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DOCKET NO. 47472

COMMISSION STAFF'S PETITION
TO DETERMINE REQUIREMENTS
FOR SMART METER TEXAS

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PUBLIC UTILITY COMMISSION

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DIRECT TESTIMONY

OF

MONA TIERNEY-LLOYD

ON BEHALF OF

ENERNOC, INC.

OCTOBER 19, 2017

ENERNOC, INC.
DIRECT TESTIMONY OF MONA TIERNEY-LLOYD
PUC DOCKET NO. 47472

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EXHIBITS

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I. INTRODUCTION

Q. PLEASE STATE YOUR NAME, YOUR POSITION, AND YOUR BUSINESS ADDRESS.

A. My name is Mona Tierney-Lloyd. I am Senior Director, Regulatory Affairs for EnerNOC, Inc., an Enel Group Company. My business address is P.O. Box 378, Cayucos, CA 93430.

Q. PLEASE DESCRIBE YOUR WORK HISTORY AND QUALIFICATIONS FOR PROVIDING THIS TESTIMONY.

A. My work history and qualifications are contained in Exhibit MTL-1.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY TODAY?

A. The purpose of my testimony is to provide the perspective of a third-party energy service provider in improving data access options for customers and third parties relative to Smart Meter Texas in the Public Utility Commission of Texas Docket No. 47472. I will describe how EnerNOC relies upon access to data to provide its services to utilities and wholesale market operators alike. I will describe how technology has changed EnerNOC's approach to data access. Lastly, I will describe some of the trends that are occurring in terms of data access that should be considered as it relates to Smart Meter Texas (SMT). In this regard, I support certain improvements to the design of SMT.

Q. PLEASE DESCRIBE THE SERVICES THAT ENERNOC PROVIDES AND WHERE IT CONDUCTS ITS BUSINESS.

A. EnerNOC was formed in 2001 in Boston, Massachusetts as a demand response company. Since that time, EnerNOC has expanded its operations to 4 continents, including North

1 America, Australia, Europe and Asia. In North America, EnerNOC provides demand
2 response resources in the following markets: ERCOT, ISO-NE, PJM, NYISO, IESO,
3 AESO and CAISO. In addition, EnerNOC provides demand response resources to many
4 public and investor-owned utilities in North America through bilateral contracts.
5 EnerNOC has also added other business lines, including Energy Intelligence Software
6 (EIS) and a procurement platform that provides procurement services to wholesale,
7 government and retail customers. As of August 2017, EnerNOC was acquired by Enel
8 Group.

9 Q. PLEASE DESCRIBE YOUR ROLE WITH ENERNOC.

10 A. I am the Senior Director, Western Regulatory Affairs for EnerNOC. I have been employed
11 by EnerNOC for nine years. During that time, I have been responsible for regulatory and
12 legislative advocacy in the Western United States. Within the past two years, I have been
13 responsible for regulatory advocacy in Texas, including ERCOT.

14 Q. WHAT SERVICES DOES ENERNOC PROVIDE IN ERCOT?

15 A. EnerNOC is registered with the Public Utility Commission of Texas as an Aggregator. In
16 addition, EnerNOC is a corporate member of ERCOT, is a QSE, and a provider of ERS
17 service. In addition, EnerNOC is qualified to offer Load Resources in Responsive Reserve
18 Service, and plans to begin transacting RRS in the Day Ahead Market this year. EnerNOC
19 provides consulting services to utilities within ERCOT regarding demand response
20 programs and provides EIS to certain corporate clients. EnerNOC also participates in
21 several load management programs with individual TDSPs each summer. Enel Green

1 Power North America owns and operates Snyder Wind Farm, LLC, a 63 MW wind farm
2 in Scurry, Texas.

3 II. ENERNOC'S ACCESS AND USE OF DATA

4 Q. FOR WHAT PURPOSES DOES ENERNOC USE CUSTOMER DATA?

5 A. EnerNOC uses customer data for four main purposes:

- 6 1. To assess and review customer consumption and behavior patterns based upon
7 historical data;
- 8 2. To determine customer demand reduction capabilities for purposes of bidding as part
9 of an aggregated resource;
- 10 3. To monitor real-time dispatches;
- 11 4. To settle deliveries with buyers.

