing v2.8.0.0/v2.8.0.1*	MSCS 26.10	Oracle SOA Suite v14.1.2.0.0 or higher**
Oracle Utilities Network Management System v2.5.0.x*	MSCS 26.10	Oracle SOA Suite v14.1.2.0.0 or higher**

* Future releases of Oracle Utilities Meter Solution Cloud Service will support integration with this version of Oracle Utilities Customer Care and Billing and Oracle Utilities Network Management System through the end of Premier Support.

** The above integrations require separate licenses.

Head End System Integrations

Oracle Utilities Customer Cloud Service with Advanced Meter Solution and Oracle Utilities Meter Solution Cloud Service support integration with a number of vendor- specific head end systems via Oracle Smart Grid Gateway Adapters. The table below lists the supported versions of the head end systems for each Adapter available with Oracle Utilities Cloud Service with Advanced Meter Solution and Oracle Utilities Meter Solution Cloud Service.

Adapter	Protocol	HeadEnd System Version
Adapter for Itron OpenWay	Proprietary	Itron OpenWay 3.70, 3.90, 4.1, 6.10 OpenWay Collection Manager 5.4
Adapter for Itron Field Collection System	Proprietary	Field Collection System 4.63
Adapter for Landis+Gyr	MultiSpeak 3.0 CIM 1.0v2 CIM 2.0	Gridstream Command Center 7.5, 8.1, 8.4, 8.5, 9.0.4
Adapter for Sensus RNI	MultiSpeak 4.1	Sensus RNI 4.4, 4.5.1, 4.10, 4.12, 4.14, 4.15, 4.16
Adapter for Silver Spring Networks (Itron AMM)	Proprietary MultiSpeak 4.1	UtilityIQ Version 4.4, 4.7, 4.10, 4.14, 5.0, 5.1, 5.2, 6.1
MV-90 Adapter for Itron	Binary file format	N/A SGG supports the .mv9 binary, mainframe data format.

Using Oracle Utilities Testing Accelerator with Oracle Utilities Cloud Services

Oracle Utilities Testing Accelerator (OUTA) is a testing framework based on Java and Selenium used for automated testing of Oracle Utilities applications and cloud services. It allows for developing, managing and executing web service and user interface based automated tests, using meta-data based approach, without any programming language. Oracle Utilities Testing Accelerator has a user friendly graphical web interface that enables people without much programming knowledge to develop automated test flows.

Along with the automation framework, Oracle Utilities Testing Accelerator includes an accelerator that supports automated testing of Oracle Utilities cloud services, such as Oracle Utilities Customer Cloud Service and Oracle Utilities Work and Asset Cloud Service. The accelerator contains several hundred re-usable components that are the modular building blocks of an automated test flow. The Oracle Utilities Testing Accelerator user interface allows for these components to be laced together to form an automated test flow. The test data can then be coupled to the automated test flow and executed using the browser-based execution engine within the Oracle Utilities Testing Accelerator web application.

The browser-based test execution engine should be used for the execution of web service based test automation flows. In addition to the web interface, Oracle Utilities Testing Accelerator includes an eclipse IDE plugin that supports the execution of tests from local desktops or laptops. This mode should be used for executing user interface based tests that are developed using the Oracle Utilities Testing Accelerator web application. The script generation engine in the Oracle Utilities Testing Accelerator web interface auto generates the scripts for user interface based tests, which can then be executed via the Eclipse IDE (with the Oracle Utilities Testing Accelerator plugin).

The following features of Oracle Utilities Testing Accelerator have been enhanced so that they work with Oracle Utilities cloud services:

1. For executing the web service based test automation flows, the Flow Configuration that contains the web service URL along with additional properties such as smtp server, etc is pre-defined to work with Oracle Utilities cloud services. Users need not create a new Flow Configuration. **See the Executing Test Flows and Executing Test Flows Using a Browser**
   sections in the *Oracle Utilities Testing Accelerator User Guide* for more information.
2. For generating components using the component generator tool, the complete WSDL URL need not be specified in the field, only the web service end point name needs to be provided. **See the Development Accelerator Tools and Component Generation Tool** sections in the *Oracle Utilities Testing Accelerator User Guide* for more information.
3. For fetching test data from the Oracle Utilities cloud services, the WSDL URL need not be specified, only the web service end point name should be specified.
   See the **Fetching Test Data From an Utilities Application** section in the *Oracle Utilities Testing Accelerator User Guide* for more information.
4. Oracle Utilities Testing Accelerator is integrated with Oracle Cloud Infrastructure Identity and Access Management (IAM) with Identity Domains when using it with cloud services. The management of users in Oracle Utilities Testing Accelerator web application should be done through IAM. See **Identity and Access Management with Identity Domains** in the *Oracle Utilities Cloud Services Administration Guide* for more information about creating and managing users.

