


Inspur AS5300/5500G5 introduction

Contents



1. Potential market opportunities of mid-end HFA products /



2. Analysis of specifications and characteristics of mid-end HFA products /



3. Manufacturer analysis of mid-end HFA products /



4. Application scenarios and cases of mid-end HFA products /

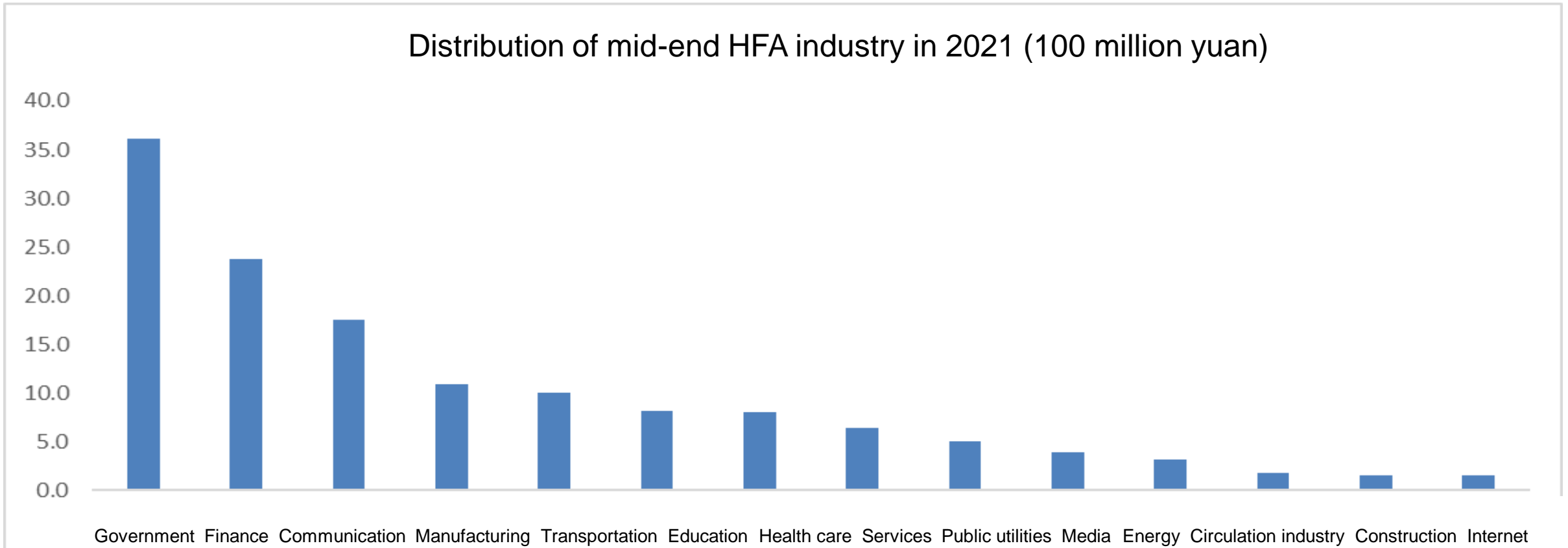
Storage market analysis

- ◆ Gartner released the global storage market report for the third quarter of 2021. The report showed that the global storage market sales in the third quarter were 34.9 billion yuan, a year-on-year increase of 2.9%; The shipment volume was 86900 units, a year-on-year decrease of 1.4%. **Among them, the sales volume of Inspur information storage products was 1.27 billion yuan and the shipment volume was 7506 sets, ranking the top five in the world and the top two in China for three consecutive quarters.**
- ◆ From the regional dimension, the Asia Pacific region has the fastest growth and has become the growth engine of the global storage market. Specifically, the size of the Asia Pacific market increased by 9.2% year-on-year, while that of North America increased by 3.2%, while the size of EMEA (Europe, the Middle East and Africa) and Japan's storage market decreased by 0.5% and 15.4% respectively. In the Asia Pacific region, China's market size was 7.52 billion yuan, a year-on-year increase of 7%, accounting for 72% of the market share in the Asia Pacific region.
- ◆ At the product level, the traditional storage market shrank, while new storage markets such as full flash storage and distributed storage grew strongly. The market scale of full flash storage increased by 14.4% year-on-year, and the hard disk drive and flash memory decreased by 5.8%. Meanwhile, the sales of the second storage and special backup equipment based on distributed architecture increased by 2.6% and 11.5% respectively in this quarter. Inspur continues to grow rapidly in the field of full flash storage and distributed storage, and is widely deployed in the fields of financial core transactions, communication network cloud, scientific research big data and so on.
- ◆ With the accelerated development of the global digital economy and the accelerated integration of new technologies such as cloud, big data, artificial intelligence and blockchain with the real economy, new forms of storage products such as full flash storage and distributed storage will usher in rapid development. Gartner predicts that by 2025, the global storage market will reach 150 billion yuan, of which the market share of full flash storage will increase from 45% in 2020 to 57%, and the market share of distributed secondary storage will increase from 17% in 2020 to 27%.
- Gartner report shows that in the fourth quarter of 2021, the global storage market sales reached 38 billion yuan, a year-on-year decrease of 2%; The shipment volume was 91326 sets, a year-on-year decrease of 12.5%. The global full flash storage market increased by 13.9% year-on-year, while hard disk drives and flash memory decreased by 14.2%. **Full flash storage accounted for more than 50% in the global storage market for the first time. It predicts that the market share of all flash storage will increase to 57% by 2025, and 60% of the global unstructured data capacity will be deployed as distributed storage.**

Mid-end HFA market analysis

- The market scale of mid-end HFA is about 13.8 billion Yuan, with a total of about 40000 sets; The total demand scale of government, financial and communication markets is about 7.7 billion, accounting for about 56%
- Medical his, university campus network, manufacturing SAP Hana and other scenarios have great opportunities in the region


Distribution of mid-end HFA industry in 2021 (100 million yuan)



Contents



1. Potential market opportunities of mid-end HFA products /



2. Analysis of specifications and characteristics of mid-end HFA products /

































3. Manufacturer analysis of mid-end HFA products /



4. Application scenarios and cases of mid-end HFA products /

Inspur storage family

| | | | | | |
|--|--|---|---|--|--|
|  HF18000G5  HF8000G5  HF6000G5  HF5000G5 |  AS18000G5  AS6800G5  AS56/5800G5  AS53/5500G5  AS22/2600G2 |  AS13000G5-H 12/24/36/60  AS13000G5-M 12/25/36/60 |  DP1000G5 |  FS9720  FS9710 |  BCP2.0 DR  Data migration software 1.0 |
|  HF18000G6-CG  HF8000G6-CG  HF6000G6-CG  HF5000G6-CG  AS5500G5-C | |  AS13000G5-CG60  AS13000G5-CG 12/25/36  AS13000G5-C 12/25 |  DP2000G5-CG |  FS8720  FS8600  FS8500 |  Backup software 1.0  Archiving software 1.0 |