12 Q. HOW HAS ENERNOC ACCESSED CUSTOMER DATA HISTORICALLY?

13 A. EnerNOC's services pre-dated the significant deployment of advanced meters. As such,
14 EnerNOC has historically relied upon its own technology to access customer data in
15 cooperation with utilities who would install EnerNOC's technology alongside the utility
16 meter. EnerNOC uses the EnerNOC Site Server (ESS), which is installed at the customer's
17 site and communicates the pulse data from a KYZ pulse device, which counts pulses on an
18 analog meter, to our Network Operations Center (NOC). The customer had to have Internet
19 access or other appropriate communications capabilities at the site in order for the
20 communication of pulse data to be relayed to our NOC.

21 This data, whether or not it was used for settlement purposes, gave EnerNOC real-time
22 visibility into the real-time consumption data at the customer premises, which is important

1 for being able to manage overall portfolio risk, and real-time operations during dispatch.
2 Further, the KYZ pulse device allowed EnerNOC to receive information at a designated
3 interval level, primarily five minutes, but as granularly as one minute, which was not
4 available from utility meters.

5 Q. HAS ENERNOC'S APPROACH TO DATA ACCESS CHANGED?

6 A. Yes. EnerNOC is trying to reduce the amount of additional infrastructure that it must
7 deploy in order to obtain reasonable access to data and is, instead, trying to leverage data
8 access through the means that are becoming more publicly available, such as through SMT
9 or other platforms that are compliant with Green Button Connect My Data.

10 Q. WHAT ARE THE FACTORS THAT ENERNOC HAS CONSIDERED IN
11 MODIFYING ITS DATA ACCESS APPROACH?

12 A. There are a few driving factors that have changed the value for and access to customer
13 energy data. First, many utilities, with those located in ERCOT being among the first in
14 the nation, have embraced the importance of advanced metering infrastructure which has
15 been deployed in many parts of the country. Secondly, alongside the ability to better collect
16 and store data has come the understanding of the importance of sharing that information
17 with customers and their authorized third-party energy service providers. Again, Texas
18 was the first in the country to make customer data available to the customer itself through
19 Smart Meter Texas (SMT). Unfortunately, customers have not accessed the system to any
20 great degree and the technology has advanced since the time SMT was first rolled out,
21 almost 10 years ago.¹

¹ Approximately 1% of the customers have accessed their data through SMT.

1 Q. HAS ENERNOC OR ITS CUSTOMERS BEEN ACTIVE USERS OF SMT? WHY OR
2 WHY NOT?

3 A. Neither EnerNOC nor its customers have been active users of SMT to any great extent.
4 We have had difficulty in getting customers to successfully complete the registration
5 process. Our customers tend to be larger customers with multiple facilities, so the process
6 to get all of their facilities to successfully complete the registration process has been an
7 obstacle. As such, EnerNOC continues to rely upon its data that it collects for operational
8 purposes, and data direct from individual TDSPs as a secondary source when necessary.

9 Q. WHAT PROBLEMS DOES ENERNOC EXPERIENCE BY NOT BEING ABLE TO
10 UTILIZE SMT FOR DATA ACCESS PURPOSES FOR THE MAJORITY OF ITS
11 CUSTOMERS IN TEXAS?

