Probabilistic Locality Exchange Factor Analysis

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DRAFT – Do Not Distribute

Overview

Review Methodology and System Topologies

Sensitivity Results

Schedule and Next Steps

Review Methodology and System Topology

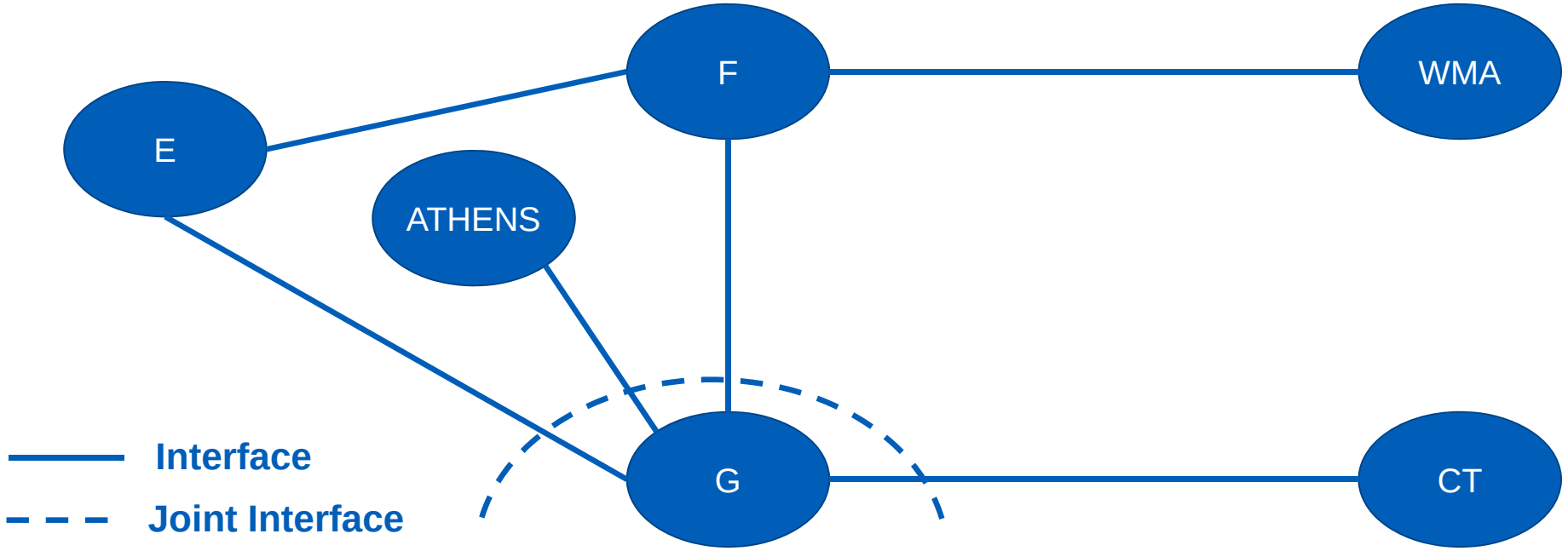
Methodology

1) Update System Topology and Set System at IRM / all LCRs
2) Model the Capacity Sale
3) Add to zones of excess west of Total East (A, C, D) until the IRM is satisfied
4) Iteratively shift from zones of excess west of Total East to GHI until the LOLE from Step 1 is met
5) Calculate a Probabilistic Locality Exchange Factor:

$$Probablistic\ LE\ Factor = 1 - \frac{GHIJ\ Replacement\ Capacity}{Total\ Contract\ Size}$$

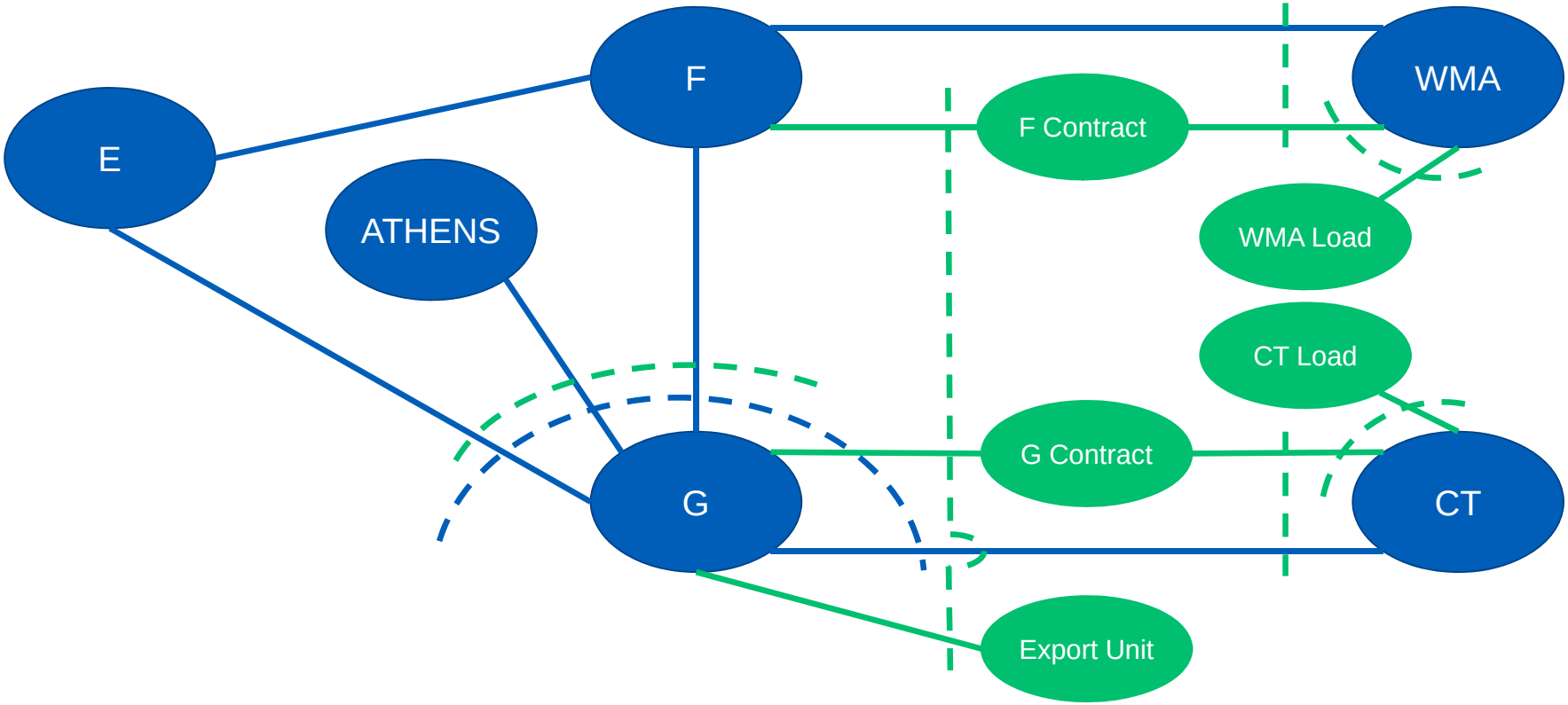
F&G to ISONE Topology

Current IRM / LCR Topology



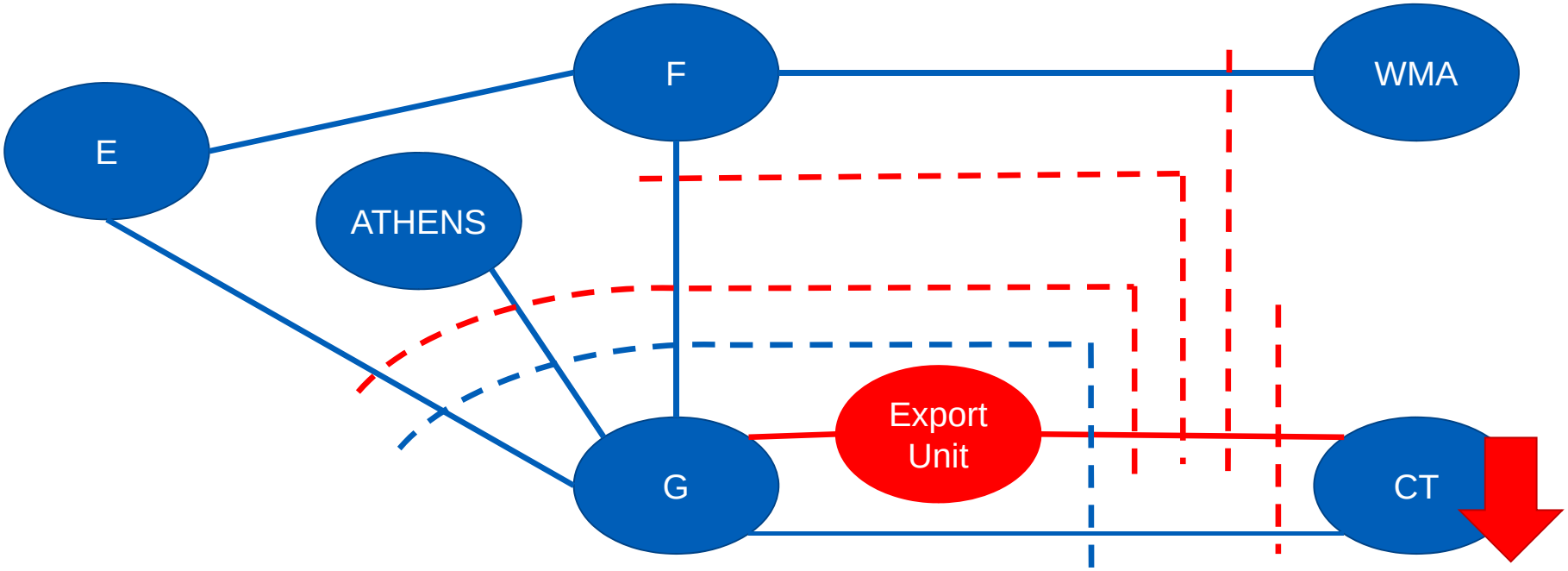
F&G to ISONE Topology

Contract Topology



F&G to ISONE Topology

Reserve Sharing Topology



Sensitivity Results

Sensitivities Currently Under Consideration

The following sensitivities are currently being considered off of each topology

- Baseline Sale – 47.8% UPNY-SENY Backflow
- 0% UPNY-SENY Backflow (100% flow from G to CT)
  - *Intuitively this case should result in 0% fungibility in ROS*
- 100% UPNY-SENY Backflow (100% flow from G to F to WMA)
  - *Intuitively this case should result in 100% fungibility in ROS*

Sensitivity Results

Fungibility Results

Case	Fungibility
Contract Topology	
Baseline Sale	52.6%
0% UPNY-SENY Backflow	39.3%
100% UPNY-SENY Backflow	63.6%
Reserve Sharing Topology	
Baseline Sale	47.2%
0% UPNY-SENY Backflow	38.1%
100% UPNY-SENY Backflow	51.8%

Discussion

- Using Both topologies the fungibility in Rest of State is approximately 50%
- The extreme edge case sensitivities both result in answers other than the intuitive result
- These edge cases will be investigated further using the Reserve Sharing Topology

Schedule and Next Steps

Further Analysis for 0% UPNY-SENY Backflow

Identify loss of load events in the Base Case where the total capacity available to NYISO is increased after the sale with replacement by quantifying:

- How often the export unit is serving NYISO
- Base Case events where the export unit is not available

If UPNY-SENY is not binding, these conditions could solve Base Case loss of load events, offsetting the need to improve events which were introduced by the sale.

