VEDERE LABS

THREAT BRIEFING

Current APT Activities

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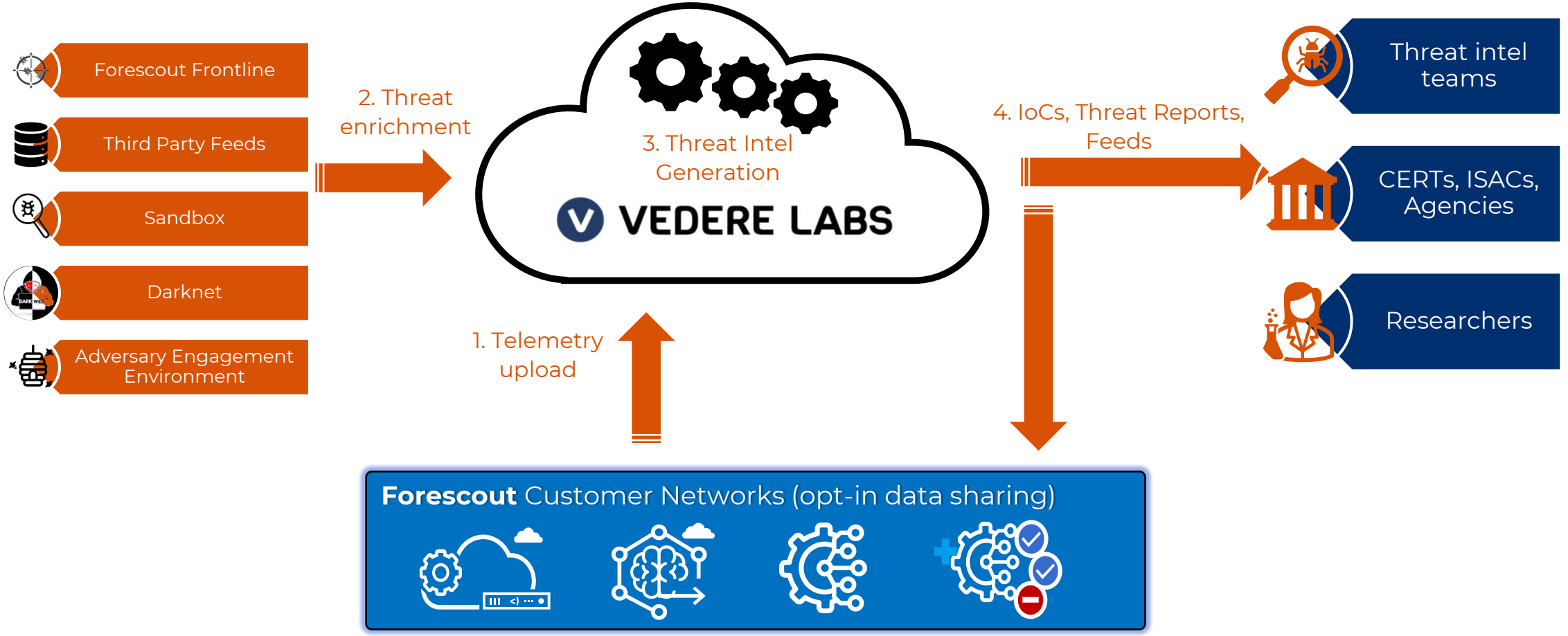
Agenda