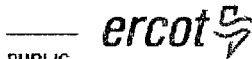
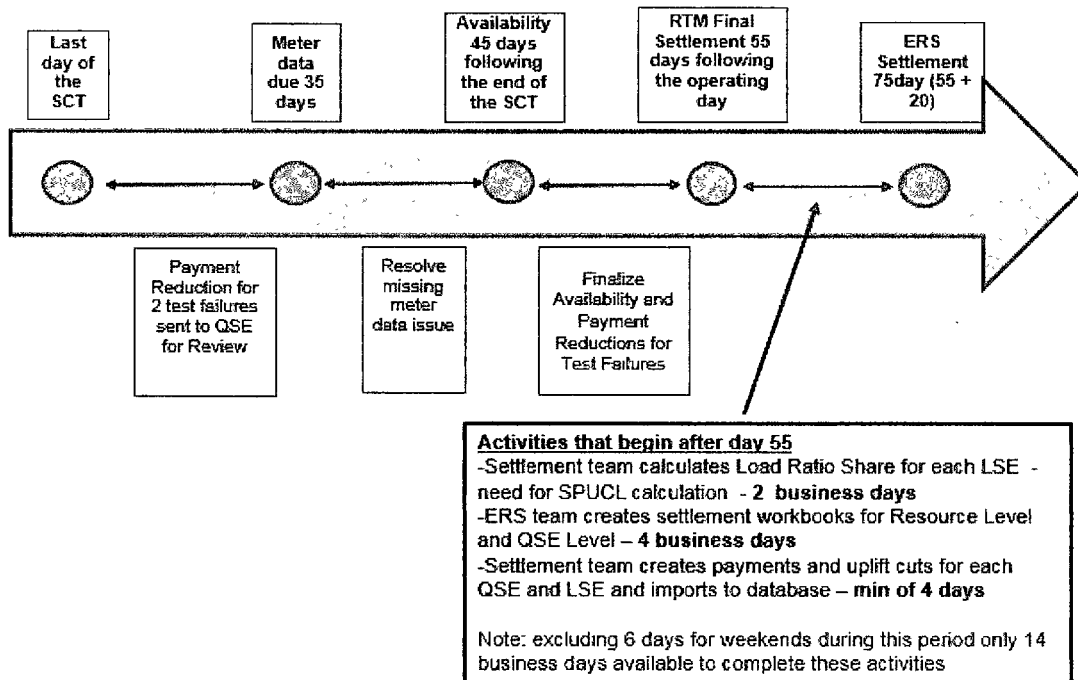
12 A. While EnerNOC does collect data from its KYZ pulse devices through its ESS, EnerNOC
13 relies upon TDSP data sent to ERCOT for purposes of settling with ERCOT. There can be
14 discrepancies between EnerNOC's data and ERCOT's data. We may not receive final
15 settlement data until 35 days after a dispatch, and 55 days after the end of a season for final
16 availability calculations (see Figure 1 below for the settlement timeline from ERCOT).
17 SMT data more closely aligns with the data used to determine how our resources are
18 compensated. In addition, we rely upon our data for submitting bids in the three ERS
19 auctions when final ERCOT data is not available in time to submit those bids. If we had
20 real-time access to SMT data, we could improve our bids in the ERS auction with another
21 data source closer to revenue grade data. Since ERS is subject to restrictive availability
22 and performance requirements (95%), better and faster access to SMT data will help us to

1 be more accurate in bidding into the ERS auctions to make sure we are complying with the
2 market requirements as best as possible.

3 In addition, ERCOT monitors the performance of EnerNOC's customers in meeting their
4 obligations as ERS participants. It is important that EnerNOC have timely access to the
5 same data that ERCOT is using to judge the performance of EnerNOC's customers so that
6 any performance concerns may be timely identified and corrected. While EnerNOC has
7 its sources of performance data, there is a potential for discrepancies, and it is prudent to
8 have access to the same data that is being used to measure and verify customer performance
9 – having more timely access to SMT data would better enable EnerNOC that access.

10 Finally, deploying duplicative measurement and communications technology is costly and
11 inefficient. Reducing costs to providing services to customers by using available
12 technologies will allow companies like EnerNOC to provide more services to more
13 customers.

ERS Settlement Timeline



PUBLIC

Figure 1, ERS settlement Timeline from ERCOT Update to DSWG August 19, 2016

Q. WHAT CHANGES IN DATA ACCESS TECHNOLOGIES HAVE OCCURRED SINCE THE ROLL-OUT OF SMT?

A. The National Institute of Standards and Technology (NIST) worked alongside the Smart Grid Interoperability Panel (SGIP) and the National American Energy Standards Board (NAESB) with the premise that customers should be able to easily access their energy information. As part of that effort, revisions were made to the Energy Service Provider Interface (ESPI) and Open Automated Data Exchange (OpenADE), to allow authorized third-party access. These standards and protocols allowed for Green Button Connect to morph into Green Button Connect My Data and Download My Data.

1 Q. PLEASE DESCRIBE THE SIGNIFICANCE OF OPENADE AND ESPI ON GREEN
2 BUTTON CONNECT MY DATA.

3 A. When Green Button was first introduced, a customer could access and download its data
4 in Comma Separated Value format. Initially, it was difficult for a customer to share its
5 data with a third party. The customer would have to enroll on a company website to obtain
6 a username and password and then either share the username and password with a third
7 party, which was not encouraged for various security reasons, or share a data file of the
8 downloaded data with a third party. Since data is updated on a daily basis, that would
9 require constant downloading of information by the customer and transmittal of that data
10 to a third party. In short, it wasn't very user friendly and customers would not want to be
11 bothered.