Further Analysis for 100% UPNY SENY Backflow

- Investigate the impact of ICAP / UCAP translations on fungibility

If the export unit has an EFORd less than the average EFORd in A, C, and D, less UCAP will be added back to the system than was removed

- Investigate the impact of congestion between A, C, D and UPNY-SENY

If shifting capacity into Rest of State causes congestion within Rest of State some of the capacity added may have diminished value

Further Analysis

- Baseline Sale Case

To the extent that issues identified in the analysis of either the 0% Backflow or 100% Backflow sensitivities are applicable to the Baseline Sale Case, their impact will be evaluated.

- ISONE Starting Point

In the Base Case, ISONE's as-found Loss of Load Expectation was greater than 0.1 days / year, load was added with the sale to keep ISONE at or near the same level of reliability. The impact of ISONE's reliability on the results of the fungibility analysis will be explored in more detail.

Schedule

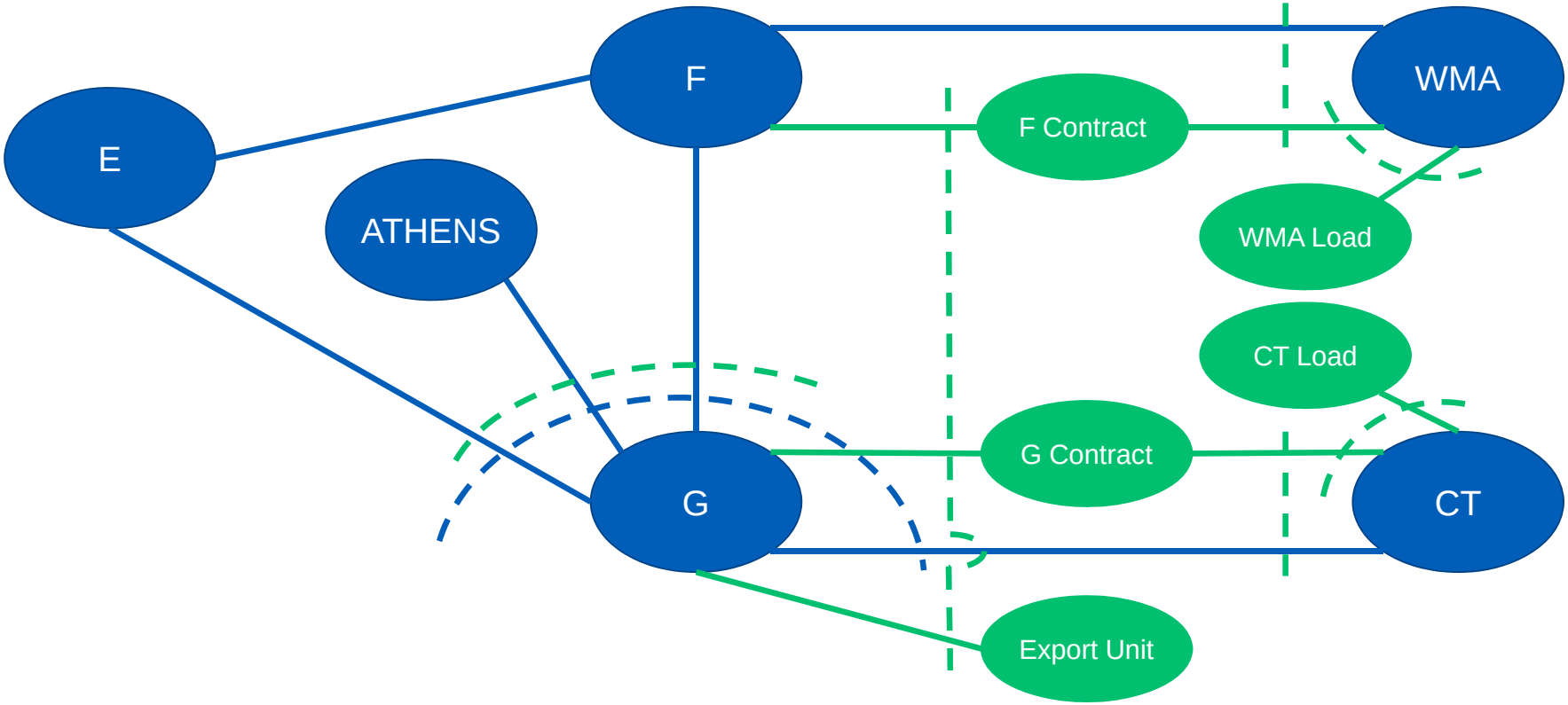
Description	Forum	Date
~~Present Initial Methodology to Stakeholders~~	~~ICAPWG~~	~~01/27/2017~~
~~Proposed Methodology and Export Topologies~~	~~ICAPWG~~	~~03/22/2017~~
Presentation of Preliminary Results to Stakeholders	ICAPWG	04/19/2017
Presentation of Final Results to Stakeholders	ICAPWG	TBD

