

## Aurora Health Care sees a bright new dawn with a Service Oriented Architecture on IBM System z



Aurora Health Care ([www.aurorahealthcare.org](http://www.aurorahealthcare.org)) is a not-for-profit Wisconsin healthcare provider. Founded in 1987 following the affiliation of two Milwaukee hospitals three years earlier, Aurora now encompasses 250 sites, including 13 hospitals and more than one hundred clinics, with net services revenue of \$2.8 billion in 2005. Aurora employs more than 25,000 people and invests heavily not only in treatment but also in improving the prevention of illness.

As a large organization, Aurora is able to offer a very broad set of services to its patients, who benefit from access to a large pool of highly qualified medical personnel and top-class facilities. Simultaneously, Aurora is very active at the level of local communities and wants its patients to get the personalized service they might typically associate with a much smaller organization. Aurora's goal was to engage patients to take an active role in their own healthcare. In order to be successful, Aurora needed to provide a collaborative environment where both employees and patients could access their healthcare information.

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### Overview

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#### ■ **Challenge**

*Present data from around 1,000 systems in an accessible manner; drive greater internal process efficiency and improve the patient experience; simplify and accelerate the delivery of management information; provide self-service tools to patients*

#### ■ **Solution**

*Used IBM WebSphere® technologies to deploy and host "i-Connect" portal system for internal staff, running on the IBM System z™ platform; new "My Aurora" portal will enable patients to input information and book appointments*

#### ■ **Key Benefits**

*Easy, browser-based access to information enables staff to work more efficiently and to share knowledge; streamlined workflows and reduced use of paper documentation contribute to significant cost savings; flexibility in the IT function to be more responsive to changing business requirements through a Service Oriented Architecture (SOA) that enables quicker deployment of new and changed business functionality; high reliability, scalability and performance of System z platform supports complex, 24x7 working environment*

With around 1,000 underlying systems, ranging from HR databases to patient records systems, and from accounting to supply chain management, Aurora possessed vast amounts of potentially valuable information that was effectively locked away in silos.

Says Duane Wesenberg, Vice President Enterprise Applications, “We wanted to be able to extract relevant information and present it in a familiar way across all of the regions, all of the sites and all of the business lines. So that if employees moved locations or positions, they would immediately and intuitively be able to find the information they needed to do their job. The philosophy was to have always-on information, like the Internet. Our goals were to take the complexity out of the technology, to enable much better collaboration and to enhance the patient experience.”

#### **Choosing the right platform**

Aurora did not want the cost or disruption of ripping out and replacing its entire infrastructure. Instead, the organization planned to restructure its existing

software systems and enable them to be part of a Service Oriented Architecture (SOA). The aim was to aggregate data from the underlying systems and to push information out to users through Web-based portals. This was to be done with sufficient flexibility to adapt to changing business requirements.

Gary Weckwerth, Director of Technical Systems and Operations, comments: “IT is traditionally very cost conscious, and in the healthcare environment, we want to pinch every penny out of every dollar. When we looked at the business-critical data and systems that we wanted to make available to all users, it was quickly clear that much of it was managed on the IBM System z mainframe platform.”

He adds: “With IBM committed to supporting open standards on the mainframe, the opportunity was there to simply build our new information delivery system on the very firm foundation we already had. We thought: why should we pursue anything else when we have the tools and the staff already in place to do this on the mainframe?”

To position the platform for the new workloads, Aurora upgraded to an IBM System z9™ Enterprise Class platform with an IBM System z Application Assist Processor and an Integrated Facility for Linux® engine. The new server runs IBM z/OS® V1.7, WebSphere Application Server 6.1 and IBM DB2® for z/OS V8.

Wesenberg says: “All we needed to do was to open up the mainframe and make the information available. In addition to being the platform of choice for supporting large databases and business-critical transactional systems, the System z platform is open, it supports J2EE, it supports LDAP for identity management, it has built-in RACF security—so it has everything you need to create a flexible portal solution. The IBM support for open standards was a key factor in our decision—we wanted to stay open and agile, and that’s what the System z platform promised.”

Tony Finn, Manager of Web Application Development, comments, "We chose IBM WebSphere software as the basis of our new portals for its stability and scalability. With 26,000 internal users and up to one million external customers, we needed a true enterprise-class application and Web serving environment; WebSphere fit the bill perfectly."

### **Connecting with internal users**

The adoption of SOA at Aurora enabled the organization to bring together information from disparate systems and build new workflows and delivery systems around it. The first of these delivery systems is a single sign-on employee portal called i-Connect, written in Java™ and running on IBM WebSphere Application Server technology on the System z platform.

Initially built as a way to share financial and HR information, i-Connect quickly expanded to encompass other functional areas, and now includes both clinical tools, such as patient acuity scoring and bed management, and business tools, such as supply chain management. The portal is identity-driven, enabling Aurora to personalize the information that is delivered to each user according to their role in the organization.

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"Using our SOA, we are beginning to aggregate the hospital information, the clinic information and the retail pharmacy information so that employees wouldn't need to hunt through dozens of different system to find the information they need. The i-Connect portal provides a single source of truth," says Wesenberg. "Our original goal was to have 80 percent of the workforce actively using the portal; today, almost 99 percent of employees log in at least every two weeks. There is no hesitation from the user about where to get information, and the benefit is that they are freed up to spend more time with their patients."

Aurora has set up employee kiosks to support its clinical staff, who need the ability to move from location to location without losing access to the information in the portal. Employees can perform a single sign-on from i-Connect to IBM Lotus® Domino® Web access, giving them the ability to use e-mail wherever they are.

