QoS Networking for LHC data transferring

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In this paper, we shows research works of the NRM (Network Resource Management) system for efficient transmission of large-scale of data for HEP (High Energy Physics) as a user requirement based in international advanced scientific and technology research network and also announce the demonstrated about them.

Each national research network of each countries consisting of 40 Giga network facilities which are based on optical technologies and also has each own NRM systems. And 100 Giga networks are planning to build in the future. Therefore, NRM systems and technology is very important to efficient use of network resources and support of advanced scientific research areas.

Stable transmission of large-scale of data is a complex and difficult problems, even though service provider's support for QoS techniques and etc. Furthermore, due to the expansion of international multi-domain environment, the performance of network-related guarantees is more complicated. So transmission bandwidth and performance guarantees (QoS), transfer status monitoring and control technologies are more needed. Because of these issues, the study is expected to decrease in efficiency. And research leads to reduced productivity.

Thus, through the NRM system is more efficient for large-scale data transfers between Tier centers for especially reservation of network resources on user-based (scheduled time, bandwidth, monitoring, and provisioning). It can be provided as a QoS for domestic and international. And more easy control and access to global high performance network resources

Internationally, most of countries have worked on the standard for interworking over the national research networks and as well connection optical network between each countries. as a result, developed NSI (Network Service Interface) framework and CS (Connection Service) Protocol. It have been independently implemented in software by several countries and also can be connected between US, EU, Japan and Korea based on NRM techniques.

International connectivity of the NRM based networks has been 15 networks of the worldwide by the end of 2011. At SC11, demonstrated the OGF-NSI architecture for standardized global inter-domain provisioning of high performance network connections through connections of 15 international advanced networks and 12 places in the world

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