Architecture for Demand Response for Simon Property Group

Prepared by

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1 Executive Summary

EnergyConnect provides demand response services, enabling energy market participants to be active in the electricity markets by performing load shedding, curtailment, etc. in response to energy market events and prices.

This document describes the overall technical architecture of the demand response implementation for Simon Property Group (Simon). This document is intended to provide a framework for the multiple parties involved in implementing the demand response solution.

2 Companies Involved

The demand response solution for Simon includes the following key companies:

- Simon Property Group
  - Key contacts:
    - Andy Marsh, AMarsh@Simon.com, 317.263.2449
    - Norm Campbell, NCampbell@simon.com, 317.263.8168
- EnergyConnect, Inc.
  - Responsible for providing demand response services and coordinating the solution with the other parties
  - Key contacts:
    - Scott Ameduri, sameduri@energyconnectinc.com, 408.370.3311 x102, M: 602.361.1395
    - Mark Boucher, mboucher@energyconnectinc.com, 408.370.3311 x118
    - Greg Raymond, graymond@energyconnectinc.com, 408.370.3311 x121
- FSG
  - Responsible for implementing the metering solution
  - Key contacts:
    - Patrick Davis, patd@fsgconnect.com, 512.251.6149
- Richards-Zeta
  - Provider of the RZ Mediator and Omega systems, utilized in the metering solution
  - Key Contacts:
    - Ed Richards, erichards@richard-zeta.com,
    - Brooke Raffetto, braffetto@richards-zeta.com 805.692.5560 x211, M: 805.252.5737
    - David Leimbrock, DLeimbrock@richards-zeta.com, 805.692.5560
- Roth Bros.
  - Responsible for the building automation control solution
  - Key contacts:
    - Bill Kerr, bkerr@RothBros.com, 800.USA.ROTH
- Andover Controls / TAC
  - Provider of the Network Controller and Continuum systems, utilized in the building automation control solution

3 Background and General Architecture

EnergyConnect's demand response services encompass three primary plans:

- Energy Market plans, in which the consumption is reduced in response to the wholesale market prices of electricity. This includes both real-time and day-ahead plans, using the real-time market price and the day-ahead market price of electricity on the wholesale markets.
- Reliability plans, in which consumption is reduced based on emergency events in the electricity market that require participants to shed load to maintain electric grid reliability.
- Standby Reserve plans, in which consumption is reduced based on events in the electricity market that require participants to rapidly shed load to maintain electric grid balance and operating reserves.

The products offered to a participant vary based on location in which the participant is located (e.g., regulatory restrictions may prevent one or more of the products from being offered) as well as the capabilities of the participant to respond to events (e.g., spinning reserve requires a minimum amount of load shedding or generation capability with a rapid response time). However, regardless of the product utilized by a participant, the general metering requirements are similar.

Figure 1 illustrates the overall demand response architecture. From the participant facility's perspective, there are two primary aspects to demand response:

- Metering Information – allows EnergyConnect to observe the facility's "normal" consumption patterns to calculate a baseline usage, as well as to observe the facility's consumption reduction.
- Control System – allows the facility to modify consumption in response to market prices or events. While not required, it can be advantageous to allow EnergyConnect the capability to send control signals to the facility to automate this capability.

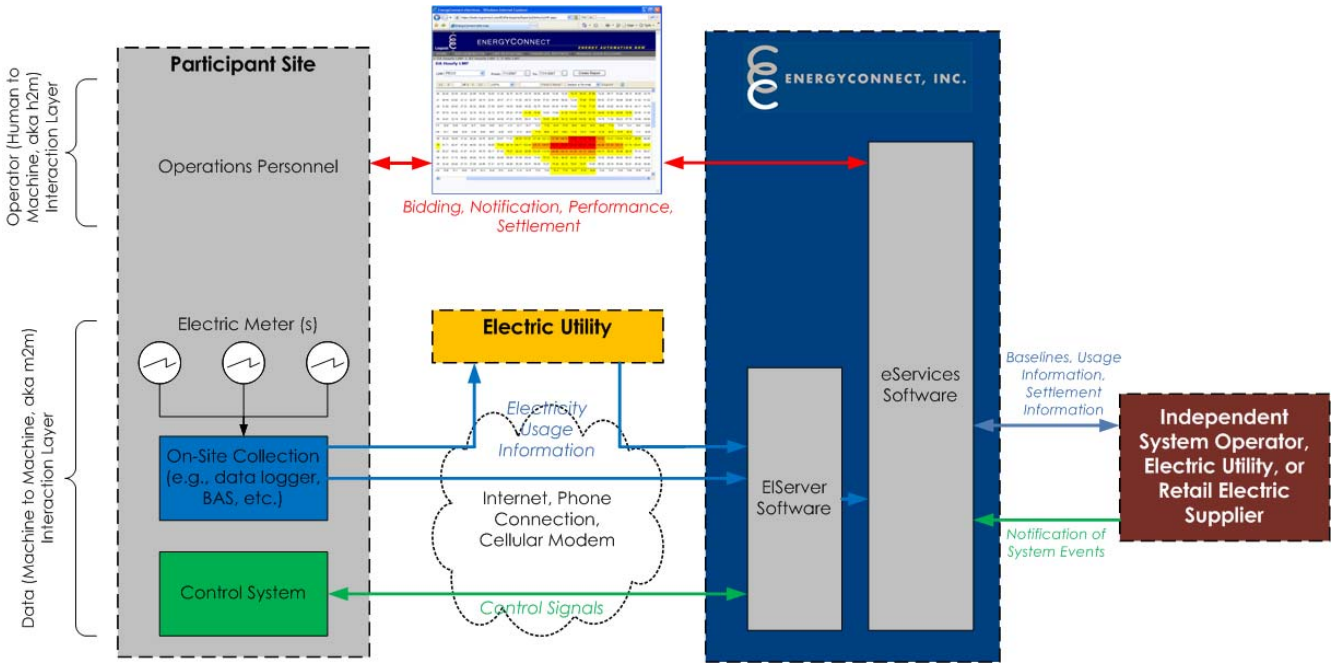

Figure 1 General Demand Response Architecture

The general demand response architecture illustrates the key components to the demand response solution:

