Data Sheet

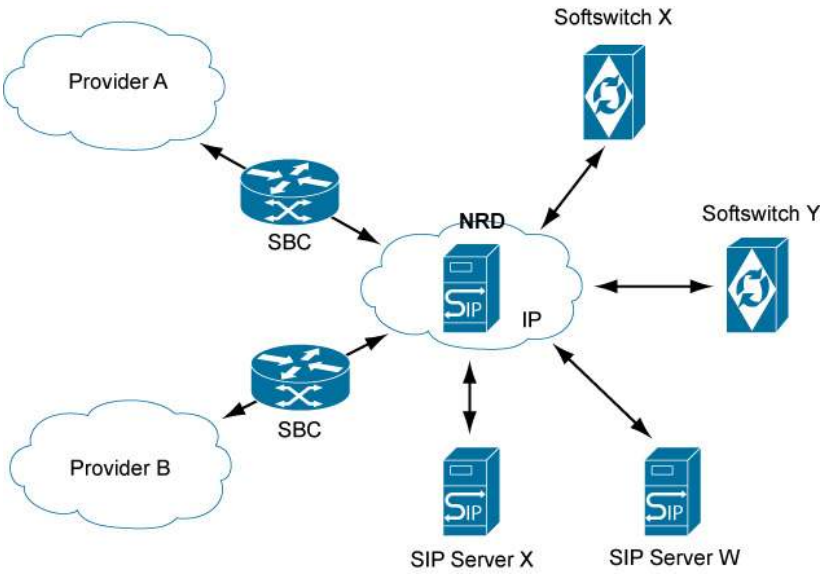
Cisco Network Route Director

The Cisco® Network Route Director (NRD) is a high-performance SIP Route Proxy for inter-carrier, inter-CMS, and on-net or off-net routing.

PRODUCT OVERVIEW

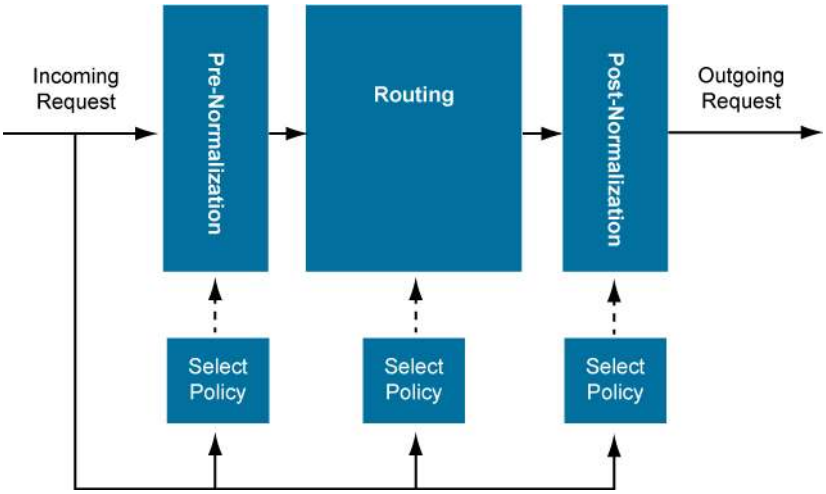
The Cisco Network Route Director (NRD) is a high-performance Session Initiation Protocol (SIP) Route Proxy for inter-carrier, inter-call management server (CMS), and on-net or off-net routing. It is typically a centralized function in the communications network. It can be deployed in multiple points of presence (POPs) and is usually deployed as a cluster of servers for scalability and high availability. Route requests can be received from any SIP server in the network. The Cisco NRD forwards SIP requests to other SIP-based applications or networks or routes the request to other SIP-based applications or networks. Typical SIP interactions include those with public-switched-telephone-network (PSTN) gateways, other SIP networks and session border controllers (SBCs) that manage connectivity to a peer provider, or to a local Media Gateway Controller Function (MGCF) such as the Cisco PGW 2200 Softswitch. The Cisco NRD is intended to support IP Multimedia Subsystem (IMS) as the Cisco implementation of the Interrogating Call Session Control Function (I-CSCF) and Breakout Gateway Control Function (BGCF).

Figure 1. Bringing Voice to IP Interconnect



Each request received by the Cisco NRD is evaluated against configurable trigger conditions (Figure 1). The NRD routing logic for each request is determined by whether or not each sequential trigger condition is met. If a trigger condition is met, then configured logic is executed. This trigger framework provides great routing flexibility. For instance, all requests coming in from a certain network interface can be routed to another interface. In another example, values of the Route header field can determine the routing behavior. The primary functions of Cisco NRD are normalization, routing, and header field masking.

