SC19 Network Research Exhibition: Demonstration Abstract

MMCFTP'S DATA TRANSFER EXPERIMENT USING FIVE 100 GBPS LINES BETWEEN JAPAN AND USA

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Abstract

Currently, major counties/regions are connected by multiple 100G lines. However, since conventional transfer protocols cannot use multiple paths, the transfer speed is limited to 100 Gbps. NII has developed a fast data transfer protocol, MMCFTP (Massively Multi-Connection File Transfer Protocol) which supports multi-path data transfer. In SC17, we demonstrated 231 Gbps data transfer between Tokyo and Denver by using three 100 Gbps lines. In SC19 we will try MMCFTP's data transfers over five 100 Gbps lines between Tokyo and Denver (Figure 1). This experiment is more challenging than the SC17 experiment. In SC17, RTTs of the shortest and longest path were 122 ms and 288 ms. In SC19, the RTT of the longest path will be 400 ms or more. The larger the RTT difference between the shortest path and the longest path, the larger window size should be supported.

Goals

1. The target speed will be 380 Gbps, up to 400 Gbps. It is necessary to restrict data transfer speed so as not to affect other communication. The effective bandwidth of each 100 G line will be 70-80 Gbps.
2. The data transfer traffic should be divided equally to five lines, to keep room of other communication on each line. In a multi-path data transfer, a lot of traffic usually flows in a short distance path, so we should eliminate this effect.

Resources

- Five 100 Gbps lines for the experiment will be prepared in cooperation with many NRENs and SCinet. Tokyo and the SC19 venue will be connected by 5 VLANs on these 100G lines.
- A pair of servers will be located at SINET5 Tokyo DC and SC19 venue. Specification of servers are shown in Table.1

Table 1 Specification of servers

	Tokyo (SINET5 Tokyo DC)	Denver (SC19 venue)
Model	Dell EMC PowerEdge R7425	
CPU	AMD EPYC 7501 (2.6GHz, 32C) x 2	AMD EPYC 7551 (2.55GHz, 32C) x 2
Memory	512 GB (DDR-2400 32GB x 16)	1TB (DDR4-2666 64GB x 16)
Disk	System Disk: SATA SSD	
NIC	Mellanox ConnectX-4 (100 GbE) x 5 (MTU:9000)	
OS	CentOS 7.6	

Involved Parties

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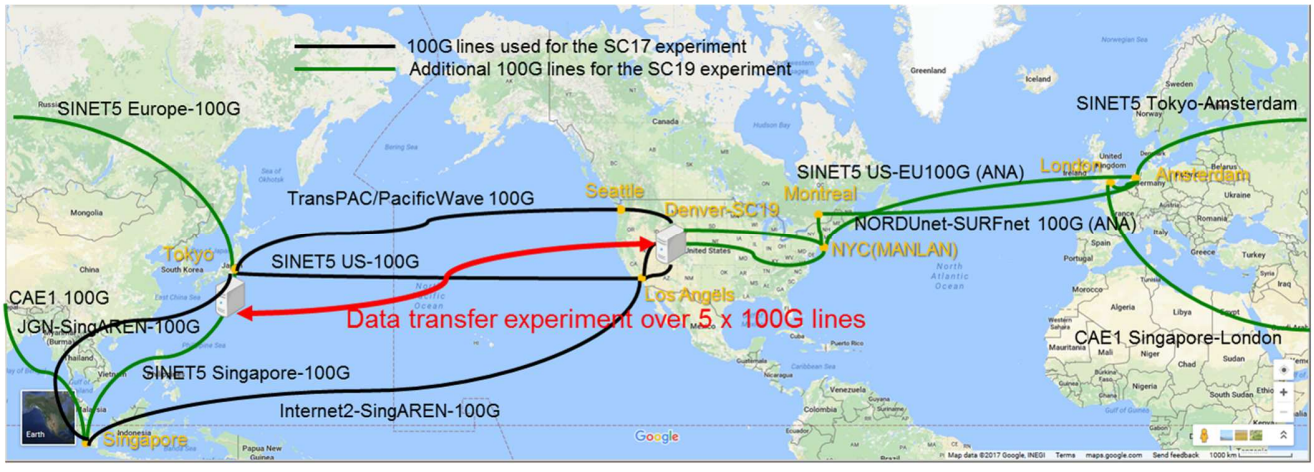

Figure 1. MMCFTP' data transfer experiment in SC19