

**UCAIug OpenSG OpenADE Task Force
OpenADE 1.0 System Requirements Specification**

1 **OpenADE 1.0 System Requirements Specification**

2 *Version: Approved v1.0*

3 **Release Date: 2/19/2010**

UCAIug OpenSG OpenADE Task Force

OpenADE 1.0 System Requirements Specification

1 **Acknowledgements**

2 The following individuals and their companies have contributed and/or provided support to the
3 work of the OpenADE System Requirements Specification:

- 4 • Arthur Salwin from Noblis
- 5 • Belvin Louie from PG&E
- 6 • Brad Bogolia from Silver Spring Networks
- 7 • Brad Johnson from Oncor
- 8 • Brent Hodges from Reliant Energy
- 9 • Bin Qiu from E:SO
- 10 • Chad Maglaque from Microsoft
- 11 • Charles Spirakis from Google
- 12 • Chris Chen from Sempra / SDG&E
- 13 • Chris Thomas from Citizens Utility Board (State of Illinois)
- 14 • Chuck Thomas from EPRI
- 15 • Claudio Lima from Sonoma Innovation
- 16 • Darren Highfill from Saker Systems
- 17 • Dave Mollerstuen from Tendril Networks
- 18 • Gerald Gray from CIMple Integrations
- 19 • Gillis Melancon from FP&L
- 20 • Jeremy McDonald from SCE
- 21 • Joe Zhou from Xtensible Solutions
- 22 • John Mani from Comverge
- 23 • Larry Kohrman from Oncor
- 24 • Mark Ortiz from Consumers Energy
- 25 • Mary Zientara from Reliant
- 26 • Michael Shames from Utility Consumer's Action Network
- 27 • Patrick Beer from Ecologic Analytics
- 28 • Ramesh Reddi from IntellEnergyUtil
- 29 • Rohit Khera from PG&E
- 30 • Sandy Bacik from Sensus
- 31 • Shawn Hu from Xtensible Solutions / SCE
- 32 • Steve Van Ausdall from Xtensible Solutions / SCE

33 The OpenADE Task Force wishes to thank all of the above-mentioned individuals and their
34 companies for their support of this important endeavor, as it sets a key foundation for an
35 interoperable Smart Grid.

36

UCAIug OpenSG OpenADE Task Force
OpenADE 1.0 System Requirements Specification

1 **Document History**

2 **Revision History**

3 Date of this revision: Feb. 19, 2010

4

Revision Number	Revision Date	Revision By	Summary of Changes	Changes marked
0.1	10/16/09	Steve Van Ausdall	Initial draft "shell".	N
0.2	10/29/09	Steve Van Ausdall	Added data elements	N
0.4	1/20/10	Steve Van Ausdall	Resolved comments from Arthur Salwin	Y
0.5	2/2/10	Steve Van Ausdall	Complete version for F2F review	Y
0.6	2/4/10	OpenADE TF	Changes from F2F review comments	Y
0.7	2/15/10	OpenADE TF	Clarification of SLA reference, minor additions from Larry; Acronym improvements from Arthur; removed specification of authentication (login) method (3.3 #1) and clarification of FTP option from Chad; softened audit requirement to SHOULD;	Y
1.0	2/19/10	OpenADE TF	Accepted changes and deleted comments, moved issues requiring discussion to open issues log.	N

5 **Open Issues Log**

6 Last updated: Feb. 19, 2010

7
8 As issues are addressed in new versions of this document, they are removed from this list.

9

Issue Date	Provided By	Summary of the Issue
2/15/10	Chad Maglaque	Add authentication options beyond service provider portal identity
2/15/10	Chad Maglaque	Discuss whether to require Secure FTP for batch transfers

UCAIug OpenSG OpenADE Task Force
OpenADE 1.0 System Requirements Specification

Contents

1		
2	1	Introduction 5
3	1.1	Purpose5
4	1.2	Scope.....6
5	1.3	Acronyms and Abbreviations.....7
6	1.4	External Considerations and References.....7
7	1.4.1	RFC 2119 Keyword interpretation.....7
8	1.5	Document Overview7
9	2	Architecture Vision 10
10	2.1	Architectural Goals and Guiding Principles11
11	2.2	Architectural Considerations.....11
12	3	OpenADE Systems Architecture..... 13
13	3.1	OpenADE Business Architecture View13
14	3.2	Integration Requirements Specification15
15	3.2.1	Functional Requirements – Business Processes15
16	3.2.2	Functional Requirements – Integration Services15
17	3.2.3	Technical Requirements – Integration Services16
18	3.3	OpenADE Application Architecture View16
19	3.4	OpenADE Data Architecture View.....17
20	3.4.1	Consumption Readings Data Requirements.....17
21	3.5	OpenADE Technical Architecture View18
22	3.5.1	Networking Standards.....18
23	3.5.2	Security Standards19
24	3.5.3	Service / Resource Patterns.....19
25	3.6	Governance.....20
26	4	Appendices 21
27	4.1	Terms and Definitions.....21

List of Figures

29	Figure 1.	OpenADE component diagram showing the actors and components.6
30	Figure 2.	The Open Group Architecture Framework (TOGAF) architecture development cycle.8
31	Figure 3.	OpenADE Stakeholders Overview 10
32	Figure 4.	Overview of Business Process Flows 13
33	Figure 5.	Overview diagram of Logical Components..... 14

UCAIug OpenSG OpenADE Task Force

OpenADE 1.0 System Requirements Specification

1 Introduction

Open Automatic Data Exchange (OpenADE) is an industry-led initiative under the Open Smart Grid (OpenSG) subcommittee within the UCA International Users Group (UCAIug). The OpenADE Task Force defines systems requirements, policies and principles, best practices, and services, required for information exchange and control between 3rd Party energy usage data service providers (3rd Party), and public utility web services, and customers. OpenADE, as an open user group forum, is developing a set of utility-ratified requirements and specifications for utilities and 3rd Parties to adopt and implement. The end-state of this effort will contribute to the development of open and interoperable utility data sharing applications. Please see the [OpenADE Charter](#) for additional information.