1. Data overview – risk & threats
2. Deep dive into APT trends
3. Conclusion

1. Data overview

How we collect data



https://www.forescout.com/research-labs/

Global Cyber Intelligence Dashboard

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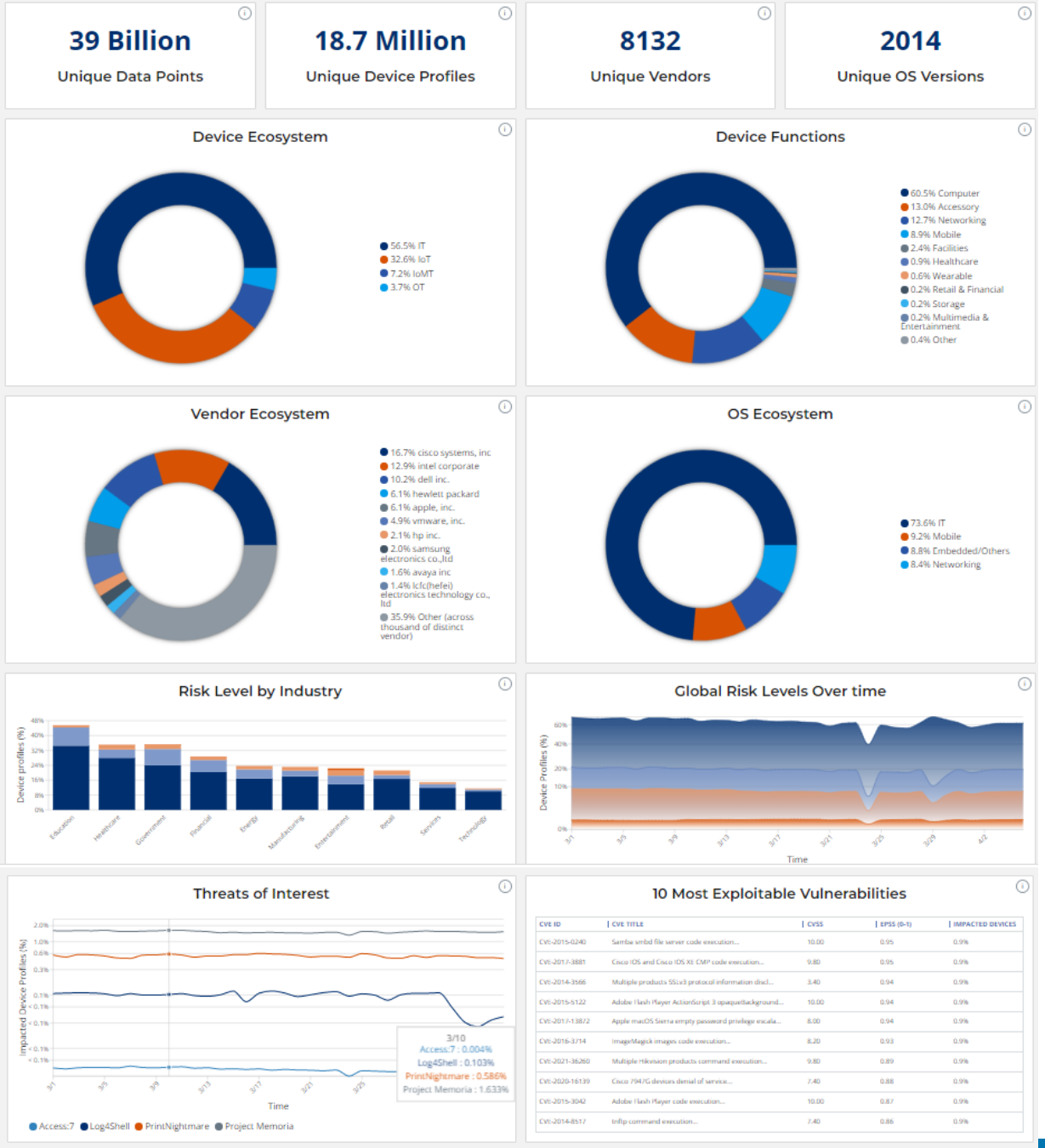


01 Data, a lot of data

Vedere Labs Threat Intelligence is based on **millions of devices** and **billions of data points** that include device configuration and network behavior at **more than 1500 sites** globally

02 Global Risk

We compute the risks for millions of devices by considering multiple factors, including CVEs, exploitability, misconfiguration and misbehavior

03 Global Threats & Vulnerabilities

We monitor the impact of industry threats & vulnerabilities (e.g., Log4Shell) over time

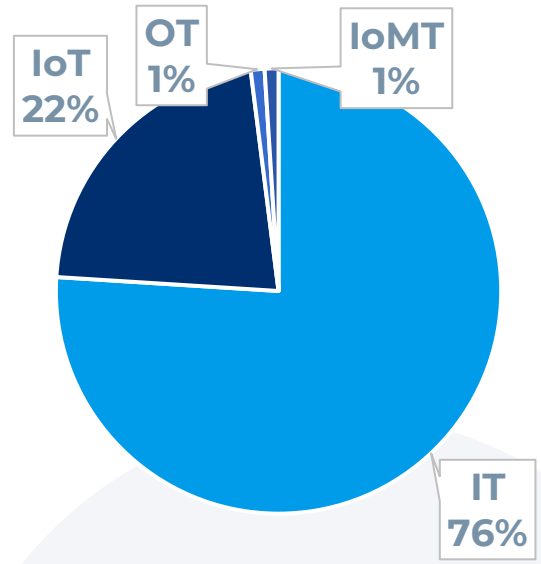
https://dashboard.vederelabs.com/

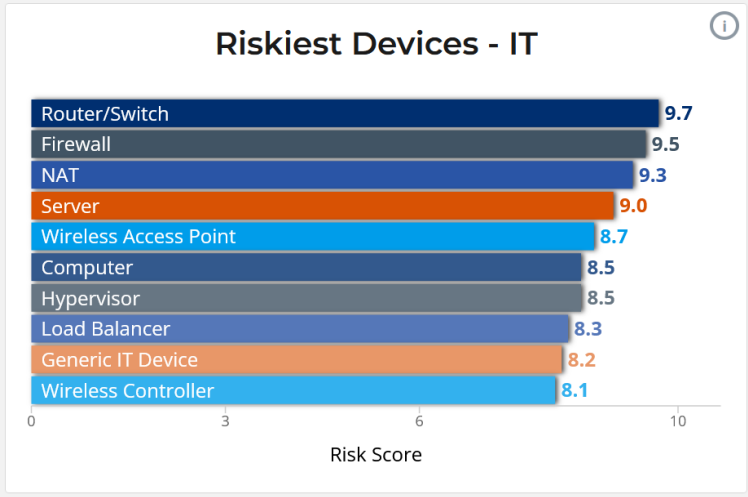
Network risks

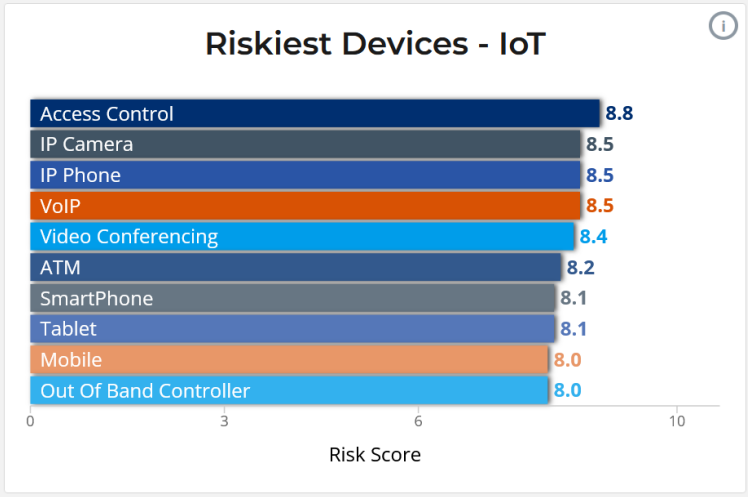
- Data from **18+ million devices** on customer networks
  - 24% of devices are **non-IT**
  - **Major attack surface** that is growing and being targeted by threat actors

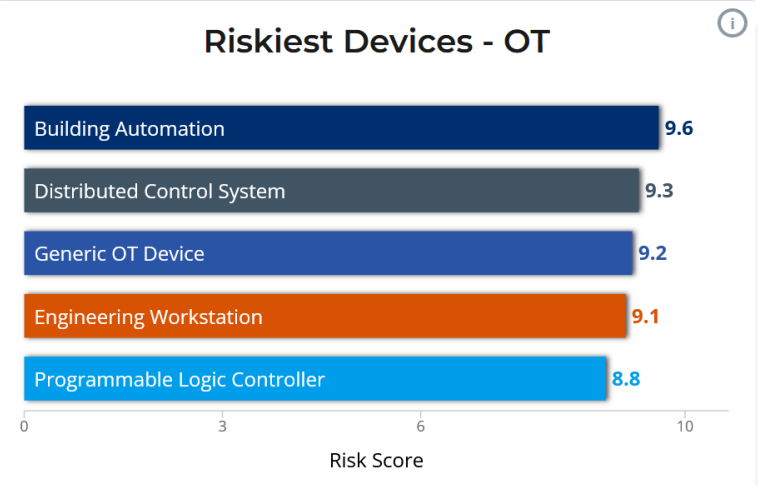
- Riskiest devices are
  - **IT: network infrastructure** (e.g., routers and firewalls), one of the main initial access points for ransomware and other actors
  - **IoT: surveillance** (e.g., IP cameras and NVR) and **VoIP**, lots of easily exploitable vulnerabilities and Internet exposure
  - **OT: building automation** (e.g., HVAC and access control), critical impact and often Internet connectivity