Unified storage

Mass storage

Backup all-in-one machine

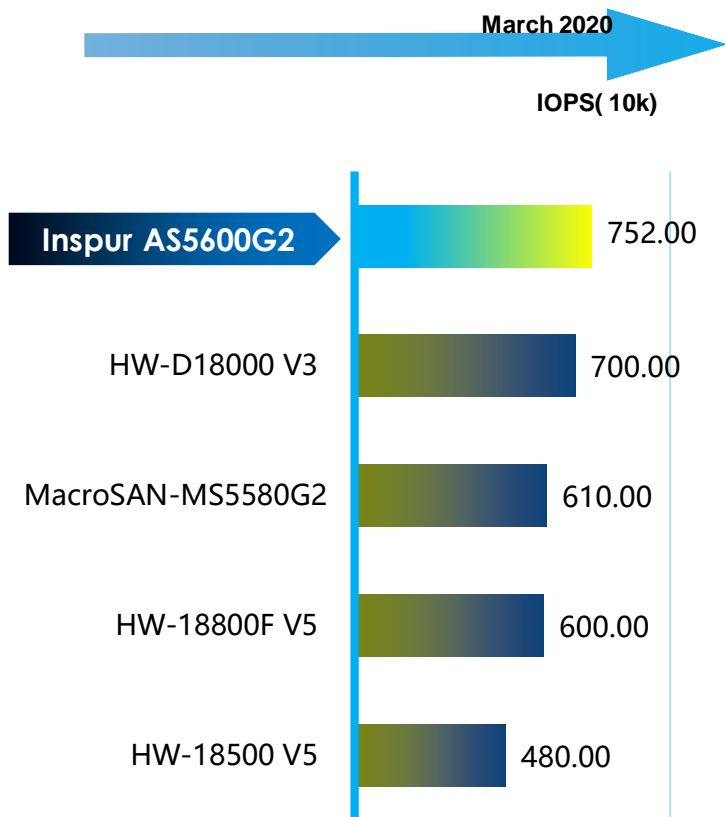
FC Switch

Software

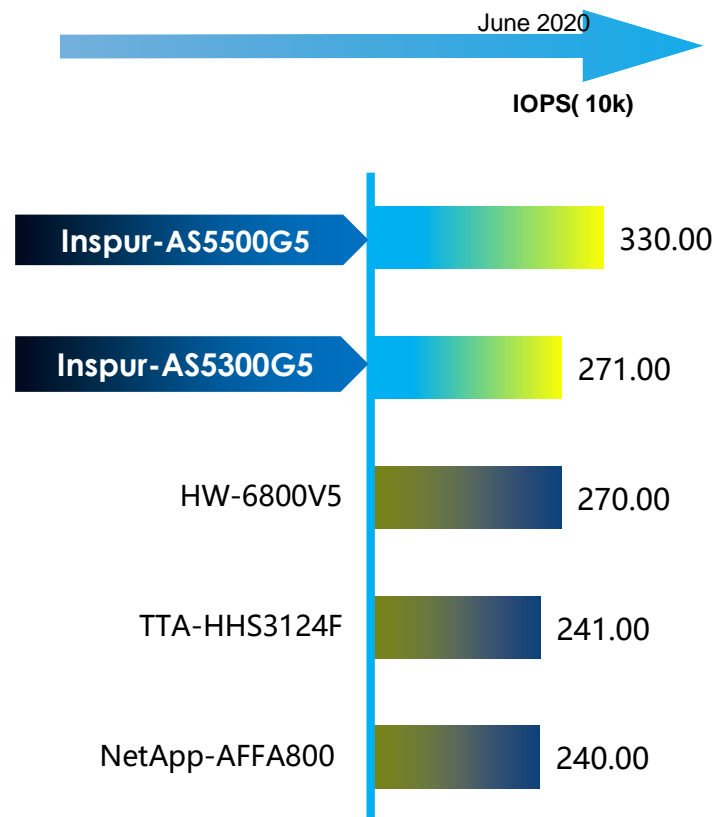
G5 mid-end HFA performance ranking data

Continuous acquisition of spc-1™ Top of the list

16-controller mid-end storage performance ranks first in the world



8-controller performance ranks first in the world



Data source: spc-1

G5 mid-end HFA hardware specifications

| Product name | AS5300G5 | AS5500G5 |
|--|---|---------------------------------|
| Controller chassis form ★ | 2U12/2U25/ 3U48 | 2U12/2U25/ 3U48 |
| Number of controllers | 2~16 | 2~16 |
| Processor ★ | 2* 6C 1.9G Cascade lake | 2* 10C 2.2G Cascade lake |
| Cache ★ | 64GB/128GB/ 256GB | 128GB/256GB/ 512GB |
| Host interface card | 6 | 6 |
| Disk backend interface | SAS3.0 | SAS3.0 |
| Maximum number of hard disks | 1300 | 1600 |
| IO card type | 1/10/40Gb ISCSI, 16/32Gb FC | |
| RAID level | RAID 0, 1, 10, 5, 6, 50, 60, InRAID 5, 6 | |
| SSD | 960GB/1.92TB/3.84TB/7.68TB/15.36TB(2.5") | |
| SAS/NL HDD ★ | 1.2TB/1.8TB/2.4TB (10K RPM, 2.5"), 600GB(15K RPM, 2.5") 4TB/6TB/8TB/10TB/12TB/14TB (7.2 RPM, 3.5") | |
| JBOD specification | 2U12, 2U25, 3U48, 5U92 | |

G5 mid-end HFA hardware

Basic storage system



2U12 Controller chassis



2U25 Controller chassis



3U48 Controller chassis



4U Controller chassis

Expansion card



4-port 16/32Gb/s FC
4-port 1/10Gb/s iSCSI



2-port 10/40 Gb/s
iSCSI



2-port 16/32 Gb/s
FC



Compression card
(AS5500G5)



Accelerator card
(AS56&5800G5)

JBOD



2.5" / 3.5" 2U12 SAS



2.5" 2U25 SAS



2.5"/3.5" 3U48 SAS



3.5" 5U92 SAS

Hard disk



2.5" SAS
HDD & SSD



3.5" SAS
HDD

Cabinet



Inspur cabinet



Third party
cabinet

AS5300&5500G5 2U controller chassis

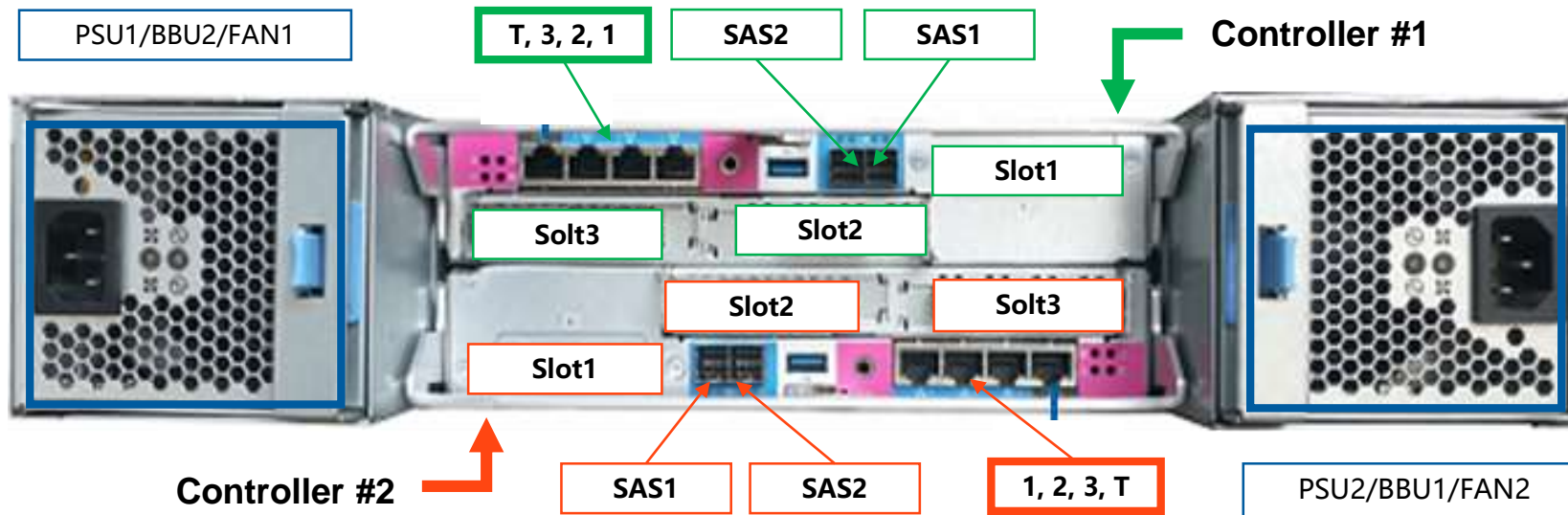


2U12



2U25

Ports 1, 2 and 3 can run business, and port T is dedicated to maintenance



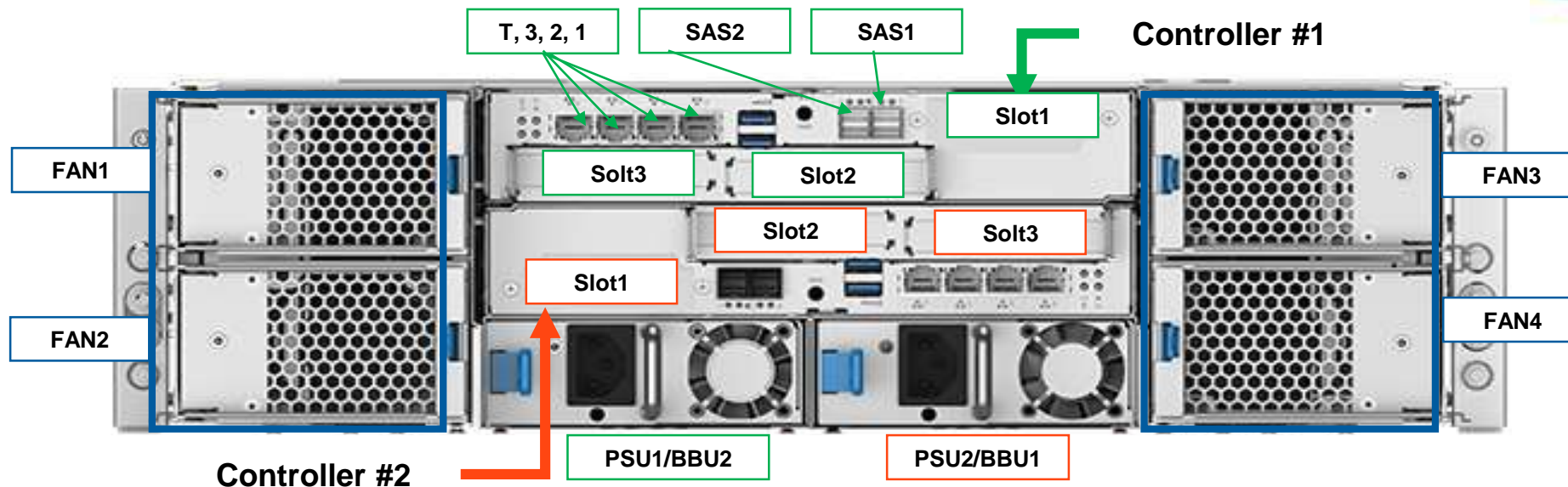
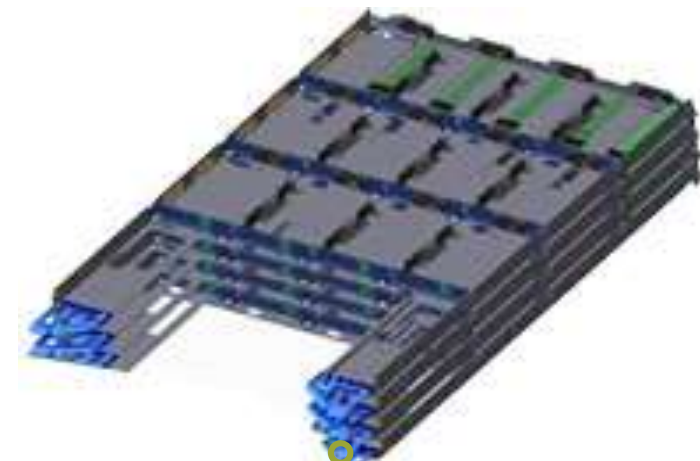
Note:

- ❑ For 12 / 25 bays model, the on-board SAS ports form two links, the number of expansion enclosures is no more than **20**, and the number of expansion enclosures using SAS cards is no more than **40**;
- ❑ For 48 / 92 Bay models, the on-board SAS ports form two links, the number of expansion enclosures is no more than **8**, and the number of expansion enclosures using SAS cards is no more than **24**;

AS5300&5500G5 3U controller chassis

Support 48 hard disks and 3U control cabinet with **the highest density** in the industry

Drawer design
Tank chain cable protection



G5 mid-end HFA JBOD



2U12 (2.5" /3.5")



2U25 (2.5")



3U48 (2.5" /3.5")



5U92 (3.5")

G5 mid-end HFA software features

| | |
|--|--|
| Efficiency improvement software | Intelligent Thin Provisioning (Inthin), Intelligent virtualization RAID (InRAID), Intelligent data migration (InMigration), Intelligent tiering (InTier), Intelligent volume conversion (InTune), Intelligent heterogeneous virtualization (InVirtualization), Intelligent unified management (Inview), Intelligent online compression (InCompression), Intelligent file service (InFileService), Intelligent WAN acceleration (InAccelerator), Intelligent Report (InReporting) |
| Data protection software | Intelligent snapshot (InSnapShot), Intelligent clone (Inclone), Intelligent volume backup (InBackup), Intelligent volume mirroring (InVdiskMirror), Intelligent remote replication (InRemoteCopy), Intelligent active-active (InMetro), Intelligent data erasure (InErase) |
| Key business support | Intelligent service guarantee (InQoS), Intelligent automatic cache partition (InAutoPartition), Intelligent cache acceleration (InFlashCache) |
| Virtualization features | Heterogeneous Virtualization: support more than 95% models and realize unified management Raid Virtualization: block level virtualization technology, system balance, no hot disk Virtualization system support: mainstream virtualization technology support in the industry, including intelligent perception plug-ins, such as VAAI, VVOL, VASA, vCenter integration, etc. |

Note:

Intelligent compression: AS5500G5 uses hardware compression card to realize compression, and AS5300G5 supports soft compression (not recommended)

Data deduplication: the function of data deduplication has been realized in AS5500G5, but it needs to be reported one month in advance for development and activation. AS5300G5 is not recommended.

Configuration limitations: traditional RAID (TRAIID) and distributed RAID (InRAID)

| Property | TRAIID | InRAID |
|---------------------------------|--------|------------------------------|
| Max RAID number of cluster | 128 | 32 |
| Max RAID number of I/O group | 48 | 10 |
| Max number of RAID member disks | 16 | 128 |
| Number of RAID-0 member disks | 1-8 | N/A |
| Number of RAID-1 member disks | 2-2 | N/A |
| Number of RAID-5 member disks | 3-16 | 4-128 |
| Number of RAID-6 member disks | 5-16 | 6-128 |
| Number of RAID-10 member disks | 2-16 | N/A |
| RAID-5 stripe width | 3-16 | 3-16 (recommended value: 9) |
| RAID-6 stripe width | 5-16 | 5-16 (recommended value: 12) |

| Disk capacity | < 8TB | >= 8TB |
|---------------|-------|--------|
| TRAIID5 | ● | ○ |
| TRAIID6 | ● | ○ |
| TRAIID10 | ● | ○ |
| InRAID5 | ● | X |
| InRAID6 | ● | ● |

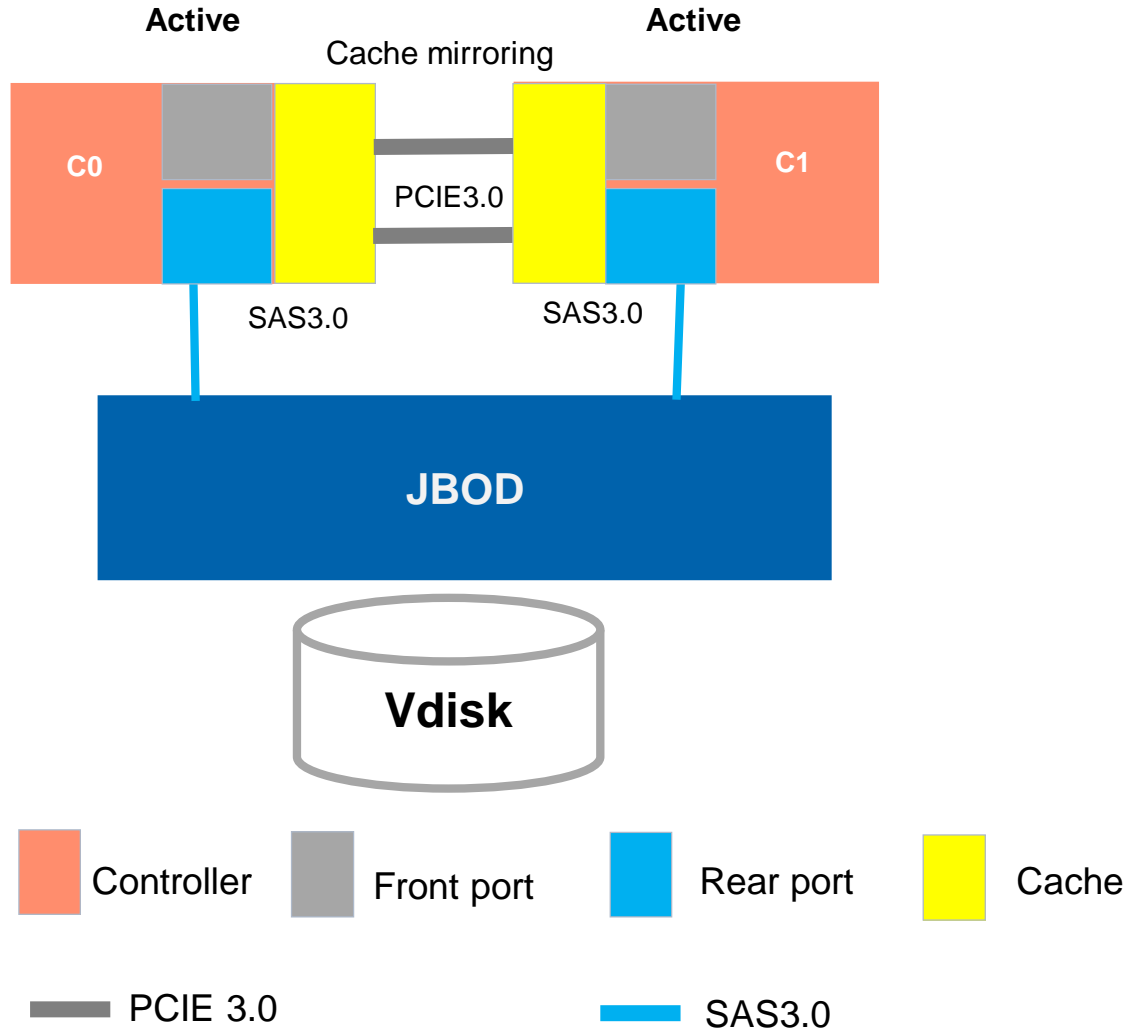
●: Support GUI and CLI creation

○: Only cli creation is supported

x: Not Support

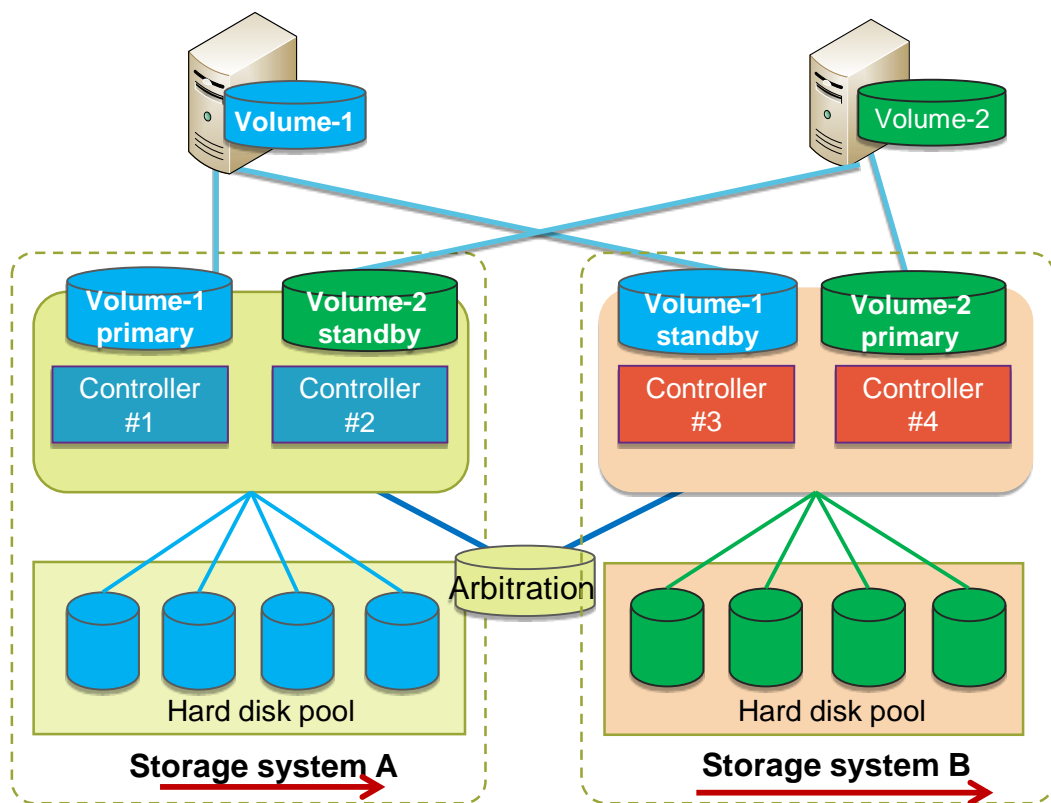
The single disk capacity is greater than or equal to 8TB. InRAID5 is not supported. It is recommended to use InRAID6.