The OpenADE group is organized with three sub-groups:

- **Use Case Team:** to develop common business process models and functional requirements.
- **SRS Team:** to develop overall systems architecture principles, integration requirements and specifications.
- **Service Definition Team:** to develop standards-based, platform independent integration services that support the business processes, adhere to the architecture principles and patterns, and are open and support extensible interoperability.

The main goal of the task force is to work with utilities and 3rd Parties to develop requirements and specifications necessary to enable 3rd Parties to gain access to Customer usage data. This will be achieved by defining and making the following OpenADE related items available to the market:

- Common business processes and functional requirements
- Common architecture principles and patterns
- Common information requirements and model
- Common integration services (functional & informational)
- Tested interoperability between vendor products

Our current charter can be found on Smartgridipedia, at http://www.smartgridipedia.org/index.php/OpenADE_Charter.

1.1 Purpose

The purpose of this document is to provide both the functional and technical guidance and requirements needed to serve as the “rules of engagement” for messaging and data exchange to achieve interoperability. This would lead to open and interoperable components that can be delivered with different vendor products and/or solutions within the scope of OpenADE. The functional requirements will be driven by business processes and the technical requirements will be driven by desired architectural principles and best practices.

UCAIug OpenSG OpenADE Task Force

OpenADE 1.0 System Requirements Specification

1.2 Scope

The scope of OpenADE 1.0 SRS includes authorization and transfer of Customer consumption information. Future functional scope may include prices and billing related information. The SRS defines the logical components and business functions in order to identify the interfaces that must be specified to enable interoperability across different implementations, for many utilities to many 3rd Parties. It includes architectural aspects and specific requirements. The inputs include OpenADE use cases, as well as industry best practices and standards, including information models and other specifications.

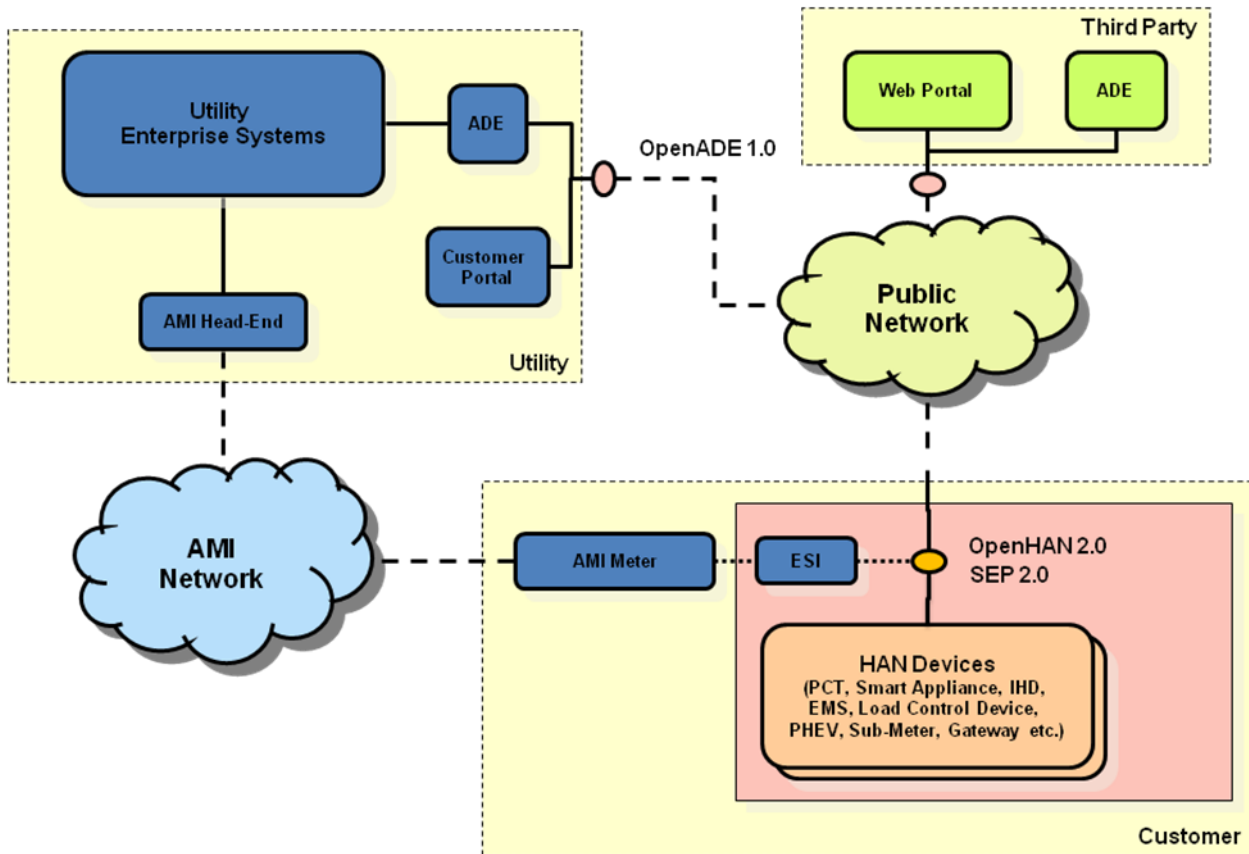


Figure 1. OpenADE component diagram showing the actors and components.

