



Managing the Changing Mainframe Environment

Years ago the mainframe was proclaimed dead, to be replaced by client/server environments. However, 70 percent of organizations' data today still remains on these super-systems. The Internet has given way to a new set of technologies that enable organizations to leverage these legacy systems and their unmatched processing and storage power without re-engineering. But what are the short and long-term benefits of these solutions?

Nearly everyone resists change, largely because we are required to expend more effort than normal adapting to it. This is especially true in the mainframe user world. As the state-of-the-art changes, users have had to adapt to changes in menu selections, applications, even the equipment used on the desktop.

Most 3270, 5250, and VT200 terminals have disappeared. In their place, personal computers of various types provide much more capability, while offering the familiar mainframe application screens. DOS has vanished, replaced by Microsoft Windows, which permits simultaneous operations and cut-and-paste capability. Users have had to adapt to all these changes. Now client/server and Web-based applications are appearing, forcing another change upon users. As with all transitions, this one is easiest if it can be done without causing complete disruption and user re-education.

The Changing Mainframe Environment

Client/Server

Client/server applications promise an environment that uses the network as an enabler of processing power on the desktop. But the mainframe computer is not dead. In fact, it is enjoying a strong comeback as organizations realize that a server-based environment does not always address issues of scalability, reliability, and security. Client/server applications can require huge amounts of bandwidth. Local area network (LAN) technologies easily provide fat pipes to run applications, but organizations linked to one another or to portable or mobile users may not be so fortunate.

Wide area networks still lack a LAN's cheap bandwidth, especially to international locations. This can cause serious problems with client/server applications that may assume ethernet or higher speeds from server to workstation. This is not meant to defile client/server applications, but rather to illustrate the best way for an organization to offer service may continue to be a mixture of the traditional mainframe and client/server. A rush to throw the mainframe out for the sake of *modernization* may be counterproductive. If the conversion from mainframe basing to client/server is justified, the conversion process usually represents a significant modification of user behavior when interacting with the data.

Wider Need for Strategic Information

Internal change is stressful, but technological changes in the past few years have also brought an external element into the mix. Other organizations may now need to access information that has traditionally been unavailable, or available only as printed material. Printed material is outdated nearly as soon as it is printed, so direct access to information is more desirable. If several external organizations require access, there will be a need to provide transitional tools to them as well. Web-based access

becomes extremely valuable in this case, as each external user may be presented with a custom interface to the information.

The Mainframe Answers Back

TCP/IP Networking

Access to mainframe computers has become easy in recent years. Where System Network Architecture or DECnet were once the only game in town, Transmission Control Protocol/Internet Protocol (TCP/IP) has taken over. The Department of Defense (DoD) development of the Internet provided a growth medium that has spawned an incredible commercial communications force. That has benefited the DoD with much wider access and higher bandwidth. Users can connect to an organization's mainframe computer from anywhere on earth (or in space) through a dial-in TCP/IP connection. Security concerns are still valid and more important than ever, but access is now an administrative, rather than a technological, issue.

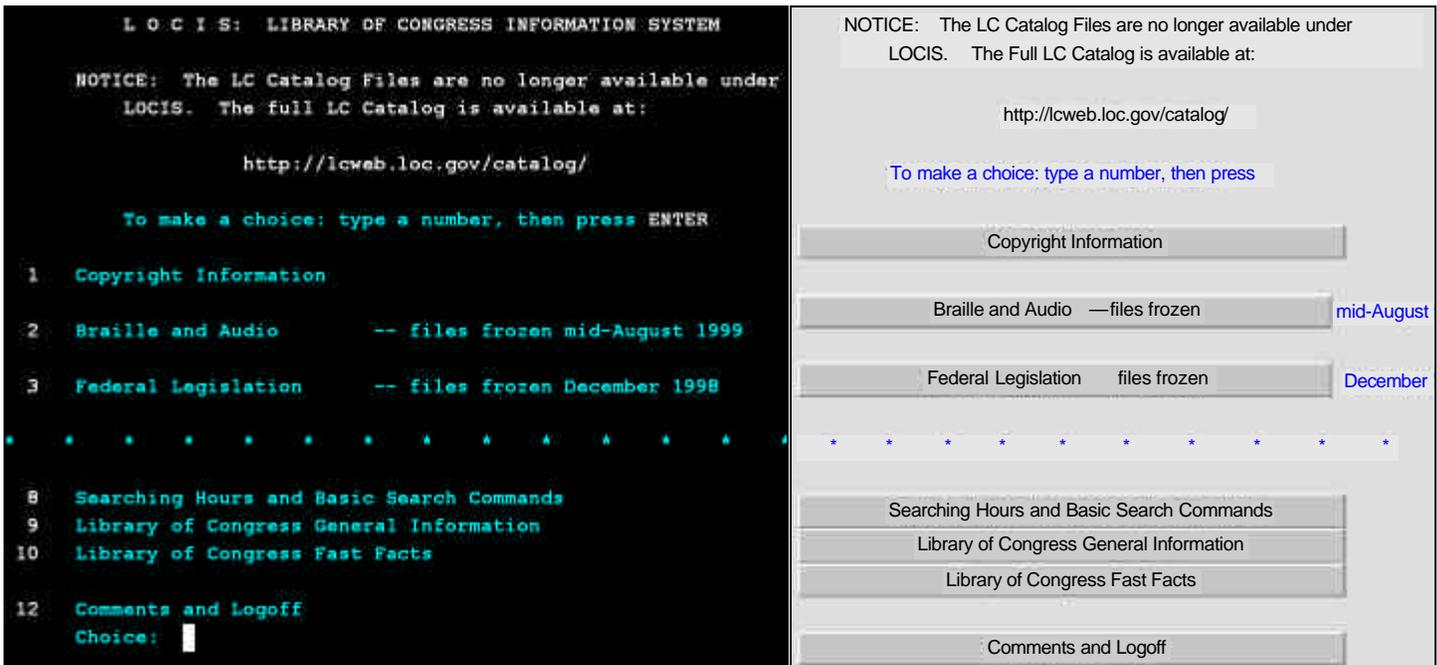
The explosive access to mainframe systems and changing mission requirements has made organizations focus externally. Information that was once only for internal use or occasionally available by request is now required to supplement real-time decisions. Tasks involving outside organizations can be accomplished more quickly with immediate access. A mechanism to offer the information online streamlines the entire workflow process. Yet, as data access opens up, there are fewer people available to install and maintain the systems to do the job. Many talented people leave government service for higher salaries in the private sector. Those who remain have a challenge to provide more and better services with less budgetary support.

