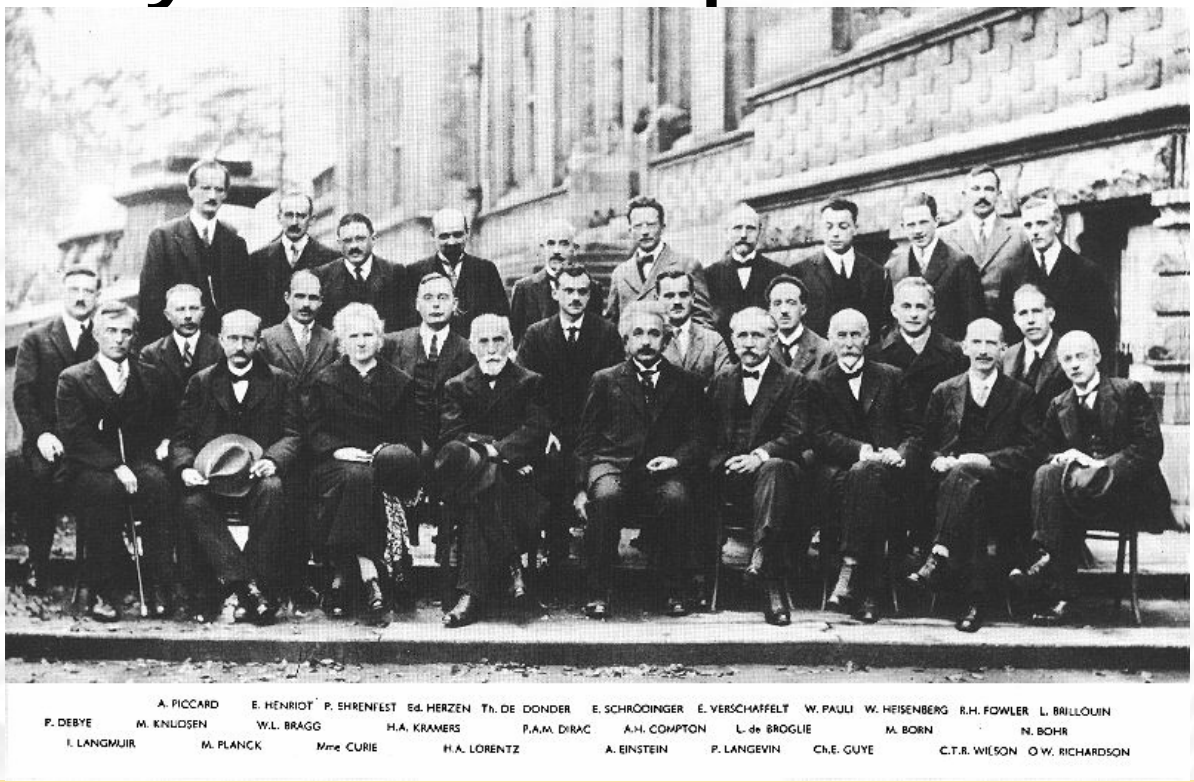
Welcome to the Interoperability Workshop

