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OF NEW YORK

DER Real-Time Telemetry: Distribution Utility Solutions

August 30, 2022

August 30, 2022: Workshop Agenda 10:00am – 11:00am

Time Frame	Agenda Topic
10:00 – 10:05am	Introduction
10:05– 10:35am	Overview of Telemetry Solutions offered today
10:35-10:45am	Looking Forward: Future Solutions and Next Steps
10:45-11:00am	Q&A

Objectives

1. Aid stakeholder understanding of approach and solutions for aggregator communication with distribution utilities
2. Receive stakeholder feedback on telemetry requirements.

If you have questions…..
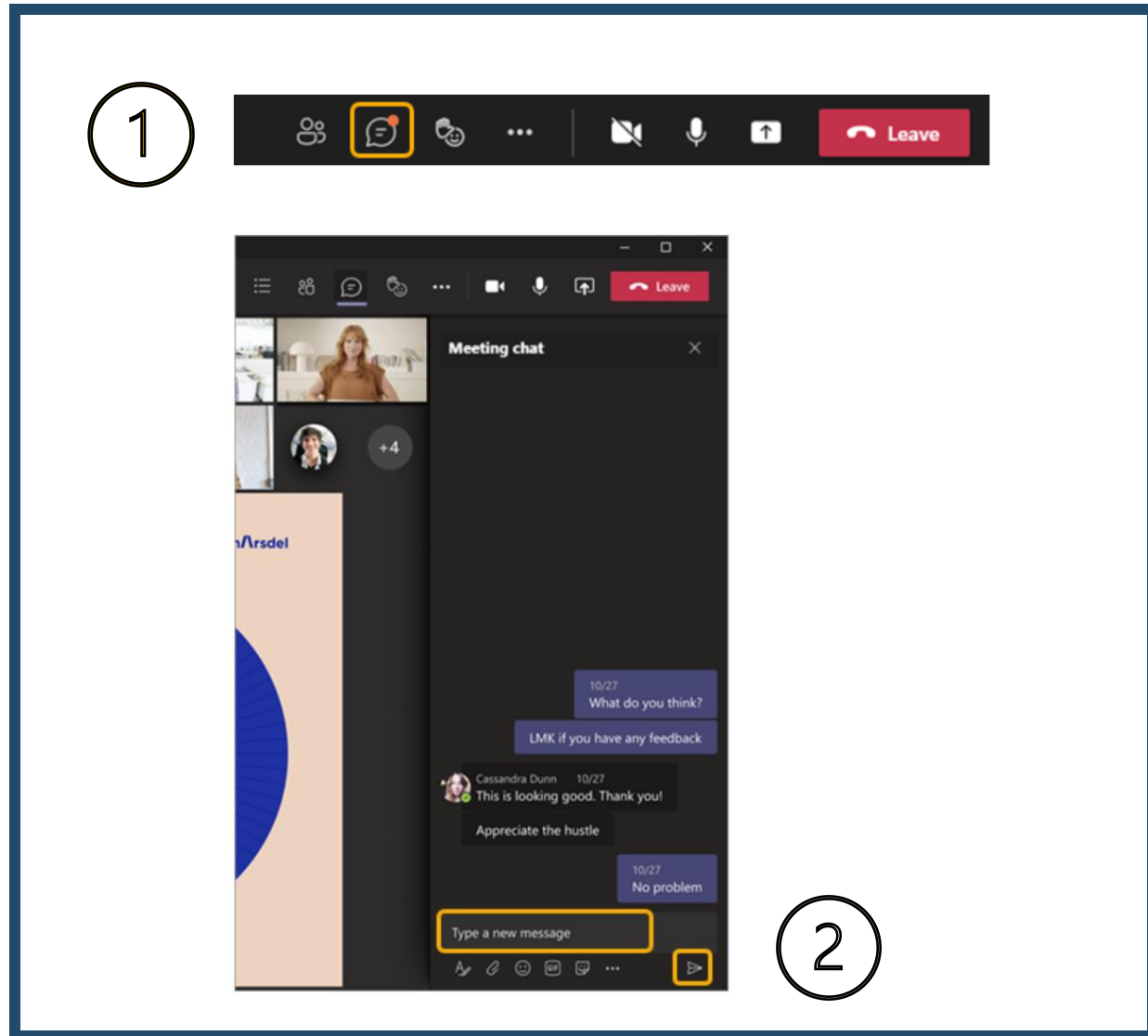
- There will be an opportunity for participants to ask questions and provide feedback during the call

- Please use the "raise hand" function and/or type your questions in the Teams chat box

- The moderator will call on you

- We will address questions within the time allotted as we present

- However, there will be an additional 15-minute Q&A at the end of the session

- To the degree there is further feedback, please reach out to ICF or the presenters by email

- Please note: this webinar is being recorded and will be made available on the Joint Utilities of New York Website

Introduction

5-min

Background

- At the 4/29/2022 webinar, several participants supported a request for visibility into utilities' current telemetry architecture, in order to better understand what telemetry requirements are necessary for Aggregator – Utility communication.

