SmartConnect Use Case:

C5 - Customer Uses Smart Appliances

January 05, 2009

Document History

Revision History

Revision Number	Revision Date	Revision/Reviewed By	Summary of Changes	Changes marked
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Approvals

This document requires following approvals.

Name	Title
Ivan O'Neill	*Project Manager, Edison SmartConnect*
Bryan Lambird	*Project Manager, Edison SmartConnect*

Contents

1. Use Case Description

1.1 Use Case Title

Customer Uses Smart Appliance

1.2 Use Case Summary

The SmartConnect advanced metering infrastructure (AMI) is allowing customers to become actively involved in changing their energy consumption habits by connecting their personal Smart Appliances to the utility grid. This use case describes how the customer installs and begins using Smart Appliances to manage their energy usage and costs.

1.3 Use Case Detailed Narrative

Customers are becoming increasingly aware of the importance of understanding how the amount of energy they use and when they use it not only impacts their own personal interests, but the entire system as well. Wanting to optimize their energy use and lower their monthly power bills, utility customers are turning to new commercially available Smart Appliances that allow them to monitor and manage their energy usage. Utilities and regulatory agencies have a stake in making the customer more aware of the energy they use, helping them change their consumption habits and advancing the integration and implementation of smart technologies on the grid. The SmartConnect system enables the communication between the utility and the customer's residence or business, making it possible to transmit data and messages via the SmartConnect meter and Smart Appliance. This communication allows the utility to convey important information such as power system conditions and energy conservation alerts to the customer and the Smart Appliances to feedback information to the utility. These interactive Smart Appliances can receive utility or public messages and price signals, or sense a power system condition directly and take action based upon customer preferences. Customers can exercise override to out-of-band conditions or change their Smart Appliance settings/preferences in response to events and information received from the utility.

The following scenarios will be covered in this use case:

1) Customer installs, configures, and registers smart appliance.
2) Smart Appliances respond to price signals or reliability events.

The first scenario begins with the most common sequence of the utility actions, registering a customer with a Smart Appliance and enrolling them in a utility sponsored Smart Appliance program. The next step is connecting the Smart Appliance onto the SmartConnect network. The customer then selects their program preferences for how the energy information is to be delivered to the Smart Appliance, and configuration messages are sent over the SmartConnect system to the Smart Appliance.

This use case's second scenario describes how the Smart Appliance receives a price signal, demand response event notification, public message or other energy and power system related information, and takes the necessary steps for reducing or limiting load at their premises. Demand response (DR) event signals from the utility or public broadcast reliability alerts can be sent to the Customer's Smart Appliance to trigger a program that automatically reduces or limits load. This scenario also deals with the concept of delivering real-time prices to devices in the form of a day ahead, 24-hour price schedule and special delivery of critical peak time pricing (CPP) or real-time pricing (RTP) energy costs. The Smart Appliance decision mechanism can also be simplified to respond to simple peak/shoulder/off-peak energy messages.

The utility is able to broadcast Smart Appliance information and messages to those customers that possess a certain type of Smart Appliance, to all Smart Appliances in a targeted program, and/or to Smart Appliances located in a certain geographic region, etc. Customers can override a request to limit and reduce load (e.g., energy saving mode, delayed turn on/off) for any event notification, price signal, or power system situation. The Smart Appliance also generates reports on the messages it receives, customer setting changes, energy usage, any power system conditions recorded, and operational history.

All Smart Appliances should be in compliance with the Utility AMI Home Area Network (HAN) System Requirements Specification (OpenHAN Specification), and this document was developed to comply with these specifications.

1.4 Business Rules and Assumptions

- The SmartConnect meter is installed at the customer's premises acting as a gateway between the utility and the customer's devices.
- Connectivity is established for the SmartConnect meter and HAN appliances/devices.
- The Smart Appliance(s) can be registered, exclusive of program enrollment.
- The utility has the Customer's permission to access and communicate with the devices at their premises.
- The Utility is not the smart appliance provider.
- The SmartConnect network does not support customer originated status request messages from appliances/devices.
- For this use case, the SmartConnect Meter provides the HAN gateway for all smart appliances. In the future, other HAN gateways that are not SmartConnect Meter enabled may be allowed.
- Due to the prior assumption that the meter is the primary gateway to HAN devices, it is assumed for this use case that all HAN device and Smart Appliance messaging traffic must flow through the SmartConnect NMS. In the future, it may be possible that all messages sent to HAN devices via the SmartConnect Meter need not flow through the NMS but instead could use other communications channels such as connecting the customer's internet broadband to the utility's HAN web portal.