Dallas, Texas

11 April 2007



PNNL-SA-54816

Opening Session

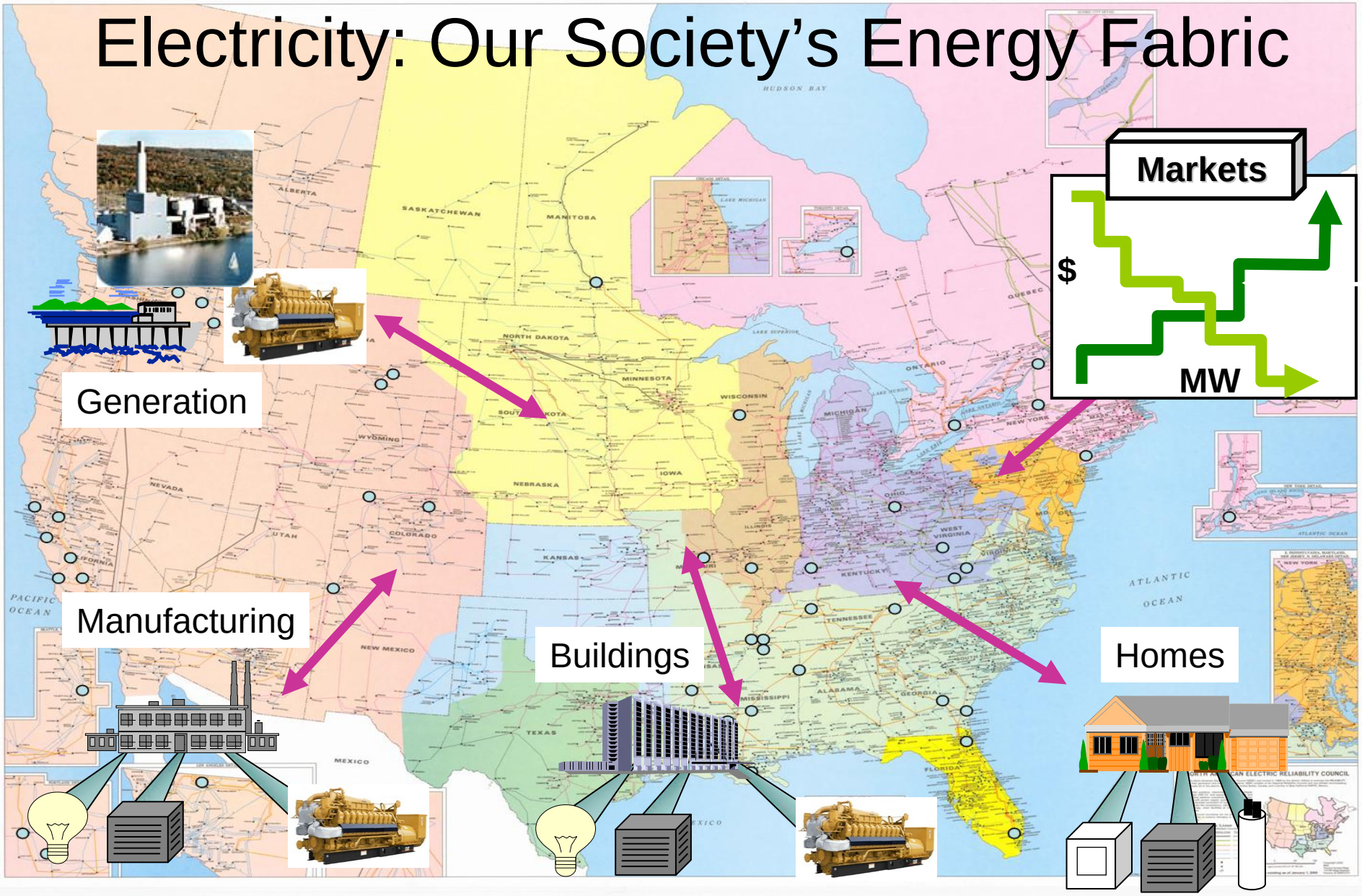
- Welcome
  - Jack McGowan, Chair GWAC
- Keynote
  - Kelly McNair, Dir. Information Mgmt, TXU ED
- Introductions
- Workshop Briefing
  - Andreas Tolk, Old Dominion University
  - Steve Widergren, PNNL

Interoperability Workshop Briefing

Topics

- Why are we holding this workshop?
- A context-setting framework
- Our agenda
- Test drive scenarios
  - Toby Considine, University of No. Carolina
    - Lots-O-Alarms home security & green energy
  - David Holmberg, NIST
    - Commercial buildings & real-time electricity pricing

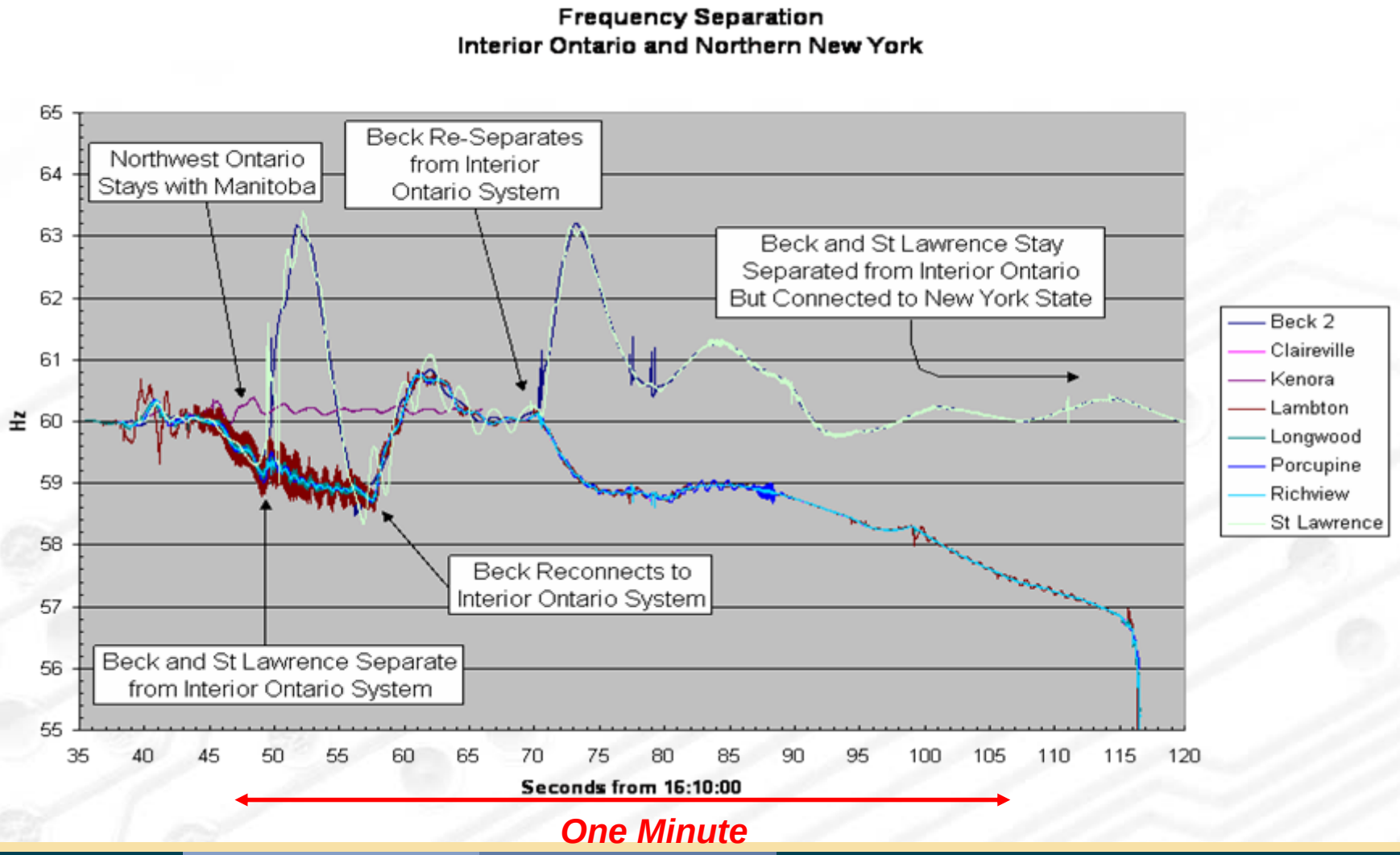
Electricity: Our Society's Energy Fabric



