VeriSign®

INTELLIGENT INFRASTRUCTURE OVERVIEW

VeriSign Intelligent Infrastructure:
An Overview

Where it all comes together.™

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VeriSign Intelligent Infrastructure:
An Overview

+ Introduction

We are living in an era defined by unprecedented access to information. People all over the world are accessing the Internet and corporate intranets via multiple desktop PCs, laptops, handheld computers, and cell phones. Organizations are exchanging critical information via increasingly sophisticated collaborative systems, and consumers are demanding immediate access to richer and richer content, including applications, games, music, videos, and images.

To serve this growing demand, enterprises, operators, publishing companies, and other organizations are relying on intelligent infrastructure services such as cross-platform mobile-content delivery platforms, multiple-credential authentication solutions, and real-time publishing tools, to mitigate the complexities of delivering digital services while garnering the greatest possible returns. Intelligent infrastructure services can enable important transactions, establish connections, protect data, and safely distribute critical information across myriad protocols and devices. In large part, the world's most critical digital interactions rely on intelligent infrastructure services provided by VeriSign.

VeriSign operates intelligent infrastructure services that enable and protect billions of interactions every day across the world's voice and data networks. With a strong heritage in operating Internet infrastructure, providing industry-proven security services, and delivering a full spectrum of communications solutions, VeriSign operates intelligent infrastructure services that can provide the necessary interoperability, scalability, and security to meet today's unprecedented demand for information. In addition, VeriSign services are delivered by specialized teams of experts. VeriSign intelligent infrastructure services are supported by the following core components:

+ Global Registries
+ Extensive, Reliable Networks
+ Continuously Operated Data Centers

In this paper, we provide an overview of our intelligent infrastructure capabilities, describing how these components operate in tandem to support individual VeriSign intelligent infrastructure services. Because VeriSign is a rapidly growing company that is continuously expanding its services and infrastructure, what follows is not a comprehensive list; for the latest information, please visit www.verisign.com or consult a VeriSign representative directly.

In addition, VeriSign is continuously developing its services to enable new forms of digital transactions and address a rapidly changing technological landscape. We invite the reader to imagine new ways in which the components of our intelligent infrastructure can be integrated, and new uses for our intelligent infrastructure services.

Figure 1: VeriSign Intelligent Infrastructure

+ Registries

One of the central functions of an intelligent infrastructure service is to store information in a secure format that is readily accessible across myriad networks and provide a certifiable record of all contents. Registries perform this critical function, and VeriSign operates global registries that are fundamental to the everyday operation of the Internet and key telecommunications services.

VeriSign operates the following registries:

+ Global Domain Name Registry
Stores Internet Protocol (IP) addresses and domain names, facilitating service to every address (Web, email, File Transfer Protocol [FTP], etc.) in some of the most critical top-level domains (TLDs), such as *.com, .net, .edu, and .tv.*

+ The VeriSign® Network Routing Directory
Acts as a master repository of subscriber and network information, providing the network intelligence for secure interconnection and service delivery among users of different technologies.

+ The VeriSign® Object Naming Service (ONS)
Stores critical information that allows authorized individuals to track products across the global supply chain using Radio Frequency Identification (RFID) tags and Electronic Product Codes (EPCs).

+ Weblogs.com Ping Server
Automatically notifies subscribers when new content is posted to a Web site, Web log, or podcast.

+ CI-Metabase
Provides access to breaking news and business information from Web sites, Web logs, and broadcast video and audio feeds.