- Participant Site
- Electric Utility
- EnergyConnect
- Independent System Operator, Electric Utility, or Retail Electric Supplier

The Participant Site (e.g., a Simon Mall), is both the consumer of the energy and is the primary point of data collection for the energy usage information. In general, there is on-site collection of the energy usage through a metering system. In addition to the metering, at many customer sites there is a control system (e.g., a building automation control system (BAS), generation control system, etc.) whereby the facility can be engaged to automatically perform curtailment or generation based on energy market conditions.

Electric Utility (e.g., the provider of energy to the Participant Site) can be a point at which the metering/electricity usage information is collected, depending upon the capabilities of the Participant Site and of the Electric Utility.

EnergyConnect provides the software and systems to collect and store the metering information, as well as to do settlement with the energy markets. In addition, if the participant site supports the capability, EnergyConnect's systems will also initiate pre-defined load control sequences at the Participant Site based on energy market conditions.

The Independent System Operator (ISO), Electric Utility, or Retail Electric Supplier operates the energy markets and requests performance for synchronous reserve events. EnergyConnect interfaces with the ISO or Electric Utility to submit sufficient information to perform settlement of energy usage, as well as to receive notification of grid events.

3.1 General Metering Information

Regardless of the mechanism chosen to obtain the meter data, certain aspects of the meter data are common. Figure 2 illustrates the time aspects of the meter data. The meter data has two key elements: sampling frequency (how often the meter data is read/recorded) and data update frequency (how often the meter data is accumulated and sent to another entity for use). These aspects will be discussed in further detail in the remainder of the section.

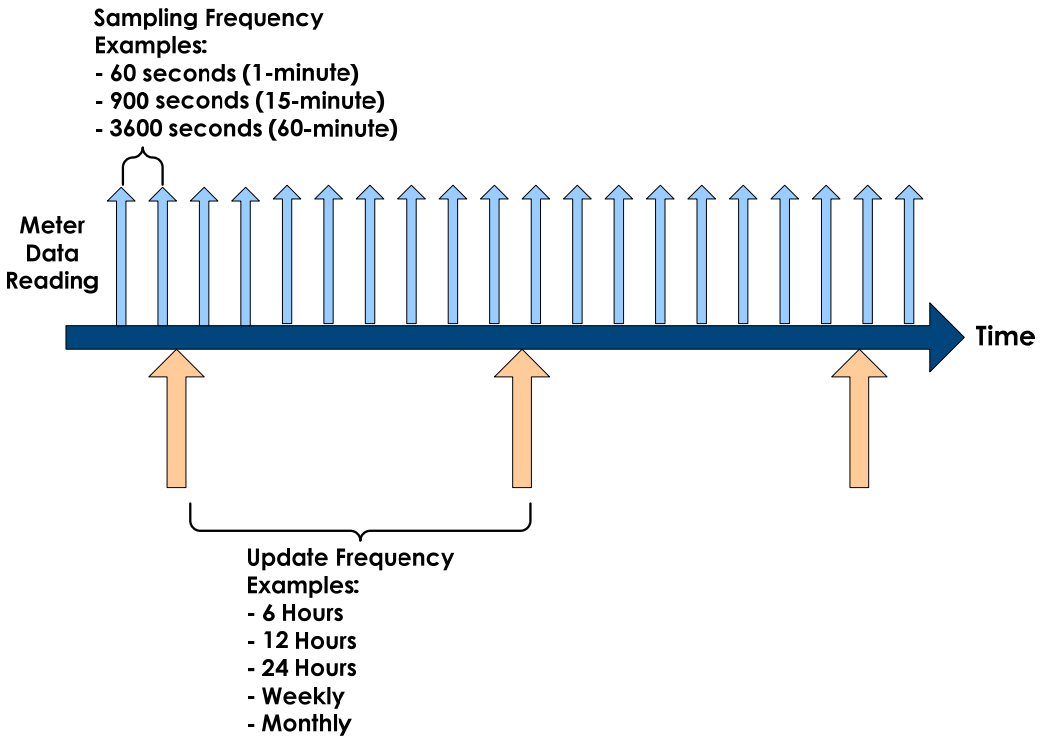

Figure 2 Meter Data Terminology

Metering information can be obtained through one of several mechanisms. The actual mechanism used can vary from facility to facility, as long as the mechanism complies with the metering information requirements shown later in this document.

3.1.1 Metering Requirements

Metering requirements for demand response includes the following minimum requirements:

1. The Metering Information provided shall be sufficient to establish the aggregate usage information for the entire facility.
    - Note: Total electricity usage for the site is utilized for demand response observations. For example, if a facility has 3 primary meters, each of which feeds 5 sub meters, there are a total of 3*5 + 3 = 18 meters. For demand response services, only the 3 meter information from the 3 primary meters is needed to generate the aggregate facility usage.
2. The Metering Information shall be of sufficient accuracy to satisfy EnergyConnect's and the regulatory authority's requirements for settlement of the usage information.
    - If the utility meter's pulse outputs are utilized, then this requirement is satisfied
    - If another mechanism (e.g., a current transformer) is utilized, that mechanism must be sized appropriately, calibrated, and validated with recent utility information to ensure accuracy.
3. The Metering Information sampling frequency and update frequency shall conform to the following minimum times:

	Plan		
Geographic Region	**Energy Market**	**Reliability**	**Standby Reserve**
California	N/A	Sample: 60 min Update: 24 hours	N/A
Mid Atlantic ***Midwest*** ***Metro Chicago***	Sample: 60 min Update: 24 hours (Weekly permitted for small customers)	Sample: 60 min Update: 24 hours	Sample: 1 min Update: 12 hours
New England	Sample: 5 min Update: 24 hours	Sample: 5 min Update: 24 hours	N/A
New York	Sample: 5 min Update: 24 hours	Sample: 5 min Update: 24 hours	N/A

4 Demand Response Architecture for Simon

The demand response solution for Simon follows the same general architecture as described above. However, Simon's existing systems and enterprise solutions add another layer to the general architecture.