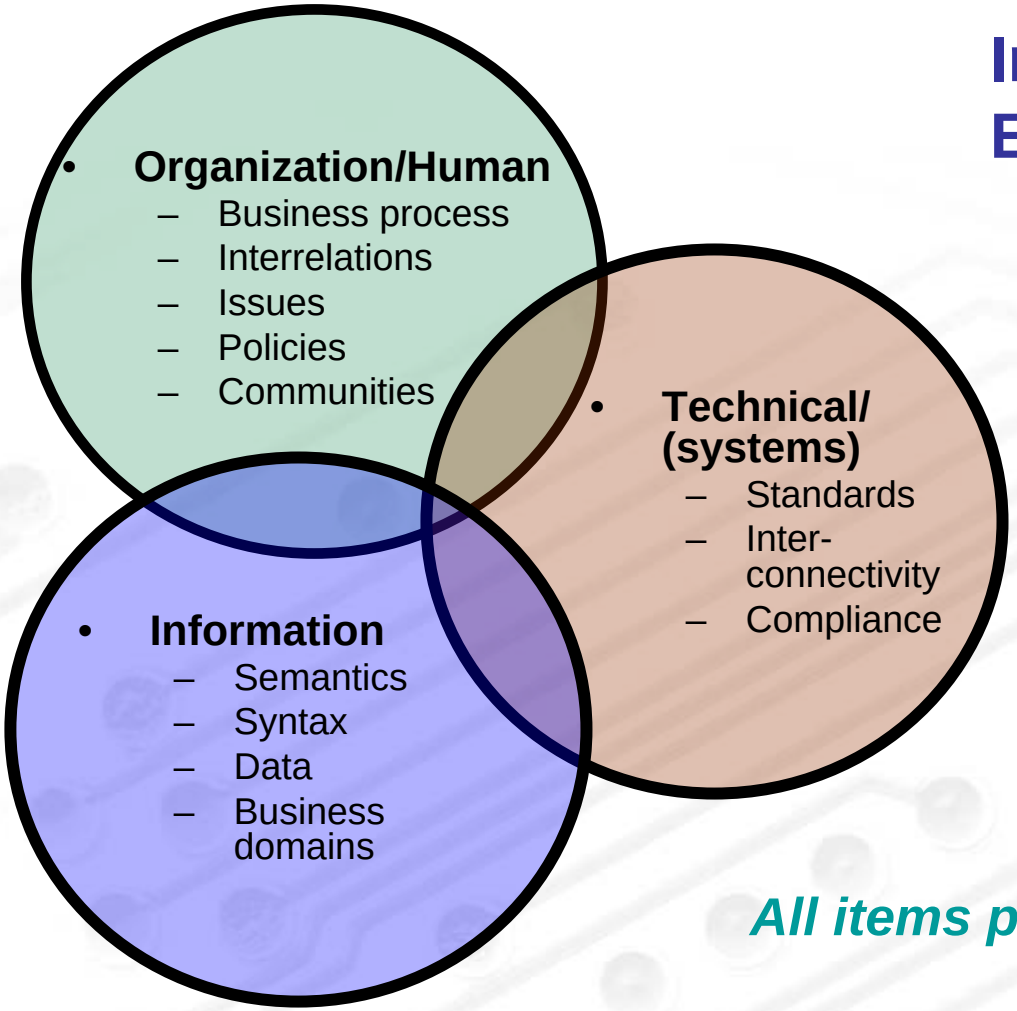
Becoming Interconnected

Frequency in Ontario and New York during Breakup

- Niagara Generation Stays with Western NY



GWAC Mission - Interoperability



Interoperable Software - Expected Impact:

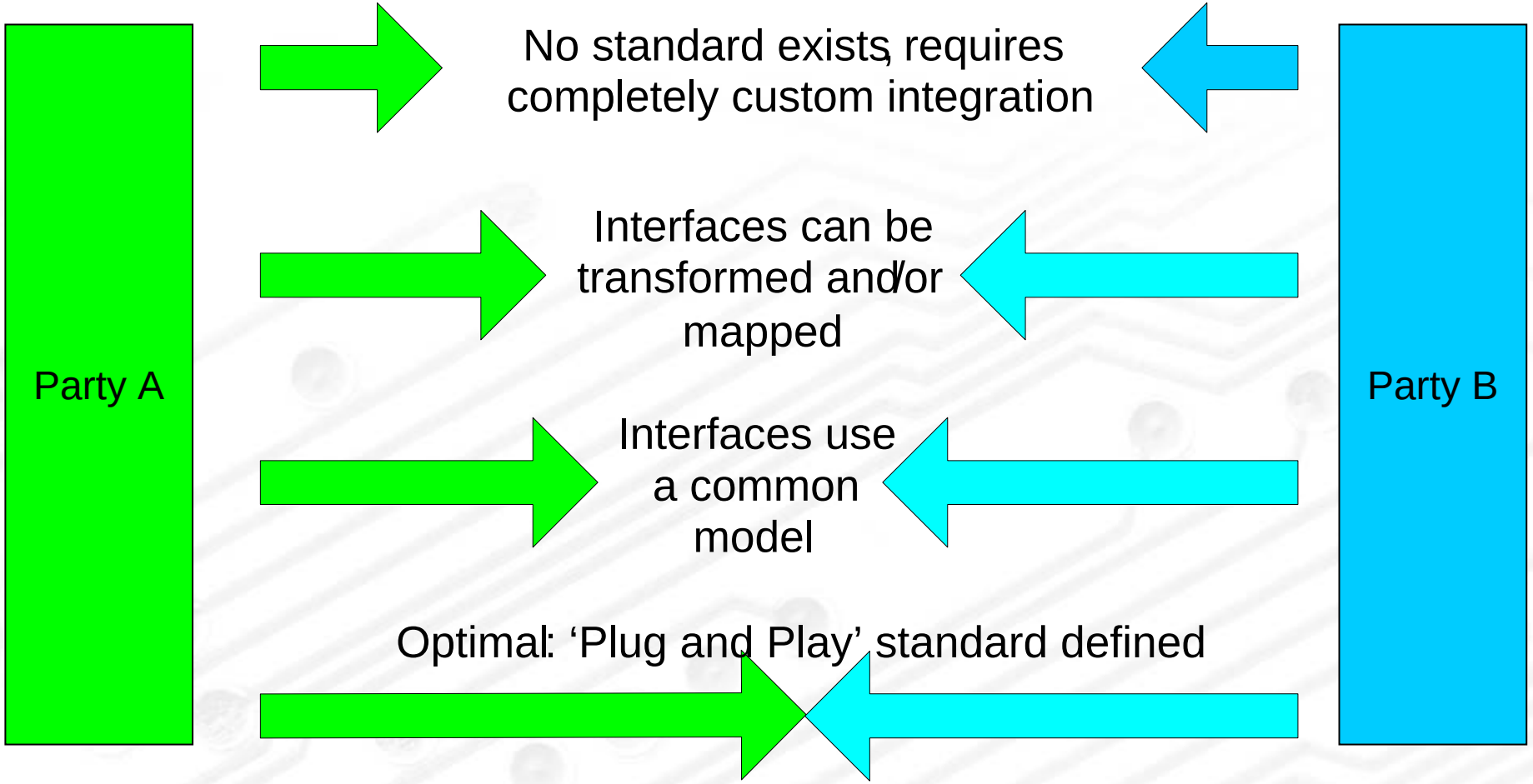
- **Reduces integration cost**
- **Reduces cost to operate**
- **Reduces capital IT cost**
- **Reduces installation cost**
- **Reduces upgrade cost**
- **Better security management**
- **More choice in products**
- **More price points & features**