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2. Actors

Describe the primary and secondary actors involved in the use case. This might include all the people (their job), systems, databases, organizations, and devices involved in or affected by the Function (e.g. operators, system administrators, customers, end users, service personnel, executives, meters, real-time databases, independent system operators, power systems). Actors listed for this use case should be copied from the global actors list to ensure consistency across all use cases.

Actor Name	Actor Type (person, device, system etc.)	Actor Description
Utility	Organization	A generic term referring to the collection of systems, business functions, and organizations that form an electric utility organization. The term is used whenever the precise actor is unknown or many actors utilize a particular service.
Smart Appliance	Device	Household appliances with communications capabilities allowing it to receive remote data or messages over a Home Area Network. Typically they are capable of receiving signals from the utilities or public broadcast sources and adjusting their operational modes based on consumer preferences (e.g., energy saving mode, delayed turn on/off).
Meter Data Management System (MDMS)	System	Gathers, validates, estimates and permits editing of meter data such as energy usage, generation, and meter logs. Stores this data for a limited amount of time before it goes to a data warehouse and makes this data available to authorized systems.
Customer	Person	Residential or small business energy user that contracts to receive electrical service from a utility and agrees to have a SmartConnect meter installed. May or may not participate in programs provided by the utility such as pricing events, load control or distributed generation.
Customer Service System (CSS)	System	Maintains customer contact information, calculates and formats customer bills, receives, and applies payments for individual accounts. The system is responsible for storing customer information such as site data, meter number, rates, and program participation.
SmartConnect Meter	Device	Advanced electric revenue meter capable of two-way communications with the utility. Serves as a gateway between the utility, customer site, and customer's load controllers. Measures, records, displays, and transmits data such as energy usage, generation, text messages, event logs, etc. to authorized systems (i.e., the SmartConnect NMS) and provides other advanced utility functions.

Actor Name	Actor Type (person, device, system etc.)	Actor Description
SmartConnect Network Management System (NMS)	System	The utility's back-office system responsible for two-way communications with the SmartConnect Meters to retrieve data and execute commands. Balances load on the communications network resulting from scheduled meter reads. It retries meters during communications failures and monitors the health of the advanced metering infrastructure. Remotely manages and implements firmware updates, configuration changes, provisioning functions, control and diagnostics.
Customer Service Representative (CSR)	Person	Utility personnel that respond to customer complaints, outage notifications, and customer requests to activate, modify and/or terminate delivery of service. CSRs also enroll customers in utility sponsored programs and answer questions related to the customer's energy consumption and cost data. Many off-cycle reading, billing, work orders and diagnostics requests are initiated by CSRs in response to customer contact.
Customer Service System (CSS)	System	Maintains customer contact information, calculates and formats customer bills, receives and applies payments for individual accounts. The system is responsible for storing customer information such as site data, meter number, rates, and program participation.
Customer Device Communications System (CDCS)	System	The communications system that notifies customer devices of demand response events and other related messages. Tracks and uses customer selected preferences for notification (e.g. pager, email, SmartConnect Meter, IHD, EMS, etc.)
Utility Web site	Web site	A platform allowing customers to view their usage and cost data while away from their residence or business site and to perform usage and cost analysis. It can also display other information such as outage notices, press releases, and educational materials. The utility website can also be used by the customer to enroll in or change preferences for customer programs / services.

3. Step-by-Step Analysis of Each Scenario

Describe steps that implement the scenario. The first scenario should be classified as either a primary scenario or an alternate scenario by starting the title of the scenario with either the word "Primary" or "Alternate." A scenario that successfully completes without exception or relying heavily on steps from another scenario should be classified as Primary; all other scenarios should be classified as Alternate. If there are more than one relevant scenarios (set of steps) make a copy of the following section (all of 3.1, including 3.1.1 and tables) and fill out the additional scenarios.

