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**NATIONAL STANDARD OF THE
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GB/T 42644-2023

Space data and information transfer systems - Bundle protocol

空间数据与信息传输系统 束协议

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Foreword

This document is in accordance with the provisions of GB/T 1:1-2020 "Guidelines for Standardization Work Part 1: Structure and Drafting Rules for Standardization Documents" drafting: This document is drafted with reference to "ISO 21323:2016 "Spatial Data and Information Transmission System Bundle Protocol Specification"", and the degree of consistency is very high: equivalent: Please note that some contents of this document may refer to patents: The issuing agency of this document assumes no responsibility for identifying patents: This document is proposed and managed by the National Aerospace Technology and Its Application Standardization Technical Committee (SAC/TC425): This document was drafted by: Beijing Institute of Tracking and Communication Technology, Beijing Space Vehicle Overall Design Department, National Space Agency of the Chinese Academy of Sciences Science Center, Nanjing University, Ningde Institute of Standardization Science and Technology, China Aerospace Standardization Institute, China Electronics Technology Group Corporation The 54th Research Institute, Shenzhen Gelonghui Information Technology Co., Ltd., and Zhongguancun Spatial Information Industry Technology Alliance: The main drafters of this document: Chen Yunjun, Yu Tao, Liu Yan, Chen Xiao, Zhou Yuxia, Huang Lei, He Xiongwen, Huang Yonghui, Zhao Kangyan, Lu Liangqing, Wu Xunji, Wei Rong, Fan Fei, Xu Dongyan, Cao Yanjun, Lin Ying, Chen Shouhong, Ouyang Ling, Ma Guanghao:

The Bundle Protocol (BP) standard proposal was originally formulated by the Internet Engineering Task Force (IETF), and the standard proposal released is RFC5050 The Advisory Committee on Space Data Systems (CCSDS) evaluates that for the harsh space communication environment, the use of RFC5050 The BP protocol stipulated in the standard proposal can improve the communication capability: Based on the RFC5050 standard proposal, the CCSDS organization aims at Supplementary provisions have been made for inter-communication application requirements, and the CCSDSBP protocol

standard proposal has been released, namely CCSDS734:2-B-1 "BundlePro- Standard, namely ISO 21323:2016: In order to ensure the integrity of the technical content, this document adopts non-equivalent adoption of ISO 21323:2016, refers to and joins the IETF Space Data and Information Transmission System bundle agreement

1 Scope

GB/T 42644-2023 specifies the Bundle Protocol for space data and information transfer. It is the transport of delay and disruption tolerant networking, designed for links that TCP/IP cannot work over: a signal to Mars takes minutes each way, a relay orbiter is only in view for part of an orbit, and there is no moment at which both ends of the path are up at once. The protocol answers that by storing each bundle at every hop and forwarding it when a link appears, rather than assuming an end-to-end path exists. The standard sets the protocol overview and the services it provides, then the core protocol: the bundle format, bundle processing, administrative record processing, the service requirements on the convergence layer and the security considerations, together with the IPN endpoint naming scheme, the convergence layer adapters and the extension blocks. It took effect on 1 September 2023.

This document specifies the data unit format, protocol flow, business requirements of the aggregation layer, and security considerations of the bundle protocol (hereinafter referred to as BP protocol) and other content, supplementary provisions are made on the application of BP protocol in spatial data and transmission system, mainly including convergence layer adapter, service type extension, etc: extension, aggregate custody signaling, delay-tolerant load adjustment, and protocol management information content: This document is applicable to data transmission of space mission systems where communication resources are tight and communication time is extended, and the network may be temporarily interrupted:

2 Normative references

The contents of the following documents constitute the essential provisions of this document through normative references in the text: Among them, dated references For documents, only the version corresponding to the date is applicable to this document; for undated reference documents, the latest version (including all amendments) is applicable to this document: GB/T 9387:

1 Information Technology Open System Interconnection Basic Reference Model Part 1: Basic Model

GB/T 17967 Information Technology Open System Interconnection Basic Reference Model OSI Service Definition Convention

GB/T 42041 Terminology for Space Data and Information Transmission in Aerospace

3 Terms and Definitions

GB/T 9387:1, GB/T 17967, GB/T 42041 and the following terms and definitions apply to this document:

3:1 bundle bundle The protocol data unit of the BP protocol is composed of protocol data blocks:

3:2 BP protocol node BPnode Any entity capable of receiving and/or sending Bundles:

3:3 BP protocol agent bundleprotocolagent; BPA A component in a node that executes the BP protocol process and provides BP protocol services:

4 Application agent applicationagent;AA Components in nodes that use BP protocol services for communication:

5 An adapter that sends and receives Bundles on behalf of BPA:

3:6 BP protocol endpoint BPEndpoint A set of zero or more BP protocol nodes, all nodes in the set use the same endpoint identifier: