

VeriSign

Security arrives for Web applications

Highlights

Company

Verisign, Inc.

Business Challenge

Develop an industrial strength, secure website for 24 x 7 operation using for the marketing of security products.

Solutions

Build a scalable and flexible architecture based on Sun hardware and Solaris O/S.

Hardware/Software

2- Ultra Enterprise 4000
70 + additional Sun Servers including UltraSPARC and SPARCstations workstations.

Key Business Results

- Stability
- Security
- Flexibility
- Scalability
- Extensibility

Overview

VeriSign's digital IDs provide secure, authenticated, electronic commerce transactions for tens of millions of users. VeriSign has built its Web-based business on a foundation of Sun servers to ensure unfailing reliability and a path for rapid growth into the future.

Introduction

Since the days of tribal tattoos and clan tartans, humans have relied on "proofs of identity" as a way to organize society and establish orderly commerce. In the twentieth century, tattoos gave way to picture IDs and the magnetic stripe of credit cards. Today, the growing popularity of electronic commerce has rendered these traditional ways of trust-building obsolete. There has become a pressing need for new ways to verify one's "tartan colors". Founded in April, 1995 as a spin-off from RSA Data Security, VeriSign has built a rapidly expanding business by providing Digital IDsSM to individuals and companies needing secure communication over the Internet. VeriSign's Digital IDs are a modern-day "coat of arms" and provide a trusted means of authenticating the identity of each party in an electronic exchange—be it credit card purchase, e-mail message, or on-line software distribution.

Today, VeriSign sports an industrial-strength ID issuing system that has issued over a million IDs to date. To help develop its business-critical system architecture, VeriSign created a strategic alliance with Sun Microsystems. Together, engineering teams from both companies have mapped out a solid strategy for security, scalability and availability.

By combining its security expertise with scalable transaction processing and subscriber management systems, VeriSign has successfully grown its ID business by over 100% each year. VeriSign's customers include individuals, banks, brokers, credit card issuers, and Internet content providers, to name a few. It has also created an affiliate in Japan and a multitude of partnerships with industry leaders such as Netscape, Microsoft, Visa, and Oracle, all of which now embed the company's Digital ID technology into their own software products.



How Verisign Digital IDs Work

The Digital IDs are a binary file containing user identification data, the user's public key, the name of the issuer (VeriSign), and are protected via a public/private key encryption developed by RSA Data Security. In this type of encryption, the public key is made available to anyone who wants to correspond with the owner of the key pair. The private key is seen by no one but the user, and is password protected. The public key can be used to verify a message signed with the private key or to encrypt messages that can only be decrypted using the corresponding private key. Hence the security of an encrypted message relies on the security of the private key, which must be protected against unauthorized use.

“We need an architecture that is reliable today and tomorrow, one that will allow us to grow our business without stopping our business. Sun’s grow-as-you-go, risk-free scalability combined with the top-rate performance and ease of deployment made it the ideal choice for us.”

—GEORGE PARSONS
HEAD OF TECHNICAL
SUPPORT,
VERISIGN

The Digital ID serves as an authentication tool which acts as a set of electronic credentials for both consumers and businesses. This facilitates the process of electronic commerce and on-line dialog, without risk of exposing critical information to intruders, by making sure users know who they're communicating with privately.

VeriSign issues and manages three classes of IDs with escalating levels of identity. Class 1 IDs, which verify email addresses, are typically used for Web-browsing, personal e-mail, and Internet transactions such as subscription-based Internet news services and on-line directories. Class 2 IDs, which provide a higher lever of assurance, are typically used for corporate email and higher-security access applications. Finally, Class 3 IDs for consumers, require a personal presence, and are used for securities trading, home purchases and other large financial transactions. VeriSign also offers a Class 3 Secure Server IDSM product line for businesses that authenticates web sites and provides customers with a private and secure channel. Some of these products include a Global Server ID for internationalization communication, an EDI Server ID for business partner trading, and an OFX Server ID for home banking and other financial transactions.

