

Chapter 37

Glossary of Terms

Terms used in descriptions throughout this document are defined below.

adjacency

Adjacency is a relationship formed between selected neighboring routers for the purpose of exchanging routing information. Not every pair of neighboring routers becomes adjacent.

autonomous system

An autonomous system is a set of routers under a single technical administration, using an interior gateway protocol and common metrics to route packets within the autonomous system, and using an exterior gateway protocol to route packets to other autonomous systems. Since this classic definition was developed, it has become common for a single autonomous system to use several interior gateway protocols and sometimes several sets of metrics within an autonomous system. The use of the term “autonomous system” stresses that even when multiple IGPs and metrics are used, the administration of an autonomous system appears to other autonomous systems to have a single coherent interior routing plan and to present a consistent picture of what networks are reachable through it. The autonomous system is represented by a number between 1 and 64511, assigned by the Regional Internet Registries (RIR) which has been delegated this responsibility by the Internet Assigned Numbers Authority (IANA).

BGP - Border Gateway Protocol

The Border Gateway Protocol (BGP) is an exterior (inter-domain) routing protocol used for exchanging routing information between autonomous systems. BGP routes contain “path attributes”, which provide various information about reachable network destinations. These attributes contain loop-prevention information, information about route origin, and other properties that may be administratively set on the routes to aid in BGP route selection.

BGP is described in more detail in the BGP Protocol section. See “Chapter 14 Border Gateway Protocol (BGP)” on page 61.

designated router

A designated router in OSPF is a router that generates a link-state advertisement for the multiaccess network and assists in running the protocol. Each multiaccess network that has at least two attached routers has a designated router.

destination

A destination is any network or any host.

DVMRP - Distance Vector Multicast Routing Protocol

DVMRP is the original IP multicast routing protocol. DVMRP was designed to run over multicast capable LANs (like Ethernet) as well as through non-multicast capable routers. In the

case of non-multicast capable routers, the IP multicast packets are “tunneled” through the routers as unicast packets.

EGP - Exterior Gateway Protocol

EGP can mean one of two things. First, it can refer generically to the class of routing protocols for inter-domain routing - an exterior gateway protocol.

Second, it can refer specifically to the EGP, the historic predecessor to BGP.

forwarding table

The forwarding table is the table in the kernel that controls the forwarding of packets. The forwarding table is also known in OSI terms as a “forwarding information base,” or FIB. The forwarding table contains tuples that are used to determine how packets are forwarded.

These tuples consist of the following fields:

- network (or CIDR prefix)
- next hop(s)
- the interface that the packet goes out

The table that GateD uses internally to store routing information that it learns from routing protocols is a “routing table,” known in OSI terms as a “routing information base,” or “RIB.”

gateway

A gateway is an intermediate destination by which packets are delivered to their ultimate destination. A gateway is a host address. Gateways are specified in the format of their address family, which in IP is the dotted-quad format, for example, 192.0.2.1. In IP, it may also be specified as an 8-digit hexadecimal string preceded by 0x, for example, 0xc0000201.

If “`options noresolve`” is not specified, a gateway can be a symbolic hostname, for example, gw.example.com. The numeric forms are much preferred over the symbolic form.

gateway_list

A *gateway_list* is a list of one or more gateways separated by white space.

IGMP - Internet Group Management Protocol

IGMP was primarily designed for hosts on multi-access networks to inform locally-attached routers of their group membership information. Hosts inform routers by multicasting IGMP Host Membership Reports. Once multicast routers listen for these reports, they can exchange group membership information with other multicast routers. This reporting system allows distribution trees to be formed to deliver multicast datagrams.

IGP - Interior Gateway Protocol

IGP is one of a class of routing protocols used to exchange routing information within an autonomous system. (A detailed explanation of interior gateway protocols is available in “Chapter 24 Internet Group Management Protocol (IGMP)” on page 119.)

inter-domain routing

Inter-domain routing protocols are used to exchange routing information between autonomous systems. (See also “EGP - Exterior Gateway Protocol” on page 174.)

interface

The *interface* is the host address of an attached interface. This is the address of a broadcast, NBMA or loopback interface, and the remote address of a point-to-point interface. As with any host address, it may be specified symbolically.

interface

The interface is the connection between a router and one of its attached networks. A physical interface may be specified by a single IP address, domain name, or interface name (unless the network is an unnumbered point-to-point network). Multiple levels of reference in the configuration language allow identification of interfaces using wildcard, interface type name, or delete word address. Be careful with the use of interface names, because there may be more than one address per interface. Dynamic interfaces can be added or deleted, and indicated as up or down, as well as changed to address, netmask and metric parameters.

interface_list

An *interface_list* is a list of one or more interface names, including wildcard names (names without a number) and names that may specify more than one interface or address, or the token "all" for all interfaces. See "Chapter 7 Interface Statement" on page 23 for more information.

intra-domain routing

Intra-domain routing protocols are used to exchange reachability information within an autonomous system (AS). (See also "IGP - Interior Gateway Protocol" on page 174.)

IS-IS - Intermediate System to Intermediate System

Intermediate System to Intermediate System (IS-IS) is one of a class of interior gateway protocols (See also "IGP - Interior Gateway Protocol" on page 174.) IS-IS is a link-state interior gateway protocol originally developed for routing ISO/CLNP (International Organization for Standardization/Connectionless Network Protocol) packets. IS-IS is described in more detail in "Chapter 13 Intermediate System to Intermediate System (IS-IS)" on page 55. The version distributed in GateD routes IP.

local_address

The *local_address* is the host address of an attached interface. This is the address of a broadcast, NBMA, or loopback interface, and the local address of a point-to-point interface. As with any host address, it may be specified symbolically.

mask

A *mask* is a means of subdividing networks using address modification. A mask is a dotted quad specifying which bits of the destination are significant. (Except when used in a route filter (see "route filter" on page 177), GateD supports only contiguous masks.)

mask length

The mask length is the number of contiguous one bits at the beginning of the mask.

metric

A metric is one of the units used to help a system determine the best route. Metrics may be based on hop count, routing delay, or an arbitrary value set by the administrator, depending on the type of routing protocol. Routing metrics may influence the value of assigned internal preferences. (See "Assigning Preferences" on page 11.)

