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GB/T 46352-2025

**Information technology - Technical requirement for distributed
storage protocol interconnection**

信息技术 分布式存储协议互联技术要求

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part

1.Structure and Drafting Rules of Standardization Documents". Drafting. Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents. This document was proposed and is under the jurisdiction of the National Information Technology Standardization Technical Committee (SAC/TC28). This document was drafted by: Inspur Electronic Information Industry Co., Ltd., China Electronics Technology Standardization Institute, and Shenzhen CESI Information Technology Co., Ltd. Shenzhen Jiangbolong Electronics Co., Ltd., China Mobile Communications Group Co., Ltd., Huazhong University of Science and Technology, and Chengdu Huawei Technologies Co., Ltd. Technology Co., Ltd., Beijing Tongyou Feiji Technology Co., Ltd., Jinan Inspur Data Technology Co., Ltd., Jiangsu Zhongtian Technology Co., Ltd. Company, Hangzhou Hikvision Digital Technology Co., Ltd., Zhejiang Bangsheng Technology Co., Ltd., Chongqing University, Northwestern Polytechnical University, Huiju Storage Technology (Dongguan) Co., Ltd., China Mobile (Hangzhou) Information Technology Co., Ltd., Shenzhen Jinsheng Electronic Technology Co., Ltd., Xiamen University, Shandong Provincial Computing Center (National Supercomputing Center in Jinan), Zhejiang Dahua Technology Co., Ltd., Shenzhen Zhongtong Internet Information Technology Co., Ltd. company. The main drafters of this document are. Li Hui, Sun Wei, Lu Lu, Yang Hong, Meng Xiangrui, Guo Xiong, Feng Yi, Zhang Chun, Wang Fang, Feng Dan, Meng Fanhui, and Liu Yang. Sun Bin, Gao Xichun, Bai Xinlu, Zhang Xiao, Zhou Danyuan, Zhan Huan, Qin Wei, Zhang Zaigui, Chen Xian, Zhang

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With the explosive growth of data volume, cross-protocol access to diverse business data has become an important development trend in the field of distributed storage. To meet the needs of diverse computing services on a host computer accessing unstructured data across file, object, and other protocols, and to achieve real-time data sharing and interoperability. This paper proposes a distributed storage protocol interconnection technology for distributed storage systems. As a new storage implementation method, this document aims to provide... The technical architecture for interconnecting distributed storage protocols is defined, and the technical requirements for implementing such interconnection are specified, thereby meeting the needs of single non-standard storage protocols. While maintaining the key characteristics of traditional distributed storage in the design of structured data access services, it supports cross-service communication for unstructured data. This approach reduces data duplication caused by accessing different protocols, minimizes data flow, and reduces semantic operation loss during real-time concurrent access. Loss, improve business performance and space storage data utilization, thereby helping to reduce energy consumption during continuous business operation, through a single data copy Interoperability and sharing improve the space efficiency and overall performance of the storage system. Information technology distributed storage protocol interconnection technology requirements

1 Scope

GB/T 46352-2025 is the Chinese national standard covering making distributed storage systems talk to each other - the protocol interfaces for block, file and object access, the metadata mapping between systems that model data differently, the consistency guarantees carried across, and the error semantics. First edition, in force from 1 May 2026. Issued on 5 October 2025, it has been in force since 1 May 2026.

This document specifies the architecture and technical requirements for interconnecting distributed storage protocols. This document applies to the design and implementation of distributed storage protocol interconnect architectures.

2 Normative references

This document has no normative references.

3 Terms and Definitions

The following terms and definitions apply to this document.

3.1 Distributed storage A data storage technology that integrates storage space resources

distributed across multiple machines through a network to form a virtual storage device.
[Source: GB/T 36074.3-2019, 3.17]

3.2 storage protocol Rules and methods for transferring, accessing, and storing data between hosts and storage devices.

Note. The storage protocols in this document refer to file storage protocols (NFS, SMB/CIFS, POSIX file operation related interface specifications) and object storage protocols. Distributed storage protocols include S3, SWIFT, and HDFS, which are primarily used in unstructured data applications.

3.3 A technology for ensuring semantic compatibility between storage protocols.

Note. To enable real-time access to a single set of data by various applications on a host across storage protocols, distributed storage provides a global single-database scalable layer based on a globally extensible data object layer. A single-copy data sharing storage method, while simultaneously enabling access and semantic manipulation of storage protocols through unified storage protocol semantic mapping processing. Compatible.

3.4 metadata Data that defines and describes other data includes information such as creation time, modification time, type, and access permissions generated by the host application. The information also includes information such as the mapping between logical and physical addresses of data generated within the distributed storage system. [Source: GB/T 18391.1-2009, 3.2.16, with modifications]

3.5 unified metadata Multi-protocol metadata is integrated to form information with a consistent data structure.

Note. Protocol metadata includes information such as directory (file) and bucket (object) names, sizes, times, and user owners.

3.6 Metadata objects are merged, processed, and stored according to certain rules and methods.