VeriSign's Global Domain Name Registry

Every day, billions of individuals around the world will visit a Web site ending in *.com, .net,* or several other popular top-level domains, and every day, billions of individuals will send and receive email using these suffixes. Behind the scenes, a globally distributed network of hundreds of thousands of Domain Name System (DNS) servers translate domain names, such as verisign.com, into the appropriate numerical IP address of the server which houses the domain name. This function is critical to the daily functioning of the Internet; without it, users would be forced to memorize long strings of numbers rather than meaningful domain names. If a DNS server lacks information on a registered domain name, the server asks another server which might, in turn, consult one of the world's 13 authoritative DNS root servers for the requested information. VeriSign operates two of these authoritative DNS root servers and is responsible for authoritative DNS service to the *.com* and *.net* top-level domains, as well as a variety of other domains, including *.edu* and *.tv.*

VeriSign's global DNS registry has exhibited industry-proven scalability, performance, and availability, much of which can be attributed to the VeriSign® Advanced Transaction Lookup and Signaling℠ (ATLAS®) platform. From 1995 to 2000, VeriSign had been using Berkeley Internet Name Domain (BIND) software for running directory services for the *.com* and *.net* top-level Internet domains, but in 2000, it became clear that Internet usage was increasing astronomically (even as the number of "dot com" businesses fell precipitously), and that BIND would not be sufficiently scalable. VeriSign initially designed ATLAS® as an improvement to BIND; though VeriSign now processes as many as 18 billion DNS queries a day, ATLAS® is capable of supporting many times that amount without diminished performance or availability. However, ATLAS® supports many other systems in addition to the DNS. The ATLAS® platform can be applied to any of VeriSign's technologies that require very fast, reliable, and scalable lookups, including a variety of telecommunications services. The ATLAS® platform is compatible with myriad protocols, so it is instrumental in facilitating interoperability between them.

KEY CAPABILITIES

Supported by VeriSign's Global Domain Name Registry, VeriSign performs 18 billion DNS queries in a single day. And VeriSign has been performing this service for over eight years (as of 2006) with 100% accuracy and availability. VeriSign's Domain Name Registry has easily scaled to accommodate huge spikes in Internet usage and can easily handle dramatically increased usage.

In addition to VeriSign's global DNS registry, VeriSign has developed two additional registries based on ATLAS®:

+ **The VeriSign® Network Routing Directory**
  Acts as a master repository of subscriber and network information, providing the network intelligence for secure interconnection and service delivery among users of different technologies.

+ **Object Naming Service (ONS)**
  Stores critical information that allows authorized individuals to track products across the global supply chain using Radio Frequency Identification (RFID) tags and Electronic Product Codes (EPCs).

VERISIGN® SUPPLY CHAIN SERVICE CONSULTANTS: ADDING VALUE TO VERISIGN'S SUPPLY CHAIN OFFERINGS

All of VeriSign's supply chain services are supported by professionals highly trained in supply chain processes and technologies. VeriSign® Supply Chain Service Consultants are highly experienced in many industries, including consumer goods, retail, pharmaceuticals, and electronics, and have helped a growing number of companies to better leverage data to improve operational supply chain efficiencies, sales, and marketing processes. For many companies these consultants have aided in designing and deploying advanced tracking systems within high-speed packaging environments.

VeriSign Supply Chain Service Consultants cover all phases of a company's supply chain optimization project. They begin by helping companies to deploy sensory technologies, such as radio frequency identification (RFID), which creates a critical foundation of data, and they help each company to integrate this data into internal processes and systems. To extend the benefits of this data, they help companies share the data with partners and assist in analyzing the data across trading partner networks and product categories.

The VeriSign Network Routing Directory

When voice calls are made over the Internet, they often take place within isolated networks or must default to the Public Switched Telephone Network (PSTN) for termination to other networks. To realize the value of end-to-end IP communications, Voice-over-Internet Protocol (VoIP) networks must have a method to discover if there is an IP address and routing information associated with a telephone number. The VeriSign Network Routing Directory stores the critical subscription and routing information for VoIP calls and IP services and makes it available to myriad other networks via a secure, trusted registry that serves as a central directory. Such a directory provides efficient and cost-effective network routing. But in addition to directory services, the VeriSign Network Routing Directory also facilitates interoperability, security, and application delivery. For example, the VeriSign Network Routing Directory maps telephone numbers to email addresses to enable the secure delivery of mobile messages between operators, enterprises, and portals.

