

Dell R510 Server Hardware Specifications



Specifications for the Server used in these tests are:

Processor:	Dual Intel Xen E5620
RAM:	16GB DDR3
NIC:	Intel Dual port X520DA2
RAID Controller:	PERC 700 (LSI controller), 1GB RAM
Disks:	Seagate 1TB NearLine SAS, 6Gbps SATA3
RAID Controller Configuration:	RAID-5 with 12 disks, No Spare
Raw Disk Space:	11.0 TB

Dell R510 Benchmarks

Bonnie++ is a disk benchmarking tool available for Linux and for other operating systems. In the first test we used CentOS 5.6 distribution with latest CentOS kernel while in the second test a 2.6.38 kernel was used from kernel.org. Along with the kernel different I/O schedulers and RAID StripSize with either WriteThru or WriteBack were tested to identify the performance. Section B at the end shows network tests using Section A disk tests.

Summary of Disk Tests in tabulated format (in Gbits/sec):

StripSize Kernel	128KB				256KB			
	WT		WB		WT		WB	
	Deadline	Noop	Deadline	Noop	Deadline	Noop	Deadline	Noop
2.6.18.238.9.1							5.6	5.6
2.6.38	9.26	8.98			9.05	7.88	9.19	8.58

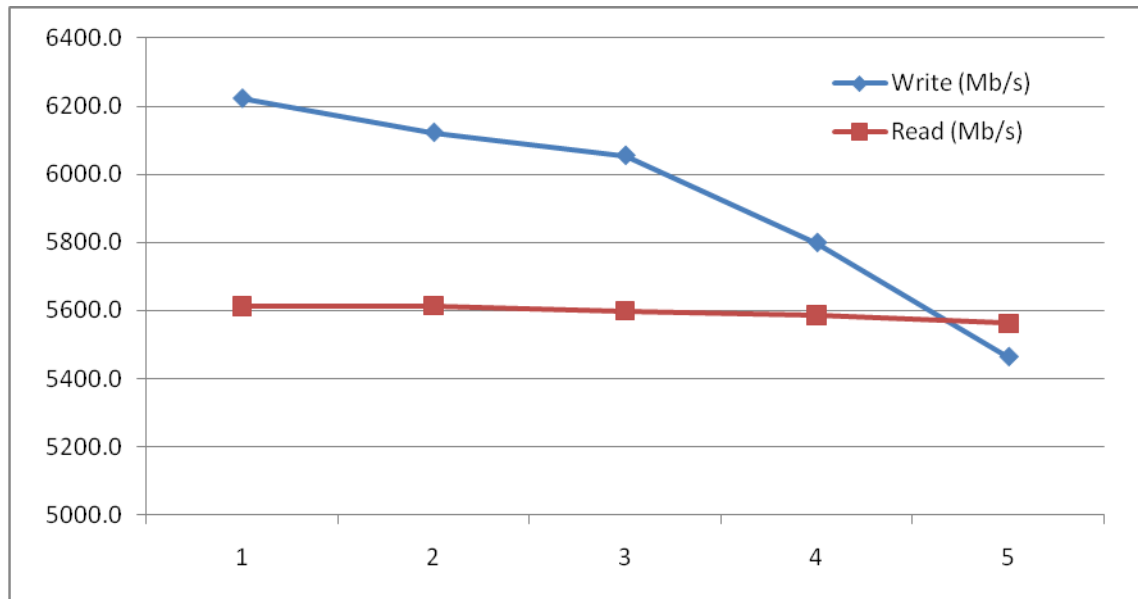
(Note: Only XFS results are shown in this summary, EXT4 results are excluded due to slow performance)

