

§2. Data Transfer and Direct Data Acquisition from GAMMA 10/PDX to LHD Virtual Laboratory via SNET

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In GAMMA 10/PDX, base data acquisition is normally performed by using a CAMAC system. These data are collected on the Soralis10 data server system with 4TB RAID system. In addition, we have many stand alone PC data collection systems for many diagnostics, such as fast cameras, electro static probes, gold neutral beam probe, and spectroscopy systems. We constructed the Linux (CentOS) data collection server system with 24TB RAID, in order to collect total collection data in GAMMA 10/PDX, such as CAMAC collection data. We connected the NIFS LABCOM/X system under the new framework of “Fusion Virtual Laboratory”, where users can access the data equivalently regardless of their whereabouts. Such the activity is named “SNET”, which is based on a closed VPN on Japanese academic internet backbone SINET3 and covers multiple experimental remote devices. In Fig. 1, we show the SNET formation between GAMMA 10 local network and NIFS server segment.

In this fund year, new three diagnostics are added to the CAMAC collection system, such as a multi-channel end divertor microwave interferometer, a probe, and a secondary electron detector. Moreover, we added the three radial positions' Thomson scattering data (Thomson-osc4, 5, and 6). We send the GAMMA

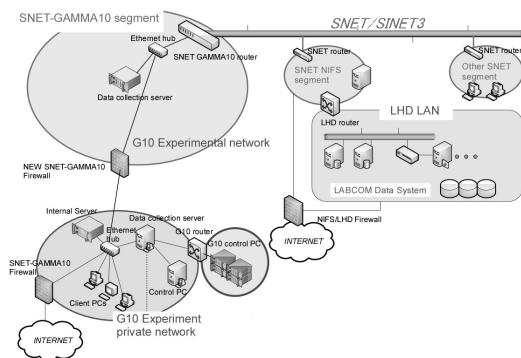


Fig. 1. SNET formation between GAMMA 10 local network and NIFS server segment.

10 total collection data from the GAMMA 10 data collection server to the NIFS LABCOM/X system. The total shot number of GAMMA 10/PDX plasma shot was about 2847 and the experiment days are 55 days in FY 2014. In Table 1, we show the total transfer data names and sizes. Total file size of transfer data is about 1 TB/year.

The essential information of experimental operation, the sequence timings and the shot number, are given by the GAMMA10 experimental control system through the hard wires and the http network communication, respectively.

In addition to share the already acquired data, remote DAQ nodes were installed at GAMMA10/PDX to measure eight channels of end plate potential measurements, eight channels of microwave interferometer signals in the central cell plasma and the eight channels of end divertor probe signals in end region. We measured the end plate potential #1, #2, central cell, west anchor cell, and west barrier cell microwave interferometer signals, simultaneously, for fluctuation study.

Diagnostics	data name	Size [kB]
GNBP	bp-epv	2,176,683
	bp-ssv	171.153
	bpcc	7,433,437
	bpcc2	0
SX	elx-mcpcc	2,627,321
ICRF	rf-eprobe	16,306,473
	rf-mach2probe	0
	rf-machprobe	403,799
	rf-mprobe	192,013,302
	rf-other	2,113,177
	rf-probe	43,160,263
	rf-ref	44,395,524
Thomson	Thomson-osc1	64,600,124
	Thomson-osc2	9,455,860
	Thomson-osc3	9,455,860
	Thomson-osc4	9,455,860
	Thomson-osc5	9,452,300
	Thomson-osc6	870,772
Spectroscopy	sp-ct100c	7,197,285
	sp-usb1	106,672
	sp-usb2	75,024
	sp-usb3	56,482
NBI	nb-cm	615,814
	nb-hs-camera2	92,051,060
	nb-hs-camera3	237,804,118
	nb-usb1	94,635
PRC	g10-camac	28,378,019
	Total size	780,471,015

Table. 1. Total transfer files.