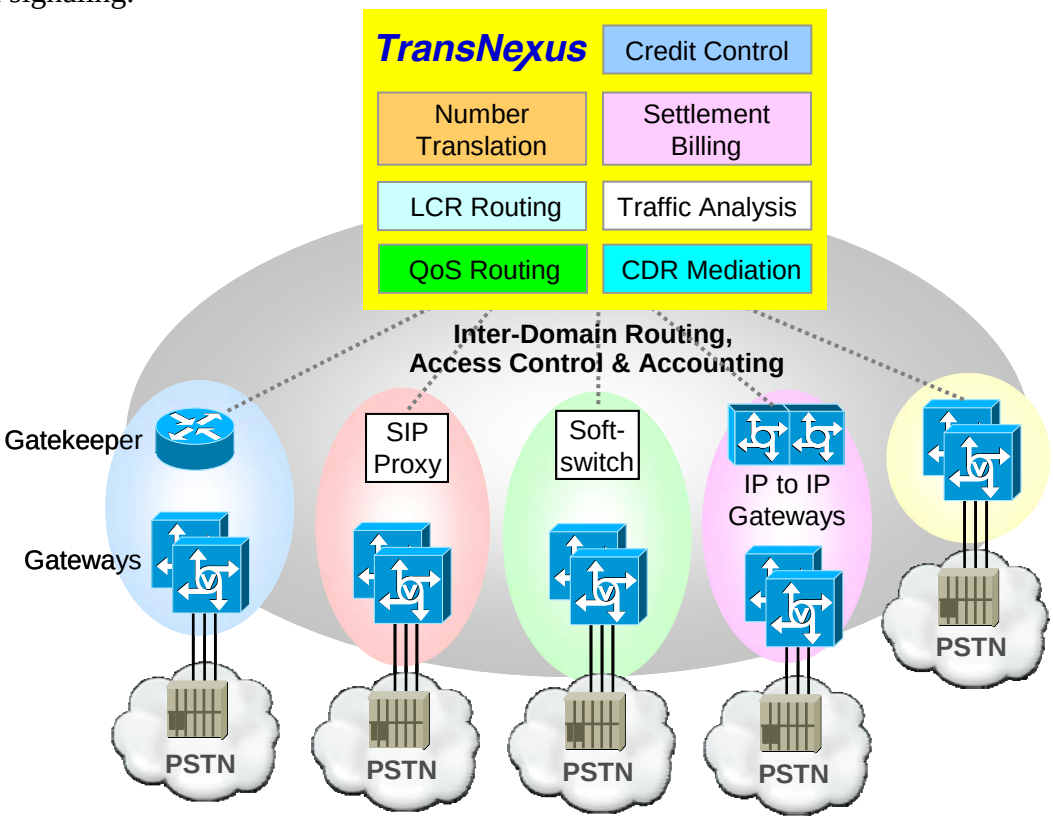
Introduction to *TransNexus* OSS/BSS

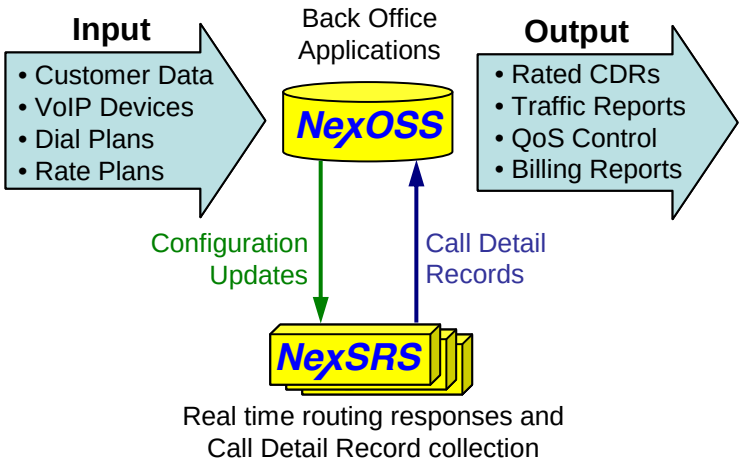
The TransNexus Operations and Billing Support System (OSS/BSS) is a complete software solution for managing interconnect or peering traffic among VoIP networks. The TransNexus OSS/BSS platform is not a softswitch or SIP proxy. It does not perform any H323 or SIP call signaling. Instead, the TransNexus OSS/BSS platform is a suite of applications that complement any VoIP signaling device such as a softswitch, session border controller, SIP proxy, H323 gatekeeper or any other devices which performs VoIP call signaling.



