

# Seventeen Years -- Network Security Is Even Worse Than A Plague Of Locusts

An epilogue to RFC 1281 “Guidelines for the Secure Operation  
of the Internet”

Barbara Fraser  
Stephen Crocker

# 1991: The Internet Wasn't What It Is Today

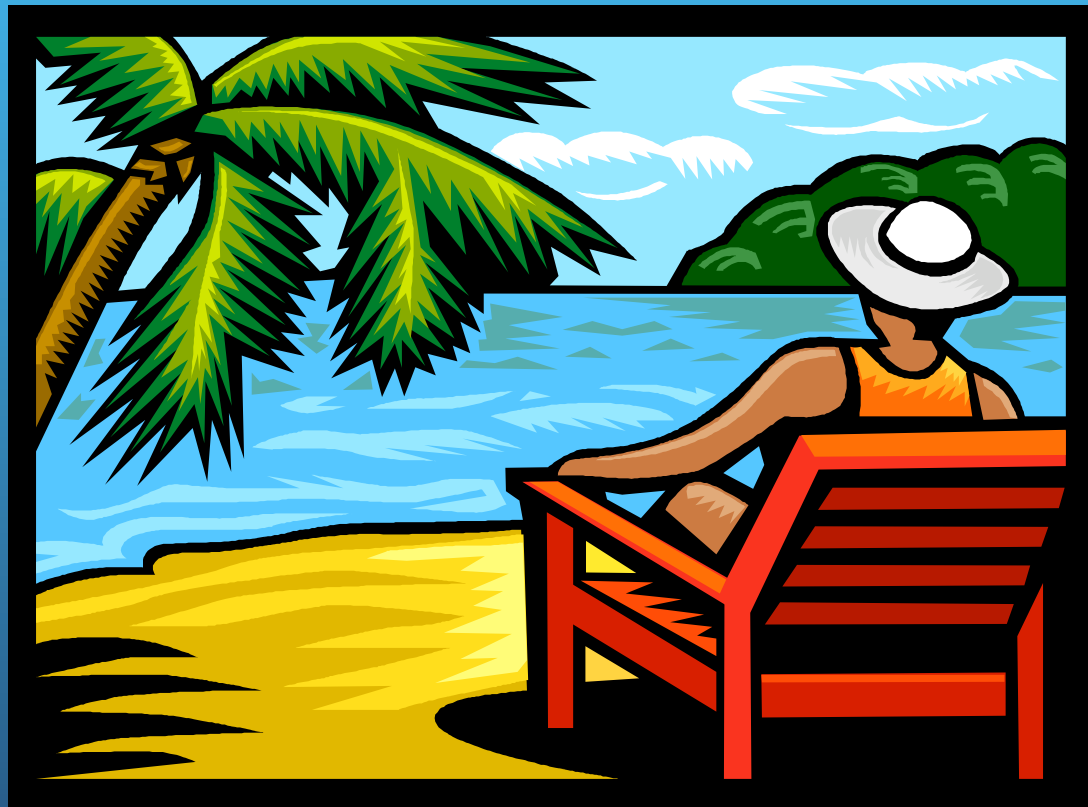
- 1 million host computers
- Personal computers not widely used
- No world wide web yet
- No Internet cafes
- No e-commerce
- Packet-filtering firewalls in their infancy
- Fairly easy to track down who was sending packets

# The Internet Was A Friendly Place

- A largely cooperating community of Internet service providers, private network operators, users and vendors



# Security Problem... Then



# RFC 1281- Our Advice

- Users are individually responsible for understanding and respecting the security policies of the systems (computers and networks) they are using. Users are individually accountable for their own behavior
- Users have a responsibility to employ available security mechanisms and procedures for protecting their own data. They also have a responsibility for assisting in the protection of the systems they use.
- Computer and network service providers are responsible for maintaining the security of the systems they operate. They are further responsible for notifying users of their security policies and any changes to these policies.

# Our Advice - Cont.

- Vendors and system developers are responsible for providing systems which are sound and which embody adequate security controls.
- Users, service providers, and hardware and software vendors are responsible for cooperating to provide security.
- Technical improvements in Internet security protocols should be sought on a continuing basis. At the same time, personnel developing new protocols, hardware or software for the Internet are expected to include security considerations as part of the design and development process.

# Report Card

- Many studies:
  - 3 National Academy of Sciences reports on cybersecurity
  - US government presidential directives
  - Other international efforts
- The threat is real and growing
- Continuing discoveries of new vulnerabilities
- Continuing and increasing reliance on Internet
- Security means different things to different people
- Increased size and complexity
- Decreased knowledge level

