Not long ago, the state of Hawaii’s criminal records were isolated in scattered databases, with crucial data managed in part by police departments, prosecutors, courts, and even federal agencies. Bringing together the data from these varied systems was a huge challenge, given the widely differing formats in which it was stored.

Over the past few years, however, the state has developed a system that solves the problem, tapping a solution built on Sybase’s EAServer and PowerBuilder technologies. Using Web services technology, Honolulu-based systems integrator ISDI Technologies, Inc., has channeled this sea of databases together into a single data pool. The resulting product, the Offender Based Transaction Statistics and Computerized Criminal History System, has given about 3,000 users access to the newly unified data set.

What’s more, users can access nearly all of the data by employing a browser rather than maintenance-intensive desktop client software, saving the staff at the Hawaii Criminal Justice Data Center (HCJDC) a great deal of trouble. “Having to maintain client code on each PC was problematic, from the data center’s perspective,” says John Agsalud, president of ISDI. “Requirements for support were greater than what the center was able to provide with its staff.”

Web Services for Government
Web services interfaces are proving increasingly critical in data integration projects, especially for government organizations with restricted budgets and a bewildering list of critical legacy systems to manage. State and federal organizations are using Web services technology to share data between systems without having to spend extra millions on proprietary interfaces.
As they’re usually defined, Web services are modular applications that can be described, published, located, and invoked over a network through standardized Extensible Markup Language (XML) messaging. Taking advantage of new technologies such as Simple Object Access Protocol (SOAP), Web Services Description Language (WSDL), and Universal Discovery, Description, and Integration (UDDI), developers create applications from reusable software modules accessed on the Web.

Today, Sybase’s EAServer is helping governments work with this critical technology. EAServer, which integrates Java 2 Enterprise Edition (J2EE) 1.3, C/C++, PowerBuilder, and Component Object Model (COM), in addition to secure enterprise Web services, is the backbone for a growing number of government projects, including Hennepin County, Minnesota, and the Texas Workforce Commission (see “EAServer Fuels Government Deployments”).

The Hawaii Criminal Justice Data Center (www.hawaii.gov/hcjdc/), an agency of the state’s Department of the Attorney General, is another government organization that sees the benefits of exploiting Web services technology.

EAServer’s Web Services Toolkit allows developers to easily create, test, automate, and deploy Web services applications and connect them to established business processes.

The toolkit includes the Message Bridge for Java engine, which automatically manages transformations from XML to Java and back to XML—providing a no-code XML-to-Java binding solution. Developers can graphically create new Web services through simple point-and-click steps.

The EAServer’s Deployment wizard, meanwhile, enables developers to quickly generate WSDL files and to expose components as Web services. Using the Deployment wizard, developers publish Web services via a UDDI registry—creating applications that quickly, easily, and dynamically find and conduct transactions with other Web services.

In addition, Web services developed with EAServer inherit and leverage the advanced security features, including single sign-on, role-based access control, and secure business objects.

**Flexible, Powerful, and Integrated**
The HCJDC, which is responsible for the statewide criminal history record information system—along with the statewide automated fingerprint identification system and the issuance of the Hawaii State identification cards—had struggled for years to build a flexible, powerful, integrated system for data storage and retrieval.

ISDI actually began discussing the problem of building a next-generation data infrastructure with the HCJDC several years ago, in 1994. The HCJDC is one of several state government agencies ISDI has worked with; others include the Department of the Attorney General, Department of Human Services, Department of Public Safety, and Department of Taxation.

At the time, the HCJDC housed its data in an IBM mainframe based at the state’s central computing agency. But by that point, the agency was looking for a system that could provide more flexibility and ease of use than the mainframe could.

“The mainframe system provided a lot of the functionality we’re providing now, but the HCJDC still felt hamstrung by it,” Agsalud says. “But the new system would allow it to take better advantage of new technologies.”

At about that time, ISDI started developing prototypes for a client/server-oriented, GUI-based system. The client/server prototypes were intended to make the point that moving off the mainframe would offer the HCJDC easier modifications, the ability to integrate new technologies (such as image processing), and an increased ability to integrate LAN and WAN networks rather than putting in specialized gateways. “With client/server, you could add features as you went along,” Agsalud says. “Departmental areas could add changes without going through the central agency.”