Section A : Disk Tests

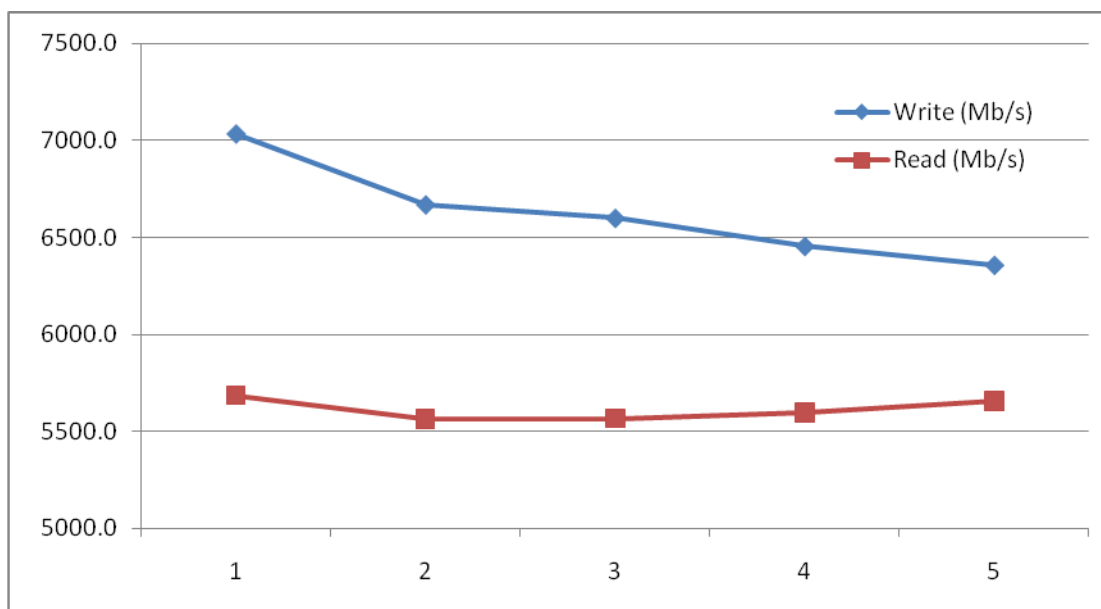
Test 1 : CentOS Default Kernel

RAID Level = 5, No of Disks in RAID Set = 12, Strip Size = 256KB, FileSystem = XFS
WriteBack, ReadNone

Scheduler "DEADLINE"



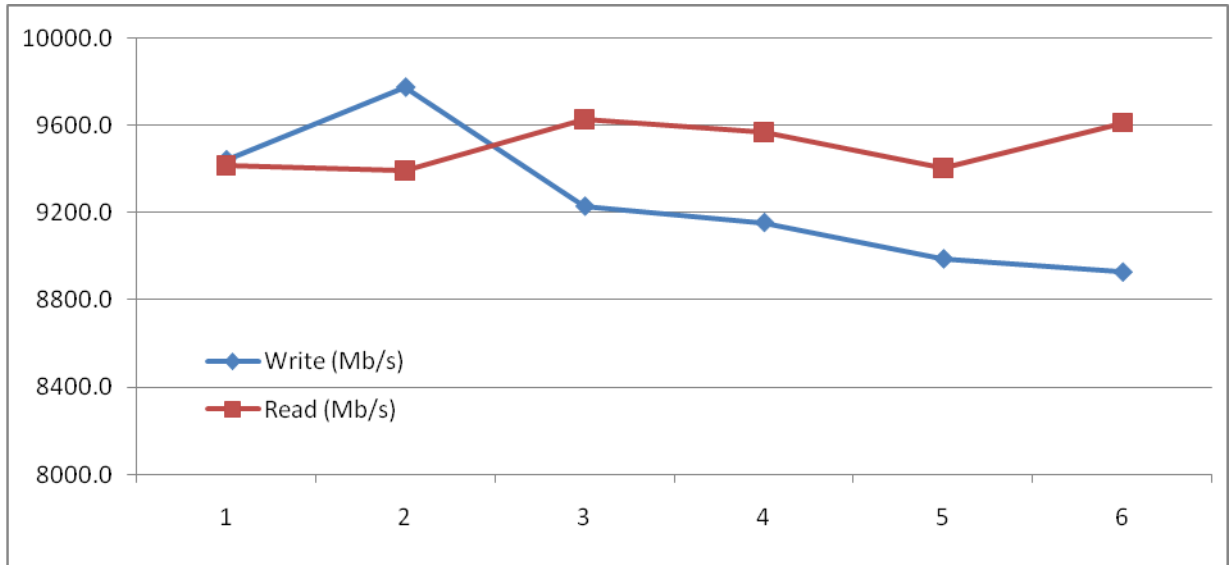
Scheduler "NOOP"