12 OpenADE allowed for third parties to access a central platform whereupon the third party,
13 with proper authorization, could access all of its customers' data on an ongoing basis using
14 a standard protocol. This was simpler and easier.

15 Q. WHERE IS GREEN BUTTON CONNECT MY DATA BEING UTILIZED IN THE
16 UNITED STATES?

17 A. California, Illinois, Colorado, and New York are states that are implementing data access
18 policies to streamline the ability for customers to authorize third party data access.

19 Q. WHY IS THIRD PARTY ACCESS TO DATA IMPORTANT?

20 A. While providing customers access to their data is of primary importance, most customers
21 do not have the means to analyze their own data or understand the breadth of services that
22 are available to them for energy management purposes. Third party service providers can

unlock those benefits on behalf of the customers. In addition to increasing the efficient utilization of electricity at the customer premise, energy management services provide other benefits to the grid at large by increasing reliability, decreasing scarcity, increasing the utilization of existing infrastructure, etc.

Q. WHAT OTHER CHANGES IN THE PROVISION OF ELECTRICITY SERVICES MAKE DATA ACCESS SO IMPORTANT?

A. Customer participation in energy services has exploded in the past ten years in many different forms. Customers are accessing different sources of energy delivery including behind-the-meter (BTM) solar, distributed generation, energy efficiency, demand response and storage. Customers are not only more active in managing on-site consumption and generation, but are participating in wholesale markets through aggregators or other Qualified Serving Entities. The types of services that resources can provide either at the customer premise or in wholesale electricity markets alone or in combination is just beginning to be realized. In some instances, customer provided electricity services are superior to traditional generator provided services.

III. SUGGESTED MODIFICATIONS TO SMT

Q.. WHAT ATTRIBUTES WOULD YOU LIKE TO SEE ENHANCED TO MAKE SMT MORE USER FRIENDLY?

A. There are several enhancements that could make SMT more user friendly: not requiring a customer to establish an online account as the sole means of providing third party access; ensuring that the customer may authorize the data to be shared either for a designated period or indefinitely, with the option of the customer terminating access at will or for the

1 third party to terminate access if it no longer provides services to the customer; allowing
2 for continuous access to data through a web portal and API using a standardized protocol
3 and format to minimize the amount of unique development required; accepting Open
4 Authorization 2.0 as the standard way for customers to authorize third party access;
5 minimizing the number of screens and clicks that a customer would have to provide in
6 order to both authenticate themselves and authorize third party access; and providing a
7 mobile-friendly platform that customers can access on their mobile devices, the availability
8 of access to data within a very short period of time after authorization.

9 Q. HAVE THESE FUNCTIONALITIES BEEN APPROVED TO BE DEPLOYED IN ANY
10 OTHER MARKET?

11 A. Yes. In California, through various decisions including D.11-07-056, D.13-09-025 and
12 Resolution E-4868, the CPUC adopted policies regarding customer and third-party data
13 access. In addition, the CPUC adopted rules around third party data access through
14 OpenADE, which is Green Button Connect, and lastly, the CPUC adopted a more
15 streamlined way for customer authentication and authorization for third party data access.

16 A copy of the CPUC's decision may be accessed at
17 <http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M194/K746/194746364.PDF>.

18 Public Service Company of Colorado has also agreed to implement Green Button Connect
19 and has adopted data access policies for third parties. The NYPSC approved Con Edison's
20 request to deploy smart meters conditioned on robust access to data for customers and their
21 designated third parties; early in 2018, a C&I customer's five- minute interval data will be
22 available through Green Button on a 24-hour lag basis to the customer and their third party.

1 Over time, the lag is expected to decrease to 30-45 minutes, enabling improved operational
2 visibility and facilitating streamlined settlement.

3 IV. DATA PRIVACY AND SECURITY

4 **Q.** DOES ENERNOC HAVE DATA PRIVACY AND SECURITY POLICIES AS IT
5 RELATES TO THE PROTECTION OF CUSTOMER INFORMATION FROM
6 UNINTENDED DISCLOSURES?