The Web Site is the Message

In 1995, when VeriSign first opened its electronic doors to the world, it hoped that its customer base would grow quickly. VeriSign knew its choice of a computing platform was critical to the success of its operations and that it could not afford the usual growth hiccups of insufficient capacity, downed systems, or costly upgrades. VeriSign had to create an internal infrastructure that would instill customers with the confidence necessary to do business electronically, support customers in 24 x 7 mode, while building extra capacity to handle future needs.

Since all business is done on-line, VeriSign knew that it would never be able to take its internal computing environment “down” for major maintenance or repairs. “We cannot upgrade, we can only add,” explains George Parsons, director of systems engineering at VeriSign. “Therefore, we needed a system that could scale up and meet the demands of our growing customer base,” he says. “And we needed a robust, flexible, fault-tolerant platform that would allow us to be there, 24 hours a day, 7 days a week, without a glitch.”

VeriSign relies on Sun Ultra Enterprise servers to run internal applications, as well as its high-performance commercial operation, which handles sales and 95% of after-sale support. In each of its operational centers in the US, Japan, and Europe, VeriSign maintains a highly fault-tolerant computing configuration, secured communications and disaster-recovery capabilities. “Our robust architecture, which includes both internal LANs and an electronic commerce Web site, allows VeriSign to securely service tens of millions of

users per year,” says Diane Keith, director of customer service. “Our entire business is based on the accessibility and reliability of our Web-resident storefront,” she says. “We rely on Sun as our sales connection to the world.”

A High Performance, Mission Critical Web Presence

VeriSign’s commercial Web site doubles as an information center and an on-line storefront. Visitors find information about everything from trends in encryption technology to articles about e-mail fraud. A detailed product overview provides technical information about how Digital IDs work, their cost, and offers answers to a host of frequently asked questions. Other areas of interest at the VeriSign site include company background, investor information, business partners, and a detailed practices statement: a kind of electronic commerce “rules of the game” which explains what Digital IDs can and cannot do and the legal issues surrounding their usage.

Once potential customers are satisfied with their understanding of the market and the product, they sign up for a Digital ID by entering the Digital ID CenterSM. This step is required only once a year. The center is open 24 hours a day, seven days a week, and handles all sales and after-sale support for VeriSign, including all transaction processing, from taking new ID orders, to processing requests, authenticating IDs, and responding to customer questions.

Customers can complete the ID sign-up process on-line. They can enroll (request an ID), pick up an ID that’s been issued, terminate an existing ID, search the ID database or check on the validity of someone else’s ID from their desktop. To enroll, customers fill out a smart form, a CGI wizard which includes some intelligence such as automatic authentication of the details provided by the customer. (In Class 3 cases, a follow up in-person interview and/or further confirmation is required.) Once a positive authentication is made, the ID Center issues a new ID (a binary code with a new pair of keys) which the customer can use to enter into electronic commerce transactions. By leveraging its powerful Sun platform, VeriSign has managed to cut the turnaround time on new IDs to 15 seconds for Class 1 IDs, and 30 seconds for Class 2 IDs.

All post-sale support is handled via e-mail to the on-line customer help desk. VeriSign strives for a 24-hour turnaround on e-mail questions. Only 1% of help requests come by telephone, and those are usually related to the higher level Class 3 certificates. Class 1 certificates are handled 99.5% of the time through the Web.

