

Symmetric Conflict in Cyberspace

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INTA 8803: Deterrence

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Symmetric Conflict in Cyberspace

- What are we talking about here?
 - What is feasible and what is Science Fiction
- Where are we coming from?
 - The History of Cyber Warfare
- Who runs this show?
 - The authorities of US Cyber defense and offense
- Where is this going?
 - The future of cyber warfare

What are we talking about here?

- Cyber War is:
 - “conducting, and preparing to conduct, military operations according to information-related principles. [sic]”¹

1) Arquilla, John, and David Ronfeldt. "Cyberwar is Coming!." In *In Athena's Camp: Preparing for Conflict in the Information Age*. Santa Monica: Rand Corporation, 1997. 23-60.

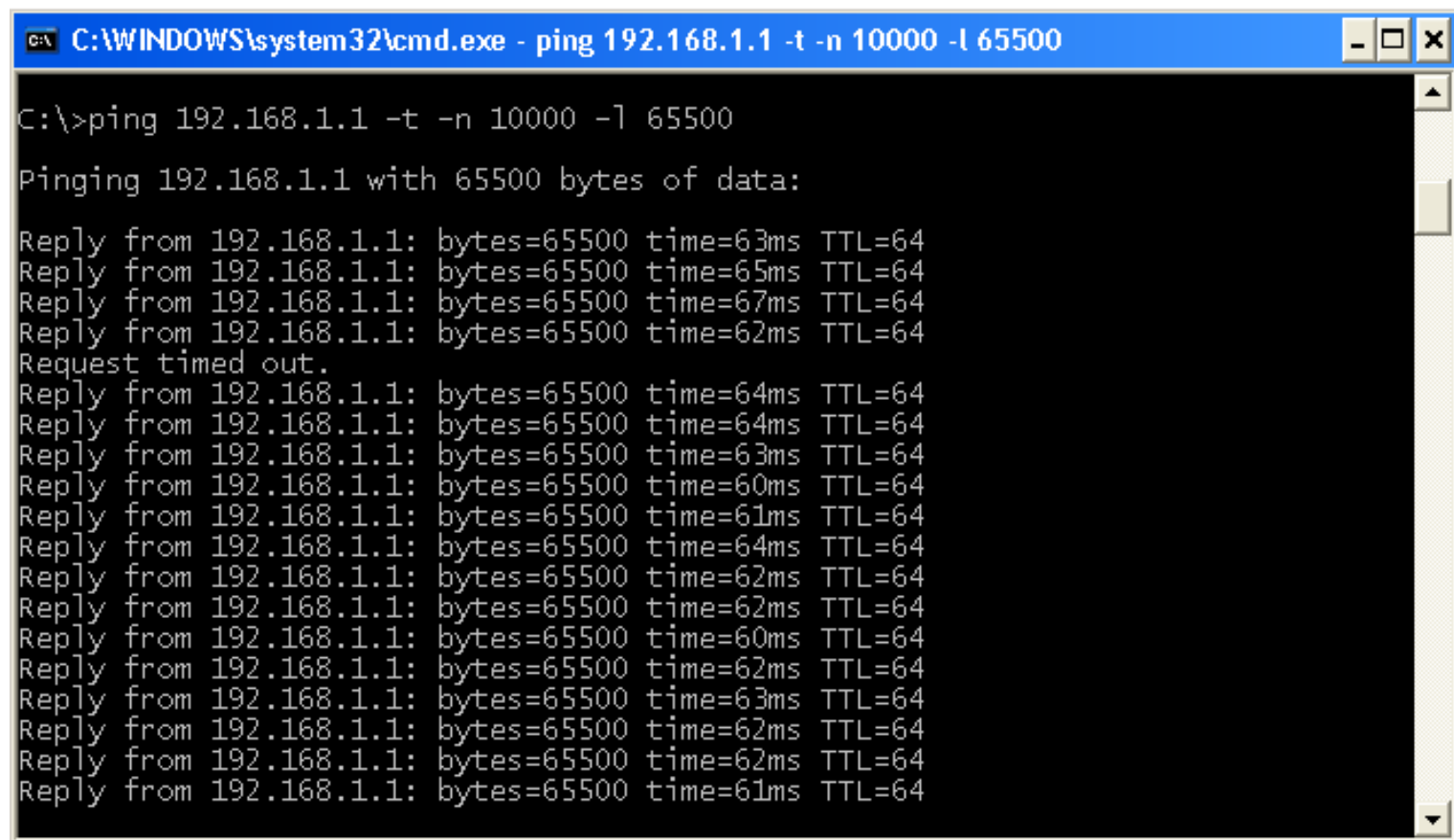
What are we talking about here?

