
What can Technologists learn from the History of the Internet?

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Munich Center for Internet Research
September 22, 2016

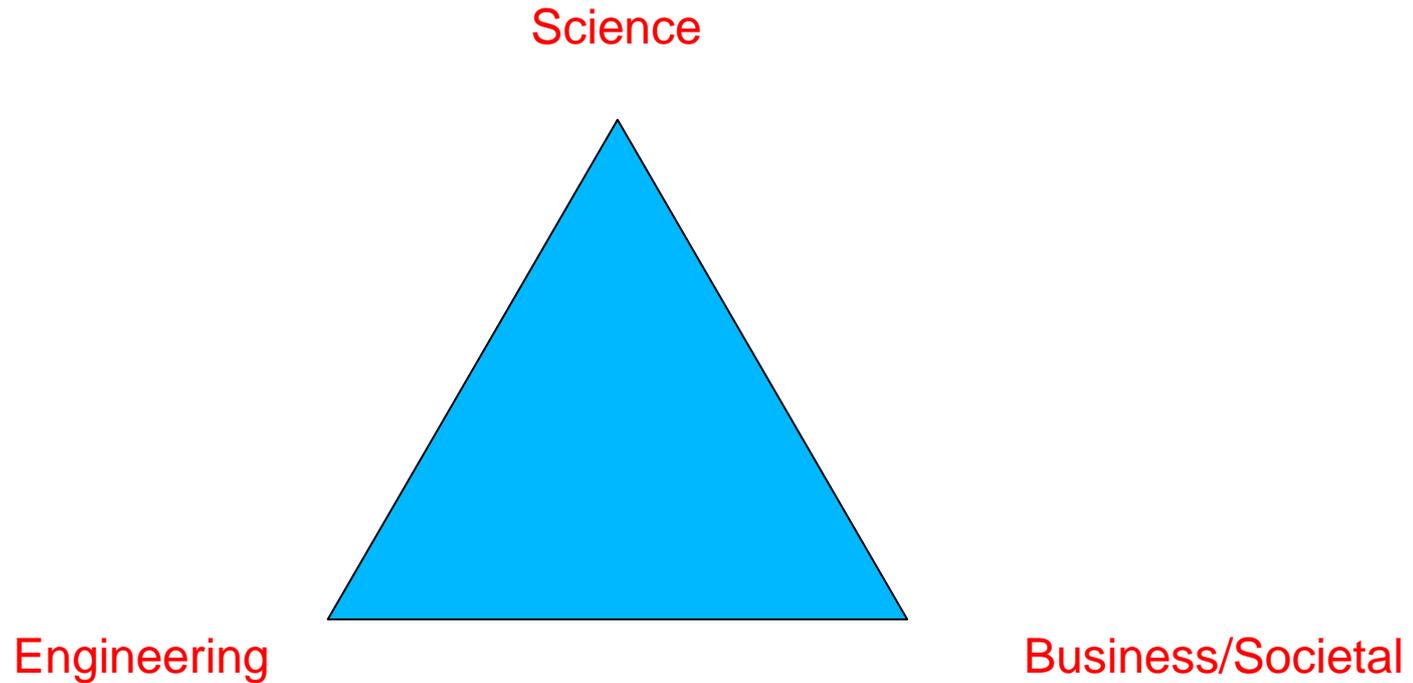
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What can **Security** Technologists learn from the History of the Internet?

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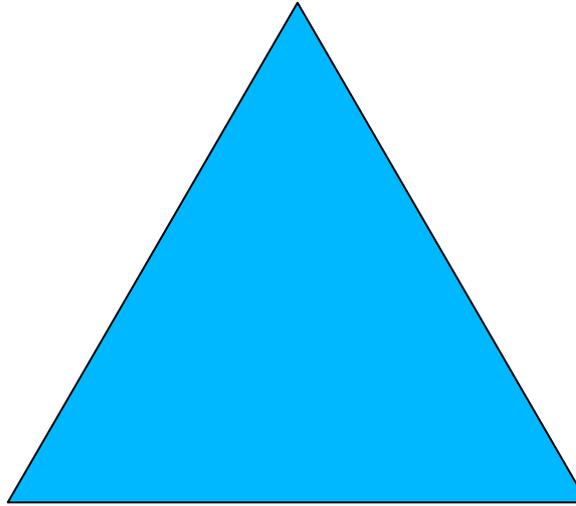
Cyberspace Characteristics