All items provide compounding benefits

Interoperability – Integration at Arm's Length

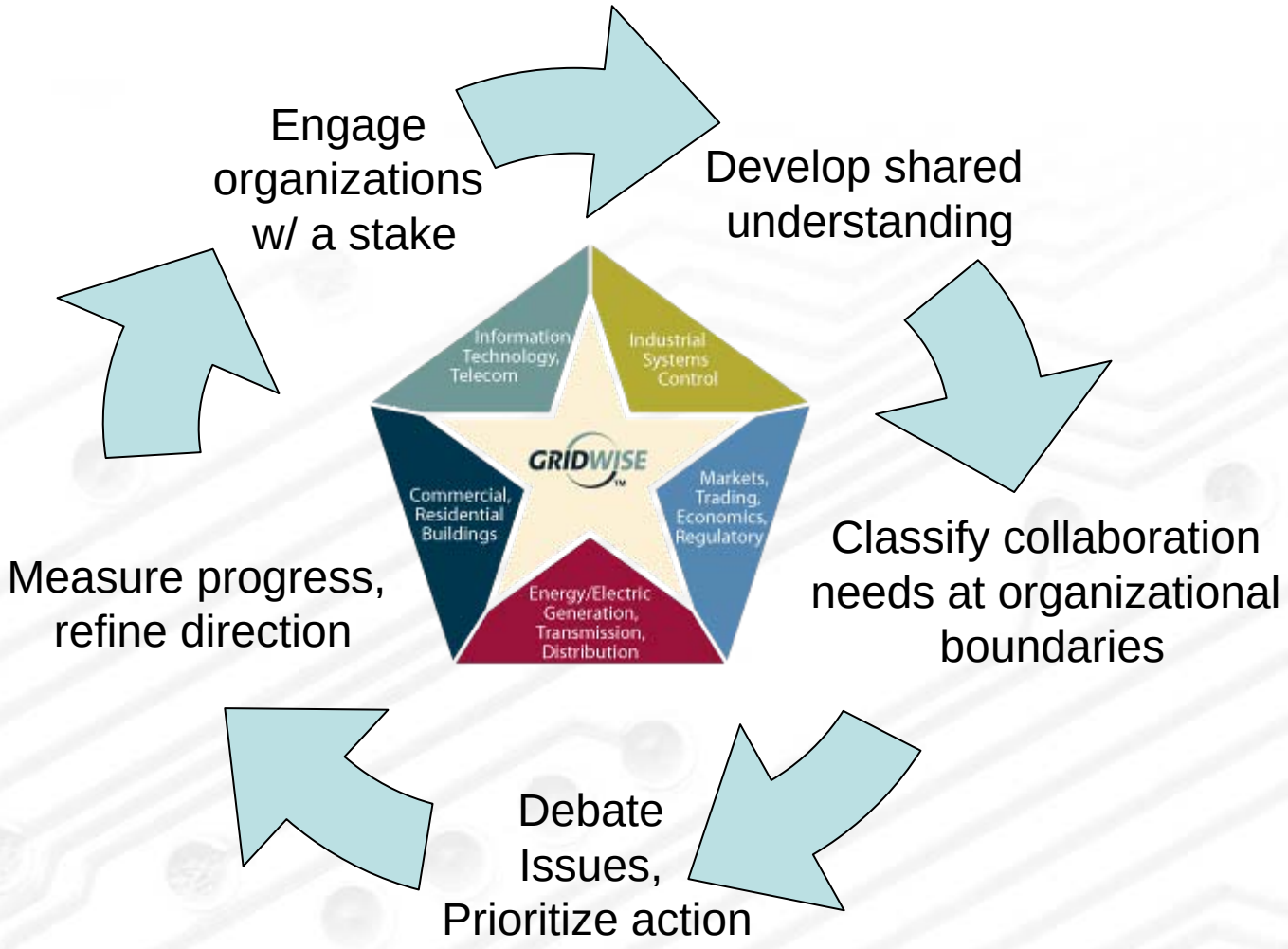
- Exchange of actionable information
  - between two or more systems
  - across organizational boundaries
- Shared meaning of the exchanged information
- Agreed expectation with consequences for the response to the information exchange
- Requisite quality of service in information exchange
  - reliability, fidelity, security