- Today's discussion primarily focuses on the utilities current plan to establish telemetry on Day 1 of the NYISO DER Market Participation Model Rollout.

- There are Subject Matter Experts (SMEs) from each utility on the line to address any specific questions or feedback on utility-specific requirements.

- Utilities are assessing alternative telemetry solutions and welcome stakeholder feedback on these in today's discussion or potential future discussions.

Contact Information

Consolidated Edison

William Taylor

taylorwi@coned.com

National Grid

Primary: Ariel Maiorano

ariel.maiorano@nationalgrid.com

Backup: Richard Fifield

Richard.fifield@nationalgrid.com

Central Hudson

Jay Tompkins

Jtompkins@cenhud.com

Orange and Rockland

Ralph Devitto

devittor@oru.com

David Balban

Balband@oru.com

NYSEG / RG&E

Keith Jones

Robert Cunningham

distributedgenerationadmin@avangrid.com

ICF

Walter Rojowsky

Walter.Rojowsky@icf.com

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Utility Telemetry Solutions

30-Min

Why is Utility-Aggregator telemetry required?

Aggregator telemetry provides critical data for operational situational awareness to both the NYISO and the Utilities

- Both the NYISO and the Utilities use real time (RT) Telemetry in their Energy Management Systems to monitor and control the system in real time and contingency scenarios to maintain safe and reliable operation.

- The NYISO requires that the utilities have direct communication of resource telemetry to provide visibility should one of several scenarios takes place that renders the NYISO incapable of dispatching and securing the NYS Electric System. i.e. Interim Control Center Operation (ICCO)

  - While ICCO has a low probability of being required the impacts of not having this fail-safe protocol are incredibly large. Inability to secure the system leads to enormous system and financial impacts.

- The utilities are the owners of the system assets and are responsible for operating and maintaining their assets in a safe and reliable manner. RT telemetry is required to be provided without latency and with high availability to provide system safety and reliability. Inability to perform this function can lead to financial and system impacts.

What telemetry solutions are the utilities proposing and why?

Existing and Proven Solutions are Being Leveraged to Facilitate the Near-Term Market Launch

- The utilities have proven solutions that currently exist for wholesale generators to communicate telemetry

- Utilities will facilitate day 1 participation in the NYISO's DER market model by leveraging these existing solutions

Three Main Principles inform the Utilities' Current Approach

Reliability

- Necessary to meet operating reliability criteria

Safety and Security

- Maintains utility cybersecurity requirements and maintain situational awareness of the power system
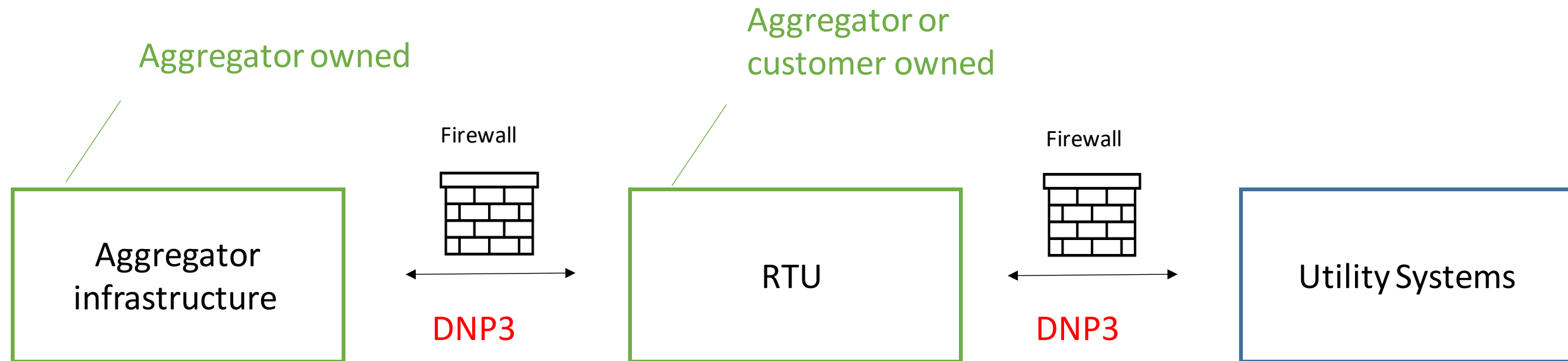
Proven and Accessible