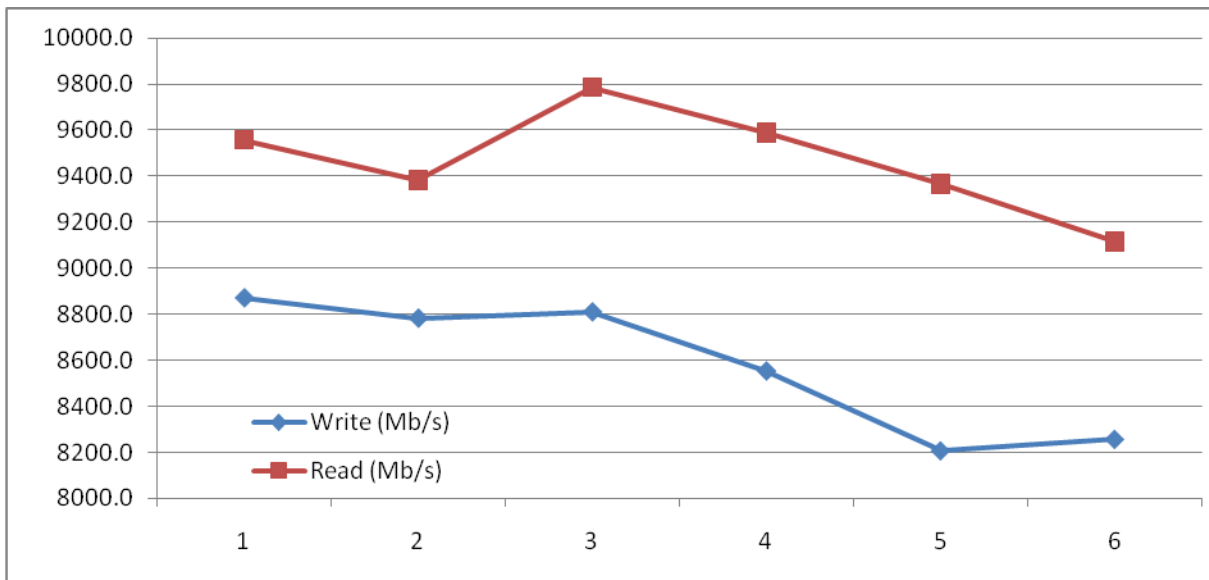
Test 2 : CentOS with Kernel 2.6.38

RAID Level = 5, No of Disks in RAID Set = 12, Strip Size = 256KB, FileSystem = XFS
WriteBack, AdaptiveReadAhead

Scheduler "DEADLINE"



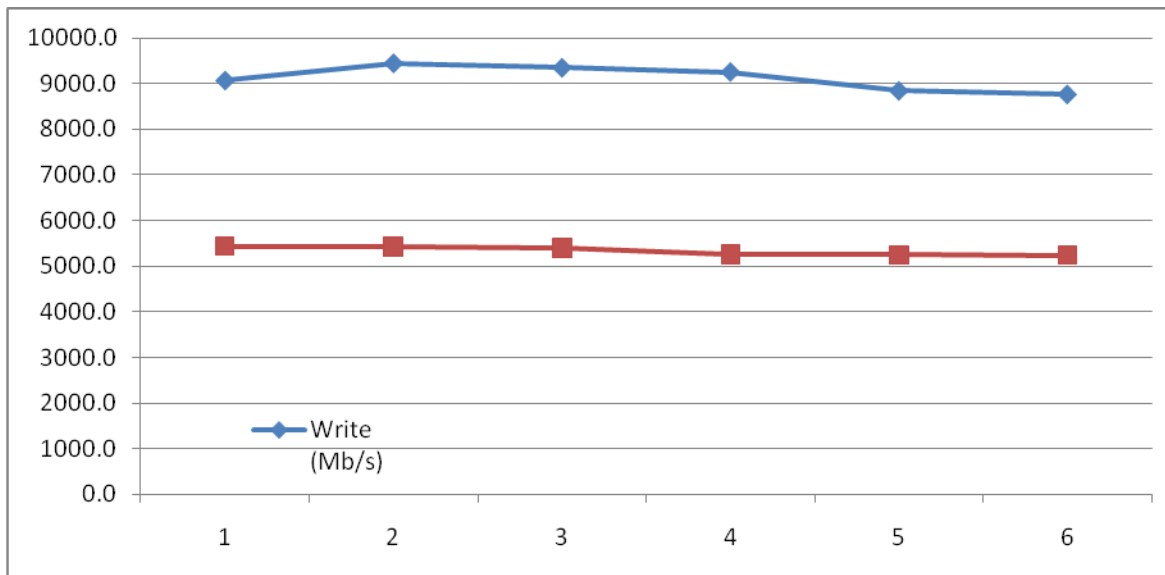
Scheduler "NOOP"



