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Earth Observation Data Management Systems (4)

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THE DATA MANAGEMENT STRATEGY AND THE IMPLEMENTATION FOR THE GROUND
SEGMENT

Abstract

Recently, the number of payloads and the data rate of the spacecraft have been on the rise steadily in space programs. Therefore, the data management becomes important issues at ground segments. However, most perspective is concentrated on the data management for after-launch. In fact, as much as the operation, ground test segment for before-launch also deals with the huge data. Although the data in the ground segment mostly do not include valid image or information, the volume is considerably occupied. In addition, if some problems occur during the ground test, it repeats again and again for the demonstration. It can last day and night until the cause becomes identified. As a result, a huge amount of the data will be generated and the ground segment, especially ground test segment, needs a new approach for the large data. First, two types of large data storage, internal and external, are prepared to achieve the mobility and the dependability. The internal storage is used directly with the test instruments in one rack and its storage capacity is smaller than the external. It should follow the spacecraft whenever various tests are performed in different place (e.g., Electrical/Engineering Test Bed, Integration System Test, Thermal Vacuum Test or etc.) On the contrast, the external storage with relatively larger storage capability is located in separate and fixed place. All data from different place will be transmitted and finally get together into this external storage. Second, the automation of the data-back up and the distribution are considered for prevention of data loss and efficiency of data distribution. Different kinds of payloads and subsystems generate a lot of data and diverse teams or groups of engineers want the data that they are interested in respectively. The data loss can be occurred without any authority and access control. The internal storage transfers the data to the external storage automatically in semi-real time. It can be realized by applying the event trigger principle of developed software. Also, FTP protocol at the external storage is used so that only authorized engineers can approach the centralized test data and their access information is recorded as a log. Lastly, various formats of the test data such as CADU, Space Packet or etc. are provided for each user and group at External Storage. It is very helpful to compare and analyze the test result quickly.