Dual control A-A architecture



- 1 • AS5500G5 is Active-Active storage architecture
- 2 • IO can be handled by two controllers together
- 3 • Can provide continuous performance and efficient IO processing efficiency
- 4 • Through the wide stripe technology of InRAID, any Vdisk is evenly distributed to each controller and each hard disk

Gateway free storage Active-Active (InMetro)



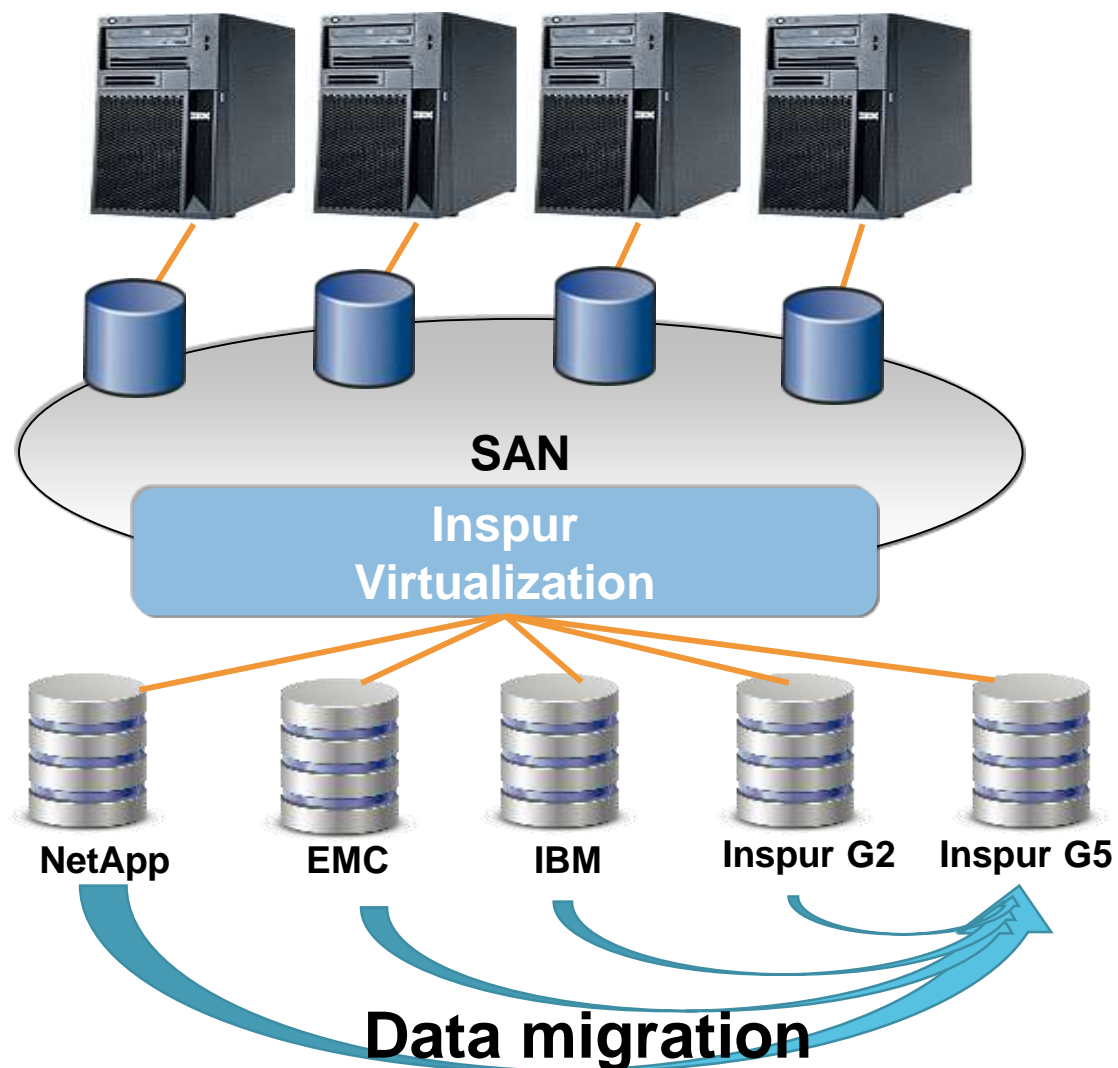
Ensure 7 * 24-hour sustainable operation of business applications

- The intelligent Active-Active (InMetro) function provided by Inspur G5 storage system is based on **the cluster system**,
- Each logical volume is managed by two I / O groups at the same time.
- The InMetro function uses **synchronous remote replication**, **volume change technology** and **online data migration technology**.
- **Two arbitration modes** are supported: IP arbitration and FC arbitration disk arbitration

Customer revenue

- No additional storage dual active gateway is required, and **the architecture is simple and stable**
- Double write, local read, automatic switching, **uninterrupted service**
- Double activation can be done between **any model** to reduce TCO
- **99.9999%** reliability, guaranteed RPO = 0, RTO = 0

Heterogeneous virtualization (InVirtualization) ★



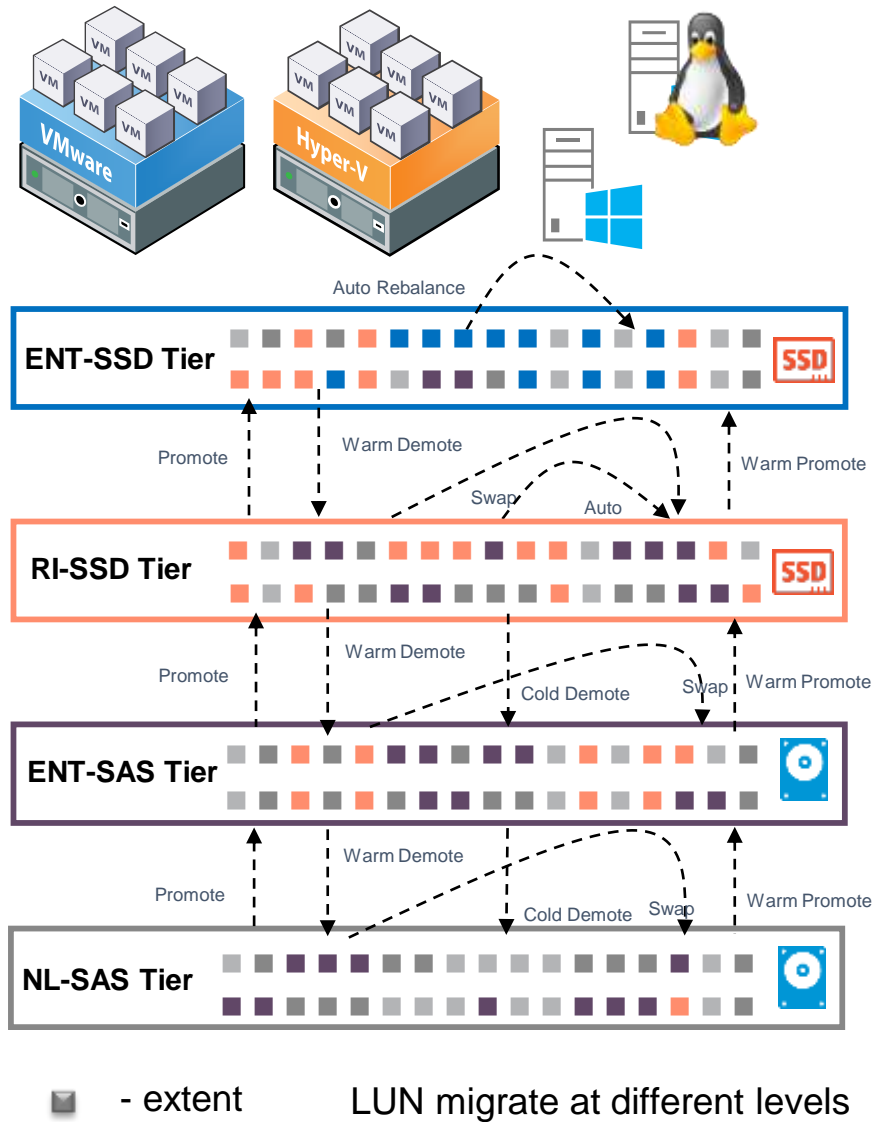
Inspur G5 storage forms Mdisk from volumes mapped from other storage. Then, Inspur G5 storage will form a storage pool of one or more Mdisk, and then divide the storage pool to form a logical volume mapped to the front-end host

The mapped heterogeneous storage space can be integrated with the local space for application use

Customer revenue

- Make good use of old equipment and improve resource utilization
- Eliminate differences between different types of storage resources
- Realize unified resource management and reduce operation and maintenance costs
- The integrated virtualized storage device can have the same rich and advanced functions as G5 storage
- Online data migration, no business perception, ensuring business continuity

Intelligent tiering (InTier)