3.1 Primary Scenario: Customer installs, configures, and registers Smart Appliance

This scenario describes how the utility registers a customer with a Smart Appliance who may want to enroll in a Smart Appliance program. As described in the main narrative section, these smart appliances can receive utility or public messages, price signals, or directly analyze the condition of the power system and take action based on the customer's settable preferences. The utility supports the customer by providing information and assistance for registering their appliance, enrolling in utility sponsored Smart Appliance programs, and connecting to the SmartConnect network. Upon connection, configuration messages are sent to the Smart Appliance via the SmartConnect system. Smart Appliances connected to a customer Energy Management System (EMS) are also registered and/or enrolled. Smart Appliances not registered or enrolled may still receive utility or public messages over the SmartConnect network via the public broadcast channel.

Triggering Event	*Primary Actor*	*Pre-Condition*	*Post-Condition*
Identify the name of the event that initiates the scenario.	*Identify the actor whose point-of-view is primarily used to describe the steps.*	*Identify any pre-conditions or actor states necessary for the scenario to start.*	*Identify the post-conditions or significant results required to complete the scenario.*
Customer wants to install a Smart Appliance and view their energy information.	*Customer*	*SmartConnect Meter must be installed and provisioned.*	*Customer's Smart Appliance is able to receive messages and signals from SmartConnect*

3.1.1 Steps for this Scenario

Step #	Actor	Description of the Step	Additional Notes
#	What actor, either primary or secondary is responsible for the activity in this step?	Describe the actions that take place in this step. The step should be described in active, present tense.	Elaborate on any additional description or step value to help support the descriptions. Short notes on architecture challenges, etc. may also be noted in this column.
1	Customer	Initiates request to register and/or enroll Smart Appliance by contacting Utility. Provides customer information and Smart Appliance identification and type. Customer contacts either the CSR or account manager in-person or by phone, or logs onto the utility's Web site.	*Issues 1,2,3*
2	CSR/ Utility Web site	Using the CSS, verifies customer identity, customer account, service location, and premise ID(s). Checks to ensure the specific type of Smart Appliance is available for registration in the system and confirms it meets the utility requirements.	
3	CSR/ Utility Web site	Presents customer with Smart Appliance Program information and selections from CSS.	Customer program enrollment is optional. Some benefit could be received by only registering the device on the HAN gateway.
4	Customer	Selects Smart Appliance Program and sets the program parameters (price, usage and demand, scheduled price, DR event and parameters, current tier, etc.) to be recorded by the CSS and CDCS.	
5	Customer	Connects the Smart Appliance at their premise location.	
6	CSS	Initiates the SmartConnect NMS commissioning process to activate the customer's Smart Appliance.	

Step #	Actor	Description of the Step	Additional Notes
7	SmartConnect NMS	Initiates communications binding of the Smart Appliance to the HAN by way of the SmartConnect Meter associated to the customer's premise. The SmartConnect Meter initiates HAN communications binding the Smart Appliance to the system and maintains secure communications between the SmartConnect network and customer Smart Appliance.	(Bind – to establish a communications link)
8	Smart Appliance	Transmits device ID, device type, and cryptographic key materials to the utility over SmartConnect network via the SmartConnect Meter.	
9	SmartConnect NMS	Identifies and authenticates SmartConnect meter ID, and Smart Appliance device ID. Confirms Smart Appliance device meets utility requirements and is the same device ID and type provided by the customer in an earlier step.	
10	SmartConnect NMS	Transmits message to the Smart Appliance with authentication parameters via SmartConnect Meter.	
11	Smart Appliance	Receives authentication message and sets authentication parameters.	
12	Smart Appliance	Transmits message to NMS via SmartConnect Meter acknowledging receipt of valid authentication message and authentication parameters.	
13	SmartConnect NMS	Transmits to the CSS that the Smart Appliance network connection has been authenticated.	
14	CSS	Transmits a request to the CDCS to send a Smart Appliance configuration message.	Configuration message may include utility program group code, pricing configuration messages, etc.
15	CDCS	Transmits configuration message to a Smart Appliance via SmartConnect Meter.	
16	Smart Appliance	Updates configurations according to message received and sends to the CDCS a confirmation it has received the configuration message.	
17	CDCS	Forwards confirmation of receipt of the configuration message to the CSS.	