- Ability to be leveraged day 1 in market

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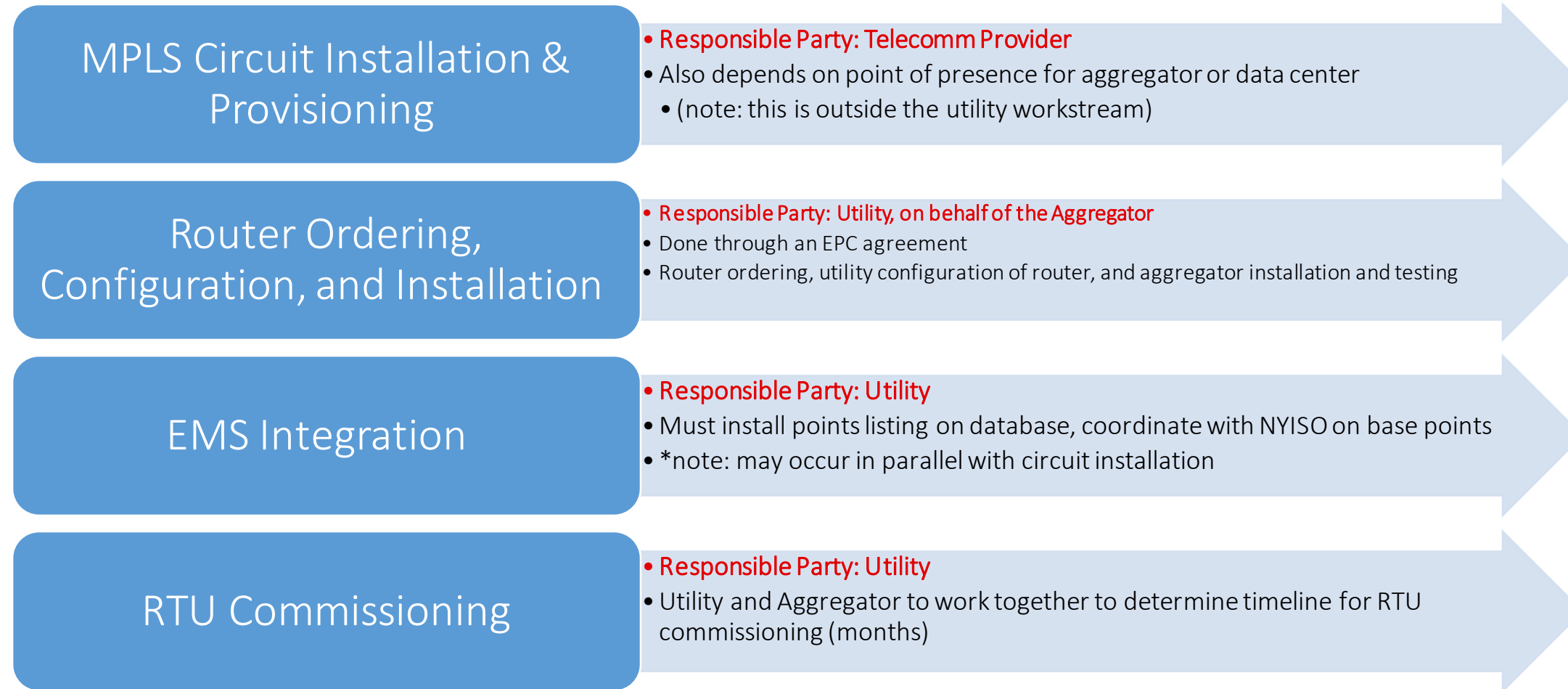
At a high-level, what is the utility telemetry approach?

The aggregator and utility will own different portions of the hardware and software components

Aggregator owned

Aggregator or customer owned

Firewall

Firewall

Aggregator infrastructure		RTU		Utility Systems
	DNP3		DNP3	

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How long will it take to establish telemetry communications?

The timeline to establish connection and integration may take between approx. 4 – 6 months or more for completion. (Some steps may occur in parallel)

MPLS Circuit Installation & Provisioning
- Responsible Party: Telecomm Provider
- Also depends on point of presence for aggregator or data center
  - (note: this is outside the utility workstream)

Router Ordering, Configuration, and Installation
- Responsible Party: Utility, on behalf of the Aggregator
- Done through an EPC agreement
- Router ordering, utility configuration of router, and aggregator installation and testing

EMS Integration
- Responsible Party: Utility
- Must install points listing on database, coordinate with NYISO on base points
- *note: may occur in parallel with circuit installation

RTU Commissioning
- Responsible Party: Utility
- Utility and Aggregator to work together to determine timeline for RTU commissioning (months)

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Please note these timelines are provided for discussion only and may vary due to a number of factors.

