Protection of a Communication Based Train Control System from Hackers

Aspect 2019, Delft, the Netherlands

Ir Henry CHEUNG, IRSE Hong Kong
Mr K W PANG, IRSE Hong Kong

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What is Cyber Security?

- Protection of computer systems, networks and software from unwarranted access by a third party

Graphics courtesy of securityintelligence.com

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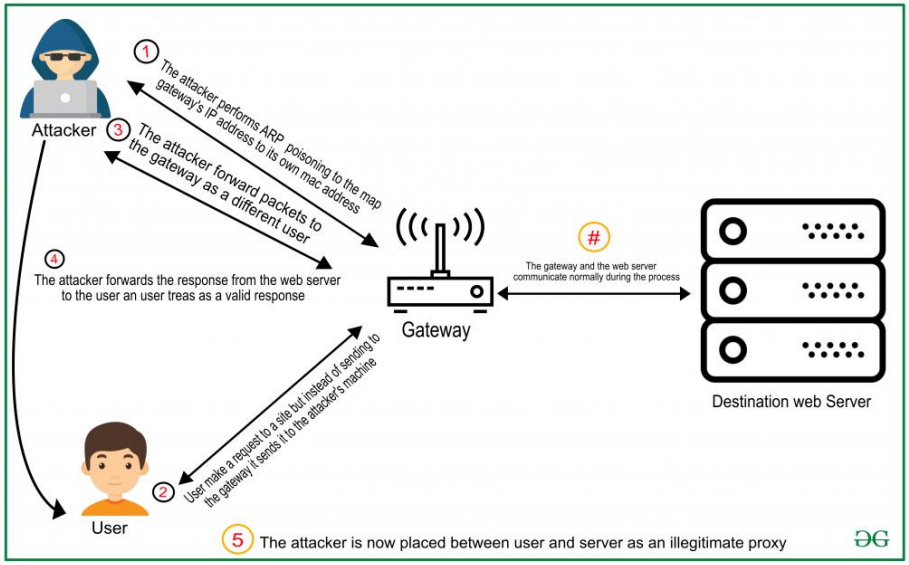
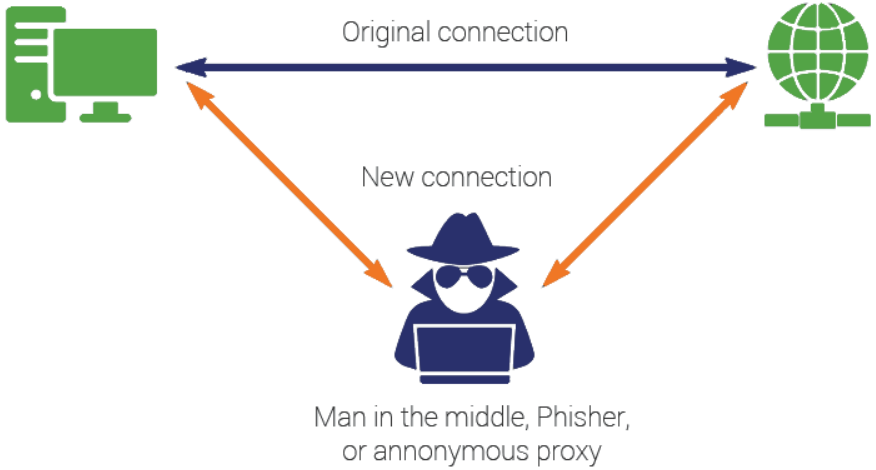
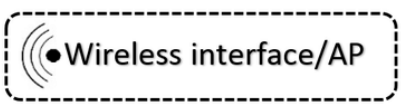
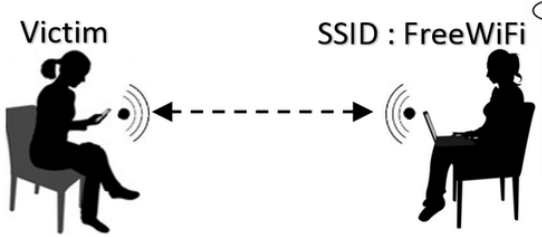
Cyber Attack from Wi-Fi Access