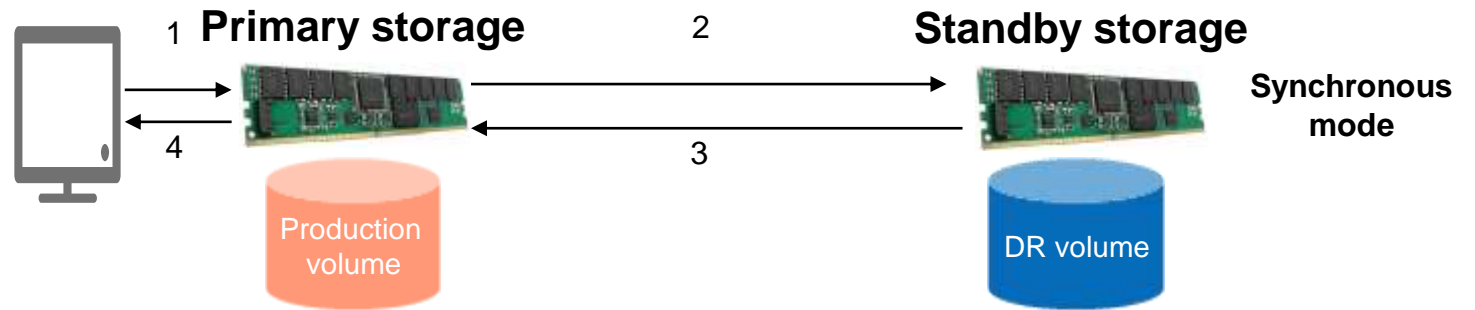
- **Four tier** automated storage tiering, the highest in the industry
 - T0-Flash SSD
 - T1-Flash 3D NAND SSD
 - T2-Enterprise SAS 15K/10K RPM
 - T3-Nearline SAS 7200 RPM
- **Reflect in real time** and **automatically** adjust the hot and cold operation status of business data
 - Data hotspot operation cycle analysis can be carried out in a minimum of 5 minutes
 - Minimum 16MB data block fineness, optimized disk configuration effect

Customer revenue

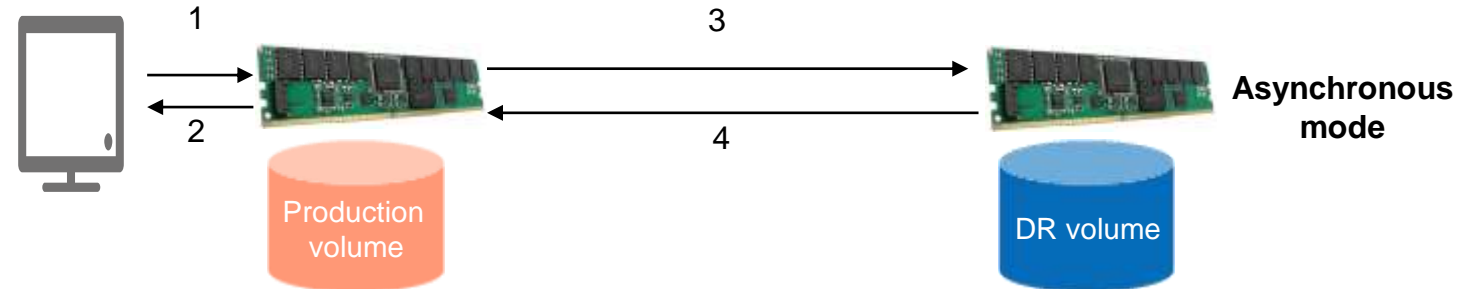
- Users do not need to manually migrate data from primary storage to secondary storage
- **Effectively reduce storage costs** and automatically store data to a more cost-effective level
- Ensure the business data **response performance** of core applications

Remote disaster recovery replication technology (InRemoteCopy)

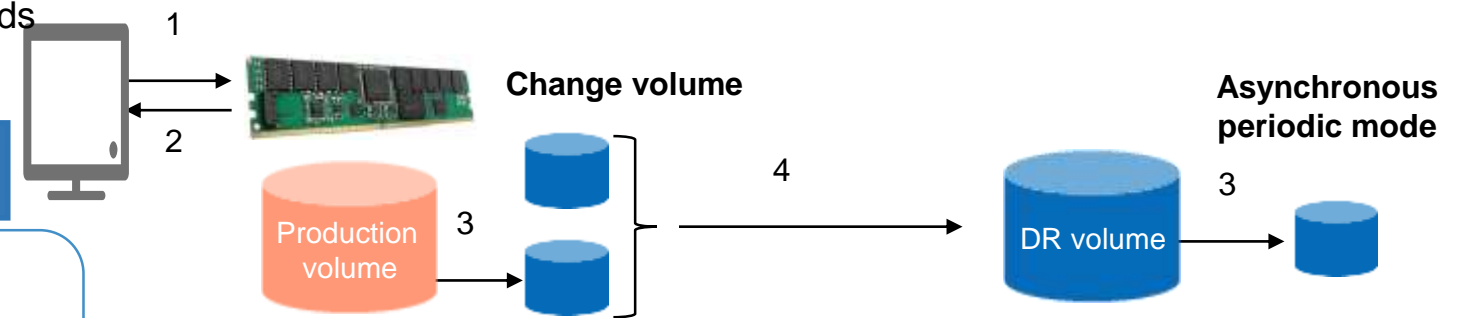
- 1: host write IO is written to the cache of primary storage
- 2: the primary storage synchronizes the IO in the cache to the standby storage cache
- 3: standby storage feedback received write I/O
- 4: feedback to the host that IO has been written



- 1: host write IO is written to the cache of primary storage
- 2: feedback to the host that IO has been written
- 3: the primary storage synchronizes the IO in the cache to the standby storage cache
- 4: standby storage feedback received write I / O



- 1: host write IO is written to the cache of primary storage
- 2: feedback to the host that IO has been written
- 3: create change volumes at the primary and standby ends
- 4: copy variance data of change volume



Customer revenue

- Multiple disaster recovery replication technologies, synchronous, asynchronous, asynchronous cycle
- Unique Wan acceleration technology improves transmission efficiency by 90%

Intelligent WAN acceleration (InAccelerate)



Applicable to remote disaster recovery replication, which is replicated through IP

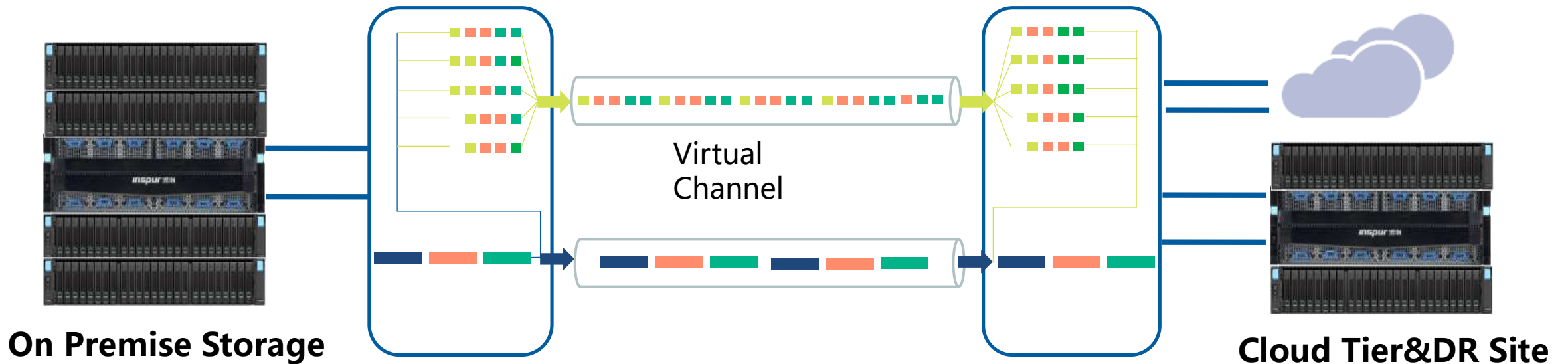
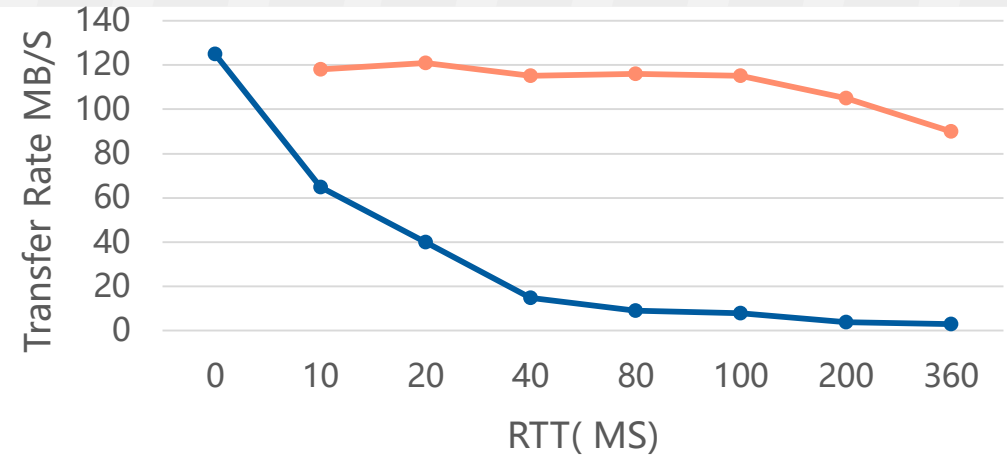
Optimize the IP link, adjust the number of windows and virtual connections through AI algorithm, and improve the performance under extreme unstable links