**Internet Impact**
By 1996 ISDI began work in earnest to integrate and harvest data for the HCJDC’s clients. The integrator developed a transitional system, based on JDS Uniphase technology, that allowed users to make inquiries only across the data set. “This was to get the user community used to working in a nonmainframe environment,” Agsalud says.

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EAServer Fuels Government Deployments

When Hennepin County, Minnesota, needed an application server, one stood out above the rest. To squeeze the most out of its existing code base and skill set, the IT department believed that its best choice was EAServer from Sybase.

Hennepin County’s developers had a large and complex project on their hands and couldn’t afford to let it turn into a time- and resource-consuming mess. Their plans included a court scheduling and disposition application, a commercial property assessment application, a residential property information and tax payment application, and an application to help voters find their polling location and get election results.

Building on legacy PowerBuilder applications, the county’s IT department easily created a suite of EAServer-based applications. “Once the environment was in place and we tuned our applications, they ran very well,” says David Beckman, the county’s information technology manager.

Hennepin’s EAServer implementation runs PowerBuilder and Enterprise JavaBeans (EJB) components on the back end, with JavaServer Pages (JSP) for the presentation layer. The servers handle a constant volume of internal and external hits while managing high-volume, high-burst traffic periods such as election nights.

EAServer, an application server integrating J2EE 1.3, C/C++, PowerBuilder, and COM, is proving to be a government agency’s best friend when the agency moves applications to the Web. Working easily with key Sybase tools such as PowerBuilder components and the Adaptive Server Enterprise database, EAServer can launch organizations into new and productive development projects that don’t require developers to reinvent their skills.

EAServer is also a key platform for building secure enterprise Web services. EAServer Web Services Toolkit enables developers to easily create, test, automate, and deploy Web services applications and connect them to current business processes.

The EAServer Deployment wizard, for example, enables developers to quickly generate WSDL files and expose components as Web services. Another option, the Message Bridge for Java engine, automatically manages transformations from XML to Java and back to XML — providing a no-code XML-to-Java binding solution. With help from these tools, developers can graphically create new Web services through simple point-and-click steps.

The Only Choice

When entities such as Hennepin County; the Texas Workforce Commission; and Wellington City Council, New Zealand, are ready to unlock the value of their current data and reach out with new applications such as Web services, they’re increasingly turning to EAServer. Particularly as transaction speeds increase and data access gets restructured, EAServer is proving to be a valuable option.

“We selected EAServer for the Department of Defense, because it was the only application server that could reliably and securely handle the high volume of data processing required in the middle tier,” says Bob Glass, a senior analyst with Northrop Grumman Mission Systems, a Sybase systems integrator and contractor to the Department of Defense.

Offering efficiency and return on investment may be even more important, however. Government organizations such as Beckman’s are asked to wring more value out of their existing assets and improve service to employees and the citizens they serve. To do that, they must build an open yet integrated infrastructure, one that exposes legacy data efficiently while working with cutting-edge technology.

Not only are these organizations working with severely limited budgets but they are also often working with old technologies or a hodgepodge of systems in various groups served by the organization’s IT department. Tying these systems together might not even be feasible if these groups had to build an integration solution from scratch. But EAServer can often provide the means to link key assets.
Making old applications “Web-friendly” has become particularly important. Governments see big savings as they Web-enable standard applications. For example, Arizona residents who renew car registrations online save their state $5 each, creating an annual savings of more than $1.5 million for the Arizona Motor Vehicle Department. Another case in point is the U.S. Internal Revenue Service, which saves $1.20 on each electronic tax return it processes.

EAServer customers are quickly making such gains. Within six months, an application built on EAServer helped the Wellington City Council reduce the time required to process most customer inquiries from six minutes to one minute, cutting the budget for day-to-day operations and operator training.

Wellington, New Zealand’s capital city, must manage property information for 163,000 residents, processing requests for key real estate information such as sewage drainage, easement, and rates as quickly as possible.

The council’s EAServer-based solution provided the tools for generating interface components (including Java and PowerBuilder objects), connecting to an Adaptive Server Enterprise database. With the solution in place, any Web user can access not only key property details such as owner name, area, and value but also geospatial data such as under- and over-ground maps.

“EAServer gave us the ability to take our business logic, put it into a middle tier, and link to a client that doesn’t require any abilities beyond Web browsing,” says Brett Priddley, who works for Wellington’s IT department.