Distance to Integrate

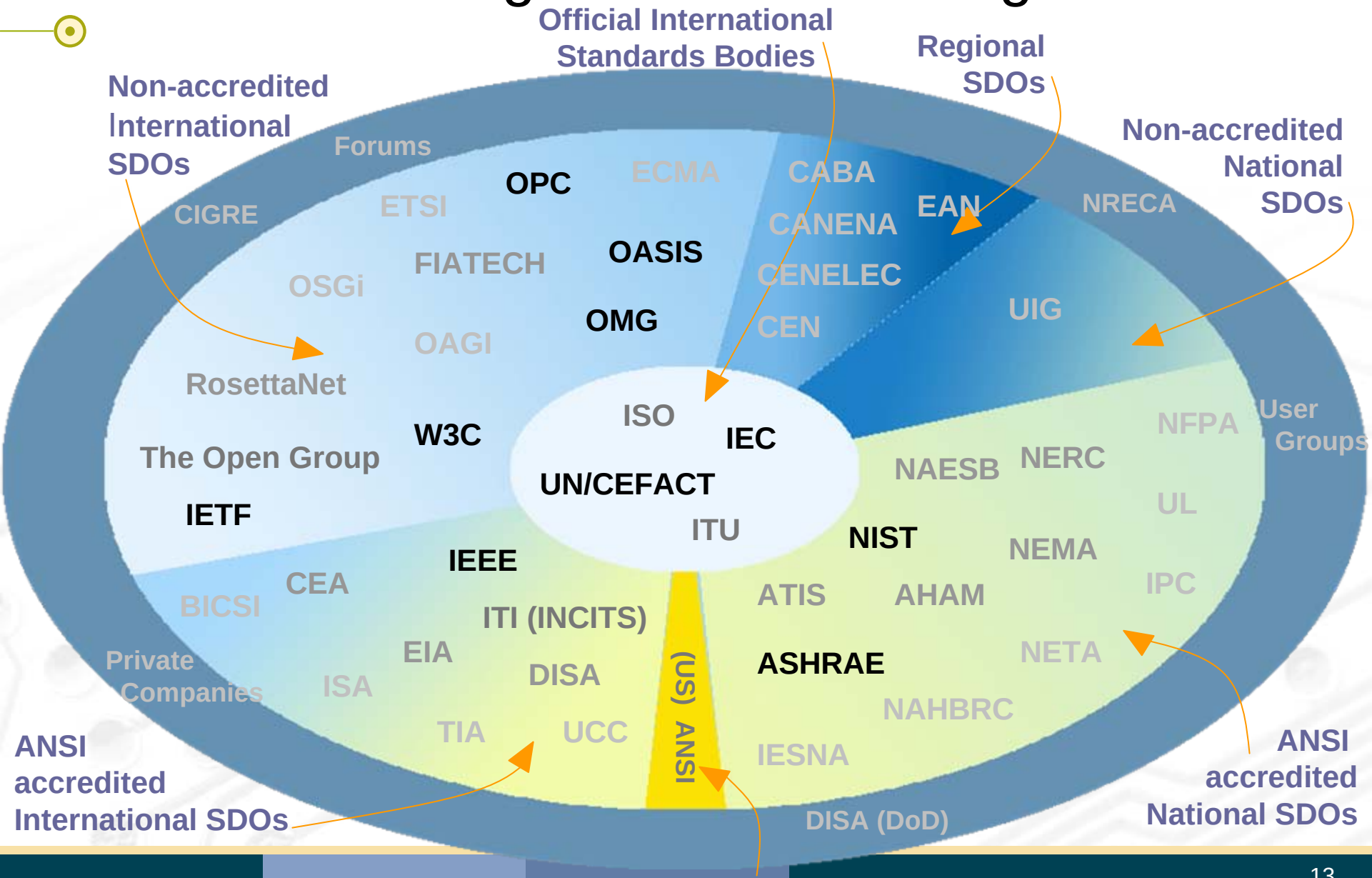


Credit: Scott Neumann, UISol position paper

Interoperability Path Forward



Standards Organizations: a Tangled Web



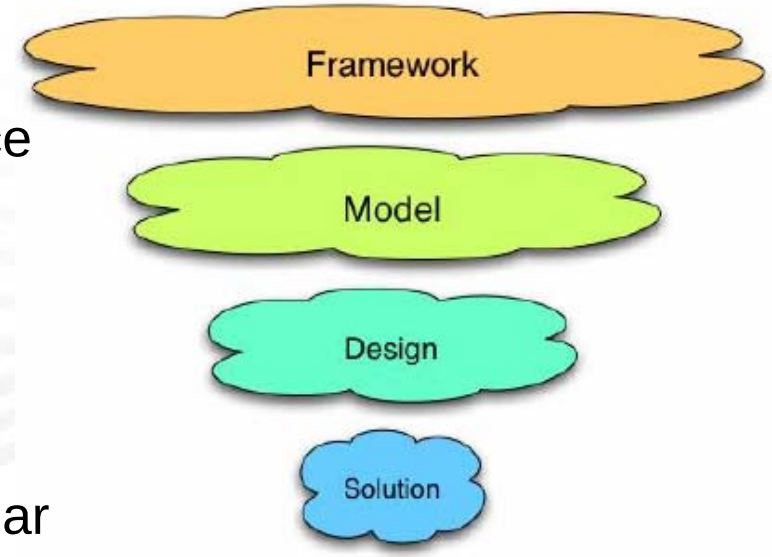
The Framework: Context for Interoperability Dialog

Interoperability Framework

- Organizing concepts
  - Taxonomy, definitions, levels, tenets
- Attempts to simplify the complex
  - Warning – it's still complex
- Aids communication between community members
  - Careful – semantics remain a stumbling block
- Provides perspective from selected viewpoints
- Reveals points where agreement simplifies integration
- Focus plight of integrator, not component developer

What do we mean by “Framework”?

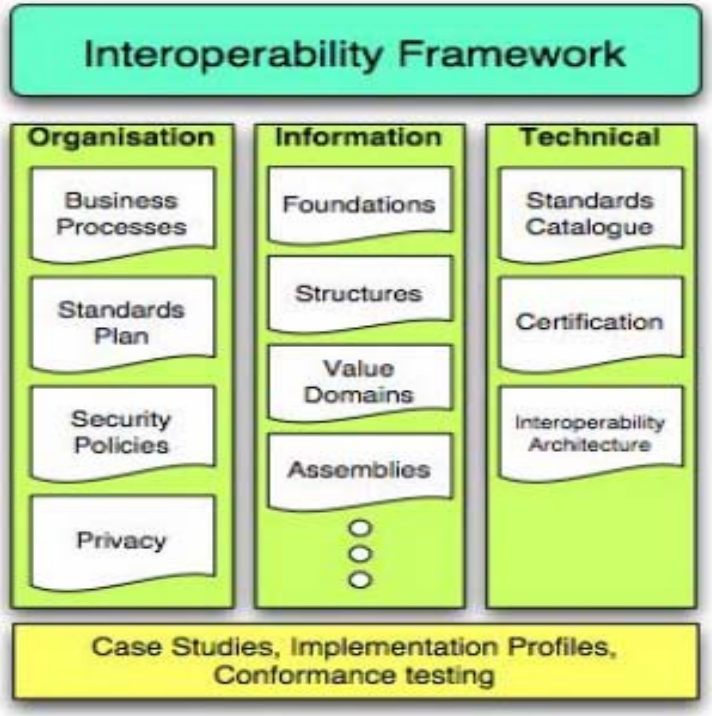
- *Framework* organizes concepts and provides context for discussion of detailed technical aspects of interoperability
- *Model* identifies a particular problem space and defines a technology independent analysis of requirements
- *Design* maps model requirements into a particular family of solutions
  - Uses standards and technical approaches
- *Solution* manifests a design into a particular developer software technology
  - Ensures adherence to designs, models, and frameworks.



