



DATA/ONE Campaign: Implementing Bono's Wish

An IDC Case Study
Sponsored by Sun Microsystems Inc.

THE COMPANY

DATA, a partner of Sun Microsystems, aims to raise awareness about the African crises: unpayable debts, uncontrolled spread of AIDS, and unfair trade rules that keep Africans poor. DATA is an acronym for the crises of Debt, AIDS, and Trade in Africa and was cofounded in 2002 by rock star and social activist Bono, Bobby Shriver, and activists from the Jubilee 2000 Drop the Debt Campaign.

The ONE Campaign is a non-profit initiative launched by Bono to raise the voices of citizens to combat AIDS and reduce poverty in Africa. This opportunity, and the offer to make it a reality, was part of a wish granted to Bono as a recipient of the inaugural Technology, Entertainment, Design (TED) Prize, awarded on February 24 at the 2005 TED Conference in Monterey, California.

THE OBJECTIVE

Bono wants to mobilize 1 million American voices in support of his fight against AIDS and poverty. With more than 600,000 fans in possession of tickets for the first U.S. leg of U2's concert tour, Bono wanted a technology infrastructure that enabled him to call on fans to join him in his fight from the time and space constraints of a rock concert venue.

THE SOLUTION

As his band performs in-concert, Bono calls on his fans to join him in his fight. He asks them to send a text message from their mobile phones to a short code — UNITE (86483). The text message establishes an initial link between the fan and the ONE Campaign. A reply message is sent from Bono to the fan and provides a URL where the fan can register with ONE after the concert.

This solution uses Sun Fire v20z and Sun Fire v40z servers running Solaris 10 and the Java Enterprise System's Web Infrastructure Suite. The solution is integrated with a visual rendering engine running at each concert. The names of people who have responded to Bono's call are displayed and become part of the show's visual experience. This process builds on a tradition of fans lighting candles, or holding lighters, at concerts to show support for a rock group's call to action.

WHY SUN?

With just six weeks to architect, build, test, and deploy the solution, Sun's Enterprise Web Services practice combined a service oriented architecture (SOA) with the reuse of Java patterns. These combined disciplines allowed Sun to rapidly integrate technologies from a variety of partners, which were necessary to complete the solution. The SOA discipline also provided Sun consultants with the flexibility to manage the system's requirements, which were in flux as requirements changed over time.

THE RESULTS

The in-concert system delivered by Sun resulted in more than 600,000 new voices in the ONE Campaign in eight weeks. In the spring of 2005, the text-messaging infrastructure was being readied to support the tour when it moves on to Europe this summer. Plans are in place to use the system when the tour returns to the United States in the fall of 2005.

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EXECUTIVE SUMMARY

The ONE Campaign is a non-profit initiative launched by Bono, the lead U2 singer and social activist. The ONE Campaign, backed by a broad coalition of aid agencies, is focused on raising the voices of American citizens to combat AIDS and poverty in Africa.

As the recipient of the inaugural Technology, Entertainment, and Design (TED) prize, awarded on February 24 at the 2005 TED Conference in Monterey, California, Bono expressed the wish to enlist 1 million Americans into the ONE Campaign and challenged Sun to provide a technology infrastructure that would enable him to call on his fans during his concert tour.

With just weeks between the date Bono's wish was announced and the kick-off of the concert tour, Sun's Enterprise Web Services practice built a system comprising best-of-breed technologies using a pragmatic service oriented architecture (SOA) approach to deliver an efficient and scalable infrastructure that enabled thousands of concertgoers to participate. Figure 1 shows the solution at a glance.

The key to success was leveraging proven software patterns within a SOA — patterns being a Sun term to describe integrated technology components, as described in Sun's series of *Patterns* publications. Sun's SOA is a framework for building loosely coupled solutions in complex and heterogeneous computing environments. Sun engineers reused proven software patterns to gain efficiency, ensure quality, and reduce risk.

SITUATION ANALYSIS

BACKGROUND

Lead U2 singer and social activist Bono was granted three wishes as one of three winners of the inaugural TED Prize at the 2005 TED conference in Monterey, California. Bono and two others were given time to formulate their wishes, and they were strongly encouraged to think big in order to impact life on this planet.

Winners were allowed to wish for anything at all, and TED agreed to spend \$100,000 on each winner to help make their wishes come true. The dream behind the TED Prize is that the three recipients will find a way to leverage the resources of the TED community, as well as TED's corporate sponsors and partners, to achieve value that is an order of magnitude greater than the \$100,000 set aside for their wishes.