KEY CAPABILITIES

The VeriSign Network Routing Directory provides a flexible and scalable platform that supports a highly distributed environment for Session Initiation Protocol (SIP) and ENUM (electronic number) based service discovery and delivery. This capability provides a foundation for a suite of intelligent infrastructure services that provide interoperability across multiple VoIP networks, related Internet Protocol (IP) services, and bridges to cellular networks.

The VeriSign Object Naming Service (ONS)

Radio frequency identification (RFID) technology is increasingly being used for tracking products across global supply chains. Unlike barcodes, RFID tags can be read without line-of-sight scanning so that tracking a product's movement can be done at a much more granular level. RFID tags that transmit Electronic Product Codes (EPCs) enable authorized individuals to look up information about a given product from across distributed supply chains via the emerging EPCglobal Network™. However, the EPCglobal Network™ needed a central registry for storing the IP addresses of all servers entrusted with EPC information, just as the Internet required the DNS. For this reason, EPCglobal selected VeriSign to run the Object Naming Service (ONS), the authoritative directory of EPC servers.

KEY CAPABILITIES

VeriSign's ONS is similar to VeriSign's Global DNS Registry, in that it is designed for maximum scalability and performance, and when pallet- and object-level RFID comes into widespread usage, and manufacturers and distributors begin to leverage Internet-enabled systems for delivering product information on a global scale, creating, in effect, an "Internet of Things," VeriSign's ONS will leverage a similarly interconnected network of servers, but on a scale that has the potential to dwarf the current Internet.

In addition to the ATLAS®-based registries, VeriSign operates additional registries, including:

+ **Weblogs.com Ping Server**
  Automatically notifies subscribers when new content is posted to a Web site, Web log, or podcast.

+ **CI-Metabase**
  Provides access to breaking news and business information from Web sites, Web logs, and broadcast video and audio feeds.

Weblogs.com Ping Server

On October 3, 2005, VeriSign acquired the assets and infrastructure of Weblogs.com, including the Weblogs.com Ping Server, which maintains a voluminous list of Web sites and Weblogs and sends out a notification (or "ping") whenever new content is added.

KEY CAPABILITIES

The Weblogs.com Ping Server processes two million such pings a day and supports thousands of daily RSS feeds from bloggers and professional publishers, providing VeriSign with a highly scalable system that offers extensive visibility across the Web.

CI-Metabase

On October 4, 2005, VeriSign acquired Moreover Technologies, a wholesale aggregator of links to real-time content for Web sites, search engines, and enterprises. Locating information from across 180 countries in 56 languages, the Moreover team uses an advanced content tagging system with more than 45 metadata tags and 380 categories to provide access to hundreds of thousands of unduplicated real-time content articles every day. This process allows VeriSign clients to perform sophisticated analyses of the content.

KEY CAPABILITIES

The Moreover infrastructure aggregates more than 25,000 news sources and millions of blogs, providing VeriSign with a highly scalable content-distribution system and comprehensive visibility into news content.

VeriSign Global Registries and Databases

REGISTRY / DATABASE	INTELLIGENT INFRASTRUCTURE SERVICES SUPPORTED
The Global Domain Name Registry	**Global DNS service for *.com*, *.net*,** and a variety of other top-level domains, allowing people all over the world to visit Web sites and send email using domain names.
The VeriSign Network Routing Directory	**VeriSign® PBX IP Connect,** facilitating interoperability between disparate PBX systems. **VeriSign® Carrier Connect,** facilitating private peering, which allows carriers to extend VoIP services beyond the borders of their own network.
The VeriSign Object Naming System (ONS)	**VeriSign® Intelligent Supply Chain Services,** providing manufacturers and distributors with real-time retail data that is relevant to their particular business needs.
The Weblogs.com Ping Server	**The Weblogs.com Ping Server** is offered directly as an intelligent infrastructure service, providing notification when a Weblog has been updated.
The CI-Metabase	**VeriSign® Connected Intelligence Services,** providing access to real-time news and product information.

