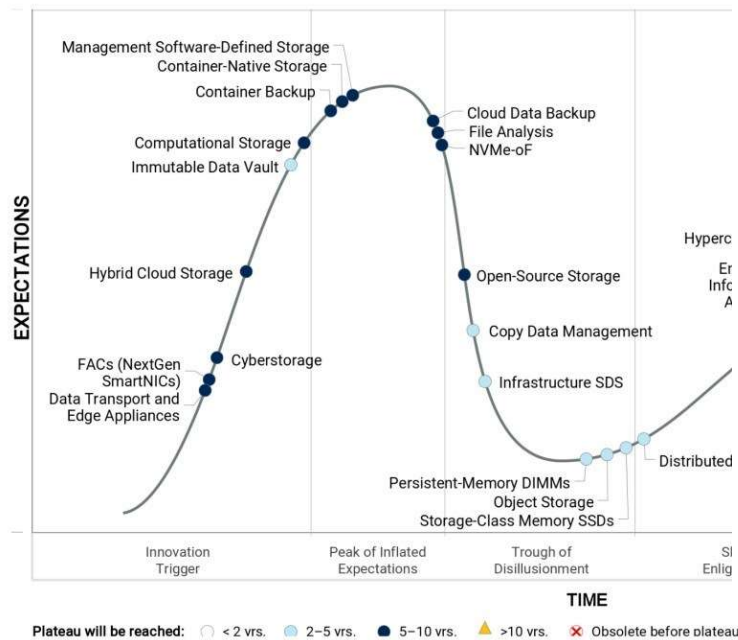


2023 Storage Trends & Technologies

Futurewei Boston Storage Lab
2/7/2023

Hype cycle for storage and data protection – From 2021 to 2022

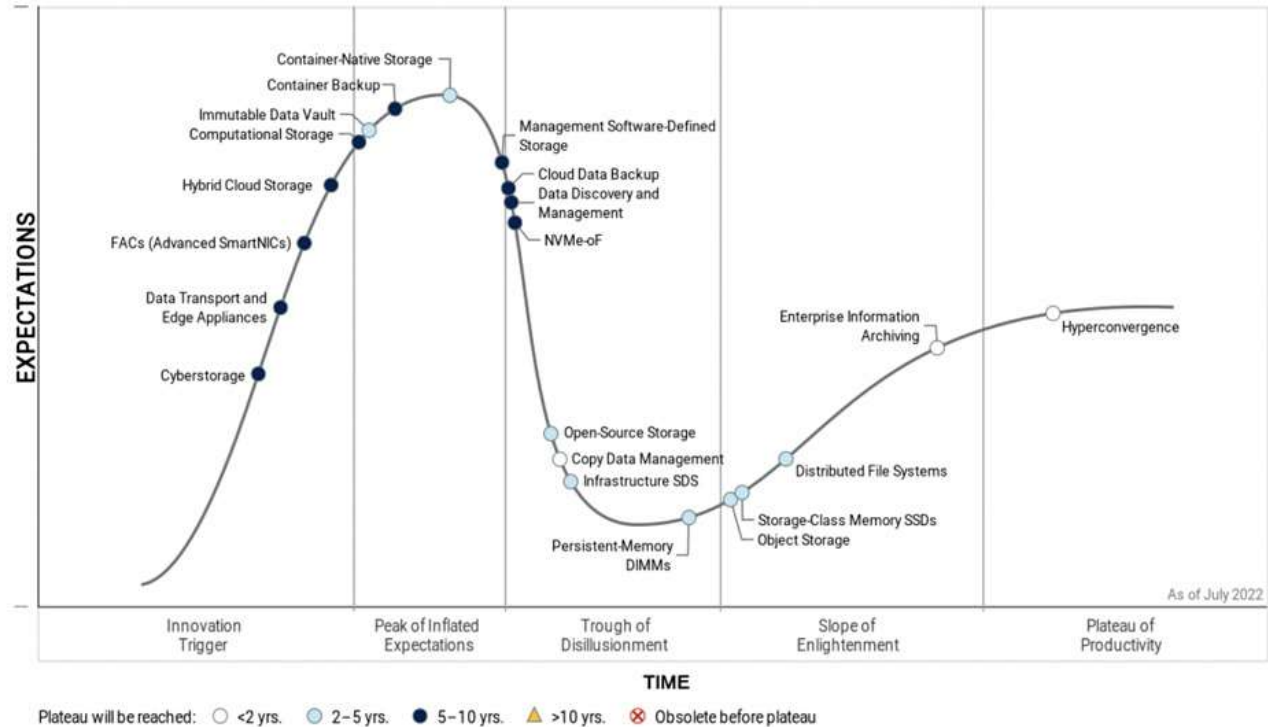
Hype Cycle for Storage and Data Protection Techno