OpenADE SRS does not include the following items that are typically a part of solution architecture. Some of them are or have been addressed by other parts of the OpenSG initiative. Others will need to be dealt with specifically for each implementation.

- Network and hardware infrastructure architecture
- Operational architecture
- Testing methodology and architecture
- Internal application architecture

UCAIug OpenSG OpenADE Task Force
OpenADE 1.0 System Requirements Specification

1.3 Acronyms and Abbreviations

This subsection provides a list of all acronyms and abbreviations required to properly interpret the OpenSG OpenADE System Requirements Specification.

Acronym	Name
ADE	Automatic Data Exchange
AMI	Advanced Metering Infrastructure
CIM	IEC TC57 Common Information Model
EMS	Energy Management System
ESI	Energy System Interface; Energy Services Interface
HAN	Home Area Network
IETF	Internet Engineering Task Force
IHD	In-Home Display
PHEV	Plug-In Hybrid Electric Vehicle
SDO	Standards Development Organization
SEP 2.0	Smart Energy Profile
SLA	Service Level Agreement
SRS	System Requirements Specification
TOGAF	The Open Group Architecture Framework

1.4 External Considerations and References

The work of OpenADE SRS is dependent upon the best practices available from the following entities and standards organizations:

- [OADE] OpenSG OpenADE Business and User Requirements 1.0
- IETF Internet Suite - Internet Standards, including the following
 - [RFC-793] IETF Transmission Control Protocol (TCP)
 - [RFC-791] IETF Internet Protocol (IP)
 - [RFC-2616] Hypertext Transfer Protocol -- HTTP/1.1
- [IEC-61968] IEC TC57 Working Group 14 (IEC 61968) (Common Information Model)
- [ASAP-SG-3P] Security Profile for Third Party Access (ASAP-SG)

1.4.1 RFC 2119 Keyword interpretation

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in RFC 2119.

1.5 Document Overview

TOGAF 9.0 defines four architecture domains that are commonly accepted as subsets of overall enterprise architecture, all of which TOGAF is designed to support, see Figure 2:

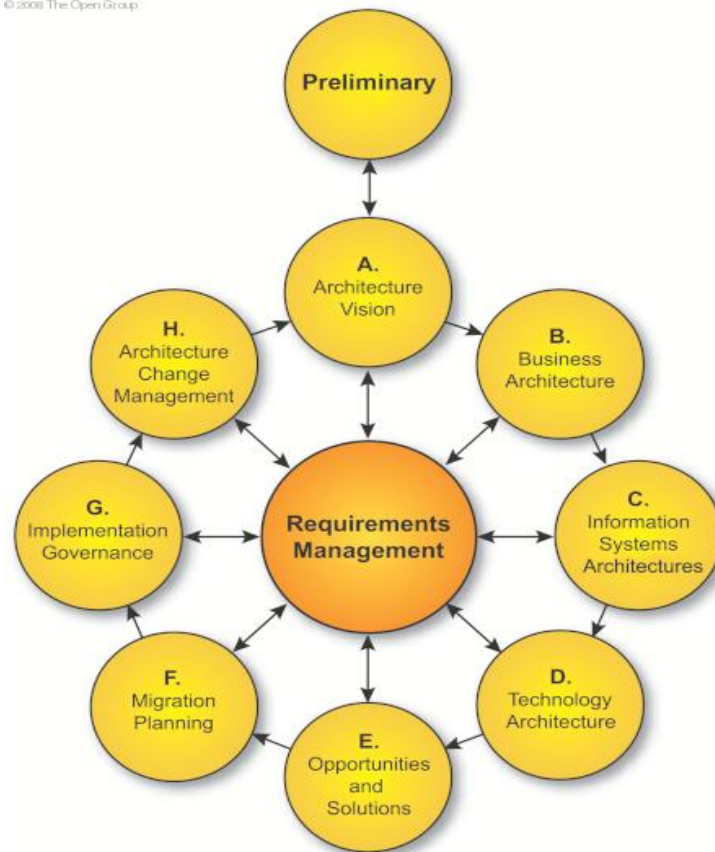
- **Architecture Vision** defines overall architecture guiding principles, goals and objectives and desired traits.

UCAIug OpenSG OpenADE Task Force

OpenADE 1.0 System Requirements Specification

- 1 • The **Business Architecture** defines the business strategy, governance, organization, and key business
2 processes.
- 3 • The **Information Systems Architecture**, including the following.
- 4 ○ The **Data Architecture** describes the structure of an organization's logical and physical data assets and
5 data management resources.
- 6 ○ The **Application Architecture** provides a blueprint for the individual application systems to be deployed,
7 their interactions, and their relationships to the core business processes of the organization.
- 8 • The **Technology Architecture** describes the logical software and hardware capabilities that are required to
9 support the deployment of business, data, and application services. This includes IT infrastructure,
10 middleware, networks, communications, processing, standards, etc.

© 2008 The Open Group



11
12 **Figure 2. The Open Group Architecture Framework (TOGAF) architecture development cycle.**

13
14 As such, the document will be structured as follows:

15
16 **Section 2** describes the overall Architecture Vision for the system, including Guiding Principles, Architectural
17 Considerations, and the OpenADE Reference Model, all relevant to providing a consistent framework within
18 which the four architecture components can be developed.