Alternative Strategies

From Gooney to GUI

One of the most cited reasons for going to client/server technology is the provision for a graphical user interface (GUI), which presents a more orderly and intuitive entry method than traditional mainframe menuing systems. However, for users who have been entering mainframe data for years, this change can be intimidating. What if there were processes to ease users into the GUI?

As it happens, there are such processes. Either as an interim step, or as a way of postponing a large client/server conversion, transformation of mainframe application "green screens" into Web-style interface can be accomplished. Green screen rejuvenation uses existing application screens, and overlays Windows button and mouse techniques to provide an easier navigation path. If a GUI is the primary requirement for going to client/server architecture, rejuvenation should be considered as a viable alternative to a complete system change. With out-of-the-box solutions such as J42, provided by J&B Computing Services and integrated into



A typical mainframe application green screen before and after J42 rejuvenation BEFORE/AFTER

WRQ Reflection EnterView (www.wrq.com/enterview), this transformation can be done automatically. As a result, the mainframe system may be completely disguised from the user and presented entirely as HTML pages on a web site.

The Browser—A Unified GUI Standard?

The explosion of the World Wide Web has made nearly everyone who touches a computer familiar with Web browsers. New technologies are bringing Web-based terminal emulation to the fore, providing a means to have a single user interface accessing applications that may be based on a Web server, then browsing to data on a mainframe with a traditional terminal interface contained on a Web page. Many client/server applications are offering a browser interface as an alternative form of presentation, which makes the browser an ideal transition display for changing systems.

As an added benefit, HTML is relatively easy to write, change, and maintain. System look and feel can be modified to suit individual groups, or in extreme cases, individual users. The addition of links to written or graphic help files are also easily included, which makes Web technology an ideal vehicle to present training along with the new application look. As a bonus, the help files can be made interactive with JavaScript, allowing users to be guided directly to the proper sequence of actions.

Security always heads the list of concerns when external access is discussed. Web-based host access models are available now with encryption through proxy servers that can provide 168-bit DES protection and close control of user access. This technique can be applied to internal networks as well for protection of sensitive information within the organization.

Alternate Strategy

An organization might wish to modernize an application with client/server technology and find that the expense is prohibitive. However, the benefits of a simplified interface to users

are still desirable. In these cases, use of rejuvenation tools and browser-based clients will simplify and streamline tasks residing on the mainframe. HTML also allows the presentation of mainframe data in more convenient or effective formats. Graphic charts may be included for tabular data without custom mainframe programming or applications. Special fonts such as large typefaces may be included for emphasis or use by the visually impaired. Changes can be quickly and easily made if the format is ineffective or if emphasis changes. Many organizations now have dedicated HTML writers who are responsible for external Web site content and appearance, who can also be helpful in interface construction.

Another benefit is that the mainframe application code can remain unchanged. Legacy applications can be hard to modify and customize. Web-based access provides an opportunity to precisely define presentation styles and content without having any program modification. The ability to have multiple sessions active and provide information to the same page can enable viewing of data relationships in a way that has not been available before. Even in the client/server model, this view can be difficult or impossible to provide if the information is present within the organization but not part of the server database.

