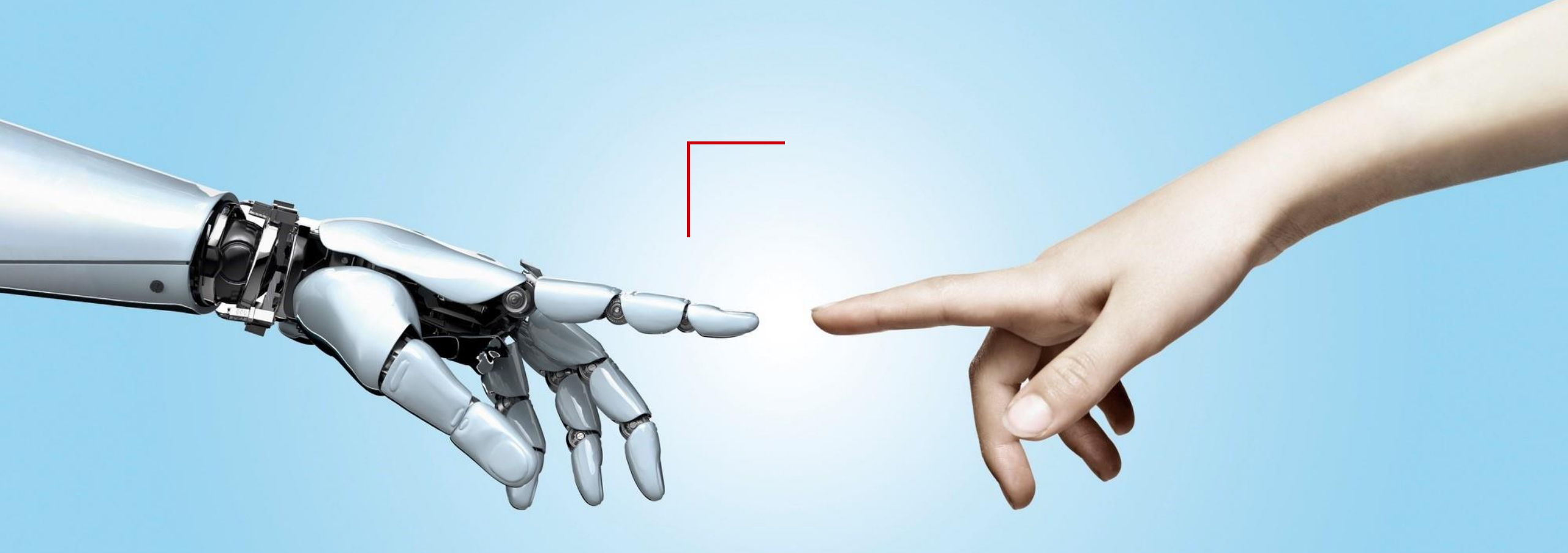


Fullstack Ransomware Protection (feat. AI)