High-Level Roles and Responsibilities

This section outlines high-level roles and responsibilities involved in the deployment, configuration, and maintenance of Oracle Utilities cloud services, and the party responsible for each. The **Owner** column in the tables below indicates the party responsible for each role and responsibility.

Hardware, Storage, Technology, and Application Software

Role and Responsibility	Owner
Provide, deploy and monitor hardware and storage	Oracle
Provide, deploy, run and monitor all required technology (such as containers, operating systems, databases, clustering, monitoring, tracing)	Oracle
Provide, deploy, run and monitor all Oracle Utilities base application software	Oracle
Plan, prepare, and perform configurations for uninterrupted operations, in case of a Disaster Recovery (DR) event	Customer

Security

Role and Responsibility	Owner
Monitor cloud service infrastructure security	Oracle
Administer Oracle network security	Oracle
Administer customer network security (for example Cloud Guard, enable Multi-factor Authentication, review users, logs, and so on), including integrating with the Oracle networks	Customer
Configure & maintain cloud service users and access	Customer
Integrate with Oracle networks	Customer
Pro-actively monitor and maintain unexpired, secured, and valid TLS / SSL Certificates on customer-specific DNS entries requested for outbound traffic from the Oracle Cloud Infrastructure (OCI) network.	Customer
Perform security monitoring via Access Logs	Customer

Database

Role and Responsibility	Owner
Database administration services (monitoring, administration, etc)	Oracle
Backup and Restore	Oracle
Backup retention	Oracle
Data replication for Disaster Recovery (where applicable)	Oracle
Disaster Recovery database fail-over	Oracle

Role and Responsibility	Owner
Refresh of a target environment from an existing environment, such as from PROD to TEST (upon customer request and within prescribed limits)	Customer and Oracle
Information Lifecycle Management, including activities such as adding historical months partitions, running compression, and dropping old partitions to maintain storage usage within subscribed limits	Customer
Information Lifecycle Management - Add future month partitions (ONLY)	Oracle
Provide a daily off-peak time window during which Oracle can perform required database maintenance activities, and during which the customer will minimize the usage of the cloud service so as to avoid any performance-related issues during the defined time window.	Customer
Extract, analyze, and provide (as requested) Performance Hub reports from environments.	Customer

Implementation, Configuration, and Extensions

Role and Responsibility	Owner
Plan and execute implementation project	Customer
Perform configuration of enterprise software features and functions	Customer
Execute functional, system, load and performance testing of configuration and extensions	Customer
Ensure operational readiness	Customer

Patching and Upgrading

Role and Responsibility	Owner
Patch and upgrade underlying infrastructure software	Oracle
Patch and upgrade Oracle Utilities base application software	Oracle
Decide the cloud service upgrade schedule (within prescribed limits)	Customer
Trigger environment upgrades (Development, Test and Production)	Customer
Perform regression testing of configuration and extensions after patching / upgrades	Customer
Make changes as needed in custom configuration and extensions after patching / upgrades	Customer

Batch Processing

Role and Responsibility	Owner
Monitor underlying batch infrastructure	Oracle
Provide infrastructure logs for batch incidents	Oracle

Role and Responsibility	Owner
Resolve infrastructure batch issues	Oracle
Determine batch schedule	Customer
Monitor batch stream/job completion	Customer
Perform first level investigation of batch issues	Customer
Provide customer logs of batch incidents	Customer
Resolve functional batch issues and stream/job restart	Customer
Resolve data issues	Customer