+ Networks

In addition to storing information in central registries, it is equally critical to be able to transfer information quickly, reliably, and securely across myriad protocols to a variety of devices. VeriSign intelligent infrastructure services are supported by key networks that carry much of the world's data traffic.

VeriSign operates the following networks:

+ Signaling System 7 (SS7) Network
A digital network that enhances the service offerings of a wide variety of companies, including Public Switched Telephone Network (PSTN) carriers, cable operators, Internet service providers (ISPs), wireless providers, and advanced intelligent network/wireless intelligent network database (AIN/WIN DB) service providers.

+ VeriSign® GPRS Roaming Exchange (GRX)
Enables mobile data roaming between GSM networks.

+ VeriSign® CDMA Roaming Exchange (CRX)
Enables mobile data roaming between CDMA networks.

ROAMING EXPERTISE

Customers can also leverage VeriSign® Global Roaming Professional Services, which help operators to offer wireless roaming services by assisting with the process of building and maintaining roaming agreements, assisting with billing and settlement, and performing the tests necessary to deploy voice and data roaming and other third-generation (3G) services. Such assistance allows new entrants to compete with established operators, and maintain large-footprint roaming networks. VeriSign Global Roaming Professional Services experts have extensive industry contacts to help support the acquisition, launch, and management of roaming agreements.

The VeriSign SS7 Network

In the 1980s, SS7 networks were introduced as a method for providing a layer of signaling intelligence on top of the existing telephone network, mitigating the complexity of rapidly proliferating phone lines and enabling a much more efficient use of the existing infrastructure. In addition, SS7 has enabled a variety of telecommunications services, including Caller ID, voicemail, call blocking, prepaid calling cards, and multi-party conferencing. More recently, SS7 has also been providing the signaling capability to allow mobile phones to move between cells and providers, so that people can fly to a different city and immediately begin making calls, receiving voicemail, and even downloading email, videos, games, and other types of rich content. VeriSign operates the largest independent SS7 network in the world, with 4,300 links and 14 Signaling Transfer Point (STP) pairs (See below for more information about VeriSign STPs).

The VeriSign SS7 Network also comprises a comprehensive variety of specialized databases and Signal Control Points (SCPs) for facilitating numerous services such as the retrieval of 800 numbers, Calling Name data, or ported telephone number information. For example, the VeriSign® Intelligent Message Processor (IMP) serves as a roaming gateway for VeriSign customers, providing them with access to roaming on international networks.

KEY CAPABILITIES

VeriSign's SS7 Network offers reliable and extensive connectivity with the system of networks that makes up the Public Switched Telephone Network (PSTN), allowing VeriSign to support carriers with a wide range of flexible, highly available services.

VeriSign GPRS and CDMA Roaming Exchanges

The VeriSign® GPRS Roaming Exchange (GRX) is a high-capacity, private (secure) data network that interconnects mobile carriers worldwide, allowing data roaming between GPRS networks. This network employs state of the art IP transport plus physical transport over terrestrial fiber, as well as submarine and satellite systems where needed. Similarly, the VeriSign® CDMA Roaming Exchange (CRX) supports data roaming between CDMA networks.

KEY CAPABILITIES

VeriSign GRX and CRX Roaming Exchanges employ full redundancy to provide maximum availability and performance and support a wide variety of data types, enhancing VeriSign's ability to facilitate the delivery of data services to mobile phones.

VeriSign Networks

NETWORKS	INTELLIGENT INFRASTRUCTURE SERVICES SUPPORTED
The VeriSign SS7 Network	The VeriSign SS7 Network supports the intelligent infrastructure services offered by VeriSign's Communications division, including a variety of connectivity and interoperability services for wireless, wireline, and cable operators.
The VeriSign GRX Network	The VeriSign GRX Network is offered to carriers and other service providers directly as an intelligent infrastructure service, facilitating data roaming across GPRS networks.
The VeriSign CRX Network	The VeriSign CRX Network is offered to carriers and other service providers directly as an intelligent infrastructure service, facilitating data roaming across CDMA networks.

+ Data Centers

It is impossible to effectively manage global registries and networks, or the services they enable, without the support of dedicated data centers that provide stringent physical security, robust backup capabilities, high visibility, and constant availability. VeriSign maintains state-of-the art data centers across the globe to deliver the world's most capable services.

VeriSign maintains the following data centers:

+ The VeriSign Global Network Operations Center (GNOC)
Designed for monitoring the global DNS and housing critical systems.

+ VeriSign Security Operations Centers (SOCs)
The global nerve centers from which our security experts manage and monitor customer networks.

+ VeriSign Local Operations Centers
Additional Data Centers for housing critical Internet and telecommunications systems, such as storing and protecting critical data for VeriSign® Managed Security Services (MSS) customers.

+ VeriSign Point-of-Sale Data Centers
Designed to draw data from retailers for distribution to supply-chain customers.

+ VeriSign Signaling Transfer Points (STPs)
Route SS7 messages.

+ The VeriSign Network Surveillance Control Center
Designed to monitor, secure, and optimize SS7 network traffic.

EXPERT SPECIALISTS ENHANCE THE VERISIGN SECURITY INFRASTRUCTURE

Customer devices are managed and monitored by highly trained and credentialed security experts, and most hold multiple certifications In all, VeriSign's Security Operations staff boasts more than 100 separate certifications.

The iDefense Advantage

The iDefense research team at VeriSign provides comprehensive, actionable intelligence on network-based security threats and vulnerabilities for financial services firms, government agencies, retailers, and other large organizations. VeriSign® iDefense® researchers work in tandem with the VeriSign SOC to provide sophisticated insight into emerging threats.

The iDefense researchers at VeriSign are made up of specialized teams that work in concert to provide a clear picture of cyber threats. The Vulnerability Aggregation Team (VAT) continuously monitors more than 10,000 applications, devices, and operating systems and immediately notifies customers of vulnerabilities and emerging exploits that target these assets. VeriSign also does original vulnerability research through iDefense Labs and the Vulnerability Contributor Program (VCP), a worldwide network of hundreds of independent security researchers across more than 30 countries. This original vulnerability research provides advance warning for potential threats by identifying vulnerabilities an average of 91 days in advance of public disclosure.

In addition, the Malicious Code Operations Team and the Threat Intelligence Team gather intelligence on malicious code, cyber terrorism, incidents, and malicious actors, as well as cyber-crime incidents that impact security on a global basis. Finally, the Rapid Response Team provides the first line of defense for organizations that need to respond instantaneously to threats. The Rapid Response Team calls upon resources from all the other teams to quickly identify a threat in process and provide mitigation strategies to customers.

The VeriSign Global Network Operations Center (GNOC)

Like all of VeriSign's data centers, the VeriSign GNOC is built to stringent, U.S. Department-of-Defense-level standards to maintain uptime with high levels of performance. The GNOC is fully replicated in multiple locations, for recovery from physical damage. The primary function of the GNOC is to monitor global traffic across the DNS, but the GNOC also supports a variety of intelligent infrastructure services, including:

+ **Certificate Authority (CA) functions**
  for managing the security credentials of digital certificates, including the certificate revocation list (CRL) of invalid certificates
+ **VeriSign® PrePay IN**
  a wireless prepaid billing service for carriers
+ **VeriSign® speedSUITE**
  a postpaid billing and customer relationship management (CRM) application for carriers
+ **The VeriSign® Shared Registry System (SRS)**
  through which multiple registrars can simultaneously access VeriSign's DNS services and offer names to their customers.
+ **VeriSign's VoIP Services**
  including VeriSign® Carrier IP Connect and VeriSign® PBX IP Connect

VeriSign Security Operations Centers (SOCs)

VeriSign Security Operations Centers (SOCs) are the nerve centers for VeriSign® Managed Security Services (MSS). Inside the SOCs, security experts monitor security events across thousands of customer devices worldwide. Security events are correlated across individual customers and across the entire customer base. Security analysts utilize a variety of specialized tools to analyze data and provide timely and actionable data to our customers.

At the edge of VeriSign's distributed TeraGuard™ architecture, the Security Defense Appliance (SDA), managed and supported by VeriSign, is stationed on a client's network and is connected to a SOC over a single IPSec (Secure Internet Protocol) tunnel. The SDA has visibility into a wide range of devices on the client's network, including firewalls, IDS/IDP systems, host agents, network devices, applications, and operating systems, and translates all information into a single consolidated device-independent data model before correlating the data with other activity on the network, determining a priority level for each security event, and passing along high-priority events, in close to real time, to the VeriSign SOC for further action. Because the system uses a single connection to the VeriSign SOC, it requires only one pathway into the client's firewall, for maximum security; however, a fully redundant out-of-band dial-up modem is on hand should the IPsec connection experience a disruption.

VeriSign Local Operations Centers

VeriSign also runs a series of local operations centers which adhere to the same security standards as the other data centers. For example, in addition to operating the authoritative DNS servers that power all services to the *.com* and *.net* top-level domains *(See "Global Domain Name Registry" previous page)*, VeriSign also runs a large number of name servers on behalf of corporations and other organizations that manage their own DNS, supported by VeriSign's local operations centers *(See VeriSign® DNS Assurance below)*. VeriSign operates a robust IP network connecting over a hundred DNS servers, distributed over 13 data centers dispersed widely across the globe, with access to multiple Internet service providers (ISPs) for maximum query response time. Each name server is backed up on thousands of redundant systems that are continuously monitored and supported and are capable of coming online in seconds in the event of a distributed denial-of-service (DDoS) attack, mechanical failure, or other unforeseen circumstance. In addition, VeriSign maintains a data center specifically designed for storing and protecting critical data for VeriSign® Managed Security Services (MSS) customers (MSS customers are also supported by SOCs, above).

VeriSign Point-of-Sale Data Centers

VeriSign operates specialized data centers that draw point-of-sale data from key retailers, streamlining, cleansing, and formatting the data for distribution to customers on an as-needed basis. Through this extensive validation process, the data becomes more immediately actionable to key players in the retail supply chain. The information can be updated daily, which allows companies to drive operational process improvements. VeriSign's retail data centers accept data from many sources for smooth integration into a wide variety of enterprise applications, and the system provides flexible security by creating authorization profiles for each user.

VeriSign Signaling Transfer Points (STPs)

Signaling Transfer Points (STPs) are the "brains" that route SS7 signals between a carrier's central office and special databases that provide services such as 800 numbers and Caller ID. Many carriers operate their own STPs, while others turn to a provider such as VeriSign for such infrastructure. VeriSign has 14 STP pairs in support of its SS7 network, the largest independent SS7 network in the world.

VeriSign STPs support the same intelligent infrastructure services supported by VeriSign's SS7 network, including a wide variety of connectivity and interoperability services for wireless, wireline, and cable providers.

The VeriSign® Network Surveillance Control Center

From the VeriSign® Network Surveillance Control Center, VeriSign continually monitors the entire SS7 network, taking appropriate measures to ensure maximum performance, efficiency, and reliability for all signaling traffic. The NSCC is supported by robust tools for advanced monitoring and troubleshooting analysis, comprehensive fault-management, and enhanced IP support.

The VeriSign Network Surveillance Control Center supports the same intelligent infrastructure services supported by VeriSign's SS7 network, including a wide variety of connectivity and interoperability services for wireless, wireline, and cable operators.

KEY CAPABILITIES OF VERISIGN DATA CENTERS

With regard to managing data, each of VeriSign's data centers offers industry proven scalability, reliability, availability, security, and visibility, and provides a strong foundation for facilitating interoperability across myriad devices and adaptability in response to future technological changes.