Source: Gartner (July 2021)

747395

Hype Cycle for Storage and Data Protection Technologies, 2022



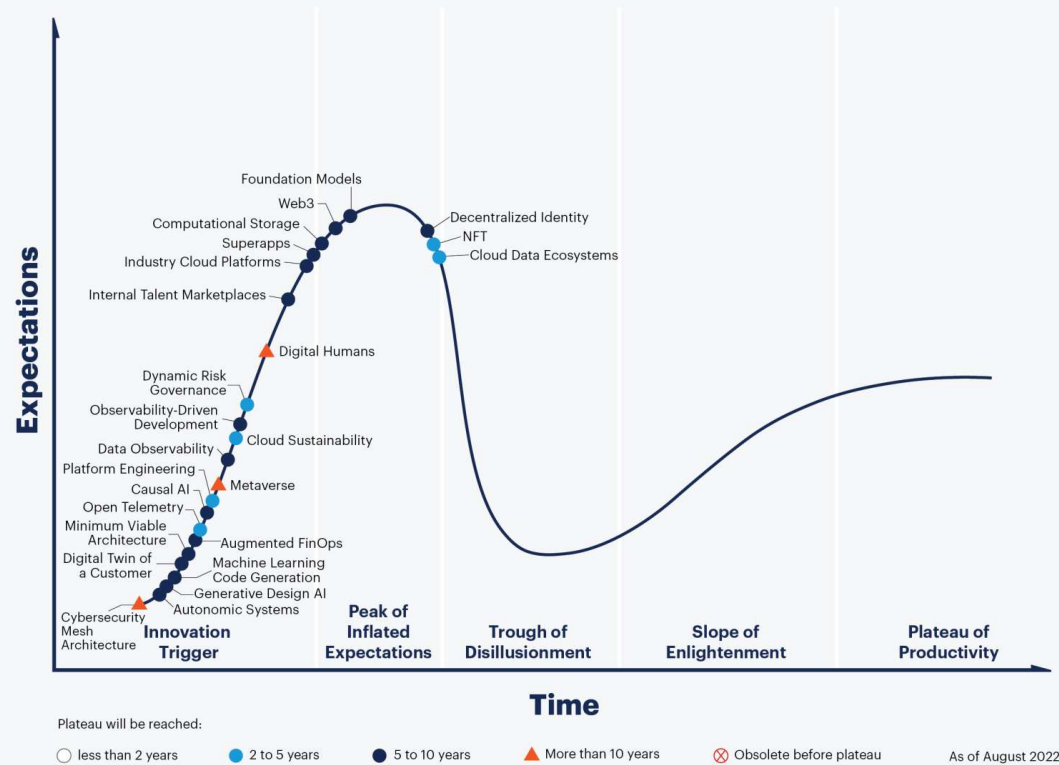
Source: Gartner (July 2022)

Gartner.

FUTUREWEI
Technologies

Hype cycle for Emerging Technologies - 2022

Hype Cycle for Emerging Tech, 2022



3 key themes on 2022 chart:

1. Expand immersive experiences
2. Accelerate artificial intelligence (AI) automation
3. Optimize technologist delivery

gartner.com

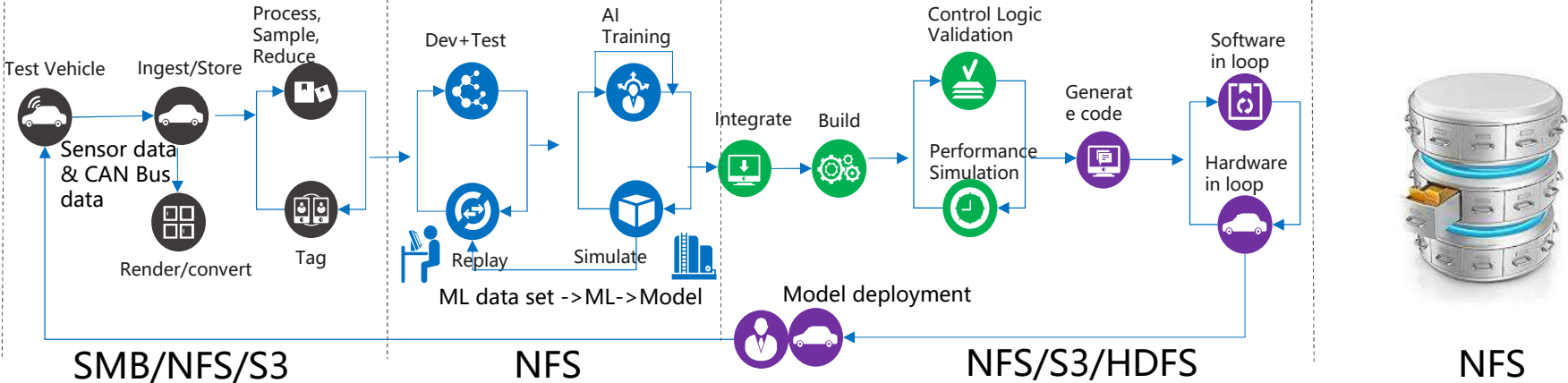
Source: Gartner
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Gartner

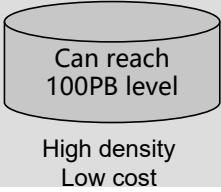
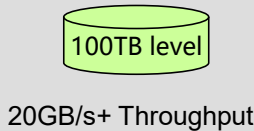
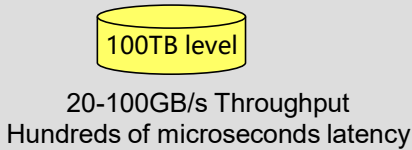
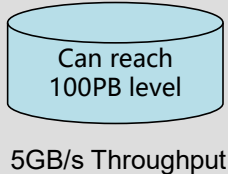
 **FUTUREWEI**
Technologies

Storage for AI - example: ADAS

Phase	Data collection and pre-processing	AI Training	Validation, simulation, SIL, HIL	Backup and archiving
Core requirements	Support expansion to hundreds of PBs	Support large number of small files, high throughput, and ultra-low latency	Support high throughput	High capacity, low cost, long term



