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## PROJECT ATHENA TECHNICAL PLAN

### Section D.4

## Evolution to the Athena Workstation Model: An Overview of the 1988-1991 Continuation Plan

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This section provides an overview of changes and additions to be made to the Athena system during the three-year continuation period running from 1988 through 1991. It will be apparent in reading this section that in many ways the model of the system now is more advanced from the one described in the earlier sections. Although not its primary intent, the Technical Plan provides an historical development of the plans for Project Athena. Section C, written in 1984 and 1985, outlined the overall model of computation as envisioned at that time. Sections D.1—3, in 1986, provided a more detailed evolution plan for the initial 1984-1988 phases of the project. Section C.6, written in 1987, provided fuller detail on the file storage aspects of the Athena system from a perspective of two additional years of experience and planning. The current section provides a more current perspective.

Since the time of writing of the earlier sections, a plan of action comparable to that outlined there has been implemented. Two areas for which plans were vague at that time are now fully developed; later sections of the Technical Plan describe them in detail.

- A network name service (called Hesiod) provides up-to-date and rapid answers to questions such as "which file server holds the assignments for the economics class?" and "which post office has my mail?"
- A first generation Service Management System has been designed and implemented. This Service Management System is essentially a database that contains all authoritative information about the Athena system, such as names of users and identity of servers; from this database the Service Management System extracts and creates the driving tables used to configure the individual servers.

### The primary projects

The projects are in four areas, with labels that correspond to the Athena Continuation Plan.

### **1. *Stabilize and Standardize the Athena System.***

- Releases. Major releases involving system rebuilds in Summer, 1988, Summer 1989. Minor releases as needed to provide bug fixes, minor upgrades, and additional functions. Revision of release mechanism to allow controlled upgrades of less than the entire system. Significant amount of cleanup of loose ends and bug-tracking. Improvement of installation process for releases.
- Convergence with vendor systems. Starting Spring 1988, transfer technology of Kerberos, Hesiod, SMS, and workstation UNIX design to IBM and DEC for evaluation and potential integration with AIX and Ultrix, respectively. Goal: by Summer 1990, to be able to run with binary operating kernels from the vendors. (Athena may choose not to run with those binary kernels, but it should be an option.)
- Technology export. (Relates to convergence with vendor systems.) Make Kerberos, Hesiod, SMS, and the workstation design available to the world. Goal: Kerberos and Hesiod should be industry standards, allowing interoperability with other vendors.
- Review of third party software. Especially word processing, lab data management, and spread sheet. Replace where needed.
- Visual Courseware. Complete and integrate visual courseware image management software on an experimental basis.
- Compatibility support. Where upgrades of third-party-supplied software are incompatible, provide programming support to bridge the compatibilities.
- New hardware. Adapt Athena system to run on new server and workstation hardware as it becomes available from vendors.

### **2. *Improvements in installation and operability***>

- File System quota management upgrade. Design, implement, and deploy a quota system more appropriate for the Athena environment, probably based on the concept that a directory (NFS locker), rather than a user, has a quota.
- Printer service management. Design and implement quotas and a cost-recovery system.
- SMS upgrade. Second-generation (evolutionary) reimplementations of SMS to make it into a warm, lovable, forgiving, management tool.
- Personal/Private workstation. Provide version of workstation and library software that can be configured for private workstations located in dorm rooms (eventually, owned by students) and owned by research groups.

**3. Improved User Interfaces and Application Tools.**

- Unix user interface upgrade. Import Sun/AT&T Open Look and Microsoft Presentation Manager for experimental use and evaluation; eventually adopt one or both as standards.
- Making application development easier. Provide Open Look and Presentation Manager programming interfaces.
- Graphics upgrade. Addition of (Xtk, Andrew) toolkits; GKS/PHIGS/PEX, and similar packages. Picture editor, 2D drafting, geometric solid modeling, chart construction, function plotting, image editing.
- Library interface. Develop interface to the M.I.T. library system that allows any Athena workstation to be used as a library terminal.
- Upgrade inter-user communications. Turn Discuss and OLC into a product, install Andrew Message System as an experimental bulletin board.
- Guidebook. Write a guide for application developers that provides background on each of the several options (Xtk, Andrew ToolKit, GKS, Blox, Open Look, Presentation Manager) for application development.

**4. Integration of Second-tier Personal Computers>**

- Interface to low end. Provide mail reading, file transfer, and if easily available, NFS access to PC's and Mac's connected either via dialup lines or local network.