Cloud Service Delivery and Performance

Role and Responsibility	Owner
Provide scalable and elastic cloud services	Oracle
Provide core services and tools, including: • Embedded infrastructure and platform services • An extensible application framework • Highly configurable product features and functions • Content Migration Assistant • Data Migration Tools • Generalized/Specialized Data Extract	Oracle
Ensure quality of maintenance packs and updates	Oracle
Resolve performance issues related to core services and tools	Oracle
Configure features, and implement extensions	Customer
Perform functional and performance testing of configuration and extensions	Customer
Perform analysis of performance issues, including the use of Performance Hub reports	Customer
Resolve performance issues related to configuration, extensions, and data using business, batch and access logs, as well as Performance Hub reports	Customer
Subscribe to any additional resources required	Customer

Support

Role and Responsibility	Owner
Triage, analyze, and resolve issues with the cloud service	Oracle
Triage, analyze, and resolve issues with configuration and extensions	Customer
Review and analyze browser HAR (HTTP Archive) files in case of any online performance issues	Customer
Raise Service Requests via My Oracle Support and provide all requested information	Customer

Data Migration

Role and Responsibility	Owner
Provide data migration tools (SQL Loader, validation batch controls and so on)	Oracle
Provide guidelines on data migration via online documentation	Oracle
Triage, analyze, and resolve issues with the data migration tools via My Oracle Support	Oracle
Create Service Request with Cloud Operations team to nominate the environment(s) to be used for conversion and for Cloud Operations team to disable internal database maintenance jobs. This is required before starting any conversion related activity during the implementation phase and another Service Request is required to enable the internal database maintenance jobs when the customer go live.	Customer
Define, review and execute data migration strategy in-line with the provided data migration tools	Customer
Review and follow documentation on data migration	Customer
Validate the Cloud Subscription Metrics with data migration scope metrics	Customer
Configuration and development work required for data migration	Customer
Data cleansing	Customer
Plan and execute data migration mock runs (Oracle suggests a minimum of three) to confirm successful testing results and ensure a clean data migration process.	Customer
Triage, analyze, and resolve data migration issues	Customer
Plan, review and execute cut-over activities	Customer
Ensure that before go live, all indexes are rebuilt and database objects statistics are up to date.	Customer
Create and execute plug-in driven batch programs to correct data errors during critical project milestones and after go-live, if needed	Customer

Integration

Role and Responsibility	Owner
Provide productized integrations (where explicitly agreed).	Oracle

> **Note**
>
> Productized integrations require customer-specific configuration and (optionally) extension.

Role and Responsibility	Owner
Integrate Oracle Utilities cloud services with all other services or applications	Customer

GoldenGate Replication for Enterprise SaaS

Role and Responsibility	Owner
Deploy source components into the customer designated source environment	Oracle
Support the source components of the replication extract services as part of Enterprise SaaS	Oracle
Subscribe to all required SaaS and technology pre-requisites	Customer
Deploy, configure and operate target components	Customer
Ensure technical specialists are available on the project during initial implementation and ongoing live operate	Customer
Performance test and size the target components	Customer
Support the target components	Customer
Maintain the target data, indexes, etc.	Customer

Performance Guidelines

This section provides a number of performance-related guidelines and recommendations to take into account when implementing Oracle Utilities Meter Solution Cloud Service. This includes guidelines related to the following:

- Benchmarking, Scalability, Elasticity and Performance
- Initial Measurement Data and Event Processing
- Usage Transactions
- User Interfaces
- Commands and Events
- General Topics

Benchmarking, Scalability, Elasticity and Performance

Oracle Utilities cloud services such as Billing Cloud Service, Customer Care and Billing Cloud Service, Customer Cloud Service (with Advanced Meter Solution) and Meter Solution Cloud Service are important components of a utility's solution set, and are:

- **Mission critical** in terms of revenue generation
- **Highly configurable** as many aspects of the solution are designed to be configured to meet market specific requirements
- **Compute intensive**, as many validation and calculation rules need to be applied during daily processing
- **Time sensitive**, as processing must be completed daily, on schedule and within a predefined (and strict) batch window

These cloud services have been designed and built from the ground up with all of these concepts in mind, but successfully implementing and operating them depends on a *shared responsibility model* with respect to Benchmarking, Scalability and Performance.

Who is Responsible for Scalability, Elasticity and Performance?

