

SSCL COMPUTER PLANNING

JUL 1 0 1990

L. E. Price
Argonne National Laboratory, Argonne, IL 60439

The SSC Laboratory is in the process of planning the acquisition of a substantial computing system to support the design of detectors. Advice has been sought from users and computer experts in several stages.

A Computer Planning Committee was convened in December, 1988, under the chairmanship of Joe Ballam, to make recommendations to the Laboratory on initial needs for computing to support the experimental program and related theoretical calculations. Their report¹ constructed a scenario based primarily on detector simulation. It recommended that the SSCL provide by March, 1992, a system with 4000 VAX 780 equivalents of processing power, 400 Gbytes of disk space, and 6 Tbytes of accessible tertiary storage such as jukeboxes of optical disks or video cassettes. The committee also made that point that substantial computing was needed early and called for 1/8 of the system to be installed by October, 1990. The Computer Planning Committee also recommended that the SSCL Computer Department should structure itself to be a major resource for HEP computing. It endorsed a distributed-function computing model based on open systems (UNIX or variations) with separated compute engines, file servers, and batch job schedulers connected by a high speed local-area network and accessible to outside users by fast wide-area networks. The wide area networking now being provided by ESNET (4 T1 links to different points in the US) was considered adequate for the near future, but would need to be upgraded to T3 (45 Mbits/sec) or some intermediate value by 1992. It was expected that remote users would increasingly use workstations running a version of X-windows to access the SSCL system.

SSCL has largely accepted the recommendations of the Computer Planning Committee, and has established a Computer Acquisition Committee, chaired by Laird Cormell, to plan the initial acquisition of about 500 VAX 11/780 equivalents and corresponding amounts of storage. An example design of the initial system developed by the Acquisition Committee is shown in Fig. 1. The committee is developing a statement of requirements² to become part of a Request for Proposals to vendors, which is expected to be released in June, 1990. SSCL hopes to take delivery of the initial system in the Fall and to have it running for initial use by users around the end of 1990.

A major issue for the Computer Acquisition Committee is the operating system and scheduler to be run by this initial system. It is thought desirable to allow convenient use of multiple CPU's for a single job, in order to allow concentrations of computing for a single user's job. Many people,

MASTER

particularly in computer science departments of universities, have thought about ways to implement such scheduling systems, but a standard way to proceed has not yet emerged. Hence, the SSCL will inevitably be involved in at least a partial development of an operating system/scheduler. In order to be educated on recent developments in the field, a Workshop on Distributed Unix Computing was held in February, with experts from universities and laboratories invited to talk. Proceedings are available³.

In addition to planning a short term acquisition, the Laboratory has convened a Computer Policy Committee, chaired by Stewart Loken, to make longer term recommendations on the organization and goals of computing at SSCL. Questions put to the committee include the desirability of a concentrated central computing facility as opposed to a model where each major detector provides its own computing and attendant organization. The committee was also asked to make recommendations on the extent to which the SSCL computing organization should take as one of its goals the development of needed software for general use in the SSC and broader HEP community. The committee met in May, 1990, and is expected to make a report by the end of the Summer.

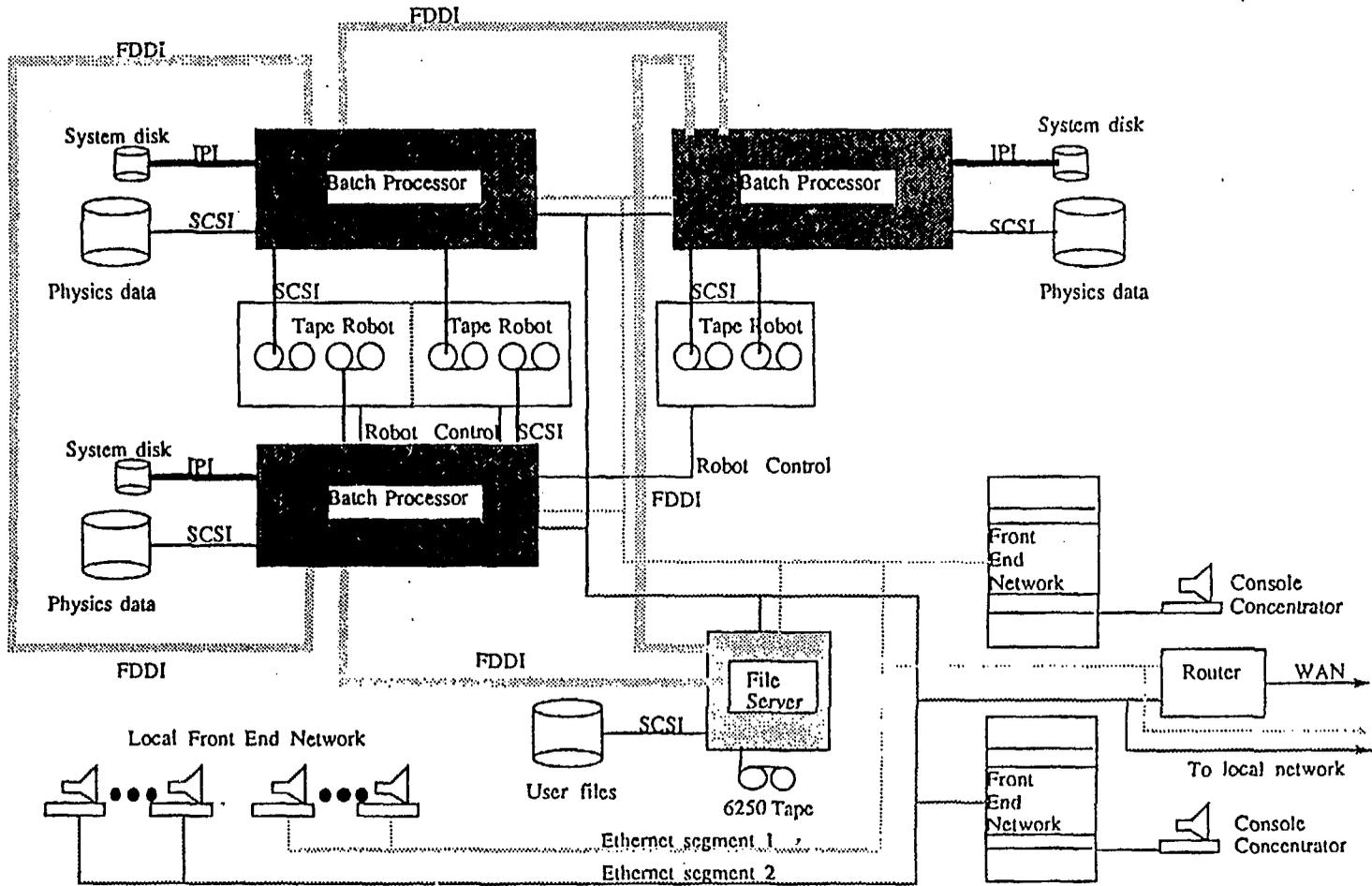
Work supported by the U.S. Department of Energy, Division of High Energy Physics, under contract W-31-109-ENG-38.

References

1. L. Price, ed., SSCL-N-691 (Dec. 1989).
2. "Physics and Detector Simulation Facility Specifications", SSCL-275 (1990).
3. G. Yost, ed., SSCL-SR-1050 (Feb. 1990).

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.



Functional diagram (block diagram) of the simulation facility.

Fig. 1