SMB/NFS/S3/HDFS multi-protocol interoperability



Storage as a service

WORM

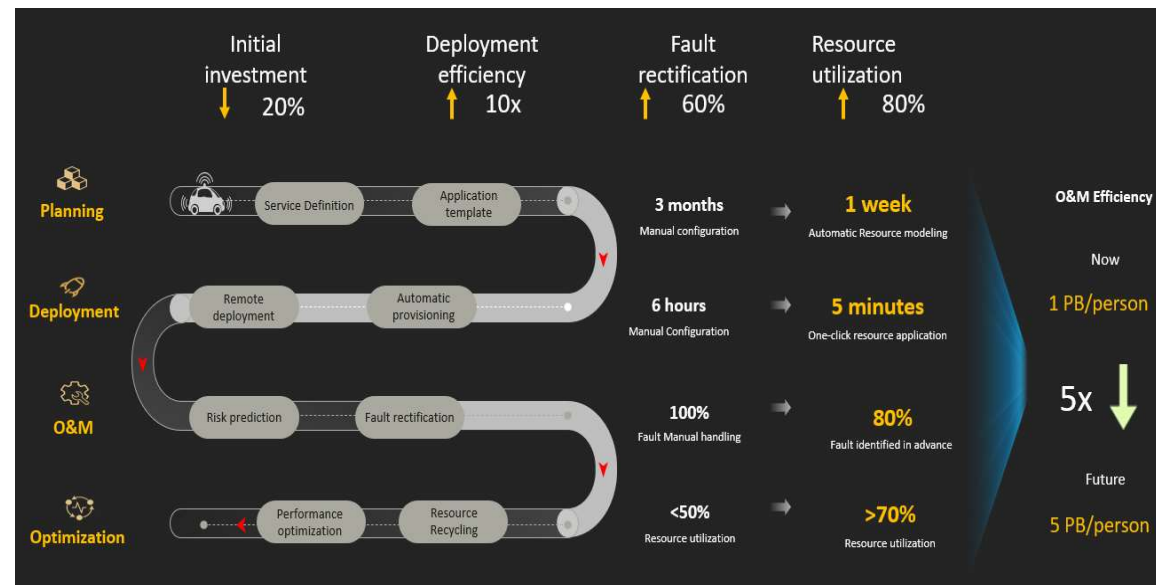
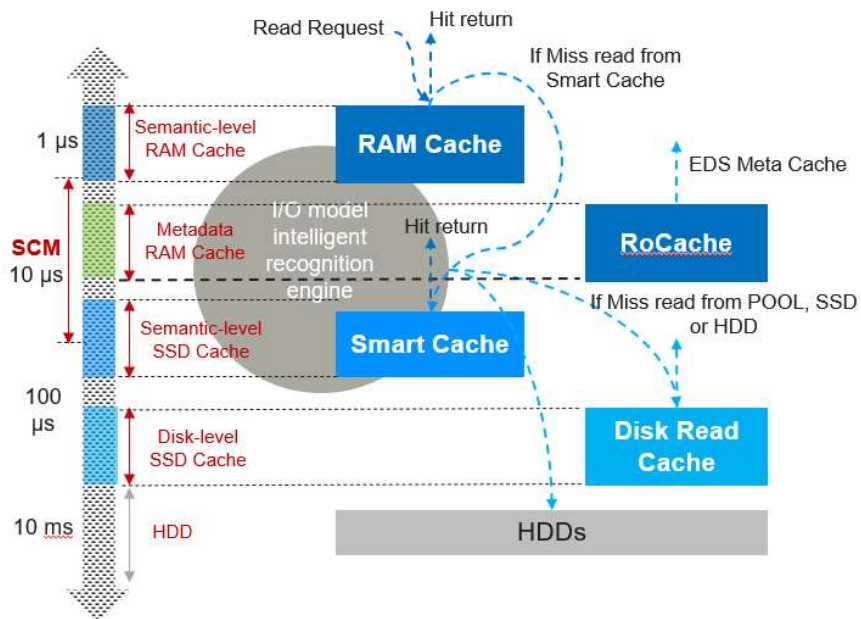
Tiering Global Access Multi-Tenancy
Life-cycle based data management and data flow