Additional feedback may be sent to jboles@nyiso.com and deckels@nyiso.com

Detailed Descriptions of the System Topologies

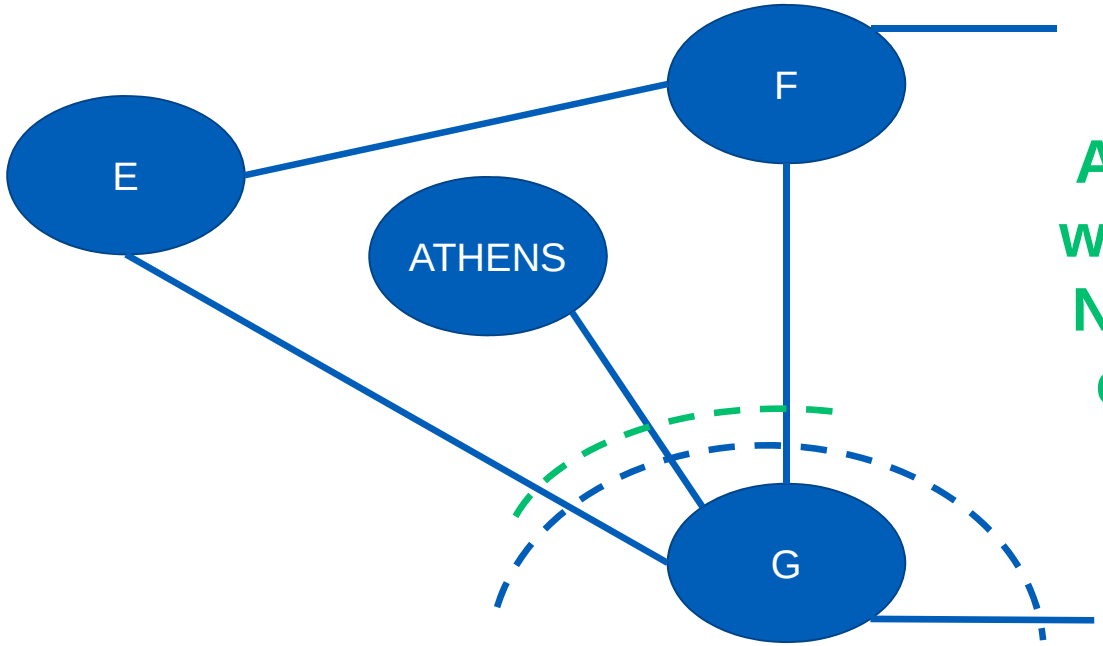
F&G to ISONE Topology

Contract Topology



F&G to ISONE Topology

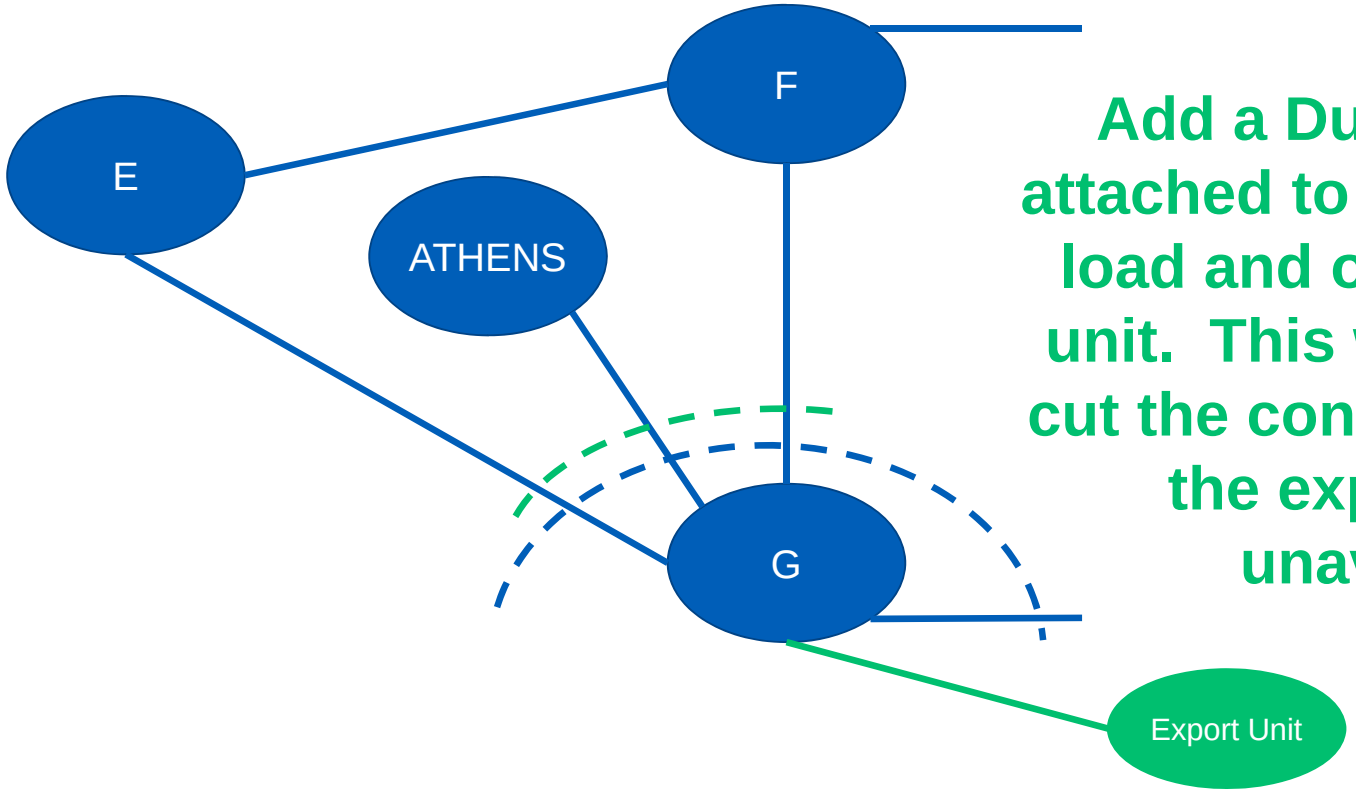
Contract Topology – New York Only UPNY-SENY Interface



Add an open interface which crosses only the NY components of the existing UPNY-SENY interface.