VeriSign Data Centers

DATA CENTER	INTELLIGENT INFRASTRUCTURE SERVICES SUPPORTED
The VeriSign Global Network Operations Center (GNOC)	**Certificate Authority (CA) functions** for managing the security credentials of digital certificates, including the certificate revocation list (CRL) of invalid certificates **VeriSign® PrePay IN** a wireless prepaid billing service for carriers **VeriSign® speedSUITE** a postpaid billing and customer relationship management (CRM) application for carriers **The VeriSign® Shared Registry System (SRS)** through which multiple registrars can simultaneously access VeriSign's DNS services and offer names to their customers **VeriSign's VoIP Services** including VeriSign® Carrier IP Connect and VeriSign® PBX IP Connect

VeriSign Data Centers *(continued)*

DATA CENTER	INTELLIGENT INFRASTRUCTURE SERVICES SUPPORTED
VeriSign Security Operations Centers (SOCs)	**VeriSign® Managed Security Services, including** **+ VeriSign® Firewall Management Service,** providing expert rule and configuration management to maintain device health, maximize uptime, and manage changes **+ VeriSign® Intrusion Detection Management Services,** providing proactive identification and isolation of real security attacks via event correlation, data normalization, and analysis **+ VeriSign® Intrusion Prevention Management Services,** providing proactive prevention of security attacks via expert device configuration, management, and monitoring of industry-leading IPS platforms **+ VeriSign® Log Monitoring Service,** providing reliable log monitoring, reporting, analysis, storage, and event correlation with detailed query functionality via a secure portal **+ VeriSign® Vulnerability Management Services,** providing a broad suite of services to help customers identify and track remediation of network, device, and application vulnerabilities **+ VeriSign® Security Risk Profiling Service,** providing a comprehensive, quantifiable view of companies' risk exposure and policy compliance, including change modeling and attack simulation **+ VeriSign® Phishing Response Service,** providing around-the-clock response to phishing attacks with faster remediation by security experts and forensic analysts
Local VeriSign Operations Centers	**VeriSign® DNS Assurance and VeriSign® DNS Assurance Pro,** providing organizations with hosted DNS infrastructure for faster, more reliable access to Web and email services **VeriSign® Managed Security Services (MSS),** a comprehensive suite of services that include 24/7 management and monitoring by security experts, as well as real-time security intelligence **VeriSign® Unified Authentication,** a single, integrated platform for provisioning and managing all types of two-factor authentication credentials **VeriSign® Digital Brand Management Services (DBMS),** services for managing, monitoring, and building digital brand equity **The Secure Sockets Layer (SSL) Key Ceremony,** VeriSign's process for validating public key infrastructure (PKI) security system **VeriSign® SS7 Connectivity** (See "The VeriSign SS7 Network" above)

