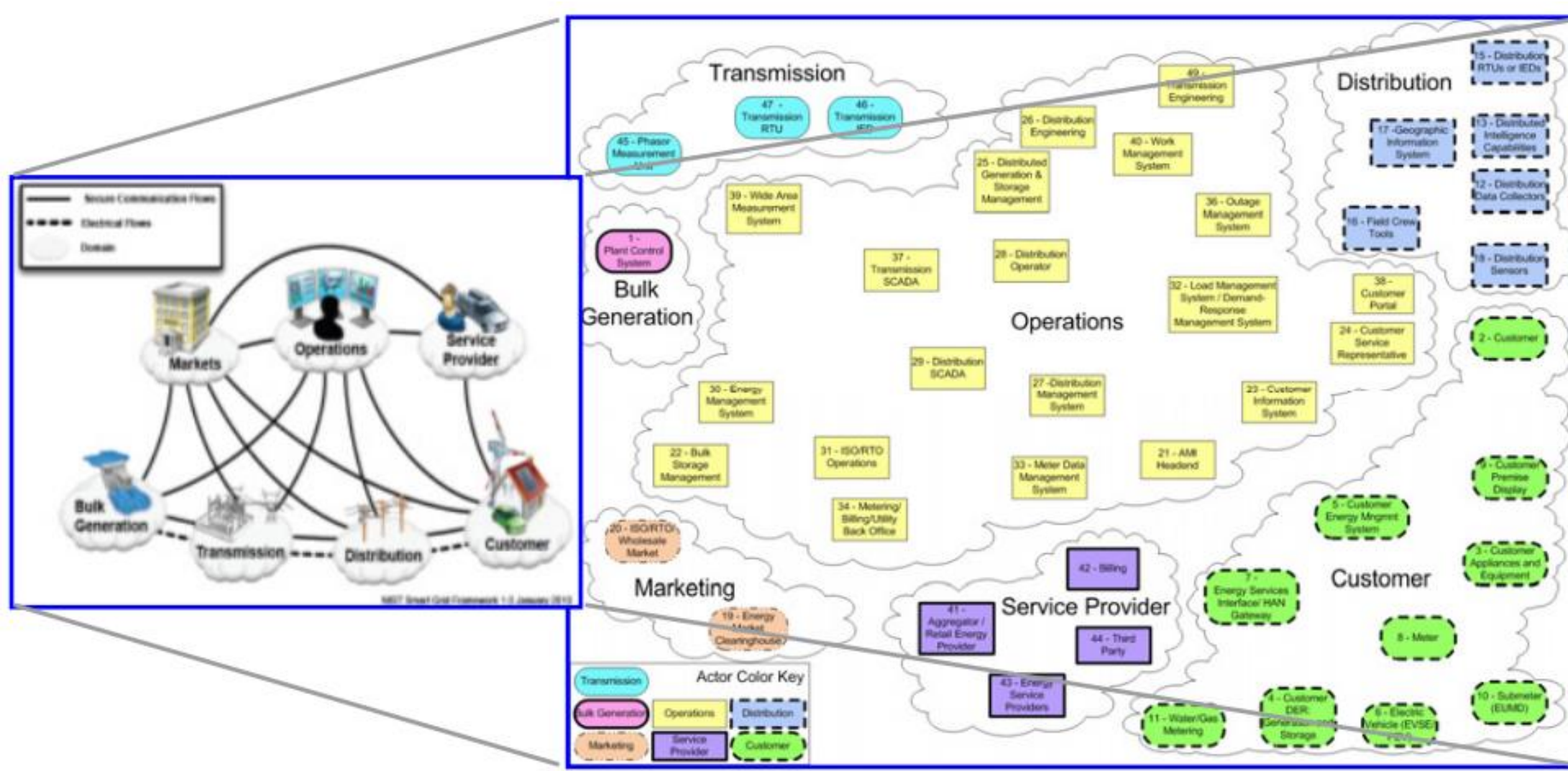


GOALS

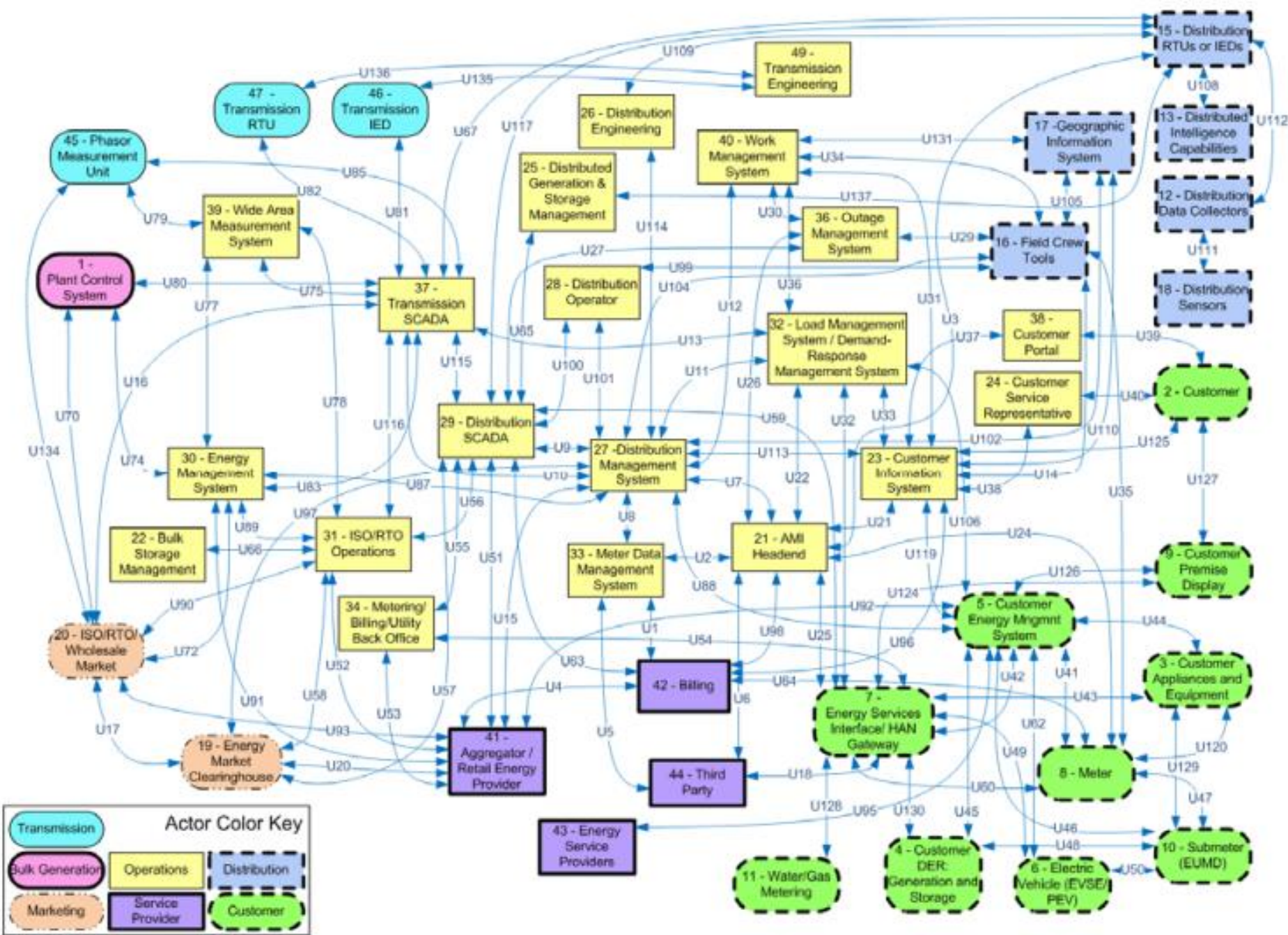
- Develop a visualization application to aid understanding of the complex security guidelines and relationships conceptualized in the **National Institute of Standards and Technology Interagency Report (NISTIR) 7628**, Guidelines for Smart Grid Cyber Security.
- Enable the aggregation and organization 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 a 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