90% \times
Transmission efficiency improvement



50% \times
TCO reduction

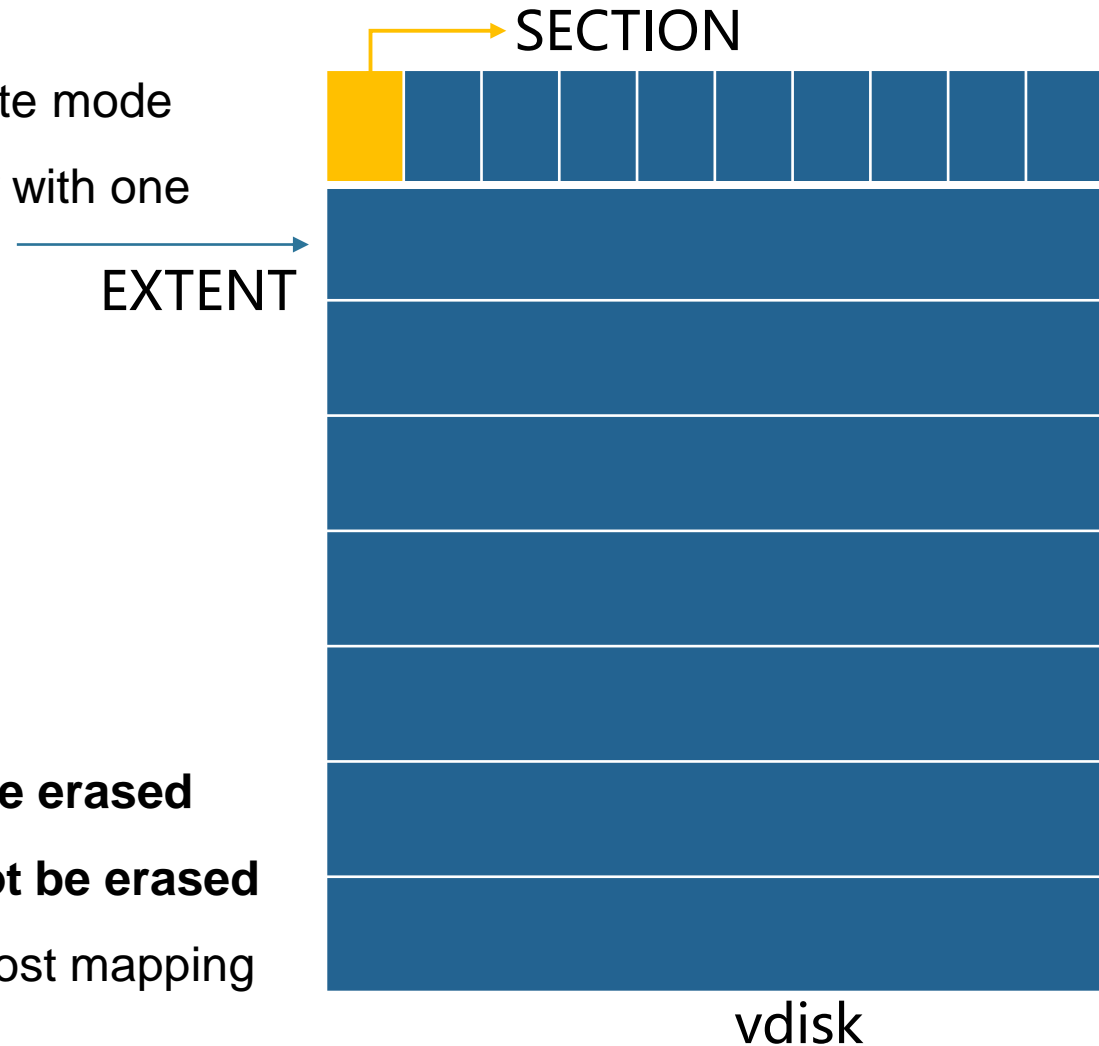


Intelligent data erasure (InErase)

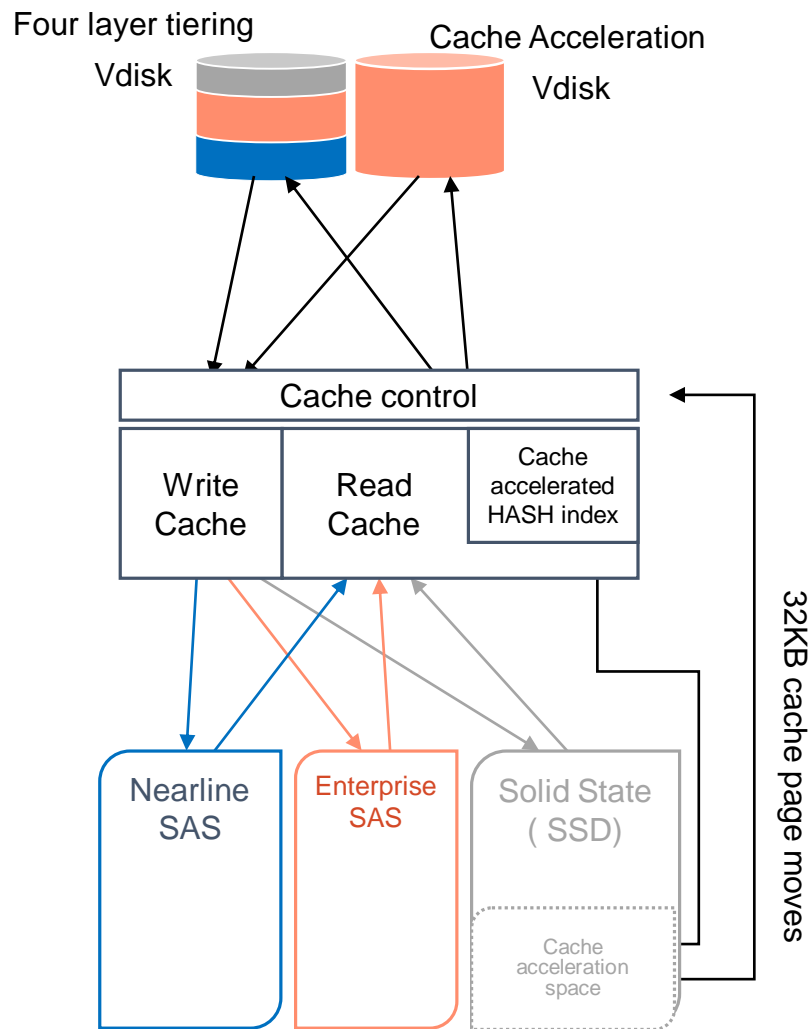


When the data in a Lun is no longer needed, the data of the Lun is erased by overwriting the data

- ❑ Erase mode: the minimum unit of section, 0 / 1 overwrite write mode
- ❑ Erase operation: obsolete data can be destroyed intelligently with one click and cannot be recovered
- ❑ Application scenario:
 - Confidential data destruction
 - Hard disk life is about to expire
- ❑ Application restrictions:
 - Erase only non thin volumes
 - Volumes configured with value-added services **cannot be erased**
 - Formatting, migration and cache partition volume **cannot be erased**
 - Before overwriting, the Lun is normal and the Lun and host mapping are to be unmapped



Intelligent Cache Acceleration (InFlashCache)



This acceleration using SSD as a read cache is suitable for applications such as databases, virtualization, analysis systems, and so on.

1. Single-control maximum configuration 10TB cache acceleration capacity
2. Maximum 32 cache partitions
3. Read performance IOPS can be increased by more than two times and read latency reduced by one time
4. With RAID0 technology, only one disk is needed for performance acceleration


Customer revenue

- With SSD cache acceleration, performance can be doubled
- **Effectively reduce storage costs** and TCO
- Ensure the business data **response performance** of core applications

Contents



1. Potential market opportunities of mid-end HFA products /



2. Analysis of specifications and characteristics of mid-end HFA products /



3. Manufacturer analysis of mid-end HFA products /



4. Application scenarios and cases of mid-end HFA products /


G5 mid-end HFA manufacturer analysis

| Inspur | HW | HPE/H3C | MacroSAN | DELL/EMC | Netapp (Lenovo) |
|----------|----------|-------------------------|----------|--------------|-----------------|
| AS5300G5 | OS5310V5 | Primera C630 CF22030 | MS3000G2 | Unity XT 480 | FAS8300 |
| AS5500G5 | OS5510V5 | Primera C650 CF22050 | MS5520G2 | Unity XT 680 | FAS8700 |
| AS5600G5 | OS5610V5 | Primera C650 CF22050 | MS5520G2 | Unity XT 880 | FAS9000 |
| AS5800G5 | OS5810V5 | PrimeraC670 CF22070 | MS5580G2 | Unity XT 880 | FAS9000 |

Contents



1. Potential market opportunities of mid-end HFA products /



2. Analysis of specifications and characteristics of mid-end HFA products /



3. Manufacturer analysis of mid-end HFA products /



4. Application scenarios and cases of mid-end HFA products /

Application of mid-end HFA products

Product features

Application scenario

**AS56&5800G5
MLEs**

Ultimate expansion, ultimate capacity
Mid-end price experience high-end performance
Maximize customer investment value

