

Description of SoftLayer Technologies, Inc.'s Platform Services

Headquartered in Dallas, Texas, SoftLayer provides on-demand cloud infrastructure as a service through its Platform Services system. SoftLayer lets customers create virtual servers, bare metal, or hybrid computing environments, leveraging global data centers and points of presence (PoP).

SoftLayer was acquired by International Business Machines Corporation (IBM) in June 2013. Operations, processes and personnel are in the process of being transferred to IBM but as it relates to the delivery of Platform Services, SoftLayer remains operationally independent with the exception of Human Resource services. Human Resource services have been transferred to IBM, which include the recruiting, onboarding process for U.S. based employees, employee handbook process, and performance evaluations, and off-boarding. SoftLayer retains Human Resource functions for some international (non-U.S.) employees.

SoftLayer provides Platform Services from 29 data centers located in the following cities:

1. **United States of America**
 - Dallas, Texas (7)
 - Houston, Texas (1)
 - Seattle, Washington (1)
 - San Jose, California (2)
 - Washington, DC (3)
2. **Outside of U.S.A.**
 - Amsterdam, Netherlands (2)
 - London, England (1)
 - Singapore (1)
 - Toronto, Canada (1)
 - Hong Kong (1)
 - Melbourne, Australia (1)
 - Montreal, Canada (1)
 - Sydney, Australia (1)
 - Milan, Italy (1)
 - Paris, France (1)
 - Queretaro, Mexico (1)
 - Sao Paulo, Brazil (1)
 - Tokyo, Japan (1)
 - Chennai, India (1)

The Network Operations Center (NOC) is based in Houston, Texas. In case of a failure at the Houston NOC, any other data center can resume operations. Through the NOC, SoftLayer provides 24 hours per day monitoring to support all of the data centers. The NOC utilizes a variety of tools in combination to monitor, mitigate, and resolve potential issues. Each data center also has its own local Data Center Control Room (DCR), which is used to monitor and resolve potential issues locally.

SoftLayer automates its customer interactions via its Customer Portal and most server support activities using an open Application Programming Interface (API). SoftLayer empowers enterprises of any size with control, security, scalability, and ease-of-management. Proprietary offerings include the industry's first "Network-Within-A-Network" topology for true out-of-band access, providing remote access to all management options.

Global Network

SoftLayer's global network offers more than 2,600 gigabits per second of bandwidth (Gbps) of connectivity between data centers and networks. These locations each have multiple 10Gbps transit connections as well as peering links to additional service providers and access networks. 26 geographically diverse PoPs provide seamless, direct, private and high speed access to the backbone network. Every upstream network port is multiple 10 Gbps connections, and every rack is terminated with a minimum of two 10 Gbps connections to the public Internet and two 10 Gbps connections to SoftLayer's private network.

The SoftLayer production network delivers added scalability and control because of its unique topology as a “network of networks”. Public, private, and management traffic travel across separate network interfaces, segregating and securing traffic while streamlining management functions. See *Figure 1* for a diagram of the “Network-Within-A-Network” topology and further discussions below on the different networks: public, private, and management.

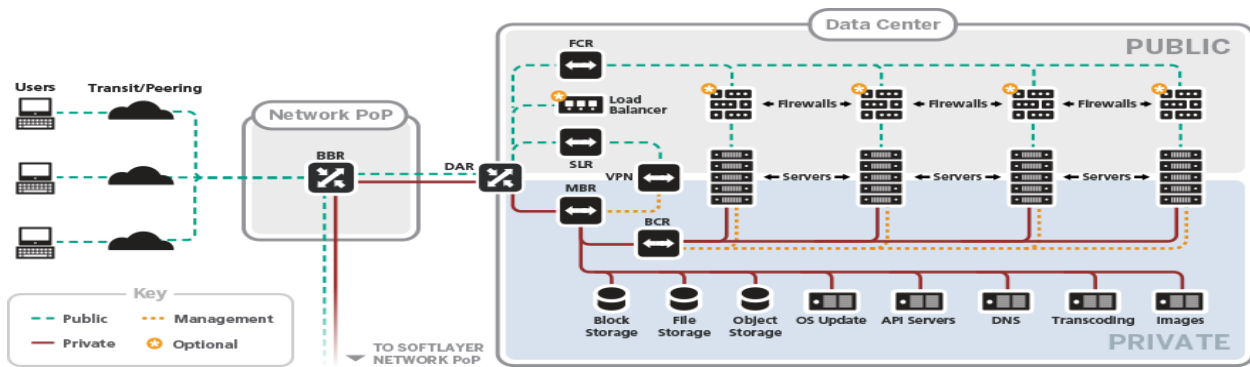


Figure 1: SoftLayer’s “Network-Within-A-Network” Topology

Public Network

Every data center and network PoP has multiple 10 Gbps connections to top-tier transit and peering network carriers. Network traffic from anywhere in the world will connect to the closest network PoP, and it will travel directly across the network to its data center, minimizing the number of network hops and handoffs between providers. Inside the data center, SoftLayer offers up to 10 Gbps to individual servers to meet even the most demanding network-intensive workloads.

Private Network

All SoftLayer data centers and PoPs are connected by SoftLayer’s private network backbone. This private network is separate from the public network, and it provides a seamless connection to customer’s servers (bare metal or virtual) in SoftLayer data centers around the world. Data can be moved between servers through the private network and customers can utilize various services, such as the update and patch servers, software repositories, and backend services without interfering with public network traffic.

Management Network

In addition to the public and private networks, each SoftLayer server is connected to an out-of-band management network. This management network, accessible via VPN, allows access to each server independently of its CPU, and regardless of its firmware and operating system for maintenance and administration purposes. The customer can perform OS reloads, power-cycle the server, or use the Intelligent Platform Management Interface (IPMI) connection to watch the server boot up as though the customer was standing in the data center with a keyboard, monitor, and mouse physically connected.

Network Design for Availability and IMS Impact on Customers’ Environments

Based on the configuration of SoftLayer’s “Network-Within-A-Network”, with 3 network interfaces; if an outage occurs at a data center on the public network, the traffic will be routed and can traverse through the other established networks to provide continued availability of the server, by routing traffic to another data center and then utilizing the other networks to reach the server.

Also, based on SoftLayer’s design of the environment, IMS is connected to the customers’ bare metal and virtual servers; however, any IMS outage that may occur will not have an impact on the customer’s environments. IMS is set up separately from the customers’ environments, such that public and private traffic will still route even if IMS becomes unavailable.

SoftLayer provides native IPv6 support for its publicly available services eliminating the need to tunnel to carry IPv6 over IPv4 networks, which in turn means that the networks are not limited by the diminishing pool of IPv4 addresses.

Technical Support

Technical support requests may be submitted via the SoftLayer Customer Portal, the SoftLayer Mobile Portal for wireless Internet devices, the SoftLayer API, chat, or by telephone. Support issues are triaged as they are received ensuring SoftLayer customers will receive the level of care they require when facing an issue. Customers also have access to a comprehensive selection of online resources for direct troubleshooting and incident response, including:

- Automated Tools—via SoftLayer’s leading portal and API
- KnowledgeLayer®—a database of articles, tutorials, frequently asked questions (FAQs), and tips from certified third-party providers
- SoftLayer Development Network—libraries, guides, and technical resources for developers using the SoftLayer API

Systems management access to the customer environment is performed via two-factor-authenticated “jump-boxes” (remote authentication servers), which have individual Network Interface Cards (NICs), one connected to the corporate environment and one connected to the SoftLayer Platform environment. No direct communication path exists between the SoftLayer Corporate Network and the SoftLayer Platform environment.

