

# Aggregation of Demand Side Resources

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# Purpose

- ◆ **This presentation is designed to be used as a reference for concepts relating to aggregation of demand side resources**
  - *May also serve as a foundation for aggregation of distributed energy resources*
- ◆ **Topics include:**
  - *Aggregation concepts*
  - *Modeling concepts for aggregations*
  - *Tracking individual resources within an aggregation*
  - *Metering and data requirements*
  - *Aggregator obligations*
- ◆ **Information included is from the NYISO's existing Demand Side Ancillary Services Program (DSASP)**

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# Demand Side Ancillary Service Program (DSASP)

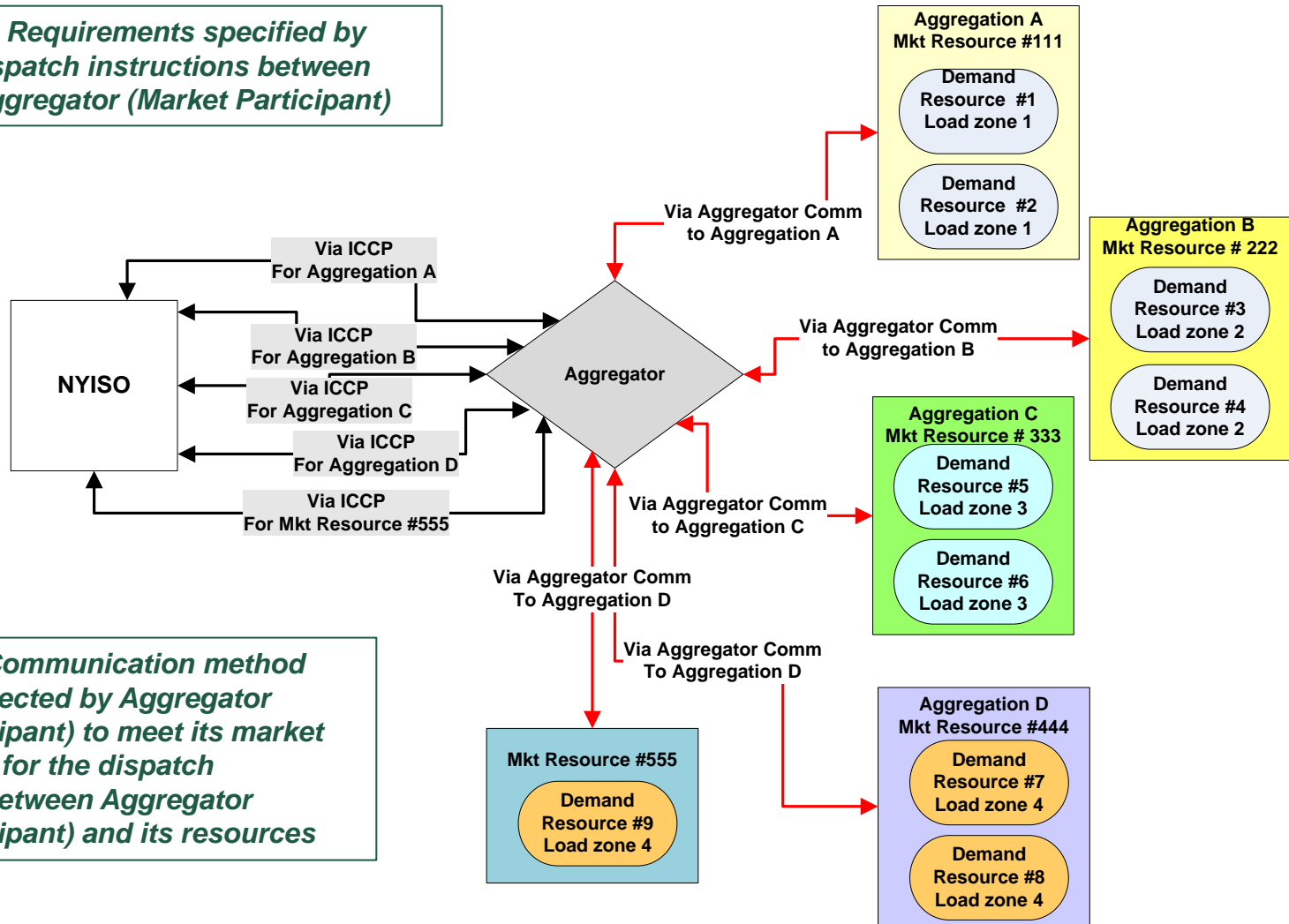
- ◆ Participate in Ancillary Service Market to provide Operating Reserves and/or Regulation Service
  - *Economic evaluation and price-setting capabilities identical to generation*
- ◆ Interruptible loads only for Spinning Reserves or Regulation
  - *Loads with a qualified behind-the-meter Local Generator may provide Non-Synchronous Reserves*
- ◆ Minimum Reduction
  - *1 MW, in aggregate by Load Zone*
- ◆ Minimum Energy Offer
  - *\$75/MWh*
- ◆ Response is mandatory when scheduled and dispatched