Figure 2. Cisco NRD Processing Model



Normalization

Normalization is the process by which the Cisco NRD corrects for incompatibilities in number formats and structures between different networks (Figure 2). When the NRD receives a request, it normalizes based on where the request came from (incoming normalization). The request is then acted upon by the routing logic of the NRD. When routing has concluded, the NRD normalizes the number format based on where the request is going to (outgoing normalization).

Routing

When determining where to send a message, the Cisco NRD can be configured to use any or all of the following:

- Redirect server—A SIP server that contains information necessary to route requests
- E.164 Number Mapping (ENUM) server—A server that resolves fully qualified telephone numbers to fully qualified domain name addresses
- Domain Name System (DNS) server—A server that translates domain names to IP addresses
- Internal, preconfigured route tables

Header Field Masking

The Cisco NRD can be configured to inspect outgoing SIP traffic and remove header fields that may carry information that reveals internal network configurations. In the case of Via header fields, the header information is stripped as the request leaves the network, and returned to the corresponding response entering the network. Via header field masking does not affect protocol operation and is transparent to SIP user agents.

KEY FEATURES AND BENEFITS

The Cisco NRD is a powerful SIP route proxy that enables efficient and reliable routing of SIP signaling in a multimedia communications network. Cisco NRD features and benefits include the following:

- Multiple configurable and hierarchical routing policies
- Multiple configurable normalization policies
- Trigger-based selection of policies
  - Source IP and port

    - Destination IP and port
    - Network name
    - Route header field value
    - Request Uniform Resource Identifier (URI) domain name
- Multiple independent routing and normalization plans on a single instance of Cisco NRD
- Multistep routing policies consisting of any number of configured route steps
- ENUM-based routing (RFC 3761)
    - Multiple ENUM roots
    - Sequential searches across roots
- Prefix-based routing based on:
    - Calling and called party numbers
    - Carrier codes
    - Location Routing Numbers (LRNs)
- Domain-based routing and RFC 3263 processing
- Multilayer route advance with configurable triggering codes
- Number normalization
    - Telephone and SIP conversions
    - Domain conversions
    - Regular-expression processing
- Pre- and postnormalization for easy management of N-way interconnections
- Numerous routing decisions
    - Forward
    - Modify request URI
    - Respond
    - Try another route step
- Configurable record routing

CISCO NETWORK ROUTE DIRECTOR MANAGEMENT FUNCTIONS

The Cisco NRD includes standards-based instrumentation and interfaces to support management functions:

- Fault management—Provides Simple Network Management Protocol Version 2 (SNMPv2) trap notification and throttling, debugging, and network element recovery if a failure occurs
- Configuration management—Includes Telnet and Secure Shell (SSH) Protocol directly to the host, versioned network behavior, and online and offline configuration
- User management—Includes password management and deactivation of users and access control groups
- Performance monitoring—Includes host metrics, primary performance indicators, and reporting
- Security management—Administrator actions (access control groups), SSL between network element hosts, and password policy and rotation

STANDARDS COMPLIANCE

Table 1 gives standards compliance information for Cisco NRD.

Table 1. Cisco NRD Standards Compliance

Protocol	Description	Reference Number	Organization
ENUM	E.164 numbering	RFC 3761	IETF
SIP	SIP	RFC 3261 RFC 3263 RFC 3966	IETF
SNMP	Version 2c	RFC 2325	IETF

SYSTEM REQUIREMENTS

Table 2 gives system requirements for the Cisco NRD.

Table 2. System Requirements

Hardware	Sun FireV210 or Netra 210
Processors	Two 1.34-GHz UltraSPARC IIIi processors
Disk space	Two 73-GB hard disk drives
Memory	4 GB
Operating system	Solaris 10

SYSTEM PERFORMANCE

Cisco NRD can support from 160 to 260 calls per second. Call rate performance can be greater or less, depending on call model, route table size, and number of external queries, and ranges.

ORDERING INFORMATION

To place an order, visit the Cisco Ordering Home Page and refer to Table 3.

Table 3. Ordering Information

Product Name	Part Number
Cisco Network Route Director 3.0	SFBNRD-SA-K9-3.0

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FOR MORE INFORMATION

For more information about the Cisco Network Route Director, visit the product Webpage or contact your local Cisco account representative.

Corporate Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 526-4100

European Headquarters
Cisco Systems International BV
Haarlerbergpark
Haarlerbergweg 13-19
1101 CH Amsterdam
The Netherlands
www-europe.cisco.com
Tel: 31 0 20 357 1000
Fax: 31 0 20 357 1100

Americas Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-7660
Fax: 408 527-0883

Asia Pacific Headquarters
Cisco Systems, Inc.
168 Robinson Road
#28-01 Capital Tower
Singapore 068912
www.cisco.com
Tel: +65 6317 7777
Fax: +65 6317 7799

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