

**RA**

registration authority. Optional PKI entity (separate from the CAs) that does not sign either digital certificates or CRLs but has responsibility for recording or verifying some or all of the information (particularly the identities of subjects) needed by a CA to issue certificates and CRLs and to perform other certificate management functions.

**RACE**

Research on Advanced Communications in Europe. Project sponsored by the EC for the development of broadband networking capabilities.

**race condition ranging**

The process of acquiring the correct timing offset such that the transmissions of a cable modem are aligned with the correct mini-slot boundary.

**radio frequency**

Generally refers to wireless communications with frequencies below 300 GHz.

**RADIUS**

Remote Authentication Dial-In User Service. Database for authenticating modem and ISDN connections and for tracking connection time.

**RAM**

random-access memory. Volatile memory that can be read and written by a microprocessor.

**random early detection**

Congestion avoidance algorithm in which a small percentage of packets are dropped when congestion is detected and before the queue in question overflows completely.

**ranging**

Process of acquiring the correct timing offset such that the transmissions of a cable access router are aligned with the correct minislots boundary.

**RARE**

Réseaux Associés pour la Recherche Européenne. Association of European universities and research centers designed to promote an advanced telecommunications infrastructure in the European scientific community. RARE merged with EARN to form TERENA. See also *EARN* and *TERENA*.

**RARP**

Reverse Address Resolution Protocol. Protocol in the TCP/IP stack that provides a method for finding IP addresses based on MAC addresses. Compare with *ARP*.

**RAS**

1. Registration, Admission, and Status Protocol. Protocol that is used between endpoints and the gatekeeper to perform management functions. RAS signalling function performs registration, admissions, bandwidth changes, status, and disengage procedures between the VoIP gateway and the gatekeeper.

2. remote access server.

**rate enforcement**

See *traffic policing*.

**rate queue**

In ATM, a value associated with one or more virtual circuits that defines the speed at which an individual virtual circuit transmits data to the remote end. Each rate queue represents a portion of the overall bandwidth available on an ATM link. The combined bandwidth of all configured rate queues should not exceed the total available bandwidth.

**raw mode**

MICA technologies interface mode in which no framing takes place. The other interface modes are PPP and SLIP. In raw mode, data is forwarded immediately without interpretation of individual characters.

**RBAC**

role-based access control. Form of identity-based access control where the system entities that are identified and controlled are functional positions in an organization or process.

**RBHC**

regional Bell holding company. One of seven regional telephone companies formed by the breakup of AT&T. RBHCs differ from RBOCs in that RBHCs cross state boundaries.

**RBOC**

regional Bell operating company. Seven regional telephone companies formed by the breakup of AT&T. RBOCs differ from RBHCs in that RBOCs do not cross state boundaries.

**rcp**

remote copy protocol. Protocol that allows users to copy files to and from a file system residing on a remote host or server on the network. The rcp protocol uses TCP to ensure the reliable delivery of data.

**rcp server**

Router or other device that acts as a server for rcp. See also *rcp*.

**RCV**

receive. Direction of signal moving from the high-speed receiver to the low- to medium-speed interface.

**RD**

Request Disconnect.

**RDI**

remote defect indication.

**1.** Indication that a failure has occurred at the far end of the network. Unlike FERF (far-end remote failure), the RDI alarm indication does not identify the specific circuit in a failure condition.

**2.** In ATM, when the physical layer detects loss of signal or cell synchronization, RDI cells are used to report a VPC/VCC failure. RDI cells are sent upstream by a VPC/VCC endpoint to notify the source VPC/VCC endpoint of the downstream failure.

**re-activation**

Process of re-enabling network access and privileges for a subscriber device and reclaiming device attributes for other subscriber devices.

**reassembly**

The putting back together of an IP datagram at the destination after it has been fragmented either at the source or at an intermediate node. See also *fragmentation*.

**recovery**

The way that a system or a device resumes operation after overcoming a hardware or software problem.

**Redialer**

Interface hardware device that interconnects between a fax device and a Public Switched Telephone Network (PSTN). A redialer forwards a dialed number to another destination. Redialers contain a database of referral telephone numbers. When the user dials a specific number, the redialer collects the dialed digits and matches them to a listing in its database. If there is a match, the redialer dials the referral number (transparent to the user) and forwards the call to the referral number.

**redirect**

Part of the ICMP and ES-IS protocols that allows a router to tell a host that using another router would be more effective.

**redirect server**

A server that accepts a SIP request, maps the address into zero or more new addresses, and returns these addresses to the client. It does not initiate its own SIP request nor does it accept calls.