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3.2 Primary Scenario: Customer uses Smart Appliance to manage and adjust energy use

This scenario describes the most common sequence of events for sending the Smart Appliance messages regarding a price signal, demand response event notification, public notice, or other energy or power system related information so it can take the necessary action to reduce or limit load at their premises. The data received by the customer's Smart Appliance can then be used to manage and adjust Smart Appliance energy use. DR event signals sent by the utility or a public broadcast reliability alert are used to trigger a program that automatically reduces or limits load. This scenario also deals with the concept of delivering real-time *prices-to-devices* in the form of a day ahead, 24-hour price schedule special delivery of critical peak time pricing (CPP) or real-time pricing (RTP) of energy costs. Additionally, Smart Appliance decision mechanisms can be simplified to respond to simple peak/shoulder/off-peak energy messages.

The utility may selectively transmit information to target owners of a specific type of Smart Appliance, all Smart Appliances in a targeted program, Smart Appliances located in a certain geographic region, etc. Customers have the ability to override any request to limit and reduce load (e.g., energy saving mode, delayed turn on/off) for an event notification, price signal, or power system out-of-band situation. The Smart Appliance generates reports on the messages received, customer settings changed, energy usage, power system conditions recorded, and operational history.

Triggering Event	*Primary Actor*	*Pre-Condition*	*Post-Condition*
Identify the name of the event that initiates the scenario.	*Identify the actor whose point-of-view is primarily used to describe the steps.*	*Identify any pre-conditions or actor states necessary for the scenario to start.*	*Identify the post-conditions or significant results required to complete the scenario.*
Customer wants to receive price signal, DR event notification, public alert, or other real-time messages on their Smart Appliance.	*Customer*	*Smart Appliance is installed and provisioned to receive energy information from the SmartConnect Meter.*	*Customer has received price signal, DR event notification, public alert, or other energy related message on their Smart Appliance and have successfully executed programmed response to reduce or limit load at their premises.*

3.2.1 Steps for this Scenario

Step #	Actor	Description of the Step	Additional Notes
#	*What actor, either primary or secondary is responsible for the activity in this step?*	*Describe the actions that take place in this step. The step should be described in active, present tense.*	*Elaborate on any additional description or value of the step to help support the descriptions. Short notes on architecture challenges, etc. may also be noted in this column.*
1	CDCS	Transmits to the Smart Appliance the following energy related information for targeted Smart Appliances: 1. Event-related 2. Price-related 3. Power system condition 4. Public energy related messages	*Issue 4,5,6,7*
2	Smart Appliance	Acknowledges receipt of information from Utility CDCS.	
3	Smart Appliance	The customer is able to view on his or her Smart Appliance: price signal, event notification, public message, power system condition, or other energy related message.	
4	Smart Appliance	Executes programmed response to reduce or limit load at customer's premises.	
5	Customer	May, at their discretion, over-ride programmed responses to reduce or limit load at customer's premises.	Note: Adjustment of settings could have same or similar effect as explicitly overriding.
6	Smart Appliance	Sends message to CDCS via the SmartConnect Meter confirming the customer has executed an override of a programmed response to reduce or limit load at their premises.	
7	CDCS	Sends message to CSS that customer has executed an override of a programmed response to reduce or limit load at their premises.	
8	Smart Appliance	Sends message to CDCS via SmartConnect Meter with information related to Smart Appliance messages received, customer settings, energy usage, power system conditions recorded, and operational history.	

4. Requirements

Detail the Functional, Non-functional and Business Requirements generated from the workshop in the tables below. If applicable list the associated use case scenario and step.