On February 25, 2005, Bono announced his wishes to the world. He announced the launch of ONE, a major new social movement in the United States, aimed at fighting poverty worldwide and stated his wish that the ONE Campaign would sign up 1 million members by the end of the year. He then called for 1 billion media impressions about ONE prior to the G8 Africa Summit in July 2005. Lastly, he challenged the TED community to provide internetworking for every hospital, health clinic, and school in Ethiopia.

Figure 1: DATA/ONE Campaign Solution At-A-Glance

Core functionality	The system is based on Sun's Java Enterprise System (JES) and the Sun Java Web Services Infrastructure Suite, consisting of Web and application services, development tools and services and support. In addition, several highly integrated Sun and other compatible technologies were used, including Java 2 Enterprise Edition (J2EE), JavaServer Pages (JSP), Java Management eXtensions (JMX), JDBC database connectivity API, Java Architecture for XML Bindings (JAXB) and XML.
Application infrastructure	The solution was built using a pragmatic service oriented architecture (SOA) that centers on applications that are built from shareable, reusable, network- and standards-based layered services.
Platform infrastructure	The solution was implemented on a Sun platform, running on the Solaris 10 operating system and Sun Fire v20z and Sun Fire v40z servers.
Solution approach and architecture	The system was built using proven software patterns from the catalog included in <i>Core J2EE Patterns: Best Practices and Design Strategies</i> , a Sun Microsystems Press book coauthored by Sun engineers Deepak Alur, John Crupi, and Dan Malks.
Sustaining services	There are three key services delivered as part of the solution. · Inbound Service supports Short Message Service (SMS) from all Tier 1 telecommunications carriers. A universal "short code" was secured, enabling all participants to send their text message to a single address. The Inbound Service provided syntactic validation, semantic validation, and message persistence. · Outbound Service delivers the names of participants to the local venue for display. These names were "cleansed" to ensure that any inappropriate entries were filtered out before being displayed on the jumbo screen. · MT Response Service sends a reply text message to the fans with a message from Bono, thanking them for participating and providing them with a URL that provides a route to further participation.

Source: IDC, 2005; based on Sun documents

In announcing his three wishes, Bono declared: "The geopolitical world has got a lot to learn from the digital world, from the ease with which it blew away obstacles nobody knew could even be budged. You have closed the gap between dreaming and doing. My wishes are for the people at TED to blow away some more barriers and build an online activist community of 1 million Americans for the ONE Campaign; achieve 1 billion media hits for the 1 billion people living on less than one dollar a day; and to wire up every clinic and school in one African country, Ethiopia."

Technology, Entertainment, Design (TED) is an annual conference that was founded in 1984. Each year 1,000 thought leaders experience the latest, greatest ideas, inventions, and passions, delivered by more than 50 speakers and performers. The Sapling Foundation acquired TED in 2002.

In May 2003, TED set out to develop an awards program that would leverage the talents and resources of remarkable and influential members of the TED community. The project culminated in an awards program in which the winners are given three wishes.

In 2004, the Sapling Foundation appointed a team of nominators whose mission it was to find people in science, technology, business, design, the arts, entertainment, and social entrepreneurship "... whose work was capable of transcending boundaries and making a significant impact on our shared future."

Debt, AIDS, Trade in Africa (DATA), a partner of Sun Microsystems, aims to raise awareness about the crises swamping Africa: unpayable debts, uncontrolled spread of AIDS, and unfair trade rules that keep Africans poor. DATA was cofounded in 2002 by Bono, Bobby Shriver, and activists from the Jubilee 2000 Drop the Debt Campaign.

*"The geopolitical world has got a lot to learn from the digital world, from the ease with which it blew away obstacles nobody knew could even be budged. You have closed the gap between dreaming and doing."
– Bono*

Bono's goal of empowering Americans to fight poverty worldwide was based on the creation of a technology infrastructure that would allow him to enlist fans, with hundreds of thousands holding tickets to attend concerts this year, to the campaign in real time during his upcoming concert tour in the United States. The infrastructure to accomplish this will need to be robust and capable of providing high-performance scalability and reliability when handling heavy bursts of concertgoer activity — or the feedback to audiences would not be as immediate, or compelling.

The system must also be capable of delivering a mix of services, including an immediate response to participants to acknowledge registration, display of the participant's name at the concert venue, and a follow-on message to each participant within 24 hours. Finally, ONE.org would need to have a system for maintaining contact with participants for the life of the ONE Campaign initiative, to ensure follow-up on each fan's initial pledge of support.