F&G to ISONE Topology

Contract Topology – Export Unit Bubble



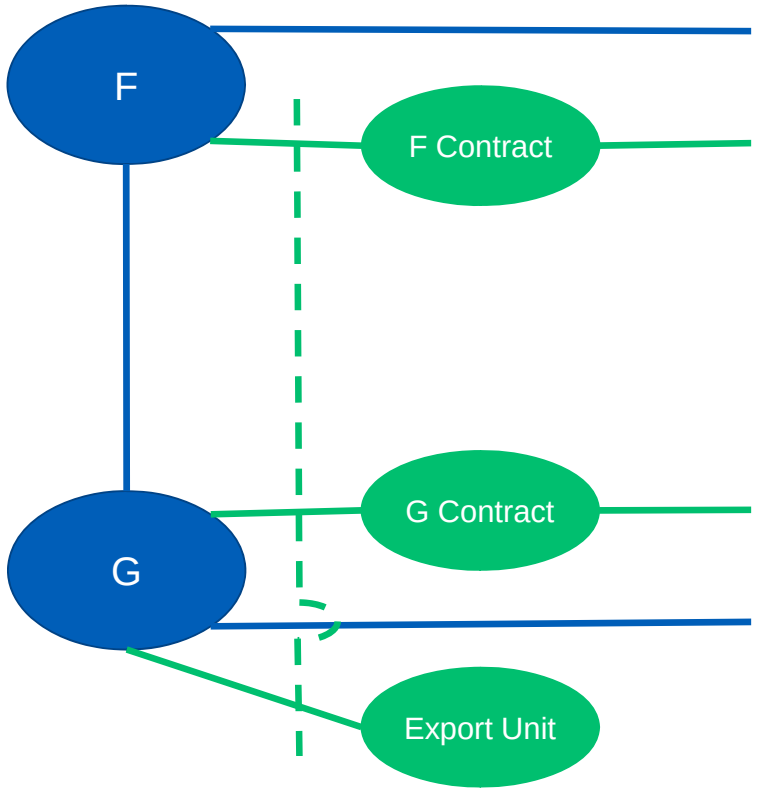
Add a Dummy Bubble attached to Zone G with no load and only the export unit. This will allow us to cut the contract flow when the export unit is unavailable.

F&G to ISONE Topology

Contract Topology – Contract Balance

Balance the flow out of the export unit bubble and across the F and G contract paths.

For example, if the export unit is unavailable, the contract path flows will be held to zero because flow from the dummy bubble to Zone G is zero.

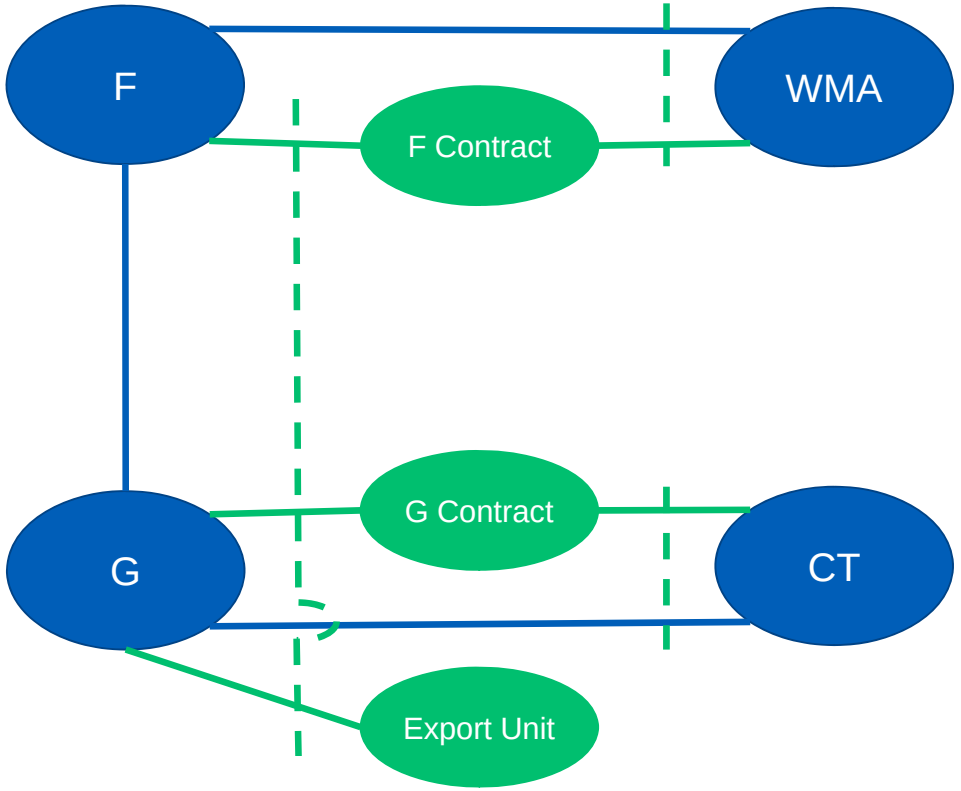


F&G to ISONE Topology

Contract Topology – NY to ISONE Limits

F and F Contract joint flow to WMA is held to the same limit as F to WMA in the base topology

G and G Contract joint flow to CT is held to the same limit as G to CT in the base topology