19
20 **Section 3** provides details on the following:

UCAIug OpenSG OpenADE Task Force OpenADE 1.0 System Requirements Specification

- 1 1. **Business Architecture:** This will refer to work products produced by the Use Case and Service
2 Definition Teams of OpenADE, which includes the list of use cases and integration requirements and
3 business services at the functional level.
- 4 2. **Data Architecture:** This provides the technical level requirements relative to how the OpenADE data
5 should be modeled and represented consistently across all integration services to ensure semantic
6 interoperability.
- 7 3. **Application Architecture:** This provides the technical level requirements relative to how applications are
8 modeled as logical components, and what services each logical component may provide or consume. This
9 should be an instantiation of the business services identified within the Business Architecture.
- 10 4. **Technology Architecture:** This provides the technical level requirements relative to how services will
11 interact with each other to support end-to-end AMI business processes.

12
13 **Section 4** contains the Appendices, which includes terms and definitions, logical components list, integration
14 requirements list, and integration services view.

2 Architecture Vision

The following diagram gives an overview of the key stakeholders. Key elements of this problem space are that we want to enable a 3-way authorization handshake, and allow for many-to-many data transfers between many utilities and 3rd Parties.

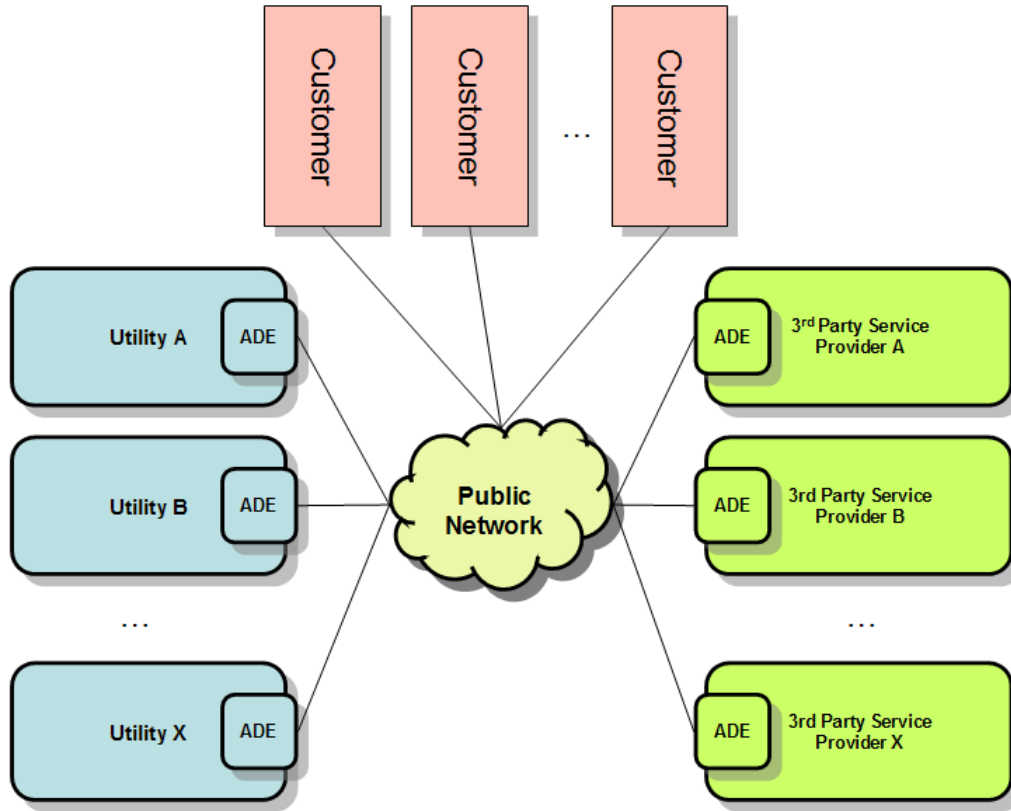


Figure 3. OpenADE Stakeholders Overview

UCAIug OpenSG OpenADE Task Force

OpenADE 1.0 System Requirements Specification

2.1 Architectural Goals and Guiding Principles

Architecture guiding principles are rules of engagement designed to ensure that all aspects of the implementation fit within a well-defined framework. These principles, discussed and agreed upon with all stakeholders of the OpenADE, are used to drive the architectural approach and patterns to be implemented. These principles should not be taken lightly as they imply what and how the overall goals of OpenADE will be met. Each of the principles has a level of effort and cost implications for utilities and 3rd Parties looking to adopt this specification. Adherence to these principles can be adjusted for specific cases driven by time and budget constraints. These exceptions should be approved by all stakeholders and must be documented.

- Exchanges of data cross enterprise boundaries
 - Industry best practices must be followed
 - The most interoperable and widely supported technologies should be used to ensure adoption regardless of development and deployment platforms used
 - The technologies chosen shall be well specified, with active communities and tools and/or frameworks available. For example, WS-I, or RESTful in conjunction with AtomPub, OData or GData.
 - Technologies chosen shall be compatible and interoperable with technologies specified for access to HAN resources.
 - Security and privacy of customer information is of utmost importance, since transfers must use public networks, and sensitive customer information may be exchanged across enterprise boundaries.
- Recommendations must promote and enable interoperability
 - Many utilities need to be interoperable with many 3rd Parties, so there are significant efficiency savings possible by defining a common interface for the OpenADE message exchanges. Therefore, recommendations must be specific and prescriptive, actionable and testable
- Must meet the goals of several different types of stakeholders
 - Requires an open process to allow discussion and negotiation of the recommendation
- Forwards and backwards version compatibility is needed
 - Existing implementations must remain operational when either side adds future extensions

2.2 Architectural Considerations

OpenADE as a system needs to be architected with requirements that cover the entire spectrum of business, technical, and market needs. The following list of architectural attributes will be used as guidelines for OpenADE systems requirements development.