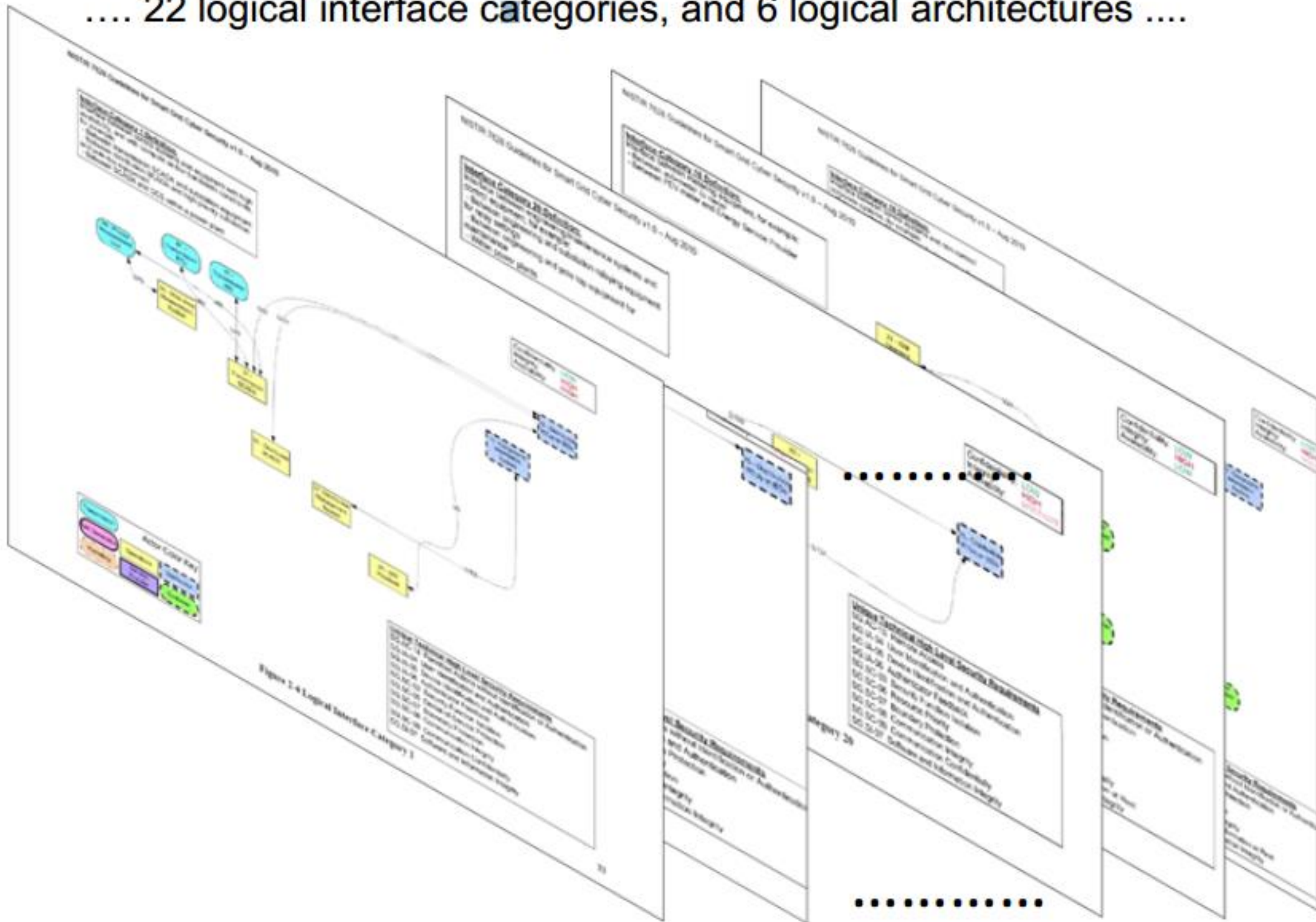
- NISTIR 7628 – a 3-volume, 600+ page technical document. Very challenging to digest and understand
- Organizes the power system into 7 domains having 49 actors,...