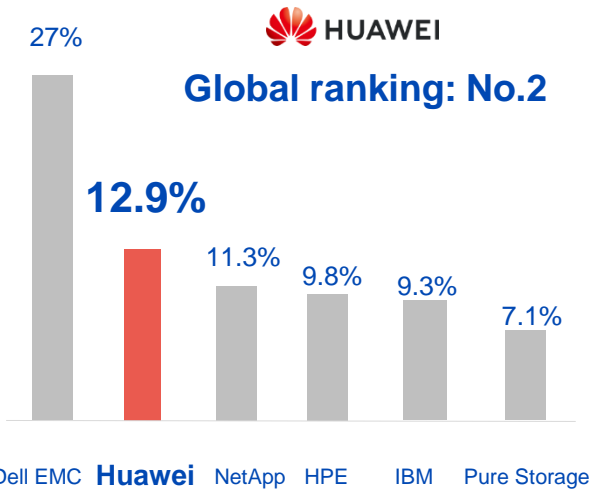


Michael Georgi
Senior Solution Sales Manager
20.06.2023





Global storage market share



Source: Gartner Market Share Report, 2022 Q2

56%
Objective
factors

Hardware failure

Site failure

Natural disaster

44%
Subjective
factors

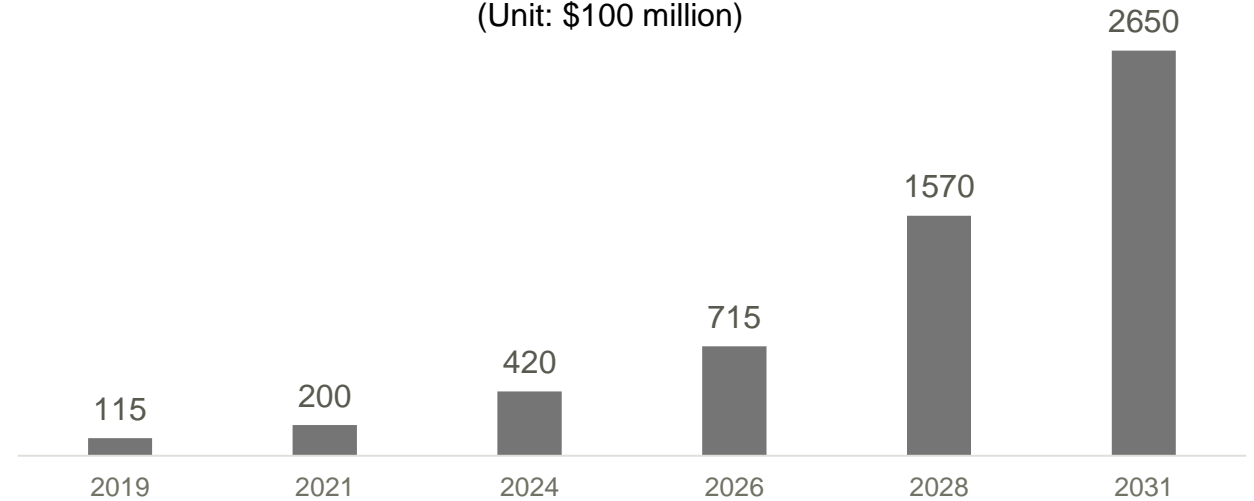
Ransomware
attacks

Logic error

Misoperation

Annual loss caused by ransomware attacks

(Unit: \$100 million)



Source: Cybersecurity Ventures

»»» **\$1.85 million** «««

In 2021, the average total recovery cost of ransomware attacks reached \$1.85 million.

Source: Sophos

»»» **11s** «««

In 2021, an organization fell victim to a ransomware attack every 11 seconds.

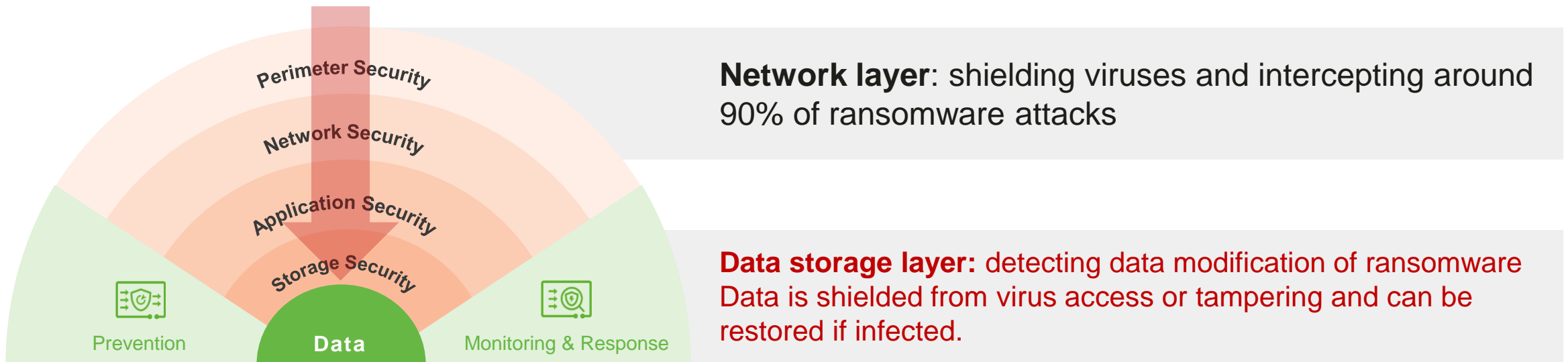
Source: Cybersecurity Ventures

»»» **16 days** «««

Ransomware attacks caused an average of 16 workdays of system shutdowns.

Source: ZDNet

Storage Is the Last Line of Defense for Data Security



Northrop Grumman's Defense in Depth (DiD) model

Providing comprehensive data protection, from physical damage prevention to human-caused damage prevention

Common solutions vs. ransomware attacks

Static file analysis VS **Masquerading** through packages or encryptors

Blocklist VS **Various** file name extension variants

Abnormal activity monitoring VS **Incubation** for months with slow actions

01

How can we effectively identify various variants?

Number of ransomware variants per year: 46%↑

02

How can we tackle sniffing and virus spreading?

If the production center is infected, backups are highly likely to be polluted.

03

How can we keep a golden copy?