Protocol	Metric Represents	Range	Unreachable
RIP	Distance (hop-count)	0-15	16
OSPF	Cost of path	1-16777216	Delete
IS-IS	Cost of path	0-254	Delete

This sample table shows the range of possible values for each routing protocol metric and the value used by each protocol to reach a destination.

multi-access networks

Multi-access networks are those physical networks that support the attachment of multiple (more than two) routers. Each pair of routers on such a network is assumed to be able to communicate directly.

multicast

Multicast routing protocols allow packets to be routed to a select set of destinations.

natural mask

A natural mask is a mask of an IP address that is determined by looking at the first two bits of the address. Classful addressing uses only natural masks.

0x - 255.0.0.0 - class A

10 - 255.255.0.0 - class B

11 - 255.255.255.0 - class C

See also RFC 950.

natural network

A natural network is any network that has the same actual and natural masks.

neighbor

A neighbor for one router is another router with which implicit or explicit communication is established by a routing protocol. Neighbors are usually on a shared network, but not always. This term is used mostly in OSPF. The term "neighbor" is usually synonymous with "peer". (See "peer" on page 176.)

neighboring routers

Neighboring routers are two routers that have interfaces to a common network. On multi-access networks, routers are dynamically discovered by OSPF's hello protocol.

network

Network refers to any packet-switched network. A network may be specified by its IP address or network name. The host bits in a network specification must be zero. *Default* may be used to specify the default network (0.0.0.0).

network

Network is either a fully qualified IP host address or an IP prefix. An IP host address should be specified in dotted-quad format, for example, 192.2.0.1. An IP prefix should be specified using only as many numbers as necessary. Both may also be specified as a hexadecimal string preceded by "0x" with an even number of hexadecimal digits of length between two and eight, for example, 0xc0020001. Also allowed is the symbolic value, "default", which has the value of 0.0.0.0. If "options noresolve" is not specified, a symbolic network name is used, for example, test.example.net. The numeric forms are much preferred over the symbolic form.

OSPF - Open Shortest Path First

OSPF is one of a class of interior gateway protocols. Open Shortest Path First (OSPF) is a link-state protocol. OSPF is described in more detail in "Chapter 12 Open Shortest Path First (OSPF)" on page 45.

peer

A peer for a router is another router with which implicit or explicit communication is established by a routing protocol. Peers are usually on a shared network, but not always.

This term is used mostly by BGP. Peer is usually synonymous with neighbor. See also “neighbor” on page 176.

port

A *port* is a UDP or TCP port number. Valid values are from 1 through 65535, inclusive.

preference

preference is a value between 0 (zero) and 255 and is used to select between many routes to the same destination. The route with the best (numerically lowest) preference is the active route. The active route is the one installed in the kernel forwarding table and exported to other protocols. Preference zero is usually reserved for routes to directly attached interfaces. A default preference is assigned to each source from which GateD receives routes. (See “Assigning Preferences” on page 11.)

prefix

A prefix is a contiguous mask covering the most significant bits of an address. The prefix length specifies how many bits are covered.

QoS - Quality Of Service

QoS is the level of service provided in terms of delay, throughput, reliability, and cost. QoS is the OSI equivalent of TOS. See also “TOS - Type Of Service” on page 178.

RIP - Routing Information Protocol

RIP is one of a class of interior gateway protocols. RIP assumes that the best route is the one that uses the fewest gateways, i.e., the shortest path, not taking into account congestion or delay on route. (See “Chapter 11 Routing Information Protocol (RIP)” on page 39 for more information about RIP.)

reject route

A reject route is a route with the characteristic that all packets sent along it are discarded. For each such discarded packet, an ICMP network unreachable message is sent to the packet originator.

route filter

A route filter is a description of the characteristics of a set of network addresses. Route filters are used to group routes that require the same policy.

router id

A router id is a 32-bit number assigned to each router running the BGP or OSPF protocol. This number uniquely identifies the router within the autonomous system.

router_id

A *router_id* is an IP address used as a unique identifier assigned to represent a specific router. It is usually the address of an attached interface.

RIB - Routing Information Base

The RIB is the repository of all of GateD’s retained routing information, used to make decisions and as a source for routing information that is propagated.

simplex

A simplex interface is an interface on a broadcast medium that is not capable of receiving packets that it broadcasts. An interface may be marked as simplex either by the kernel or by interface configuration. GateD takes advantage of interfaces that are capable of receiving their own broadcast packets to monitor whether an interface appears to be functioning properly.

time to live (ttl)

The *time to live* of an IP packet is how many hops it can make. Valid values are from 1 through 255 inclusive.

TOS - Type Of Service

The TOS is for Internet service quality selection. The type of service is specified along the abstract parameters of precedence, delay, throughput, reliability, and cost. These abstract parameters are to be mapped into the actual service parameters of the particular networks the datagram traverses. The vast majority of IP traffic today uses the default type of service. (See also "QoS - Quality Of Service" on page 177.)

unicast

Unicast routing protocols allow packets to be routed to one destination (rather than to several or all possible destinations).