Synchrophasor Data Quality (SDQ) Activity

NISTIR 7628 Visualization

Daniel Long, Brianna Drennan, and Karl Reinhard

GOALS

- Develop a visualization application to aid understanding of the complex security guidelines and relationships conceptualized in the **National Institute of Standards and Technology Interagency Report (NISTIR) 7628**, Guidelines for Smart Grid Cyber Security.
- Enable the aggregation and organization of cyber security guidance in flexible, user-specified ways to enable rapid synthesis of strategic ideas.
- Examine approaches for mapping guidelines to actual network maps.
- Provide an application to easily and effectively convey cyber security concepts and guidelines to widely varied audiences.
- Automate the ingestion of "guideline" and "relationship" information.

FUNDAMENTAL QUESTIONS/CHALLENGES

- NISTIR 7628 is a 3-volume, 600+ page technical document. Very challenging to digest and understand.
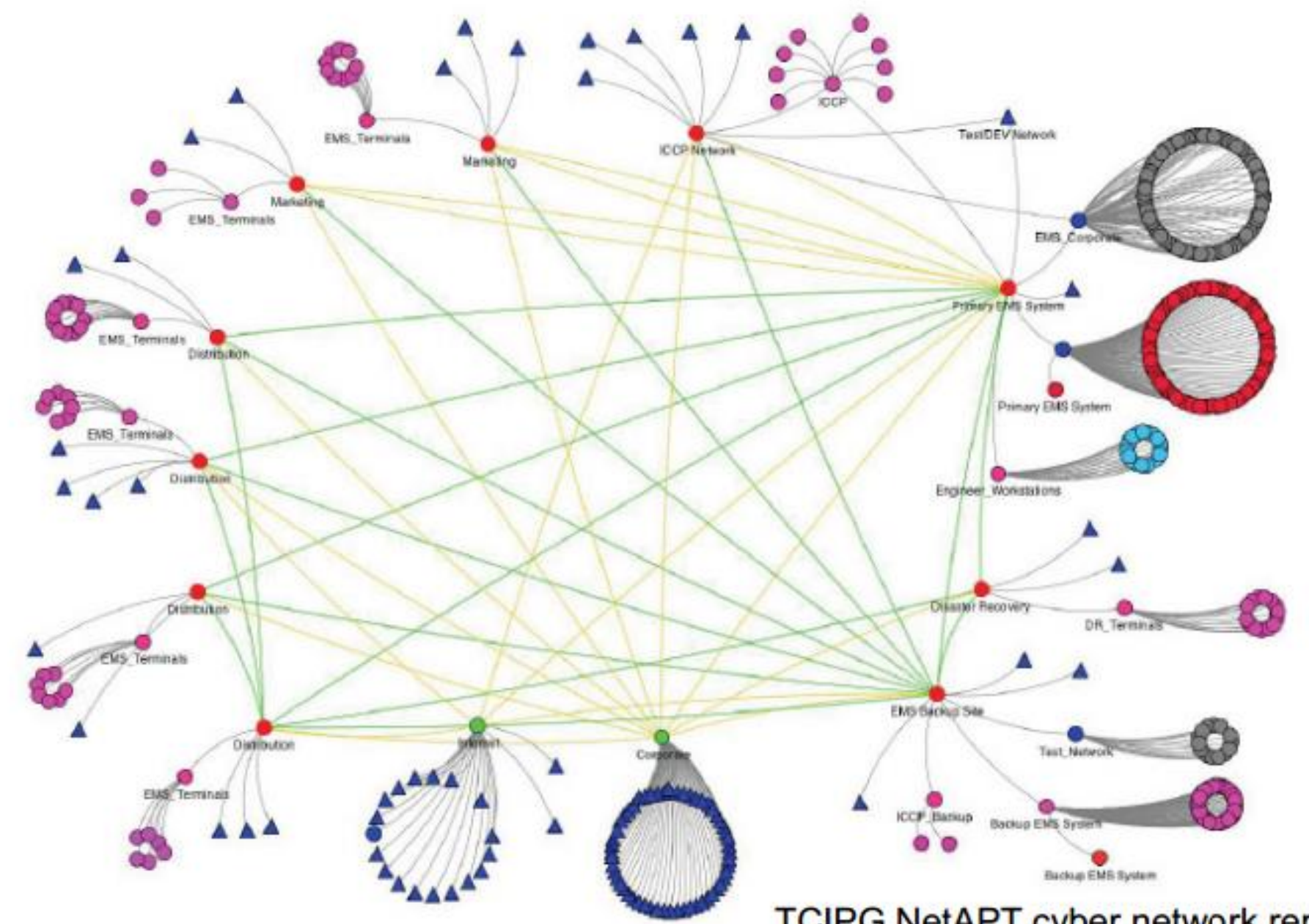- Organizes the power system into 7 domains having 49 actors...
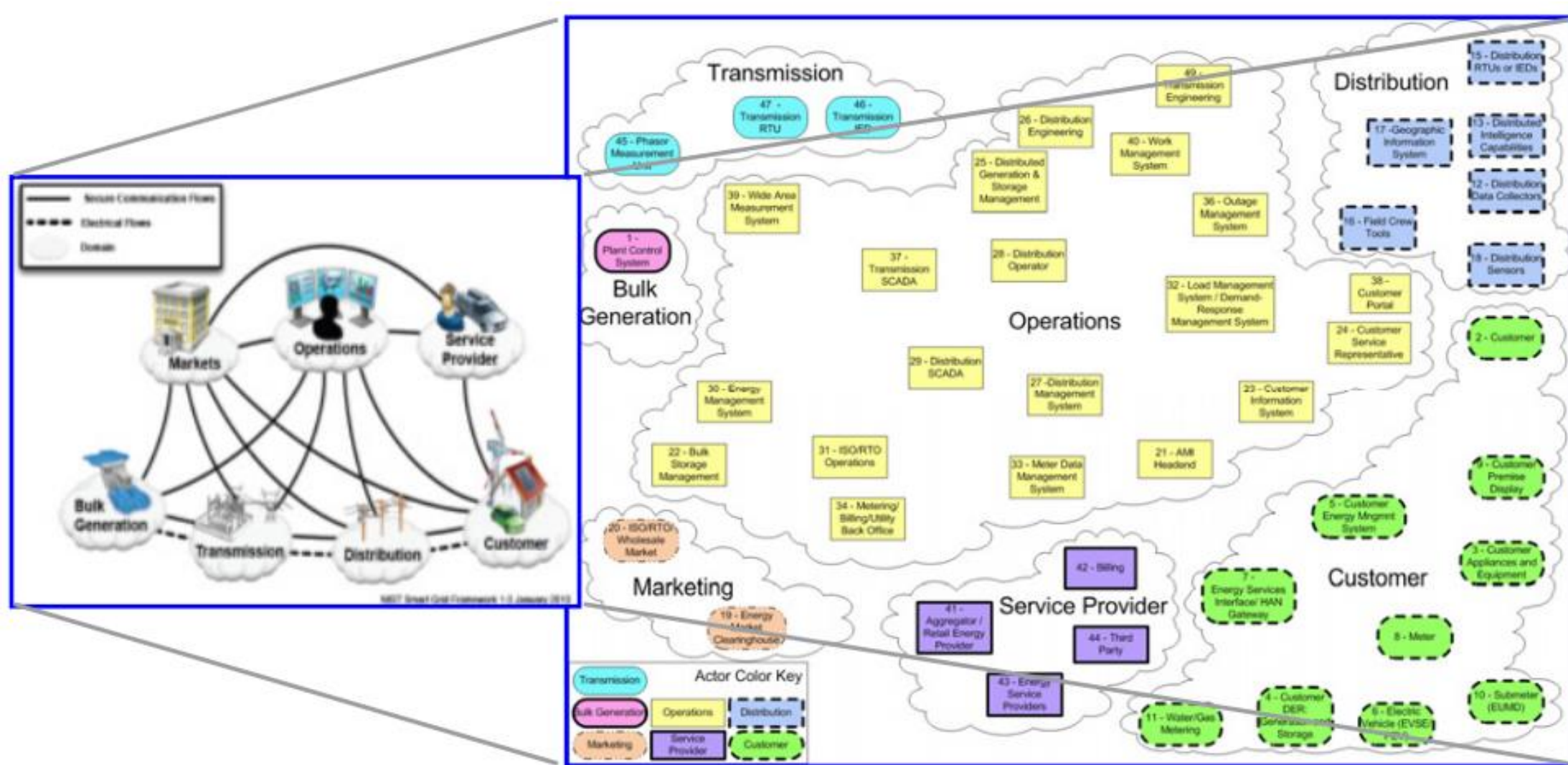
…. 127 logical interfaces,…
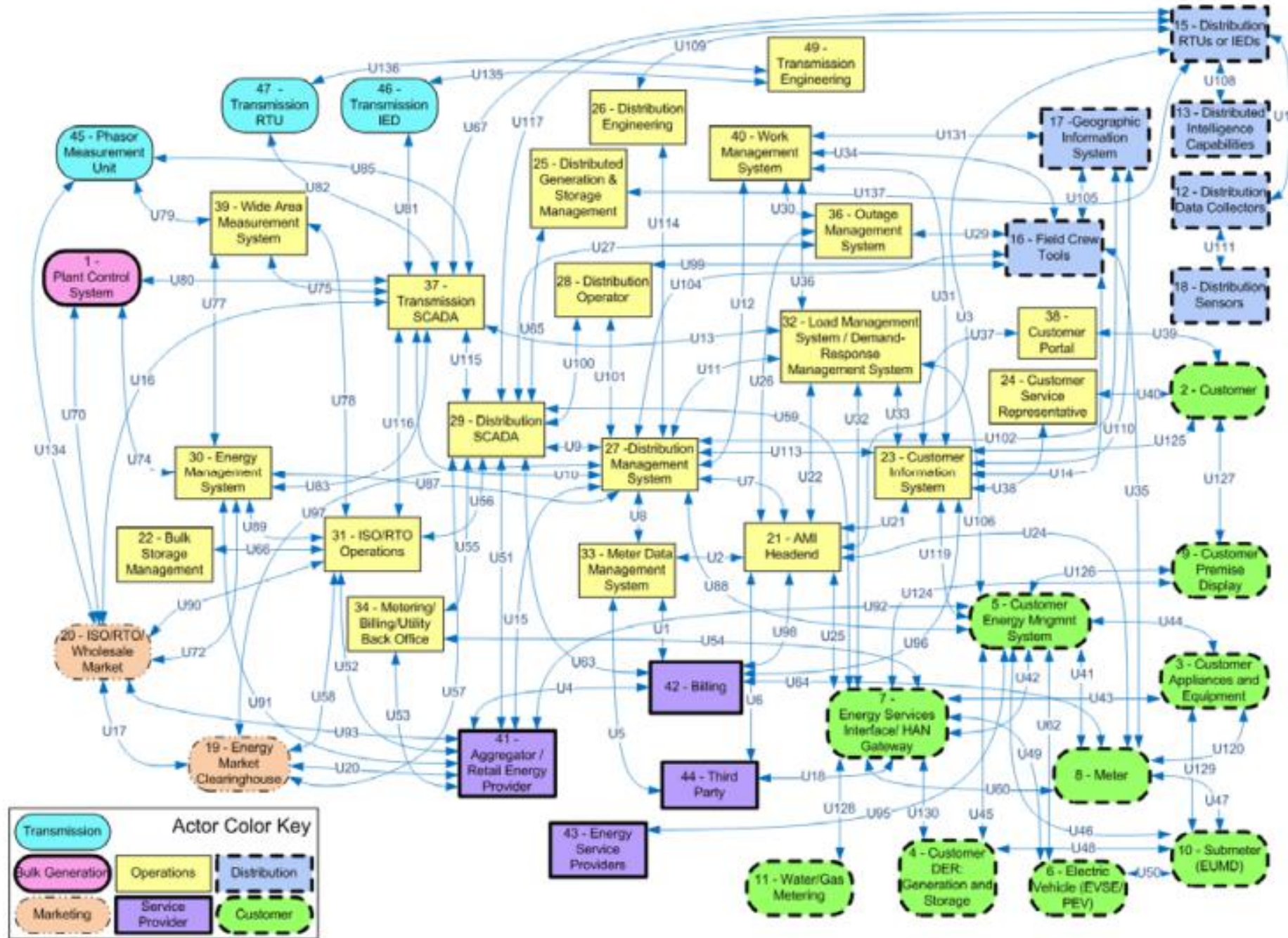