**redirector**

Software that intercepts requests for resources within a computer and analyzes them for remote access requirements. If remote access is required to satisfy the request, the redirector forms an RPC and sends the RPC to lower-layer protocol software for transmission through the network to the node that can satisfy the request.

**redistribution**

Allowing routing information discovered through one routing protocol to be distributed in the update messages of another routing protocol. Sometimes called route redistribution.

**redundancy**

1. In internetworking, the duplication of devices, services, or connections so that, in the event of a failure, the redundant devices, services, or connections can perform the work of those that failed. See also *redundant system*.

2. In telephony, the portion of the total information contained in a message that can be eliminated without loss of essential information or meaning.

**redundant system**

Computer, router, switch, or other system that contains two or more of each of the most important subsystems, such as two disk drives, two CPUs, or two power supplies.

**Reed-Solomon encoder**

Device that takes a block of digital data and adds extra “redundant” bits. When errors occur during transmission or storage, the Reed-Solomon decoder processes each block and attempts to correct errors and recover the original data. The number and type of errors that can be corrected depends on the characteristics of the Reed-Solomon code. Reed-Solomon codes are used in storage devices (including tape, compact disc, DVD), barcodes, wireless or mobile communications (including cellular telephones, microwave links, and so on), satellite communications, digital television/DVB, and high-speed modems (such as ADSL, xDSL, and so on).

**reflection attack**

Type of replay attack in which transmitted data is sent back to its originator.

**reflexive access list**

Reflexive access lists contain condition statements (entries) that define criteria for permitting IP packets. These entries are evaluated in order, and when a match occurs, no more entries are evaluated.

**registrar**

Server that accepts REGISTER requests. A registrar typically is colocated with a proxy or a redirect server and might offer location services.

**registration**

Administrative act or process whereby an entity's name and other attributes are established for the first time at a CA, prior to the CA issuing a digital certificate that has the entity's name as the subject.

**Registration, Admission, and Status protocol**

See *RAS*.

**regrade**

Deliberately change the classification level of information in an authorized manner.

**rekey**

Change the value of a cryptographic key that is being used in an application of a cryptographic system.

**relay**

OSI terminology for a device that connects two or more networks or network systems. A data link layer (Layer 2) relay is a bridge; a network layer (Layer 3) relay is a router. See also *bridge* and *router*.

**reliability**

1. Total number of system failures, regardless of whether a given failure results in system down time. Compare with *availability*.
2. Ratio of expected to received keepalives from a link. If the ratio is high, the line is reliable. Used as a routing metric.

**Reliable SAP Update Protocol**

See *RSUP* in the "Cisco Systems Terms and Acronyms" section.

**reload**

The event of a Cisco router rebooting, or the command that causes the router to reboot.

**remote alarm indication**

yellow alarm.

**remote ATM switch driver**

Set of interfaces that allows Cisco IOS software to control the operation of a remote ATM switch through a control protocol, such as a VSI.

**remote bridge**

Bridge that connects physically disparate network segments via WAN links.

**remote copy protocol**

See *rcp*.

**remote defect identification**

See *RDI*.

**remote job entry**

See *RJE*.

**remote login**

See *rlogin*.

**Remote Monitoring**

See *RMON*.

**Remote Operations Service Element**

See *ROSE*.

**remote shell protocol**

See *rsh*.

**remote source-route bridging**

See *RSRB*.

**remote system**

End system or router that is attached to a remote access network and that is either the initiator or the recipient of a call.

**remote-procedure call**

See *RPC*.

**rendezvous point**

Router specified in PIM sparse mode implementations to track membership in multicast groups and to forward messages to known multicast group addresses. See also *PIM sparse mode*.

**repeater**

Device that regenerates and propagates electrical signals between two network segments. See also *segment*.

**replay attack**

Attack in which a valid data transmission is maliciously or fraudulently repeated, either by the originator or by an adversary who intercepts the data and retransmits it, possibly as part of a masquerade attack.

**replication**

Process of keeping a copy of data, either through shadowing or caching. See also *caching* and *shadowing*.

**repository**

System for storing and distributing digital certificates and related information (including CRLs, CPSs, and certificate policies) to certificate users.

**repudiation**

Denial by a system entity that was involved in an association (especially an association that transfers information) of having participated in the relationship.

**Request For Comments**

See *RFC*.

**Request To Send**

See *RTS*.

**request/response unit**

See *RU*.

**required visual inspection**

See *RVI*.

**Research on Advanced Communications in Europe**

See *RACE*.