- Entirely human-made
- Evolves rapidly and unpredictably
- Subject to physical, mathematical and technological laws/heuristics

Science

Traditional science explains the cause of observed phenomenon

Cyber science facilitates the construction of future systems

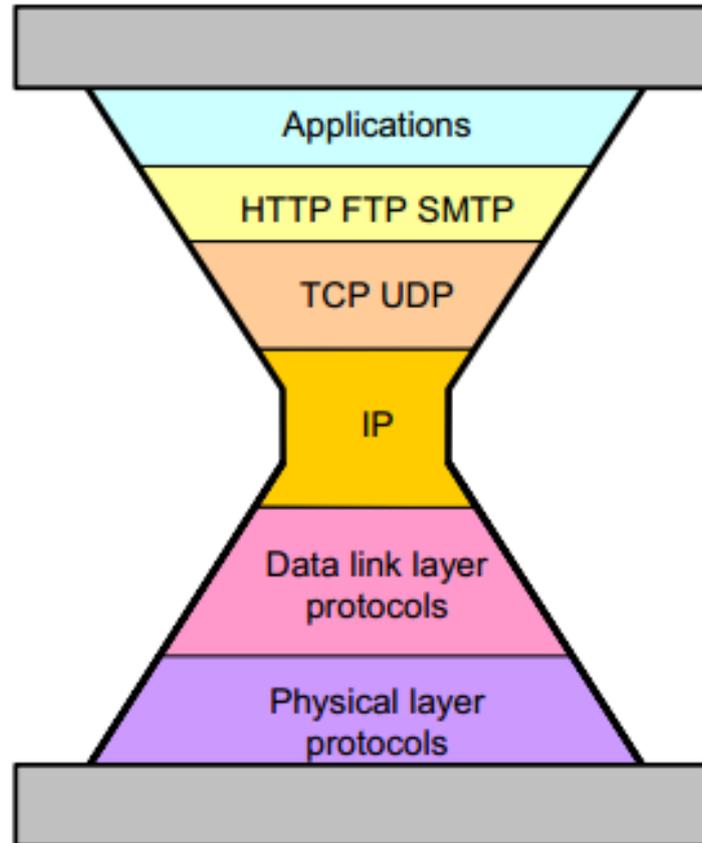


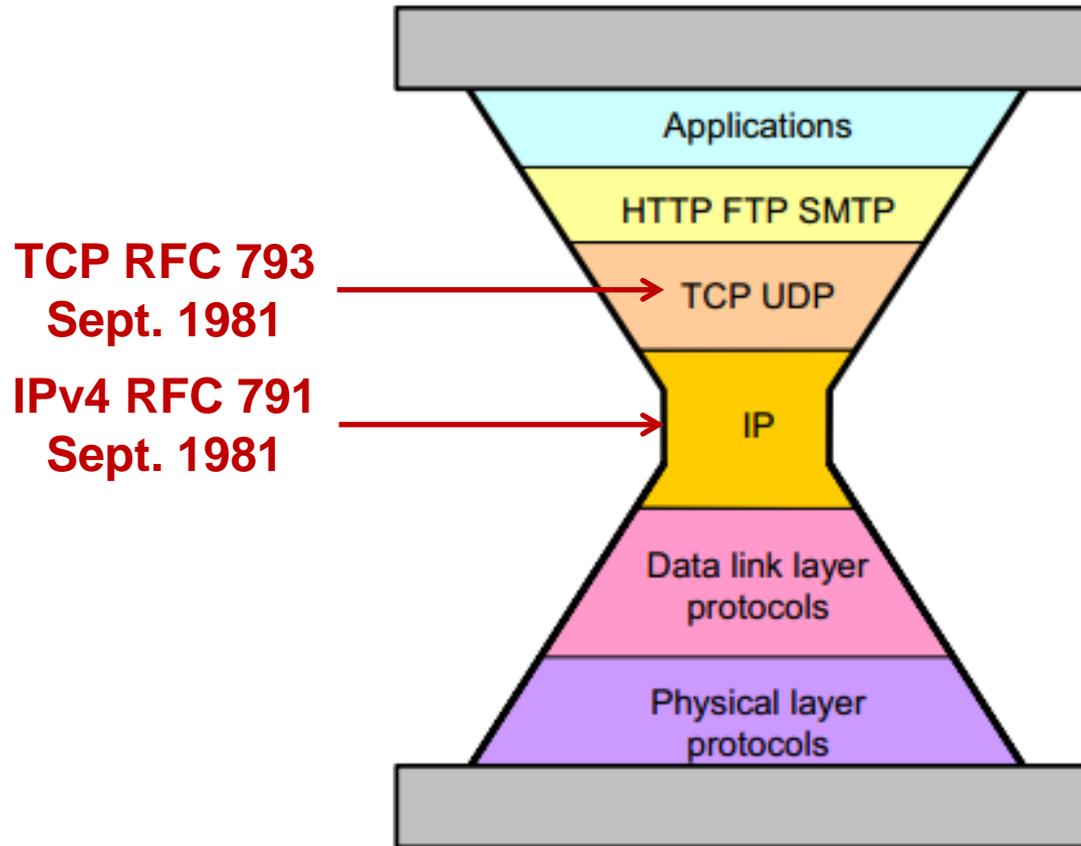
Engineering

Business/Societal

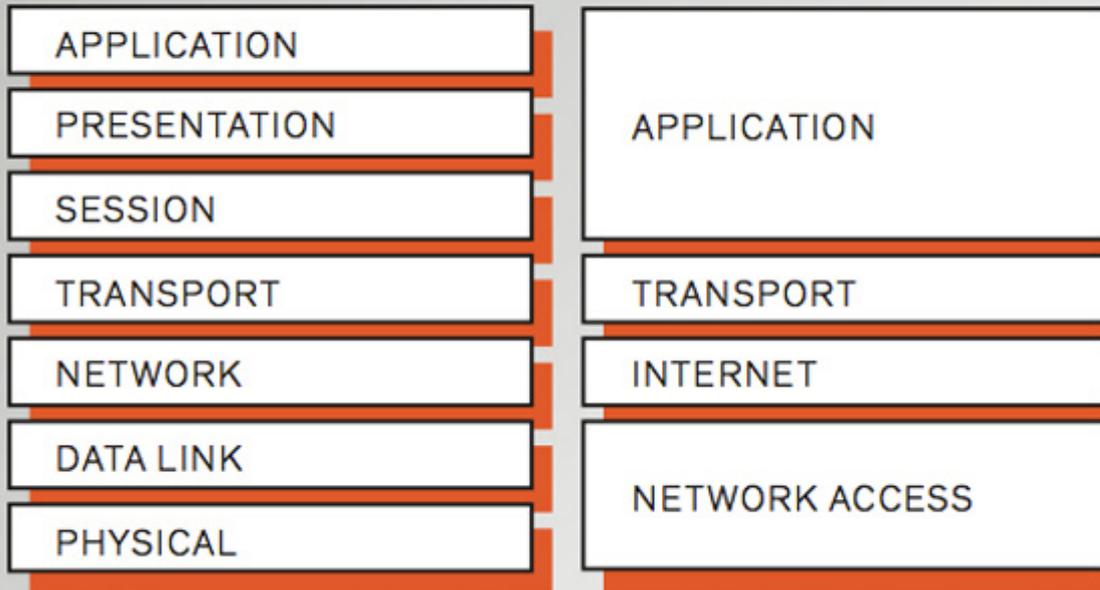
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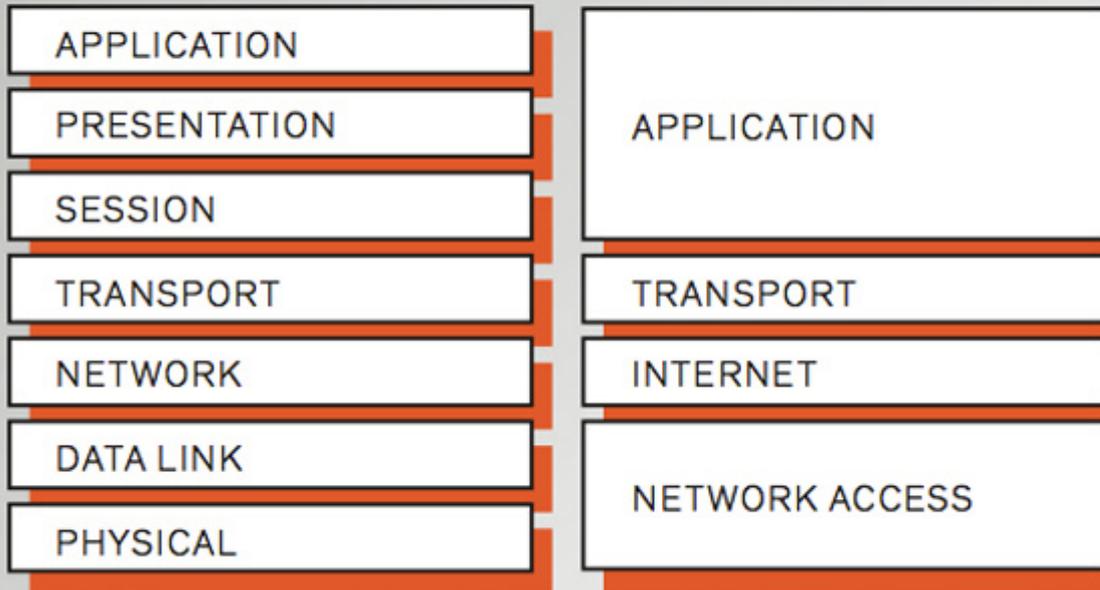