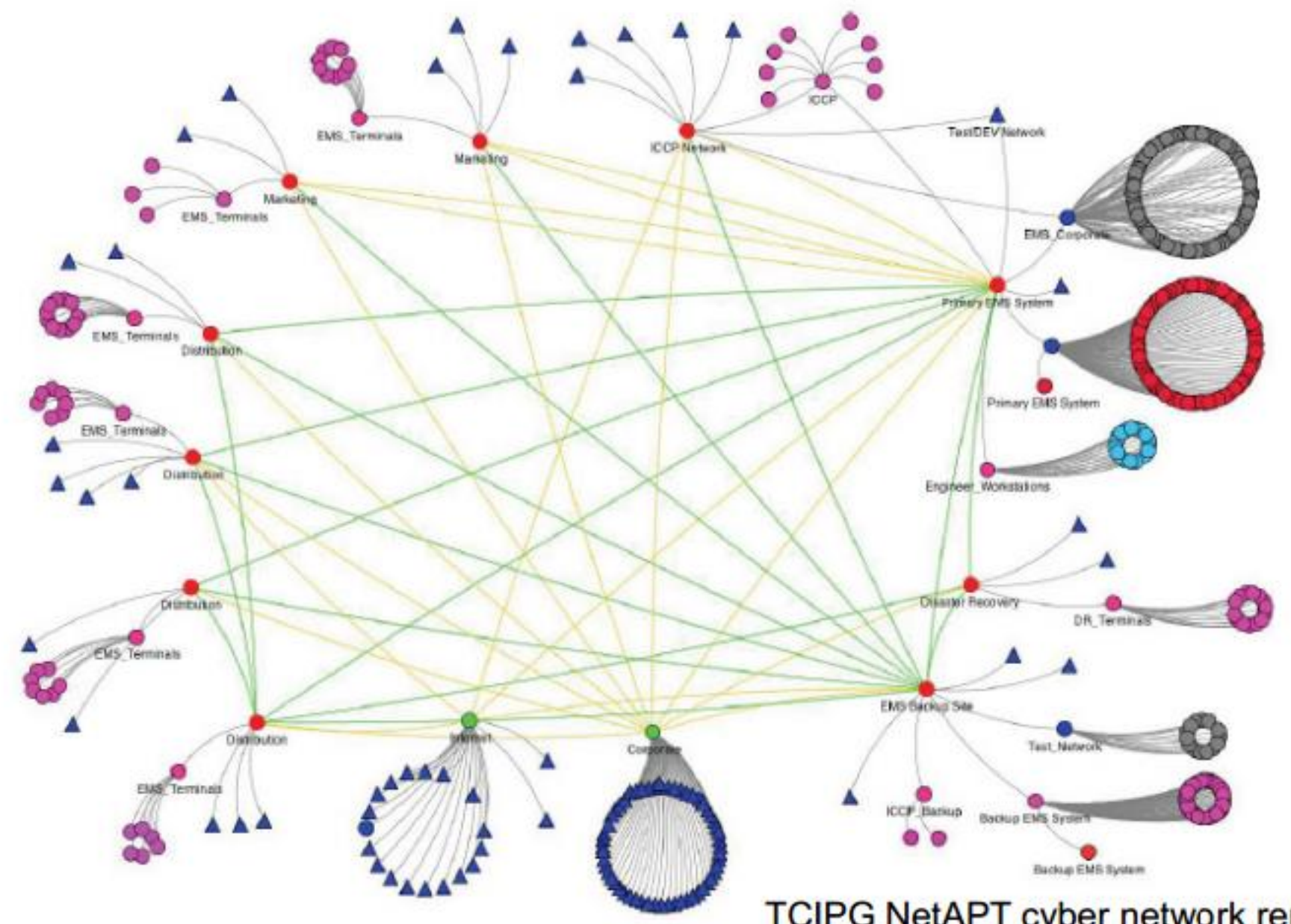
.... 127 logical interfaces,...