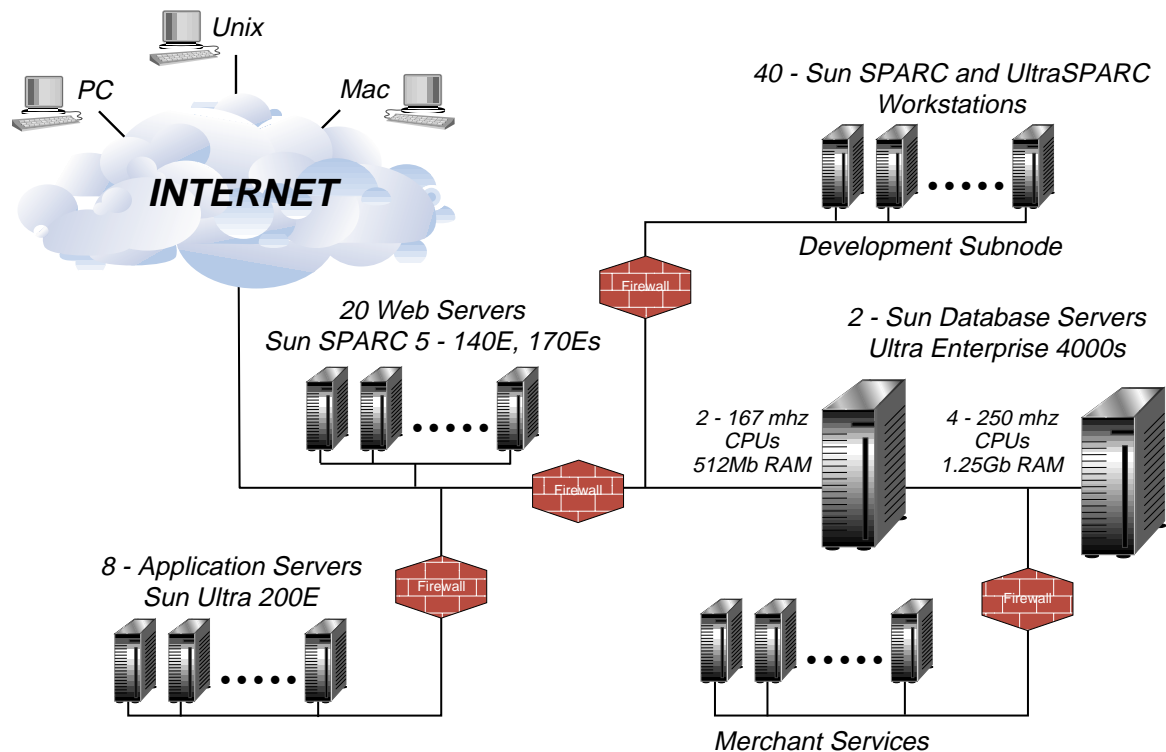
“Our entire business is based on the accessibility and reliability of our Web-resident storefront. We rely on Sun exclusively as our sales connection to the world.”

—DIANE KEITH
DIRECTOR OF
OPERATIONS,
VERISIGN

Development

When VeriSign first commenced operations, its mostly informational Web site was up in a matter of weeks. It took another nine months before 40 VeriSign engineers constructed an industrial strength electronic storefront capable of handling thousands of customer queries per day.

Developers wrote the back-end ID processing and generation application using C++, SPARCWorks, and a variety of Sun UltraSPARC workstations and Sun SPARCstations running Solaris 2.5.1. To develop the front-end Web site interface, developers used HTML, CGI and Java Script.



Verisign - Digital ID Transaction Services*

**This diagram represents the use of Sun throughout the Verisign Web Infrastructure. For security reasons, actual location of components has been rendered nominally.*

Deployment

VeriSign's Digital ID Center went live in April, 1995 and has been operating fault free ever since. By leveraging a robust network of Sun computers, including approximately 30 servers such as Sun Ultra 1s, Ultra 2s and Enterprise 4000 series, the company has been able to catapult its business from start-up to industry leadership within a year. "With Sun, we've been able to use everything from workstations to high-end servers because the architecture is entirely scalable and very easily deployed," says George Parsons, director of systems engineering.

Customers access the high-performance Web site via their Internet browsers. While authentication of IDs is done through the CGI wizard which resides on the Web site, the actual ID issuance and maintenance is handled by a proprietary C++ application called "ID Generator" which resides inside the VeriSign firewall and manages the entire life cycle of each certificate, from request to expiration.

Once a customer fills out the CGI smart form and it has been verified, the Web site delivers the details to the ID Generator. Both the generator and the Web site are hosted by a series of clustered and mirrored Sun servers. The Web site interface and application layers communicate across no less than eight firewalls via SSL and standard HTML code.

All ID related data is then stored on an Oracle relational database, which acts as a cryptographic library of IDs at the core of VeriSign's operations, and runs on two Ultra Enterprise 4000s. In addition, VeriSign relies on a variety of Sun Ultra 170s to run internal business applications.