By registering, participants would be demonstrating support toward the following commitment statement created by the ONE Campaign:

"We believe that in the best American tradition of helping others help themselves, now is the time to join with other countries in a historic pact for compassion and justice to help the poorest people of the world overcome AIDS and extreme poverty. We recognize that a pact, including such measures as fair trade, debt relief, fighting corruption and directing an additional 1% of the U.S. budget toward meeting basic needs — education, health, clean water, food, and care for orphans — would transform the futures and hopes of an entire generation in the poorest countries. We commit ourselves — one person, one voice, one vote at a time — to make a better, safer world for all."

More information about the ONE Campaign can be found at www.one.org.

SUN'S ROLE

Beginning March 2005, Sun's role in the ONE Campaign has been to design, build, and deploy a system that "elists" individuals' names for this cause. Sun delivered a system to allow individuals to send a text message from their mobile phone to initiate a connection to the ONE Campaign and ultimately to enroll.

THE NEED: A SCALABLE INFRASTRUCTURE FOR MESSAGING

The technical and logistical challenges to building a text messaging solution to support the ONE Campaign on the tour were formidable. The supporting infrastructure needed to:

- Deliver a secure, scalable, and real-time solution that could facilitate registration for the concert tour audience.

- Develop and deploy a system that could adapt to the dynamic nature of a rock concert tour — schedules, production technologies, venues, different communications carriers, and a global datacenter exchange.
- Establish a process that allows concertgoers to send a simple text message from cellular phones and other mobile devices.
- Build a rapid response process that validates and filters irrelevant submissions and ensures data integrity for future use.
- Provide bullet-proof technology that will last the lifetime of the tour and campaign.

WHY SUN?

Sun Microsystems stepped up to the challenge of delivering a technology infrastructure in support of the initiative. The Enterprise Web Services practice at Sun, a Sun consulting service, assembled the solution drawing from a portfolio of products that included Sun Fire v20z and Sun Fire v40z servers, Solaris 10, and the Java Enterprise System's Web Infrastructure Suite. The team employed a service oriented architecture, a discipline that was critical, given the short timeline for delivery.

SOLUTION PROFILE AND IMPLEMENTATION STRATEGY

Sun Microsystems was able to deploy a solution quickly in support of Bono's ONE Campaign initiative. As of the publication date of this report, the solution was being readied for implementation in Europe as the concert tour moved to the continent for the summer. The solution is slated to be reused in the United States as well, when the tour returns to North America in the fall of 2005.

CORE FUNCTIONALITY

Sun's Java Enterprise System and Web Services Infrastructure Suite, consisting of identity management services, Web and application services, development tools and services, and support, served as the core technology platform for this solution.

APPLICATION ARCHITECTURE

The system is built using the disciplines of the pragmatic SOA and is based on proven software patterns, an important consideration, given the nature of the project and the time frame in which it was expected to be delivered.

This approach centers on applications that are assembled using sharable, network-based layered services. Software patterns are recurring solutions to common problems. The development team depended upon *Core J2EE Patterns: Best Practices and Design Strategies*, a book authored by Sun engineers: Deepak Alur, John Crupi, Dan Malks (Second Edition, Core Design Series, Sun Microsystems Press, Prentice Hall, 2003; ISBN: 0131422464)

Core J2EE Patterns contains a pattern catalog that provides a vocabulary used for discussing, analyzing, and architecting large-scale enterprise applications. Using these patterns judiciously and appropriately can improve efficiency and

reduce risk. Leveraging these proven solutions helped the team architect build the solution in such a short time.