A Texas Welcome for EAServer

Another government organization seeing gains from an EAServer implementation is the Texas Workforce Commission, which oversees workforce development programs for the state of Texas.

Currently, the TWC serves about 10,000 users, all of whom must have a current copy of the TWC client to access key functions. Before the recent development project, these users had to download a new copy of a fat 45-MB PowerBuilder client every time developers made changes to business logic. The periodic updates, which took place every three to four weeks, were crashing FTP servers and frustrating users.

With help from EAServer, the TWC moved from a two-tier client/server application to three-tier architecture requiring a much smaller 10-MB client. Much of the logic formerly residing on the client is now at the application server level on EAServer.

Today, the IBM AIX-based EAServer connects to a backend Adaptive Server Enterprise database, with rules coded in

With the help from these tools, developers can graphically create new Web services through simple point-and-click steps.

Platforms such as EAServer should be more important as government spending for Web accessibility and homeland security projects increases. As long as government developers need to save money and get the job done quickly, EAServer and other Sybase tools will make that happen.
Both governments and private companies had begun to realize the commercial possibilities of enterprise Internet usage. It was becoming clear that using data retrieval solutions based on a browser, rather than on proprietary client software, was an efficient and powerful method of connecting users to information.

Also, developers and enterprises had begun to explore whether it made sense to completely scrap proprietary client-side software, relying on GUIs or perhaps Java applets to control and access key business applications. In many cases, companies were creating brand-new architectures, keeping the PC client “thin” and building new applications middleware to handle business intelligence.

ISDI executives knew that it was time to embrace this new technology to at least some degree. The project eventually shifted, making browser-based access to data one of the key objectives. “With Internet applications coming into vogue at the time, we felt we had to have at least a browser-based system for inquiries,” Agsalud says.

Keeping a Balance
Despite its benefits, however, browser technology wasn’t appropriate for the entire project. For that reason, ISDI didn’t go for an Internet-only system but instead decided to use specialized client software for data maintenance. The combination of browser and specialized desktop client kept client-side software maintenance to a minimum while giving various users the specific tools they needed.

Before doing this project, ISDI had developed a large real estate management system for Prudential California Realty, employing PowerBuilder tools. One of the five largest brokerages in the United States, Prudential California Realty generates more than $12 billion in sales per year through more than 3,000 agents.

With the HCJDC project, ISDI decided to take advantage of this experience, creating PowerBuilder clients for users who needed to do intensive data management chores. In other words, although most of the end users would continue to use a browser, a small subset would get the PowerBuilder client. “We didn’t want to have heavy transaction loads on browsers,” Agsalud recalls.

Enter EAServer
By 1999 ISDI had started to develop the data unification project in its final form. Using the Web services technology available with EAServer, ISDI created interfaces into the HCJDC’s many databases, which included mainframe-based data, client/server relational databases, and Web servers.

Having decided to use at least some PowerBuilder clients, the HCJDC realized that it was critical to take advantage of PowerBuilder’s strengths. “Because we wanted to keep PowerBuilder as a client application, we needed a Web/application server that would help leverage some of that knowledge we had in PowerBuilder,” says Agsalud.

Using EAServer enabled the HCJDC to integrate PowerBuilder clients with the rest of the infrastructure. Among other advantages, the EAServer Web Services Toolkit automatically supports PowerBuilder components whose method signatures contain Common Object Request Broker Architecture (CORBA) C++ IDL data types and/or arrays of those data types. In addition, the Web Services Toolkit allows developers to create and utilize user-defined data types. Also, the Web Services Toolkit automatically supports PowerBuilder components whose method signatures contain CORBA C++ IDL data types and/or arrays of those data types.

Leveraging Investment
The HCJDC’s application went live late last year and continues to work well. Although it may have taken several years to find the best approach to comprehensive data access, the government agency now apparently has what it needs.

Sometimes it’s a matter of having the correct tools. All told, ISDI executives have concluded, EAServer was the best choice for the project. “We were looking for a Java-based application server that would allow us to leverage our investment in PowerBuilder,” Agsalud notes. “EAServer was the only one that was able to do that and provide advanced Web application server services.”

Anne Zieger is a widely published analyst, writer, and speaker whose work has appeared in many of the technology industry’s leading journals. She is chief analyst and founder of PeerToPeerCentral.com. Zieger can be reached at azieger@peertopeercentral.com.