**Réseaux Associés pour la Recherche Européenne**

See *RARE*.

**reservation state block**

Block maintained by RSVP to store a reservation.

**residential gateway**

Customer premises equipment running XGCP that has connections to the VoIP network and connections to user telephony equipment.

**residual risk**

Risk that remains after countermeasures have been applied.

**Resource Reservation Protocol**

See *RSVP*.

**Reverse Address Resolution Protocol**

See *ARP*.

**Reverse Path Forwarding**

See *RPF*.

**RF**

radio frequency. Generic term referring to frequencies that correspond to radio transmissions, that is wireless communications with frequencies below 300 GHz. Cable TV and broadband networks use RF technology.

**RFC**

Request For Comments. Document series used as the primary means for communicating information about the Internet. Some RFCs are designated by the IAB as Internet standards. Most RFCs document protocol specifications, such as Telnet and FTP, but some are humorous or historical. RFCs are available online from numerous sources.

**RFI**

radio frequency interference. Radio frequencies that create noise that interferes with information being transmitted across unshielded copper cable.

**RFP**

request for proposal.

**RFS**

Remote File System. Distributed file system, similar to NFS, developed by AT&T and distributed with their UNIX System V operating system.

**RHC**

regional holding company.

**RIF**

Routing Information Field. Field in the IEEE 802.5 header that is used by a source-route bridge to determine through which Token Ring network segments a packet must transit. A RIF is made up of ring and bridge numbers as well as other information.

**RII**

Routing Information Identifier. Bit used by SRT bridges to distinguish between frames that should be transparently bridged and frames that should be passed to the SRB module for handling.

**RIM**

Request Initialization Mode.

**ring**

Connection of two or more stations in a logically circular topology. Information is passed sequentially between active stations. Token Ring, FDDI, and CDDI are based on this topology.

**ring group**

Collection of Token Ring interfaces on one or more routers that is part of a one-bridge Token Ring network.

**ring latency**

Time required for a signal to propagate once around a ring in a Token Ring or IEEE 802.5 network.

**ring monitor**

Centralized management tool for Token Ring networks based on the IEEE 802.5 specification. See also *active monitor* and *standby monitor*.

**ring topology**

Network topology that consists of a series of repeaters connected to one another by unidirectional transmission links to form a single closed loop. Each station on the network connects to the network at a repeater. Although logically a ring, ring topologies most often are organized in a closed-loop star. Compare with *bus topology*, *star topology*, and *tree topology*.

**RIP**

Routing Information Protocol. IGP supplied with UNIX BSD systems. The most common IGP in the Internet. RIP uses hop count as a routing metric. See also *hop count*, *IGP*, and *OSPF*. See also *EIGRP* and *IGRP* in the “Cisco Systems Terms and Acronyms” section.

**RIPE**

Réseaux IP Européennes. Group formed to coordinate and promote TCP/IP-based networks in Europe.

**RISC**

reduced instruction set computing.

**risk assessment**

Process that systematically identifies valuable system resources and threats to those resources, quantifies loss exposures (that is, loss potential) based on estimated frequencies and costs of occurrence, and (optionally) recommends how to allocate resources to countermeasures so as to minimize total exposure.

**risk management**

Process of identifying, controlling, and eliminating or minimizing uncertain events that might affect system resources.

**RJ connector**

registered jack connector. Standard connectors originally used to connect telephone lines. RJ connectors are now used for telephone connections and for 10BaseT and other types of network connections. RJ-11, RJ-12, and RJ-45 are popular types of RJ connectors.

**RJE**

remote job entry. Application that is batch-oriented, as opposed to interactive. In RJE environments, jobs are submitted to a computing facility, and output is received later.

**RLM**

Redundant Link Manager.

**rlogin**

remote login. Terminal emulation program, similar to Telnet, offered in most UNIX implementations.

**RM**

resource management. Management of critical resources in an ATM network. Two critical resources are buffer space and trunk bandwidth. Provisioning can be used to allocate network resources in order to separate traffic flows according to service characteristics.

**RMON**

remote monitoring. MIB agent specification described in RFC 1271 that defines functions for the remote monitoring of networked devices. The RMON specification provides numerous monitoring, problem detection, and reporting capabilities.

**roaming service**

Dial service for cable subscribers that require access away from their cable modems.

**ROLC**

routing over large clouds. Working group in IETF created to analyze and propose solutions to problems that arise when performing IP routing over large, shared media networks, such as ATM, Frame Relay, SMDS, and X.25.

