THE CLIPPER GROUP
Navigator™

The ADIC i2000 —
More Than Just Another Tape Library

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Management Summary

Grantland Rice may care *how* you play the game, but in team sports, success is measured in wins and losses. Victories are the measuring stick of success, and they are accomplished by the joint efforts of an entire team. In baseball, that means the management and all 25 players; in football, it means management and all 52 players on the roster. The stars on a baseball team are usually the big slugger who hits 500 ft. home runs and the starting pitcher who throws the ball at 95 mph. The stars of a football team are usually the quarterback, a running back, or some big linebacker who tackles everyone in the backfield until he finds the man with the ball. However, no baseball team can achieve success without the combined efforts of the fielders, the players on the bench and the relief pitchers in the bullpen. No football team can achieve success without the teamwork associated with the offensive and the defensive line, players who usually get no publicity. In any sport, the joint efforts of the offense and the defense, the entire roster, are required to win a championship.

The same principle holds true in the world of Information Technology (IT). **Any vendor who attempts to sell a system, as opposed to just a platform, has to have not only hardware, but a complete solution as well.** They need to have systems management software in place. They need to have a built-in maintenance capability to ensure the viability of the platform components. They need to have a complete team of players supporting their solution: development engineers, programmers, support personnel, and field service staff. Without any one component, failure is more likely than success. This is true not only for those IT companies delivering multi-purpose servers to the enterprise; it is also true for those delivering storage systems as a vital part of an enterprise solution. The major components in this segment of the IT market are disk arrays and tape libraries. One company delivering a total team effort to the enterprise in support of their tape libraries is Advanced Digital Information Company, ADIC.

ADIC, a leader in *Intelligent Storage* solutions for the open market for over 20 years, has been offering outstanding hardware for the enterprise in the form of tape library systems. However, hardware scalability and functionality is only the cover for their book. With unified library management, advanced system monitoring and alerting, and a new comprehensive service approach, ADIC takes the complexity out of managing the enterprise tape library. To learn more about ADIC's newest hardware upgrades and how their complete library solution can lower the total cost of ownership (TCO) of your data center, please read on.

The Enterprise Data Center Environment

The data center of 2005 faces a rigid set of constraints: an unpredictable, rapidly growing data storage network, a limited budget, and static headcount for staffing of storage administrators. The data center staff has to manage a never-ending stream of exception events when backups fail or files are lost, as if managing a complex storage architecture under normal operating conditions was not challenging enough. Requirements for 7x24 operation and identifying problems beyond the scope of the library put additional strain on already overworked staff. In addition, the administrators are also expected to integrate new technologies and architectures into the library, technologies that take advantage of higher capacity cartridges and the faster drives required to enable a timely backup and recovery of continually growing storage volume.

Efforts to improve the utilization of the data center server farm, not to mention data center floor space, have resulted in enterprise backup consolidation where a single library must now backup a variable array of servers, adding additional complexity to the data center. Each server may have had a different operating environment, with different enterprise backup applications. Now they must be merged into a single, cohesive process. In addition, compliance with both industry and government regulations creates an increasing challenge that has to be met. Procedures implemented to protect the enterprise management from potential lawsuits results in the preservation of everything from financial statements to email, taxing the limits of the existing infrastructure. Moreover, all of it has to be saved for years, with no end in sight to the enterprise storage requirement.

The IT staff has to reduce the complexity of the infrastructure and simplify the operation of the data center. They need to protect the information assets of the enterprise under their control, despite the complexity inherent in the existing environ-

ment. They need to implement a single, centrally managed, flexible storage resource that has the reliability, the availability, and the scalability (RAS) to guarantee continuous data protection and meet the long-term archiving and recovery needs of the enterprise.

The storage solution must be upgradeable in order to protect the investment that the enterprise makes in storage hardware, infrastructure, and applications. It needs to have the flexibility to meet the information lifecycle management (ILM) demands placed upon the staff. This includes the ability to add WORM (write once, read many) cartridges, an option for LTO and SDLT, to the library for the preservation of the compliance data. **This is where ADIC can help simplify the storage infrastructure of your data center.**

The Scalar i2000 Library

Originally announced in March 2003, the ADIC *Scalar i2000* began shipping in July of that year with intelligent enterprise library functionality, and was enhanced in February 2005. It has an exclusive *iPlatform* architecture that eliminates the requirement for an external server to control library functions and reduces operational costs with advanced, integrated management functionality. This architecture includes *iLayer,* an integrated management capability, and *iSurety* a service approach linking the library's diagnostic tools to support technicians. These integrated features enable the data center to reduce the time required to manage backup, cut the need for service calls by 50%, and shorten issue resolution time by 30%. (See *The ADIC System Solution* on page 3.) The Scalar i2000 has a blade architecture to simplify the infrastructure and offer faster, more reliable operation in SAN environments. It also has capacity–on–demand scalability for dynamic growth.