.... 22 logical interface categories, and 6 logical architectures



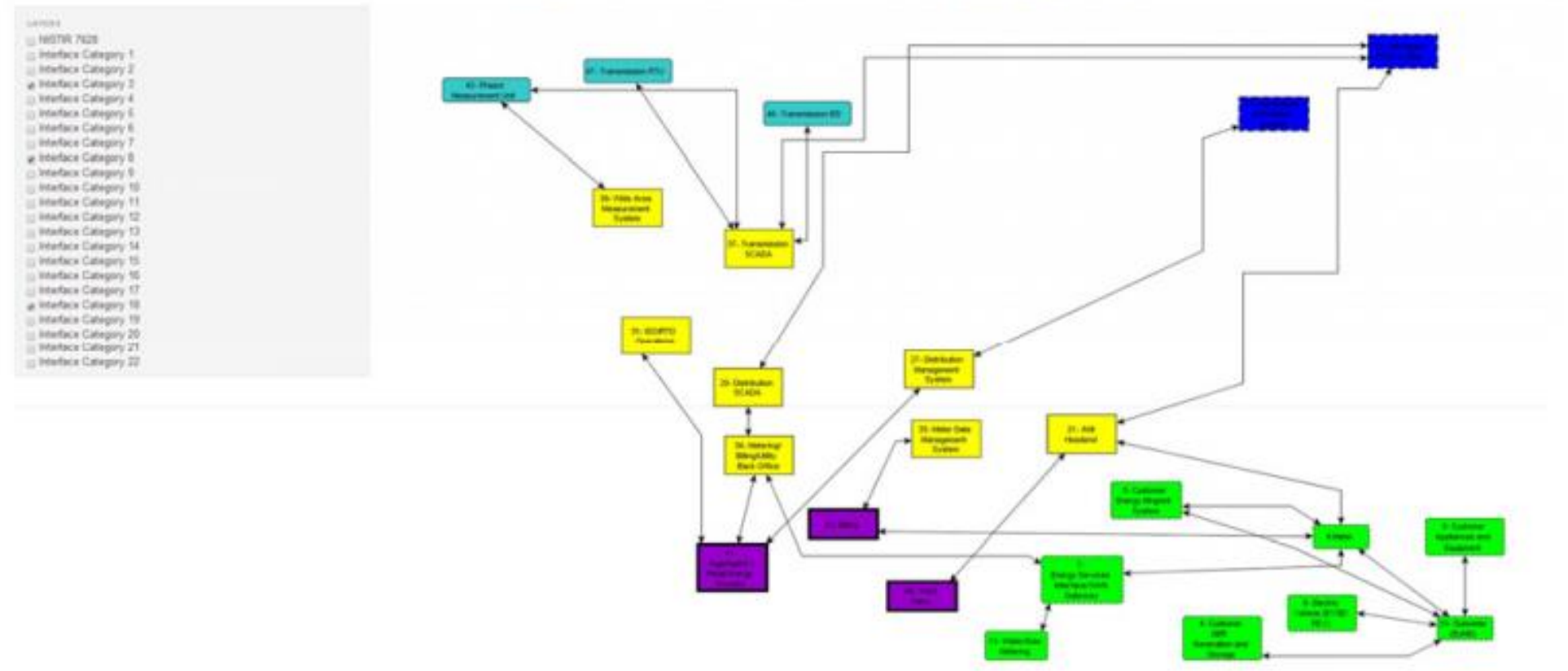
...and bears little resemblance to a typical utility system cyber network map!!



