

IFERC Newsletter



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REC

Demonstration of high speed data transfer from ITER to Rokkasho

To establish the ITER Remote Experimentation Centre (REC), fast data transfer is crucial, because production of a huge amount of data is expected in ITER, i.e. 1 Tera Byte (TB) per discharge in the initial experiment and 50TB per discharge in full operation.

Repeated transfer of 1 TB data within 30 minutes, which is the requirement in the initial experiment of ITER, was demonstrated in August 30 to September 5, 2016 from ITER in France to the REC in Japan. To realize the fast data transfer, firstly the SINETS (Science Information Network 5) managed/operated by the National Institute of Informatics (NII) was used, where a direct link 20 Giga bit per second (Gbps) broadband network between Japan and Europe (London) was established this year, and the distance of the network line has become shorter than ever (Fig. 1). Secondly, a dedicated virtual private network (L2VPN) was constructed between one server in ITER and another in the REC at IFERC in Rokkasho, Aomori Japan, in order to establish a stable, highly-secured broadband network in collaboration with The National Institutes for Quantum and Radiological Science and Technology (QST), the National Institute for Fusion Science (NIFS), NII, ITER, GÉANT that operates the pan-European network for research and education community, and RENATER, that operates the national research and education network in France. Finally, a fast data transfer protocol; massively multi-connection file transfer protocol (mmcftp) developed by NII was used.

The result of the data transfer test is shown in Fig.2.

Data transfer of 50TB per day was demonstrated by repeatedly transferring 1.05 TB every 30 min, that is an inter-continental high speed data transfer of the largest level in the world.

This result has confirmed the prospects of participation in ITER experiments at the REC in Rokkasho in a similar environment to that in the ITER site.

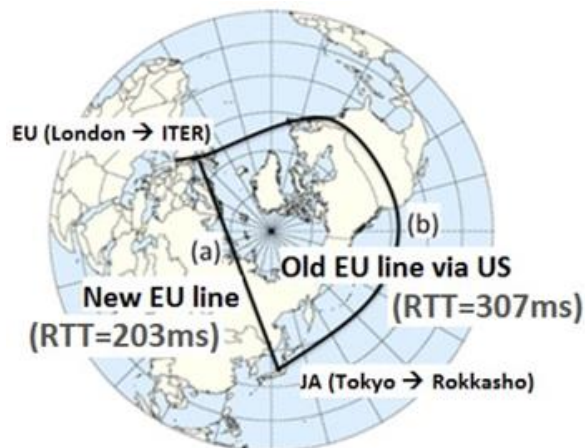


Fig.1 (a) New international line between EU and Japan, (b) International line via US. The distance of (a) is about 2/3 of that of (b). The round trip time shortened to 200ms.

(Takahisa Ozeki)

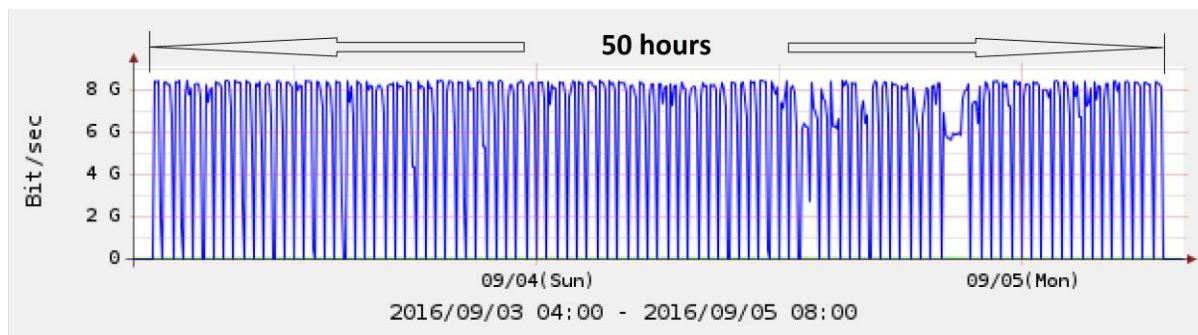


Fig.2 Result of the transfer of 1.05 TB sent repeatedly every 30min at a high speed (average of 7.2 Gbps) from ITER (France) to REC (Japan) for 50 hours