Gateway for M: Prescription for Better Health Care

by Barbara Shinrock

The need for fast, efficient and open-systems access to M data is quickly becoming a critical IS requirement within the health care industry. In response, Oracle developed the Oracle Transparent Gateway to M which provides transparent read-and-write access to data residing in the thousands of government and commercial health care information systems developed using M Technology.

When the physicians and staff at the Jerry L. Pettis Memorial VA Medical Center in Loma Linda, Calif. (Loma Linda VAMC) sought to update and network their mainframe-based computer system with a variety of standalone departmental databases, they looked to Oracle to solve what is, essentially, a medical re-engineering challenge. With 37 administrative units and an active patient roster of 25,000, information integration and flexible reporting are key to quality patient care at the center.

"The Gateway brought us an opportunity to completely redesign the way we handle computer interaction," says VAMC staff cardiologist Alan Jacobson. Dr. Jacobson chairs the medical center's IRM Advisory Committee, the group that partnered with Oracle to develop the Gateway.

DRIP Syndrome

The VA's Decentralized Hospital Computer Program (DHCP), written in M (formerly called MUMPS), is what Dr. Jacobson calls "our final data repository."

"The DHCP is rich in data but lacks accessibility," says Loma Linda Information Resource Network Manager Saul Melara. Over the years, clinicians and administrators in many of the 55 different areas of the hospital have created their own databases on a variety of platforms rather than using the cumbersome DHCP. The result was a patchwork of information with no vehicle to share the data. As Melara puts it: "Cardiology exams, cardiology reports, pulmonary exams, pulmonary reports, gastroenterology—you name it. It was out there, sitting by itself." A care provider needing laboratory results would often have to telephone the lab because the care provider either lacked the know-how to access DHCP or the lab kept its records on its own server.

Individual servers could not talk to the DHCP, making it difficult to provide focused, optimal care for a patient. "It's the DRIP management style," Dr. Jacobson declares. "We are Data Rich and Information Poor. We also have had an additional problem: The DHCP is very difficult to modify and to use for ad lib interaction. As a doctor, you have to spend a great deal of time getting information. If the computer system makes your work more difficult, you're not going to use the computer system."

"DHCP is cumbersome," agrees Loma Linda's Chief Information Officer Linda Reynolds. "Although physicians could ultimately get all the information they need, they had to wade through several menus and that took time. Our goal was to get information quickly and easily to care providers and administrators."

The IRM Advisory Committee saw its business challenge ultimately as a service goal: providing optimal care to the VA's extensive patient roster. To accomplish this goal, there was a definitive need to provide staff members with the information they needed, in the format they needed, and at a convenient time and location. The underlying technical challenge was creating a user-friendly system that would make data open to the doctors, nurses, and administrators. Key considerations were improved information integration and flexible reporting—in sum, to be able to pull together information on one patient across multiple system modules.

The Physical Exam Begins

Initially, the Loma Linda IRM team—an interdisciplinary group made up of clinical, administrative, and management staff—undertook a needs assessment and interviewed applications coordinators in each department of the hospital. According to Melara, the group conducted interviews with 95 percent of all the services in the hospital. Reynolds says, "This process validated the need to get information from DHCP."

Then Melara and his computer staff conducted extensive research to find the technology and company suited for the task. The field of options eventually narrowed to three potential solutions. Implementation of HL7 was considered. But as Jacobson says, "with that, you have to write specific interface code every time you try to talk to anyone else.

It would have created a horrible maintenance issue."

Secondly, they considered a modification of the discharge summary, which would allow other computers to enter information into the DHCP but would not allow them to get information back out. "That was distant third," Jacobson said.

Finally, Oracle's Gateway was selected as the best solution. Jacobson explains, "The Gateway had, far and away, the most flexibility for what we wanted to do."

Melara concurs. "Oracle was the only vendor who had a solution in place," he says. Moreover, he adds, "It was relational rather than hierarchical. It would be open to anything. It would, in fact, give us medical data management."

