Optimizing Wide-Area File Transfer for 10-Gbps and Beyond

- Demonstrations of network-performance testing, wide-area file systems, and file transfer applications ranging from traditional to experimental were provided in the NASA research exhibit at the SC09 conference, Portland, OR, Nov. 16–19.

- Jointly planned by GSFC's High End Computer Network Team and NCCS' Advanced Development Team, an indication of the wide-area file transfer applications demonstrated and evaluated is shown in the Data Transfer Test Matrix (top figure) and the WAN infrastructure and servers tested are shown in the configuration diagram (bottom figure).

- Demonstration highlights included over 100 gigabits per second (Gbps) uni-directional memory-to-memory data transmissions between in-booth servers, 40-Gbps bi-directional memory-to-memory data transmissions between servers in-booth and at ARC, 10-Gbps disk-to-disk data transfers between in-booth servers, between servers in-booth and at ARC, and between servers in-booth and at GSFC.

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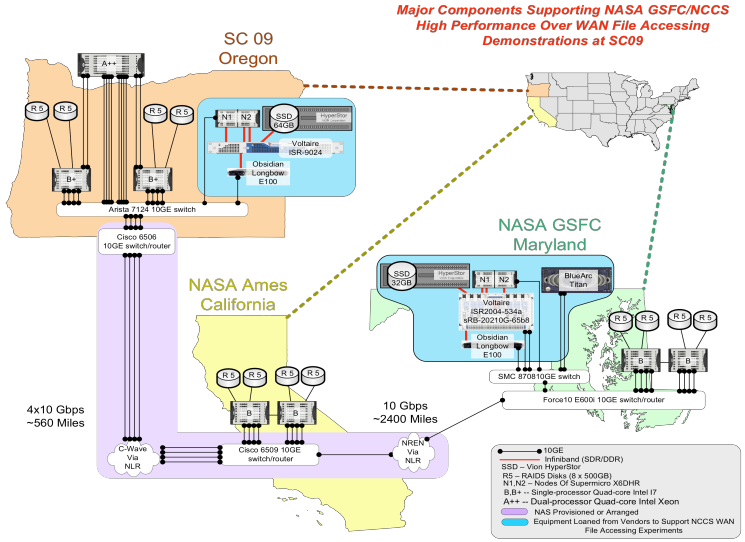
High Performance Wide Area Data Transfer Test Matrix

Tests		Protocols			Connection Points		
		IP	IPoIB	RDMA	GSFC to SC09	ARC to SC09	SC09 Intra-booth
Traditional	bbftp	●	●		● ●		
	scp	●	●		● ●		
	rsync	●	●		● ●		
Experimental	nuttcp	●	●		● ●	● ● ●	● ● ●
	nuttscp	●	●		● ●	● ● ●	● ● ●
	Trperf[1]			●	●		
	Rdma-cp[1]			●	●		
	Rdma-rsync[1]			●	●		
	Xdd[2]	●	●		● ●		
Application	Grid FTP	●	●		● ●		
	iRODS	●	●		● ●		
File Systems	NFS	●	●		● ●		
	NFS Rdma			●	●		
	GPFS	●	●	●	● ● ●		
	Lustre	●	●	●	● ● ●		

[1] Courtesy of Obsidian Research.
[2] End-to-end file transfers supported by the Oak Ridge National Laboratory Extreme Scale System Center and the Department of Defense.



Figures: Data Transfer Test Matrix (Top) and WAN infrastructure and servers tested (bottom) during SC09.