The Future: Becoming the Standard

VeriSign's plan is to become the de facto standard for Digital IDs in the electronic commerce marketplace. The company has already moved aggressively toward achieving its goal by partnering with top-notch players such as Microsoft and Netscape, which help market its technology as a core part of their products.

To ensure a flexible architecture that would be expandable enough to accommodate new customers in new markets, VeriSign has decided to rely on Sun for its enterprise-wide computing environment. "We have needs and issues with respect to flexibility, reliability and scalability," says Parsons, "which have led to the company's choice in 1995 to go with Sun all the way."

As VeriSign's business grows, it will continue to offer a wide array of interfaces to meet the demands of new third-party programs that are eager to make use of VeriSign's Digital ID technology. "We need an architecture that is reliable today and tomorrow, one that will allow us to grow our business without stopping our business," explains Parsons. "Sun's grow-as-you-go, risk-free scalability, combined with the top-rate performance and ease of deployment, made it the ideal choice for us."

HEADQUARTERS

SUN MICROSYSTEMS COMPUTER COMPANY, 901 SAN ANTONIO ROAD, PALO ALTO, CA 94303-4900 USA
PHONE: 415 960-1300 FAX: 415 969-9131 INTERNET: www.sun.com



THE NETWORK IS THE COMPUTER™

SALES OFFICES

• ARGENTINA: +54-1-311-0700 • AUSTRALIA: +61-2-9844-5000 • AUSTRIA: +43-1-60563-0 • BELGIUM: +32-2-716-7911 • BRAZIL: +55-11-5181-8988 • CANADA: +905-477-6745 • CHILE: +56-2-638-6364
• COLUMBIA: +571-622-1717 • COMMONWEALTH OF INDEPENDENT STATES: +7-502-935-8411 • CZECH/SLOVAK REPUBLICS: +42-2-205-102-33 • DENMARK: +45-44-89-49-89 • ESTONIA:
+372-6-308-900 • FINLAND: +358-9-525-561 • FRANCE: +33-01-30-67-50-00 • GERMANY: +49-89-46008-0 • GREECE: +30-1-680-6676 • HONG KONG: +852-2802-4188 • HUNGARY: +36-1-202-4415 •
ICELAND: +354-563-3010 • INDIA: +91-80-559-9595 • IRELAND: +353-1-8055-666 • ISRAEL: +972-9-956-9250 • ITALY: +39-39-60551 • JAPAN: +81-3-5717-5000 • KOREA: +822-3469-0114 • LATIN
AMERICA/CARRIBEAN: +1-415-688-9464 • LATVIA: +371-755-11-33 • LITHUANIA: +370-729-8468 • LUXEMBOURG: +352-491-1331 • MALAYSIA: +603-264-9988 • MEXICO: +52-5-258-6100 •
NETHERLANDS: +31-33-450-1234 • NEW ZEALAND: +64-4-499-2344 • NORWAY: +47-2218-5800 • PEOPLE'S REPUBLIC OF CHINA - BEIJING: +86-10-6849-2828; CHENGDU: +86-28-678-0121;
GUANGZHOU: +86-20-8777-9913; SHANGHAI: +86-21-6247-4068 • POLAND: +48-22-658-4535 • PORTUGAL: +351-1-412-7710 • RUSSIA: +7-502-935-8411 • SINGAPORE: +65-224-3388 • SOUTH AFRICA:
+2711-805-4305 • SPAIN: +34-1-596-9900 • SWEDEN: +46-8-623-90-00 • SWITZERLAND: +41-1-825-7111 • TAIWAN: +886-2-514-0567 • THAILAND: +662-636-1555 • TURKEY: +90-212-236-3300 • UNITED
ARAB EMIRATES: +971-4-366-333 • UNITED KINGDOM: +44-1-276-20444 • UNITED STATES: +1-800-821-4643 • VENEZUELA: +58-2-286-1044 • WORLDWIDE HEADQUARTERS: +1-415-960-1300