The Oracle Prescription

Oracle's solution, the Oracle Transparent Gateway for M, enables users to seamlessly access data stored in the M environment, providing the high-performance, low-cost benefits of open systems. Reynolds describes the Gateway front end as "like Windows. You point and click instead of going through menus."

The Gateway provides geographic, network, operating system, and data storage transparency, creating the appearance that all data resides in a single Oracle database. Users need not worry about the type of data, which operating system it resides on, how the data is stored, or the network protocols used to access it.

The Gateway allows the hospital's stand-alone databases to transfer data directly to DHCP; and data can be transferred from any database that is Structured Query Language (SQL) and ODBC-compliant (i.e., Microsoft Access, FoxPro, Visual Basic, Paradox, Delphi, or Oracle Forms).

The Gateway allows any VA center with M Technology and any third-party system to work together. Individual servers can talk to DHCP. Hospital employees can use Oracle tools to reach the database, create new records and update existing records in DHCP. Health care providers in all units can share and gain access to patient treatment histories, research, and test results.

Incorporation of Oracle's Discoverer/2000—a reporting tool that enables end-user ad hoc report writing and SQL* Net and SQL Plus, which facilitate the creation of SQL statements against the Oracle7 database for queries and updates, have dramatically improved the information prognosis at Loma Linda.

An Infectious Solution

The Gateway has been up and running at Pettis for close to a year. The Edward Hines Jr. and Carl T. Hayden VA Medical Centers in Chicago and Phoenix, respectively, are currently implementing the Oracle Transparent Gateway for M as well.

There are 171 Veterans Affairs (VA) medical centers, 200 clinics, and 100 care facilities. Melara says, "Once other VA centers come on-line, we'll be able to pull information from multiple sites. In the future, patients across the VA spectrum could reap the rewards of better care."

Benefits in patient care can already be seen at Loma Linda. For example, Dr. Jacobson reports that the Gateway is helping ensure that heart patients receive what he calls "ideal therapy." He explains: "We know that people with a certain heart rhythm are at very high risk of having a stroke. Therefore, it is important that these patients receive stroke-prevention medication. Information on patients' heart rhythms resides on one computer's database, while the pharmacy computer holds information on which patients are receiving the medication for this condition.

In the past, an EKG computer could not talk to the pharmacy computer. So we would get a printout of the EKG data and scan it into a PC. We then took the list of patients to the pharmacy computer to find out which patients were or were not getting the right medication. Then we would go to another computer system that has addresses and patient information. And on a fourth computer system, we put all of that data together in order to notify the patients who weren't getting the ideal therapy."

"Today, I can do that with one click of a button," Dr. Jacobson declares. "During a recent six-month period, we more than doubled the number of patients who received the ideal therapy."

Users in Quality Management, Administration, Research, and Clinical departments now have the capability to perform queries of not only the DHCP databases but also of the networked database resources. These queries can be accomplished without extensive programming, using the tools provided with the Gateway or with any of the database software packages in use at the center. Real-time, bi-directional communication between DHCP and other environments is possible through the Gateway. Reynolds calls this "the biggest positive feature."

In addition to improved care, Reynolds said the Gateway "enables people to do their jobs better by streamlining manual processes and allows operations to continue without losing quality. I see the information directly linked to supporting how well we can make business and medical decisions. The key benefits are the ability to access information that people really need, the fact that it is real-time data, and the ease of use from the end user standpoint."

Says Jacobson, "What we know for sure in the Federal Government is that in the future we will have more work and less money for people. We need a way to provide improved health care within those constraints. This [Gateway] provides us with a tool that lets us do that."

Clinically Proven by a Staff of Trained Specialists

In diagnosing and treating the ailments of the DHCP system, Melara notes that Loma Linda's partnership with Oracle has been much more than the provision of a single-faceted technical solution. One can't help but be struck with the parallel to the great medical care that a primary care doctor brings in conjunction with a team of expert specialists. He notes: "Oracle has been a good partner because they not only have the staff that understands databases, but they have the staff that understands networking, DHCP, and hospital systems alike. So we can ask the questions and they will be able to provide the right answers." As the staff of Loma Linda looks toward the future of improved patient care through integrated information, there seems to be agreement—the prognosis is excellent. **M**

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