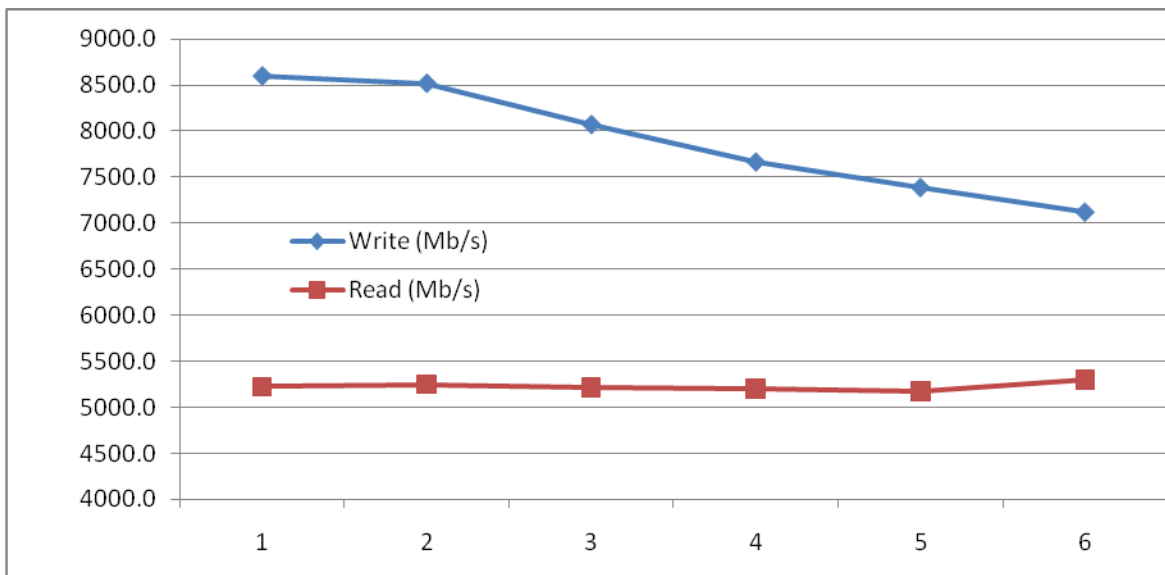
Test 3 : CentOS with Kernel 2.6.38

RAID Level = 5, No of Disks in RAID Set = 12, Strip Size = 256KB, FileSystem = XFS
WriteThru, ReadAheadNone

Scheduler "DEADLINE"