A clean backup that can be used for recovery anytime

Isolation zone for production storage

Network domain

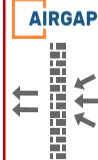


Highlights

- Data restoration on a daily/weekly basis
- Unidirectional replication and offline protection of production data
- True physical isolation



OceanStor Dorado
Isolated storage for production

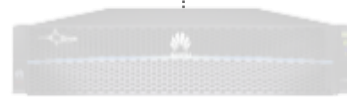


Production center

OceanCyber Appliance
or
built into Dorado/OceanStor



- Detection & analysis: up to 99.9% ransomware detection rate
- Security policy: unified management of multiple storage devices
- Proactive prevention: blocking, reinforcing, and recovery



OceanStor Dorado
Production storage



OceanProtect
Backup storage

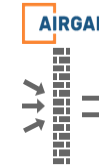
Isolation zone for backup storage

Highlights

- Data restoration on weekly/monthly/yearly basis to defend against dormant ransomware
- Unidirectional replication and offline protection of backup data
- True physical isolation



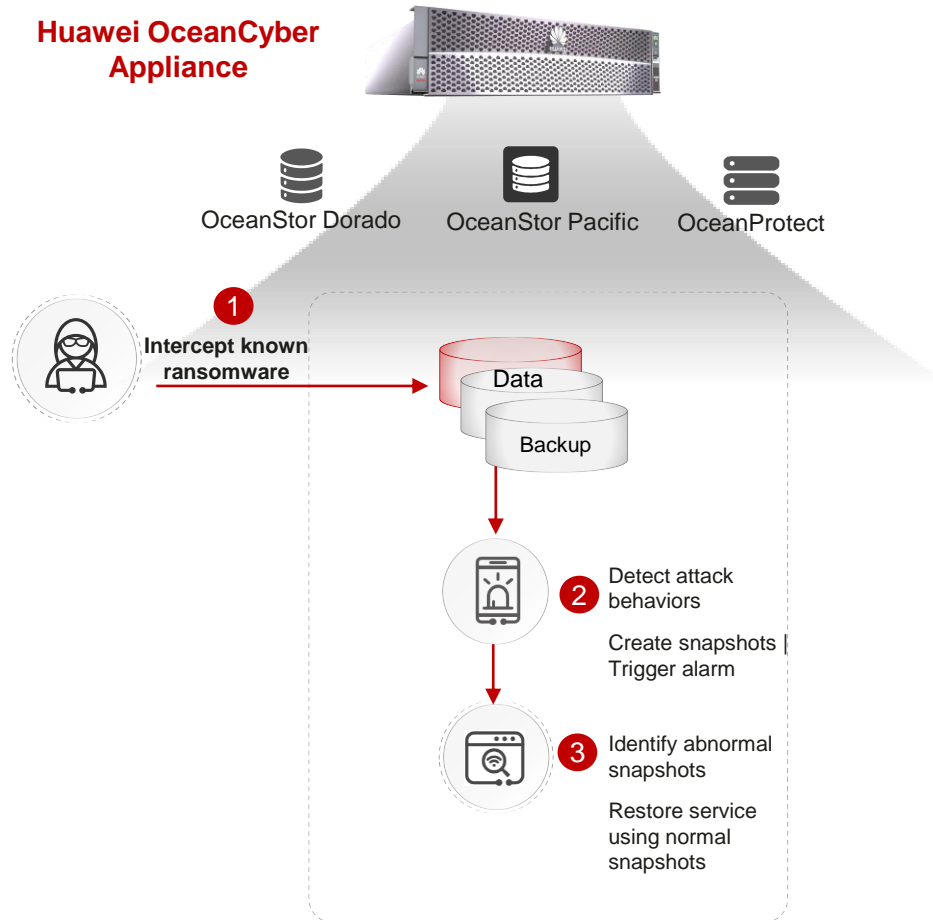
OceanProtect
Isolated storage for backup



Anti-intrusion | Anti-proliferation

Data storage: attack behavior detection | golden copy retention | rapid recovery
Ransomware protection features: detection and analysis | secure snapshot | WORM | Air Gap

99.9% Ransomware Identification Rate through Machine Learning



Comprehensive detection (NAS primary storage scenario)