This is a shared responsibility between Oracle and the customer/implementer. Oracle is responsible for the following in terms of the *base cloud service*:

- Scalability
- Elasticity
- Benchmarking
- Configurability
- Extensibility
- Performance of base product functionality, including:
  - Embedded infrastructure and platform services
  - Application framework
  - Base product features and functions
  - Content Migration Assistant
  - Data Migration Tools
  - Generalized/Specialized Data Extract

To verify the above, Oracle performs regular scalability benchmarking to confirm general solution scalability and elasticity, including:

- Vertical (scaling up), such as effectively utilizing more power (CPU, RAM, etc)
- Horizontal (scaling out), such as effectively utilizing more machines/servers

This scalability benchmarking is run on reference configurations and on very high data volumes, for example:

- 10M Billable Service Customers (CCS)
- 20M+ Utilities Device Data Channels for (MSCS)

The customer/implementer is responsible for the following in terms of the *specific implementation*:

- Performance optimization of customer configuration & extension logic
- Correction of customer data issues
- Functional testing
- Performance testing (initial and regression)
- Analysis of performance related issues

Customers/implementers should plan to run performance testing to verify that their final configuration and implementation-specific workload meets expectations and preserves general solution scalability and elasticity.

Performance testing is:

- Executed by the customer/implementer
- Uses customer specific (final) configuration

- Run on final expected customer data migration volumes and so requires data migration to be complete, configuration to be finalized / functionally tested, and the solution running in a production sized environment (a full sized Test environment is provided for this purpose)

Initial Measurement Data and Event Processing

- **Initial Measurement and Event Loading**: The initial measurement data and event loading processes should be scheduled to avoid overlap with other intense processes. For instance, do not produce bill determinants when loading meter readings.

  In addition, when processing measurement data coming from head end systems, payload files should be broken up into multiple files of approximately the same size (containing approximately 100 measurement records each) to allow for parallel processing.

  When processing files of varying sizes, the `chunkSize` parameter can be used to facilitate improved processing throughput by distributing work across multiple batch threads. See **Common Parameters** in the *Oracle Utilities Meter Solution Administrative User Guide* for more information about the `chunkSize` parameter.

  Due to high data volumes, web services should NOT be used to upload daily measurements. Projects should use Smart Grid Gateway payload processing to help avoid performance problems.

- **Direct Measurement Processing**: We recommend using Direct Measurement Processing for initial load IMDs, which has a performance boost over legacy IMD initial load processing while also saving considerable storage.

- **When using Legacy Measurement Processing**: The system includes a number of Initial Measurement Data (IMD) monitor batch processes that can be used to minimize performance issues when adding large numbers of historical or backlog readings. These use the IMD as the processing work unit instead of the Device Configuration. This prevents situations in which an error on an IMD rolls back processing for all of the IMDS for a given device configuration. These include:

  - D1-IMDV2 (IMD Monitor - Physical Devices V2): used to process initial measurements related to physical devices
  - D1-IMDD2 (IMD Monitor - Deferred IMDs V2): used to process previously held or deferred IMDs
  - D1-IMDM2 (IMD Monitor - Unattached MCs V2): used to process IMDs for standalone measuring components without a Device Configuration such as weather or price data

  Refer to the Detailed Descriptions of these batch processes for additional information about each.

- **VEE Rules**: Any VEE Rules, whether provided as part of base product or custom developed, should be configured to query no more than 30 cumulative days of historical data (i.e., High/Low) to achieve an efficient data loading process.

- **Raw Data**: The raw data section of the initial measurement data record should not be populated in a production environment.

- **Tracing**: Use the **Trace** section of the **IMD Log** to troubleshoot VEE rules. When an initial measurement data is in *Pending* status, the **Trace On** button can be used to trace all VEE Rules fired during initial measurement data processing. Once processing is complete, view the **Log** tab of the initial measurement data and review the results in the **IMD Trace Log** zone. For any custom developed VEE rules, the average run time should be no longer than the average run time of other base product VEE rules.

- **VEE and Usage Rule Configuration**: VEE and usage rule configurations can affect performance; test runs are needed during implementation to tune these processes.

- **Initial Measurement Data Business Objects**: Avoid modifying the initial measurement data business objects.

Refer to **Initial Measurement Loading Recommendations** in the **Best Practices** section of the *Oracle Utilities Meter Solution Administrative User Guide* for more details and recommendations.

Usage Transactions

- **Number of Usage Transactions**: The number of usage transactions per day should not exceed 20% of the total service point volume.
- **Daily Scalar Usage Rule**: The Daily Scalar Usage usage rule should be used when calculating usage for frequently read scalar channels (one or more reading per day). This rule only exports the beginning and ending readings.
- **Vector and Service Quantity Math Rule**: Only use the Vector and Service Quantity Math rule when other usage rules cannot perform the same calculations. For example, although the Vector and Service Quantity Math rule can perform TOU mapping, you should use the Get TOU Mapped Usage rule if TOU mapping functionality is the only requirement.
- **Measurement Data in Usage Transactions**: Minimize the amount of measurement data included in the Usage Transaction results, as individual interval records included with the usage transaction will slow down processing. Saving derived interval data and sending the data to an external system via the **Save Interval Vector** and **Extract Interval Data** options on the Vector and Service Quantity Math and Get Interval Data usage rules can have a noticeable impact on usage transaction processing. Usage transaction processing can be improved by up to 45% if extraction of interval data is eliminated. Use of these options should be limited to situations in which they are absolutely required.
- **Interval Data Export**: Usage transactions should not be used as an ETL tool to perform the mass export of interval data.

User Interfaces

- **Zones**: For better performance, user interface zones should be initially collapsed when not required for 90% or more of business processes. The initial state of zones (collapsed or not) can be controlled via the **Portal Preferences** tab on the **User** portal.
- **Number of Records**: The number of records returned to the user interface for a zone should be limited to 50 rows when building custom zones against large transactional tables.
- **Screen Troubleshooting**: To troubleshoot a screen in the user interface, click **Preferences** in the top right corner of the application and choose the **Portal Preference**s tab. Choose the appropriate portal and set all zones to "Initially Collapsed". Navigate back to the screen that has performance issues, expand the zones one by one, and measure the execution time of each zone. This should be an accurate step-by-step representation of the full screen execution.
- **Performance Optimization**: For optimal user interface performance, laptop users should ensure their computer is in high performance mode.

Commands and Events

- **Meter Events**: Only meter events that have significant business value should be imported into the cloud service. These are generally events that involve billing or outage processes. Superfluous events such as hourly meter communication confirmations should not be sent to the service.

- **Meter Commands**: Meter command processing should be configured such that it does not slow billing processes and can be supported by the advanced metering infrastructure (AMI) network. For example, meters should not be pinged every five minutes.

General Topics

- **Performance Tests**: Performance tests should be performed on all configurations to ensure daily processing windows are adequate. This includes configurations for: usage rules, VEE rules, aggregations processes, and so on.
- **Solution Changes**: Oracle should be consulted before significant solution changes are made. For example, adding new meter channels, adding a large number of meters, network changes, or new integrations, and so on.

Functional Limitations and Restrictions

This section outlines some specific limitations and restrictions regarding the functionality of Oracle Utilities Meter Solution Cloud Service beyond those identified in the service description, including:

- Usage and Event Data Formats
- Smart Meter Commands
- Common Functionality

Usage and Event Data Formats

Usage and event data being imported into Oracle Utilities Meter Solution Cloud Service can be imported using one of the following vendor-specific adapters:

- Itron OpenWay
- Landis+Gyr
- Sensus RNI
- Silver Spring Networks
- MV-90 Adapter for Itron

For custom file formats, implementation can use the Adapter Development Kit Native Format or the Adapter Development Kit to build custom data conversion process.

Smart Meter Commands

Oracle Utilities Meter Solution Cloud Service supports smart meters commands as described in the Smart Grid Gateway Adapter documentation (see Oracle Utilities Meter Solution Cloud Service Documentation). Additional smart meter command functionality must be implemented external to Oracle Utilities Meter Solution Cloud Service. This includes the following:

- Extensions to currently supported smart meter commands for supported head- end systems (see Head End System Integrations)
- New smart meter commands beyond those currently supported
- Commands for non-supported head-end systems

Common Functionality

Oracle Utilities Meter Solution Cloud Service includes functionality used by multiple Oracle Utilities cloud services. Some of the functionality provided with Oracle Utilities Meter Solution Cloud Service is restricted, and can only be used if specific cloud services have been licensed. The table below indicates the specific functional areas included with each of the listed cloud services.

- "Yes" indicates that the functional area is included with the product.
- "No" indicates that the functional area is not included with the product.