OSI vs. TCP/IP



A TCP/IP based Internet was not inevitable. The Internet was supposed to be OSI based.

OSI vs. TCP/IP



TCP and IP have several well known deficiencies but are unlikely to disappear soon IPv6 not withstanding

➤ Agility trumps perfection

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Not quite the same as

➤ Good enough trumps perfect

Agility =

Good enough for now

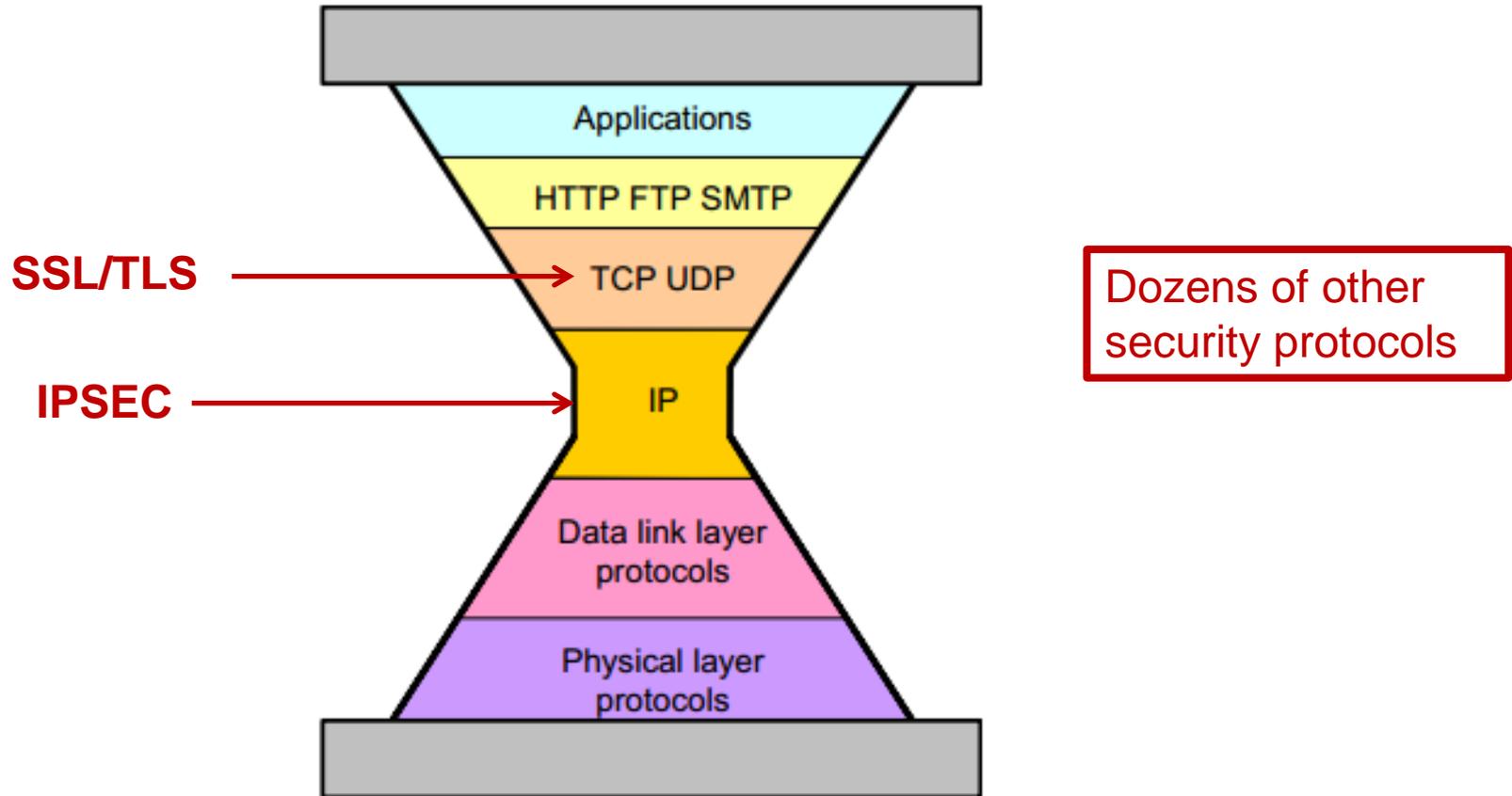
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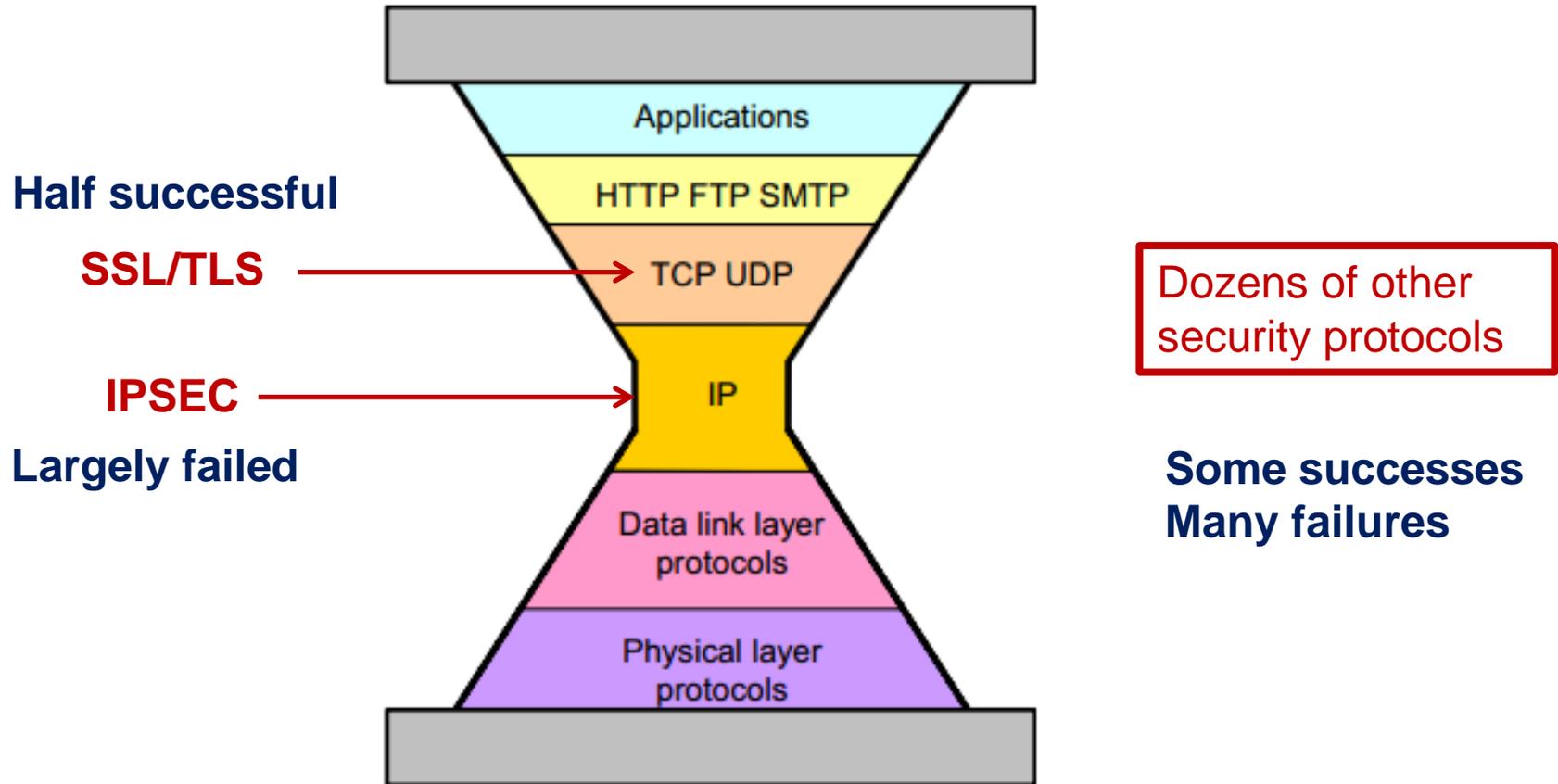
Future-proof for uncertain future