F&G to ISONE Topology

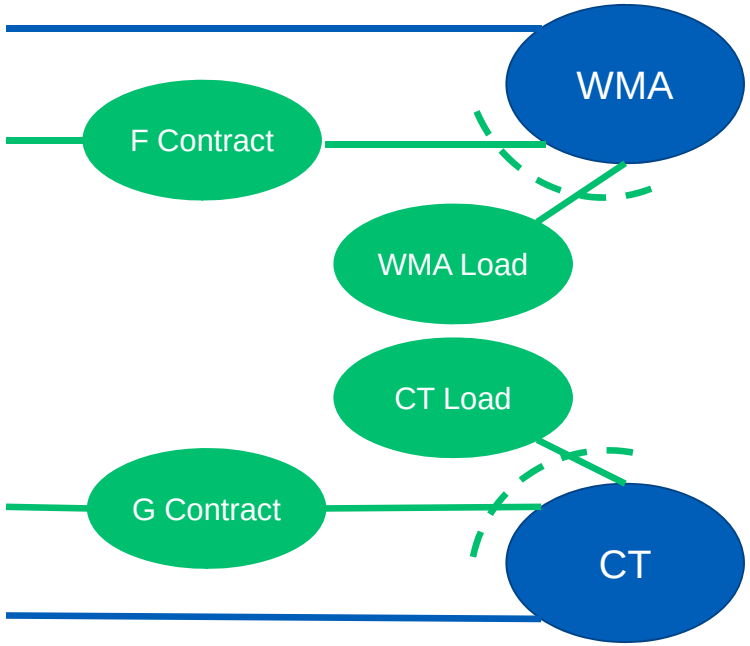
Contract Topology – Load Balance

Add WMA and CT Load Bubbles

Load = Contract Size X Capacity Split %

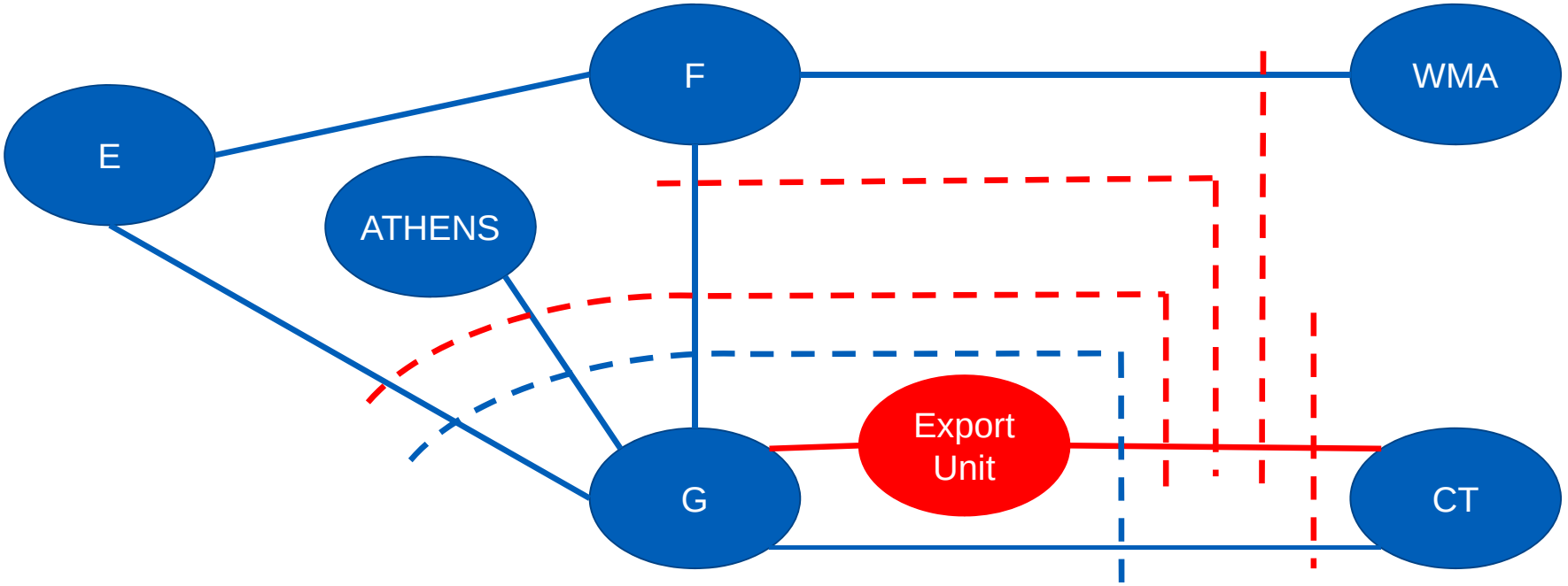
If the export unit is unavailable, the contract will not flow. The joint interfaces added will not allow flow from CT and WMA to the load bubbles if the contract is not flowing.