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Con Edison and O&R

Con Edison & Orange and Rockland Telemetry Approach for DER Market Participants

**August 2022**
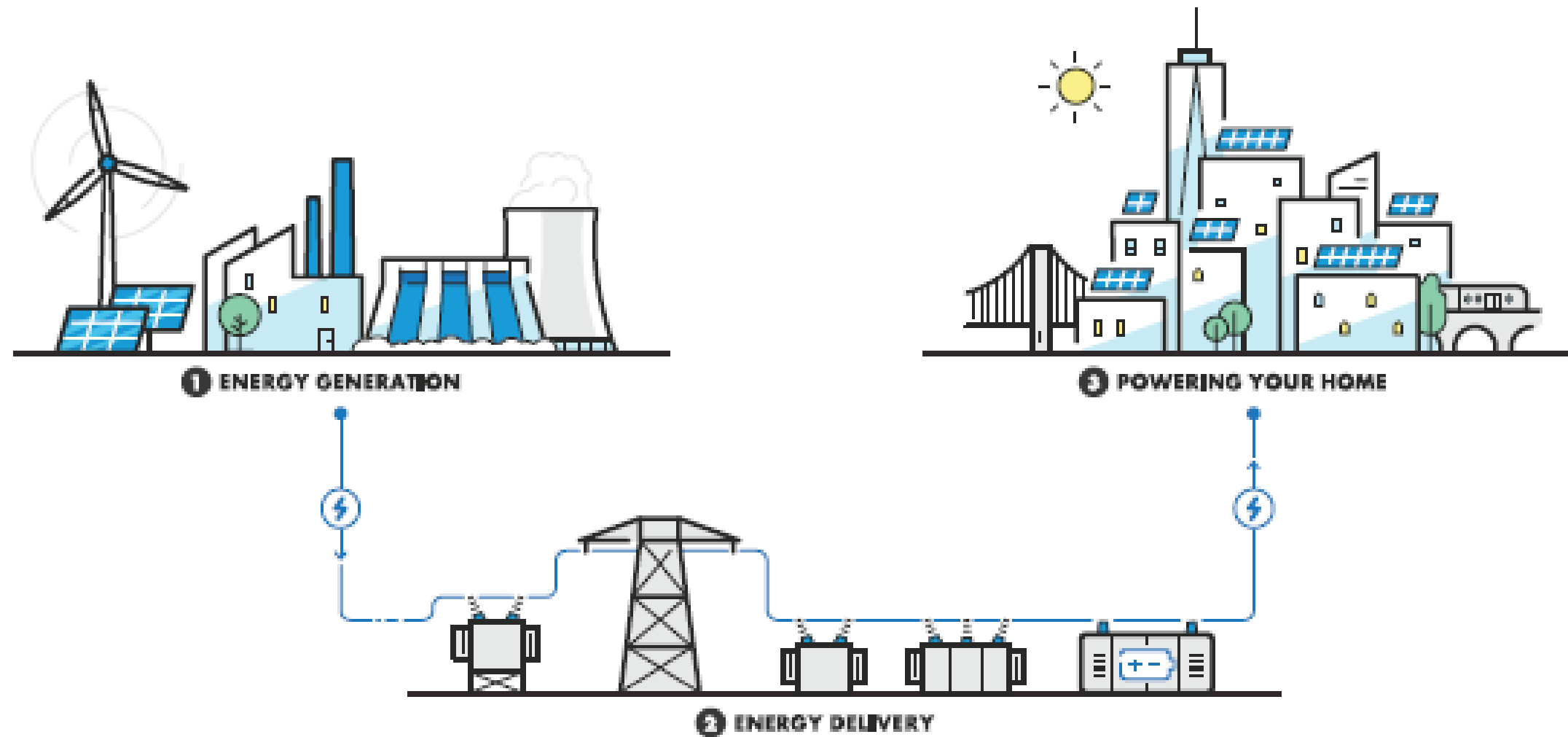
Con Edison and O&R Telemetry Solution

- SCADA based communications for interconnecting generators

- RTU @ Generator Location (Moving to RTU @ Con Ed/O&R premises)

