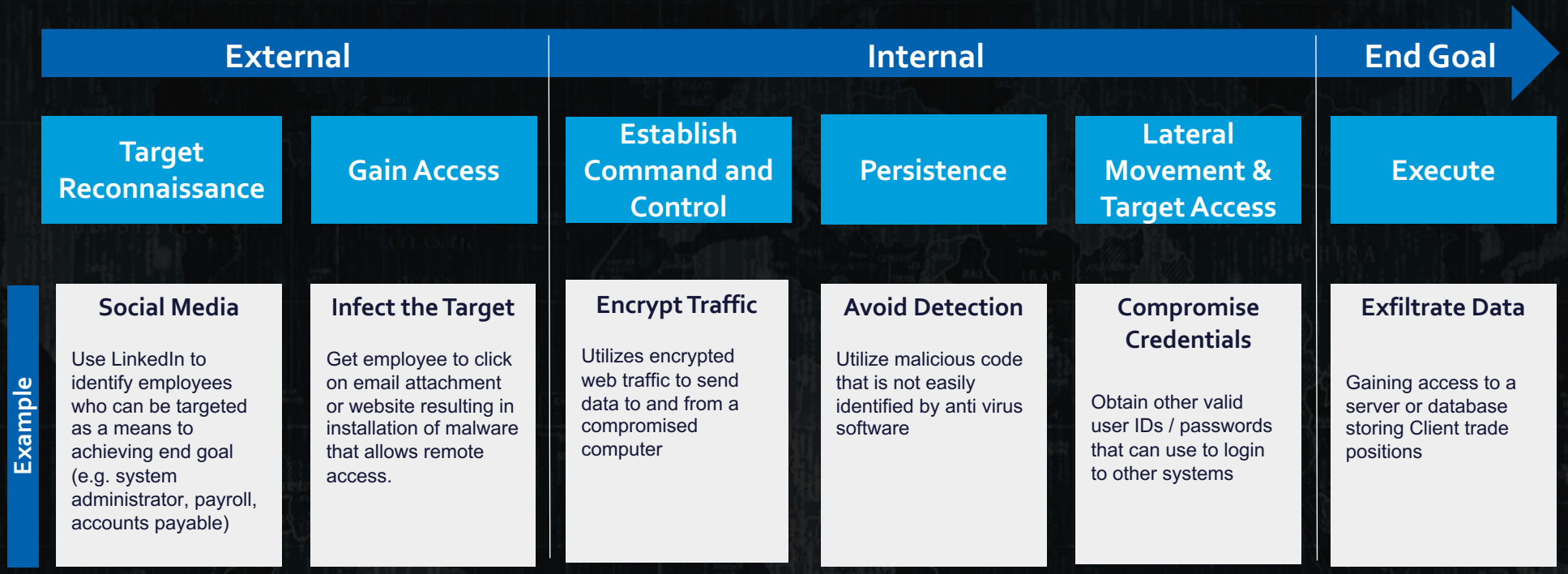
Anatomy of a Cyber Attack

Tactics and techniques span the spectrum of desired outcomes, approaches, and methods



Construct a threat taxonomy and detection/prevention from perspective of cyber actor

Targets, Tactics, and Casualties

Highest yielding assets, most impactful systems

INFORMATION THEFT

Targeted Assets

- Personally Identifiable Information (PII)
- Credit / Debit Card Numbers
- Knowledge Base Authentication (KBA) data
- Material Non-public Information

Methods of Attack

- Aggregate data in dormant storage areas and near to egress points
- Exfiltration through encrypted channels (sftp, https) to help avoid detection
- Malware that encrypts and exfiltrates via outdated protocols (e.g. FTP, SMP)

Notable Attacks / Losses

- Cap One: 100mn ppl • ~$250mn
- Target: 110mn ppl • $300mn
- Marriott: 383mn ppl • $400mn
- Equifax: 147mn people • $1.5Bn
- Sony: digital content • PII • emails

BUSINESS DISRUPTION

Targeted Systems

- External facing websites
- Internal applications and data
- Vendors (esp. cloud services / storage)
- Domain Naming Services (e.g. Akamai, DYN)

Methods of Attack

- Distributed Denial of Service (DDoS) attack that flood websites w. bad traffic
- Ransomware that encrypts hard drives
- Data deletion / corruption
- Low level format hard disk formats
- GPS Spoofing and Jamming

Notable Attacks / Losses

- 2012 Saudi Aramco: 2 month disrupt.
- 2016 DYN: 2 hour internet disruption
- 2017 NotPetya: ~$10bn losses
- 2019 AWS Route 53: 8 hour disruption
- 2017 ~ 2019 various GPS spoofs

PAYMENT FRAUD

Targeted Systems

- Internal Payment Processing Systems (e.g. account payable, wire transfers)
- Central Payment Routing Systems (e.g. SWIFT, SPEI)
- Business Email Compromise (BEC)

Methods of Attack

- Remote Access Trojan (RAT) to take over employee's user account and all of their internal systems access
- Exploit vulnerabilities in proprietary and third party software
- Phishing and impersonation emails to divert payments and payrolls