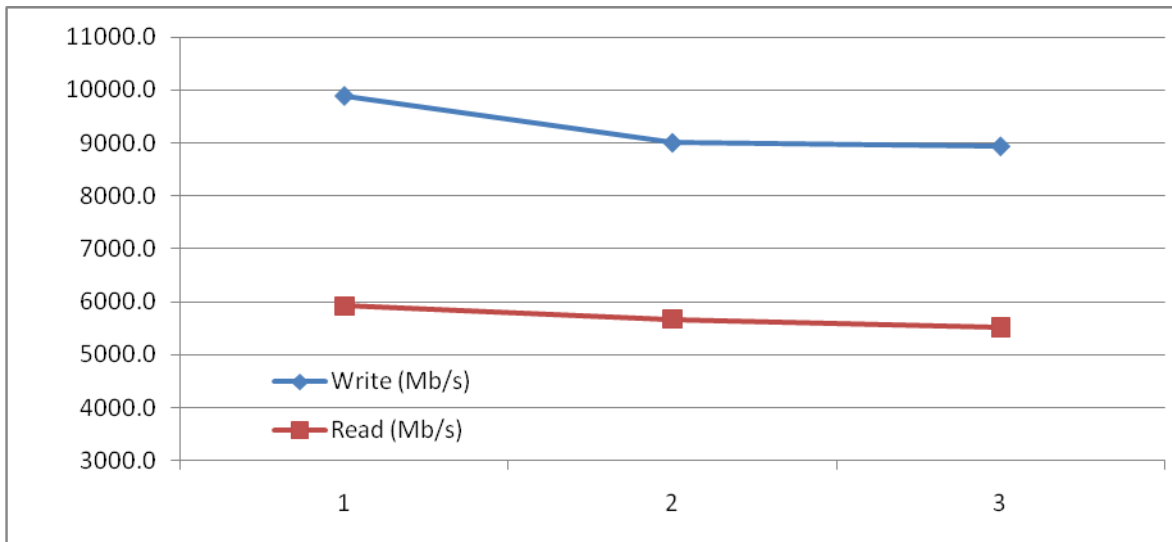
Scheduler "NOOP"



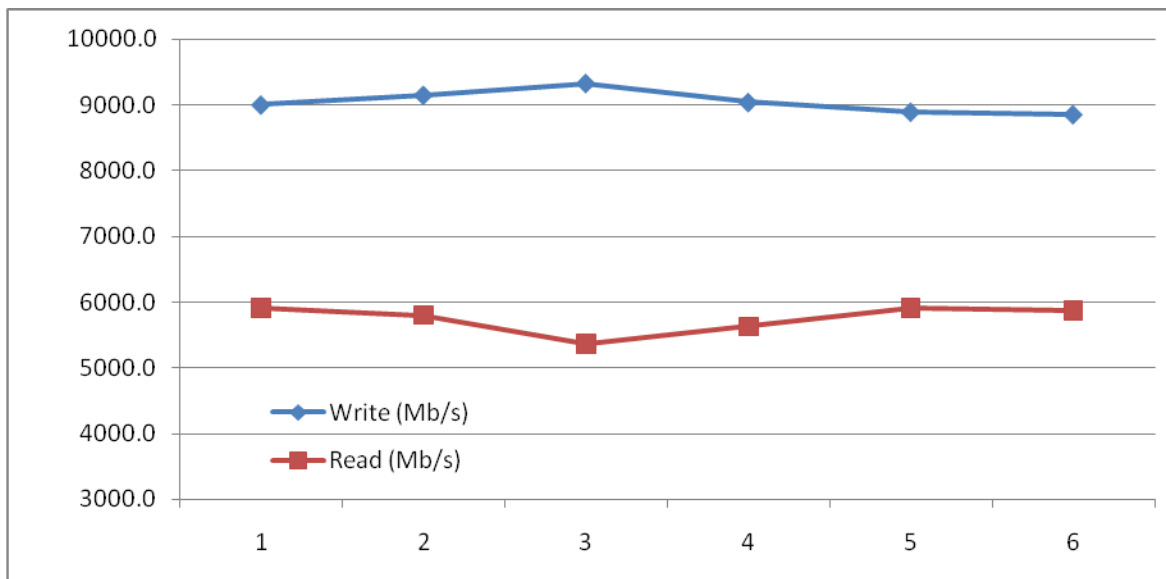
Test 4 : CentOS with Kernel 2.6.38

RAID Level = 5, No of Disks in RAID Set = 12, Strip Size = 128KB, FileSystem = XFS
WriteThru, ReadAheadNone

Scheduler "DEADLINE"



