





Security and Trust Convergence: Attributes, Relations and Provenance

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State of Cyber Security















- About as good or as bad as it is going to get
- Not too bad
- Big crime is a real threat but criminals can only defraud so many
- Big government/big business are real threats





State of Cyber Security



- Cyber should be "controllable" Nuclear, chemical, biological have been "controlled"
- > New arena for researchers
- Highly asymmetric, includes offense, clandestine
- Dual conflicting goals: strong offense, strong defense
- Need game-changing technologies



A New Threat Grows Amid Shades of 9/11 The nation remains largely unaware of the potential for disaster from cyberattacks. By TOM KEAN and LEE HAMILTON WALL STREET JOURNAL, 9/11/2014



The Institute for Cyber Security

State of Cyber Security



- Escalating reputational and even existential threat against mass theft of consumer information
- > Even the most iconic high tech companies are breachable
- Cost of clean-up after a mass theft far exceeds aggregate actual loss of money
- There are many scarier scenarios than mass data breach of consumer data
- Some of this scarier stuff has happened





State of Cyber Security



























Federal R&D priorities 2011:

- Tailored Trustworthy Spaces
- Moving Target
- Designed-In Security
- Cyber Economic Incentives
- Science of Security









DoD R&D priorities 2011:

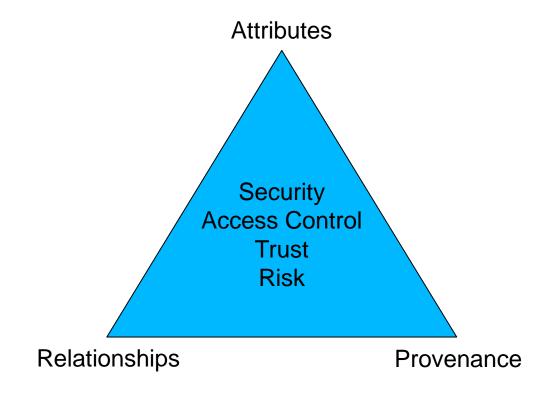
- Assuring Effective Missions
- Agile Operations
- Resilient Infrastructure
- Trust

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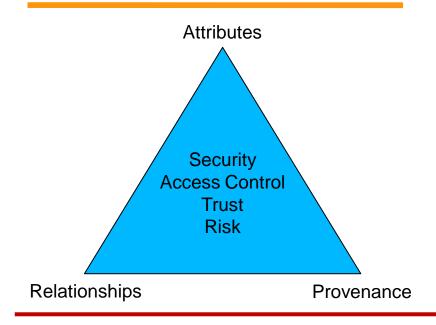






Security and Trust



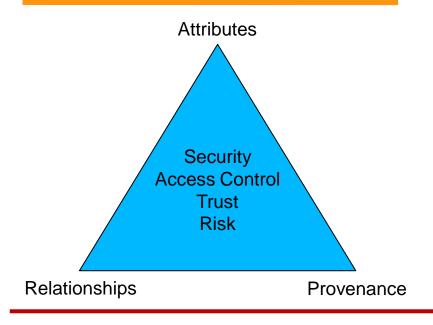


Least Privilege
Privilege Abstraction
Separation of Duty
Constrained Administration



Security and Trust





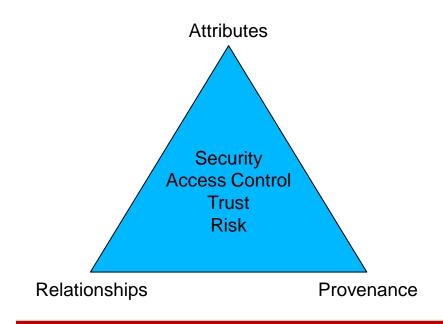
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Automation Adaptation



Security and Trust

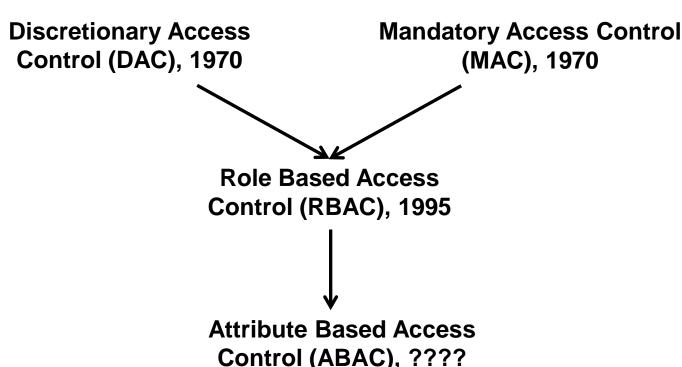




Automation Adaptation



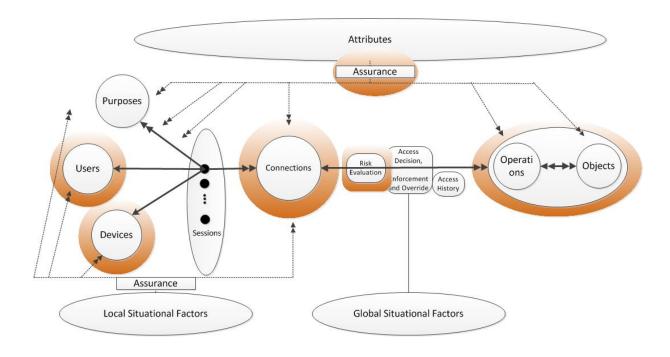








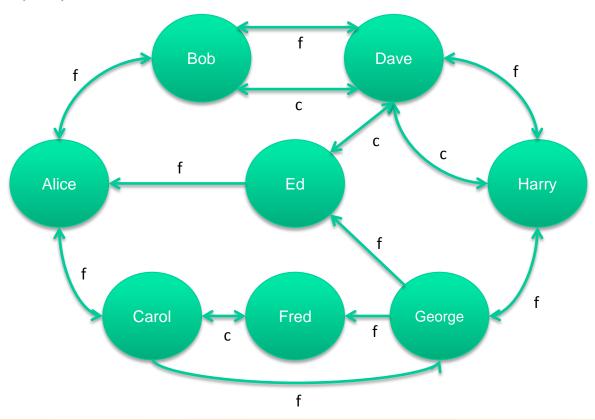






Relationships





Provenance

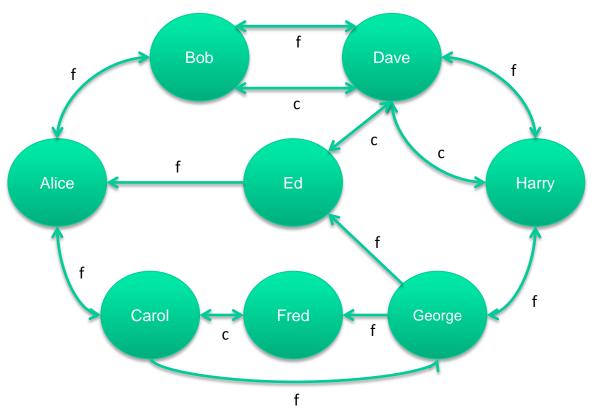




- Anyone can upload a homework.
- A user can replace a homework if she uploaded it and the homework is not submitted yet.
- ➤ A user can submit a homework if she uploaded it and the homework is not submitted already.
- ➤ A user can review a homework if she is not the author of the homework, the user did not previously review the homework, and the homework is submitted already but not graded yet.
- ➤ A user can grade a homework if the homework is reviewed but not graded yet.









Final Thoughts