ALLOW GOOD GUYS IN KEEP BAD GUYS OUT

- IP Spoofing predicted in Bell Labs report ≈ 1985
- Unencrypted Telnet with passwords in clear
- 1st Generation firewalls deployed ≈ 1992
- IP Spoofing attacks proliferate in the wild ≈ 1993
- Virtual Private Networks emerge ≈ late 1990's
- Vulnerability shifts to the client PC
- Network Admission Control ≈ 2000's

- **Persists as a Distributed Denial of Service mechanism**
- **Most of these fixes have not changed or extended IPv4**

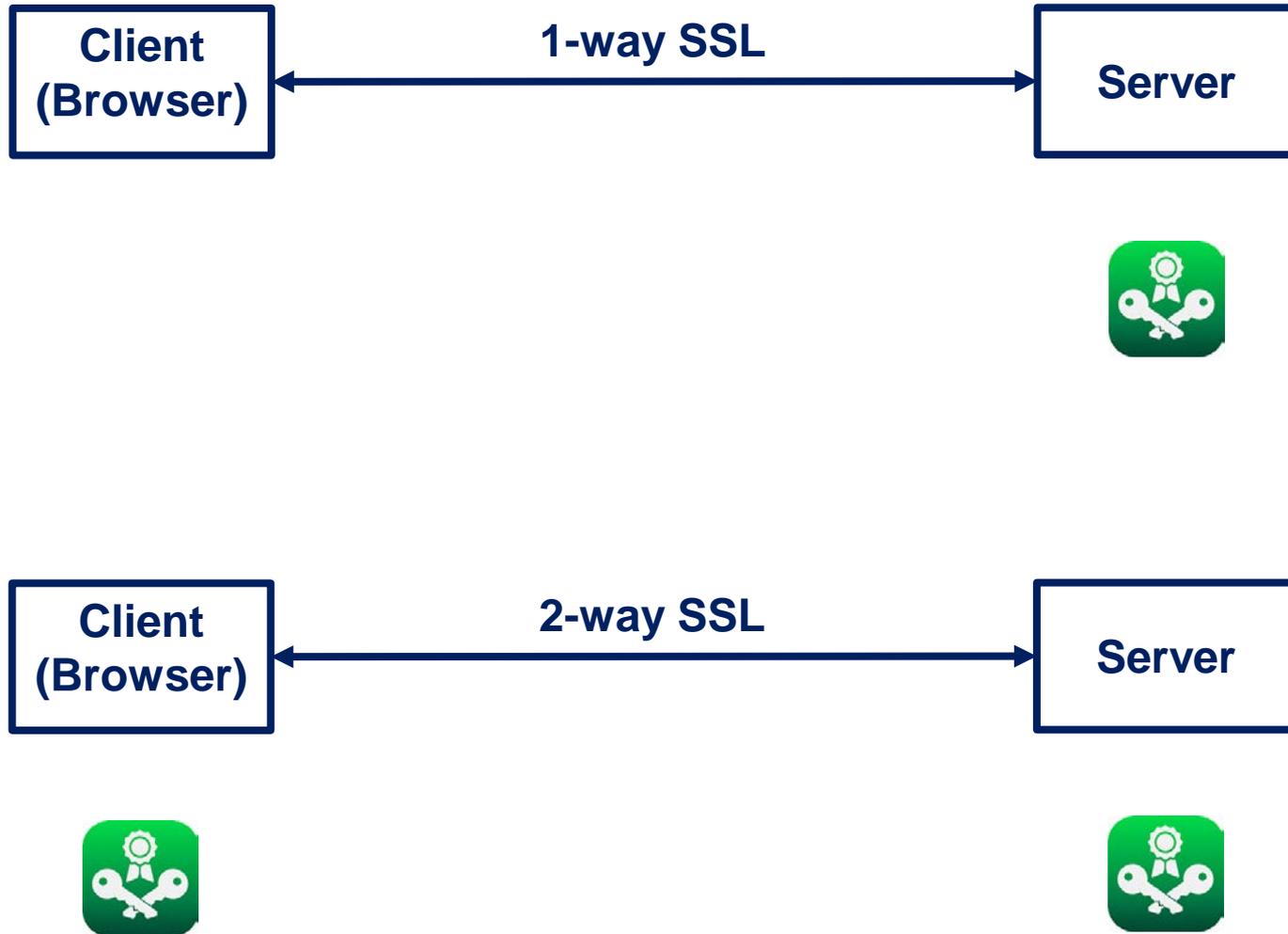


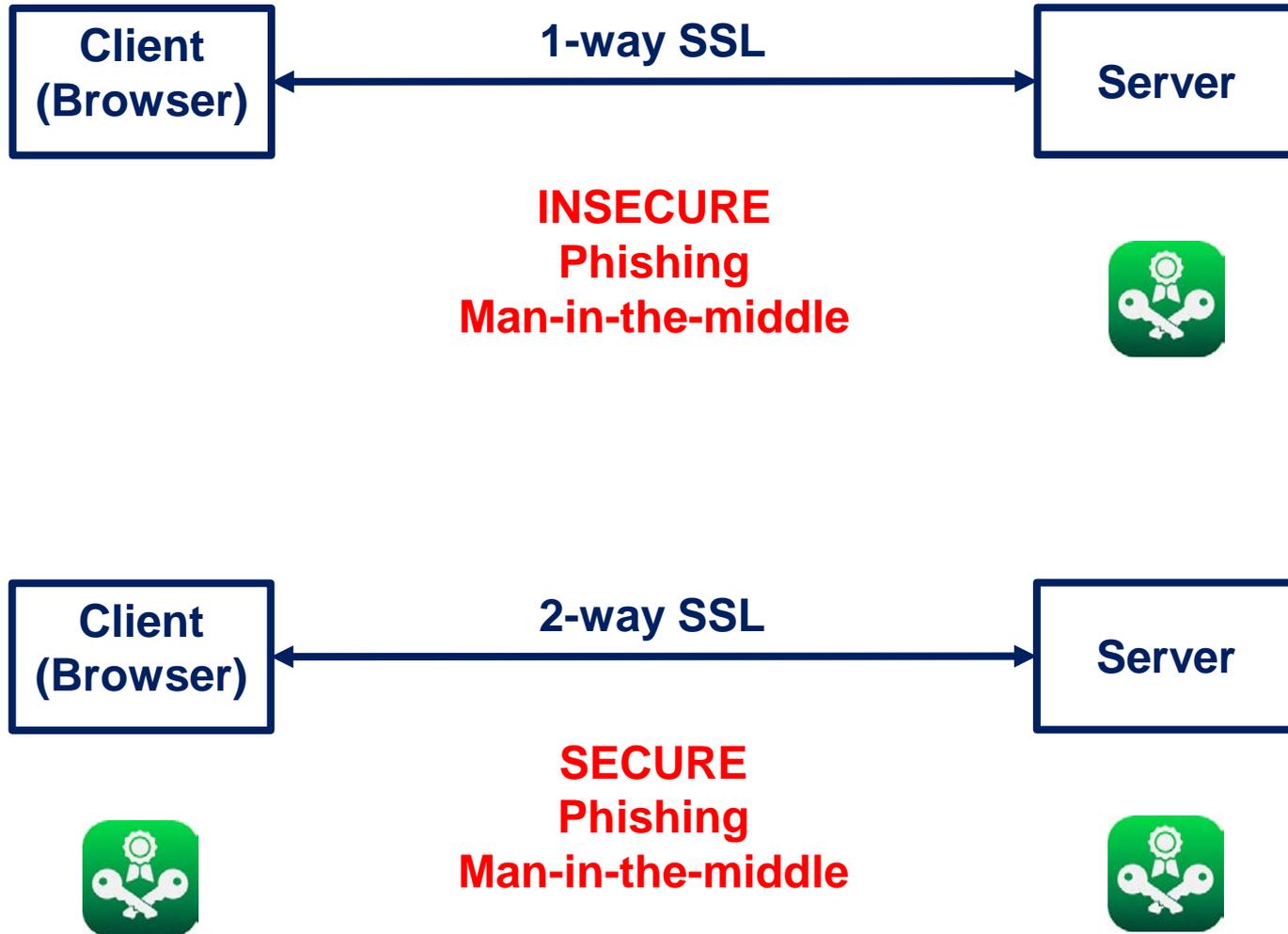


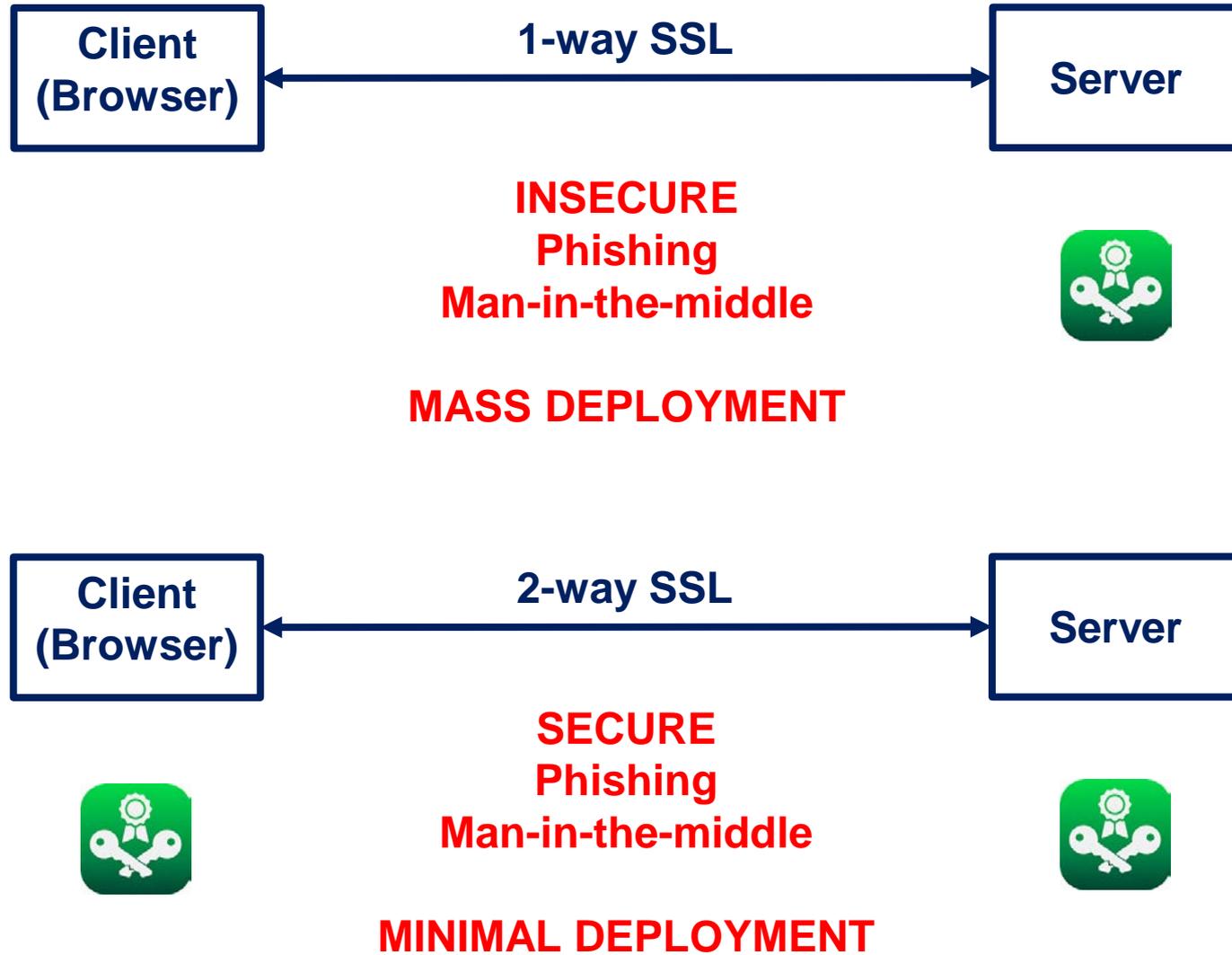
SSL Lock Icon Evolution by Browser

IE	 v5,6	 v7,8	 v9	
Firefox:	 v2	 v3,4 osx	 v3,4 win	 v3,4 linux
Chrome:				
Safari:	 osx	 win		
Opera:				
Konqueror:				

<http://elie.im/blog/>







- Client-less trumps client-full
- Start-ups (SSL) trump committees (IPSEC)

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- Client-less trumps client-full
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