- System quality attributes discernable at runtime
 - Performance - Services SHALL provide and consume data in a timely manner
 - Security – All transfers of information SHALL be encrypted (OADE BR-11)
 - Authorization – Protected resources SHALL be authorized individually by the user(s) associated with those resources.

UCAIug OpenSG OpenADE Task Force OpenADE 1.0 System Requirements Specification

- 1 ○ Availability – Services SHALL be highly available
- 2 ○ Functionality – SHALL meet the functional needs of customers and regulators
- 3 ○ Usability – SHALL require only commonly available tools and technologies
- 4 ○ Scalability – SHALL be able to add additional servers to meet performance
- 5 • System quality attributes requiring assessment for evaluation
- 6 ○ Modifiability – SHALL allow additions without affecting existing systems (OADE BR-8)
- 7 ○ Portability – SHALL be possible to implement on a variety of platforms
- 8 ○ Reusability – SHALL use standard industry object representations
- 9 ○ Integrability – SHALL be possible to map to a variety of other interfaces
- 10 ○ Testability – SHALL be possible to perform testing using a variety of methods
- 11 • Business Qualities
- 12 ○ Time to market – SHALL be available 1Q 2010
- 13 ○ Cost – SHALL not be cost-prohibitive
- 14 ○ Projected life time of the system – SHALL allow growth
- 15 ○ Rollout schedule - SHALL be operational in 2010
- 16 • Qualities directly related to the architecture
- 17 ○ Conceptual integrity – Semantics of defined elements SHALL be consistent across objects that
- 18 use those elements
- 19 ○ Correctness and completeness - Is aligned with common application architectures and addresses
- 20 all considerations required for interoperability.

21 Note that desired, minimum and maximum levels for performance, availability, functionality, acceptable use, and
22 other characteristics will likely be specified and negotiated in Service Level Agreements (SLAs) between 3rd
23 Parties and Utilities. Regulators may also require certain service levels. Each side will likely have some number
24 of terms required for use of their services. This is not part of the standardization effort, just a note to prepare for
25 these agreements.

3 OpenADE Systems Architecture

3.1 OpenADE Business Architecture View

The primary business flows include configuration, registration, and authorization of 3rd Party providers, and exchange of authorized data, as shown in the following diagram.

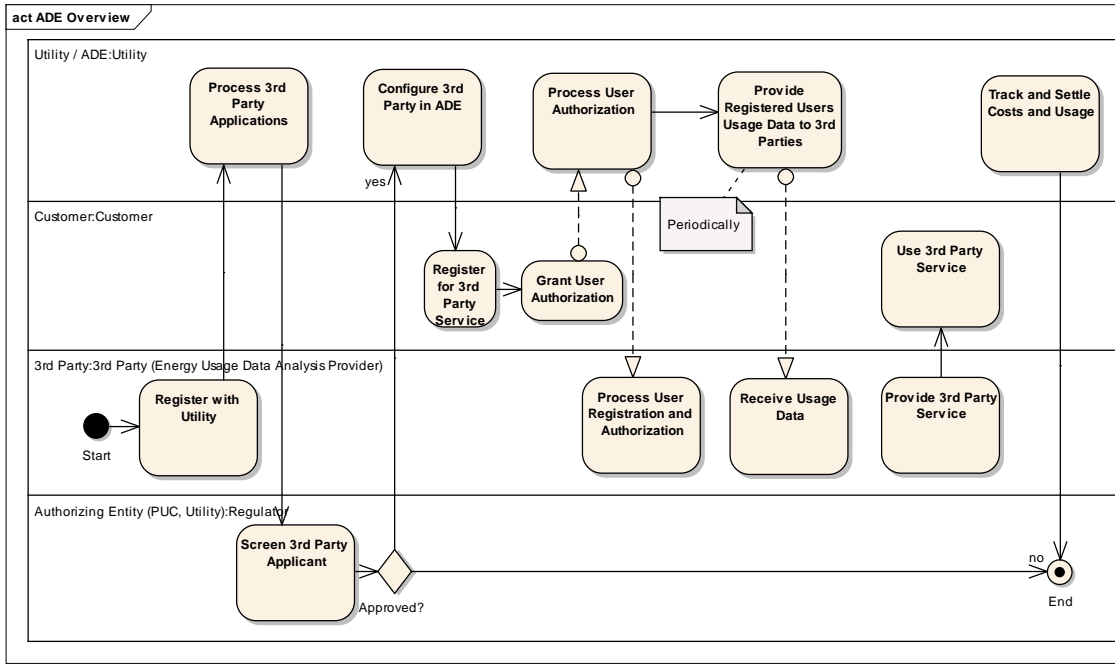


Figure 4. Overview of Business Process Flows

The business architecture is the primary topic covered in the "[Business and User Requirements](#)" document, where additional use cases and requirements are located.

3.1.1.1 Logical Components List

Logical Components are used in this document to organize interfaces (integration services) for OpenADE. These functional components may be mapped to specific physical components for a particular implementation. Following is a table listing all major logical components that will provide some functions to support ADE business processes. All services will be organized accordingly.