- 2 Leased Cell Connections (Primary and Back up) – Customer Cost

- DNP3 to Distribution SCADA – ICCP to EMS/NYISO MPLS Links

- Aggregated Dispatch Signal, NYISO Points

- ~4-6 Months or more for installation/testing and commissioning
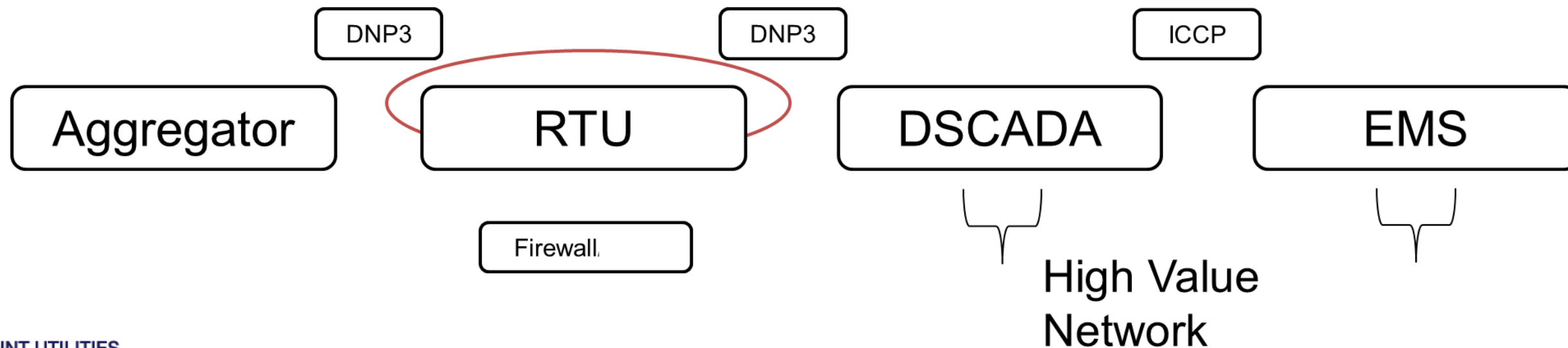
National Grid

National Grid - Telemetry & Comms Solution

- **To satisfy Day 1** market operations requirements for the DER Aggregation Model, National Grid will offer the **same technologies as we offer today** for Aggregators to connect to National Grid's energy management system (EMS) to send/receive basepoints for NYISO participation.

DER Aggregate Connectivity to NG EMS
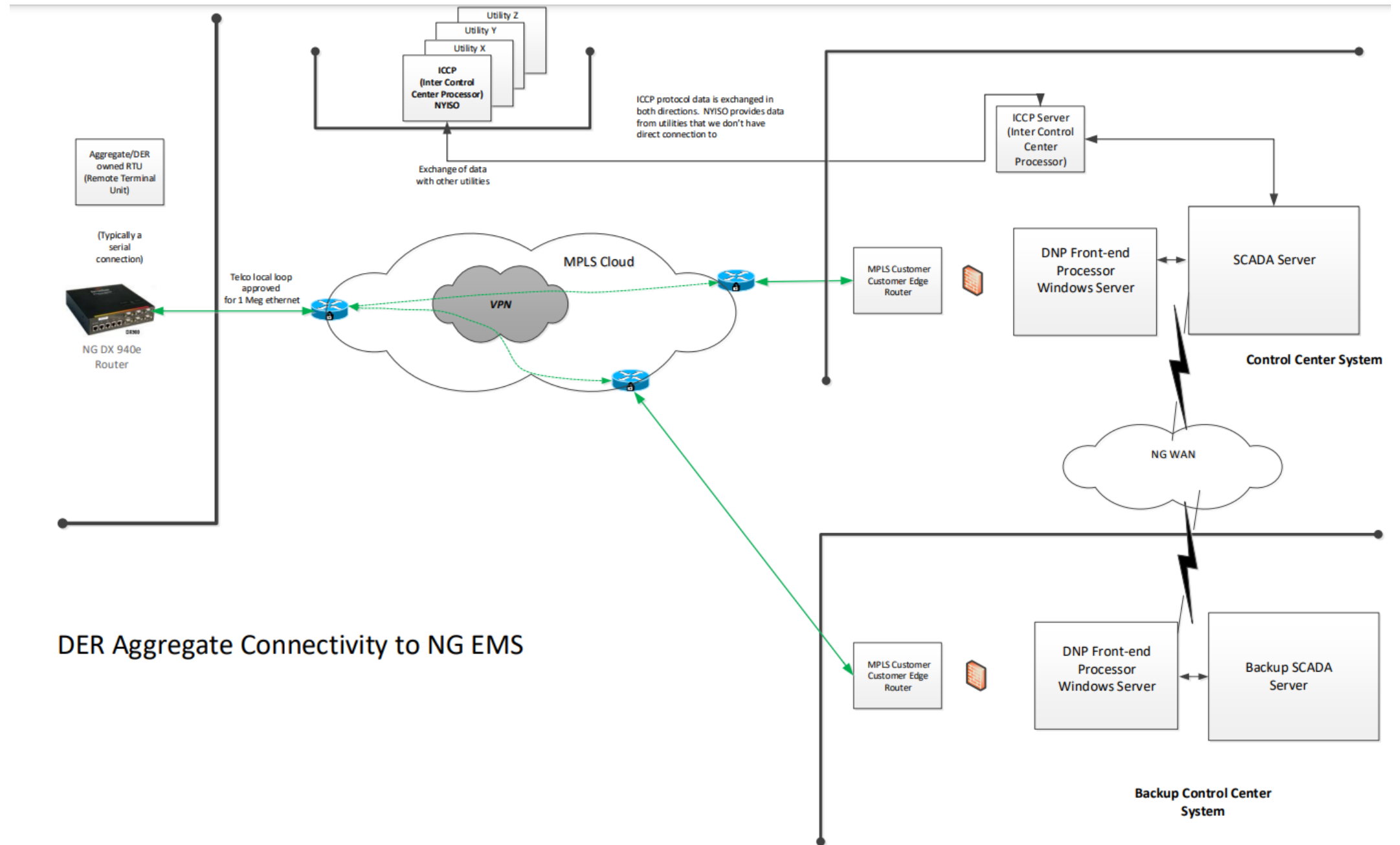
National Grid – Specific Requirements