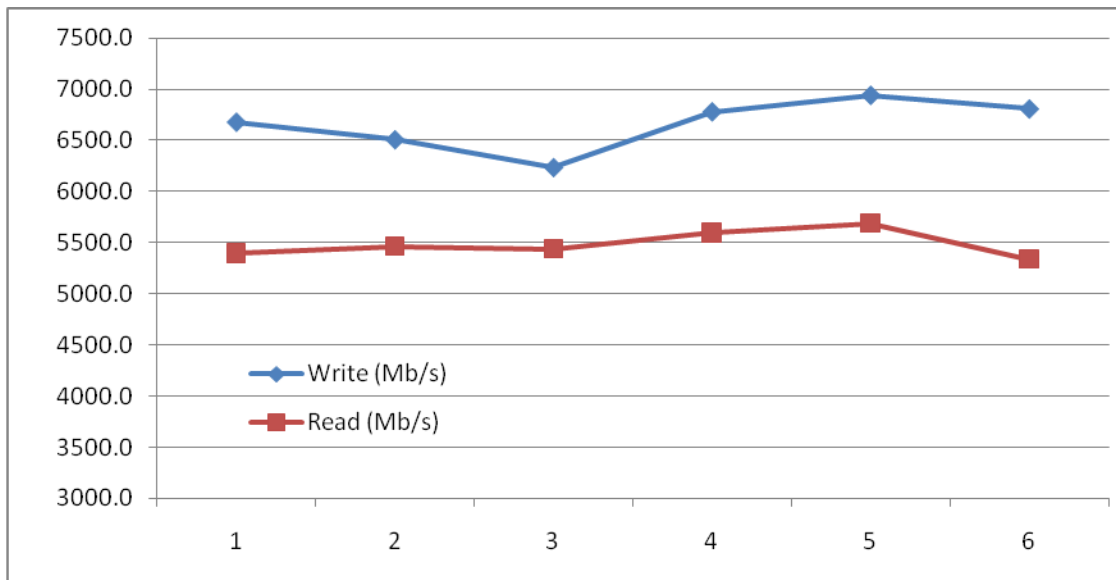
Scheduler "NOOP"



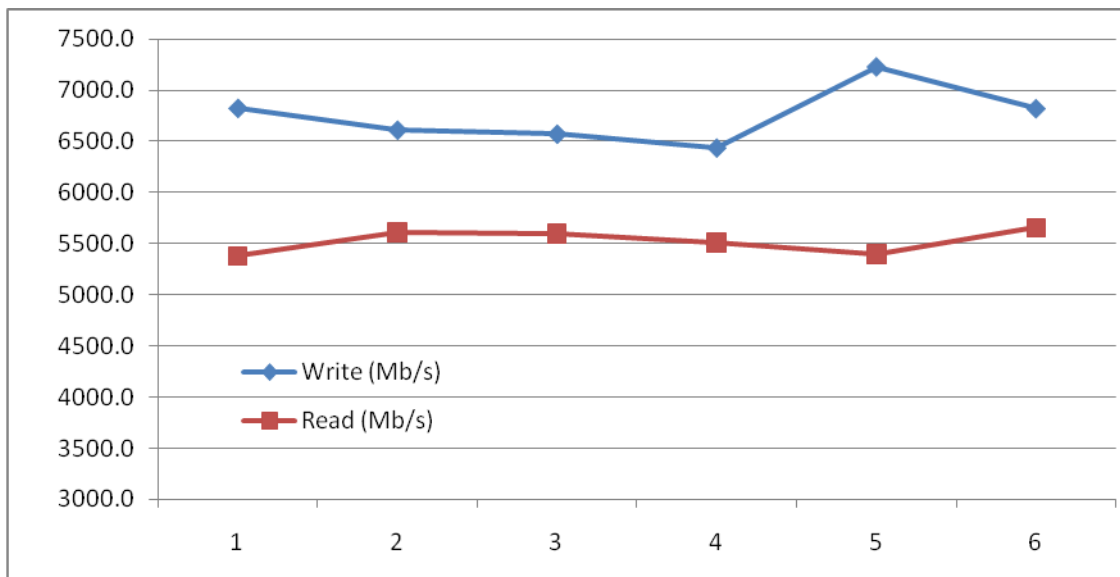
Test 5 : CentOS with Kernel 2.6.38

RAID Level = 5, No of Disks in RAID Set = 12, Strip Size = 128KB, FileSystem = EXT4
WriteThru, ReadAheadNone

Scheduler "DEADLINE"



Scheduler "NOOP"



Section B : Network Tests

Network tests were performed to see how fast Dell R510 can receive the data coming on the 10GE NIC and FDT can write on the disk array in the server. One SuperMicro server with 10GE Intel based NIC (from Interface Masters) was used as source and Dell R510 as destination using the Intel X520 NIC. We used MonALISA monitoring system to analyze the traffic.