# Aggregation Concepts

- ◆ An **individual resource** is a single end-use location that has a unique distribution utility account number (*synonymous with Demand Side Resource*)
  - *Individual resources are assigned a Resource ID by NYISO's Demand Response Information System (DRIS)*
- ◆ A **DSASP Aggregation** is a group of individual resources that make up a DSASP Resource
  - *Each individual resource in a DSASP Aggregation will be assigned the same DSASP Aggregation ID*
  - *Aggregated demand side resources must be in the same load zone and customers of the same Load Serving Entity*
- ◆ A **DSASP Resource** is the representation of the capability of an individual resource or a DSASP Aggregation as an ancillary service supplier in the Market Information System (MIS)
  - *Each DSASP Resource has a generator PTID that is used for transactions in MIS*

# Aggregation Concepts

**Black arrows:** Requirements specified by NYISO for dispatch instructions between NYISO and Aggregator (Market Participant)



**Red arrows:** Communication method developed/selected by Aggregator (Market Participant) to meet its market commitments for the dispatch instructions between Aggregator (Market Participant) and its resources

# Modeling for DSASP Resources

- ◆ **Individual Demand Side Resource**
  - *Modeled at the physical Load Bus at which it connects*
- ◆ **Aggregation of Demand Side Resources**
  - *NYISO has identified a Load Bus in each Load Zone for modeling DSASP Resources*
    - Aggregations will be modeled at the same load bus, regardless of physical location of individual resources within the load zone
  - *Benefits of the specific Load Bus approach for aggregations:*
    - Allows for demand side resources in any part of the load zone to be aggregated
    - Minimal impact to NYISO systems that support bidding, scheduling, and dispatch of DSASP Resources that are aggregations
    - Provides NYISO with experience on participation before developing more complex solutions

# Aggregations for Aggregated DSASP Resources

- ◆ Each DSASP Provider may have up to two aggregations modeled as DSASP Resources per Load Zone, based on the ancillary product(s) provided
  - *Synchronous Reserves and/or Regulation*
    - For an aggregation of demand side resources that use load reduction to qualify to provide reserves and/or regulation service
  - *Non-Synchronous Reserves Only*
    - For an aggregation of demand side resources with behind-the-meter generation to qualify to provide non-synchronous reserves
- ◆ A DSASP Provider may not have two DSASP aggregations of the same type in a zone
  - *For example: two aggregations in the same zone for Operating Reserves and Regulation are not permitted*



# Enrollment in Demand Response Information System

- ◆ **DSASP Provider is required to identify all individual resources within the aggregation that will be registered as part of a DSASP Resource**
  - *As with other NYISO demand response programs, each resource located at a single end-use location that has a unique distribution utility account number must be enrolled as an individual resource*
- ◆ **DRIS will assign a DSASP Aggregation ID to each resource upon import**
- ◆ **DRIS will perform existing resource validations, such as checking for duplicate enrollments, and will check the eligibility of the resources in the DSASP aggregation**
  - *Conflicts with other demand response enrollments or resource type will be identified*
- ◆ **DRIS will produce a report that becomes part of the DSASP Resource Registration packet**