Monitored Device Ecosystem





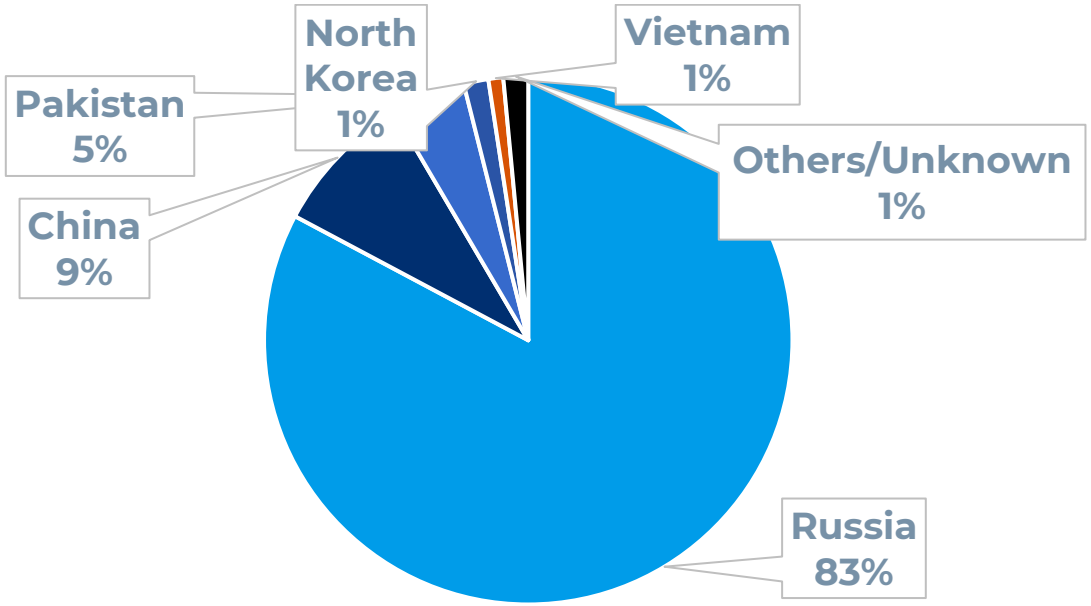




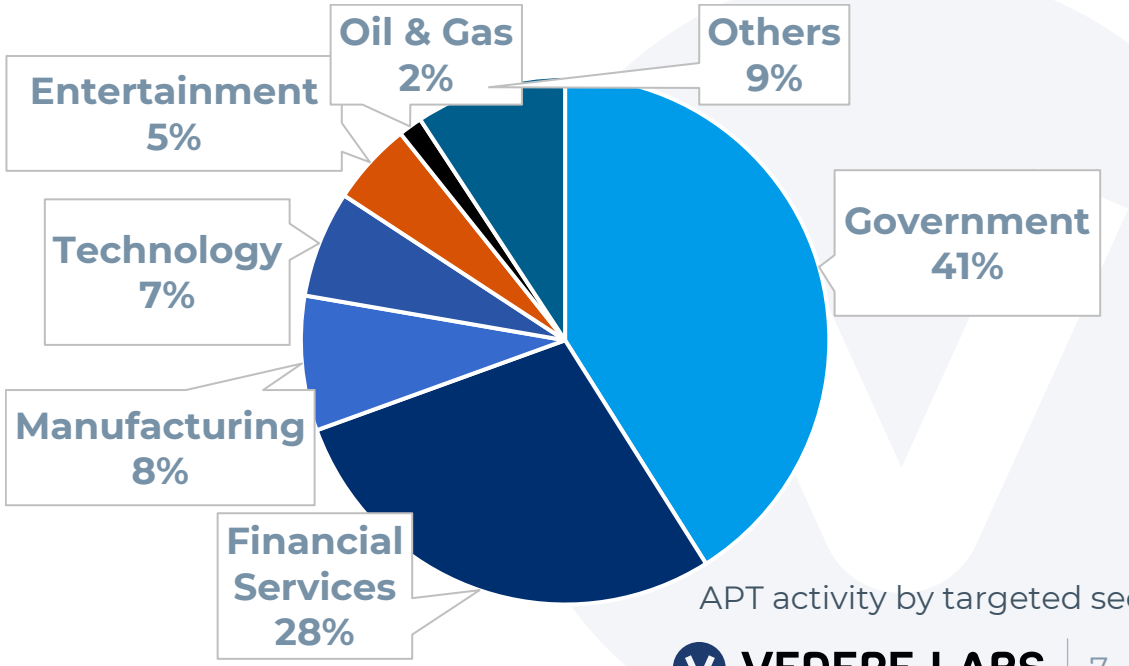
APT origins and targeted sectors

- Data from **malicious DNS requests** detected on our customer networks
  - Close to 20 APTs and more than 300 malicious domains seen

- Top observed **APTs in 2022**:
  - **APT29** / COZY BEAR – Russian state-sponsored (SVR)
  - **IcedID** / LUNAR SPIDER – Russian/Eastern European cybercriminals targeting Financial Services
  - **Evil Corp** / INDRIK SPIDER – Russian/Eastern European cybercriminals targeting several sectors