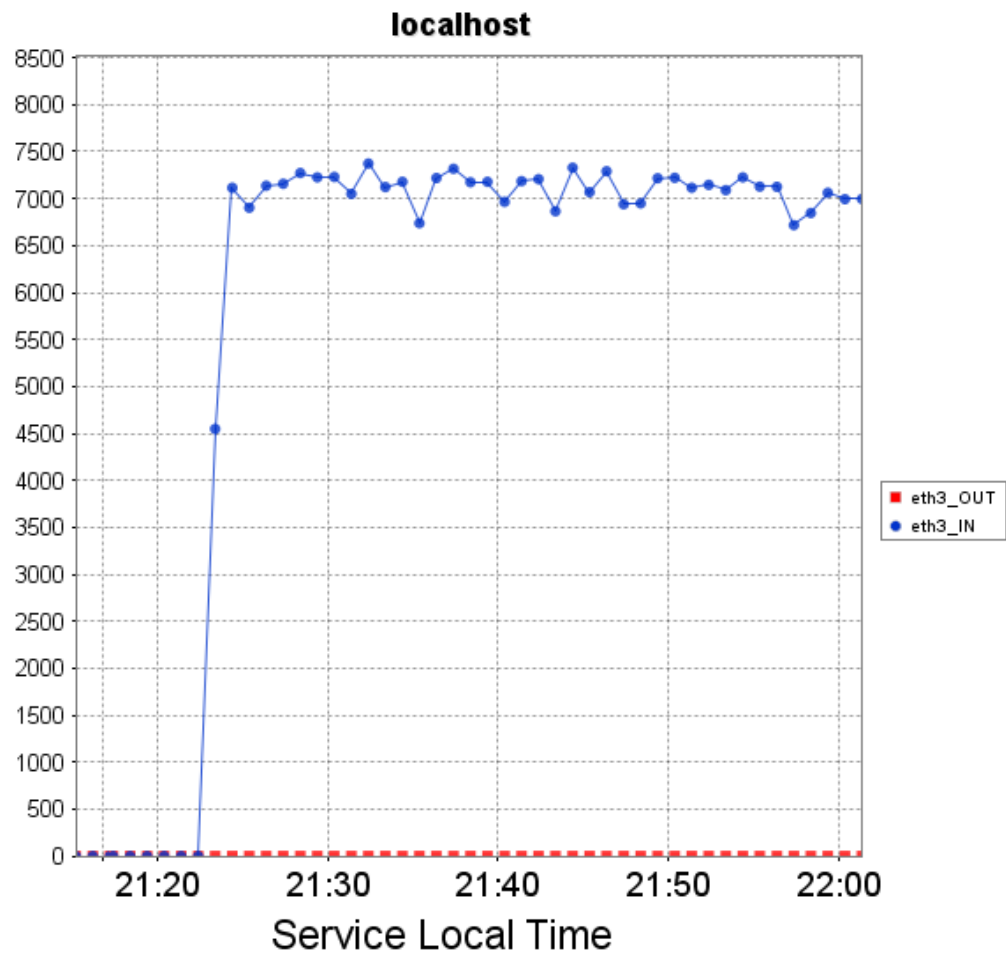
Network Test 1

- Single TCP Streams using FDT
- Source: Server A : /dev/zero
- Destination: Dell R510 : /data
- RAID Configuration : **Disk Test 2**



Network Test 2

- Five TCP Streams using FDT
- Source: Server A : /dev/zero
- Destination: Dell R510 : /data
- RAID Configuration : **Disk Test 4**



Network Test 3

- Single TCP Streams using FDT
- Source: Server A : /dev/zero
- Destination: Dell R510 : /dev/null