7 **A.** Yes. EnerNOC has its own data privacy and security policies that can be found at the
8 following URL: <https://www.enernoc.com/privacy-policy>. I also have attached a copy of
9 EnerNOC's policy to my testimony as Exhibit MLT-2. In addition, I have been actively
10 involved in the development of customer privacy policies in various states that have
11 explored data access. I see a balance between allowing customers to authorize third party
12 access and use of data and protecting customers from unauthorized disclosures. I have
13 either participated directly in the development of customer data privacy policies,
14 representing EnerNOC, or I have done so through my active participation in the trade
15 association Mission:data.

16 **Q.** WHAT ARE SOME OF THE TENETS OF GOOD CUSTOMER PRIVACY POLICY?

17 **A.** Good customer privacy policy includes informed consent of the customer's release of their
18 data to a third party for a specified purpose. If there are other uses of the data that the third
19 party has not disclosed or to which the customer has not consented, the third party must
20 disclose and the customer must consent to those uses. The third party shall not sell or share
21 the data with any entity that is not legally bound to protect the data for unauthorized
22 disclosure nor engage with a third party to use the data in any manner that has not been

consented to by the customer. The third party should limit the amount of information that is collected for the intended purpose and shall retain the data only as long as is necessary for auditing or accounting purposes. If the third party has received a subpoena for the data, the third party must notify the customer and provide an opportunity, if possible, to contest the disclosure of the data. The data shall be transmitted and stored securely using industry best practices to prevent unauthorized access.

V. CONCLUSION

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes, it does.

EXHIBIT MLT-1

STATEMENT OF QUALIFICATIONS OF MONA TIERNEY-LLOYD

Q PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A My name is Mona Tierney-Lloyd, and my business address is P. O. Box 378, Cayucos, CA 93430.

Q BRIEFLY DESCRIBE YOUR PRESENT EMPLOYMENT.

A I am currently employed by EnerNOC, Inc. as a Senior Director of Western Regulatory Affairs. I am charged with representing EnerNOC's interests in promoting demand response resource adoption by public and investor-owned utilities and wholesale markets. I participate in regulatory proceedings before state commissions in the Western United States and Texas and state legislatures. I also promote the EnerNOC Exchange, an on-line auction platform that facilitates the buying/selling of energy products and services.

Q PLEASE SUMMARIZE YOUR PROFESSIONAL AND EDUCATIONAL BACKGROUND.

A I have been employed by EnerNOC since 2008. I was previously employed by Constellation NewEnergy, Inc. in various capacities, including Vice President of Western Government Affairs from 2002 until 2006. Previous to that, I was a Director of Western Government Affairs for Enron Energy Services, Inc. from 1996 until 2001. I was employed by SDG&E as a Senior Pricing Analyst from 1994 until 1996. I held rate, supply and load forecasting analytical positions at Elizabethtown Gas Company in New Jersey from 1987 until 1994. I began my professional career working as a production analyst for an oil and

1 natural gas exploration and development company outside of Pittsburgh, Pennsylvania. I
2 have a B. S. Degree in Petroleum and Natural Gas Engineering from Penn State.

3 Q HAVE YOU PREVIOUSLY TESTIFIED ON BEHALF OF ENERNOC?

4 A Yes. I have testified on behalf of EnerNOC, Inc., in multiple California Public Utility
5 Commission Proceedings, including:

6 R.13-09-011 (Demand Response (DR)), A.16-08-006 (PG&E Diablo Canyon Power
7 Plant);

8 R.12-03-014 (Long Term Procurement Plan);

9 A17-01-012, et al. (2018-2022 DR Programs); and

10 Southern California Edison Company's (SCE's) local capacity requirements (LCR)
11 applications (A.14-11-012 (LA Basin)) and A.14-11-016 (Moorpark)).

12 I have also submitted testimony in other proceedings before the CPUC. I have also testified
13 before the state regulatory commissions in Arizona, Colorado, New Mexico, Montana and
14 Minnesota.