# Changes to a DSASP Aggregation - 1

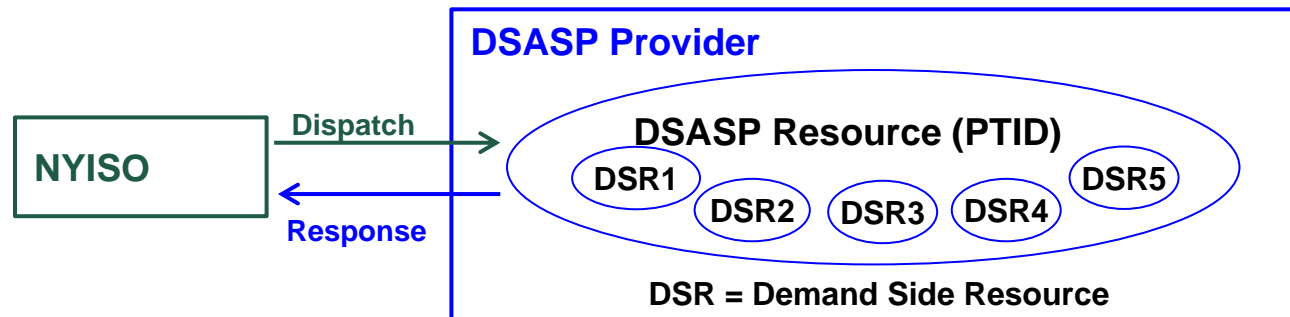
- ◆ **Any change in individual resources in a DSASP Aggregation must be reported through an import to DRIS before the resources are eligible to participate in the Ancillary Services Market, even when the net change to the DSASP Aggregation is zero**
  - *After screening the change in resources for eligibility, DRIS will produce a report showing the updated list of resources in the aggregation and the revised capability of the DSASP Resource as well as the net change in capability due to the change in individual resources in the DSASP Aggregation*
- ◆ **Any change in capability of the DSASP Resource requires the DSASP Provider to send an updated DSASP Resource Registration Packet to report the change**
  - *See DSASP Resource Capability Section of the DSASP Registration Packet*
  - *The DSASP Provider may not offer the increased capability until changes have been made to MIS*

# Changes to a DSASP Aggregation - 2

- ◆ **If a change in individual resources results in the capability of the DSASP Resource falling below 1 MW, the DSASP Resource will not be eligible to offer until it is able to increase its capability to a minimum of 1 MW**
  - *The DSASP Provider will be notified by its Customer Relations representative if it is no longer eligible to offer the DSASP Resource*
  
- ◆ **Changes to a DSASP Aggregation may be submitted at any time**
  - *Updates to the DSASP Resource in MIS will be made by Customer Relations after all market requirements associated with the change in capability have been met*

# DSASP Aggregation Telemetry

- ◆ Telemetry required via direct communication with NYISO or communication via Transmission Owner (TO)\*
- ◆ To meet performance calculation timing, it is recommended that all meters within the aggregation be scanned and totalized within 10-20 seconds
  - 1) Obtain the Instantaneous Load of the individual Demand Side Resources with time stamps
  - 2) Totalize the Instantaneous Load for the Aggregation using the most recent data from all the individuals with the same time stamp
  - 3) Provide the NYISO with the updated Instantaneous metered load
- ◆ More specific information is available in the Direct Communication Procedure (Contact Customer Relations to obtain CEII/NDA form required to receive this procedure)



*\*Implementing communication via the TO for resources in an aggregation will require the DSASP Provider to work with the applicable TO to review feasibility and understand TO requirements for a DSASP aggregation*