Graphics courtesy of ResearchGate.org

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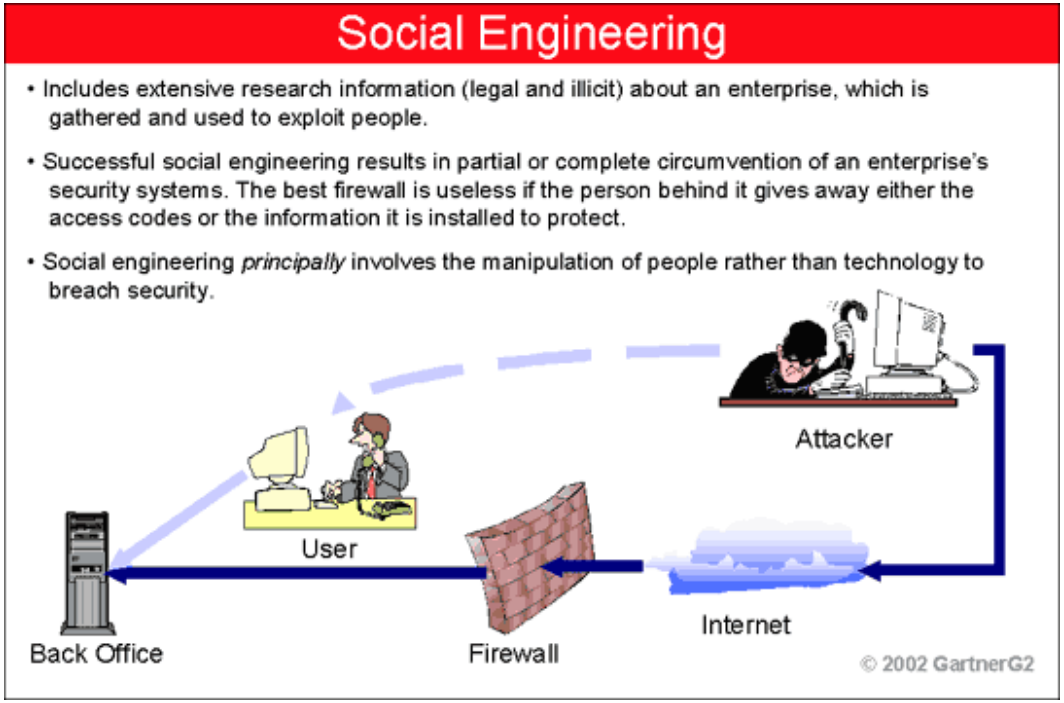
Social Engineering

- A demonstration at Dev Con in Las Vegas (an annual hackers conference) showed that it took 2 minutes to gain access to a mobile phone account by a simple call to the customer service centre, using techniques of social engineering



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Ransomware and Malware

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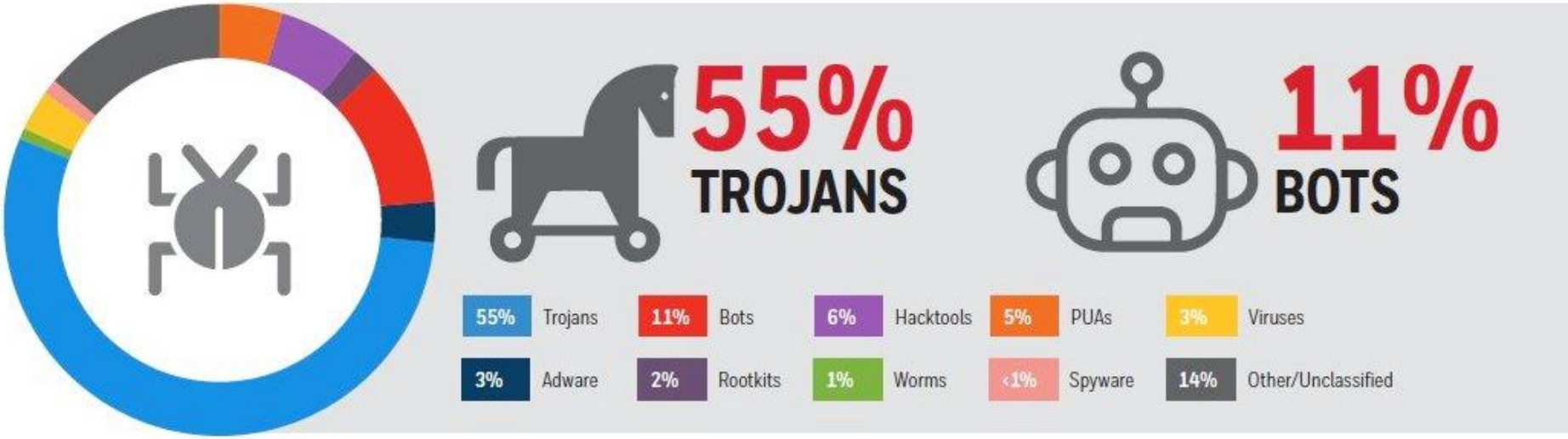
Removable Media