Logical Components	Description / Key Business Functions	Map to NIST
Utility	The distributors of electricity to and from customers. May also store and generate electricity. The carriers of bulk electricity over long distances. May also store and generate electricity.	Distribution Transmission
3 rd Party	The organizations providing services to electrical customers and utilities. Any entity that has authorization to exchange	Service Provider 3 rd Party

**UCAIug OpenSG OpenADE Task Force
OpenADE 1.0 System Requirements Specification**

	information with customers and their systems.	
Customer	The end users of electricity. May also generate, store, and manage the use of energy. Traditionally, three customer types are discussed, each with its own domain: home, commercial/building, and industrial.	Customer
Authorizing Entity	Either the utility or a regulatory body that verifies each 3 rd Party meets all requirements for use of OpenADE services.	

- 1 The following diagram shows the components involved in data exchanges. Note that while authorizations are
 2 expected to use a web browser, the 3rd Party services are not required to use a web browser to deliver their service.

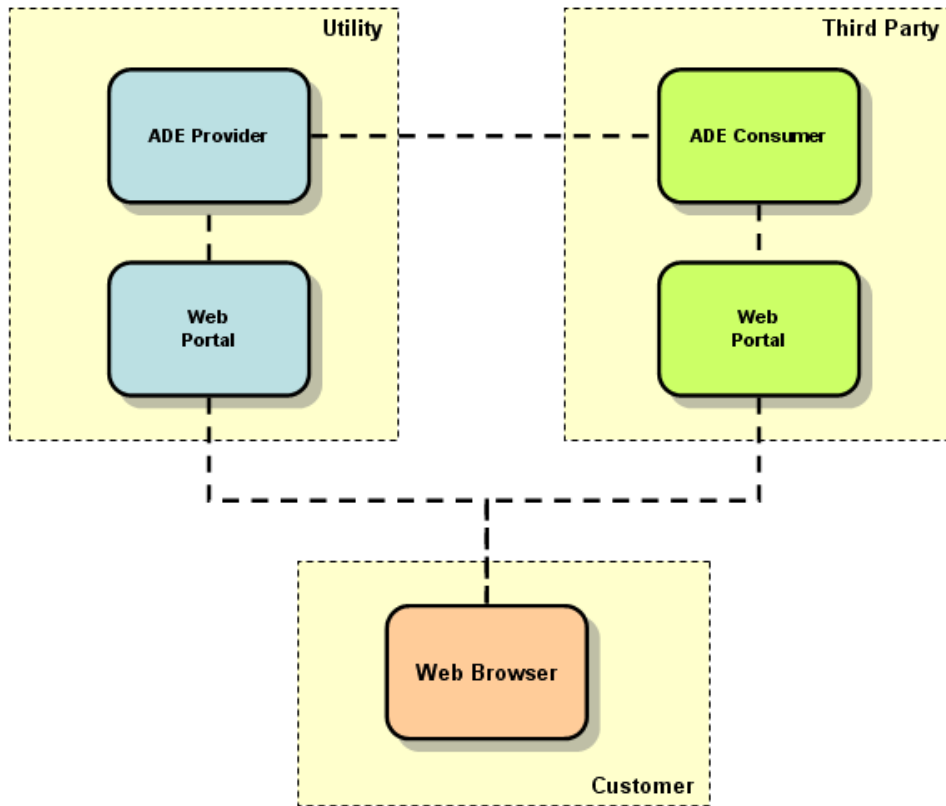


Figure 5. Overview diagram of Logical Components

- 3
4
5

UCAIug OpenSG OpenADE Task Force
OpenADE 1.0 System Requirements Specification

3.2 Integration Requirements Specification

3.2.1 Functional Requirements – Business Processes

The business processes that have been developed as part of OpenADE are listed as follows. Note that the “OpenADE Business and User Requirements” contains the details of each business process (use case).

- ADE Discovery
 - 3rd Party and Utility agree to SLAs and configure OpenADE services (OADE BR-10, 12)
 - 3rd Party retrieves listing of supported operations with extensions and versions (OADE BR-8)
 - Utility retrieves listing of supported operations with extensions and versions (OADE BR-8)
 - 3rd Party and Utility subscribe to notifications
- ADE Authorization
 - Customer Grants Permission (OADE BR-1, 2, 3, 4, 9)
 - Customer Extends Permission (OADE BR-3)
 - Customer Terminates Permission (OADE BR-4, 7)
- ADE Publication
 - 3rd Party Requests or Subscribes to Customer Consumption Data
 - Utility Provides Customer Consumption Data to 3rd Party (OADE BR-14)

3.2.2 Functional Requirements – Integration Services

Using a consistent methodology to identify integration requirements from the use cases list above, the Services Definitions Team identified the following requirements.

Use Case Scenario	Service Name	Service Provider	Functional Description of the Service
Grant Authorization	Auth Request Token	Utility	Requested from 3 rd Party to Utility to obtain an unauthorized request token.
Grant Authorization	(HTML Page)	Utility	3 rd Party passes unauthorized request token to service provider for authorization. (Redirect)
Grant Authorization	Auth Authorization	3 rd Party	After grant or deny, verification code is returned to 3 rd Party.
Grant Authorization	Auth Access Token	Utility	3 rd Party requests access token with signed request from 3 rd Party. Token is returned if successful in the response.
Publication	CustomerConsumption Data	Utility	Support individual requests for consumption data, listings of new or updated data, or prepared batch of data (new and updates)
Publication	Notification	3 rd Party	If necessary, notify about available data or authorization changes.

