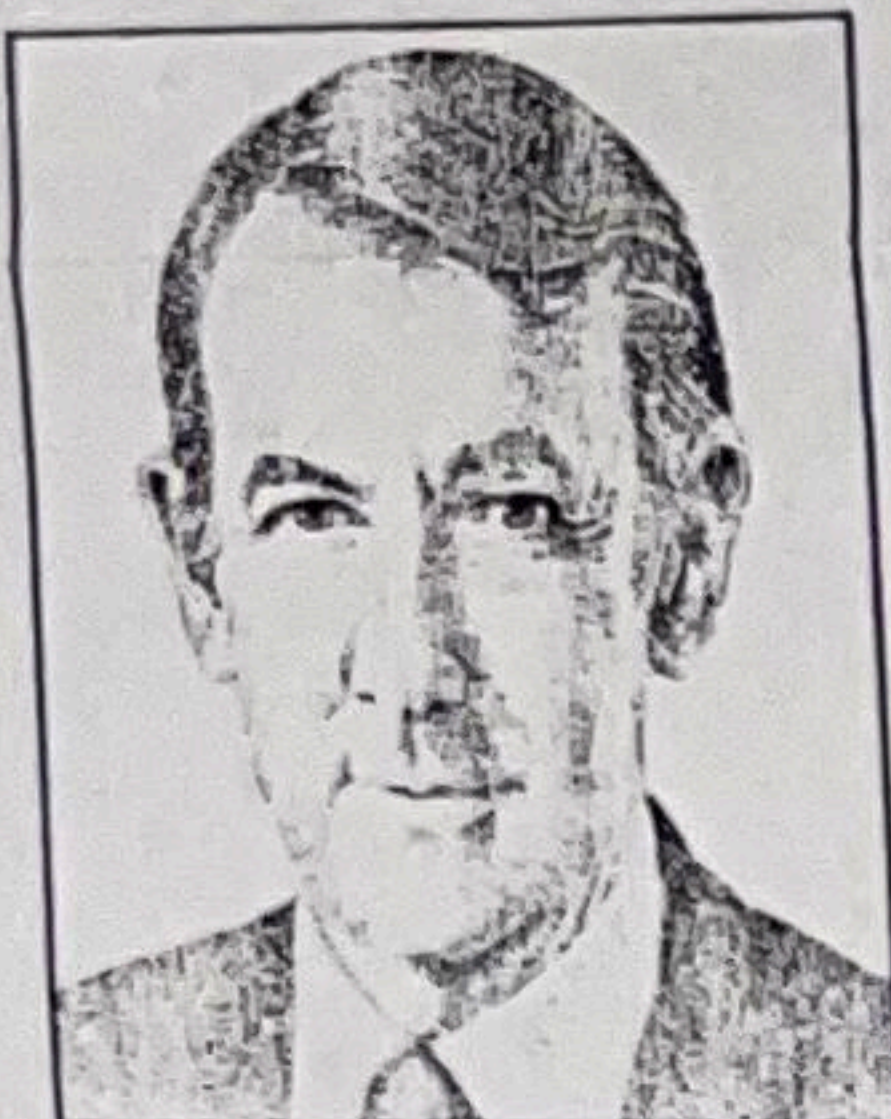


APPLIED INTELLIGENCE

SAA Offers Benefit of Cooperative-Processing Support



This is Part 5 of a series of articles on IBM's Systems Application Architecture (SAA). The introduction of integrated computing environments such as SAA will have a major impact on the software technologies of the '90s.

JAMES MARTIN

There will be dramatic improvements in hardware and software architectures in the 1990s. IBM, Digital Equipment Corp., AT&T, Hewlett-Packard Co., Software AG and others are introducing integrated computing architectures that eliminate the current differences among mainframes, midrange machines and PCs. These architectures will let programmers write to a single, common interface standard, independent of the target machine.

At the strategic level, the most important benefit of SAA is support for a cooperative-processing environment. Cooperative processing implies that different functions of an application reside on different machines and the different components of an application on each machine work together.

This is different from distributed processing, in which similar components of applications reside on different machines. An example of distributed processing is a distributed database in which the same access function resides on multiple machines. Each provides a similar service with different data.