The February 2005 upgrade doubled the enterprise library scalability of the i2000 with the capability to expand from 100 to 3,492 cartridge positions, permitting a total capacity of up to 2.8 Petabytes (PB) using

an LTO-3 format. The library also has a significant amount of portability with up to 96 LTO positions, or 80 SDLT positions, for bulk load/unload capability under software command, in removable magazines. The i2000 can support up to 48 drives in a mixed media configuration, including LTO-1, LTO-2, LTO-3, SDLT 320, and SDLT 600. With compressed throughput of 160MB/sec for LTO-3, the i2000 has the ability to achieve a total throughput of 7.68GB/sec. The library may be connected via Fibre Channel (FC) or SCSI-2 LVD. All of these features enhance the capability of the i2000 to satisfy the backup consolidation needs of any cross-platform, commodity-server-based enterprise data center.

Space is always at a premium in the data center. ADIC has recognized this by configuring the Scalar i2000 with outstanding cartridge density, 712 slots per square meter, freeing up valuable floor space and helping to reduce the TCO of the library. The i2000 comes with a one-year warranty on library robotics and a three-year warranty on the tape drives. The one-year warranty is at ADIC's Bronze level for support, including next business day response, 9 a.m. to 5 p.m. Upgrades to 4-hour and 2-hour response, 24 hours a day, are available.

The ADIC System Solution

The Scalar i2000 iPlatform environment includes advanced relational diagnostic services, library resource, and I/O management functions inside the library, making it easy to integrate the Scalar i2000 with existing cross-platform disk–backup solutions. iPlatform provides the flexibility required in an enterprise data center with a built-in capability to support multiple communications protocols, facilitate the native partitioning of a single library into multiple logical libraries, enable mixed-media operation, and provide native FC connectivity. The i2000 can self-diagnose and resolve fault conditions to increase overall backup availability. It automates root-cause identification for 80% of all service issues without having to send a field engineer on-site. This results in greater up

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Exhibit 1 — iPlatform Functionality

- Monitors all internal systems;
- Provides automated drive firmware management and download;
- Manages the system recovery settings on a remote system for rapid recovery to a backup system;
- Applies fault tree analysis when anomalies occur;
- Determines root causes;
- Automatically selects, gathers, synchronizes, and analyzes library log data to reduce service calls;
- Provides real-time reporting of drive and slot utilization and library activity;
- Recommends repair procedures; and
- Opens communications with the ADIC support team.

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time for the data center with fewer and shorter service interruptions and reduced management overhead for the IT staff. iPlatform provides the data center with automated service support through intelligent proactive diagnostics and real-time email messages to ADIC's 24-hour support team, along with proactive customer alerting. In fact, the first time that the IT staff becomes aware of a Scalar i2000 problem is when they receive a call from the support team. This is functionality normally associated with high-availability disk arrays. (See Exhibit 1, above, for a summary of iPlatform functionality.)

In order to avoid the complications implicit in the manual operation of the backup and recovery process, ADIC has implemented an integrated, intelligent *iLayer* management service with unique features built into the library platform for better management via a new approach to diagnostics. These features include:

- **True hot-swap drives** – A virtualizing technology that allows the IT staff to change tape drives without having to make any other changes to the backup

system. A replacement drive can present the same serial number and worldwide name to the host software as the drive it replaces, eliminating the need to reboot or rebuild library profiles.

- **Drive firmware auto-leveling** – Simplifies library management by automating the management of tape drive firmware levels.

- **SMI-S enabled** – Provide a common language for monitoring, reporting, and implementing multi-vendor device functionality. This simplifies Scalar i2000 management through a single set of software tools.

- **Drive utilization reporting** – Permits balanced loading of the drives through an integrated feature to monitor library resources to achieve better performance, lower TCO, and increased reliability.

- The **self-diagnostic capability** of the Scalar i2000 is supported by *iSurety,* providing a new approach to service; using a secure remote data access to link ADIC's technical support staff to the data center, tape library, and backup system diagnostic data via *iLink*. iLink provides faster and more certain resolution of complex, system-wide issues by giving the service team remote, interactive access to diagnostic data over the Internet, including information from the enterprise backup software, SAN fabric, and other storage network devices, extending the library diagnostic capability into the storage network. Simple to use, iLink provides secure, two-way communications between the data center and ADIC's *Secure Service Center*. This permits either an automated recommendation or the remote initiation of corrective action.

Conclusion

Upon initial review, the ADIC Scalar i2000 may appear to be just another platform for the IT staff to integrate into the data center infrastructure. However, once you pull back the covers and examine the heart of this tape storage solution, you will be pleasantly surprised. **The i2000 delivers the integration previously required from the data center team.**

In addition to the essential RAS functionality required from any enterprise storage solution, the i2000 also delivers the management infrastructure to assist in the implementation, rollout, and continuing maintenance of an integrated backup and recovery, as well as long-term archiving, solution. **It removes the complexity inherent in any enterprise storage environment where the staff has to organize, protect, and access enterprise data, mission-critical or not.**

The i2000 delivers an integrated storage solution for the protection of a consolidated enterprise SAN with interface capability to a wide variety of commodity backup and recovery solutions. From a hardware standpoint, this is done through a fundamental architecture advance that integrates external components, thus reducing the TCO to the data center by embedding the functionality within the library. From a system standpoint, this is accomplished via unified management, optimized drive performance, and proactive system monitoring for early detection of any problem.

If your data center is faced with the problems intrinsic to a complex, enterprise storage environment, you should consider the Scalar i2000 as part of the solution required to simplify your environment, reduce your costs, and achieve success for your enterprise.

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