



Route Explorer



Harnessing the Intelligence of IP

Route Explorer™, the industry's leading IP route analysis system, is designed for network engineers and operators managing today's complex, mission-critical enterprise and service provider networks. It provides visibility into the dynamic routing operation of the entire network, enabling fast identification and resolution of difficult-to-diagnose network problems, effective and trouble-free network maintenance, and the ability to easily and accurately plan for network changes and optimization.

IP Route Analysis – A Necessity for Today's Mission Critical Networks

IP networks are dynamic, with the inherent intelligence of IP automatically re-routing traffic when problems occur. Until now, there have not been any tools available that provide network engineers and operators with visibility into real-time network-wide routing behavior.

Without the ability to visualize, monitor, analyze and model changes to the logical, or Layer 3 operation of an IP network, pinpointing and correcting problems, performing maintenance updates or planning network upgrades is a tedious, manually-intensive and error-prone effort for routing experts, resulting in unforeseen downtime, excessive operational costs, time-consuming problem resolution and lost productivity.

Route Explorer – See the Network as the Network Sees Itself

Route Explorer leverages the intelligence of the IP control plane to let network engineers and operators visualize and understand the dynamic operation of the network as never before. By monitoring the routing protocols that direct the flow of traffic throughout the network, Route Explorer constructs the routers' view of the network, computing and displaying topology changes and routes in real-time. Loss of IP-layer connectivity is immediately detected and alerts can be sent to a management console so that corrective action can be taken. Routing instabilities or changes that go unnoticed by conventional SNMP-based management systems, but which impact network availability and performance, are visible within seconds, leading to early detection or prevention of service outages and reduced time-to-repair.

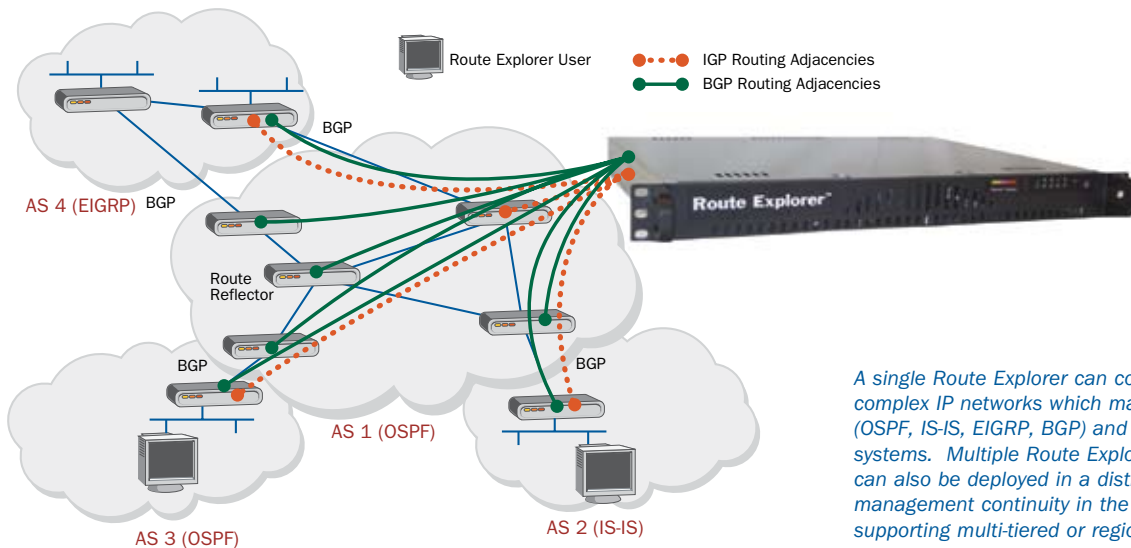
Since Route Explorer does not forward any traffic, it is neither a bottleneck nor a failure point, and places virtually no load on the network infrastructure while scaling to any network size. Route Explorer is easily installed in just hours, providing an extremely rapid time-to-value.

Route Explorer Benefits

- Maximizes network availability and customer satisfaction by rapidly identifying and diagnosing IP routing faults
- Boosts network performance by detecting and isolating the root cause of Layer 3 network instabilities and anomalies
- Reduces total operating cost by improving productivity of both network resources and network engineering staff
- Validates desired network operation after maintenance activities, helping to avert router misconfigurations that cause one third of all network problems
- Reduces “finger-pointing” often associated with difficult-to-diagnose network problems, while minimizing demands on scarce engineering resources
- Enables network engineers to predict routing problems and take action before they occur
- Verifies and alerts on changes to routing redundancy, preventing costly service outages

Unified Monitoring and Analysis of Complex IP Networks

Route Explorer is the only IP route analysis system to support all of the popular routing protocols in use on today's service provider and enterprise networks. From a single Route Explorer appliance, network engineers can view the real-time routing structure of their entire network as a seamless topology map, even when the network is running multiple protocols and spans multiple domains.