4.1 Functional Requirements

Functional Requirements	Associated Scenario # (if applicable)	Associated Step # (if applicable)
The utility shall use contact methods (CSR) and processes (CSS) available to the customer. The customer shall be able to contact a CSR or account manager, or log onto to the utility's Web site for assistance.	3.1	1
The utility shall have operational Smart Appliance programs and registration processes available for the customer to register and enroll their Smart Appliances.	3.1	1,2,3,4
The utility shall provide a customer service system capable of supporting customer requests for participation in Smart Appliance programs and reviewing customer information and selections. This CSS shall be capable of adding, changing, and deleting customer devices from Smart Appliance programs and changing the customer's preferences. Customers shall be able to register Smart Appliances controlled by and in communication with the customer's EMS.	3.1	2,3,4
CSS shall conduct operational customer verification and Smart Appliance device authentication. The utility shall only register pre-approved Smart Appliances.	3.1	2,6,10,13,14
The customer shall be capable of activating a Smart Appliance to communicate with the SmartConnect meter.	3.1	5,7
The CSS shall be able to initiate the commissioning process requests to the NMS to activate customer devices onto the SmartConnect system and bind their Smart Appliances via the SmartConnect Meter.	3.1	6
The SmartConnect (NMS) shall be capable of initiating secure communications between the Smart Appliances and the SmartConnect network.	3.1	7
The Smart Appliance shall have a unique ID and be capable of transmitting this device ID to the SmartConnect (NMS) via SmartConnect Meter.	3.1	8
The SmartConnect (NMS) shall be capable of transmitting authentication parameters and confirmation messages to the Smart Appliance.	3.1	10,12
The Smart Appliance shall be capable of receiving, executing and confirming authentication parameters from the SmartConnect system.	3.1	11,12
The CSS shall support general and diagnostic testing for the messaging functions.	3.1	14,17
The CDCS shall be capable of sending configuration messages to Smart Appliance devices via SmartConnect Meter.	3.1	15,17

Functional Requirements	Associated Scenario # (if applicable)	Associated Step # (if applicable)
The Smart Appliance shall be able to receive and respond to configure messages initiated by the utility.	3.1	15-17
The Smart Appliance shall be able to send confirmations of receipt of configured messages.	3.1	16

The CDCS shall be capable of creating text messages to be sent to the Smart Appliances. The system shall be capable of transmitting the following energy related information for targeted Smart Appliances to the Smart Appliance:
 1. Event related information
   a. Day ahead price event notification (PTR,CPP)
   b. Event start/stop time
   c. Event in progress
   d. End of event
   e. Time Management Load Control schedule
   f. Utility messages to targeted Smart Appliance
 2. Price related information
   a. Current energy price (RTP, CPP)
   b. Day ahead 24 hour price schedule (TOU)
 3. Power system condition
   a. Frequency
   b. Low voltage
 4. Public energy related messages
   a. Energy shortage alert
   b. Grid reliability alert
   c. Weather related alert
   d. End of alert
	3.2	1

The CDCS shall be capable of sending text messages to the Smart Appliance.	3.2	1
The CDCS shall be capable of supporting multiple language versions of the same message based upon the customer's selected preference.	3.1 3.2	3, 4 1, 2
The CDCS shall be capable of sending messages to targeted Smart Appliances.	3.2	1
The CDCS shall allow Smart Appliances to be placed in customized groups for messaging.	3.2	1
The CDCS shall allow users to send public notifications to registered and non-registered devices.	3.2	1
The CDCS shall specify whether messages sent to Smart Appliances are private or public.	3.2	1