Graphics courtesy of automationworld.com

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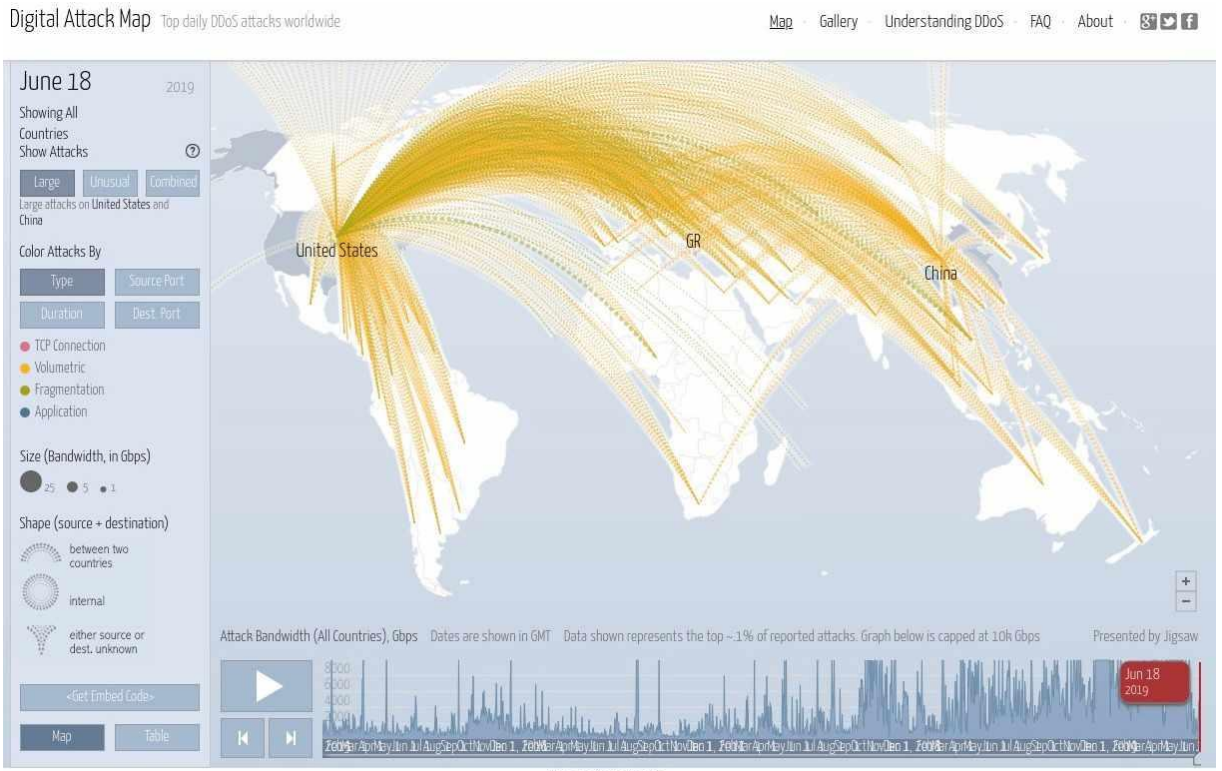
Distributed Denial of Service

- To prevent legitimate users from accessing the system or network services



Source: securitytrail.com

Cases of Cyber Attack on Railway Network

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Hackers access accounts of 1,000 Great Western Railway customers

The business says there was no successful intrusion into its network but that attackers seemed to have access to users' passwords.