This will only add load to ISONE if the contract is delivered



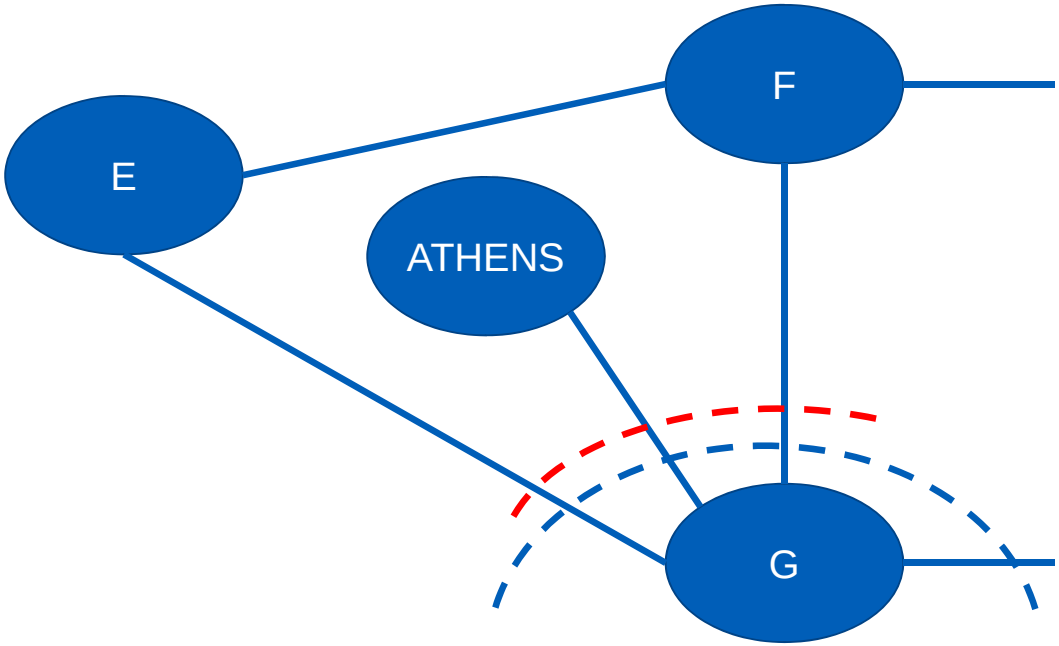
F&G to ISONE Topology

Reserve Sharing Topology



F&G to ISONE Topology

Reserve Sharing Topology – NY Only UPNY-SENY Interface

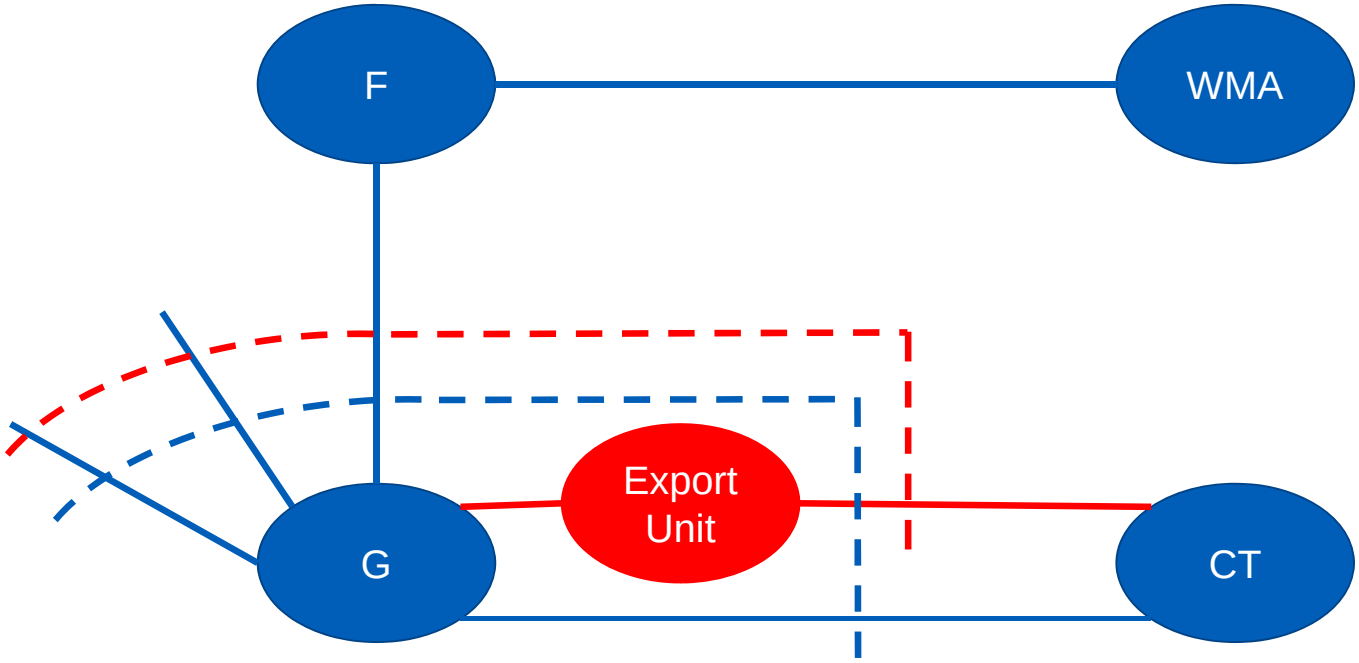


Add an open interface which crosses only the NY components of the existing UPNY-SENY interface.

F&G to ISONE Topology

Reserve Sharing Topology – Export Unit Pool

Add a new pool containing only the export unit. Assign the reserve sharing priority out of this pool to ISONE first and NYISO second.