# Exploits Not Just For Fun Anymore

Current Rank	Previous Rank	Goods and Services	Current Percentage	Previous Percentage	Range of Prices
1	2	Bank accounts	22%	21%	\$10-\$1000
2	1	Credit cards	13%	22%	\$0.40-\$20
3	7	Full identities	9%	6%	\$1-\$15
4	N/A	Online auction site accounts	7%	N/A	\$1-\$8
5	8	Scams	7%	6%	\$2.50/week-\$50/week for hosting, \$25 for design
6	4	Mailers	6%	8%	\$1-\$10
7	5	Email addresses	5%	6%	\$0.83/MB-\$10/MB
8	3	Email passwords	5%	8%	\$4-\$30
9	N/A	Drop (request or offer)	5%	N/A	10%-50% of total drop amount
10	6	Proxies	5%	6%	\$1.50-\$30

Source: Symantec Internet Security threat Report 2008



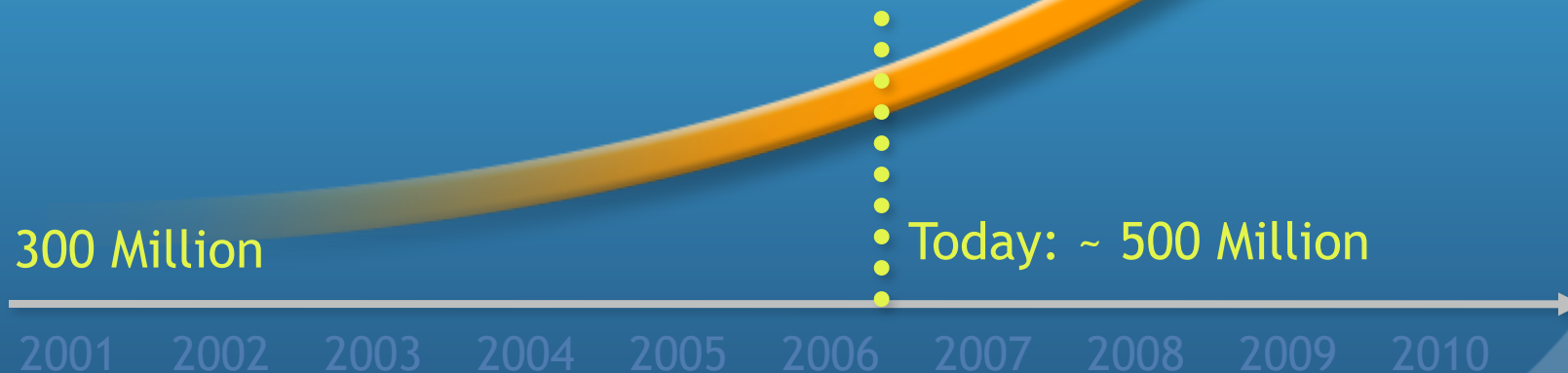
# Increased Mobility

- Roughly 40% of all Internet users worldwide currently have mobile Internet access.
- The number of mobile Internet users will reach 546 million in 2008
- More than 1.5 billion worldwide in 2012.

# Everything Will Be Connected

14 billion devices will be connected to the Internet by 2010

14 Billion

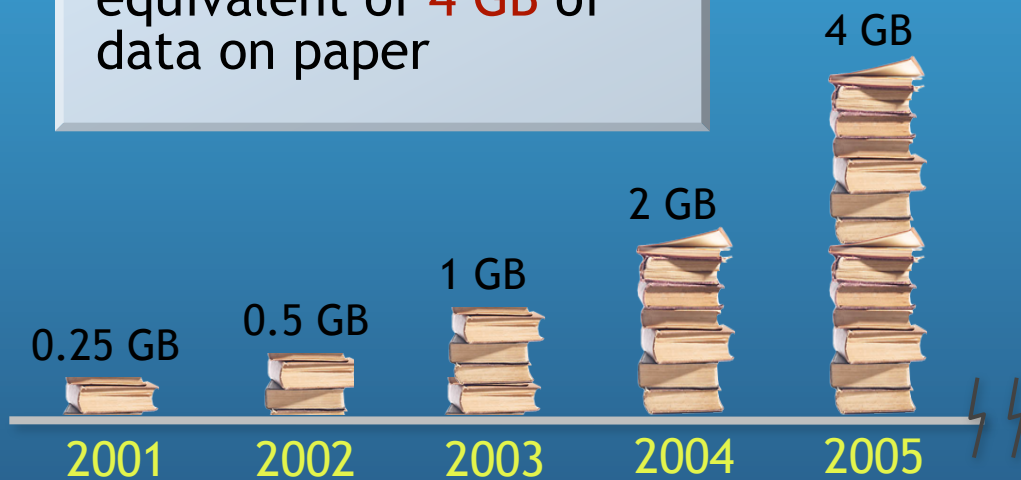


Source: Forrester Research, Inc. , "The X Internet," May 2001

# Information Explosion

Stored Data Doubles Each Year

It would take **150 feet** of books to store the equivalent of **4 GB** of data on paper