**ROM**

read-only memory. Nonvolatile memory that can be read, but not written, by the microprocessor.

**root account**

Privileged account on UNIX systems used exclusively by network or system administrators.

**root bridge**

Exchanges topology information with designated bridges in a spanning-tree implementation to notify all other bridges in the network when topology changes are required. This prevents loops and provides a measure of defense against link failure.

**root CA**

Ultimate CA, which signs the certificates of the subordinate CAs. The root CA has a self-signed certificate that contains its own public key.

**root certificate**

Certificate for which the subject is a root. Hierarchical PKI usage: The self-signed public-key certificate at the top of a certification hierarchy.

**root key**

Public key for which the matching private key is held by a root.

**ROSE**

Remote Operations Service Element. OSI RPC mechanism used by various OSI network application protocols.

**rotary groups**

Several contiguous lines that allow a connection to be made to the next free line in the group. Also called a hunt group.

**round-trip time**

See *RTT*.

**route**

Path through an internetwork.

**route distinguisher**

An 8-byte value that is concatenated with an IPv4 prefix to create a unique VPN IPv4 prefix.

**route extension**

In SNA, a path from the destination subarea node through peripheral equipment to an NAU.

**route map**

Method of controlling the redistribution of routes between routing domains.

**Route Processor**

See *RP* in the “Cisco Systems Terms and Acronyms” section.

**route redistribution**

See *redistribution*.

**route summarization**

Consolidation of advertised addresses in OSPF and IS-IS. In OSPF, this causes a single summary route to be advertised to other areas by an area border router.

**Route/Switch Processor**

See *RSP* in the “Cisco Systems Terms and Acronyms” section.

**routed bridge encapsulation**

The process by which a stub-bridged segment is terminated on a point-to-point routed interface. Specifically, the router is routing on an IEEE 802.3 or Ethernet header carried over a point-to-point protocol, such as PPP, RFC 1483 ATM, or RFC 1490 Frame Relay.

**routed protocol**

Protocol that can be routed by a router. A router must be able to interpret the logical internetwork as specified by that routed protocol. Examples of routed protocols include AppleTalk, DECnet, and IP.

**router**

Network layer device that uses one or more metrics to determine the optimal path along which network traffic should be forwarded. Routers forward packets from one network to another based on network layer information. Occasionally called a gateway (although this definition of gateway is becoming increasingly outdated). Compare with *gateway*. See also *relay*.

**routing**

Process of finding a path to a destination host. Routing is very complex in large networks because of the many potential intermediate destinations a packet might traverse before reaching its destination host.

**routing domain**

Group of end systems and intermediate systems operating under the same set of administrative rules. Within each routing domain is one or more areas, each uniquely identified by an area address.

**Routing Information Field**

See *RIF*.

**Routing Information Identifier**

See *RII*.

**Routing Information Protocol**

See *RIP*.

**routing metric**

Method by which a routing algorithm determines that one route is better than another. This information is stored in routing tables. Metrics include bandwidth, communication cost, delay, hop count, load, MTU, path cost, and reliability. Sometimes referred to simply as a *metric*. See also *cost*.

**routing over large clouds**

See *ROLC*.

**routing protocol**

Protocol that accomplishes routing through the implementation of a specific routing algorithm. Examples of routing protocols include IGRP, OSPF, and RIP.

**routing table**

Table stored in a router or some other internetworking device that keeps track of routes to particular network destinations and, in some cases, metrics associated with those routes.

**Routing Table Maintenance Protocol**

See *RTMP*.

**Routing Table Protocol**

See *RTP*.

**routing update**

Message sent from a router to indicate network reachability and associated cost information. Routing updates typically are sent at regular intervals and after a change in network topology. Compare with *flash update*.

**RP**

See *RP* in the “Cisco Systems Terms and Acronyms” section.

**RPC**

remote-procedure call. Technological foundation of client/server computing. RPCs are procedure calls that are built or specified by clients and are executed on servers, with the results returned over the network to the clients. See also *client/server computing*.

**RPF**

Reverse Path Forwarding. Multicasting technique in which a multicast datagram is forwarded out of all but the receiving interface if the receiving interface is the one used to forward unicast datagrams to the source of the multicast datagram.

**RPR**

Restore Path request. The RPR is a WaRP request sent using a Restore Path packet that is used to establish a virtual path between two nodes. The request is sent by a source node, or a proxy source node, to establish an intra-zone path for a VWP. The packet usually is sent during failure recovery procedures but also can be used for provisioning new VWPs. The node that sends the request is called the *originating node*. The node that terminates the request is called the *target node*.