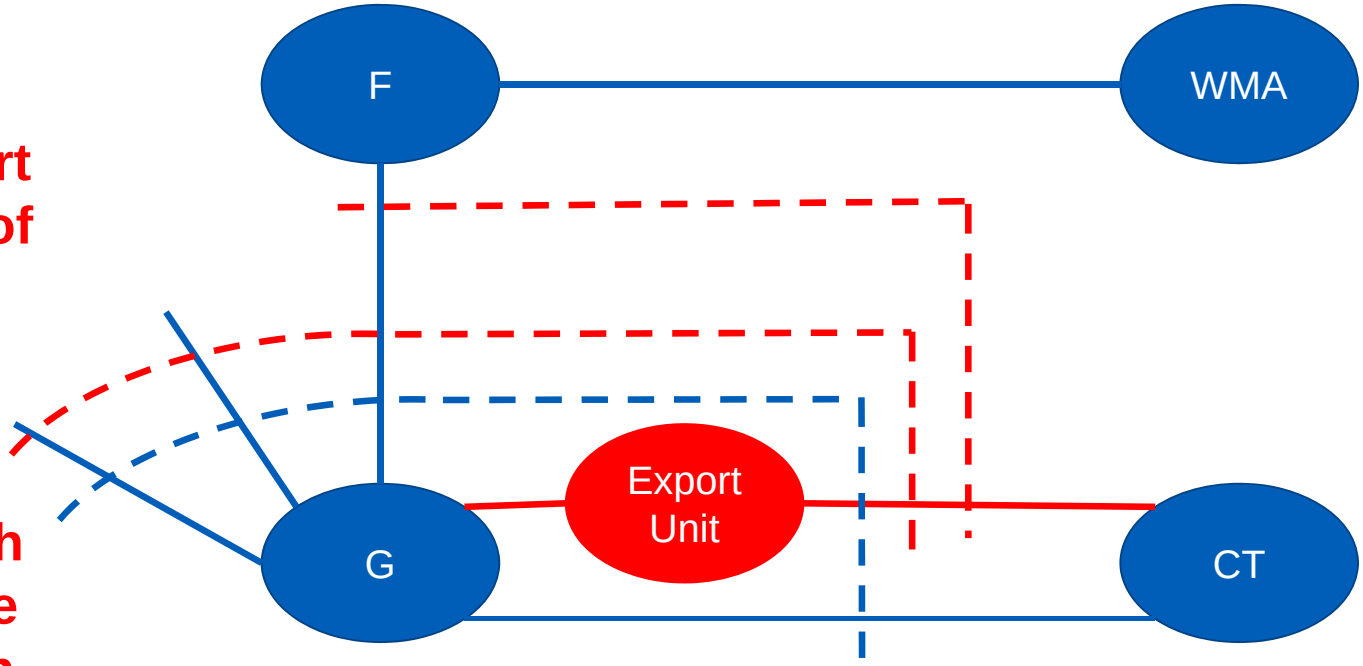


F&G to ISONE Topology

Reserve Sharing Topology – Unload Capital - Hudson Valley

Subtract the appropriate percentage of export unit to CT flow out of UPNY-SENY and Capital to Hudson Valley.

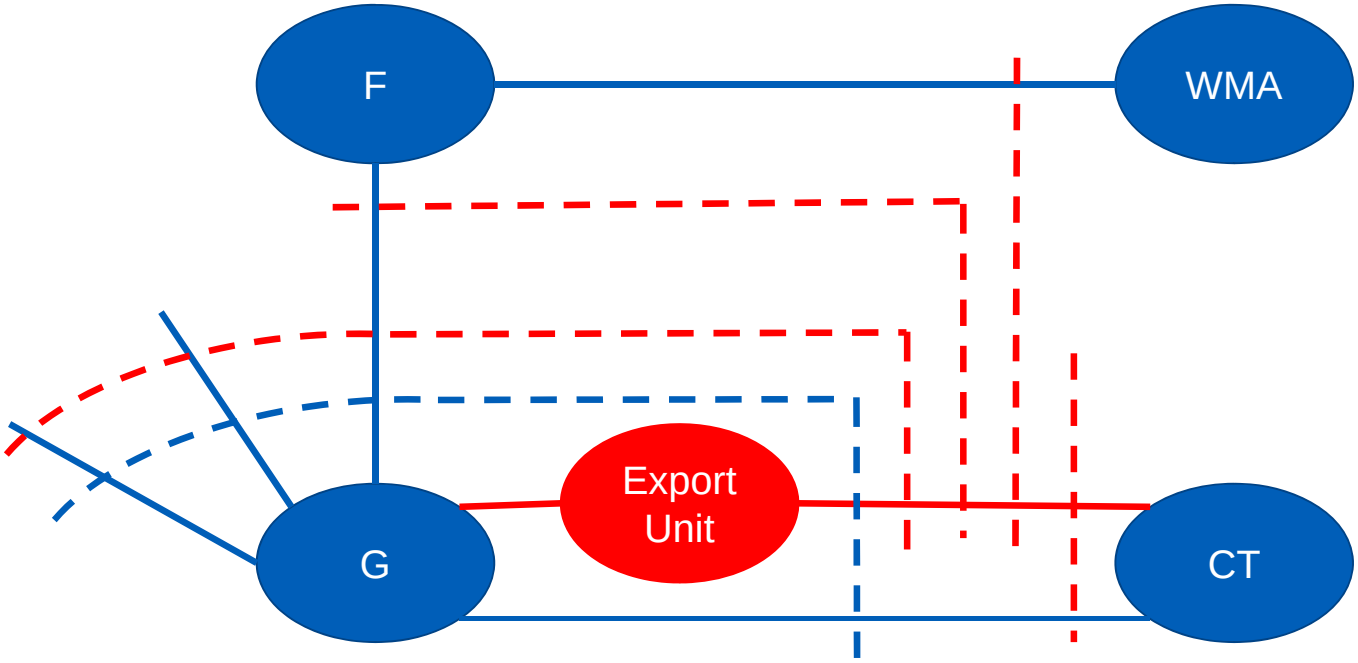
Using this approach these interfaces are only adjusted when the export unit is supplying power to ISONE.



F&G to ISONE Topology

Reserve Sharing Topology – NY to ISONE Limits

Add the appropriate percentages of export unit to CT flow to the F to WMA and G to CT interfaces.



F&G to ISONE Topology

Reserve Sharing Topology – ISONE Load

Add load to Connecticut which is the same size as the export unit.