The diagram above illustrates the relationship between the TransNexus OSS/BSS platform and VoIP signaling devices. The TransNexus platform provides routing information and Call Detail Record (CDR) collection for calls between VoIP networks. For example, if a call originates from the blue VoIP network on the left side of the diagram, the Gatekeeper will send a routing query to the TransNexus platform requesting a route and access to an external VoIP network that can complete the call. The TransNexus platform responds with the routing information and the Gatekeeper in the blue network then performs the call signaling directly to the destination network. The VoIP call signaling and media stream are not routed through the TransNexus OSS/BSS platform. At the end of the call, the signaling devices for the call send their Call Detail Records to the TransNexus OSS/BSS platform.

NexSRS and NexOSS Servers

The TransNexus OSS/BSS software platform is actually two separate software platforms that operate together. They are the NexSRS and NexOSS servers as shown below.



NexSRS Server

The NexSRS Server interfaces directly with VoIP signaling devices to provide real time routing information and Call Detail Record (CDR) collection. The NexSRS server uses either the ETSI OSP peering protocol or Cisco's GKTMP protocol to communicate with VoIP signaling devices (i.e. softswitch, SIP proxy, gatekeeper, session border controller). The NexSRS server is a stateless route server and may be distributed throughout the IP network to ensure high availability. The NexSRS server does not require NexOSS and may be used alone to manage VoIP networks. The standard NexSRS server is available for Linux operating systems and a secure version of the NexSRS server which includes a certificate authority and supports SSL/TLS (Secure Sockets Layer/Transport Layer Security) is available for the SUN Solaris operating system (for sparc CPUs).

NexSRS features:

- Routing based on source customer, source IP address, source trunk group, called number prefix, called number, calling number, time of day or day of week
- Rank order routing, percentage based load sharing, combination of rank order routing and load sharing
- Call blocking by customer, IP device, called number or calling number
- Partial call blocking from 0% to 100% by destination device
- Number translation based on source customer, source IP address, source trunk group, destination IP address, destination trunk group, calling number, called number, time of day or day of week
- Source IP address authentication
- ENUM client
- Clandestine CALEA routing and call auditing
- Call Detail Record collection
- Certificate server, digitally signed peering tokens (Solaris version only)

NexOSS

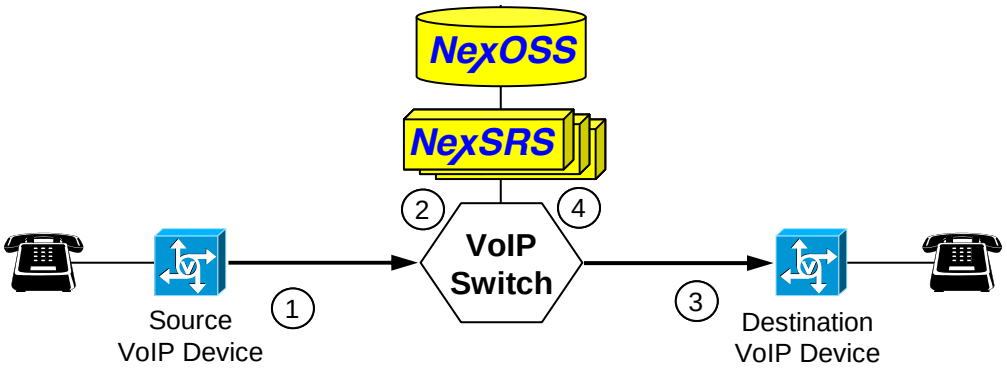
NexOSS is a suite of back office applications for managing VoIP networks with NexSRS Servers. NexOSS provides a centralized platform for managing a distributed network of multiple NexSRS servers. NexOSS requires a database and TransNexus recommends Oracle Standard Edition One (retail price $745 USD). NexOSS uses standard SQL commands for database interaction and may be compatible with other database programs. However, TransNexus only offers technical support for operation with an Oracle database. NexOSS is a suite of Java based applications and has been tested on Linux, Windows and Solaris operating systems.