APT activity by group origin

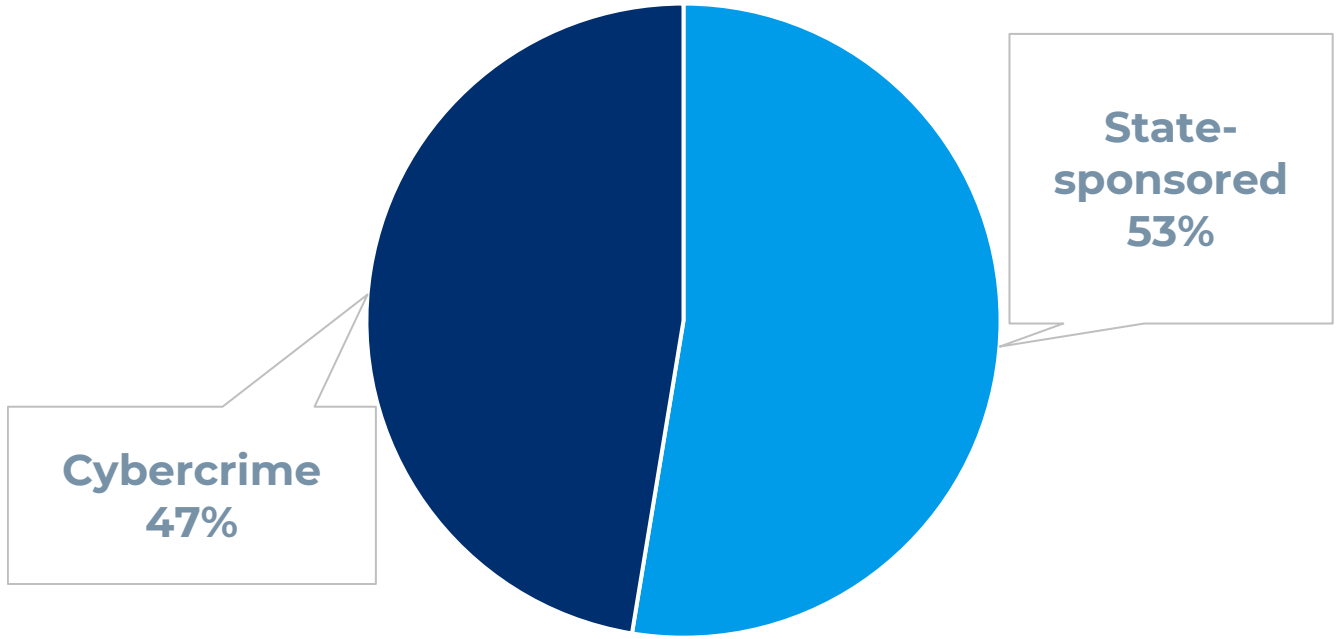


APT activity by targeted sector

APT motivations and TTPs

- Two major types of APTs with almost equal split of activity:
  - **Cybercrime** – ransomware and financial scams (BEC, phishing)
  - **State-sponsored** – espionage and destructive malware

- Top TTPs are traditional **Windows-based exploitation**



APT activity by group motivation

Top ransomware TTPs in 2021.
Source: https://www.scythe.io/library/threat-thursday-top-ransomware-ttps

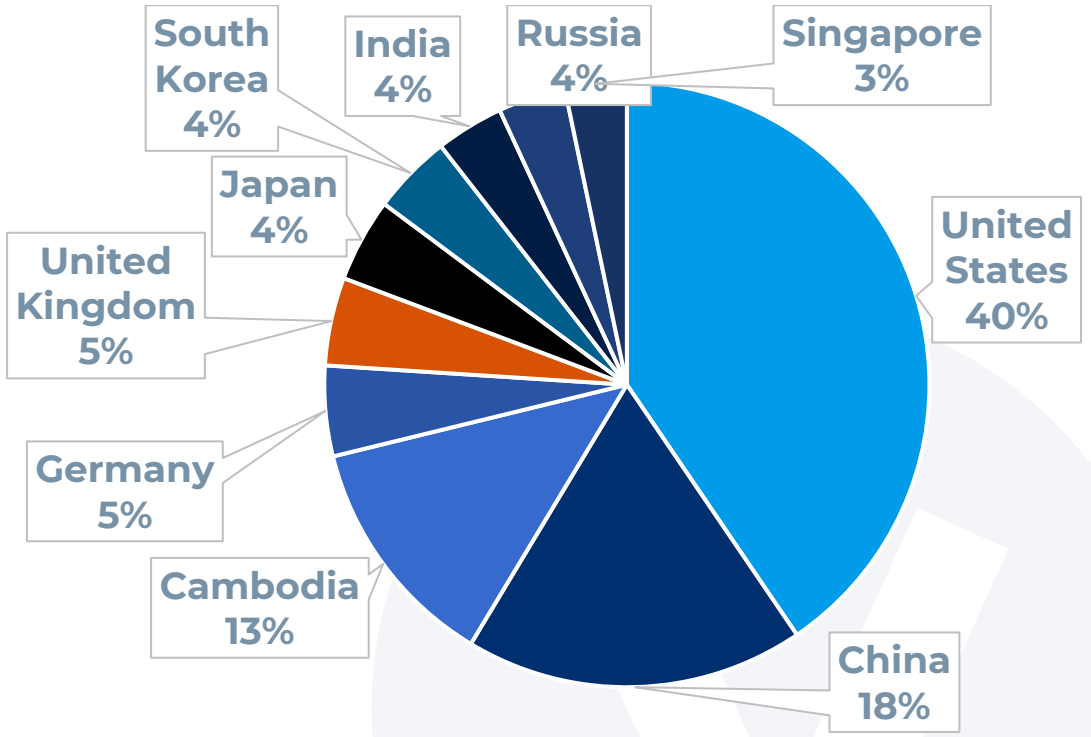
Tactic	Technique
Initial Access	T1078 - Valid Accounts
Execution	T1059.001 – PowerShell
Command and Control	T1071 - Application Layer Protocol T1573 - Encrypted Channel (HTTPS)
Discovery	T1082 - System Information Discovery T1057 - Process Discovery
Privilege Escalation	T1053.005 - Scheduled Task/Job
Collection	T1074.001 - Data Staged: Local Data Staging T1560 - Archive Collected Data
Exfiltration	T1041 - Exfiltration Over C2 Channel (HTTPS)
Impact	T1486 - Data Encrypted for Impact