- Cyber War is:
 - “conducting, and preparing to conduct, military operations according to information-related principles. [sic]”¹
- Cyber War is **not**:
 - Any hacker flick you’ve ever seen
 - Pandora’s box
 - More dangerous than conventional weaponry
 - Net War

1) Arquilla, John, and David Ronfeldt. "Cyberwar is Coming!." In *In Athena's Camp: Preparing for Conflict in the Information Age*. Santa Monica: Rand Corporation, 1997. 23-60.

What does a cyber attack look like?

- Assault on Infrastructure



The image shows a Windows command prompt window with a blue title bar. The title bar text is "C:\WINDOWS\system32\cmd.exe - ping 192.168.1.1 -t -n 10000 -l 65500". The command prompt shows the following output:

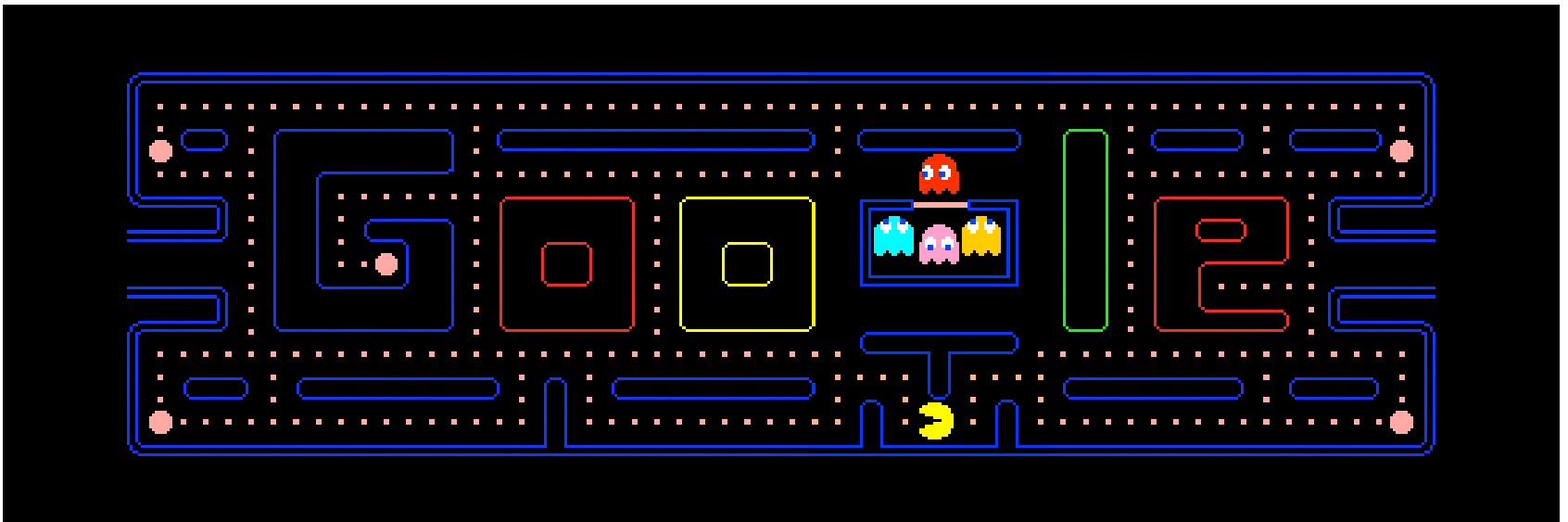
```
C:\>ping 192.168.1.1 -t -n 10000 -l 65500

Pinging 192.168.1.1 with 65500 bytes of data:

Reply from 192.168.1.1: bytes=65500 time=63ms TTL=64
Reply from 192.168.1.1: bytes=65500 time=65ms TTL=64
Reply from 192.168.1.1: bytes=65500 time=67ms TTL=64
Reply from 192.168.1.1: bytes=65500 time=62ms TTL=64
Request timed out.
Reply from 192.168.1.1: bytes=65500 time=64ms TTL=64
Reply from 192.168.1.1: bytes=65500 time=64ms TTL=64
Reply from 192.168.1.1: bytes=65500 time=63ms TTL=64
Reply from 192.168.1.1: bytes=65500 time=60ms TTL=64
Reply from 192.168.1.1: bytes=65500 time=61ms TTL=64
Reply from 192.168.1.1: bytes=65500 time=64ms TTL=64
Reply from 192.168.1.1: bytes=65500 time=62ms TTL=64
Reply from 192.168.1.1: bytes=65500 time=62ms TTL=64
Reply from 192.168.1.1: bytes=65500 time=60ms TTL=64
Reply from 192.168.1.1: bytes=65500 time=62ms TTL=64
Reply from 192.168.1.1: bytes=65500 time=63ms TTL=64
Reply from 192.168.1.1: bytes=65500 time=62ms TTL=64
Reply from 192.168.1.1: bytes=65500 time=62ms TTL=64
Reply from 192.168.1.1: bytes=65500 time=61ms TTL=64
```

What does a cyber attack look like?