15 Q WAS THIS TESTIMONY PREPARED BY YOU OR UNDER YOUR SUPERVISION?

16 A Yes.

17 Q ARE THE STATEMENTS MADE IN YOUR TESTIMONY TRUE AND CORRECT TO
18 THE BEST OF YOUR KNOWLEDGE AND BELIEF?

19 A Yes.

1 Q TO THE EXTENT THAT YOUR TESTIMONY CONTAINS EXPRESSIONS OF
2 OPINION, DO THEY REPRESENT YOUR BEST PROFESSIONAL JUDGMENT?

3 A Yes.

4 Q DO YOU ADOPT THIS DOCUMENT AS YOUR SWORN TESTIMONY?

5 A Yes.

6 Q DOES THIS CONCLUDE YOUR STATEMENT OF QUALIFICATIONS?

7 A Yes, it does.

EnerNOC's Information Security Program

Below is an overview of EnerNOC's Information Security Program, a framework that outlines the investments EnerNOC is making to protect your data. Our goal with this document is to share with you our policies, procedures, and security framework to answer any questions you may have on how we protect the information you entrust us with.

Thousands of customers have chosen EnerNOC. Our enterprise customer base includes businesses spanning regulated industries such as financial services, education and government, technology, manufacturing, services, and retail and hospitality, amongst others.

EnerNOC's Information Security Program consists of the following:

Organizational Commitment

Plan and Organize

- Our information technology (IT) management meets monthly with senior management to provide oversight, set priorities, and ensure IT alignment with the business.
- When selecting and delivering new solutions, our process is to gather business requirements and conduct a security risk assessment for inputs.
- We manage projects in accordance with Project Management Institute (PMI) principles.
- We communicate IT strategic plans, goals, major projects, expenses, and performance to senior management.

Acquire and Implement

- Our Engineering Department uses the Agile software development methodology to provide flexibility, quality control, and increased return on investment (ROI).
- Our IT Team gathers business requirements, selects, and implements solutions based on these requirements and provides performance, availability, and security.

Security Programs and Audits

Deliver and Support

- EnerNOC's Information Security Program is a risk-based program on the Council on CyberSecurity's 20 Critical Controls based on National Institute of Standards and Technology (NIST) and ISO27001 standards.
- We monitor and report against established service levels.
- Business-critical third-party services are continually reviewed.
- We have established a Business Continuity Plan (BCP), including business impact analysis, risk analysis, recovery procedures, recovery validation plan, Crisis Management Team, training, and regular updates.

- We maintain IT security staff, processes, and policies.
- We utilize security application software to protect the environment (firewalls, demilitarized zone (DMZ)-based network design, Intrusion Protection System (IPS)/Intrusion Detection System (IDS), virtual private networks, public key infrastructure (PKI), antivirus/anti-spam, security information and event management, log management, vulnerability scanning).
- Our Incident Response Team ensures that we are prepared to respond quickly and effectively to security events.
- We provide periodic security awareness training to the enterprise.
- We have conducted a risk assessment against the ISO 27001 standard with a continual review and remediation process.
- IT purchasing is conducted in accordance with an established budget that is reviewed and approved by the business. We use an electronic procurement system to ensure the appropriate review and approval of purchases.
- IT and operations have an internal training program to ensure productivity and reduced error rate.

Monitor and Evaluate IT Performance

- We assign key performance indicators (KPIs) to monitor the efficiency and effectiveness of IT processes based on Control Objectives for Information and Related Technology (COBIT), an IT governance framework.
- IT processes are evaluated against applicable regulations.
- Ernst and Young conducts regular financial audits.
- IT Steering Committee and Executive Audit Committee provide oversight and guidance of IT performance and ensure that our efforts align with business priorities.

Information Security Management

- We have designated staff for information security roles and responsibilities.
- Information Security and Acceptable Use Policies are in place.
- We utilize risk and vulnerability management processes.
- We conduct annual security awareness training for the enterprise.
- We engage independent third-party firms to conduct application security audits.

Secure Architecture

Application Security

- We fully manage limited role-based authorization.
- We provide secure tokens/passwords in place for user authentication.
- Customer sites exist as a hierarchy and users are granted rights to view specific hierarchies.
- Users must authenticate with a username and password, which meets system enforced complexity, reuse and expiration requirements (90 days).
- Users are locked out after five unsuccessful login attempts.
- Users are logged out after 120 minutes of inactivity.
- Users are granted role-based access to the application.
- Users and their associated roles can be reported on/administrated internally.
- Users can have privileges revoked without deleting their account.
- We audit:
 - User logons/off.
 - Unsuccessful login attempts.
 - User administration actions that are financially relevant (change to/from, by whom, when).
- Users access EnerNOC's application via the Internet protected by Secure Socket Layer technology. This secures network traffic from passive eavesdropping, active tampering, or forgery of messages.