Functional Requirements	Associated Scenario # (if applicable)	Associated Step # (if applicable)
The Smart Appliance shall have the memory capability to store messages for at least 12 hours.	3.2	3
The system shall be able to send messages to Smart Appliances indicating the start of new billing cycle	3.2	8
The CDCS shall be capable of sending messages with day-ahead price schedules.	3.2	1
The Smart Appliance shall have the capability of storing current active price and next price data.	3.2	3
The CDCS shall send messages that include energy and environmental alerts.	3.2	1
The CDCS shall allow users to identify messages as: low, medium, or high priority.	3.2	1
The Smart Appliance shall allow the customer to set alert limits for selected parameters or messages in the device.	3.2	3
The Customer shall be able to view price signals, event notifications, public messages, power system conditions, and other energy related messages on their Smart Appliance.	3.2	3
The Smart Appliance shall be capable of executing programmed responses to reduce or limit load at customer premises.	3.2	3
The Smart Appliance shall be capable of accepting customer overrides for programmed requests to reduce or limit load.	3.2	4
The Smart Appliance shall be capable of sending a message to the utility indicating execution of a customer override to a programmed request to reduce or limit load.	3.2	5
The CDCS shall be capable of sending a message to the CSS indicating execution of a customer override to a programmed request to reduce or limit load at customer premise.	3.2	6
The Smart Appliance shall be capable of sending information related to Smart Appliance messages received, customer settings, energy usage, power system conditions recorded, and operational history to the CDCS via the SmartConnect Meter.	3.2	7
The Smart Appliance shall observe safe and orderly operations (i.e. no food to spoil, clothes to be ruined, etc.).	General	

4.2 Non-Functional Requirements

Non-Functional Requirements	Associated Scenario # (if applicable)	Associated Step # (if applicable)
The Smart Appliance shall have the memory capability to store messages for at least 24 hours.	3.2	1

Non-Functional Requirements	Associated Scenario # (if applicable)	Associated Step # (if applicable)
Messages that pass through the network shall be prioritized over other network traffic.	3.2	1
The SmartConnect meter shall instantly update the Smart Appliance's energy usage data.	3.2	1
Delivery time for messages to and from the CDCS, NMS, IHD, and EMS shall take 2 minutes or less.	3.1 3.2	7,8,10,12,15,16 1,5,7
A gateway for information exchange security shall be enabled with or without registration.	General	

5. Use Case Models (optional)

This section is used by the architecture team to detail information exchanges, actor interactions and sequence diagrams.

5.1 Information Exchange

For each scenario detail the information exchanged in each step

Scenario #	Step #, Step Name	Information Producer	Information Receiver	Name of Information Exchanged
#	Name of the step for this scenario.	What actors are primarily responsible for producing the information?	What actors are primarily responsible for receiving the information?	Describe the information being exchanged
3.1	1	Customer	Customer Representative/ Utility Web site	Customer information, financial data, residence or business address, contact information, customer account number, Smart Appliance type
3.1	3	Customer Representative/ Utility Web site	Customer	Smart Appliance registration and program information
3.1	4	Customer	Customer Representative/ Utility Web site	Smart Appliance registration and program selection and preferences
3.1	6	Customer Representative/ Utility Web site	SmartConnect NMS	Utility request for Smart Appliance commissioning.
3.1	7	SmartConnect NMS	Smart Appliance	Binding steps for the Smart Appliance
3.1	8	Smart Appliance	SmartConnect NMS	Smart Appliance ID
3.1	10	SmartConnect NMS	Smart Appliance	Authentication message parameters
3.1	12	Smart Appliance	SmartConnect NMS	Confirmation of authentication message and parameters

Scenario #	Step #, Step Name	Information Producer	Information Receiver	Name of Information Exchanged
3.1	13	Smart Connect NMS	Customer Representative/ Utility Web site	Smart Appliance network connection authentication
3.1	14	CCS	CDMS	Downloaded configuration message
3.1	15	CDMS	Smart Appliance	Downloaded configuration message
3.1	16	Smart Appliance	CDMS	Confirmation of receipt of configuration message
3.1	17	CDMS	CCS	Confirmation of receipt of configuration message
3.2	1	CDCS	Smart Appliance	The CDCS shall be capable of transmitting to the Smart Appliance the following energy related information for targeted Smart Appliances: 1. Event related information a. Day ahead price event notification (PTR,CPP) b. Event start/stop time c. Event in progress d. End of event e. Time Management Load Control schedule f. Utility messages to targeted Smart Appliance 2. Price related information a. Current energy price (RTP, CPP) b. Day ahead 24-hour price schedule (TOU) 3. Power system condition a. Out-of-band frequency b. Low voltage 4. Public energy related messages a. Energy shortage alert b. Grid reliability alert c. Weather related alert d. End of alert
3.2	5	Customer	MDMS	Message that the customer has executed an override for a programmed response to an event notification to reduce or limit load at the customer's premises.
3.2	6	CDCS	CSS	Message that the customer has executed an override of a programmed response to reduce or limit load at the customer's premises.

