Cyberspace: A Fragile Ecosystem

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Cyber, Identity and Information Assurance
Dependence on Cyberspace
Looking Ahead ... Looking Back

Waves of IT Industry Growth in the Information Age

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<td>Users</td>
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<td>(Millions)</td>
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Grosch’s Law
Moore’s Law
Metcalf’s Law
Law of Transformation

Looking Ahead . . . Looking Back (alternate story)
Paradigm Shift
Are you a Starfish or a Spider?

- **Starfish**
  - Peered
  - Adaptive
  - Resilient

- **Spider**
  - Hierarchical
  - Resists Change
  - Fragile
Cyber Risk Management

Cyber → Time & Environment
Information → Content & Services
Identity → Individuals, Organizations, Equipment

Balancing Operational Needs against Security
Vignette: The Recapture of Fallujah
Vignette: World War II Cryptography
Shift in Strategic Focus

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<tr>
<td>• Protect Information</td>
<td>• Ensure Operational Success</td>
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<tr>
<td>• Static Pre-Placed Defenses</td>
<td>• Dynamic Network and Information Operations</td>
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<td>• Proprietary Point Solutions</td>
<td>• Policy-Based Enterprise</td>
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<td>• People Intensive</td>
<td>• Integrated Services</td>
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<td>• Fragile Information Technology</td>
<td>• Resilient Cyber Ecosystem</td>
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Toward a Resilient Cyber Ecosystem

- **A**: Reactive & Manual
  - Security administrators follow rules and do their best to “put out fires”

- **B**: Tools-Based
  - Tools and technologies are applied piecemeal to assist people in reacting faster

- **C**: Interoperable
  - Loosely integrated tools exchange data to assist people with cyber situational awareness

- **D**: Policy-Based
  - The enterprise instantiates security policy, illuminates events and helps the operators find, fix, and target for response

- **E**: Resilient
  - Enterprise optimizes service to user by dynamically isolating and containing effects – including in supply chain and underlying infrastructure
Trends, Challenges, and Opportunities

- Strengthen Network Underpinnings
- Assure Software & Systems
- Managing Attack Surfaces
- Reducing Anonymity
- Improving Cyber Awareness
- Automating Security Content
- Mission Based Architectures
It’s not just about technology . . .

National Centers of Academic Excellence in Information Assurance Education

106 Colleges & Universities in 38 States & DC

The US Cyber Challenge – discover, train and recruit the best talent in the country
Culture Change for Cyberspace