ICANN announces second First testbed registrars Public Interest Registry (PIR) Domain name business.com Name server developed at database with comprehensive name listings of Top Level Domains Number of hosts exceeds 1,000 introduced; Number of hosts servers in Whois database think.com, css.gov, mitre.org rutgers.edu, bbn.com, mit.edu, berkeley.edu, ucla.edu, cmu.edu, purdue.edu, rice.edu, University of Wisconsin, no longer exceeds 100,000 secondary market 1997: 1996: 1993: 1992: 1990: 1989: 1987: 1983: TIMELINE chartered (January); Number of in the system were symbolics.com, mit.edu, think.com, css.gov and mitre.org. The + Keeping the DNS Safe and Sound VeriSign is also a leader in DNS research and development. The ATLAS name server serves as VeriSign's platform to answer millions of DNS queries per second and allows changes to quickly resolve DNS errors. DNS error, such as the one in this example, propagates from one DNS server to another in a matter of seconds. The ATLAS name server, which has been operational for over a decade, has achieved a 100% uptime record and resolved DNS queries with 100% accuracy. The ATLAS name server is part of the DNS constellation that serves .com and .net. VeriSign developed its own proprietary name server called + Learn More • The Purpose VeriSign runs the Object Naming Service (ONS), the root directory of electronic every DNS query with 100% accuracy. VeriSign's DNS constellation has achieved a 100% uptime record and resolved DNS queries with 100% accuracy. Every DNS query is resolved through a process called resolution, which is the mechanism by which a domain name is translated into an IP address. In a few tenths of a second and is transparent to the end user. VeriSign runs the Object Naming Service (ONS), the root directory of electronic every DNS query with 100% accuracy. VeriSign's DNS constellation has achieved a 100% uptime record and resolved DNS queries with 100% accuracy. Every DNS query is resolved through a process called resolution, which is the mechanism by which a domain name is translated into an IP address. In a few tenths of a second and is transparent to the end user. VeriSign runs the Object Naming Service (ONS), the root directory of electronic every DNS query with 100% accuracy. VeriSign's DNS constellation has achieved a 100% uptime record and resolved DNS queries with 100% accuracy. Every DNS query is resolved through a process called resolution, which is the mechanism by which a domain name is translated into an IP address. In a few tenths of a second and is transparent to the end user. VeriSign runs the Object Naming Service (ONS), the root directory of electronic every DNS query with 100% accuracy. VeriSign's DNS constellation has achieved a 100% uptime record and resolved DNS queries with 100% accuracy. Every DNS query is resolved through a process called resolution, which is the mechanism by which a domain name is translated into an IP address. In a few tenths of a second and is transparent to the end user. VeriSign runs the Object Naming Service (ONS), the root directory of electronic
The DNS allows people to use names, instead of IP addresses, to access Internet services. This primer provides an overview of how the Domain Name System works and why it is so important for the continued operation of the Internet.

And yet, for too many people, the DNS belongs in the confusing realm of the technical. It is a common misconception that the DNS has nothing to do with everyday life. This is far from true. The DNS supports these domain names, is the engine that makes the Internet simple and accessible for users around the world. The DNS is not just important to the smooth running of the Internet but it also plays a very important part in everyday life. Visits to Web sites, email, online banking, and instant messaging are just a few examples of applications that rely on the Internet or Internet technology, and the DNS is a fundamental part of the technology that makes the Internet possible.

There are over 270 top-level domain names of varying types: • Generic TLDs (gTLDs) include .com, .net, and .org. These TLDs are the most popular and are used for commercial and non-commercial purposes. • Sponsored TLDs include .edu, .gov, .mil, .aero, .coop, .museum, .name, and .pro. These TLDs are sponsored by non-profit organizations or industries and are used for specific purposes. • Internationalized Domain Names (IDNs) have evolved from their early development in various test beds into viable domain names that resolve just like full ASCII domain names. The Internet Engineering Task Force (IETF) published global standards for IDNs to assure their proper functioning within the DNS in 2003. The IDN Standards standardized the way that non-ASCII names that use language characters. The local language domain name is followed by a TLD like .com or .net. Since 2000, the Internet community has been trying to make it easier for people to use IDNs to register domain names for end users - there are currently over 850 registrars, located all over the world, who register .com and .net domain names. Upon receiving a user's requested domain name, the registrar first verifies that the domain name is available by contacting the registry database to determine if the requested domain name is currently in use. If the requested domain name is available, the registrar registers the domain name with the registry, which adds the domain name to its database. Then, no one else can register that domain name during the term of the registration.