Attack attempts on exposed vulnerable services

- Main observed techniques on **Adversary Engagement**:
  - **T1190 – Exploit Public-Facing Application** – known vulnerabilities such as EternalBlue, Log4j
  - **T1078 – Valid Accounts** – default credentials for IoT devices
  - **T1071 – Application Layer Protocol** – HTTP and others for C2 and exfiltration

- These attacks include a **third threat actor type: hacktivists**
  - Adversaries **compromising devices** to use as tunnels or botnets for **DDoS**

- Attacks originating mostly from **American and Asian IP addresses**
  - Attackers often using **proxies, VPNs and Tor** exit nodes



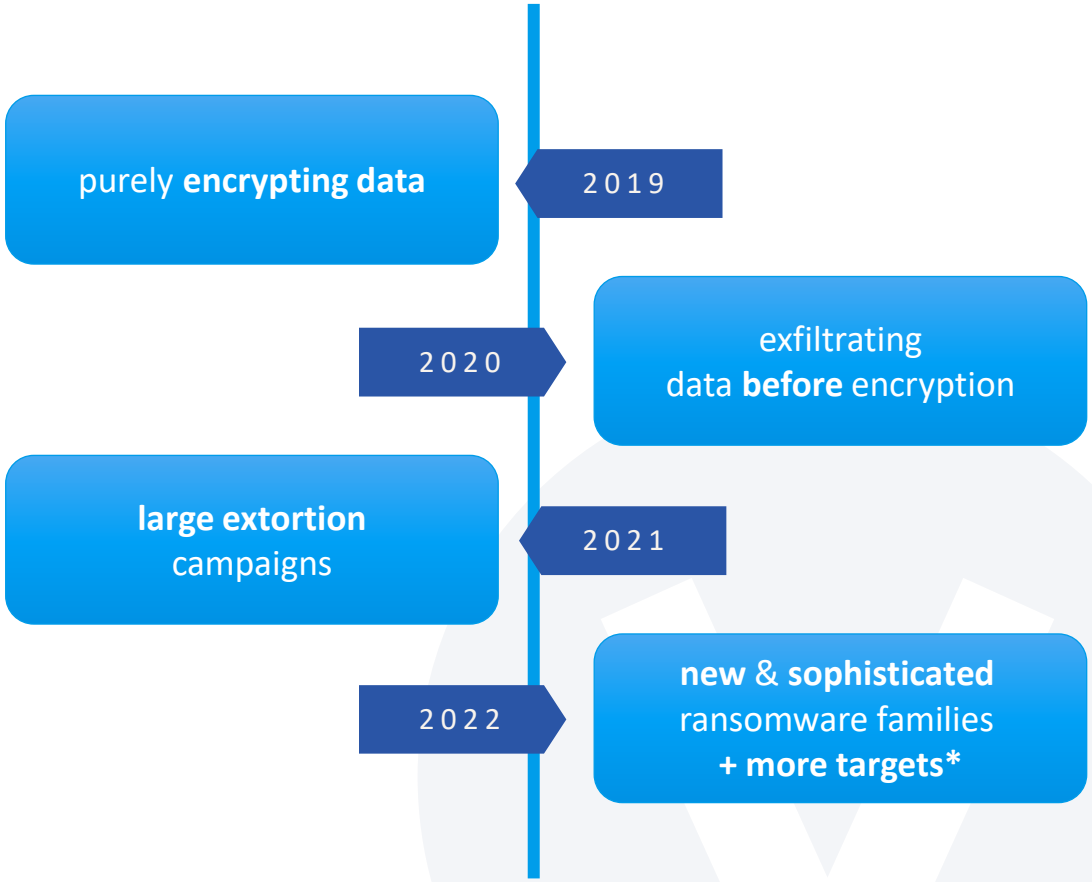
Attack attempts by country of origin (IP address)