As illustrated in Figure 3, the demand response architecture for Simon includes the following primary components:

- Simon Mall
  - Participates in the demand response services.
  - Provides curtailable electric load
  - Utilizes RZ Mediator for electric usage information
  - Utilizes Andover Network Controller for HVAC and Lighting controls
- Simon Headquarters
  - Provides overall operational control for each Simon mall
  - Utilizes Andover Continuum Platform for enterprise-wide control
- EnergyConnect
  - Provides demand response implementation linking Simon to the grid operator

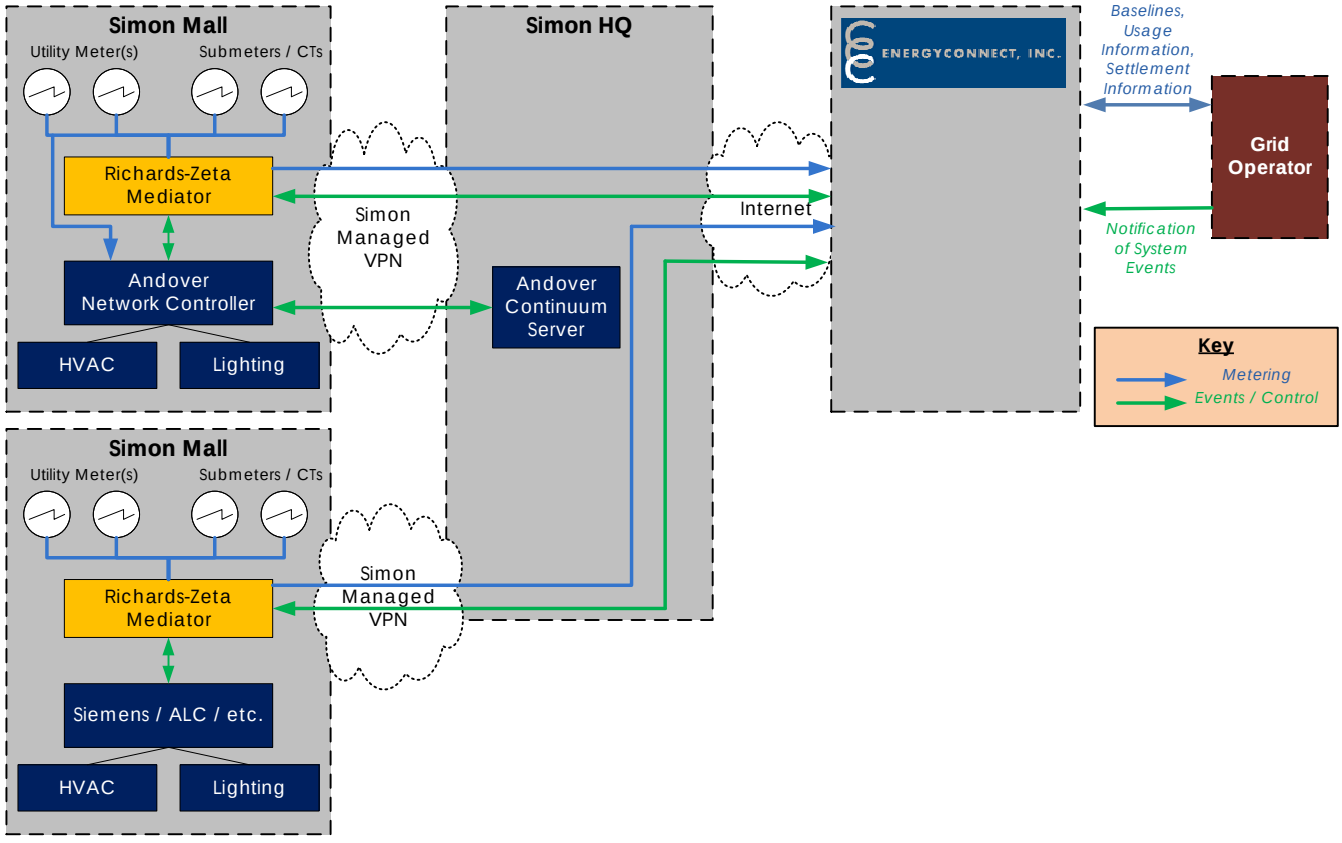

Figure 3 Demand Response Architecture for Simon

4.1 Operational Data Flow

For metering information, the general data flow is as follows:

- Mediator collects data at each mall (either directly via pulse inputs, or via XML from the Andover Controls Network Controller)
- Mediator sends collected data to EnergyConnect via FTP (current) or SOAP (Possible future)
- EnergyConnect uses data to calculate CBLs and to submit to ISO

For control signals, the general data flow is as follows:

- Simon sets price thresholds, etc. to trigger DR for economic programs. For reliability programs, the trigger is set when events are called by the grid operator.
- When price meets threshold or when event is called, EnergyConnect creates notification object in EnergyConnect database
- Mediator at mall polls EnergyConnect via SOAP for any pending notifications
- When notification is received, Mediator at mall signals to Andover Network Controller / other BAS to initiate DR tactic

5 EnergyConnect / Richards-Zeta Interface

This interface allows the exchange of metering information as well as the initiation of control sequences/schedules. The interface utilizes FTP to exchange a CSV file with the meter information, and SOAP for the retrieval of event notifications. In both cases, communication is initiated by Richards-Zeta.