In order to use functionality listed as “not included”, customers must license the product that includes the desired functionality.

Functionality	Oracle Utilities Meter Solution Cloud Service	Oracle Utilities Market Settlements Management Cloud Service
Measurement and Service Data Model	Yes	Yes
Validation and Editing Functionality	Yes	Yes
Estimation and Forecasting Functionality	Yes	Yes
Measurement Services and Aggregations	Yes	Yes
Consumer Level Usage and Bill Determinant Calculations	Yes	No
Wholesale Usage Bill Determinant Calculations	Yes	Yes
Usage Calculations for Settlement Processes	No	Yes
Usage and Event Upload Statistics Processing	Yes	Yes
Smart Meter Command Processing	Yes	No
Outage Integration	Yes	No
Service Order Management	Yes	No
DataConnect	Yes	No
Settlement Processes	No	Yes
Wholesale Gas Operations	No	Yes

Functional Areas

The table below describes the functional areas provided with the Oracle Utilities meter solution products.

Functional Area	Description
Measurement and Service Data Model	The measurement and service data model contains database tables and related functionality used to define and store meters, devices, unmetered items, service points, and measurement data.
Validation and Editing Functionality	The engine that provides the core functionality used to run validation and editing rules on usage data. This does not include technical validations such as valid format, valid number of readings, and so on.
Estimation and Forecasting Functionality	Processes to estimate missing usage and forecast future energy use.

Functional Area	Description
Measurement Services and Aggregation	Measurement services are used to process meter reading data and manipulate measurements to support billing or other downstream processes.
Consumer Level Usage and Bill Determinant Calculations	The usage engine and usage rules provide the core functionality used to perform consumer usage and bill determinant calculations based on measurement data.
Wholesale Usage Bill Determinant Calculations	The usage engine and usage rules provide the core functionality used to perform settlement and wholesale billing calculations based on measurement data. The term wholesale relates to purchasing and selling large quantities of energy between energy companies.
Usage Calculations for Settlement Processes	The usage engine and usage rules provide the core functionality used to perform settlement.
Usage and Event Upload Statistics Processing	Processing and compiling upload statistics related to upload of usage and device events.
Smart Meter Command Processing	Executing smart meter commands and communicating with a head-end system for purposes of issuing commands such as remote connect, commission meter, etc.
Outage Integration	Communicating with Oracle Utilities Network Management System, including sending/receiving bulk ping commands, receiving device events from Oracle Utilities Meter Solution Cloud Service, and suppression of device event notifications (allowing a suppression activity to be configured for a meter or service point so that specified device event notifications will not be sent to Oracle Utilities Network Management System).
Service Order Management	Orchestration of service orders that involve field work and/or smart meter commands through integration with customer information systems, mobile field work systems, and head-end systems.
DataConnect	Components used to extract interval measurements data and master data for integration with external energy management systems.
Settlement Processes	Components used for settlement processes: schedules, unaccounted for energy (UFE) calculations, capacity calculations, procurement, and true up processes.
Wholesale Gas Operations	Components used for wholesale gas operations: nominations, bids, scheduling and transportation.
Forecasting Rules	Rules used to forecast future energy use.

Operational Readiness Advisory

This section outlines suggested validations as part of operational readiness testing:

- Confirm batch stability, day over day execution according to your production schedule, and that performance is within acceptable production window.
- Leverage production converted data, along with actual production files for critical batch inputs, including usage/reads, payments and other billing input files when testing batch execution

- Confirm stable batch execution for a full month of bill cycles, plus the first three (3) cycles of the subsequent month to ensure consistency in batch execution across all bill cycles
- Review daily To Do entry volumes and confirm them to be acceptable based on available staffing
- Update database partitioning prior to go live. See **Go-Live Checklist** in the **Information Lifecycle Management** chapter of the *Oracle Utilities Cloud Services Implementation Guide*.

3

Implementation Support and Live Operate Services

This chapter describes implementation support and live operate services for Oracle Utilities Meter Solution Cloud Service:

Implementation Support Services

Implementation Support Services are services that relate to the initial set up of Oracle Utilities cloud services. If Implementation Support Services are included in your Oracle Utilities cloud service(s), it will be stated in the relevant services descriptions.