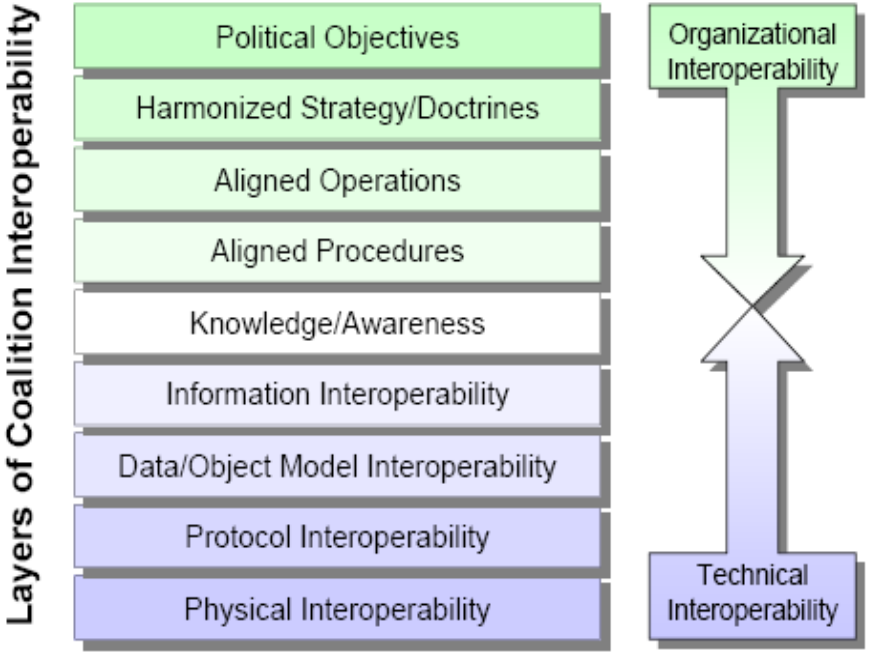
Borrowed from NEHTA: Australian National E-Health Transition Authority