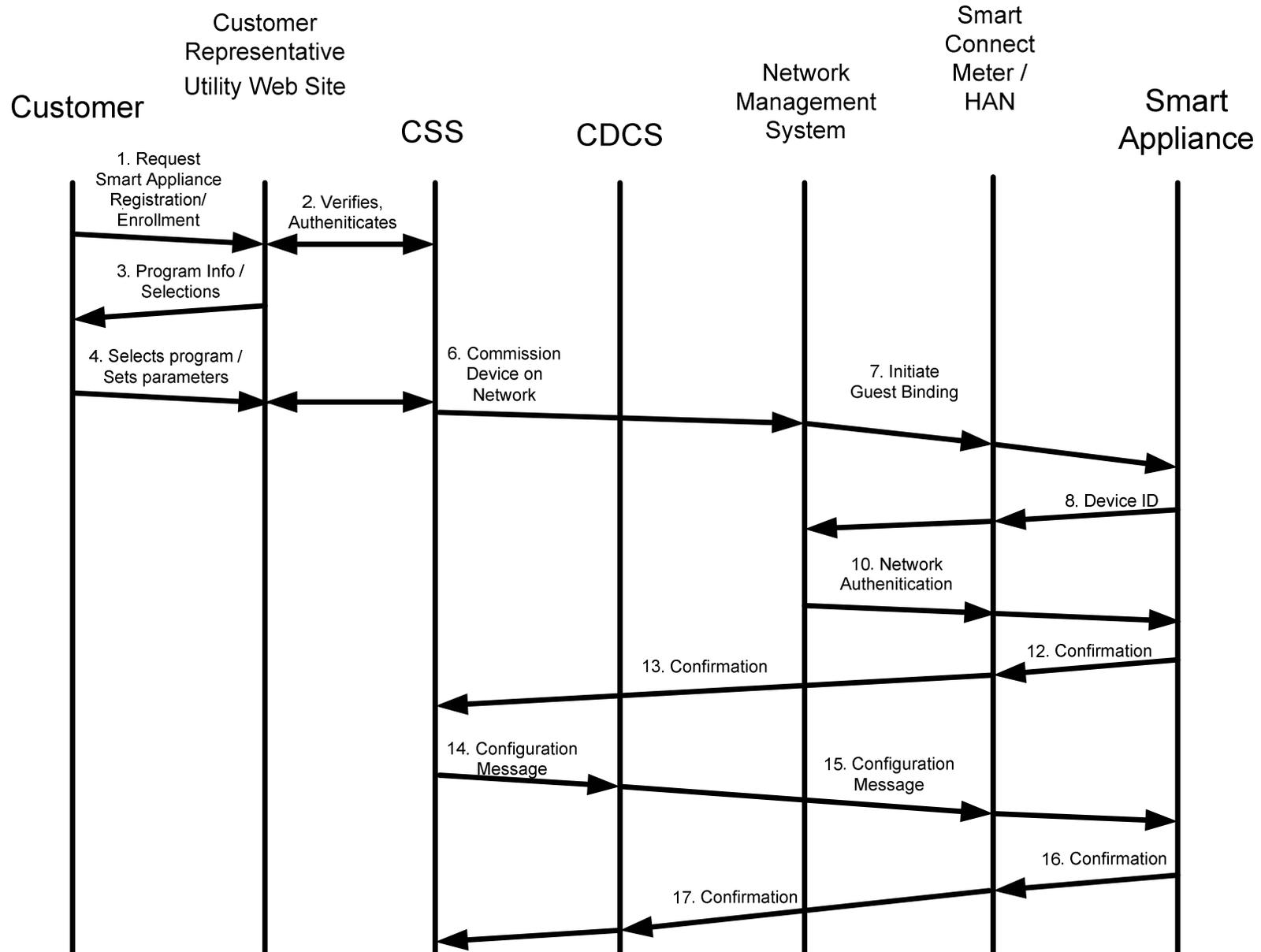| Scenario #	Step #, Step Name	Information Producer	Information Receiver	Name of Information Exchanged
3.2	7	Smart Appliance	CDCS	Message via SmartConnect Meter with information related to Smart Appliance messages received, customer settings, energy usage, power system conditions recorded, and operational history.
3.2	8	CDCS	CSS	Message with information related to Smart Appliance messages received, customer settings, energy usage, power system conditions recorded, and operational history.