NexOSS features:

- Route Provisioning to NexSRS servers
- Least cost routing and profit optimization algorithm
- Automated conversion of LATA and OCN rate plans to NPA-NXX-X dial plans
- Number Translation Provisioning NexSRS servers
- Call Detail Record file collection from NexSRS servers
- Call Detail Record Mediation
- Reformatting and export of CDRs to external systems
- Traffic Analysis Reports
- Quality of Server Controls with real time feedback to NexSRS servers.
- CDR rating
- Credit Controls with real time feedback to NexSRS servers when a customer's credit balance impacts their status to originate VoIP calls.
- Billing for wholesale settlement and Billing Reports

NexSRS as a Route Server

The TransNexus OSS/BSS solution may be configured as a route server and CDR collection server for a single VoIP network. In this type of deployment, the TransNexus OSS/BSS solution provides the intelligence and scale for routing features that cannot be provided by a VoIP signaling device. For example, since many VoIP signaling devices cannot support a large least cost routing table, this function is off-loaded to the TransNexus OSS/BSS platform. An example call scenario for this type of deployment is described below. A single VoIP Switch is shown in the diagram, but in reality multiple VoIP signaling platforms of different types could be served in parallel by the TransNexus solution.

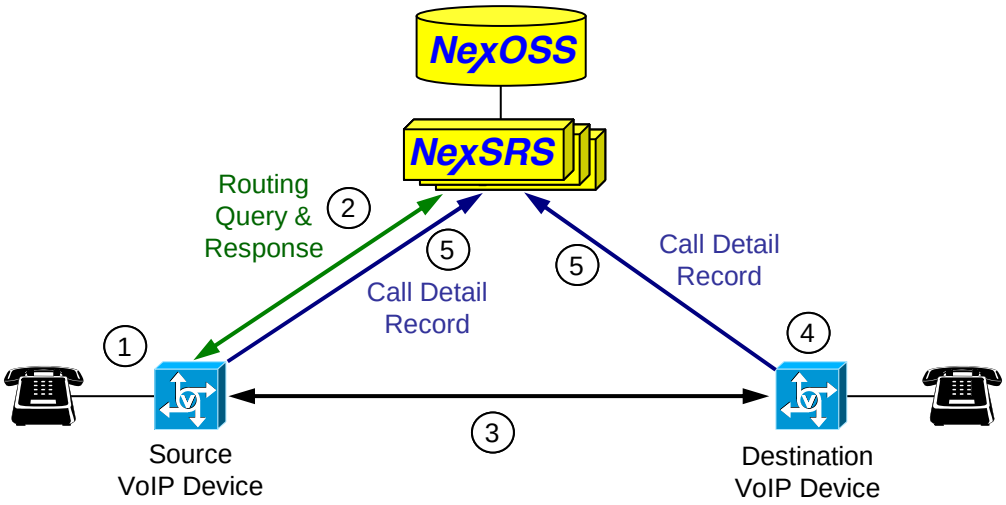


The following is a description of the call scenario in the previous diagram.

1. A call originates from the Source VoIP Device and it routed to the VoIP Switch.
2. The VoIP Switch sends a routing query to the NexSRS server. The NexSRS performs a route lookup and returns a list of IP addresses of devices which can complete the call to the called number. The NexSRS can translate the calling or called number as needed.
3. The call is routed from the VoIP Switch to the Destination VoIP Device which completes the call.
4. At the end of the call, the VoIP Switch sends a call detail record to the NexSRS server.