5.1 Metering Information

Metering information is necessary for EnergyConnect to accurately assess the facility's performance and to submit to the ISO for settlement. For the initial deployment, FTP exchange of CSV file(s) with the meter data will be utilized.

5.1.1 Example Data Flow

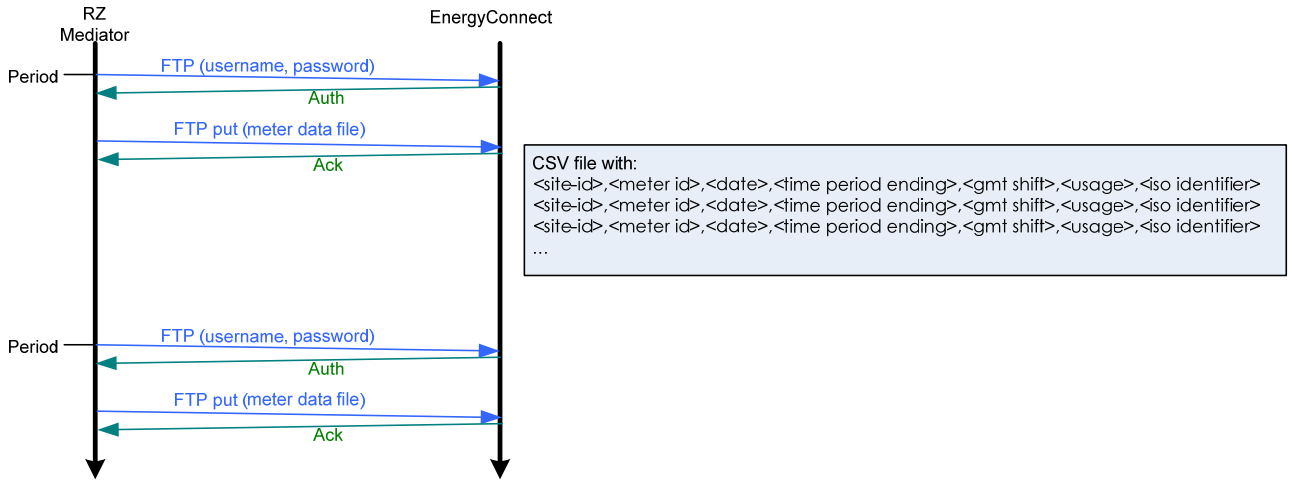

Figure 4 Richards-Zeta / EnergyConnect Data Exchange for Meter Data

5.1.2 Data Format

The BAS or other system must generate a CSV (Comma Separated Value) file. The CSV file is a text file with a table of data. The file uses the comma (“,”) to delimit the different columns of data, with each row representing a different meter/date/time pair:

<site-id>,<meter id>,<date>,<time period ending>,<gmt shift>,<usage>,<iso identifier>

Where the columns are as follows:

1. Site-ID: Unique identifier provided by EnergyConnect
2. Meter ID: ID of the specific meter, if multiple meters are on the same account. If there is only a single meter on this account, then this field is blank.
3. Date: Date of meter usage in MM/DD/YYYY format.
4. Time Period Ending: Ending time stamp of the time period in HH:MM 24-hour format.
    - For example, the period from Midnight to 01:00 AM would be 01:00.
    - Similarly, the period from 10:00 PM to 11:00PM is 23:00.
    - For minute data, the period from 10:00 PM to 10:01 PM is 22:01.
5. GMT shift: Differential from GMT time.
    - For Eastern time zone areas:
        - Eastern Standard Time would have -5.
        - Eastern Daylight Savings Time would have -4.
        - If facility will always report standard time, time would be reported as -5 year round.
    - For Central time zone areas:
        - Central Standard Time would have -6.
        - Central Daylight Savings Time would have -5.
        - If facility will always report standard time, time would be reported as -6 year round.
6. Usage: Integrated kWh value for the time period.
7. ISO identifier: Number to identify the Independent System Operator that covers this participant.
    - For PJM territories, the value is: 0 (zero).

Field Formats

1. Account number: alpha/numeric, including spaces and special characters such as "-" if applicable
2. Meter ID: alpha/numeric
3. Date: date - MM/DD/YYYY
4. Time Period Ending: time - hh:mm in 24 hour format
5. GMT Shift: integer
6. Usage: integer
7. ISO identifier: integer

Additional Notes:

- This is a ".CSV" text file.
- If commas are necessary to report any data, use pipe delimiters ("|") instead of commas and the file extension of ".psv".

5.1.3 Example Data

5.1.3.1 Example Data for 60-minute Interval

For most services, data is accumulated hourly for the file. This example shows a CSV file example with comma-separated values.

Example Row

An example row is as follows:

```
2209010008,83984663,06/04/2008,08:00,-4,594,0
```

Where:

- Column 1 is 2209010008, the account number for this participant's energy bill.
- Column 2 is 83984633, even though this site has only a single meter for the account.
- Column 3 is 06/04/2008, the date of the period.
- Column 4 is 08:00, indicating the period from 7:01 AM until 8:00 AM.
- Column 5 is -4, indicating Eastern Daylight Savings Time.
- Column 6 is 594, indicating 594.00 kWh for the period.
- Column 7 is 0, indicating that this is PJM territory.