TCIPG NetAPT cyber network representation

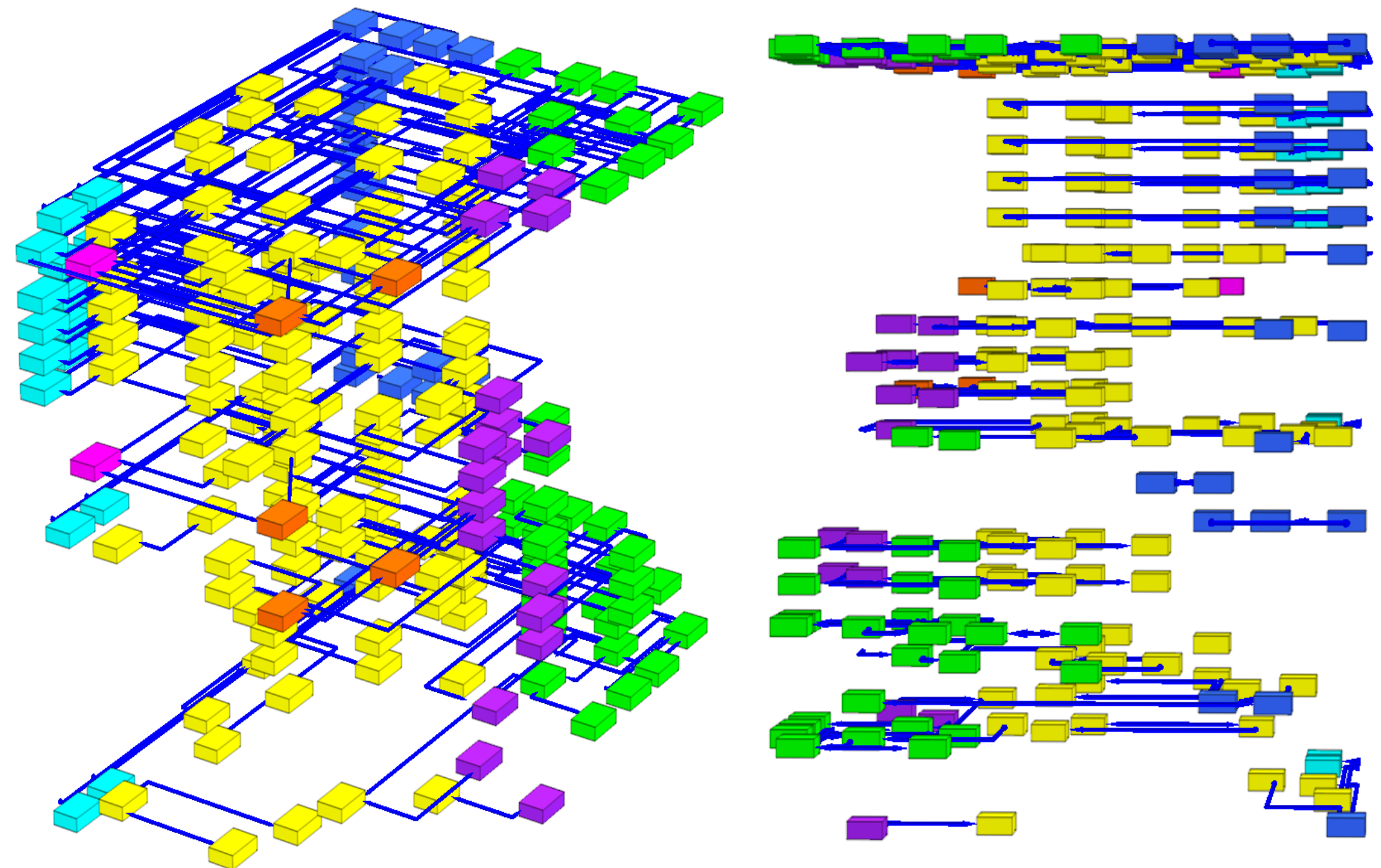
RESEARCH RESULTS

- Web-based selectable logical interface category representation.



2D NISTIR Visualization with Interfaces 3, 8, and 18 Displayed

- MATLAB 3D logical interface category representation.



3D NISTIR Visualization

- Seeking effective methods to label actors, logical interfaces, and interfaces compatible with interactive perspective changes
- Seeking ways to easily zoom in and pan out
- Seeking ways to increase information content available to user; user selects and controls the information displayed

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.