



**Complex Adaptive System of Systems  
(CASoS) Engineering Initiative**  
*<http://www.sandia.gov/CasosEngineering/>*

# Network Structure in a Multi-agent Economic Model

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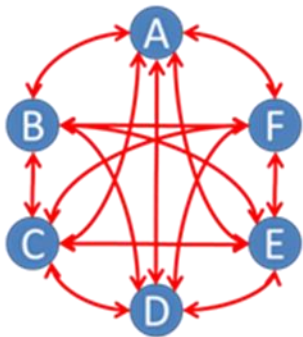
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April 3 – April 5, 2011

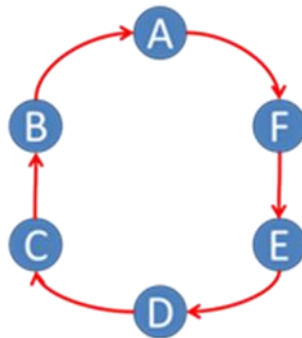
# How does structure affect network dynamics?

1. Are certain structures more robust than others?
2. Are perturbations locally or globally dependent?
3. What happens if we combine simple structures?

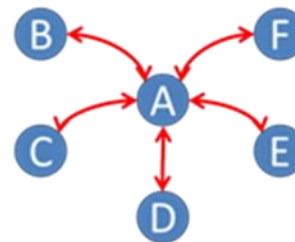
Fully Connected  
Network



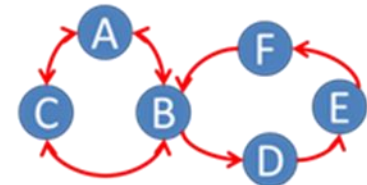
Circular  
Network



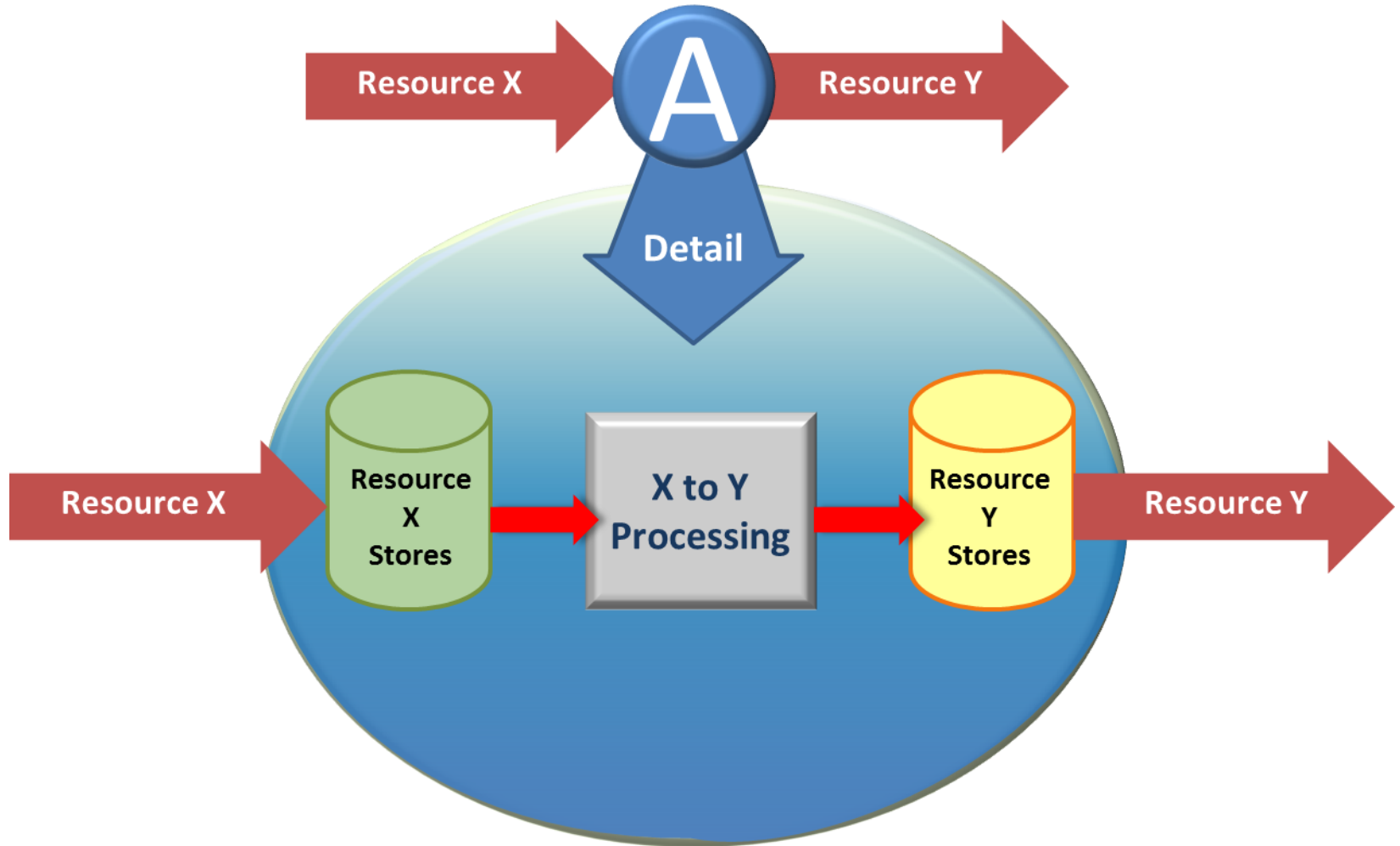
Hub  
Network



Combined  
Network



# Exchange Model



# Findings

- Network structure determines perturbation response
- Local structure has a large effect on perturbation dynamics
- Downstream nodes from the perturbation determine the network response