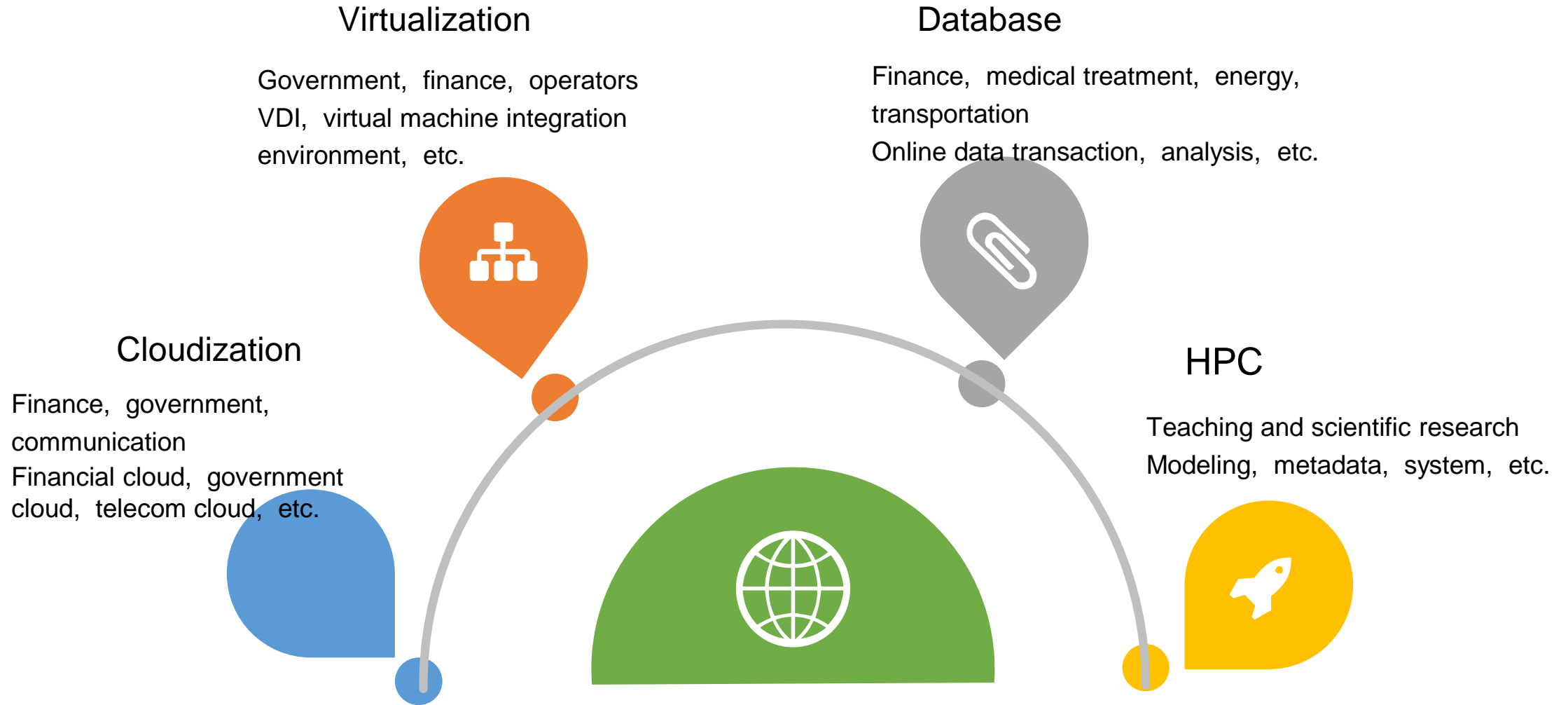
Large scale cloud platform virtualization application
Large scale database integration application
High performance application storage

**AS53&5500G5
SMEs**

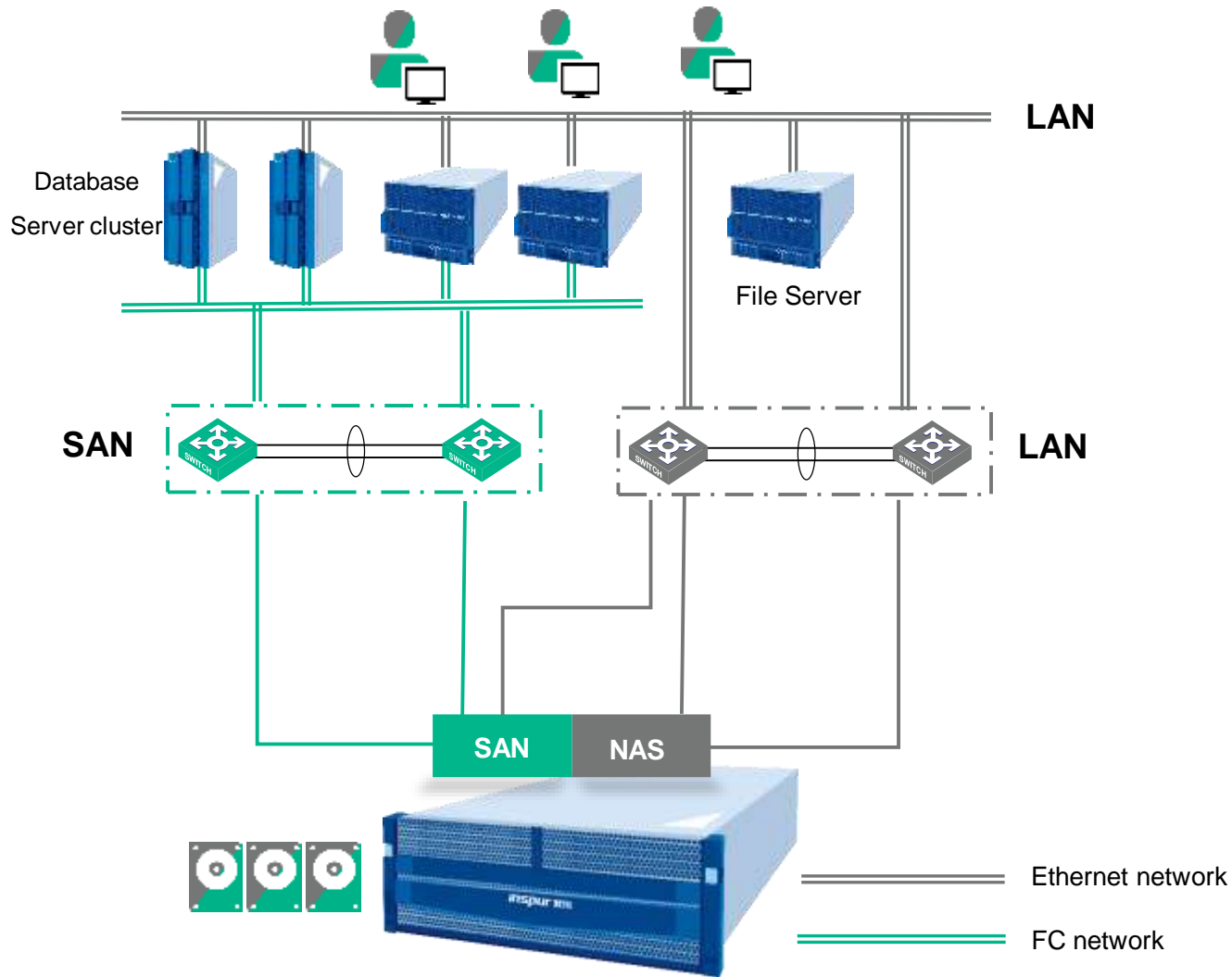
Flexible configuration and better price
High scalability, high performance
Gateway free dual active, mature and reliable

Entry level server virtualization
Office OA and document sharing
Mid scale database application

Industry and application of mid-end HFA



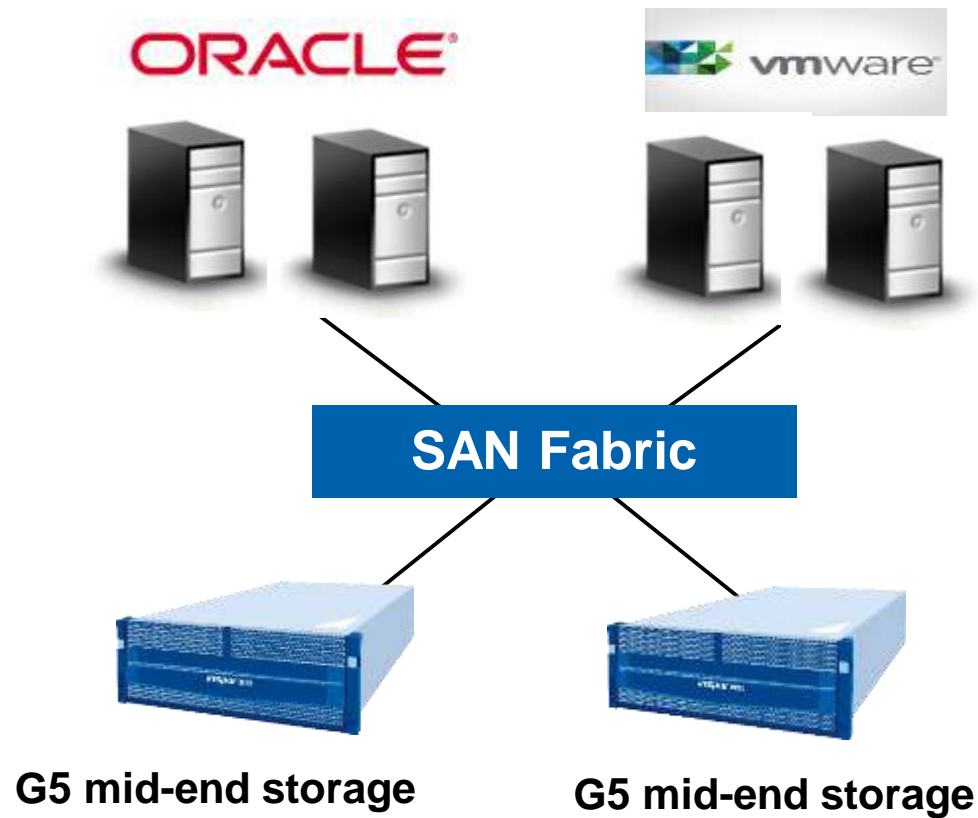
High density multi service application scenarios



Value of G5 medium and high-end products

- Business types are increased to meet the storage requirements of the system business
- 24 IO cards, highly flexible networking combination
- QAT compression engine to improve resource utilization
- Support mixed insertion of hard disks and combination of hard disks on demand
- Four tier data tiering for excellent storage performance
- Support 16 control horizontal online expansion to meet growth needs