The Domain Name System

The Domain Name System (DNS) is the Internet’s network naming service. The DNS is responsible for translating Internet addresses known in the form of domain names into Internet addresses known in the form of IP addresses. This is necessary for Internet services to function, as there are numerous Internet users, each requiring a unique IP address to connect to the Internet. The DNS is a distributed database maintained by a set of domain name servers, which work together to provide a global service.

How Resolution Works

A user wanting to register a domain name contacts a registrar. (Registrars are companies that allow users to register domain names.) After the user submits a domain name request to the registrar, the registrar checks to see if the domain name is available for registration. If the domain name is available, the registrar contacts a registry to determine if the requested domain name is currently in use. If the requested domain name is available, the registrar registers the domain name with the registry and the registrar is notified that the domain name is available. The registrar then registers the domain name with the registry, which adds the domain name to its database. Then, no one else can register that domain name during the term of the registration. If the requested domain name is not available, the registrar notifies the user that the domain name is not available and offers the user alternative domain names.

How Registration Works

A user wanting to register a domain name contacts a registrar. (Registrars are companies that allow users to register domain names.) After the user submits a domain name request to the registrar, the registrar checks to see if the domain name is available for registration. If the domain name is available, the registrar contacts a registry to determine if the requested domain name is currently in use. If the requested domain name is available, the registrar registers the domain name with the registry and the registrar is notified that the domain name is available. The registrar then registers the domain name with the registry, which adds the domain name to its database. Then, no one else can register that domain name during the term of the registration. If the requested domain name is not available, the registrar notifies the user that the domain name is not available and offers the user alternative domain names.

Who Operates the DNS?

The DNS is a global system operated by a collective of Internet service providers. The Internet Corporation for Assigned Names and Numbers (ICANN) is responsible for managing the DNS and ensuring its stability and security. ICANN is a non-profit organization that was created to oversee the allocation and management of domain names and IP addresses. ICANN is responsible for maintaining a global directory of domain names and IP addresses, which is called the Domain Name System (DNS). The DNS is a distributed database maintained by a set of domain name servers, which work together to provide a global service.

What is a Top-Level Domain (TLD)?

A Top Level Domain (TLD) is a domain name extension that comes after the dot (e.g., .com, .net, .org). TLDs are a fundamental part of the domain name system and are used to identify the type of organization or entity associated with the domain name. The DNS is a distributed database maintained by a set of domain name servers, which work together to provide a global service. The DNS is a distributed database maintained by a set of domain name servers, which work together to provide a global service. The DNS is a distributed database maintained by a set of domain name servers, which work together to provide a global service.
The Domain Name System

The Domain Name System (DNS) is a hierarchical and distributed naming system for the Internet that translates domain names into Internet Protocol (IP) addresses. It is the backbone upon which the Internet depends. Without DNS, users would have to remember IP addresses to access websites and other Internet services. DNS simplifies the process by allowing users and applications to use domain names to locate Internet resources.

How Resolution Works

When a user enters a domain name into a Web browser, a behind-the-scenes process called resolution begins. The browser first contacts its local DNS server, which checks its cache for the IP address of the requested domain. If the IP address is not found in the cache, the local DNS server sends a request to a higher-level DNS server, called a name server. This process continues until the highest-level DNS server, called the root DNS server, is reached. The root DNS server then directs the request to the appropriate DNS server for the domain.

The DNS server then performs a reverse lookup to find the IP address associated with the domain name. This process involves querying other DNS servers along the path to the domain name until the IP address is found. Once the IP address is determined, the DNS server returns the address to the requesting browser, which can then access the requested website or service.

Through this process, the DNS system allows users to access the Internet using a simple and intuitive naming system, rather than having to remember thousands of IP addresses. This makes the Internet more accessible and user-friendly, allowing for the continued growth and evolution of the online world.

The Domain Name System (DNS) is a crucial component of the Internet infrastructure, enabling users and applications to interact seamlessly with the vast network of connected devices. Its importance cannot be overstated, as it is essential for the proper functioning of the Internet and the services it supports.
The Domain Name System

The Domain Name System (DNS) is the system that translates domain names into IP addresses. It provides the key infrastructure for Internet applications like credit card processing, bank transactions, and telephony. Without DNS, the Internet wouldn't work.

The DNS is the low-level protocol that enables communications over the Internet: without DNS, the Internet doesn't work. These activities, which would not be possible if the DNS was not functioning, include everything from setting up a Web site to sending and receiving email to building an online store.

To understand how the Domain Name System works, it's important to understand a little about how people make telephone calls.