The scope of the Implementation Support Services provided by Oracle is limited and currently includes (but it not limited to) the following:

Oracle will work to:

- Provide pre-configured templates (where available). These templates may be limited in scope (and may not completely align with the scope of the implementation project) and may only be available in the English language.
- Provide Utility Reference Model and other documentation describing the business processes that are the basis for the template configuration.
- To the extent necessary and under exceptional circumstances, execute scripts (authored by the customer) to resolve data issues.
  - Scripts submitted for execution to correct data issues will be subject to review for compliance with Oracle's Software Security Assurance standards. Scripts that do not comply will be returned for correction; resubmission will require a further compliance review with approval before execution will be scheduled.
  - There is a limit of four (4) script reviews in any calendar month. Review requests beyond this entitlement may be subject to additional fees.

Customers/Implementers retain complete responsibility for all other aspects of implementing the cloud service, including (but not limited to):

- Overall setup project management, including responsibility for management of the scope, the project plan/schedule and budget.
- End-user training activities and organizational change management.
- Leading and managing the user system review.
- Designing and testing all configurations and extensions to ensure they do not adversely affect performance.
- Identifying, designing, documenting and implementing any business process changes and system operation processes.

- Coordinating with external vendors or service providers to manage dependencies that could impact the overall project scope and schedule.
- Designating a project manager who shall be responsible for coordinating all customer/ implementation related activities and responsibilities with respect to provisioning these Oracle Cloud Services.
- Business process change activities including end-user communication (e.g., status updates, newsletters, forums, etc.).
- Planning and executing all testing activities.
- All cut-over and roll-out activities.
- Business intelligence or data warehouse implementation/integration (if required).
- Procuring, setting up or otherwise provisioning any additional hardware, software or services as required.
- Providing any network hardware and/or software that may be required to connect to the Oracle Utilities cloud service(s).
- All data conversion/migration/cleansing activities such as:
  - Extracting, transforming and loading data into migration staging tables
  - Using cloud service data conversion tools (where available) to load data into the production environment
  - Creating or updating any required validation scripts
  - Any/all data cleansing activities that may be required (NB: these must be done in the source application(s) and not directly in the cloud service environment(s))
- Providing all in-scope data conversions and interfaces in formats supported by the relevant Oracle Utilities cloud service(s).
- The following interface/integration related activities:
  - Building and testing of any interfaces to or from the Oracle Utilities cloud service(s) (unless stated otherwise)
  - Any ongoing synchronization and interface monitoring activities between customer owned Customer Information System(s) (CIS) and Oracle Utilities cloud service(s)
  - Complete end to end integration flows using template interfaces
  - Any configuration of interfaces external to the Oracle Utilities cloud service(s) that are required to match the published specification for interfacing with the Oracle Utilities cloud service(s)

The provision of these Implementation Support Services is contingent on the following:

- Any integration middleware used to implement any integration will not be hosted within any Oracle Utilities cloud service(s).
- Turnaround time will be no longer than two (2) working days unless otherwise agreed. Turnaround time refers to time taken by the customer/implementation team to respond to and confirm design elements and decision points during the performance of the Implementation Support Services.

Live Operate Services

Live Operate services are services that Oracle provides to assist you with the ongoing operation of supported Oracle Utilities cloud services, once live and in production. If Live

Operate Services are included in your Oracle Utilities cloud service(s), it will be stated in the relevant services descriptions.

The scope of the Live Operate Services provided by Oracle is limited and currently includes the following:

Oracle will work to:

- Provide you with access to a Customer Success Manager ("CSM") who will deliver customer success services. To learn more about what you can expect from a CSM, please visit https://www.oracle.com/customer-hub/utilities/working-with-customer-success/.
- Provide access to information about incidents and changes made to any of your Oracle Utilities cloud service environment(s).
- Upon request, create and deliver a Quarterly Status Report summarizing the activities undertaken over the past quarter and those scheduled as major future events.
- Upon request, offer quarterly meetings with customer/implementation oversight team to present, review and discuss the Quarterly Status Report.
- Monitor infrastructure and application availability and resolve any incident that is within Oracle's scope or responsibility.
- Provide primary Help Desk Services from 08:00 to 17:00 your local time on Oracle working days.
- Respond to severity 1 incidents 24 hours per day, 365 days per year.
- Provide incident management and problem management services for events related to Oracle Utilities Cloud Services, including:
  - Analyzing issues and resolving any incidents that are within Oracle's scope or responsibility
  - Escalating any issues not within Oracle's scope or responsibility to you for resolution
  - Provide infrastructure logs to assist in the diagnosis and remediation of incidents within your scope or responsibility. NB: these logs may be scrubbed for security purposes and other sensitive data.