Says Wesenberg, "Using the i-Connect portal running on the System z platform, employees can access applications 24x7 from wherever they are. The solution is saving them time and enabling more efficient workflow, and the new interfaces are far more user-friendly. With the SOA, we can modify the applications very quickly and easily, and so we can rapidly respond to requests for changes from the users."

### **Streamlined processes**

In addition to providing valuable information in the clinical setting, i-Connect has streamlined a number of business processes at Aurora. For example, the organization's Intranet Requisitioning System simplifies stock replenishment and helps ensure that all employees buy the best available products at the best price. Human resources processes have also been improved through the use of the portal: Aurora used to print 26,000 payroll deposit checks every

other week and now simply makes them available online resulting in significant savings in printing and internal mail costs.

Robert Burgess, Supervisor of Systems Software for Aurora Health Care, comments, “i-Connect has undoubtedly made the end-user experience better. It’s more user-friendly, it presents more data and it’s easier for staff to use. It has empowered people to do their own HR administration in real-time, saving significant efforts and delays.”

Employee benefits are now administered by the employees themselves, and new members of staff can enroll online through the portal, which provides all the information they need to start work—saving time and money.

By building an open and flexible SOA, Aurora has moved from thinking about technical challenges to thinking about business solutions. The organization can now focus on how to use the information it holds to improve healthcare in the community and to generate greater operational efficiency.

Says Wesenberg: “The positive effect that i-Connect produced within our operations made us think more clearly

about how to engage our customers and our patients. This brought us to the realization that we needed to enable the patient to be integrated into the workflow and to have access to information, and sowed the seeds for the next generation of “My Aurora,” our patient portal.”

### **Simplifying patient care**

Aurora is now constructing the My Aurora patient portal, which, for example, will enable its customers to log in and schedule appointments, pay bills, view their medical information and provide new information to Aurora. My Aurora is integrated with i-Connect, enabling employees to sign in just once and access not only the internal Web applications but also the external applications.

When fully operational, My Aurora will provide information to patients 24x7, saving them time that would otherwise be spent on the phone and freeing up administrative staff at Aurora. More importantly, the portal will significantly simplify the billing process. An episode of illness is a single event from the patient’s point of view, and yet it might produce multiple different invoices from different parts of Aurora. For example,

an operation to remove the appendix might involve multiple medical physicians and clinicians at multiple sites, with various scans and laboratory tests. Regulatory requirements mean that Aurora must provide this information in full, which can be confusing and worrying for patients.

My Aurora takes the hospital billing systems and the accounts receivable systems and aggregates the information they hold in a way that reflects the experience that the patient has. Says Wesenberg: “The Aurora philosophy is to remove the complexity, to make it a continuum of care, so that the systems are natural and transparent to the patient’s view. It’s all about making it more of a person-to-person experience, which is what people actually want in healthcare.”

Finn adds: “Ultimately, our goal is to make the healthcare process as simple as possible. What might otherwise be a very traumatic or anxious experience for patients becomes less so because of the easy-to-use information products that we provide. That was behind the whole vision of building an SOA and providing a comprehensive view of data, regardless of the underlying complexity.”

### **System z—the right platform for portals**

The requirement to serve 26,000 internal and up to one million external users puts a high premium on the reliability, availability and security of Aurora's IT infrastructure. As a healthcare provider, Aurora needs to comply with very stringent regulations on data protection, including those in the US Department of Health and Human Services's HIPAA (Health Insurance Portability and Accountability Act). Aurora takes advantage of the high security offered by the mainframe platform to help meet its patient confidentiality obligations.

The combination of the System z platform with its built-in cryptographic processor, WebSphere and IBM DB2 information management has given Aurora the robust platform it needs for its ambitious portal projects. The use of the System z platform has also enabled Aurora to keep its infrastructure simple and focus more intently on the business challenges rather than technology issues.

Says Wesenberg: "The System z platform had virtually everything we needed built-in, so it allowed us to move beyond the issue of which information systems hold which information, and work more on the user experience and

on how to put together information which will ultimately move into embedded learning and knowledge management."

Weckwerth adds, "The differentiator that Aurora has in the market place is information sharing and knowledge sharing, and the concepts of transparency and transformation. By using the System z platform, and by using portal technology, we've been able to introduce the concept of always-on information, anywhere that you want, at any time. Just like the body needs the heart, information systems need information management—DB2 on System z is a vital part of the whole architecture. If you have Web apps and they're not available, they're really not any good to anyone. The System z platform gives us the three pillars we need to drive internal value and to support our external customers effectively: reliability, scalability and performance."

The use of IBM Parallel Sysplex® high-availability technology on the System z platform has enabled Aurora to upgrade its operating system, WebSphere and DB2 with almost no disruption to users. The ability to release new versions of applications within seconds of taking the existing systems down provides the flexibility and speed of response that are crucial to the SOA concept.

*"By moving to a service oriented architecture on System z, we have gained the ability to think more about business problems and work through business solutions. At Aurora Health Care, we no longer talk about the technical challenges; we talk about what is possible."*

– Duane Wesenberg, Vice President  
Enterprise Applications, Aurora  
Health Care

"Running on System z, we've been able to deploy 50-plus Web applications without significantly adding staff," says Weckwerth. "This means that System z is a very cost-effective platform for Aurora."

Wesenberg concludes: "By moving to a service oriented architecture on System z, we have gained the ability to think more about business problems and work through business solutions. At Aurora Health Care, we no longer talk about the technical challenges; we talk about what is possible."

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Route 100  
Somers, New York 10589  
U.S.A.

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