A single Route Explorer can concurrently monitor and analyze complex IP networks which may have multiple routing protocols (OSPF, IS-IS, EIGRP, BGP) and span multiple autonomous systems. Multiple Route Explorer or Route Recorder appliances can also be deployed in a distributed architecture, enhancing management continuity in the event of network failures while supporting multi-tiered or regionalized management domains.

Many of today's large enterprises employ a network architecture comprised of multiple domains or Autonomous Systems (ASs) running one or more interior gateway protocols or IGP (e.g. OSPF, IS-IS, EIGRP) that are interconnected via an exterior gateway protocol or EGP (e.g. BGP). Route Explorer concurrently monitors all routing protocols within these "private enterprise internets", enabling network engineers to see the entire, diverse network as a single, integrated system, including the unprecedented ability to highlight complete end-to-end paths across multiple ASs and IGP types. Detailed information from all monitored domains is saved in a hierarchical topology database for historical analysis of routing events.

Route Explorer similarly supports the major service provider networks, monitoring multiple BGP connections to peer and customer networks, while analyzing full Internet routes. For the first time, enterprise and service provider network staff can actually see how IP traffic traverses their entire network, providing tremendous insight into how the network is performing, while saving significant time and cost in managing, troubleshooting and maintaining the most complex networks.

Real-Time Layer 3 Network Visibility – Gain New Insights into How Your Network is Operating

Route Explorer displays a real-time, Layer 3 topology map of an IP network, so that engineers always have an accurate view of the network route status at their fingertips. Detailed data about routing events such as link status, link metrics and new prefixes can be easily displayed to diagnose and troubleshoot problems. Users can select a high-level view of the network topology showing the status of all routers and links, focus in on a specific area of the network, or view only specific types of routers, such as backbone routers. Selecting any source/destination pair will highlight the active route between the nodes, allowing operators to focus their attention on relevant devices and links when diagnosing problems. Route Explorer delivers the most accurate, up-to-date picture of how the network is operating, enabling IT staff to be much more effective at maintenance, troubleshooting and planning.



Route Explorer provides an accurate, real-time routing topology map of your entire IP network. Different domains are highlighted in different colors and link status between each node is indicated, providing an invaluable understanding of network operation.

Reduce Time and Effort to Analyze IP Network Problems

Route Explorer saves time and operating costs, providing network engineers with the ability to verify, monitor and optimize network operations, as well as detect, diagnose and resolve IP network problems faster than has been possible until now.

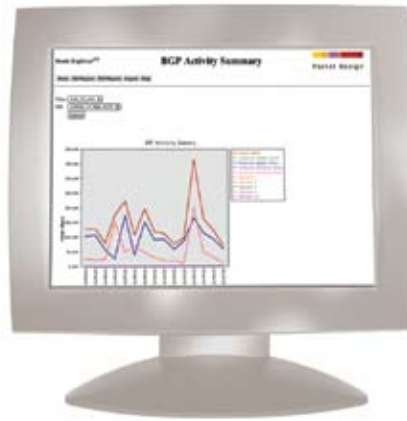
In addition to detecting IP routing faults not found by existing network management tools, Route Explorer provides a faster, top-down approach for determining the root cause of many common network problems. Rather than deducing the cause of a problem by sifting through volumes of alarms, Route Explorer can highlight the relevant routes and network devices involved for a particular application. This allows network engineers to immediately focus on the likely sources of trouble, greatly reducing the time to pinpoint and resolve the problem.

Route Explorer records all routing events, allowing users to easily review routing activity over a specified time period so that difficult to detect problems can be quickly identified and diagnosed. Route Explorer's advanced event filtering capabilities allow rapid isolation of the root cause to a single router or prefix announcement. Much like using a VCR, historical routing events can be replayed in "fast-forward" to locate the start of an event, and then stepped through slowly so that changes to the network can be easily viewed on the topology map. Replay of historical routing events is particularly useful for discovery of intermittent problems such as route flaps, or to investigate a trouble ticket regarding a past network event.