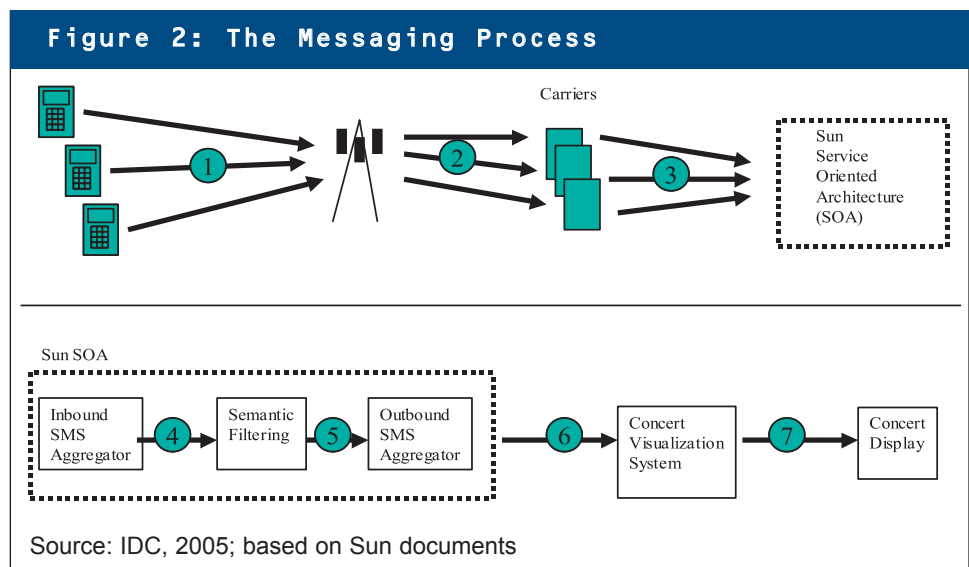
THE PROJECT: IMPLEMENTATION TIMETABLE AND ARCHITECTURE

Faced with the challenge of using a technology infrastructure to enable Bono to “enlist” fans from a rock concert stage, Sun’s Enterprise Web Services consulting practice sought to leverage the only technology that fans were likely to bring with them to the concert — their mobile phones. With the phone as the common denominator, the Sun team developed a solution.

THE MESSAGING PROCESS

The flow of information, particularly the SMS text messages sent from fans at the concert, as shown in Figure 2, follows the following sequence of hops:

1. From the fan’s phone to the local cell tower
2. From the tower to appropriate mobile carrier
3. From each carrier to the Inbound SMS Aggregator, which is based in the United States and is part of Sun’s service oriented architecture (SOA)
4. Within the Sun SOA, from the Inbound SMS Aggregator to a semantic filtering service to validate message semantics and remove objectionable words
5. From the semantic filtering to Sun’s Outbound SMS Aggregator, which is located in Singapore
6. From Sun’s Outbound SMS Aggregator to the concert visualization system onsite at the concert venue
7. From the visualization systems onsite at the concert to visual displays on stage



The performance objective was that this entire trip must take less than 10 seconds — otherwise, fans would see a slowed response, and the system itself would delay and interfere with the end-user experience. Moreover, the system must be able to scale to accommodate tens of thousands of messages received within a span of less than 3 minutes.

HOW SUN DELIVERED THIS SOLUTION IN 6 WEEKS

A small group of senior Java engineers from Sun’s Enterprise Web Services Group began preparing for the project on February 8, 2005, prior to Bono formally stating his wishes on February 25, 2005, when construction of the solution began in earnest. The technology solution had to be ready in its entirety — from provisioning carriers to a reliable up-and-running infrastructure — in time for the first night of the concert, which was scheduled for March 28, 2005. Figure 3 shows highlights of the schedule.

Figure 3: Implementation Timetable					
Activity & Description	Feb 8	Feb 25	March 14	March 26	March 28
Sun and DATA teams meet for kick off and predeployment design work	*				
Bono announces his wish at TED 2005; deployment begins		*			
Testing of system integrated with the UNITE code begins			*		
End-to-end testing by hundreds of Sun employees				*	
System successfully deployed for first concert					*

Source: IDC, 2005; based on Sun documents

With little time for planning and no precise knowledge of what real-time requirements to expect from the flow of activity at the concert, the team began to construct an architecture that would be flexible enough to react to any challenges that would arise.

In order to field the project very quickly, the team built the solution using Sun Fire v20z and Sun Fire v40z servers running Solaris 10. The Java Enterprise System’s Web Services Infrastructure Suite, a quick start to Web services, provided out-of-the-box integration. Sun architects also relied heavily on the reuse of existing software patterns that are proven solutions to common problems within a certain context. Sun’s pattern-reuse approach provided both a common

vocabulary and confidence in the design and architectural quality of the rapidly delivered solution.

The core architecture had to be flexible enough to accommodate changes in the user experience that continued throughout the concert tour. The team had to architect for flexibility — allowing concert production management the flexibility to try different scenarios around the visual display and user experience. Because customer requirements were evolving in real time, Sun had to architect a system that was both reliable and flexible.

RESULTS

Working with partners for aggregation, integration, visualization, and campaign management, Sun provided a Web infrastructure solution designed to handle up to tens of thousands of fan registrations within a matter of minutes.

Using open industry standards and specifications, coupled with the Java platform, Sun's architects leveraged proven software patterns, which are preconfigured technology solutions, to quickly construct an integrated solution using Sun's core Java Enterprise System (JES) infrastructure technology as the key to providing the rapid response times and data integrity that are critical to the ONE Campaign's success.

The system that Sun built handled many tens of thousands of text messages in the first weeks of the concert tour, and by June of 2005, enrollment in the ONE Campaign had already surged to more than 800,000 people. More are expected to join in coming months as the tour continues in Europe and returns to the United States.



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