National Grid will utilize existing technology as those used for other wholesale generators for communication of telemetry to/from wholesale DER aggregations for Day 1 Implementation of the DER Aggregation Model. These include:

- Verizon MPLS Virtual Private IP network using VPN for private connectivity between NG's Energy Management system and the DER aggregations
- 1MB land-based ethernet circuit to the aggregation's point of presence or data center
- DNP 3.0 protocol for National Grid SCADA data monitoring, control, and regulation
- Connectivity to the RTU to NG's solution via Serial Cable
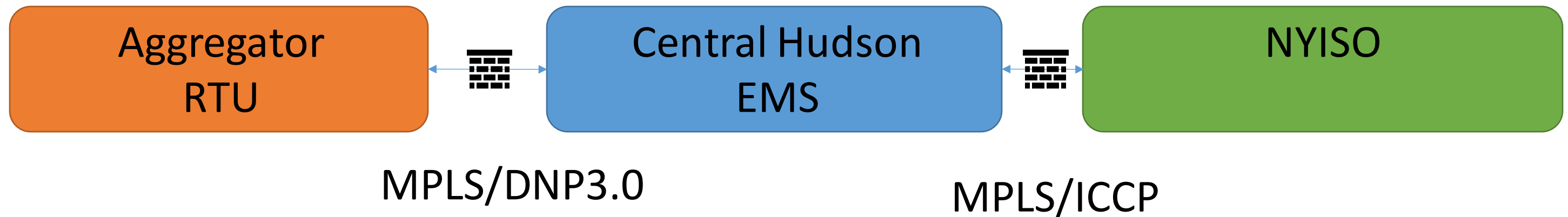- National Grid will continue to use our existing MPLS-based ICCP connection with NYISO

Roles and responsibilities

- Telemetry for wholesale participation will require a separate circuit for each aggregation, not individual DER sites.
- Aggregator shall order a leased line (1) megabyte ethernet circuit from Verizon using National Grid's circuit ordering process.
- National Grid will procure, configure and administer the appropriate security-approved router for interfacing with the aggregator RTU and circuit.
- RTU or data collector shall be owned by the Aggregator and installed at their Aggregator site

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Central Hudson

Central Hudson Telemetry Solution

- MPLS Virtual Private IP network using VPN for connectivity to Central Hudson's Energy Management System

- DNP 3.0 protocol SCADA data monitoring, control, and regulation

- Connection to primary and secondary EMS (but could be one or the other)

- Continue to use our existing MPLS-based ICCP connection with NYISO

- Investigating development of an SD-WAN solution as part of our Grid Modernization program.

Aggregator RTU	⟷	Central Hudson EMS	⟷	NYISO

MPLS/DNP3.0   MPLS/ICCP

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NYSEG and RG&E

NYSEG and RG&E Telemetry Solution

- We offer DGs and IPPs the below options:
  - Private Line POTS
  - T1
  - Carrier MPLS/Ethernet, and/or direct fiber(where appropriate).

Notes:

- MPLS/Ethernet options while cost effective versus T1 setups require more layers of cybersecurity to ensure that both sides are secure.

- Ethernet lit service options must have end to end encryption and firewalls.