Route Explorer can also import external time series data and correlate it with routing changes on vital performance parameters such as jitter, delay and packet loss.



Route Explorer provides the ability to review and replay routing events. This view shows a histogram, which enables easy identification of when significant events took place.



Route Explorer reports present an easy to understand historical view of specific routing events, as well as a consolidated understanding of general network health.

Route Explorer Highlights

Real-Time IP Network Visualization and Monitoring

- Computes and displays a real-time, network-wide routing topology map, including the ability to display end-to-end routes, link status, link metrics, path redundancy, and more
- Supports major IP routing protocols including OSPF, IS-IS, EIGRP and BGP, providing a seamless, integrated view of routing operations across multiple ASs and multiple protocols
- Effortlessly maintains accurate network topology documentation, freeing valuable IT resources for more strategic initiatives

Detect, Analyze and Diagnose Layer 3 Problems

- Detects and pinpoints routing problems not found by SNMP-based management systems, maximizing network availability and performance
- Records all routing events allowing animated or step-by-step playback for historical analysis of past or intermittent problems
- Imports external time-series data for correlation with routing events and root cause analysis

Comprehensive User-Defined Alerts and Reports

- Monitors user-defined "watch lists" of routes and prefixes, sending alerts to SNMP-based management console or Syslog; enables immediate detection of changes or anomalies, avoiding potential network outages
- Generates detailed reports on vital information related to routing operation including flapping routes, changes in link metrics, and new routes and routers advertised; enables rapid isolation of complex network problems

Model Failures and Changes on the As-Running Network

- "What-if" analysis features let engineers simulate changes to the "as-running" network so they can determine exactly how the network will respond before implementation, or analyze the impact of potential failures
- Routing changes can be modeled to optimize for network redundancy, disaster recovery, error-free maintenance or network upgrades

Easy Installation, Scalable and Network Friendly

- Single or distributed appliances install in just hours and handle the largest networks
- Places virtually no load on the network, enabling unlimited scalability



Route Explorer automatically generates alerts based upon a range of user-defined conditions and can send alerts to Syslog or an SNMP-based NMS.

Accurately Model Changes on the “As-Running” Network

Route Explorer’s “what-if” analysis features let engineers accurately model changes on the “as running” network, using the actual routed topology at the current time or from any point in the past. Engineers can simulate a broad range of changes, such as adding or failing routers, interfaces and peerings; adding or moving prefixes; and adjusting IGP metrics or BGP configurations. Critical initiatives such as data center migrations/consolidations, disaster recovery planning, change validation testing, or failure impact and redundancy analysis can be easily and accurately performed.

Planning with an accurate, up-to-date network model lets architects see the impact of their changes before implementing, and prevents surprises afterwards, thereby reducing time-to-deploy and avoiding unexpected problems. IT organizations can effortlessly maintain real-time and historical network documentation, whether for regulatory compliance, proof of SLA fulfillment, or as part of their best practice processes.

Comprehensive Reports Help in Isolating Problems and Viewing Trends

Route Explorer’s extensive reporting capabilities enable network engineers to easily comprehend routing activity and trends, while quickly identifying potential problem areas so corrective action can be taken. Web-based reports can be generated for any historical time period stored in the Route Explorer database. Key information related to router health and operation including flapping interfaces, changes in link metrics, and new prefixes and routers advertised in the network are available on-demand as predefined reports and can be saved or forwarded to others as needed.

A range of reports is available that present overall network health, pinpoint sources of greatest routing activity, and display statistics for monitoring trends and routing events. Reports analyzing individual routing protocols (e.g. OSPF, IS-IS, EIGRP, BGP) are useful for diagnosing and troubleshooting protocol- or domain-specific problems.

Alerts Provide Real-Time Awareness of Potentially Critical Problems

Route Explorer lets users set up proactive alerts that can signal critical routing events as they happen. Alerts are sent based on user-defined thresholds, allowing engineers to customize the types of activities for which they want to be alerted as conditions change within their network. The types of alerts generated are selectable and include route flaps, excessive routing events, and router adjacency loss. “Watch lists” can be created to trigger alerts when changes take place on critical or known problem routes. Network operators can be immediately made aware of any reductions to route redundancy, so action can be taken before a complete outage occurs.

Not intended to replace conventional network management solutions, Route Explorer works in conjunction with existing management tools. Alerts can be sent as SNMP traps directly to network management consoles or recorded in Syslog, allowing for the consolidation of network problem notification and management.



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