SARNET Alliance

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Why we need SARNET Alliances? Model autonomous SARNET behaviors to identify risk and benefits for SARNET stakeholders.

Stojan Trajanovski
Ralph Koning
Motivation

• Creating SARNET Alliance
• Collaborative defense.
• Sharing Cyber Security Information.
• Autonomous response.
• To enhance cooperation.
• Attack against one member is considered as an attack against all.
• Each participant must trust other participants to correctly detect and mitigate cyber threats.
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Trust must be organized and maintained across multi-domains.
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• ! Well-defined Trust
  • No Information Sharing
  • High Risk
  • Cost
  • Vulnerable to Attack
Inter-organizational and Interpersonal Trust

- Impact of trust at different levels on collaborative micro to macro level (entity/co-entity).
- (Positive) Relationship between the extent of interpersonal trust and inter-organizational trust.
- Top – down approach and bottom-up approach and their impact on trust.
Trust Framework
The Digital Prisoners’ Dilemma

• **Agent based model Demo**
  - Apply an Evolutionary Prisoners’ Dilemma to cyberspace
  - Different Players
  - Different Strategies to choose From (e.g. Always Defect, TFT, Always Cooperate).

• **Goal**
  - Evolutionary Prisoners’ Dilemma
  - Good Strategy
  - Learn from game
  - Observe members’ behavior

• **Outcome**
  - We have to cooperate to save our organization.
  - Lacking Trust and fear of the other’s betrayal motivates both prisoners to testify against each other.
  - Predicts our opponents' next move.
  - Over time the proportion of the population choosing the strategy cooperate eventually becomes extinct.
  - Challenges and opportunities for cooperation.
The Importance of Trust

• Productive relationships are based on trust – often unrecognized and taken for granted;

• It’s a resource that increases with use;

• Enables coordination without coercion;

• Enables commitments to be undertaken in high risk situations.
\[ \text{Trust} = \text{Speed} \downarrow \uparrow \text{Cost} \]
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