Example 24-hour Period

Filename: customer_c.csv

An example complete file for a single day (24 hour period) is shown below:

```
2209010008,83984663,06/04/2008,01:00,-4,18,0
2209010008,83984663,06/04/2008,02:00,-4,18,0
2209010008,83984663,06/04/2008,03:00,-4,18,0
2209010008,83984663,06/04/2008,04:00,-4,18,0
2209010008,83984663,06/04/2008,05:00,-4,26,0
2209010008,83984663,06/04/2008,06:00,-4,363,0
2209010008,83984663,06/04/2008,07:00,-4,775,0
2209010008,83984663,06/04/2008,08:00,-4,594,0
2209010008,83984663,06/04/2008,09:00,-4,632,0
2209010008,83984663,06/04/2008,10:00,-4,684,0
2209010008,83984663,06/04/2008,11:00,-4,903,0
2209010008,83984663,06/04/2008,12:00,-4,672,0
2209010008,83984663,06/04/2008,13:00,-4,593,0
2209010008,83984663,06/04/2008,14:00,-4,597,0
2209010008,83984663,06/04/2008,15:00,-4,423,0
2209010008,83984663,06/04/2008,16:00,-4,325,0
2209010008,83984663,06/04/2008,17:00,-4,91,0
2209010008,83984663,06/04/2008,18:00,-4,48,0
2209010008,83984663,06/04/2008,19:00,-4,48,0
2209010008,83984663,06/04/2008,20:00,-4,46,0
2209010008,83984663,06/04/2008,21:00,-4,45,0
2209010008,83984663,06/04/2008,22:00,-4,48,0
2209010008,83984663,06/04/2008,23:00,-4,45,0
2209010008,83984663,06/05/2008,00:00,-4,46,0
```

5.1.3.2 Example Data for 1-minute Interval

For Synchronous Reserve Services (SRS), data is accumulated on a minute-by-minute basis for the file. This example shows a CSV file example with comma-separated values.

Example Row

An example row is as follows:

```
0220297012019,,04/30/2008,00:01,-5,599,0
```

Where:

- Column 1 is 0220297012019, the account number for this participant's energy bill.
- Column 2 is blank, since this site has only a single meter for the account.
- Column 3 is 04/30/2008, the date of the period.
- Column 4 is 00:01, indicating the period from midnight until 1 minute after midnight.
- Column 5 is -5, indicating Eastern Standard Time.
- Column 6 is 599, indicating 599 kWh for the period.
- Column 7 is 0, indicating that this is PJM territory.

Example Hour

Filename: customer_b.csv

An example complete file for a single hour is shown below:

```
0220297012019,,04/29/2008,00:01,-5,222,0
0220297012019,,04/29/2008,00:02,-5,222,0
0220297012019,,04/29/2008,00:03,-5,223,0
0220297012019,,04/29/2008,00:04,-5,227,0
0220297012019,,04/29/2008,00:05,-5,226,0
0220297012019,,04/29/2008,00:06,-5,227,0
0220297012019,,04/29/2008,00:07,-5,230,0
0220297012019,,04/29/2008,00:08,-5,231,0
0220297012019,,04/29/2008,00:09,-5,233,0
0220297012019,,04/29/2008,00:10,-5,235,0
0220297012019,,04/29/2008,00:11,-5,237,0
0220297012019,,04/29/2008,00:12,-5,235,0
0220297012019,,04/29/2008,00:13,-5,234,0
0220297012019,,04/29/2008,00:14,-5,233,0
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0220297012019,,04/29/2008,00:27,-5,226,0
0220297012019,,04/29/2008,00:28,-5,227,0
0220297012019,,04/29/2008,00:29,-5,226,0
0220297012019,,04/29/2008,00:30,-5,227,0
0220297012019,,04/29/2008,00:31,-5,230,0
0220297012019,,04/29/2008,00:32,-5,231,0
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0220297012019,,04/29/2008,00:39,-5,234,0
0220297012019,,04/29/2008,00:40,-5,232,0
0220297012019,,04/29/2008,00:41,-5,233,0
0220297012019,,04/29/2008,00:42,-5,231,0
```

```
0220297012019,,04/29/2008,00:43,-5,231,0
0220297012019,,04/29/2008,00:44,-5,231,0
0220297012019,,04/29/2008,00:45,-5,232,0
0220297012019,,04/29/2008,00:46,-5,235,0
0220297012019,,04/29/2008,00:47,-5,236,0
0220297012019,,04/29/2008,00:48,-5,237,0
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0220297012019,,04/29/2008,00:56,-5,231,0
0220297012019,,04/29/2008,00:57,-5,231,0
0220297012019,,04/29/2008,00:58,-5,232,0
0220297012019,,04/29/2008,00:59,-5,235,0
0220297012019,,04/29/2008,01:00,-5,236,0
```

5.1.4 Delivery of Meter Data to EnergyConnect

File Naming and Format

The exported data should transmitted via FTP to EnergyConnect, Inc. There are several items that must be considered:

- File name:
  - If there is only 1 meter for the site or if all meters are sent in a single file, the file name should be the site id (e.g., 987654321.csv) with the ".csv" file extension.
  - If there are multiple meters for the site sent as individual files, the file name should be the site id plus underscore "_" plus the meter id (e.g., 987654321_001.csv)
- File extension:
  - Since commas are used as delimiters, use the ".csv" file extension.
- Number of files:
  - If there is only one meter for this account, only a single file should be included.
  - If there are multiple meters for this account:
    - If all meters can be sent in a single file, then each meter's data should be sent in the same file. The meter ID should be indicated in the second column of the file.
    - If a separate file is used for each meter, then the meter data is sent in an individual file for each meter, with the meter ID indicated in the second column of the file.