- We are developing a solution utilizing Private Cellular Child APN (Managed or Unmanaged) at the DG/IPP sites. The solution is in the design/cybersecurity stages at this time.

Future Telemetry Solutions

10-min

Looking Forward

- The utilities have sought to leverage existing and proven telemetry approaches to quicky facilitate communications with Aggregators participating in the NYISO's DER participation model.

- Reliability, Security, Scalability, and Cost are important considerations.

- Utilities are investigating telemetry alternatives as part of their progression of network communications

  - A case study is presented on the following slide, regarding one utility's assessment of an alternative solution

- The Joint Utilities welcome stakeholder feedback

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Case Study: Con Edison

- Con Ed/Orange and Rockland will move towards Software Defined Wide Area Network Solution

- Will remain DNP3

- SD Wan has been evaluated and procured

- Testing and Implementation Phase to begin late 2022
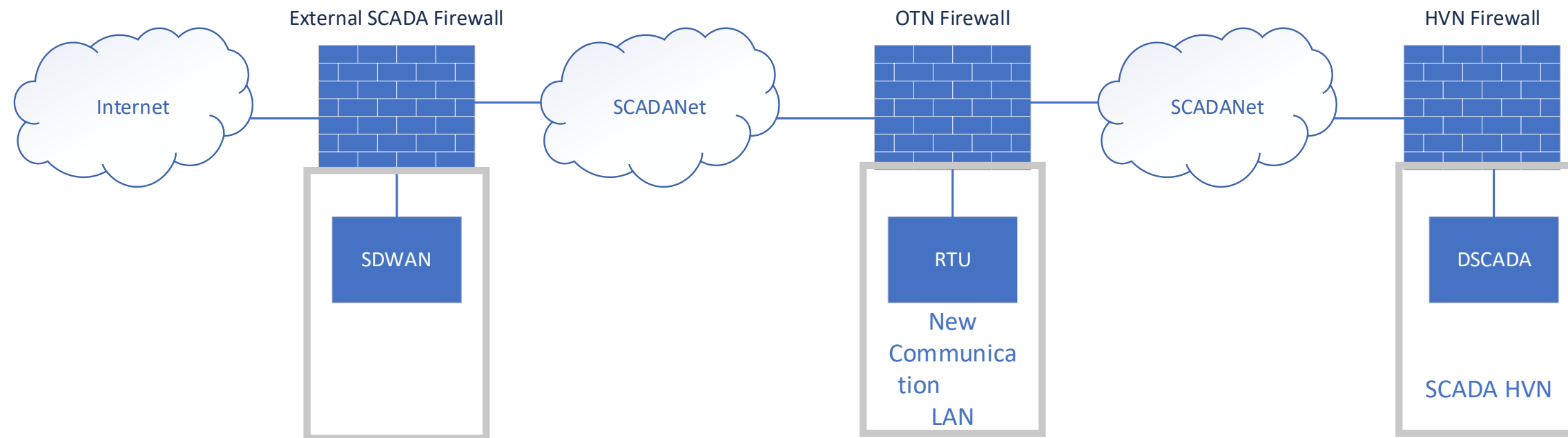
Next Steps

Next Steps

- Each utility intends to make available on their website relevant information pertaining to Aggregator requests, including steps for telemetry requests.

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Open Discussion

Q&A

15-min

Open Discussion and Q&A (15-min)

The Joint Utilities welcomes your feedback and questions.

- Please type your questions in the Teams chat box (navigate using the two-step process as shown in the diagram). We will call on you and ask that you

  - Briefly introduce yourself

  - Repeat or restate your question

- Please note: this webinar is being recorded and will be made available on the Joint Utilities of New York Website.