UCAIug OpenSG OpenADE Task Force OpenADE 1.0 System Requirements Specification

1 3.2.3 Technical Requirements – Integration Services

2

3 Integration services that are well defined, understood and managed are the linchpin of an open and interoperable
4 implementation between the utility enterprise and other business entities. Following is a list of guiding principles
5 for integration services design:

- 6 • Common protocol and business semantics SHALL be used to achieve loose coupling of end-point service
7 (directly or indirectly)
- 8 • Services SHALL be representative of a unique unit of work and reusable across business functions.
- 9 • Services SHALL be reusable across common practices of utilities.
- 10 • Service design SHALL be driven by business requirements and reflected in the architecture.
- 11 • Service design SHALL be governed with a common approach and framework to achieve conceptual
12 integrity.
- 13 • Service level agreement should be defined to support key architecture qualities: security, reliability,
14 performance, availability, scalability, data quality, information fidelity, etc.

15 3.3 OpenADE Application Architecture View

- 16 1. OpenADE application architecture SHALL use the data service provider (Utility, or its representative)
17 web site / portal for identity (authentication). *(Note that expanding these options is in discussion.)*
- 18 2. All users SHALL have verified accounts at the data service provider (Utility) as well as at each 3rd Party.
- 19 3. Users SHALL be allowed to view and manage (change) their authorizations for each 3rd Party, possibly
20 within limits set by the provider (Utility).
- 21 4. Audit information SHOULD be maintained, so that a report could be produced containing details (who,
22 what, when, etc.) about authorizations, transfers, and other significant events.

23

UCAIug OpenSG OpenADE Task Force
OpenADE 1.0 System Requirements Specification

3.4 OpenADE Data Architecture View

Based on OpenADE use cases, the following data objects have been identified. The OpenADE services SHALL implement methods to make requests related to these objects.

- Authorization Request
 - Request an unauthorized access token
- User Authorization (Page)
 - Grant access to 3rd Party X to access resource Y data related to date/time range Z
- 3rd Party Authorization Callback
 - To redirect back to 3rd Party to continue authorization flow
- Access Token
 - An authorized access token
- Notification
 - e.g. authorization for data resource X was revoked, data Y is available
- Consumption Readings Request
 - Get data from period X through Y, or since Z
- Consumption Readings
 - Measurements

3.4.1 Consumption Readings Data Requirements

The list of logical data elements needed for the main “Consumption Readings” publication contains the following items.

Data Element	Description	CIM Element
Utility Identifier	Used to distinguish between data elements from different utilities	ServiceSupplier name
User Resource	A key value, generated during the authorization process, to be used by the utility and 3 rd party to represent a user / service point combination.	CustomerAuthorization
Service Point Name	An identifier (name) for the (metered) point at which the commodity was delivered to the customer. (Optional)	ServiceDeliveryPoint name
Service Type	The type of commodity related to the readings, such as energy, gas, water, etc.	ServiceCategory kind
Interval Start Date/Time	The date and time of the beginning of the interval during which the readings apply.	IntervalReading startTime
Interval End Date/Time	The date and time of the end of the interval during which the readings apply.	IntervalReading endTime
Reading Type	The type of measurement represented by the value of the reading (e.g. energy, voltage, pressure)	ReadingType kind
Interval Reading	The number of measured units delivered, for this interval.	IntervalReading value

UCAIug OpenSG OpenADE Task Force

OpenADE 1.0 System Requirements Specification

Data Element	Description	CIM Element
Reading Units	The units of the reading value (e.g. kW, kWh)	ReadingType unit
Reading Source	Specifies whether the reading is an estimate or actual reading	MeasurementValueSource name
Reading Date / Time or Interval	The start or end time of each individual reading, or which interval within the block.	MeasurementValue timeStamp or IntervalReading sequenceNumber (new)

1

2 Note that it is assumed there may be some missing intervals.

3 To help understand how the elements relate to each other, the following shows a preview of what selected sections of a
4 typical message might look like. This is only a sample, and may change significantly during the service definition phase.

5 [...] (header, etc. will go here)

6 <MeterReading>

7 [...] (user resource, etc. will go here)

8 <IntervalReading>

9 <endTime>2009-06-23T00:00:00-07:00</endTime>

10 <startTime>2009-06-23T01:00:00-07:00</startTime>

11 <MeasurementValueSource>

12 <name>ACTUAL</name>

13 </MeasurementValueSource>

14 <value>2.716549</value>

15 </IntervalReading>

16 </IntervalReadingList>

17 <ReadingType>

18 <kind>ENERGY</kind>

19 <unit>Wh</unit>

20 </ReadingType>

21 </IntervalBlock>

22 [...] (full message could contain multiple MeterReading elements)

23 Note that some extensions may have been included in the above that are not shown in the logical data model diagram in the
24 next section, but these will be in sync when the actual message structure is built.

25 3.5 OpenADE Technical Architecture View

26 Given a large variety of integration technologies that exist in the market place and in the utility enterprises, it
27 would be up to each utility to implement the OpenADE systems requirements specification that fit with their
28 chosen technology infrastructure and architecture goals. However, regardless of the technologies, the following
29 architectural issues are important and needs to be addressed when it comes to achieving interoperability.

30 3.5.1 Networking Standards

- 31 1. OpenADE services SHALL be provided via TCP/IP (internet) networks. (See [RFC-1122])
- 32 2. OpenADE services SHALL be exposed primarily using the HTTPS protocol. (See [RFC-1123])
- 33 3. OpenADE services MAY support Secure FTP. Since OpenADE requires HTTPS, FTP is only an option if both
34 parties implement and agree to use FTP. (Note that requiring support is in discussion.)