File Delivery

Once exported, the file must be transmitted via FTP to EnergyConnect, Inc. to be handled by the settlement software. There are several items that must be considered:

- FTP Server: ftp.energyconnectinc.com
- Username: simon
- Password: <to be sent separately>

5.2 Control and Event Notification

The service for the control and event notification utilizes a SOAP-based web service to communicate event notifications. In the initial deployment, the RZ Mediator at each Simon mall will be polling an EnergyConnect server to obtain event notifications. The remainder of this section describes this interface in more detail.

5.2.1 Example Data Flow

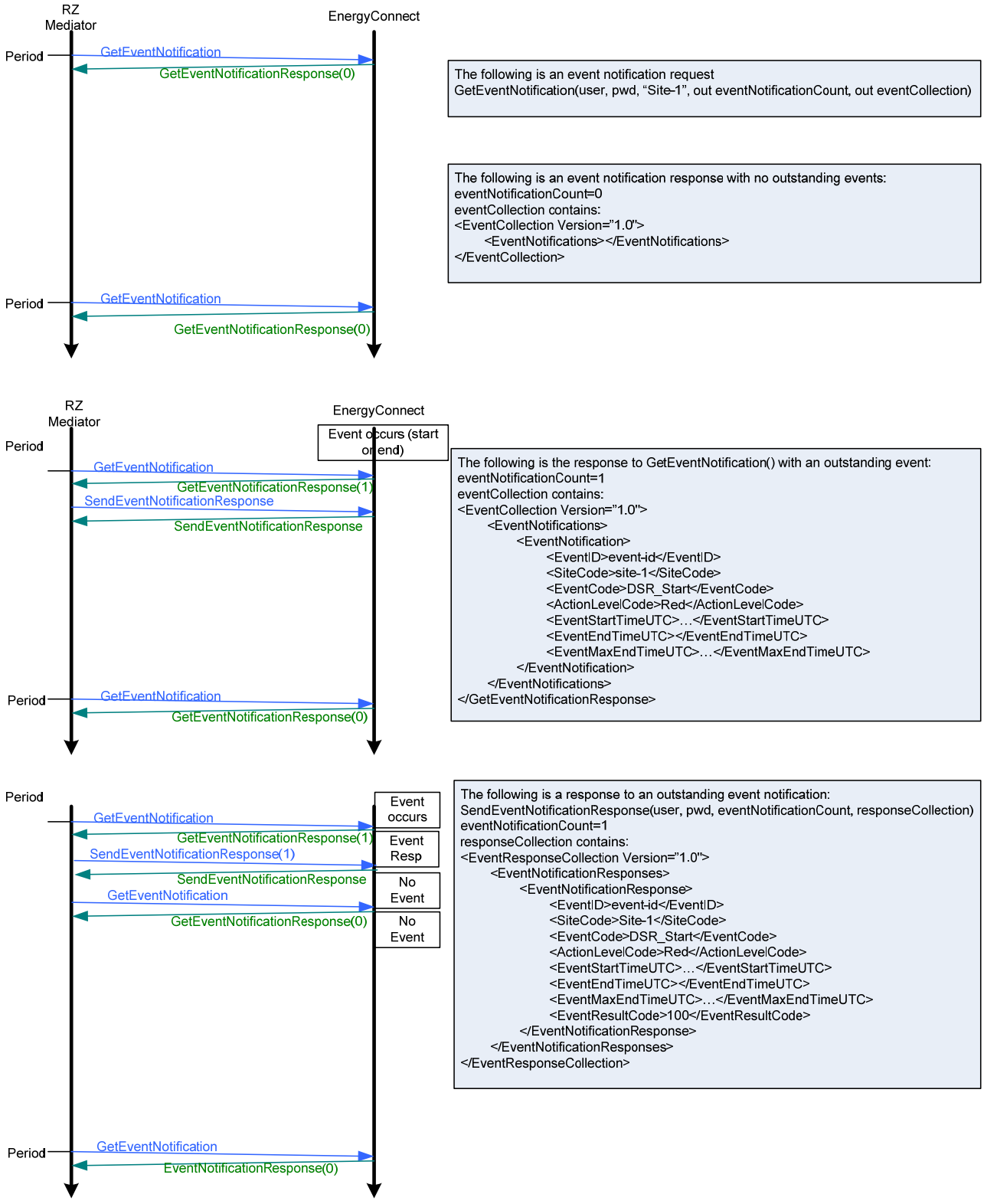

Figure 5 EnergyConnect / Richards-Zeta Data Exchange for Event Notification

5.2.2 Event Notification Request

The following describes the web method for Event Notifications.

```
int returnCode = GetEventNotification(
            string userName,
            string password,
            string siteCode,
            out int eventCount, /* 0 or greater */
            out EventCollection eventCollection
      )
```

The fields to the GetEventNotification call are as follows:

- userName: unique username for the Simon properties
- password: unique password for the Simon properties
- siteCode: unique site code for each Simon mall. See the table in Section 7 for the site codes for each mall.
- eventNotificationCount: count of the number of event notifications returned by the call. Typically this is 0 if there are no outstanding events, greater than zero if there are outstanding events.
- eventCollection: Array of outstanding events.

The return value of the web service indicates whether the call could be acted upon by EnergyConnect. The possible values are listed below under Web Service Return Codes.

5.2.2.1 EventCollection Output

The EventCollection output parameter is:

```
<EventCollection Version="1.0">
    <EventNotifications>
        <EventNotification>
            <EventID>event-id</EventID>
            <SiteCode>site-1</SiteCode>
            <EventCode>DSR_Start</EventCode>
            <ActionLevelCode>Red</ActionLevelCode>
            <EventStartTimeUTC>...</EventStartTimeUTC>
            <EventEndTimeUTC></EventEndTimeUTC>
            <EventMaxEndTimeUTC>...</EventMaxEndTimeUTC>
        </EventNotification>
    </EventNotifications>
</EventCollection>
```

The Version attribute of the EventCollection element indicates that this is version 1.0 of the EventCollection layout.