2. Deep dive into APT trends

https://www.forescout.com/threat-briefings/

Ransomware evolution

- More than **4000 publicly tracked incidents** in the past couple of years (https://darkfeed.io/)
  - **US top targeted country** with more than 700
- **Hundreds of active groups, many using the RaaS model**
  - **Lockbit** and **Conti** the most active
- TTPs evolved **from data encryption to multi-faceted extortion attacks**
  - Exfiltration, denials of service, public shaming
- **Evolution of the ransomware** landscape is far from over. Adversaries changing because of:
  1. Proliferation of **IoT/OT devices**
  2. **State-sponsored** ransomware



***Example: ALPHV** exploiting unpatched network infrastructure, releasing sophisticated encryption software and targeting virtualization servers

Ransomware and IoT/OT

- **Conti**:
  - Affiliates relying on **common TTPs** (such as initial access via stolen or weak RDP credentials, execution via PowerShell and lateral movement via Windows vulnerabilities) **mixed with IoT exploits**
  - Leaked internal **documentation and chats advocate for the use of IoT** devices as entry points, since they are often unpatched.
  - Also encouraged their affiliates to **leverage botnets** with dormant infections on IoT equipment. https://www.forescout.com/resources/analysis-of-conti-leaks/

"CISA and FBI have observed Conti using Router Scan to maliciously scan for and brute force routers, cameras, and network-attached storage devices"

https://www.cisa.gov/uscert/ncas/alerts/aa21-265a

- Other examples:
  - **DeadBolt, Qlocker, Checkmate** targeting Internet-exposed and local **NAS devices**
  - Ransomware groups targeting CVE-2022-29499 on **Mitel VoIP devices** for initial access
  - **Trickbot** (frequently used to drop ransomware) abusing **MikroTik Routers** as C2 Proxies
  - **EKANS** targeting **OT processes** in 2020

“State-sponsored ransomware”

- Ransomware is getting **increasingly mixed with state-sponsored activities**. Examples:
  - **Conti** publicly taking Russia's side in the ongoing war, then crippling and promising to topple the Costa Rican government
  - **Chinese threat actor** Dev-0401 / Bronze Starlight using several similar ransomware families (LockFile, AtomSilo, Rook, Night Sky, and Pandora) against targets across the world since mid-2021 in a campaign believed to be a disguise for espionage. This actor
  - **North Korean actors** using the Maui ransomware against healthcare organizations

- They often **differ from RaaS groups**, being involved in every stage of an incident and lacking infrastructure for communicating with victims or distributing decryption keys.
  - That’s because the ransomware is usually a disguise for other attacks

- “State-sponsored ransomware” is a **growing trend that can lead to larger consequences**, since these actors have the funding and the means to cause greater disruption than exfiltrating or encrypting files
  - For instance, they could focus on **OT targets to cause physical disruption**

State-sponsored malware trends

- **Wipers** used for **sabotage, as part of cyberwar, or for destruction of evidence**
  - Sometimes **disguised as ransomware** to mislead incident response or hide motivations
  - Overwriting or encrypting files, overwriting MBR/MFT
  - Typically used on IT systems, but recently **AcidRain used to wipe SATCOM modems in Ukraine**

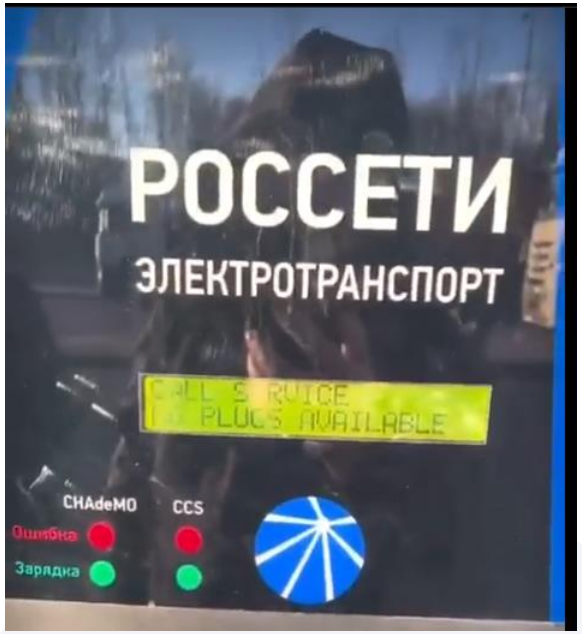
Message left by WhisperGate after reboot