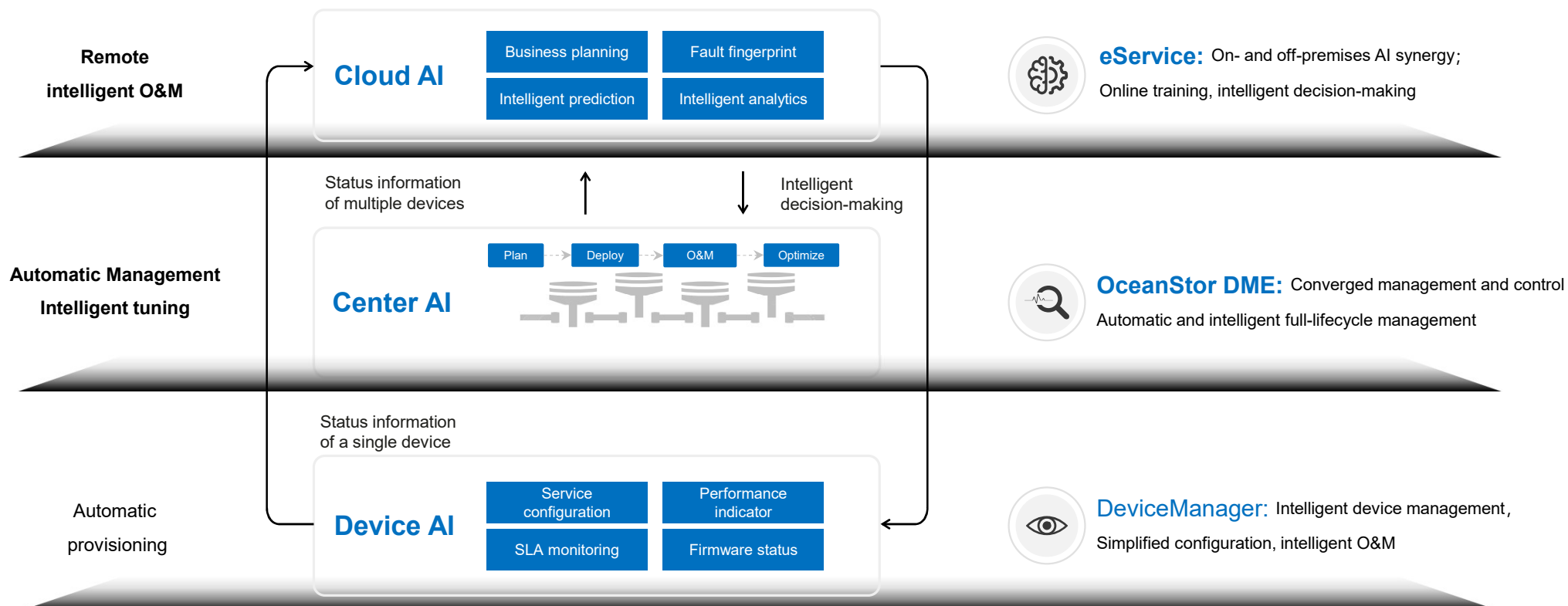
AI for Storage

- Fully automated and predicative O&M
- Improved algorithm with dedicated AI hardware offloading

Multi-level distributed read cache



Automation: Three-Layer Collaboration for Efficient O&M



Cloud vs On-Premise

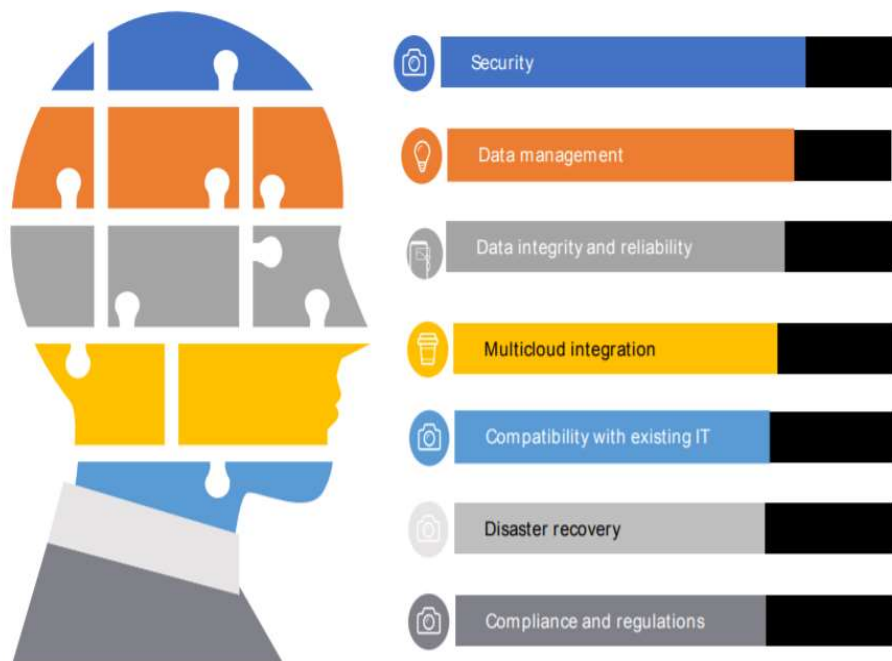
- The pandemic brought massive new business to cloud.
- Meanwhile some companies are moving off the public cloud.
- Enterprise storage cloud-integration capability is becoming more and more valuable.