Network Protection

- Multiple firewalls provide a layered network security model that controls access to and between the application servers, database server, web servers and customer/meter control devices.
- EnerNOC's application is EU Safe Harbor compliant.

Physical Security

- EnerNOC's data center is hosted at a colocation facility and managed by a third party.
- Extensive multi-point security system secures this facility including complete real-time video surveillance, door alarms, motion sensors, biometrics, roving physical security, and card access points.
- EnerNOC's headquarter office has manned security at the building entry security desk, delivery entrance, roving guards, electronic access controls, secured sensitive computing spaces, video surveillance, along with a "Class A" fire system.

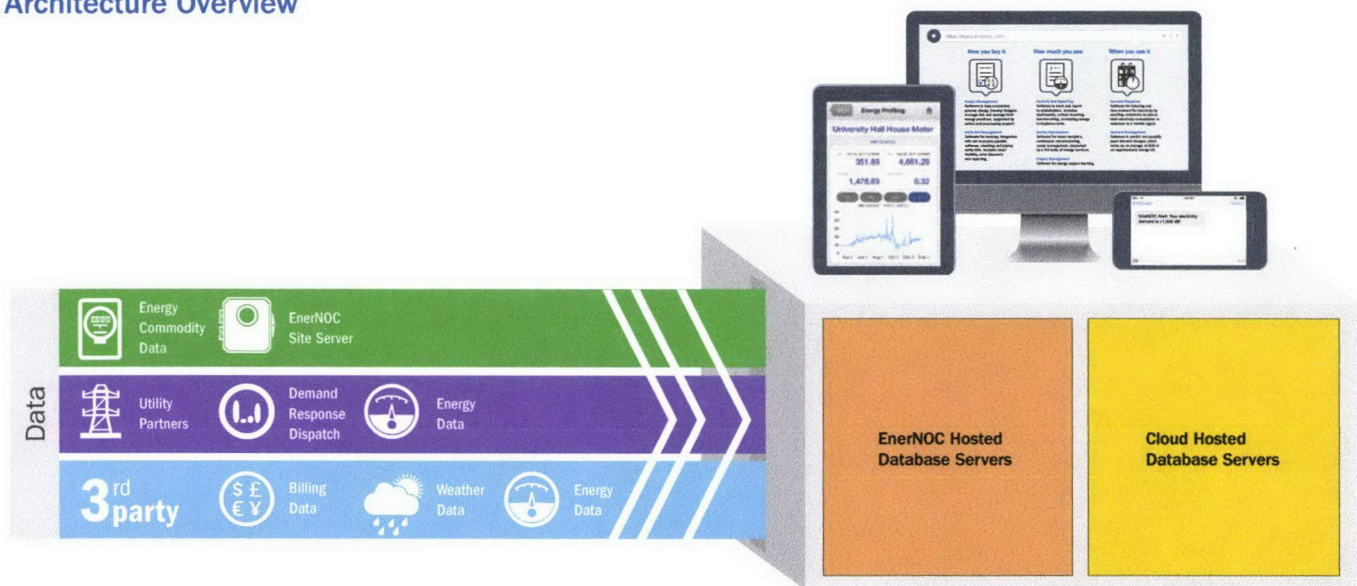
EnerNOC's Site Server (ESS) Hardware

- EnerNOC's S2 is a UL-listed, two-way communications solution.
- The server captures five-minute or one-minute electricity consumption intervals.
- The ESS uses EnerNOC PowerTalk® technology for low-latency data exchange and control signaling.
- The hardware has remote control of on-site customer equipment as enabled by customer.
- The ESS has a toggle delay typically less than 20 seconds.
- All interaction with utility meters are one-way (read-only) with no risk of utility meter reading interference.
- Communications back to the EnerNOC application are secured through virtual private network (VPN) tunnels and cellular signals.