The browser makes an ideal access point for the information. Most personal computers are equipped with either Netscape or Internet Explorer. Traditional full-featured host access clients often occupy tens of megabytes of storage space. While this is usually not of concern in laptop computers with multigigabyte hard drives, using browser-based host access frees up the majority of the space by allowing the client to be downloaded only when necessary. If network speed is a concern, host access based on Java technology can be persisted in the browser on the first download. Applets stored in this fashion take up much less disk space than traditional clients. Version management becomes extremely simple. When a persisted applet is run, the version number is checked, and if a newer version of the applet is available on the

Web server, it is replaced. Desktops need never be touched, and all changes to applet versions can be done once at the server level. Similarly, if access to new systems is required, or withdrawn from old systems, a single modified configuration parameter will suffice for all users concerned with the change. Other options include providing both a standard green screen interface and a rejuvenated interface using the same client applet. A number of different implementations can be made and offered to different groups of users. It is even possible to have several host sessions presented on a single HTML page, or to launch multiple separate windowed instances from a single HTML link.

Rejuvenation cannot answer the issues of operating expense and support staff required to maintain a mainframe computer. But if the drivers of change are primarily access to mainframe information and appearance, Web-based host screen rejuvenation becomes a competitive alternative to client/server conversion.

The Human Factor

Change in the mainframe host environment is never trivial and often overwhelming. With the right tools, it can be accomplished with less pain than expected. Web-based host screen rejuvenation is an example of an alternative solution to client/server requirements. Conversions to Web-based host access are themselves change agents. In the traditional mainframe world, there was not much need for interaction with computer resources outside the information technology department. With the advent of personal computers, many organizations have formed groups that specialize in desktop, LAN, and Web deployment. These groups have a different reporting structure than the mainframe support department. It can be a challenge for such potential competitors to work together to provide support for a common user group. When another organization is involved as a user or provider of some data, cross-organizational differences can completely over-

shadow technical aspects of any project. Users have become more active as they are asked to take on additional responsibilities with the shrinking and consolidation of organizations. Their demands for ease of use, often traditionally ignored, must now be considered carefully in any system design. The downfall of the mainframe and complete switch of mission critical applications to client/server environments has been predicted since the first commercially available personal computer appeared in the early 1980s. This has not been the case, and access to mainframe-based applications is experiencing new interest as Web technologies widen their appeal. Client/server environments still offer advantages in some situations, but the wise information technology manager will realize that there are few instances where one size fits all. Do not be afraid to look at interim solutions or other alternatives to disrupting your users. After all, are *they* not the reason we all work so hard in this business?

About the Author

Doug Wetzel is a systems engineer, specializing in the network management needs of WRQ's government customers. His technical engineering background also includes work at American Satellite Co., AT&T, Hercules Aerospace Corp., and US WEST. He enjoys digital and space communications, amateur radio technology, and flying airplanes. WRQ is a provider of software that enables information technology to connect, manage and secure networked environments, including WRQ Reflection host access software, which connects PCs with IBM mainframe, AS/400, UNIX, Digital and HP host systems.

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CMMISM Draft Models Released and Reviewed

PITTSBURGH—Public review of version 0.2 of an integrated model for systems and software engineering improvement, CMMI-SE/SW v. 0.2, was completed in November.

The Capability Maturity Model[®] Integration [CMMISM] Project developed the model. The project was a collaboration sponsored by the Office of the Secretary of Defense and the National Defense Industrial Association with participation by government, industry, and the Software Engineering Institute. The objective is to develop an integrated set of models, an assessment method, and training materials that provide support for process and product improvement in industry and government.

The project received 2,345 change requests during the public review, which began August 31 and included participation

from 67 organizations and 105 individuals. Project members are gratified by the quantity and substance of the responses to the call for review and will process all comments to improve the content and form of the model.

Draft components of the integrated model that include support for integrated product and process development (IPPD) also underwent a public review period, which ended Feb. 15. With the IPPD model extension, organizations using different models for improving systems engineering, software engineering, and integrated product and process development will be able to use the integrated model to coordinate efforts to improve in all three disciplines. Using this CMMISM model encourages enterprise-wide improvement and integrated assessment of all three functions.

The integrated model incorporates the best features of the source models from which it is derived—Capability Maturity Model for Software (SW-CMM[®]) v. 2.0

draft C, EIA/IS-731 Systems Engineering Capability Model (SECM), and Integrated Product Development Capability Maturity Model (IPD-CMM).

It will enable organizations to build on previous investments in improvement based on the SW-CMM, the SECM, or the IPD-CMM, and benefit from the standardization and commonality of the integrated model.

For more information about the CMMI Project and the public release of IPPD model components, see <http://www.sei.cmu.edu/cmm/cmms/cmms.integration.html>

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