

**Montana State Library IT Infrastructure Strategic Planning
Library Commission Discussion Document
April 2, 2003**

1 Introduction

22-1-103 MCA State Library Commission – Authority

The state library commission shall have the power to:

(2) maintain and operate the state library and make provisions for its housing;

(4) make rules and establish standards for the administration of the state library and for the control, distribution, and lending of books and materials;

22-1-1103 MCA Nondisclosure of library records. (1) No person may release or disclose a library record or portion of a library record to any person except in response to:

(a) a written request of the person identified in that record, according to procedures and forms giving written consent as determined by the library; or

(b) an order issued by a court of competent jurisdiction, upon a finding that the disclosure of such record is necessary because the merits of public disclosure clearly exceed the demand for individual privacy.

The Montana State Library continues to embrace and expand the use of information technology to carry out its functions. The 2003 Legislature approved the merger of MSL's Library and Information Services Department and its Natural Resource Information System to form the Montana State Digital Library (MSdL). MSL continues to expand its offerings of active, database driven, Internet applications (e.g. the Montana Shared Catalog; the NRIS Thematic Mapper) that users have come to depend on for access to information relating to business, regulatory, land management, and recreational issues.

While MSL has been making huge technological leaps in the development and implementation of data discovery and access tools, a more fundamental consideration has come to the forefront that relates to the new MSdL and the IT infrastructure needed to support the MSdL; that being the issue of ultimate control of the content of the MSdL, the rules and standards that dictate access to that content and related services, and the protection of patron privacy.

Per 22-1-103 MCA, ultimate control of library resources is placed with the Library Commission, and for good reason. There is much discussion, at the state and federal level and within all branches of state government, relating to issues of access to information. Differing opinions, conflicting laws, and overlapping levels of responsibility will make decisions relating to information access increasingly complex. In this environment, it is important that the Library Commission be in command of access to the information within its realm of responsibility. The Library Commission is uniquely able to keep decisions regarding information access out of the political arena, to ensure that MSL information remains unbiased, to protect the privacy of library patrons, and to

make decisions regarding information access on the basis of sound legal and ethical arguments.

Our increasing development in, and reliance on, information technology to fulfill our mission, and the more important policy level question of control of content, discovery, and access, necessitate reevaluation of the agency IT plan, better identification of the IT infrastructure that is needed to support the MSdL and all other MSL programs, and sound decisions regarding the development and support of that IT infrastructure.

As a first step, it is necessary to examine the relationship of the IT infrastructure to the MSL programs that the infrastructure supports. To what extent is the IT infrastructure an integral, inseparable component of the MSdL and its mission? Can we rely on other agencies and/or organizations to maintain critical components of our infrastructure, either partially or totally? What assurances should MSdL users have regarding continuous, full-time access?

MSL's information technology infrastructure has become the equivalent of a traditional library's shelves, books and reference desk. To meet our patrons' needs, we must ensure that the content of the digital library is organized and stored in a manner that provides easy search and retrieval, has equitable and efficient access, is secure and protected, and is readily and consistently available. To achieve these goals, fundamental assumptions regarding servers, software, data storage, access, and professional support staff must be set forth to provide guidance for the development of the MSL IT Infrastructure Plan. In accepting the assumptions discussed below and supporting the conclusions that follow, the Commission must be aware of the resource commitments necessary to meet the identified needs and of the consequences of failure to meet these needs.

2 Assumptions and Rationale

MSL primary IT infrastructure

2.1 Servers and Software

Providing effective, efficient, widespread, and consistent access to the information held in the MSdL's electronic information stores requires an extensive array of software and hardware tools from many different vendors, all operating in an integrated, interdependent environment that is complex and ever-evolving.

Many of the software tools currently in use at MSL are very specialized. Software used for library cataloging, data discovery, and data access are critical to our mission, but are much less likely to be used in the global state enterprise. This specialization holds true for our web application and geographic information system (GIS) infrastructure as well, as the NRIS program has long been the leader in development and deployment of state-of-the-art online mapping and information access applications. These specialized needs are not generally supported by the state enterprise 'off-the-shelf' software solutions. To support these applications, MSL has necessarily built a highly talented and motivated technical staff, with the knowledge to troubleshoot and maintain the MSL application base.