- **OT/ICS malware** continues to **abuse insecure-by-design** native capabilities of OT equipment
  - **Industroyer2** leveraging OS-specific wipers and a dedicated module to communicate over the IEC-104 protocol for electrical substations
  - **INCONTROLLER** toolkit with modules to read/write from/to ICS devices using industrial network protocols, such as OPC UA, Modbus, CODESYS, and Omron FINS

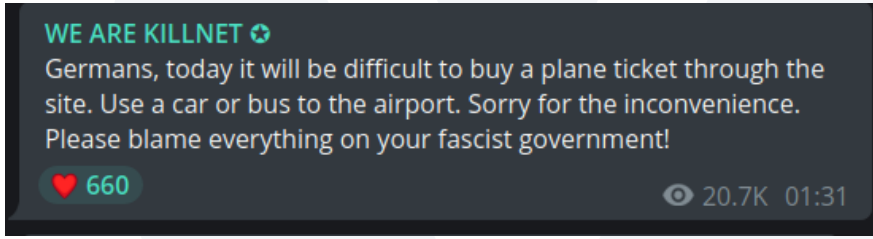
- **Botnets:** Cyclops Blink developed by Sandworm as a possible successor to VPNfilter. Taken down soon after discovery, but active since 2019
  - Targeted WatchGuard and ASUS routers

Hacktivism

- More than **100 groups** have conducted cyberattacks since the beginning of the Russian invasion of Ukraine
  - Mostly **DDoS**, but also data breaches, wipers and distributing propaganda
  - Some **attacks on critical infrastructure**: e.g., EV chargers in Moscow
  - Currently more than 70 active groups, located mainly in Russia or Ukraine but also in Belarus, Turkey, Romania, Poland, Portugal and Italy
  - Coordination and the communication of their actions usually happens via **Twitter or Telegram**



- **Killnet** became notorious using simple DDoS tools to take down websites of critical infrastructure companies in US/Europe
  - Targeted airports, banks, gov. agencies and others
  - Also spread propaganda to more than 100,000 members of their Telegram channel
  - Several attacks detected on our honeypots brute forcing credentials on FTP, HTTP/S, and 22



3. Conclusion

Mitigation

- **Why it is possible**
  - Attacks are ***not* immediate and fully automated**. Dwell time changes per attack type but it's typically at least a week
  - **Cybercrime-as-a-service** means that there are up to *hundreds* of very similar attacks happening simultaneously
  - Most **tools and techniques used are well-known**. Except in the case of some state-sponsored malware

- **Recommendations**
  - Extend visibility, monitoring and patching to **IoT** and **network infrastructure** devices
  - Plan for **virtualization and storage servers** as main targets – i.e. backup VMs and server infrastructure
  - Monitor **activity in dark nets** for hacktivist behavior
  - Invest in **DDoS protection** via CDNs, load balancers, web application firewalls, etc
  - **Hunt for threats** in networks using known TTPs more than any specific IoC
  - **Segment** the network in a way to isolate IT, IoT and OT. Limit network connections to only specifically allowed devices.
  - Use **OT-aware DPI-capable monitoring** to alert on malicious indicators and behaviors, watching internal systems and communications for known hostile actions.

Takeaways

- **Attack surface increasing**: IoT, OT, network infrastructure, virtualization servers, …

- Cybercrime, hacktivists and state-sponsored **actors are** all **leveraging this increased attack surface**

- **Mitigation should** be based on threat intelligence and **prioritize the increased attack surface**

References

- Dashboards: https://dashboard.vederelabs.com/

- Technical Threat Reports: https://www.forescout.com/threat-briefings/
  - Russia-Ukraine – https://www.forescout.com/resources/monitoring-cyber-activities-connected-to-the-russian-ukrainian-conflict/
  - Conti – https://www.forescout.com/resources/analysis-of-conti-leaks/
  - Night Sky – https://www.forescout.com/resources/night-sky-ransomeware-threat-brief/
  - ALPHV – https://www.forescout.com/resources/analysis-of-an-alphv-incident
  - Killnet – https://www.forescout.com/resources/analysis-of-killnet-report/
  - Industroyer2/Incontroller

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Thank you.