- Assault on Infrastructure
- Assault on Economy²



2) "The Tragic Cost of Google Pac-Man – 4.82 million hours « RescueTime Blog." RescueTime Blog.
<http://blog.rescuetime.com/2010/05/24/the-tragic-cost-of-google-pac-man-4-82-million-hours/> (accessed November 2, 2010).



YouTube

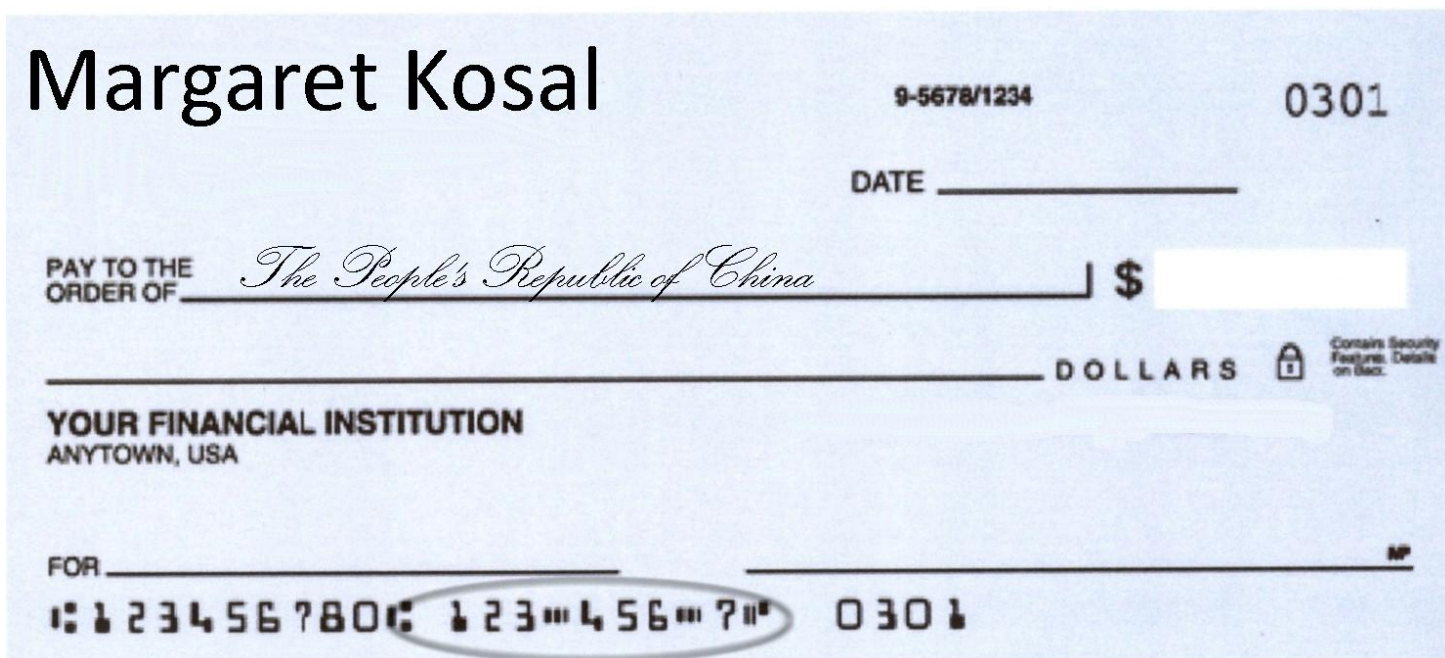


0:00 / 4:47



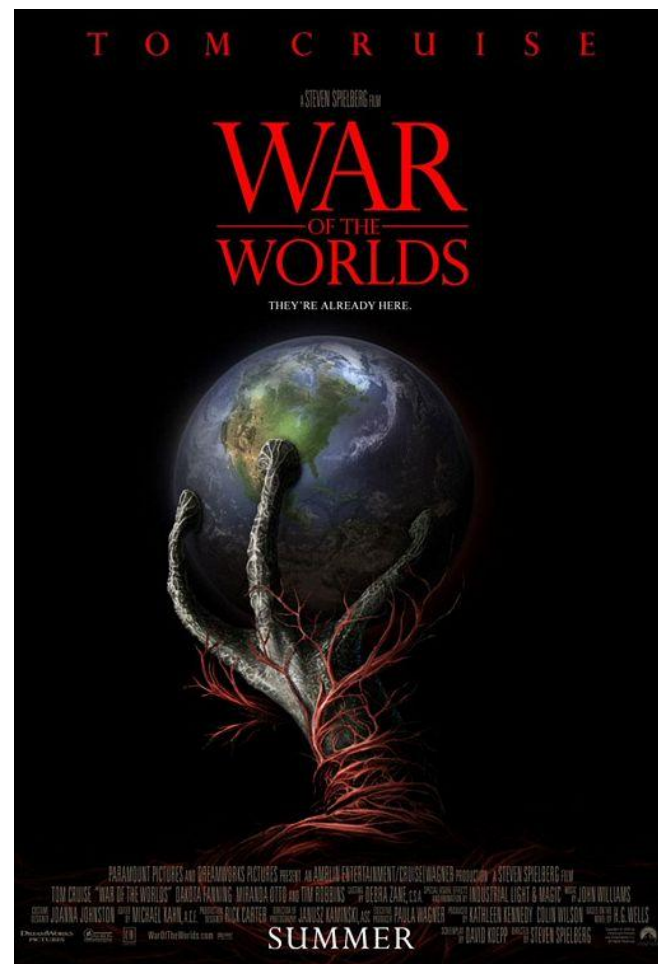
What does a cyber attack look like?