The MSdL is on the cutting edge of the development of interactive access to electronic information and of the development of digital libraries, and MSL staff must research, install, test, and deploy many of the solutions to issues specific to digital libraries. As such, MSL staff, for the foreseeable future, will need to operate in a hardware and software environment that is flexible, nimble, and dynamic. In this environment, there are daily requirements to monitor application and server performance, test new applications, and occasionally restart servers. We therefore conclude that:

MSL staff must have immediate and full access to and control over the MSL software and servers. The MSL IT Infrastructure Plan must therefore be predicated on the conclusion that, for the foreseeable future, the MSL primary server and software infrastructure must be under the direct control of MSL staff – maintained physically within MSL and staffed by MSL.

2.2 Information Storage

Electronic storage media is the modern-day representation of the shelves on which the books and other material of a print-based library reside. MSL has implemented a significant amount of storage capability, using technology that provides a reasonable level of redundancy. However, to achieve the level of robustness, scalability, and performance necessary to meet the needs of the MSdL, it will be necessary to configure our electronic storage in a stand-alone environment, completely separate from the servers that are utilizing it. Such advanced storage networks have built in redundancy of all features and functions that eliminate any single point of failure.

Access to all of the content at the MSdL is controlled by a complicated interaction of hardware and software tools, technically independent of the storage solution and technically capable of being configured so that the storage solution is maintained at a separate location under the control of another agency. However, there are both policy and technical reasons for continuing to maintain all electronic storage for MSL at MSL and under the control of MSL staff and the Library Commission. The data access considerations discussed in the introduction (relating to ultimate control over MSL's information and protection of patrons rights) are all applicable to MSL's electronic storage. In addition, in order to achieve the throughput necessary to take full advantage of their capabilities, high performing storage networks need to be in close proximity to the servers under which they operate. We therefore conclude that:

For the foreseeable future, and especially during the formative years of the MSdL, Commission oversight over the electronic information and storage devices that constitute the MSdL books and shelves translates to actual physical control as well as control of the hardware and software environment that provides access to these information stores. The MSL IT Infrastructure Plan must therefore be predicated on the conclusion that MSdL information stores will be physically located at MSL and will be maintained by MSL staff.

2.3 Access and Availability

MSL users have become dependent on full-time access to MSL information and applications; that dependence will continue to grow, and the level of dependence will become more critical. Developers in the public and private sectors will implement applications that depend on access to the MSL. Libraries across the state will depend on MSL on-line applications in order to carry out their daily business. In order to be successful, MSL must be able to guarantee its users a stated level of access. Moreover, MSL success may someday depend on its ability to guarantee uninterrupted access, within reasonable limits as determined by factors both within and outside of the control of MSL. We therefore conclude that:

The MSL IT Infrastructure Plan must be predicated on the goal of access generally being available 24/7, with the exception of minimal downtime for maintenance. In the absence of funding for the hardware, software and staffing environment that will ensure such availability, the Plan must recognize that this goal may remain unrealized for some time and must provide for contingencies in the meantime. However, the Plan shall be based on the assumption that, with the exception of major disaster compromising the integrity of the MSL building, there shall be no single point of hardware or software failure that would be likely to cause access disruption for a period longer than four hours. A disaster recovery plan shall be developed, predicated on the ability to restore access to the MSdL information stores and to essential MSL on-line applications within forty-eight hours after a major disaster that affects operation of the primary site.

3 Conclusion and Agency Mandate

In accepting these assumptions as the guiding force behind the development and implementation of the MSL IT Infrastructure Plan, the Commission acknowledges the significant nature of this undertaking, specifically regarding the commitment of resources to hardware, software, and the related physical plant, as well as to staff and related training. The Commission also acknowledges that current funding limitations will prohibit full response to many of the issues identified above, specifically those relating to assurance of full-time availability of MSL information resources discussed under section 2.3, at least through the fiscal year 04/05 biennium.

The Commission authorizes MSL staff to prepare a plan for the implementation of IT infrastructure that fully supports the operational parameters set forth above. In developing the Plan, MSL must recognize that funding limitations exist, and must seek out interim solutions that provide the greatest degree of assurance that these operational parameters can be met.