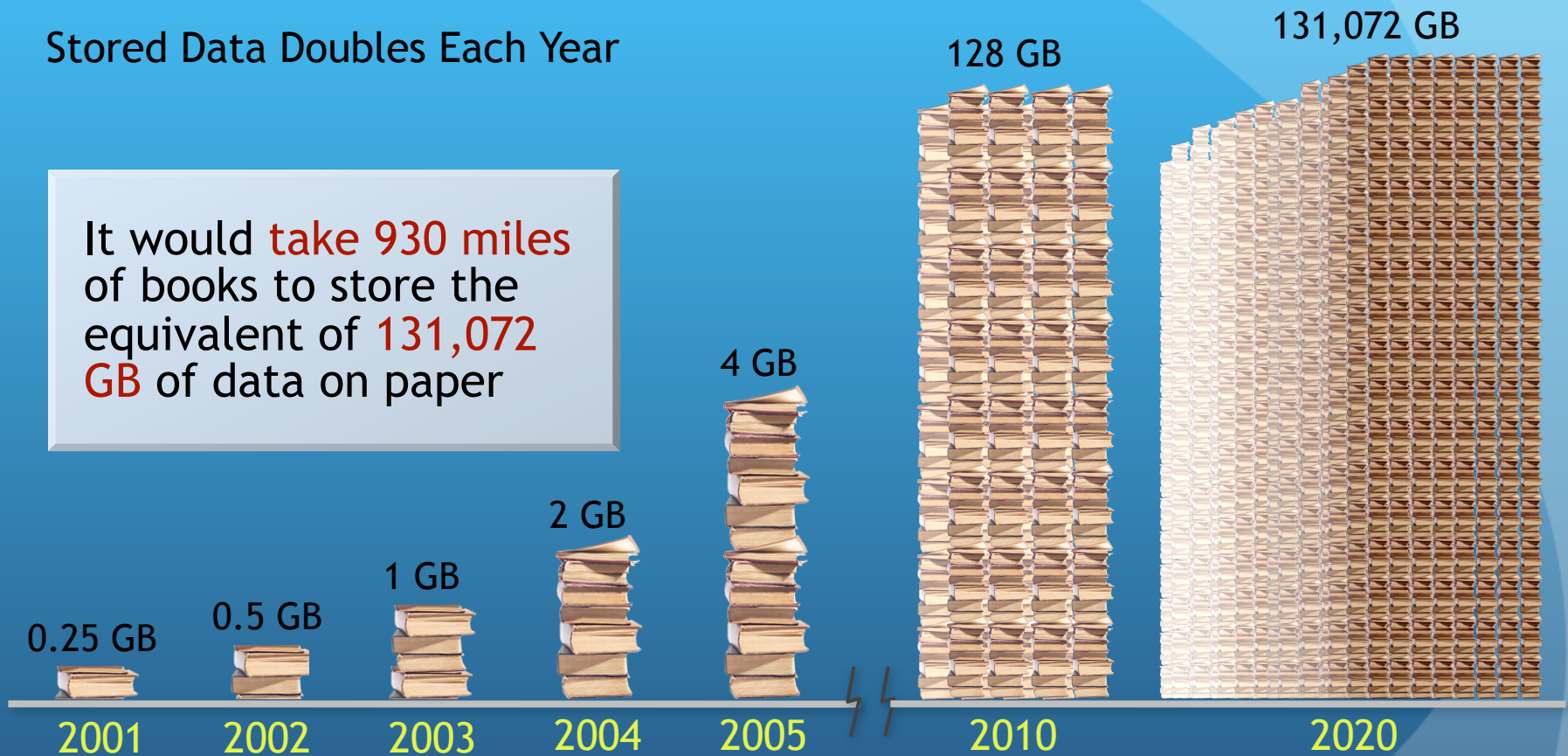
Information Stored Per Person Worldwide

Sources: ExtremeTech, July 2003; University of California at Berkeley, 2003

# Information Explosion

Stored Data Doubles Each Year

It would **take 930 miles** of books to store the equivalent of **131,072 GB** of data on paper



Information Stored Per Person Worldwide

Sources: ExtremeTech, July 2003; University of California at Berkeley, 2003

# Security Problem Now...



# Going Forward

- Traffic coming into the Internet must be identifiable according to its source
- Reliable identification and authentication of end points is essential
- Devices that are easily taken over by predators are inherently dangerous and need to be identified and given separate treatment.
- Internet security is a global issue, not solely a national problem. The legal and law enforcement framework has to evolve to deal with threats and misbehavior from all quarters.
- Solutions based on partitioning the Internet, and identification of selected “critical” resources are insufficient. Rather, solutions are needed that are applicable across the entire Internet and promote adoption through a virtuous cycle

# On Cue - CSIS Commission

CSIS = Center for Strategic and International Studies

1-1/2 year study (“commission”) on cybersecurity  
fashioned as “advice to the 44<sup>th</sup> president”

Bi-partisan so as to apply to whomever was elected

Report issued this week:

Securing Cyberspace for the 44th Presidency

- A Report of the CSIS Commission on Cybersecurity for the 44th Presidency

# CSIS Recommendations

- All of ours
- High level government attention
- Regulation!
  - Require government and contractors to networks with secured protocols
- Federal purchasing power
  - Acquisition
  - R&D
- International cooperation



We look forward to seeing  
you in another 17 years -  
will security still be worse  
than a plague of locusts?