UCAIug OpenSG OpenADE Task Force

OpenADE 1.0 System Requirements Specification

1 3.5.2 Security Standards

2 A major component of OpenADE is ensuring that protected resources, including data, can and will be secured to prevent
3 unauthorized access. This responsibility originates with the utility, where the data is obtained, and is passed to 3rd Party
4 providers when customers authorize their use of specific utility data. To ensure that data is not provided to unauthorized
5 parties, the constraints and controls documented in [ASAP-SG-3P] are to be complied with for OpenADE installations.

6 Using the terminology specified in the ASAP-SG Third Party Data Access document, the customer is the Resource Owner,
7 the Data Service Provider is the Resource Custodian. (The 3rd Party is still called the Third Party)

8 3.5.3 Service / Resource Patterns

9 Service and/or resource naming standards are important to achieve a level of “plug & play” at the run time
10 environment. It implies the semantics of the service and its operations.

11 The OpenADE services naming convention has the following rules:

- 12 ○ **Information Object** – Collection of entities (classes and attributes) to describe an object in a business
13 context.
- 14 ○ **Service / Resource Name** – Service naming convention follows the information object in a business
15 process for an interface definition.
- 16 ○ **Operation Name** – Operation name indicates a specific action that will be performed to the Information
17 Object. Here is a list of operation naming patterns utilizing IEC 61989 verbs (See IEC61968-1
18 Specification for details):
 - 19 • The following verbs are used for service/operation provided by the master system that owns the
20 Information Object to entertain the request for the specified action implied by the verb.
 - 21 ▪ **Create**
 - 22 ▪ **Change**
 - 23 ▪ **Cancel**
 - 24 ▪ **Close**
 - 25 ▪ **Delete**
 - 26 • The following verbs are used for service/operation provided by systems that are interested in
27 receiving the Information Object as the result of the specified action implied by the verb. This
28 can be invoked by the master system or an intermediary to supply the Information Object.
 - 29 ▪ **Created**
 - 30 ▪ **Changed**
 - 31 ▪ **Closed**
 - 32 ▪ **Canceled**
 - 33 ▪ **Deleted**
 - 34 • The following verbs are used for query type services provided by the master system of the
35 Information Object.
 - 36 ▪ **Get**
 - 37 ▪ **Show**
 - 38 • The following verbs are not used within OpenADE.
 - 39 ▪ **Subscribe**
 - 40 ▪ **Unsubscribe**

41

UCAIug OpenSG OpenADE Task Force

OpenADE 1.0 System Requirements Specification

1 3.6 Governance

2 Governance defines the rules by which parties participating in interoperability (integration, or data exchange)
3 efforts can change the interfaces and components providing and consuming them, in order to maintain efficient
4 operation. For OpenADE, governance includes guidelines recommended for addition or extension of standard
5 interfaces, as well as modifications to or extensions to become part of the standard.

- 6 1. Changes shall be made to be backwards compatible (optional additions only), to allow existing implementations to
7 continue to operate.
- 8 2. Participants are encouraged to submit extensions to the working group as business requirements, with additional
9 recommendations as necessary, to be discussed, ratified, and added to periodic updates.

UCAIug OpenSG OpenADE Task Force
OpenADE 1.0 System Requirements Specification

4 Appendices

4.1 Terms and Definitions

This subsection provides the definitions of all terms required to properly interpret the OpenSG OpenADE SRS.

Term	Definition
Advanced Metering Infrastructure (AMI)	The infrastructure built around advanced metering allowing the utility and consumer to communicate in real time with respect to energy consumption. Based on the information collected, the utility is able to obtain an accurate reading of demands, while consumers are able to modify their usage to save energy.
Daily Consumption	The amount of energy a customer uses in a 24 hour period. This information is used to drive business intelligence solutions.
Data Service Provider	The utility, or organization acting on behalf of the utility, that is providing the OpenADE service.
IEC	The International Electrotechnical Commission (IEC). The IEC TC57 maintains an electric utility focused information model called CIM (Common information model).
IEC 61968	International standards for Energy Distribution Managements Systems, respectively, specify a Common Information Model (CIM) for utility data exchange, Applications Programming Interfaces (API) for application integration (GID), and XML messaging standards.
Logical Data Model	A representation of an organization's data based upon entities and attributes of those entities. A logical data model is often a logical representation of a business' integration or business requirements.
SLA	Service Level Agreement: the part of a service contract where the level of the services are agreed upon between two systems.

CIM Term	Definition
IntervalBlock	Used within a MeterReading to identify a time sequence of Readings of the same ReadingType.
IntervalReading	Data captured at regular intervals of time. Interval data could be captured as incremental data, absolute data, or relative data. The source for the data is usually a tariff quantity or an engineering quantity. Data is typically captured in time-tagged, uniform, fixed-length intervals of 5, 10, 15, 30, or 60 minutes. Interval Data is sometimes also called "Interval Data Readings" (IDR).
MeasurementValueSource	MeasurementValueSource describes the alternative sources updating a MeasurementValue. User conventions for how to use the MeasurementValueSource attributes are described in the introduction to IEC 61970-301.
MeterReading	Used to convey quantities that are measured by a meter.

UCAIug OpenSG OpenADE Task Force
OpenADE 1.0 System Requirements Specification

CIM Term	Definition
Reading	Used to convey a specific value measured by a meter or other asset. Each Reading is associated with a specific ReadingType.
ReadingType	Used to identify the type of data that is conveyed by a specific Reading.
ServiceDeliveryPoint	There can be multiple service points at a single ServiceLocation, each one identified as a ServiceDeliveryPoint. They deliver service in accordance with a CustomerAgreement.

1