The IBM Enterprise Information System, which is based on SAA, incorporates a high degree of both cooperative and distributed processing. This article will focus on SAA strategic planning for cooperative processing.

A cooperative processing approach supports the distribution of both processing power and data throughout a computer network. In a cooperative-processing application, each element of the network is assigned functions that it performs best. For example, the functions assigned to host processors and programmable workstations may be completely different. Host processors are best at serving multiple users and coordinating access to large corporate databases. The workstation is best suited for user-interface support and local analysis functions. Some specific application functions might be assigned to one or more computing environments.

Both a host environment and a workstation environment are needed for most business applications. Until now, it has been necessary to assign applications to one environment, forgoing the advantages of the other. With the advent of integrated environments such as SAA, however, applications can be built that take advantage of both environments in a cooperative manner.

With any one application, there are three components that might be separated using a cooperative approach: user

interface, application logic and database access. All three might be on a single machine (host or workstation), or the application might be split in any of three ways, as shown in the figure.

The first configuration in the figure is entirely host-based; the last configuration is entirely workstation-based. In the second configuration, the application is split, with the application function and data access on the host, and the user interface on the workstation. The third has the data access on the host, the user interface on the workstation and the application functions split between the two. The fourth has the data access on the host with the user interface and ap-

plication logic and database access on the workstation. This configuration is appropriate for distributed applications that require a high degree of user interaction and access to remote data.

Information Builders Inc., the vendor of Focus (a tool for user analysis of data), is moving toward support of a client-server approach that is SAA compliant. Compatible versions of Focus are available for the PS/2 and S/370 environments, and a version for the AS/400 is under development. Focus will use a cooperative client-server approach that

this direction might be adding processing modules to the workstation-based user-interface code of a primarily host-based application. In this configuration, much of the data editing and validation would be assigned to the workstation.

By designing modular applications with these types of configurations in mind, it is easier to migrate progressively to a full cooperative-processing environment. If the data access portion of an application is isolated, it can be easily modified to change a single machine application to one that accesses distributed data within an SAA-compliant environment. The rest of the application does not need to change.

Thus, the first steps toward cooperative processing are to isolate the user-interface code for the workstation and the database access code on the host. These are the components of an application that most readily adapt to a particular environment. The next step is to separate the application functions and decide which are most appropriate for a workstation or host environment.

The discussion so far has assumed cooperative access across the boundary between workstation and host. Equally valid are applications with components on both large central hosts and smaller departmental hosts, such as an AS/400.

