CE0973a - Issues in Network Security
4: Attacks and Defences

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Attacks

Attacks can generally be classified according to the CIA trio:

- C – Data compromise
- I – Defacement/impersonation
- A – Volumetric/DoS

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Goal: overwhelm some critical component, disabling service, usually via amplification

- Ping – directed broadcast "smurf attack"
- DNS[1]
- DNSSEC[2] - 50:1
- NTP[3]

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Open resolvers

Google, Verizon and Cisco (OpenDNS) run public open resolvers. How do they secure those?

Defences

- Block directed broadcasts, DNS etc
- Rate-limiting
- Anti-spoofing: reverse-path filter
- ISP BCP: disallow spoofed traffic
- BGP blackholing: block specific abuse sources

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DDoS case studies

- CloudFlare links earlier
- Janet attack[4]
- Andrews & Arnold[5]
- Linode[6]

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- Akamai
- Generally: DNS hosting, geolocation, security issues
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Lab Exercise

Design robust hosting for a company, protected against various attacks. How would you structure this and why?

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- SSL
- Email
- Database
- Backups
- Location of data storage.

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