Data Connect API (If Customer Sends EnerNOC Existing Interval Data)

- EnerNOC has interval data ingestion via API.
- We have RESTful API with key based authentication for authorized users.
- Users are restricted to authorized data streams and platform use for ingestion of data.
- Interconnect Service transmits interval data that EnerNOC collects to end-use customers for varying analysis/display purposes.

Architecture Overview



Frequently Asked Questions

How does the communication between EnerNOC and our Company work?

EnerNOC will install an EnerNOC Site Server (ESS) on site which will be used to collect and log electricity usage information about that site. The electricity usage information is collected directly from the site's meter and is stored within the device. Embedded PowerTalk® software on the device initiates an outbound XMPP connection to our collection servers. Once the connection is established the electricity usage information is sent to our servers over a secured Transport Layer Security (TLS)/Secure Sockets Layer (SSL) connection. Communication is always initiated by our device on the customer network to our servers. The only data being transmitted is the kWh (or other commodity usage demand information agreed during implementation) used during each five-minute interval and that data is encrypted during transmission. The device will not interface with any of the customer systems/devices except the networking equipment itself (routers, switches) as it attempts to connect to our servers over the Internet. Management of the device requires login credentials so only authorized users can view/modify the device configuration.

What physical security/physical access controls are at your facilities?

All of EnerNOC's primary servers and equipment are located in two redundant colocation centers, one in Boston, MA and the other in Dallas, TX. Physical security is managed by the owners of the colocation facilities whereby access to the equipment

is restricted to authorized individuals only. The facilities only provide access to previously approved individuals and must provide government-issued ID upon entry to the facility. Access to any data center space is protected with multifactor authentication devices.

What other services to external clients or internal operations are collocated in the facilities?

EnerNOC's servers are located within the two colocation facilities. Various other enterprise systems are located within the facilities such as mail servers, network storage, etc.

What is the information (and physical) security team structure and complement of personnel? What is the experience and background of staff at the facilities? What ongoing information security training or staff development do you provide to your organization? What security awareness training/communication do you provide to all staff associated with the business unit? Within our Network Operations Center (NOC) there are four network administrators within the EnerNOC Operations Group. Each member has a varying background within the network administration field.

EnerNOC has a dedicated Information Security Team focused on enterprise security. EnerNOC provides training to the organization on information security best practices.

What is the process for establishing information security procedures and standards? Can you characterize or outline types of documented procedures and standards (e.g., security configurations for network devices, hosts, DMZ architecture standards)?

EnerNOC establishes information security guidelines and standards based on ISO27001, NIST, and the SANS 20 Critical Controls (20CSC).

What is your information risk assessment and management process?

Risk assessments are based on ISO27001.

What is the process and technology for accomplishing security monitoring (e.g., individuals involved, IDS, logging from IDS, network devices and hosts, procedures for responding to alerts, review of logs, process for defining necessary monitoring requirements)?

Security monitoring is performed by the Network Operations Team and the Information Security Team. All network events are logged to the hardened Security Information and Event Management (SIEM) device. Network- and host-based security tools are deployed at critical locations throughout the environment.

What are the internal incident response policy and procedures? What policies, procedures, and Service Level Agreements (SLAs) are in place for escalating/coordinating “security” events with clients?

An incident response plan is in place to handle any security events. Communication of security events takes place on a case-by-case basis as defined by the customer's requirements.

What cloud providers does EnerNOC use?

EnerNOC uses Amazon Web Services (AWS).

- AWS allows EnerNOC to secure our infrastructure and content.
- AWS multi-copy storage solution is based in secured facilities designed for 99.999999999% availability.
- AWS provides a secured, scalable, and effective solution.
- AWS provides the tools to help ingest, store, process, and deliver content worldwide with highly scalable, secured, and cloud-base services.
- EnerNOC is able to easily create and use redundant servers for all business applications where AWS are used.

How do you anonymize data?

When we use data collectively, the result, be a baseline or predication the customer information is not shared with other users of the application.

What customer data do you maintain/store in the cloud?

No master source of customer identifiable data associated with consumption data is stored in the cloud. EnerNOC uses Salesforce.com as our primary customer relationship management (CRM) application.

How do you protect data in transfer to and from the cloud?

Data is secured and encrypted. EnerNOC uses IPsec encryption protocol.

For more information visit enernoc.com or email info@enernoc.com.
Catch up on the latest best practices in energy management on our EnergySMART blog, energysmart.enernoc.com.