EventID is a unique identifier for this event. It is used to recognize duplicate notifications and to match the notification response to the original Event Notification. It is EnergyConnect's intention to prevent

duplicate notification, and the use of the Event ID to recognize a duplicate is simply an extra precaution.

SiteCode is the same SiteCode that was passed as an input parameter to the web service.

EventCode indicates the type/purpose of the notification. These codes should translate on the facility end to taking an action with a device, BAS, generator etc. to reduce load according to a known scenario. The ActionLevelCode indicates the relative extremity of a given event and/or opportunity. The Action Level Codes plus Event Codes should map to an action on the facility side for load reduction.

EventStartTimeUTC is the time the action should start. If the start time is in the past by the time the web service call is received or processed, the action should begin immediately.

If the end time is known at the time of the beginning web service call, that time will be provided in the EventEndTimeUTC, however it is often the case that that time is not known ahead of time. When the ending time is not known ahead of time, the EventEndTimeUTC field will be passed as NULL.

EventMaxEndTimeUTC is used to specify the maximum end time for the event. For example, when a synchronous reserve event is called, the EventStartTimeUTC is known, and the EventMaxEndTimeUTC is 60 minutes after the EventStartTImeUTC (60 minutes maximum per SRS event). The exact release time of the event is determined by the grid operator in real time.

The values for EventCode are given below.

EventCode	Short Description	Description
ILR_Start	Start of ILR Event	CRITICAL EVENT – start of Interuptible Load for Reliability (ILR) event starting at the time specified for the EventStart. ACTION REQUIRED for long term reliability even.
ILR_Release	Release from ILR Event	ILR is ending at the EventEnd datetime and facility can be released from its obligation at the specified time.
ILR_PreNotify	Heads up on probable near term ILR event	This is a heads up notification that an ILR event is probable (although not imminent). Preparation for an ILR or other event is highly recommended.
DSR_Start	Start of DSR Event	CRITICAL EVENT – start of Demand Synchronous Reserve event starting at the time specified in the EventStart. IMMEDIATE ACTION REQUIRED for short term reserve event.
DSR_Release	Release from DSR Event	DSR is ending at the EventEnd datetime and facility can be released from its obligation at the specified time.
RTD_Start	Start of RTD Event	Real Time Dispatch (RTD) event starting at the time specified in the EventStart. ACTION HIGHLY RECOMMENDED though compliance is not mandatory.
RTD_Release	Release from RTD Event	RTD is ending at the EventEnd datetime and facility can be released from its obligation at the specified time.
EconOpp_Start	Start of Economic Opportunity	An economic opportunity is present and a load reduction is recommended. ACTION HIGHLY

		RECOMMENDED though compliance for the grid is not mandatory.
EconOpp_Release	Release from identified Economic Opportunity	The economic opportunity has passed and load reduction is not as critical. However, conditions may still be present for economic benefit and normal load reduction schedules maintained.

Action Level Codes indicate the relative extremity or opportunity of a given event.

ActionLevelCode	Short Description	Description
Green	Take measures to reduce	Green indicates there are good reasons to change load and measures should be taken to comply with an event or take advantage of an economic opportunity
Red	Take as strong measures as possible to reduce applicable to Event Type	Red indicates there are extreme grid events and very strong economic opportunities for load reductions.

Event Response Codes

100	Event Compliance	Facility able to accept and respond appropriately to the event notification
101	Event Non-Compliance	Facility unable to accept and/or respond appropriately to the event notification

Web Service Return Codes

Code	Short Description	Description
1000	Success	The data was successfully loaded
2000	General Error	General failure, unspecified or unknown reason, this is the catch-all for unexpected conditions
2001	XML Structure Error	Unexpected xml structure
2002	Data Formatting Error	Format of data incorrect (such as date format)
2003	Meter ID Not Found	Meter ID supplied does not match any known ID
2004	Value Out of Bounds	Data value out of bounds
2005	Site ID Not Found	Site ID supplied does not match any known ID
2008	Customer ID Not Found	Customer ID supplied does not match any known ID
2008	Authentication Failure	The login / password failed to authenticate
2008	Service Unavailable	The web service cannot complete the operation at this time

5.2.3 Event Notification Response

The purpose of the Send Event Notification Response is to confirm receipt of the Event Notification and to indicate how it was handled at the Simon end.

The following describes the web method for Event Notification Response.

```
int returnCode = SendEventNotificationResponses(
            string userName,
            string password,
            int eventNotificationCount, /* 0 or greater */
            EventResponseCollection eventResponseCollection
      )
```

The parameters to the SendEventNotificationResponse() call are similar to those in the GetEventNotification() with the exception of:

- eventNotificationCount gives the number of responses in the eventResponseCollection.
- eventResponseCollection is an array of notification responses to previous event notifications. They need not be sent back in the same order as they were received nor must all of them be included in a single web service call.

The returnCode values are as described above.

5.2.3.1 EventResponseCollection Output

The format of the EventResponseCollection parameter is:

```
<EventResponseCollection Version="1.0">
    <EventNotificationResponses>
        <EventNotificationResponse>
            <EventID>event-id</EventID>
            <SiteCode>site-1</SiteCode>
            <EventCode>DSR_Start</EventCode>
            <ActionLevelCode>Red</ActionLevelCode>
            <EventStartTimeUTC>...</EventStartTimeUTC>
            <EventEndTimeUTC></EventEndTimeUTC>
            <EventMaxEndTimeUTC>...</EventMaxEndTimeUTC>
            <EventResponseCode>100</EventResponseCode>
        </EventNotificationResponse>
    </EventNotificationResponses>
</EventResponseCollection>
```

All elements in this XML are as described in the EventCollection with the exception of:

EventResponseCode indicates whether the event was acted upon. The values for EventResponseCode are given above.

