Securing the Digital World

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What is Security?

- From www.thefreedictionary.com
- Something that gives or assures safety, as:
  - **a.** A group or department of private guards: *Call building security if a visitor acts suspicious.*
  - **b.** Measures adopted by a government to prevent espionage, sabotage, or attack.
  - **c.** Measures adopted, as by a business or homeowner, to prevent a crime such as burglary or assault: *Security was lax at the firm's smaller plant.*
  - **d.** Measures adopted to prevent escape: *Security in the prison is very tight.*
What is Security?

- From www.investorwords.com
  - Property which is pledged as collateral for a loan.

- By Daniel Miessler (http://dmiessler.com/blog/my-preferred-definition-of-security)
  - The process of maintaining an acceptable level of perceived risk.
What is Security?

- Department of Homeland Security, USA:
  - The Department of Homeland Security has a vital mission: to secure the nation from the many threats we face. This requires the dedication of more than 230,000 employees in jobs that range from aviation and border security to emergency response, from cybersecurity analyst to chemical facility inspector. Our duties are wide-ranging, but our goal is clear – keeping America safe.
What is Security?

- From Wikipedia:
  - The objective of computer security includes protection of information and property from theft, corruption, or natural disaster, while allowing the information and property to remain accessible and productive to its intended users.
What is Security?

- From Wikipedia:
  - **Information security** means protecting information and information systems from unauthorized access, use, disclosure, disruption, modification or destruction.
Early Efforts at Physical Security

- United Nations: Everyone has the right to life, liberty and security of person.
- Early man’s security attempts (from “Social Life of Early Man” by Sherwood Washburn): fire, tools, families, house, fortified cities (3000 years ago in Egypt).
Modern Man’s Physical Security

- Self-defense
- Firearm
- Bodyguards
- Police
- Armed forces
- High technology – cameras, motion sensors, alarms
Modern Man’s Security – Images
Recent Headline (ndtv.com, May 26)

- ATM with Rs 16 lakh stolen as guards slept

A gang disappeared with an HDFC bank ATM in Bangalore in the wee hours of Tuesday, hoodwinking two security guards on duty.
World Statistics

- Global retail theft $115 billion
- American businesses lose $250 billion a year to copyright piracy, and intellectual property theft costs 750,000 jobs a year.
- According to the World Customs Organization, more than $600 billion in pirated and counterfeited goods flooded the world market in 2005.
Security Model

## Applying the Model to Physical Security

<table>
<thead>
<tr>
<th>Threat Source</th>
<th>Actor</th>
<th>Motivation</th>
<th>Vulnerability</th>
<th>Security Technique</th>
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<tbody>
<tr>
<td>Fire</td>
<td>Nature</td>
<td>Nil</td>
<td>Wooden structures, flammable liquids</td>
<td>Guard, fire retardant, extinguisher, firemen</td>
</tr>
<tr>
<td>Fire</td>
<td>Enemy</td>
<td>Political</td>
<td>Wooden structures, flammable liquids</td>
<td>Intelligence, guard, fire retardant</td>
</tr>
<tr>
<td>Weapons</td>
<td>Enemy</td>
<td>Political</td>
<td>Gates, doors, windows, unarmed, no self-defense</td>
<td>Intelligence, guards, motion sensors, police, hospital</td>
</tr>
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Digital World
Digital Systems
Losses in Digital World

- ID Theft: $48 billion
- Credit Card fraud: $300 billion
- Cost of Lost Data: $100 billion
- Virus/Spyware: $7 billion (US alone)
Physical vs. Digital Security

- Cost of Digital Security Vulnerabilities approaching that of Physical Security Vulnerabilities
- Rate of Increase is much higher for Digital Security
- Securing digital assets is very important for modern commerce
Applying the Model to Digital Security

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# Applying the Model to Digital Security

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<th>Vulnerability Description</th>
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<tbody>
<tr>
<td>Data change</td>
<td>Hacker</td>
<td>Financial, Fun(!), …</td>
<td>Poor naming conventions, accessibility of data stores</td>
<td>Authentication, authorization</td>
</tr>
<tr>
<td>Virus</td>
<td>Hacker, Government</td>
<td>Political, Financial</td>
<td>Open ports, poor software</td>
<td>Scanners, policies to prevent downloads (.zip)</td>
</tr>
<tr>
<td>Spyware</td>
<td>Hacker, Government</td>
<td>Political, Financial</td>
<td>Open ports, poor OS settings</td>
<td>Regular scanning, controlled network access</td>
</tr>
<tr>
<td>ID Theft</td>
<td>Enemy</td>
<td>Financial</td>
<td>Access to personal data including cards</td>
<td>Physical security, using safe cards</td>
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Factors for Digital Security

- Ease of implementation
- Cost
- Number of users affected
- Value of asset
- Hardware compatibility
- Software compatibility
Issues with Digital Security

- Creating laws
- Enforcing laws
- Compensation
- Performance
- Hardware capability
- Networking
User Habits

- “The human element is the largest security risk in any organization; most security incidents are the result of human errors and human ignorance and not malicious intent. Therefore, it is critical that significant effort is focused on education and awareness to reduce these occurrences.”

- “The most powerful preventive tools will be communication and the reinforcement of secure behaviors.”

- **What habits can we adopt?**