A Design Necessity

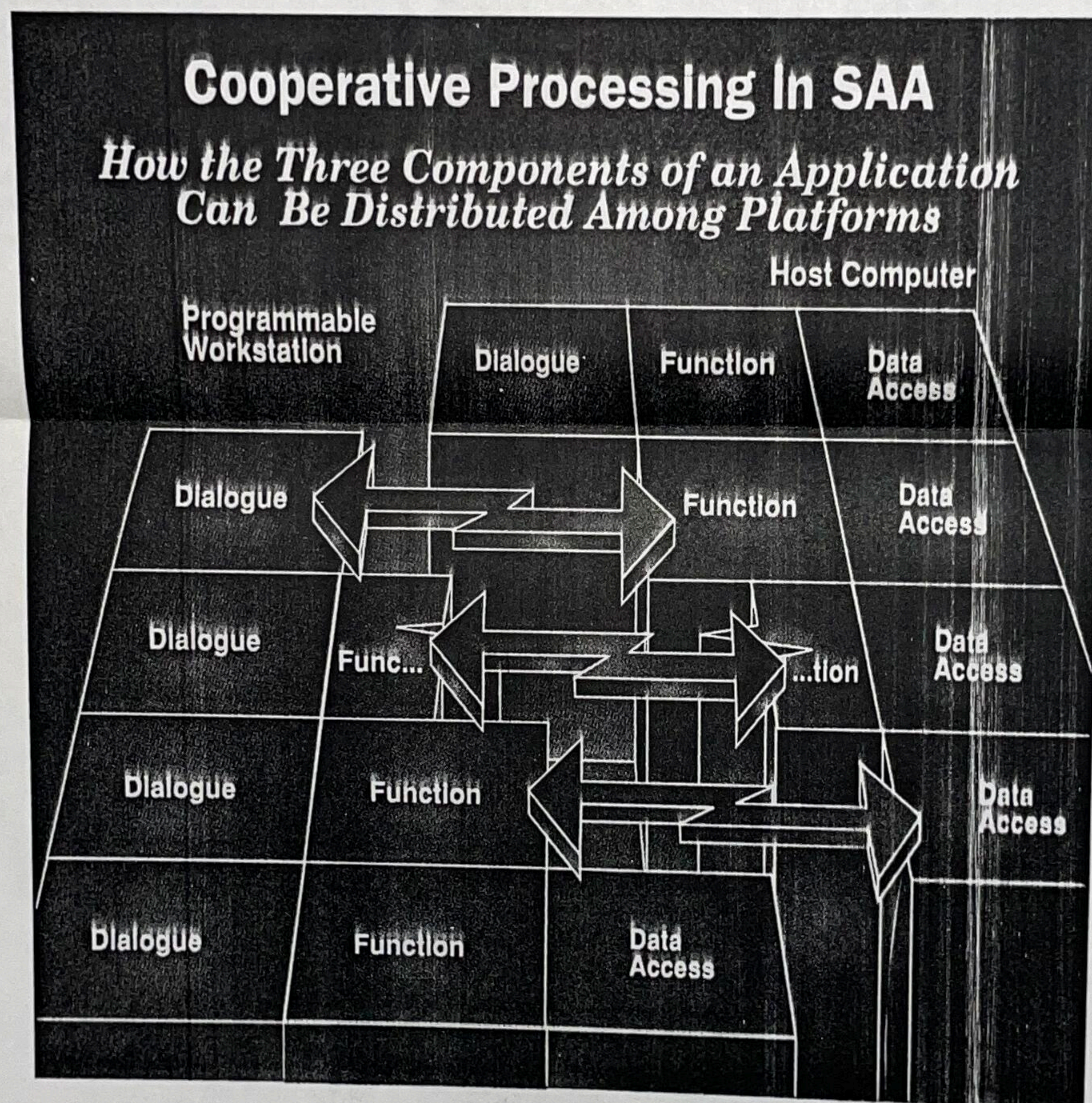
Isolation of modules is the key to designing cooperative applications for the Enterprise Information System and SAA. Modules are used to isolate the various interface portions of the application. This applies not only to modular boundaries defined by the services of SAA, but to application-dependent code as well. For example, an enterprise might offer its own services for pricing or tax calculations.

The interfaces to these services should also be isolated from the rest of the application. In fact, these modules would be well suited to a client-server configuration where workstation-based applications access a host-based server for central pricing information.

Good application-development practices use isolation techniques to shield details of data access, user interface, application services, communication services and security from other parts of the application. These techniques make it easier to maintain and port application modules regardless of whether SAA is used. SAA adds to the formula by providing tools and services for incorporating the isolated modules within a cooperative-processing environment.

Next week, I'll describe the advanced, graphically oriented user-interface services provided by SAA. ■

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application functions on the workstation.

Application vendors have been among the first firms to announce products that implement each of the cooperative-processing configurations illustrated. Vendors such as Management Science America Inc. and McCormack & Dodge Corp. have announced cooperative-processing versions of their products that are primarily host-based, but with the dialogue portion distributed to the workstation. These vendors market application packages that are resident on a large host to both preserve the code and still provide the benefits of user interfaces on programmable workstations.

The next logical stage in the imple-

ment of cooperative processing is a client-server configuration, in which a workstation-based application requests services—such as database access—from the host. This configuration is appropriate for distributed applications that require a high degree of user interaction and access to remote data.

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supports workstation client machines for local processing and servers on the host for access to corporate data. Aion Corp. takes a similar approach with its expert-system tool ADS. In ADS, the host is also a server of corporate information for workstation-based client expert-system applications. In the most complex configuration, major application functions are split between the workstation and the host. Major application vendors and business organizations are moving toward this configuration as they partition application processing into components, some best suited for the workstation, others more suitable for the host. The first step in