For questions and comments not addressed today – the JU will seek to follow-up after today's discussion.
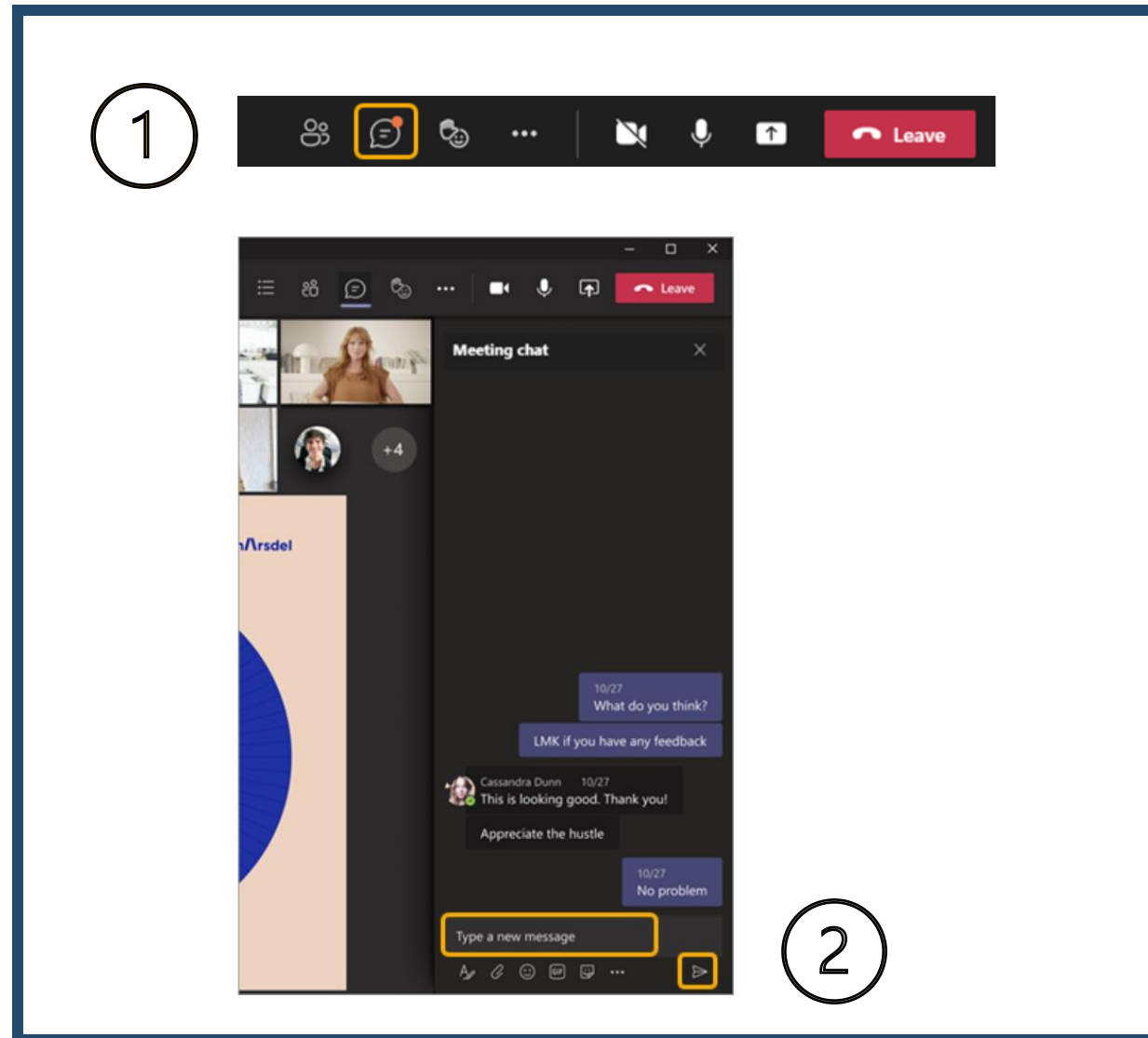
Addendum

Glossary of Terms

Term	Definition
DNP3	A communications protocol used in automation control systems. DNP can be used over serial or ethernet.
DSCADA (Distribution Supervisory Control and Data Acquisition)	The SCADA system specific to the electric distribution system (see SCADA)
EMS (Energy Management Systems)	The group of tools used by grid operators to collect, monitor, control and optimize system performance.
Engineering Procurement Construction (EPC) Agreement	Agreements between a company and contractor to provide engineering and construction services.
HVN (High Volume Nodes)	A communication point built to process a large volume of information.
LAN (Local Area Network)	The group of devices connected on a network in the same geographic area.
Lit Service	A service provided by a Telecom carrier where light and/or packet handling services are offered
MPLS (multiprotocol label switching)	A technique directing data from node to node based on labels (vs. network addresses that use end to end points)

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Glossary of Terms (continued)

Term	Definition
Private Line Plain Old Telephone Service (POTS)	Analog telephone service.
RTU (Remote Terminal Unit)	The units that are used to monitor and control devices; part of the SCADA system
SCADA (Supervisory control and data acquisition)	The group of software and hardware elements that allows grid operators to control, monitor, and engage with system components.
SD-WAN	A software-defined approach to communicate and manage network connectivity.
Private Cellular Child APN (Managed vs. Unmanaged)	A private APN provides an isolated traffic path from other cellular public and private APNs. Managed services are provided by third parties(often telecom carriers) where the third-party company is responsible for management of the router at the telecom carrier customer site. Managed services are primarily offered on "Lit Services" though third parties do offer managed services for Lit services.

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