Framework Inspirations

NEHTA Interop Framework

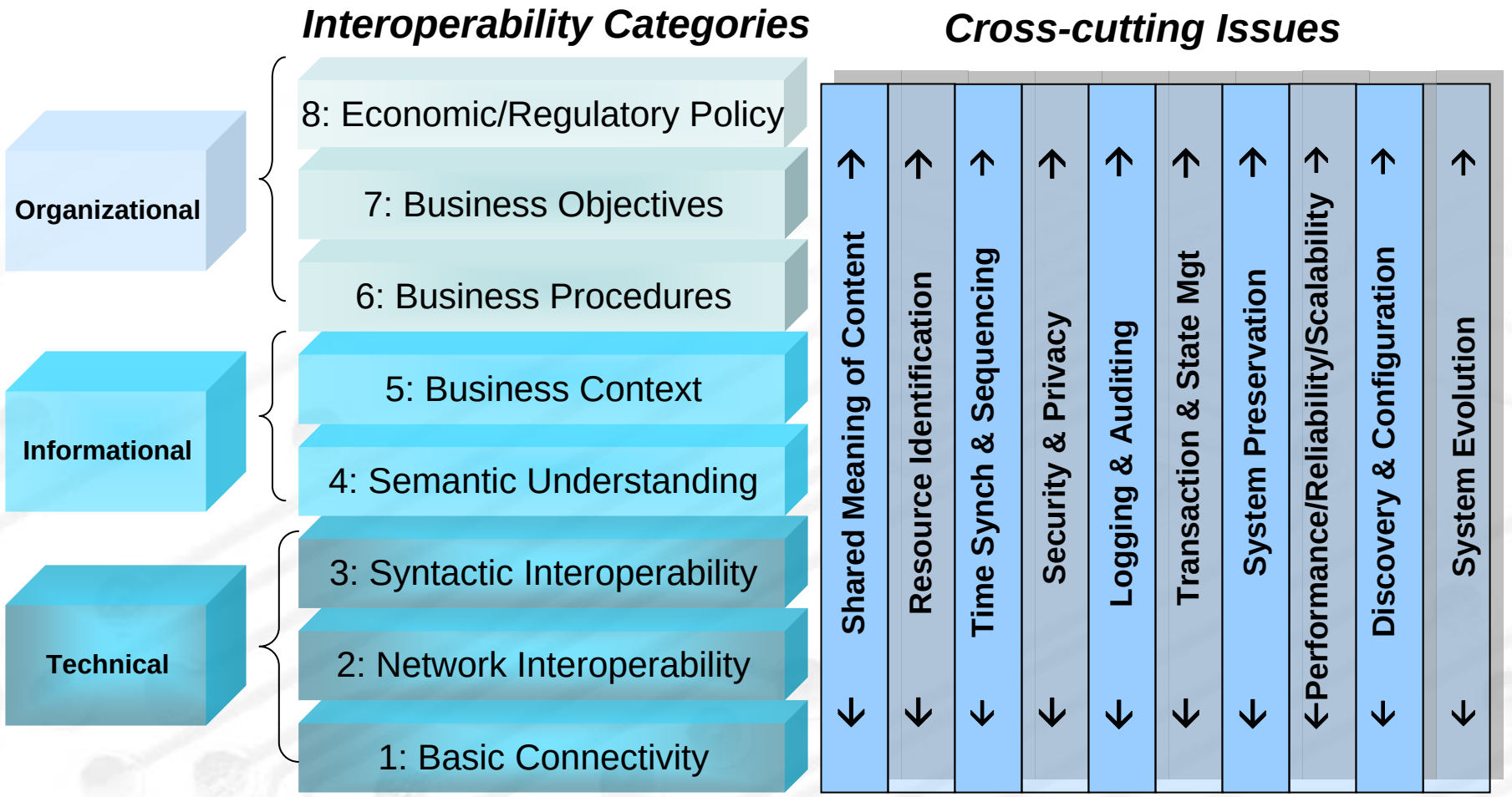


Layers of Coalition Interoperability



A. Tolk, *Beyond Technical Interoperability*, 8th CCRTS, National Defense University, Jun 03

Interoperability Context-Setting Framework



System Integration Tenets

- Agreement at the interface
  - Create an interaction contract
  - Terms and conditions, consequences for failure to perform…
- Boundary of authority
  - Respect privacy of internal aspects on either side of the interface (technology choice and processes) – Principle B01
- Decision making in very large networks
  - Decentralized/autonomous decision-making
  - Multi-agent v. hierarchical approach
  - Addresses scalability, evolutionary change, and eases component integration

Multiple Audiences

- Interoperability Framework Document
  - Experts familiar with large system integration and interoperability issues
  - Does not replace enterprise architecture frameworks (e.g., DoDAF, TOGAF, Zachman, etc.)
    - Layers and crosscutting issues support various views / approaches
- Other targeted material
  - Audiences: designers, business decision-makers, policymakers, across various industry sectors
    - Checklists (tests/reminders)
    - White papers
  - Cross-cutting issue papers

Some already identified Challenges

White Paper Contributions and Discussions

How many Standards are enough?

- Do we need standards?
- Are there upper and lower bounds?
- Do we need meta-standards and mapping to applicable standards?
- Should standards be mandated or recommended?
- When does an accepted solution become a standard and who owns the standard?
- How do we ensure that standards doesn't hinder progress?

How do we migrate?

- Architecture view
  - From the As-is-Architecture migrating to the To-Be-Architecture
  - What Architecture Frameworks are applicable
    - DoDAF derivates (ATAM)
    - TOGAF
    - OPM (D. Dori)
    - SysML
- How to connect organizational procedures with technical solutions?

Verification and Validation

- Are we doing the right thing?
- Are we doing the thing right?
- What are our Measures of Merit on the various levels and overall?
- How do we ensure quality on the various levels and overall?

Securing the Critical Infrastructure

- System internal challenges
  - Non-linear complex system (chaos and catastrophe theory)
  - Redundancies and alternatives
- System external challenges
  - Natural disasters (hurricane, flooding, …)
  - Hacker and Terror attacks
- Political challenges
  - International collaborations
  - How does the Grid behave at the border?

The Workshop

Workshop Desired Outcomes

Objective: *Consensus building forum for the preparation of community involvement to improve integration of emerging automation systems related to all elements of the electric system.*

- Consensus on interoperability framework paper
  - Actions to improve the paper
  - Develop credibility to framework paper
- Champions for articulating and addressing interoperability issues
- Leaders for a follow-on symposium

Workshop Sessions Wed.

10:30 am	Framework Breakout Sessions Raise document issues and proposed improvements Themes (inspired by the document organization) - Technical interoperability - Informational interoperability - Organizational interoperability - Cross-cutting issues - Overall framework structure & philosophical tenets
12:00 pm	Lunch
1:00 pm	Resume Framework Breakouts
4:30 pm	Assembly for Quick Summary
5:00 pm	Adjourn Breakout Meetings for the day
6:00 pm	Reception and Networking

Workshop Sessions Thurs.

8:00 am	Welcome Back and Breakout Presentation Results
9:00 am	Summary, General Discussion and Instructions for Next Breakout Sessions
10:00 am	Interoperability Next Steps Breakout Sessions - Resolve open issues for framework document - Address focus questions concerning impediments and actions to improve interoperability
12:00 pm	Working Lunch
1:00 pm	Resume Next Steps Breakouts - Address focus questions: a symposium to engage the electricity community in articulating interoperability issues, proposing actions to improve the situation, other events/activities
2:30 pm	Group Review on Breakout Results
4:30 pm	Meeting adjourns

Test Drive Scenarios