6 Richards-Zeta @ Simon Mall / BAS Interface

The interface between the Richards-Zeta Mediator at the Simon Malls and the Building Automation Control System (BAS) at the mall varies depending upon the manufacturer of the BAS system.

6.1 Richards-Zeta @ Simon Mall / Andover Network Controller Interface

The interface between the RZ Mediator and the Andover Network Controller will utilize XML for data exchange.

6.1.1 Meter Data

The exact mechanism for collection of the pulses will depend upon the specifics of the mall. Considerations include:

- Number of meters
- Location of meter(s) relative to the existing or planned equipment
    - E.g., is there a Mediator in the same room as the utility pulses
    - E.g., is there an Andover Network Controller in the same room as the utility pulses

Depending upon these situations, the exact collection mechanism will be either pulse collection by the Andover Network Controller or by the RZ Mediator.

Pulses into Andover Network Controller

For those facilities where the RZ Mediator is not in a location that is near the meter installation, if the Andover Controls system is near the meter the Andover Controls system will collect the meter data. In this case, the Andover Network Controller will receive the pulses and make the meter data available via XML. The RZ Mediator will then pull the XML file as part of the normal data interaction.

Pulses into RZ Mediator

For those facilities where the RZ Mediator is in a location that is near the meter installation, the Mediator will collect the meter pulses. In this case, Mediator will make the meter data available to the Andover Network Controller via an XML file.

<OPEN ISSUE for FSG / Roth>: Please confirm this interface. Details on this interface are needed.>

6.1.2 Event Notification

For event notification, the RZ Mediator will interact with the Andover Network Controller to inform the BAS of an event. For this interaction, the Mediator will do an HTTP Post of the event notification to the Andover Network Controller.

<OPEN ISSUE for FSG / Roth>: Please confirm this interface. Details on this interface are needed.>

6.2 Richards-Zeta @ Simon Mall / Siemens Interface

<OPEN ISSUE for FSG>: Details on this interface are needed.

7 Facility List

The list of Simon malls that are slated for initial deployment are shown in the table below.

	Shopping Center	Location	Utility	ILR	Econ	SR	BAS Type	RZ on site	Peak kW	Utility Account #	# Meters on Bill	# Meters needed with pulses	FSG involved ?	Roth involved ?
1	Granite Run	Medina, PA	PECO	Y	Y	Y	Andover	N	2,400	050-03-90-0330-24-01	1	1	Y	Y
2	Oxford Valley	Langhorne, PA	PECO	Y	Y	Y	Andover	Y	7,500	18253-00809	1	1	Y	Y
3	River Oaks	Calumet City, IL	Com Ed	Y	Y	Y	Andover	Y	2,100	8125060002	42	TBD	Y	Y
4	King of Prussia	King of Prussia, PA	PECO	N	Y	N	Siemens	Y	17,000	88976-00700	1	1	Y	
5	Northfield Sq.	Bourbonaise, IL	Com Ed	N	Y	N	Andover	N	550	1346227004	5	5	N	Y
6	Orland Sq.	Orland Park, IL	Com Ed	Y	Y	Y	Andover	N	4,600	8384044006	168	TBD	Y	Y
7	Gurnee Mills	Gurnee, IL	Com Ed	N	Y	N	L&G/ Siemens	N	2,500	8838075011	48	TBD	TBD	
8	Franklin Mills	Philadelphia, PA	PECO	N	Y	N	ALC	N	13000	5399400105	2	2	Y	
9	Lincolnwood TC	Lincolnwood, IL	Com Ed	N	Y	N	Andover (July)	Y	1,500	0261524001	10	TBD	Y	Y
10	Montgomery	North Wales, PA	PECO	N	Y	N	Trane	Y	4,000	76371-01402	1	1	Y	

Figure 6 Simon Facility List

The table below has the Site ID (utilized for data exchange), requirements for meter data recording frequency and meter data upload frequency, minimum event notification polling frequency, and the data when the first even could occur.

	Shopping Center	Site ID	Data interval for Data recording	Data Upload Frequency	Event Notification Polling Frequency for initial deployment (6/1/08)	First Event could occur	Event Notification Polling Frequency for later deployment (e.g., for SRS)
1	Granite Run	simon0001	1 min	Noon and Midnight	30 minutes	6/1/08 (ILR) Rolling (others)	0.5 minutes
2	Oxford Valley	simon0002	1 min	Noon and Midnight	30 minutes	6/1/08 (ILR) Rolling (others)	0.5 minutes
3	River Oaks	simon0003	1 min	Noon and Midnight	30 minutes	6/1/08 (ILR) Rolling (others)	0.5 minutes
4	King of Prussia	simon0004	60 min	Midnight	30 minutes	Rolling	30 minutes
5	Northfield Sq.	simon0005	60 min	Noon and Midnight	30 minutes	Rolling	30 minutes
6	Orland Sq.	simon0006	1 min	Midnight	30 minutes	6/1/08 (ILR) Rolling (others)	0.5 minutes
7	Gurnee Mills	simon0007	60 min	Midnight	30 minutes	Rolling	30 minutes
8	Franklin Mills	simon0008	60 min	Midnight	30 minutes	Rolling	30 minutes
9	Lincolnwood TC	simon0009	60 min	Midnight	30 minutes	Rolling	30 minutes
10	Montgomery	simon0010	60 min	Midnight	30 minutes	Rolling	30 minutes

Figure 7 Facility List with Metering and Data Interaction Requirements