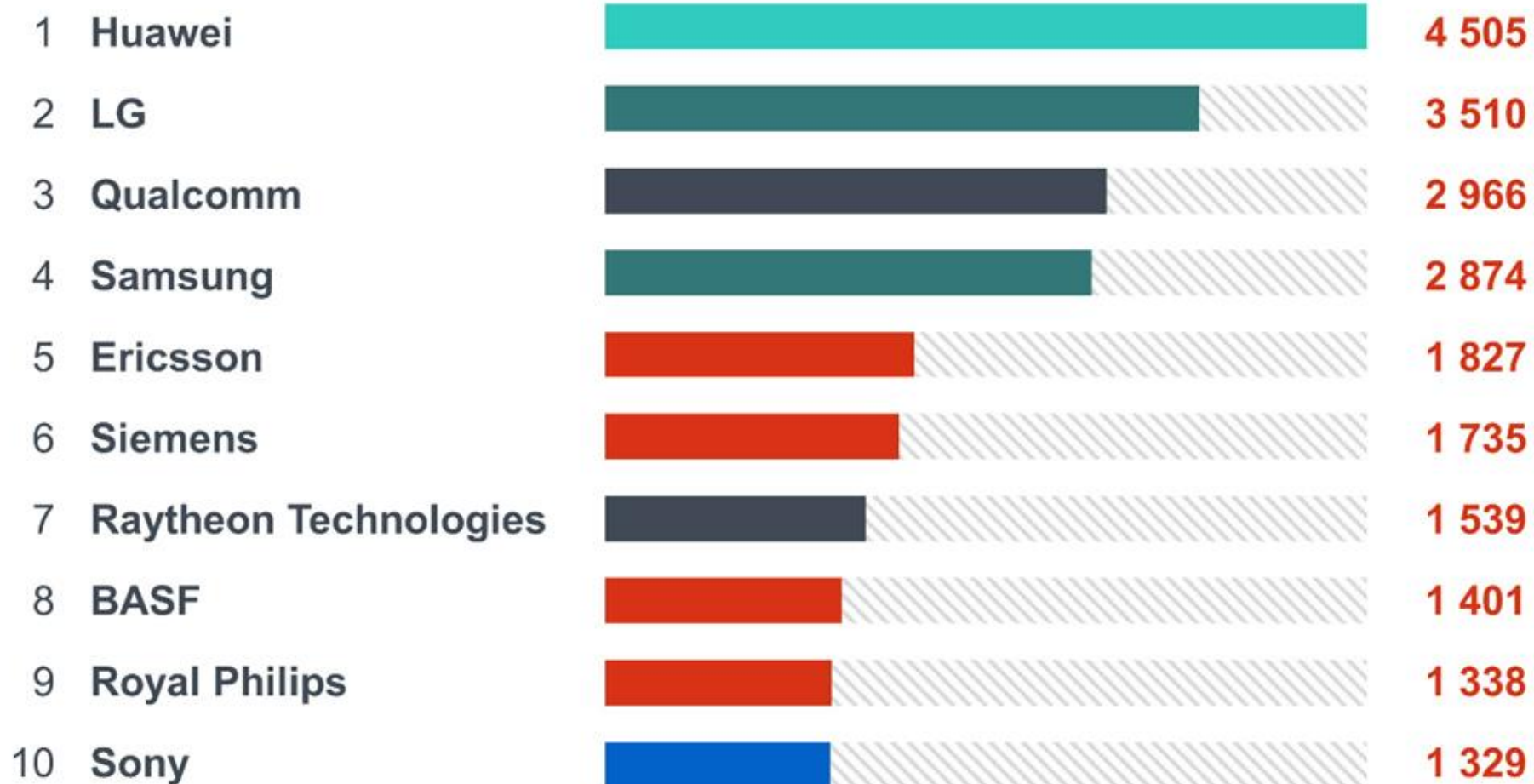
Detection Phase	Feature	Huawei	D***	N****	P*** S*****
Pre-attack	Blacklist and trustlist	✓	×	✓	×
Attack	User behavior analysis	✓	✓	✓	
Post-attack	Periodic detection	✓	✓	×	

Accurate identification

- **Pre-event (before data is polluted): File interception**
 - Build blacklist of file name extensions to prevent ransomware from encrypting files and changing file name extensions
- **In-event (during attack): Detection of abnormal I/O behaviors**
 - The number of ransomware is huge, but they share similar read/write characteristics (such as massive amounts of reads/writes and write-back after format change, data deletion after huge amounts of reads).
- **Post-event (after attack): In-depth detection**
 - Compare file changes and snapshot entropy values to check whether files are encrypted or damaged.
 - Combine Huawei-patented **incremental partial entropy model, partial histogram model, and machine-learning detection**
 - Huawei: 99.9% identification rate; other vendors: 80% identification rate, built on χ^2 detection

TOP 10

Patentanmeldungen beim EPA 2022





DEVELOPING RANSOMWARE RESILIENCE WITH MULTILAYER NETWORK, STORAGE, AND DATA PROTECTION ARCHITECTURE

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<https://www.youtube.com/watch?v=tQ7Lhzfje8w>



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