In a telephone call, the person making the call dials a set of random numbers, for example 123.45.67.254, to reach a Web site or other destination. The person on the receiving end must type a set of random numbers to respond to a call, for example 123.45.67.254, but the series of random numbers or numbers and letters can be difficult to remember. The DNS allows people to use names, instead of numbers, to reach destinations.

The Domain Name System

The Domain Name System maps domain names to IP addresses. Domain names are easy to remember but hard to type because they are too long. IP addresses are hard to remember because they are too short. Domain names, such as verisign.com, are translated into IP addresses for the Internet to work. The Domain Name System is also used to store information about domain names such as IP addresses, nameservers, and additional data.

The DNS is a distributed system. There are many name servers across the Internet that perform this function. To ensure the system is robust, the DNS is distributed in a way that makes it difficult for a single point of failure to bring down the entire system.

The DNS was created in 1983 by Paul Mockapetris at Berkeley and the University of California. It was originally created as a way to make it easy to remember domain names such as example.com. The DNS was designed to be simple and efficient. It was not designed to have the complexity or functionality of modern systems.

How Resolution Works

When a user enters a domain name into a Web browser, a behind-the-scenes process occurs. The Web browser sends a request to a domain name service (DNS) to translate the domain name into an IP address. The request is sent to a DNS server that has been configured to handle the domain name.

The DNS server looks up the domain name in its local database. If the domain name is not in the database, the DNS server sends a request to another DNS server that has been configured to handle the domain name. This process continues until the domain name is resolved.

Once the domain name is resolved, the DNS server sends the IP address back to the user. The user's Web browser uses the IP address to access the Web site associated with the domain name.

The DNS server also stores information about the domain name, such as the IP address and nameservers. This information is used to resolve future requests for the domain name.

For more information on how the Domain Name System works, please contact VeriSign.
As the leading global domain name registry, VeriSign closely monitors the state of the domain name market through a variety of analytical and statistical research. This brief provides a primer on the Domain Name System (DNS), domain names and the key players in the industry.
### Domain Name System (DNS)

The Domain Name System (DNS) is a hierarchical and decentralized naming system for the Internet. It provides a way to map domain names to their corresponding IP addresses. DNS is based on a structure of servers, each of which stores a portion of the DNS database. When a user enters a domain name into their browser or email client, the system looks up the requested domain name in the DNS database. If the local name server doesn't have the information, it will query a root name server, which will in turn query a TLD (top-level domain) name server. This process continues until the domain name is resolved to an IP address.

### History of DNS

- **1984:** The Domain Name System was introduced by the US Defense Advanced Research Projects Agency (DARPA) in 1984. Some of the earliest domain names included rutgers.edu, bbn.com, mit.edu, berkeley.edu, ucla.edu, cmu.edu, purdue.edu, rice.edu, and symbolics.com.
- **1985:** The Internet owes its roots to an ambitious 1973 research program of the U.S. Defense Advanced Research Projects Agency (DARPA) to develop communication protocols to enable networked computers to communicate transparently across multiple networks.
- **1984-1987:** The Domain Name System was developed and implemented during this period. The Domain Name System was essentially a directory service for the Internet. It allowed users to use names instead of IP addresses to access resources on the network.

### Early Testbed Registrars

- **1994:** After the original testbed of four universities (rutgers.edu, bbn.com, mit.edu, and symbolics.com), another 15 universities were added to the InterNIC (the Internet Network Information Center), bringing the total number of hosts to over 1,000.
- **1995:** The first testbed registrars were established, including EDUCAUSE, which took over the database with comprehensive name listings of Top Level Domains.
- **1997:** ISI at USC assumed responsibility for DNS root look-up directory to determine who registered which domain names and the path to other systems.

### VeriSign's Role

VeriSign, a company formed by an agreement between the Internet Corporation for Assigned Names and Numbers (ICANN) and Network Solutions, became the first registered registrar to come online in 1995. The company was established to transition DNS from a government monopoly to a cooperative agreement for domain names registration.

### Verisign's DNS Constellation

- **2008:** VeriSign’s DNS constellation, known as the DNSSEC, is a network of distributed name servers using words instead of numbers to represent an Internet address. The constellation consists of high bandwidth and tight security controls. To meet the exceptional requirements of today's safer Internet, VeriSign's team of DNS experts has designed and deployed a scalable and secure system.

### The Future of DNS

- **2003:** The Internet Corp. for Assigned Names and Numbers (ICANN) was established by the U.S. Department of Commerce to transition DNS from a government monopoly to a cooperative agreement for domain names registration.

### Conclusion

As the leading global domain name registry, VeriSign closely monitors the state of the domain name market through a variety of analytical and statistical research. This brief provides a primer on the Domain Name System (DNS), domain names and the key players in the industry.