Customers remain completely responsible for all other aspects of using or otherwise operating the cloud service. Examples of customer obligations in this regard would be to:

- Assign a manager to act as the primary conduit for all issues relating to the delivery of these services.
- Provide Oracle with the dates for key business and technology events (i.e. testing calendar, refresh schedule etc.) at least thirty (30) days prior to the event.
- Assign appropriate resources to support your activities.
- Support scheduling of meetings as required.
- Participate in all scheduled meetings.
- Manage all activities, including:
  - Prioritizing work activities
  - Providing coordination across any teams and/or interested parties external to Oracle.
  - Escalation of issues to the Oracle CSM in a timely manner.
  - Providing any information required to progress service requests. Oracle is not responsible for meeting any agreed (or stated) targets or objectives if required or requested information is not forthcoming in a timely manner.

  - Assigning appropriate resources to conduct all required acceptance testing for all software packages delivered.
  - Accepting all software packages prior to promotion to the Production environment.
  - Maintaining a contact list for all persons performing governance functions.
  - Participating in Oracle's internal quality assurance processes on a mutually agreed schedule.
- Manage the Oracle Utilities cloud services, including:
  - Defining and (as necessary) modifying batch schedules to meet business needs.
  - Monitoring batch and interface processes to confirm and verify completion.
  - Defining, implementing, testing and deploying any changes to the configuration and extensions required to:
    * Resolve incidents or problems within the customers scope or responsibility
    * Meet evolving business needs
    * Conform with upgrades, patches or any other Oracle Utilities cloud service requirements or prerequisites.
- Notify Oracle of any incidents detected.
- Action each SR in accordance with the relevant Oracle Cloud Hosting and Delivery Policies.
- Establish the method of communication between the incident management team and the Oracle team for each incident.
- Redirect any SRs to the correct (non- Oracle) support team if the SR is not within the scope of the Oracle Utilities cloud service(s).
- Assist the Oracle team with SR analysis of data originating outside the applications.
- Correct business data as reasonably requested by Oracle to achieve closure of an identified problem.
- Monitor customer network and network connections to ensure sufficient bandwidth and performance.
- Conduct all functional, regression, performance, system integration, acceptance and/or user acceptance testing as appropriate, and accept and approve all software changes, prior to the production roll out of any change, in accordance with any agreed-on release management process, for any change resulting from:
  - An incident remedy or fix, or
  - Any service pack update or upgrade.
- Provide suitably qualified support personnel who are able to extract, interpret, analyze and respond to information provided in the Performance Hub reports.
- Provide authorizations and/or validations for data correction and/or adjustments to the supported environments.
- Apply configuration changes that are within the customer's or implementation’s scope as recommended by Oracle to prevent recurring incidents.
- At Oracle's request, provide approval through the environment change management process for the installation of fixes to prevent recurring incidents.
- Initiate documented escalation processes when the urgency of the incident has increased due to business requirements.

- Provide incident support where the remediation is within Oracle's scope or responsibility, specifically:
  - Provide Oracle with access to the user who reported the problem.
  - Provide all information as reasonably requested by Oracle and participate in diagnostics, including, but not limited to, business/access logs and Performance Hub reports.
  - Provide a test case and access to an environment where the SR incident is reproducible.
- Provide Oracle, as necessary, with access to any other support teams.
- Acknowledge that the supplied break-fix resolves the incident or problem and accept the SR closure.
- Provide internal approvals to Oracle before the migration of any change recommended by Oracle into a production environment.
- When an incident or problem is determined by Oracle to be unrelated to an Oracle Utilities cloud service or to be caused by data problems arising from data conversion or some other error, a separate, paid contract may be required to cover Oracle's time spent investigating and, if relevant, correcting the problem at Oracle's prevailing time and materials rates, and to reimburse Oracle for all reasonable out of pocket expenses.

4

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This chapter provides information regarding third-party software used in Oracle Utilities cloud services, including:

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- Third Party Software Licenses

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