**RR**

relative rate. In ATM, one of the congestion feedback modes provided by ABR service. In RR mode, switches set a bit in forward and backward RM cells to indicate congestion. See also *ABR* and *RLM*.

**RRJ**

registration rejection. RAS message sent as a registration rejection.

**RRQ**

registration request. RAS message sent as a registration request.

**RS-232**

Popular physical layer interface. Now known as EIA/TIA-232. See also *EIA/TIA-232*.

**RS-422**

Balanced electrical implementation of EIA/TIA-449 for high-speed data transmission. Now referred to collectively with RS-423 as EIA-530. See also *EIA-530* and *RS-423*.

**RS-423**

Unbalanced electrical implementation of EIA/TIA-449 for EIA/TIA-232 compatibility. Now referred to collectively with RS-422 as EIA-530. See also *EIA-530* and *RS-422*.

**RS-449**

Popular physical layer interface. Now known as *EIA/TIA-449*. See also *EIA/TIA-449*.

**RSA**

Acronym stands for Rivest, Shamir, and Adelman, the inventors of the technique. Public-key cryptographic system that can be used for encryption and authentication.

**rsh**

remote shell protocol. Protocol that allows a user to execute commands on a remote system without having to log in to the system. For example, rsh can be used to remotely examine the status of a number of access servers without connecting to each communication server, executing the command, and then disconnecting from the communication server.

**RSIP**

ReStart In Progress. MGCP command used to indicate that a span (or collection of spans) has come into service, has gone out of service, or is about to go out of service.

**RSM**

Route Switch Module.

**RSP**

See *RSP* in the “Cisco Systems Terms and Acronyms” section.

**RSRB**

remote source-route bridging. SRB over WAN links. See also *SRB*.

**RSUP**

See *RSUP* in the “Cisco Systems Terms and Acronyms” section.

**RSVP**

Resource Reservation Protocol. Protocol that supports the reservation of resources across an IP network. Applications running on IP end systems can use RSVP to indicate to other nodes the nature (bandwidth, jitter, maximum burst, and so on) of the packet streams they want to receive. RSVP depends on IPv6. Also known as Resource Reservation Setup Protocol. See also *IPv6*.

**RTCP**

RTP Control Protocol. Protocol that monitors the QOS of an IPv6 RTP connection and conveys information about the on-going session. See also *RTP (Real-Time Transport Protocol)*.

**RTFM**

read the fantastic manual. Acronym often used when someone asks a simple or common question.

**RTMP**

Routing Table Maintenance Protocol. Apple Computer's proprietary routing protocol. RTMP establishes and maintains the routing information that is required to route datagrams from any source socket to any destination socket in an AppleTalk network. Using RTMP, routers dynamically maintain routing tables to reflect changes in topology. RTMP was derived from RIP. See also *RTP (Routing Table Protocol)*.

**RTP**

**1.** Routing Table Protocol. VINES routing protocol based on RIP. Distributes network topology information and aids VINES servers in finding neighboring clients, servers, and routers. Uses delay as a routing metric. See also *SRTP*.

**2.** Rapid Transport Protocol. Provides pacing and error recovery for APPN data as it crosses the APPN network. With RTP, error recovery and flow control are done end-to-end rather than at every node. RTP prevents congestion rather than reacts to it.

**3.** Real-Time Transport Protocol. Commonly used with IP networks. RTP is designed to provide end-to-end network transport functions for applications transmitting real-time data, such as audio, video, or simulation data, over multicast or unicast network services. RTP provides such services as payload type identification, sequence numbering, timestamping, and delivery monitoring to real-time applications.

**RTP Control Protocol**

See *RTCP*.

**RTS**

Request To Send. EIA/TIA-232 control signal that requests a data transmission on a communications line.

**RTSC**

read the source code.

**RTSP**

Real Time Streaming Protocol. Enables the controlled delivery of real-time data, such as audio and video. Sources of data can include both live data feeds, such as live audio and video, and stored content, such as pre-recorded events. RTSP is designed to work with established protocols, such as RTP and HTTP.

**RTT**

round-trip time. Time required for a network communication to travel from the source to the destination and back. RTT includes the time required for the destination to process the message from the source and to generate a reply. RTT is used by some routing algorithms to aid in calculating optimal routes.

**RU**

request/response unit. Request and response messages exchanged between NAUs in an SNA network.

**RUDP**

Reliable User Data Protocol.

**run-time memory**

Memory accessed while a program runs.

**RVI**

required visual inspection.