Wednesday 11 April 2018 15:21, UK

About 1,000 customer accounts were accessed. Pic: Great Western Railway

Cyber attack hits Danish rail network

File photo: Henning Bagger/Ritzau Scanpix

Danish state rail operator DSB was the victim of an unprecedented DDoS cyber confirmed on Monday.

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Cyber Security Framework

Prioritizing the scope → Orienting the organization → Creating a current profile → Conducting a risk assessment → Creating a target profile → Determining, analyzing and prioritizing any gaps → Implementing an action plan

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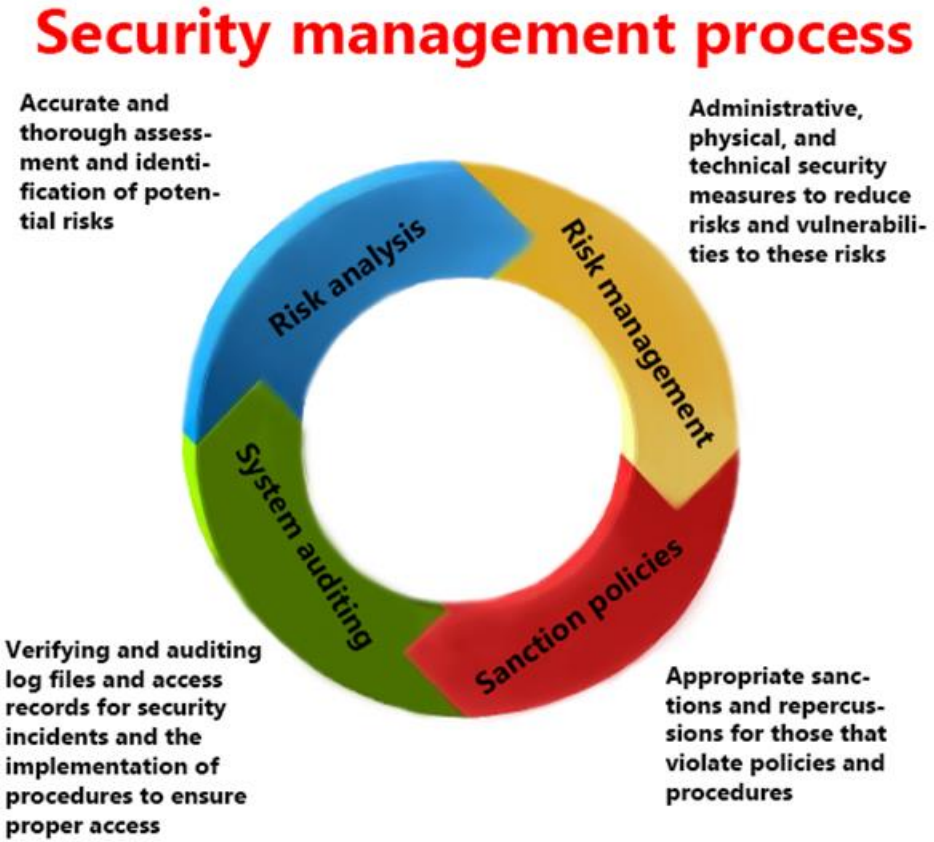
CBTC System Design with Cyber Security Principles

- CBTC are now connected to many other railway systems such as PIDS, CCTV, and radio – potential cyber entry point
- Similarity to system safety approach
- Risk based and structured
- Common standard within industry?

Management and Operations



Source: itgovernance.co.uk and jarvislab.com

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Thank You