VeriSign Data Centers *(continued)*

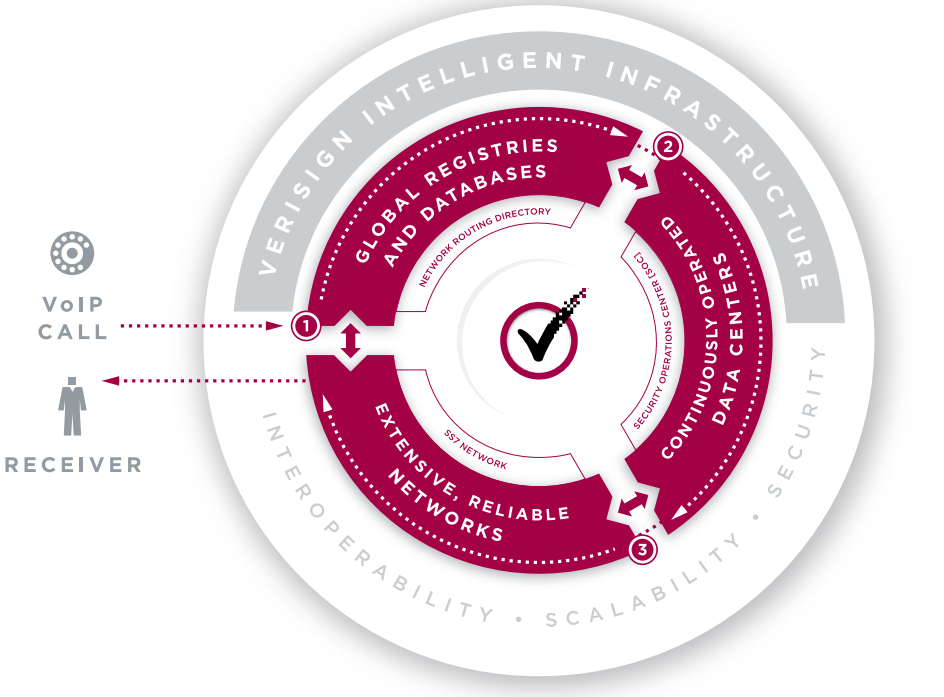
DATA CENTER	INTELLIGENT INFRASTRUCTURE SERVICES SUPPORTED
VeriSign Point-of-Sale Data Centers	**VeriSign Retail Data Services,** enabling customers to gain comprehensive visibility into retail data
VeriSign Signaling Transfer Points (STPs)	**VeriSign STPs** support the same intelligent infrastructure services supported by the VeriSign SS7 network, including a wide variety of connectivity and interoperability services for wireless, wireline, and cable providers
The VeriSign Network Surveillance Control Center	**The VeriSign Network Surveillance Control Center** supports the same intelligent infrastructure services supported by the VeriSign SS7 network, including a wide variety of connectivity and interoperability services for wireless, wireline, and cable operators

+ Use Case: Voice-over-Internet-Protocol (VoIP)

As we have seen, the core components of VeriSign's intelligent infrastructure (global registries; extensive, reliable networks; and continuously operated data centers) often connect to other core components to form the basis of an intelligent infrastructure service. Here is a brief description of how VeriSign's VoIP services are made possible by infrastructural components across all three categories.

Consider the example of an enterprise VoIP call reaching a cell phone in a different network (See Figure 2). In order for a VoIP call to reach outside an enterprise network, both parties need to quickly access a registry containing the phone number and related information for each caller. This is provided by the VeriSign Network Routing Directory (1), a global registry that also handles interoperability issues that may arise if the two parties are using different VoIP protocols (such as SIP and H.323). Strong security technology, including real-time encryption, is also needed to help prevent data from being apprehended in transit, and, since VoIP networks are susceptible to the same attacks that threaten all IP-based services, managed security services may be deployed via a specialized data center (2) called the VeriSign Security Operations Center (SOC), to manage risks. Finally, in order for the call to reach a cell phone, the call needs to pass through an SS7 network (3), and, ideally, it is an SS7 network that has extensive reach and one that is carefully monitored and analyzed for optimal traffic flow.

Figure 2: A VoIP Call Traverses the VeriSign Infrastructure



+ Conclusion

There are numerous infrastructure providers with expertise in Internet routing, security, and telecommunications, but VeriSign has proven experience that spans all three industries, each with its own technologies and protocols. In addition, VeriSign subjects its services to regular, thorough audits to maintain compliance with regulations such as the Sarbanes-Oxley Act of 2002 (SOX) and the Health Insurance Portability and Accountability Act of 1996 (HIPAA), as well as rigorous internal service testing. VeriSign intelligent infrastructure services provide unmatched scalability, interoperability, adaptability, availability, security, and visibility, allowing current and next-generation organizations to smoothly bridge protocols and technologies to enable virtually any form of digital transaction and protect virtually all forms of data from vandalism or theft.

Visit us at www.VeriSign.com/intelligence for more information on intelligent infrastructure services.

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