# Metering and Measurement

- ◆ **Totalization of real-time metered load for a DSASP Resource must include all individual Demand Side Resources enrolled as part of that DSASP Resource (PTID), regardless of how the DSASP Provider instructs individual Demand Side Resources to meet the dispatch instruction**
  - *All individual resources were counted to make up the capability of the DSASP Resource and therefore real-time metered load of all individual resources in the DSASP Aggregation must be included in each reporting interval*
- ◆ **The DSASP Resource's performance is based on the combined (totalized) instantaneous metered load of all individual resources in the DSASP Aggregation**
- ◆ **Totalization methodology and meter data management is required by NYISO in the Infrastructure and Technology Plan of the DSASP Provider Registration Packet**

# After-the-Fact Data for DSASP

- ◆ **NYISO requires the Meter Authority or Meter Data Service Provider to submit after-the-fact meter data for each resource enrolled in the DSASP**
  - *Allows NYISO to validate instantaneous bus load via meter authority submission of bus load MW-hour data*
  - *This data also allows NYISO to analyze data provided in real-time with after-the-fact data for consistency and detection of meter issues*

# Requirement for Meter Data of Individual Resources in a DSASP Aggregation

- ◆ **NYISO requires the DSASP Provider to retain all real-time interval meter data from every individual resource that is part of a DSASP Aggregation**
  - *Data retention is a requirement of the DSASP Provider's Infrastructure and Technology Plan*
- ◆ **NYISO may request the instantaneous interval meter data for any or all Demand Side Resources in a DSASP Aggregation at any time**
  - *Such data may be evaluated for consistency with data collected via telemetry of a DSASP Resource*

# DSASP Provider Operational Responsibilities

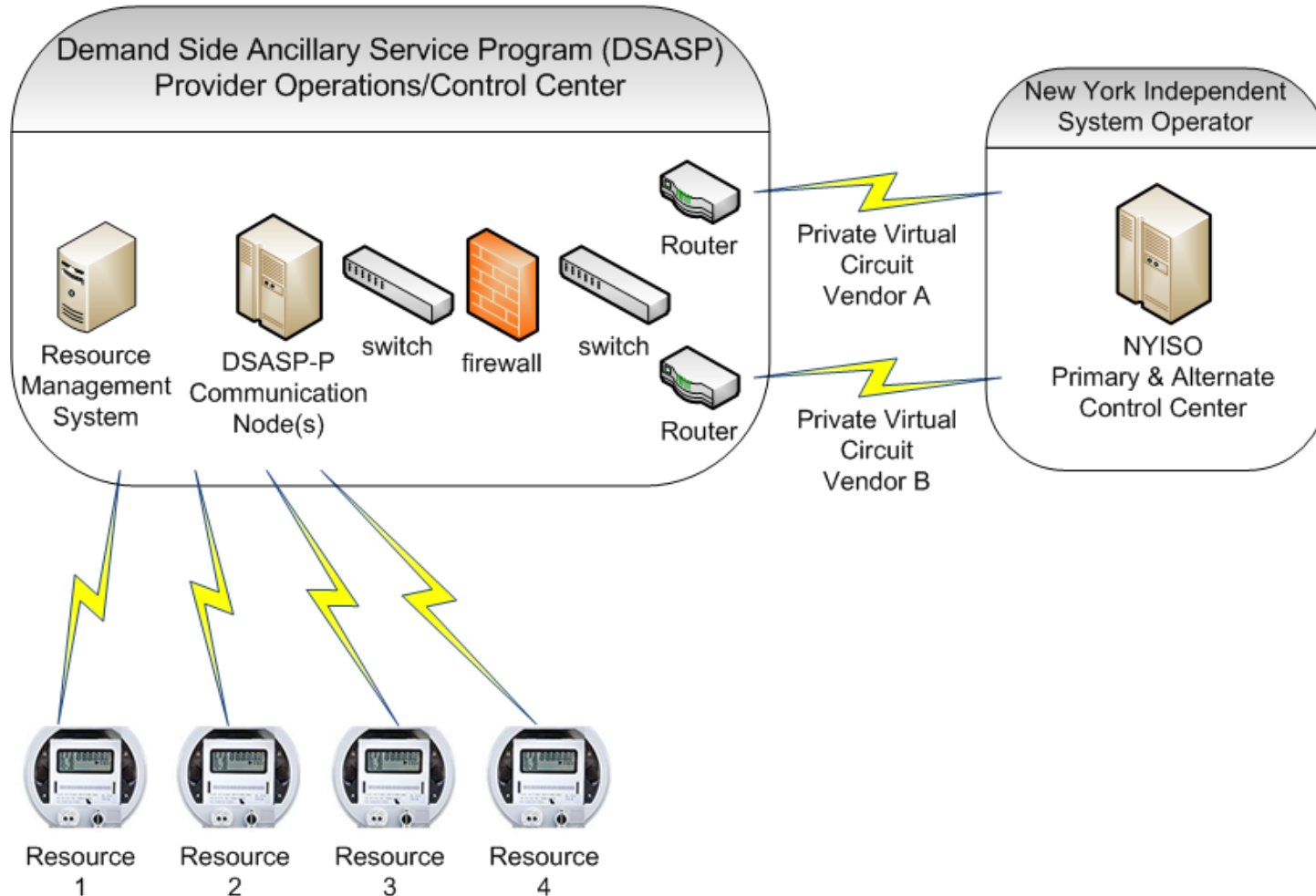
- ◆ Communicates directly with the NYISO
- ◆ Takes on the responsibility for accepting NYISO Dispatch and providing telemetry back to the NYISO
  - *Sends dispatch signals to DSASP Resources under its control*
  - *Obtains telemetry from DSASP Resources under its control*
- ◆ Schedules ICCP communication outages based on the Direct Communications Procedure
- ◆ Schedules computer control system outages based on [NYISO Control Center Requirements Manual](#)
- ◆ Schedules DSASP Resource outages like a Generator based on the [NYISO Outage Scheduling Manual](#)