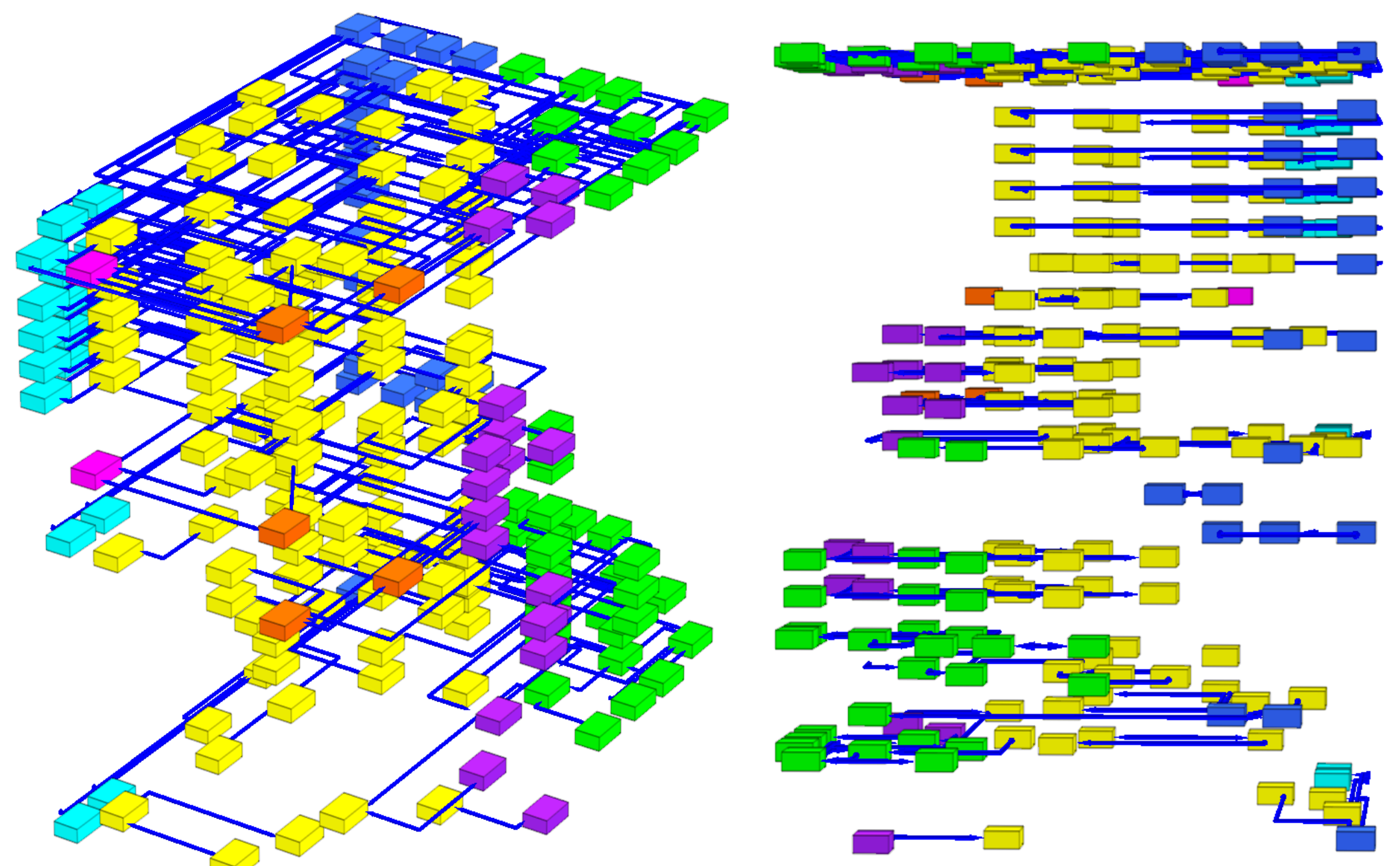... 22 logical interface categories, and 6 logical architectures ...

….and bears little resemblance to a typical utility system cyber network map!!

TCIPG NetAPT cyber network representation

RESEARCH RESULTS

3D NISTIR Visualization

- Web-based, HTML-5 visualization tool.
- User selects and controls the information displayed:
  - Zooms in and out;
  - Rotates in 3 axes;
  - Selectable layers;
  - Windowed "player" information from NISTIR 7628.

- Seeking effective methods to label actors, logical interfaces, and interfaces compatible with interactive perspective changes.
- Seeking ways to increase information content available to user.

BROADER IMPACT

- Visualization application has the potential to provide far-reaching benefits in conveying complex information effectively to wide audiences.

FUTURE EFFORTS

- Leverage an advanced application platform to increase the NISTIR 7628 technical content available to the user.
- Automate data and "relationship information" ingestion.
- Leverage computer graphics expertise outside the existing team.
- Investigate effective ways to visually map NISTIR 7628 guidelines to realistic cyber networks.