Database, virtualization, centralized storage, scenario application



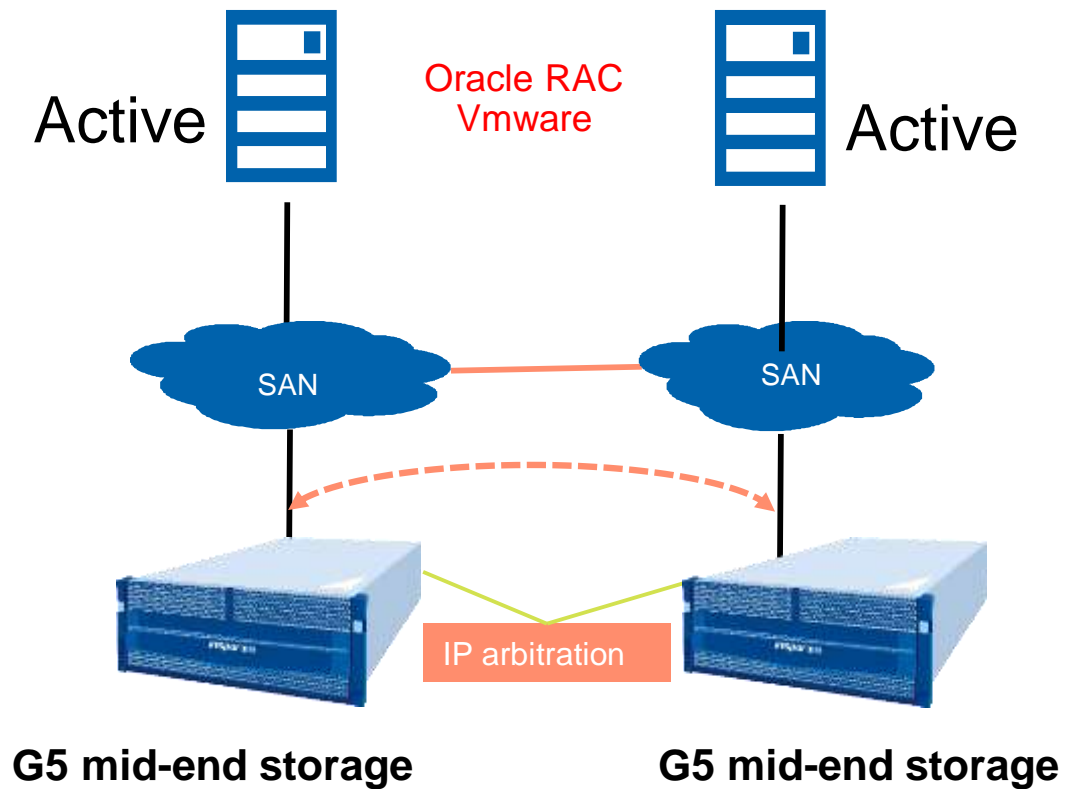
G5 mid-end product value

- Leading CPU platform, chip specification upgrade, performance improvement of 30%+
- Intelligent cache accelerates performance growth, reduces TCO and improves responsiveness
- Intelligent tiering enables automatic data storage, reduces TCO and improves responsiveness

Solution

- Configure SSD cache acceleration
- Configure intelligent tiering feature +SSD
- Configure SSD data compression features
- Meet high-performance requirements, reduce storage costs and improve data responsiveness

Application of high reliability AA scheme



Gateway free data center level AA

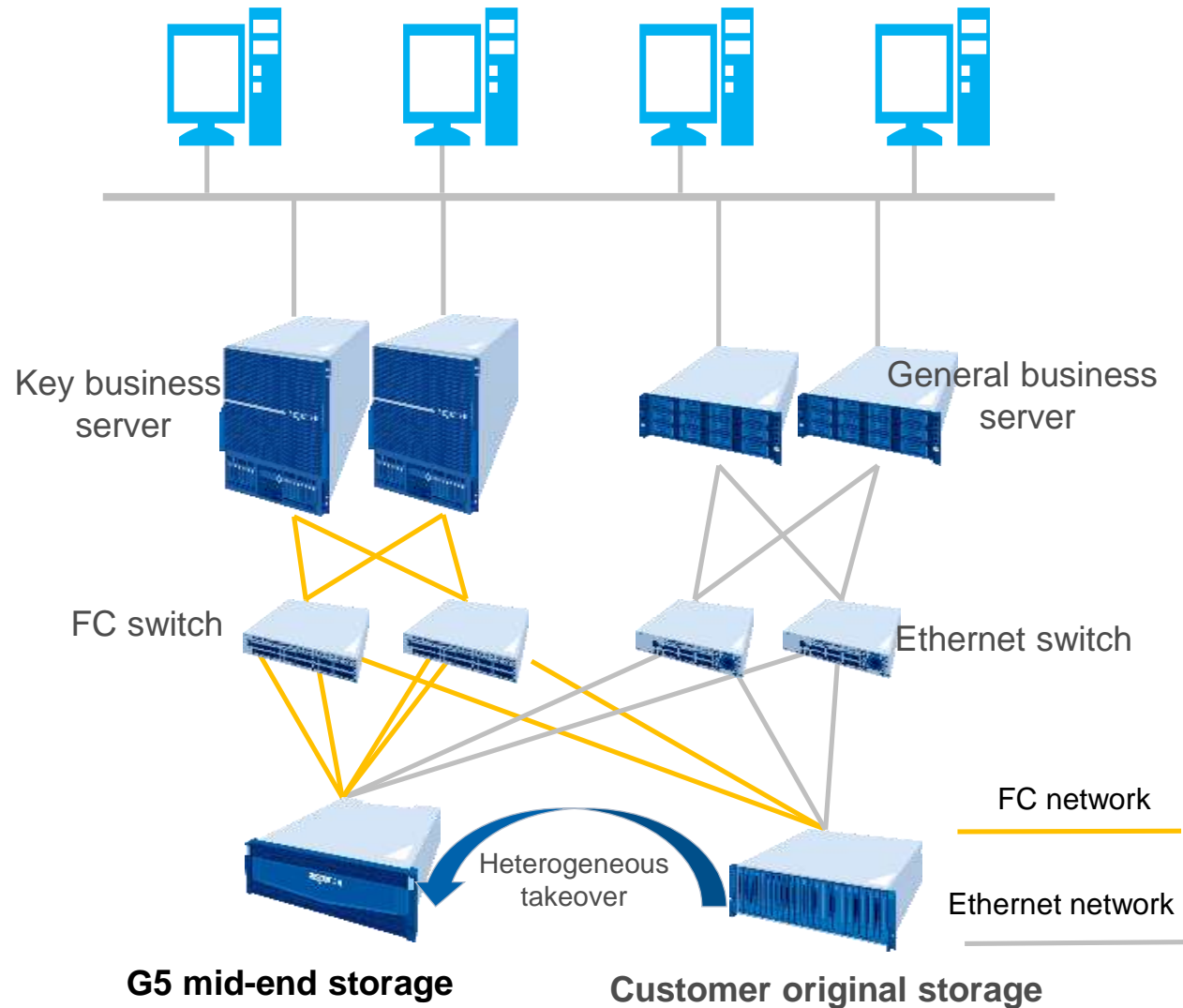
Value of medium and high-end products

- The hardware is fully redundant and modular design, without single point of failure
- The storage system operates without fault and the business has high availability
- Multiple data protection methods (backup + disaster recovery), high availability
- Data security under various circumstances to ensure the continuous operation of the business

AA solution

- The primary center and the standby center build a AA storage solution based on G5 synchronous replication
- Through nearly 100% network transmission efficiency, the storage of the two data centers is fully synchronized and the data is 0 lost
- Automatic sensing equipment failure, service second level automatic switching

Heterogeneous virtualization replaces storage from other vendors



Value of medium and high-end products

- The old storage cannot meet the application requirements and needs to be replaced with a new storage
- Storage device replacement involves data migration. Traditional migration methods need to interrupt business, and the migration efficiency is low
- Old equipment was eliminated, difficult to profit from the old

Solution

- G5 transparently takes over the data volume of the original array to realize the data replication from the original volume to the new volume without business downtime
- After the data migration, the old storage can be re-planned for edge business to realize the effective utilization of the old equipment, and can be managed and planned uniformly through the G5 platform

Map of successful application cases of mid-end HFA

| | Finance | Government | Medical care | Energy transportation | Teaching and scientific research | Manufacture |
|-----------------|---------|-----------------------------------|---|--------------------------------|--|----------------------|
| OLTP | BOC | COD | The First Affiliated Hospital of Zhengzhou University | State Grid | Tsinghua University | China tobacco |
| Virtualization | CCB | NDRC | Gansu people's Hospital | ONCF | Peking University | FAW Volkswagen |
| | ABC | MeP | Wuhan Zhongnan Hospital | National Energy Administration | Fudan University | Guangzhou automobile |
| Cloud computing | PSBC | MoA | Shaanxi second hospital | SINOPEC | Sun Yat-sen University | Angang Group |
| | BCM | Foreign Ministry | Shanghai Health Commission | CNPC | China University of science and technology | COFCO group |
| Big data | PAB | Yunnan provincial Party committee | Ningxia health and Family Planning Commission | China Southern Power Grid | Chinese Academy of Engineering | NARI Group |

500 + sets of storage, AA services, government, medical, education, energy and manufacturing industries

Manage heterogeneous storage capacity for 200 + customers

Power minicomputer + G2 / G5 storage has been successfully used in finance, social security and transportation

Help government, finance, healthcare, manufacturing and digital transformation

高度决定视野

谢谢

Thank you

inspur 浪潮