# DSASP Provider Infrastructure Responsibilities

- ◆ The infrastructure between NYISO and itself, and the DSASP Provider and its resources
  - *Computer systems used for:*
    - Communicating with the NYISO
    - Managing its resources
    - Communicating and dispatching its resources
  - *Resource metering infrastructure*
    - PSC-approved instantaneous meters will be used
  - *Voice communications with NYISO to address communication outage or issues of operational performance*

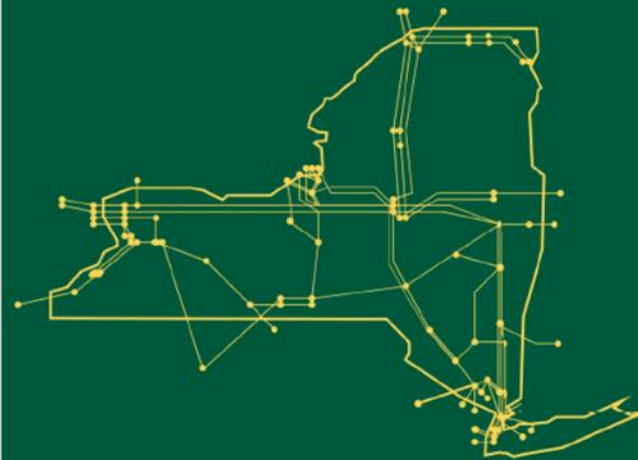
## Example of a Direct Communications setup for DSASP



# Ancillary Services Manual

- ◆ [Ancillary Services Manual](#) is available on the NYISO website ([www.nyiso.com](http://www.nyiso.com))
- ◆ **Section 6.2.3 “Other Supplier Requirements”**  
**-- under Operating Reserve Service**
- ◆ **Section 6.2.4 “Registration and Technical Specifications for DSASP Providers Electing NYISO Direct Communications”** -- also under **Operating Reserve Service**

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