Notable Attacks / Losses

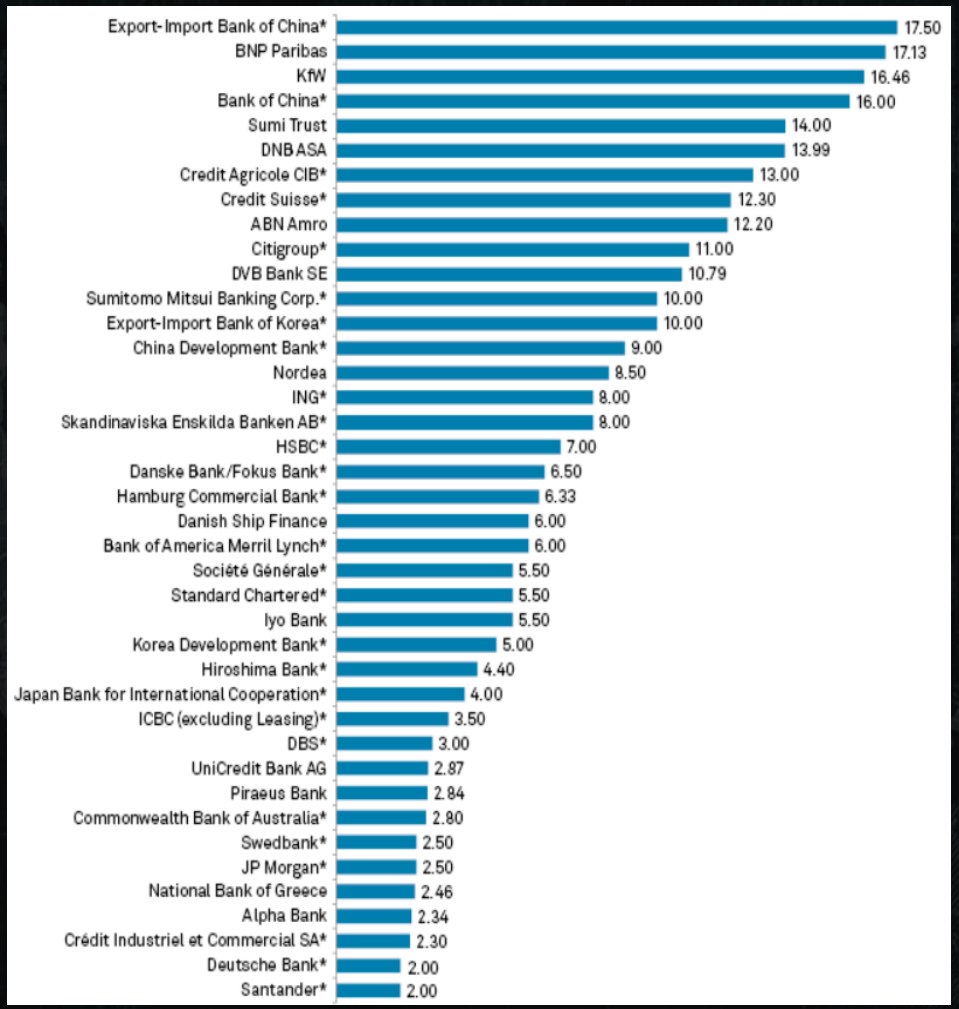
- Bank of Bangladesh SWIFT: $81mn
- Cosmos Bank Payments: $13.5mn
- Mexico SPEI: $15.2mn
- Nikkei BEC: $29mn
- Toyota Boshoku BEC: $37mn

Challenges and Inter-dependencies

Challenges to All Industries

- Constantly evolving adversaries and tactics
- Weakest links
  - Clients
  - Vendors
  - Supply-chain
  - Business Email Compromises (BEC)
- Day zero vulnerabilities with known exploits
- End of Life Software
  - Operating Systems
  - Web infrastructure
  - Software libraries
- Laws and Regulations
  - variances by state / country
  - fines based on revenue (e.g. GDPR)

2018 Global Bank Shipping Portfolios($Bn)



*Market estimates

Source: Petrofin Research

Success Stories

Self Defense

- Multifactor authentication
  - external-facing portals
  - sensitive internal applications
- Virtualization
  - VPNs
  - Citrix applications
- Hygiene
  - Patching
  - End of Life / End of Service
- Specialist Teams
  - Threat Intelligence
  - Vulnerability Management
  - Incident Response Center
  - Hunter
  - Fusion

Financial Services Cooperation

- Industry Consortiums
  - FS-ISAC - incident & vulnblt'y share
  - FS-ARC - stress & resiliency testing
  - FSSCC - DHS coordination
  - FBIIC - US Treasury coordination
  - ORX - anonymized incident share
- Industry Exercises / Frameworks
  - NIST Cybersecurity Framework
  - SIFMA Quantum Dawn
  - Bank of England CBEST
  - MITRE ATT&CK
  - FS-IASC CAPS
  - HKMA CRAF
- SWIFT Out of band Reconciliation