

An Initial Report of StarBED for HpFP Development

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With the rapid development of big data and cloud computing technologies, Earth observation (EO) data generated by satellites and sensors are transferred to remote cloud data centers for analysis and storage. Real-time monitoring and tracking applications such as disaster management, military, agriculture, etc. utilize these EO data and play an important role in human life. However, it is hard to handle a large and growing amount of these EO data, and to achieve them in real time. We develop a novel transport protocol, named high-performance and flexible protocol (HpFP), to enhance the efficiency of data transfer of the EO data. The HpFP is designed on the top of user datagram protocol (UDP), but is a connection-oriented and reliable stream-type protocol. The original HpFP is designed first for specified networks and puts more emphasis on latency and packet loss tolerances than fairness and friendliness, while the HpFP2 is more suitable for real network environments. To accommodate different usage scenarios, we complete four operating modes of HpFP2: aggressive, fair, fast-start, and modest modes. StarBED is constructed and operated by National Institute of Information and Communications Technology (NICT), Japan as a large-scale, general-purpose Internet simulator connected by network switches to the 728 servers (nodes). In this research, we present an initial report of StarBED for HpFP development. We conduct to evaluate our HpFP2 under real-time situations with several QoS requirements using the StarBED. The details of setup and usage of the StarBED for HpFP development are presented. In addition, the experiment results are also presented and discussed.

Keywords: HpFP, Data Transfer, Earth Observation, Real-Time Monitoring