	Cloud	On-Premise
Cost model	OPEX	CAPEX
Control	Less control	Full control
Security	Complete control over data and applications	Limited control and authority for data security
Compliance	More friendly to compliance regulations	Depends on region and availability
Flexibility	Superior flexibility	More suitable for predictable workload

Containerizing Key Business Workloads

Container Deployment Challenges

Top challenges when deploying containers



Source: IDC, 2021

Key engineering tasks moving forward:

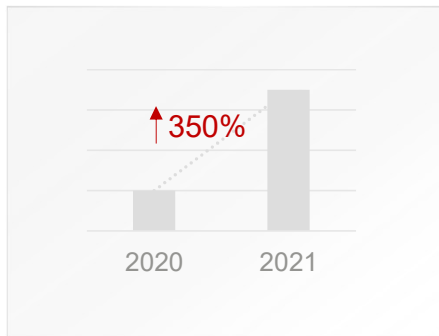
- Increase integration of container orchestration platform
- Continue enriching container ecosystem
- Continue expanding data services for edge container use cases.
- Expand data services messaging to benefits around automated container strategy, cloud optimization, autoscaling, and cloud migration.

From an engineering perspective, strengthen governance-related features around compliance, regulatory obligations, granular searches, rolling backups, and role-based access controls and security.

Ransomware Has Become a Major Global Cyber Threat

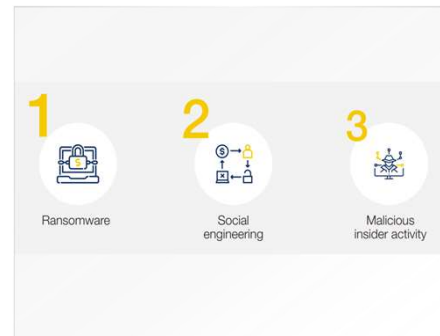
Ransomware is a type of malware that encrypts or steals victim's data and makes computers or specific files unusable or unreadable, and then demands a ransom to recover the computer or decrypt the encrypted file. Ransomware is constantly evolving, and often evades common antivirus software.

»» Sharp increase in attacks ««



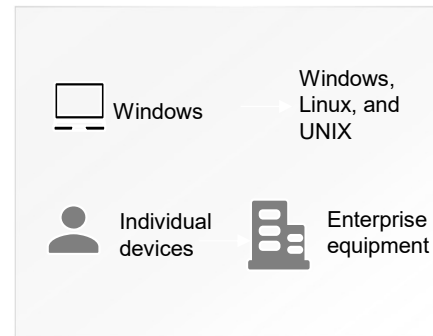
- > 350% attack CAGR.
- The number of new ransomware variants has increased by 46%.

»» Mainstream network threats ««



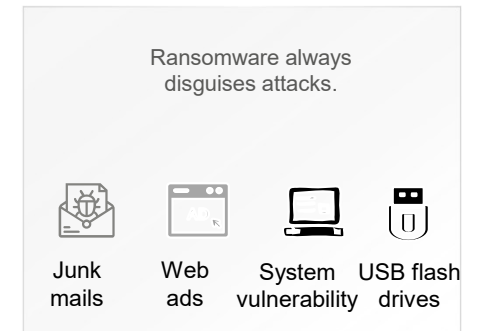
- Global Cybersecurity Outlook 2022 reported that **ransomware attacks are the highest business** concern for cyber leaders.

»» Diverse attack targets ««



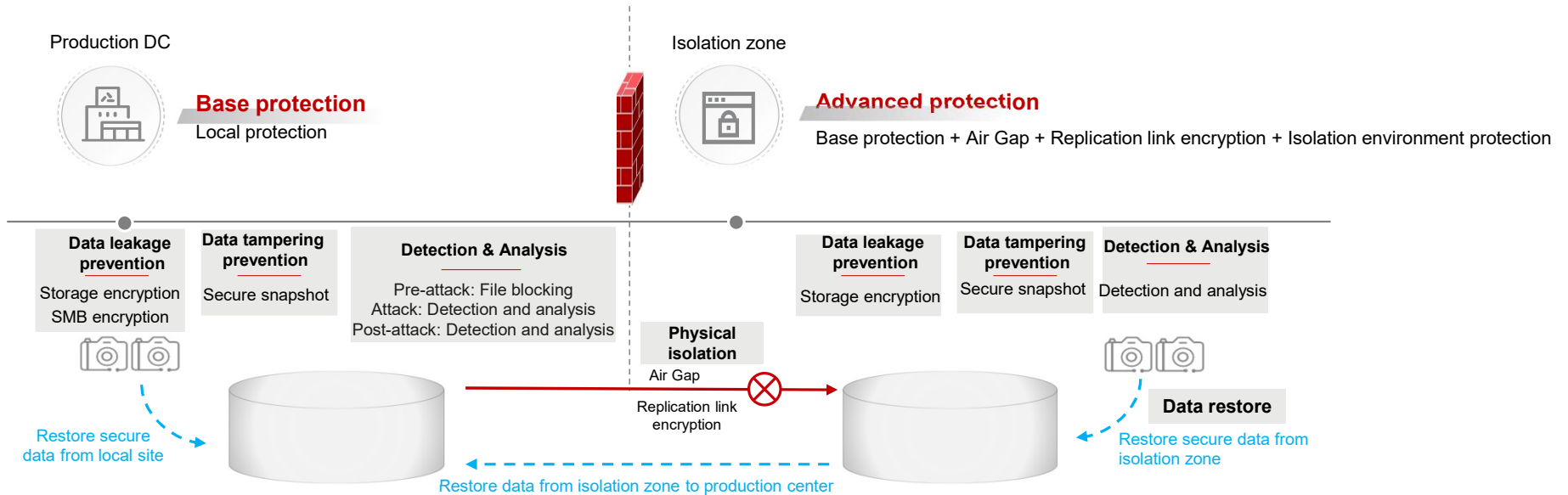
- In 2021, the global industry sectors, such as manufacturing, service, construction, finance, energy, healthcare, industrial control, and government organizations were frequently attacked by ransomware, causing severe losses to global output.

»» Stealthier ««



- Phishing attacks: Obtain sensitive information through masquerading.
- Brute force attacks: Use trial-and-error to guess login info.
- Zero day attacks: Exploit the software vulnerability before developers can find a fix.

A Complete Ransomware Protection Solution



Key Technologies

- 1 Storage encryption**
Ensures storage data security and prevents sensitive information leakage caused by ransomware attacks.
- 2 Replication link encryption**
Encrypts data transmitted to prevent sensitive information leakage during replication.
- 3 SMB encryption**
Transmits SMB packets in ciphertext to prevent data theft.
- 4 Secure snapshot**
Ensures storage data is read-only and cannot be modified or deleted within a specified time range in the production center and isolation zone.
- 5 Air Gap**
Automatically disconnects replication links and replicates data to the isolation zone for better protection.
- 6 File blocking**
Creates a file name extension blacklist to prevent common ransomware.
- 7 Detection & analysis**
Uses proprietary detection and analysis engine installed in the built-in container of the storage array, and the ML algorithm to analyze user behavior and file damage characteristics, issuing event alarms and providing client information to track the source.

Higher density components enables better heat dissipation while providing higher density

Low hardware density means high per-GB energy consumption, large footprint, and poor heat dissipation.



High energy consumption per unit capacity



4U24



Poor heat dissipation

High-density components



HDD

- Typical power consumption: ~7W
- Typical capacity: 600 GB/1.2 TB



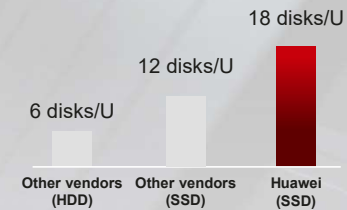
SSD

- Typical power consumption: ~7W
- Typical capacity: 3.84 TB/7.68 TB

Industry-leading hardware density for 25% higher heat dissipation efficiency

High-density systems

2U36 NVMe SSD



Interpret the Gartner® Magic Quadrant



Strength: Strong execution

Huawei® has avoided the supply chain and component shortage issues that affected the lead times and price increases of its industry peers, maintaining normal lead times throughout the trailing 12-month period.

Weakness:

Geopolitical situation continue to weigh.

Thank You.

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