NexSRS as a Peering Server

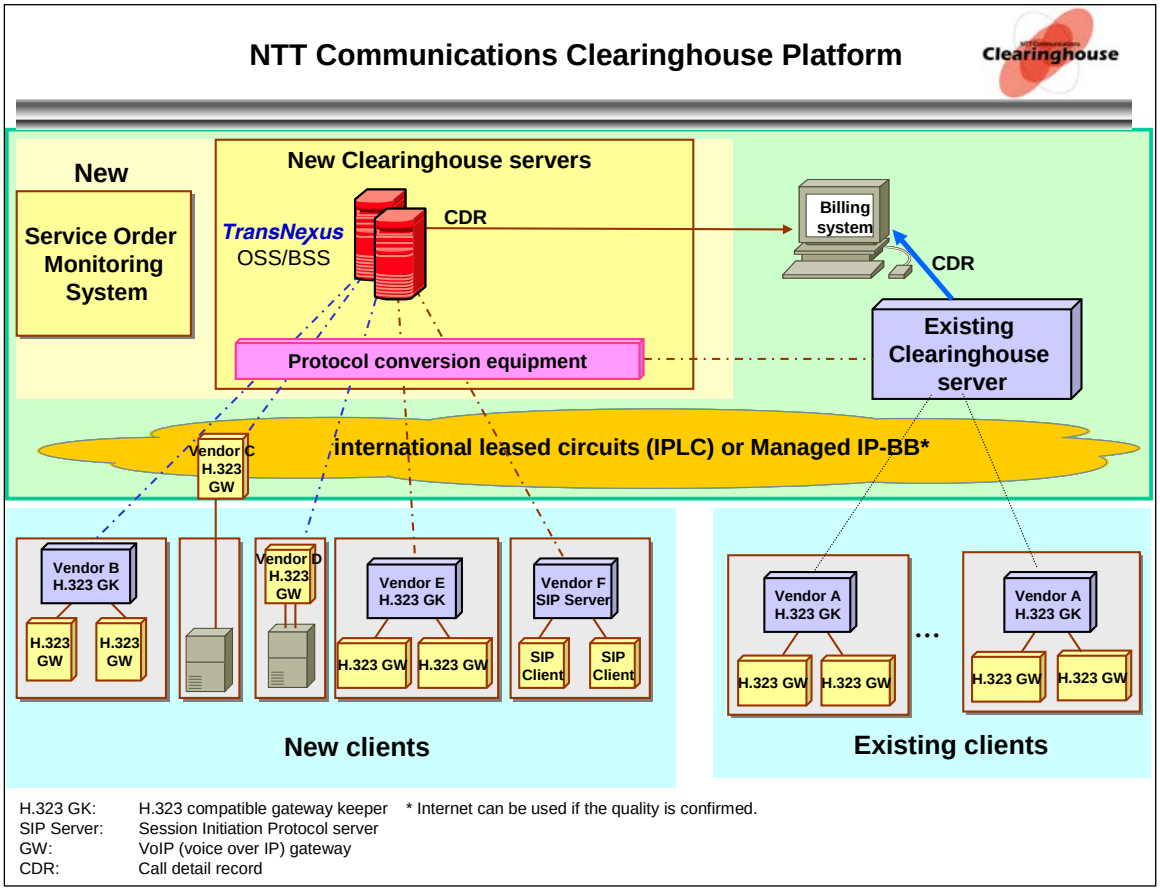
The NexSRS server may also be used as a secure peering server for authorizing and accounting for direct peer to peer communications between anonymous VoIP networks. For direct peering, each VoIP peer must enroll with the NexSRS certificate authority to obtain the NexSRS server's public key. Also, the NexSRS server digitally signs the certificate request from each VoIP device. This feature requires the certificate authority and security features available only on the Solaris version of the NexSRS server. The call scenario in the diagram below illustrates the NexSRS server being used as a peering server.



1. A VoIP call originates from the Source VoIP Device.
2. The Source VoIP Device sends a route query to the NexSRS server which returns a list of IP addresses of devices which can terminate the call. Included with each address is a digitally signed peering token authorizing the call.
3. The Source VoIP Device sends a SIP Invite or Q.931 call setup message directly to the destination peer. The peering token is included in the SIP Invite or Q.931 call setup message.
4. The Destination VoIP Device validates the peering token with the NexSRS server's public key. If the token is valid, the Destination VoIP Device accepts the call.
5. When the call is finished, both the source and destination devices send call detail records to the NexSRS server.

Case Study

NTT Worldwide Telecommunications Corporation (NTTWT), a wholly owned subsidiary of NTT Communications Corporation (NTT Com) launched a multiprotocol/ multi-vendor compatible VoIP service for interconnection among carriers and Internet Telephony Service Providers (ITSPs) that use different VoIP protocols and equipment. NTT-WT selected the TransNexus OSS/BSS solution as their next generation platform for managing the NTT VoIP clearinghouse and its value-added applications. NTT recognized the Open Settlement Protocol (OSP), supported by the TransNexus solution, as the first open standard for the exchange of VoIP traffic among service providers that would provide a guide to future network development and deployment.



NTT "Public Domain" Network Infrastructure

TransNexus, Inc
555 14th Street, NW
Atlanta, GA 30327
USA
1.404.526.6060
info@TransNexus.com
www.TransNexus.com