- Assault on Infrastructure
- Assault on Economy
- Assault on Financial Security



What does a cyber attack look like?

- Assault on Infrastructure
- Assault on Economy
- Assault on Financial Security
- Assault on Personal Security



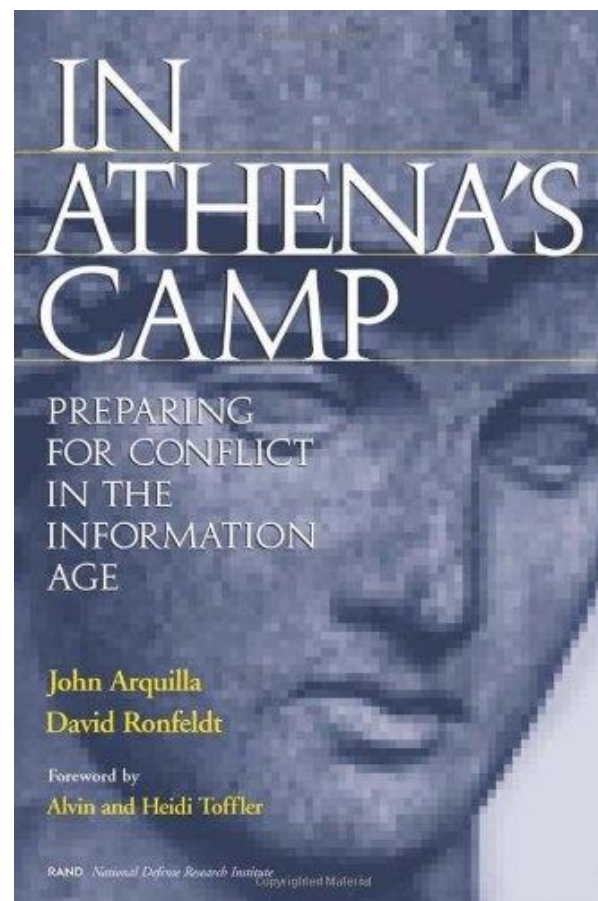
Two Sides of a Cyber War

Offense	Defense
<p>Viruses, Worms, Trojans DDOS, Spam SQL Injection Negotiated Hardware Cold Booting Social Engineering Man-in-the-Middle Proxies</p>	<p>Firewalls Filters Smarter Code Trusted Access Program Physical Security User Education Network Security Audits Network Forensics ...Deterrence?</p>

Where does this come from?

- Athena³
- Mongol Hordes⁴
- Clausewitz⁵

- And in modern times?



3) Arquilla, John, and David Ronfeldt. "A New Epoch--and Spectrum--of Conflict." In *In Athena's Camp: Preparing for Conflict in the Information Age*. Santa Monica: Rand Corporation, 1997. 1-22.

4) Ibid.

5) Clausewitz, Carl Von. "16." In *On War*. 1832. Reprint, Princeton: Princeton University Press, 1989. 86-92.

Has it happened before?

- Russian attack on Estonia – 2007
 - The Problem of Attribution
 - Article V
- Russian attack on Georgia – 2008
 - Attribution again
- Gazan attack on Israel – 2009
 - Cyberwar or Cyberterrorism?

Who runs this show?

- Defense Information Systems Agency
- National Security Agency
- USCYBERCOM



Who runs this show?



“USCYBERCOM plans, coordinates, integrates, synchronizes, and conducts activities to: direct the operations and defense of specified Department of Defense information networks and; prepare to, and when directed, conduct full-spectrum military cyberspace operations in order to enable actions in all domains, ensure US/Allied freedom of action in cyberspace and deny the same to our adversaries.”

What is the future of cyber warfare?

- For the U.S. military?
- For the rest of the World?
- Can it be deterred?