5.2 Diagrams

The architecture team shall use this section to develop an interaction diagram that graphically describes the step-by-step actor-system interactions for all scenarios. The diagrams shall use standard UML notation. Additionally, sequence diagrams may be developed to help describe complex event flows.

5.2.1 Sequence Diagram: Scenario 3.1

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Customer	Customer Representative Utility Web Site	CSS	CDCS	Network Management System	Smart Connect Meter / HAN	Smart Appliance

1. Request Smart Appliance Registration/ Enrollment

2. Verifies, Autheniticates

3. Program Info / Selections

4. Selects program / Sets parameters

6. Commission Device on Network

7. Initiate Guest Binding

8. Device ID

10. Network Authenitication

12. Confirmation

13. Confirmation

14. Configuration Message

15. Configuration Message

16. Confirmation

17. Confirmation

6. Use Case Issues

Capture any issues with this use case. Specifically, those still unresolved, to help the use case reader understand the constraints or unresolved factors that impact the use case scenarios and their realization.

Issues
Describe the issue as well as any potential impacts to the use case.
Potential additional scenario: Appliance responds to power system condition (under-frequency, low voltage, etc.).
Will need to identify utility's role with regards to troubleshooting customer owned Smart Appliances and their need to communicate over a utility provided communications network.
Specifics on interfacing public messages into the utility's SmartConnect messaging system are not covered in this use case.
This use case does not cover Smart Appliance self-management of maintenance, problem reporting, request scheduled maintenance, etc. It could explore the use of a utility communications network to report this information to third parties (appliance OEMs, service providers, etc.)
The utility could recommend that a Customer be on a certain rate schedule depending upon information reported by Smart Appliance regarding energy usage and operational history.
An actor is needed that calculates price information delivered to appliances, IHD, EMS, PEV, etc.

7. Glossary

Insert the terms and definitions relevant to this use case. Please ensure that any glossary item added to this list is included in the global glossary to ensure consistency between use cases.

Glossary	
Term	**Definition**
SmartConnect	SCE's system name for their Advanced Metering Infrastructure (AMI) implementation. A combination of communications infrastructure and computer applications that provide for remote access to customer meters and advanced applications such as time-of-day metering, remote connect/disconnect, outage information, and demand response.
Advanced Metering Infrastructure (AMI)	System of communications infrastructure and computer applications that allow remote access to customer meters providing advanced applications such as time-of-day metering, remote connect/disconnect, outage information and demand response.
Energy Management System (EMS)	A customer supplied system for monitoring and managing energy usage at their residence or business. It includes human interface displays for interacting with the system and allows the customer to program functions, control loads, and display energy costs, usage, and related information.
In-Home Display (IHD)	A device installed at the customer's home or business allowing communication with the SmartConnect meter and monitoring of usage and cost data, utility transmitted text messages including reliability or economic events, planned outages, and other useful energy information. Data is passed to this device via the SmartConnect Meter. Utility approved to connect to the SmartConnect network and receive data and communication from the utility.
Home Area Network (HAN)	Local communication network at customer premises that allows devices to communicate with each other.
Time-of Use (TOU) Rate	A rate structure based on a time schedule, daily and throughout the week.
Critical Peak Pricing (CPP)	A rate structure that imposes a very high tariff in times of critical energy supply constraint.
Real Time Peak (RTP)	A rate structure that provides for a peak time rate that varies according to time of day, day of week, and time of year.
Peak Time Rebate (PTR)	A credit provided to the customer who participates in a demand response event and reduces load below a nominal threshold.

8. References

Reference any prior work (intellectual property of companies or individuals) used in the preparation of this use case.

Utility AMI 2008 Home Area Network System Requirements Specification

9. Bibliography (optional)

Provide a list of related reading, standards, etc. that the use case reader may find helpful.