

## IP Infusion Product Brief

# ZebOS® Internet Route Server Solution

To support heavy traffic on the Internet resulting from increased data being sent from mobile phones and web-enabled devices to telecommunications data centers, Internet Service Providers (ISPs) have to peer with each other, which has led to the emergence of Internet Exchange (IX) junctions or Internet Exchange points (IXPs). These exchange points are used to hand off traffic between service provider domains. As Internet traffic moves across different autonomous systems, it is important to ensure that routes are properly propagated through provider peers while tracking and monitoring routes to ensure that bogus and malicious information is not propagated.

The ZebOS® Internet Route Server Solution is designed to address the need for a scalable, secure and low-cost server which can be used for route-viewing and monitoring, as well as for policy-controlled route propagation in the control plane. The ZebOS Internet Route Server Solution features a Linux®-based platform optimized for handling a large number of peers and routes. The platform can be easily used for writing custom applications for monitoring and viewing routes. In addition to this, the ZebOS Internet Route Server Solution can be used for virtualization and BGP Route Reflections.

The ZebOS Internet Route Server Solution has been developed to simplify communications routing protocols between routers, while at the same time mitigating any system-wide outages—also known as black holing—that might be caused by a malicious attack or operator error. This is also commonly known as router hijacking.

Border Gateway Protocol (BGP) is one of most commonly used protocols on the Internet. It depends heavily on the exchange of information between routers. Although BGP route servers operate very efficiently, they are vulnerable to attacks by malicious

hackers or to operator errors in the routing prefixes. This can result in black holing, where the traffic is directed towards the offending peer router away from the intended endpoint.

The ZebOS Internet Route Server Solution paired with support for anti-BGP hijacking provides a filtering mechanism that is a robust solution to mitigate the creation of these black holes.

### Operator Requirements to Administer BGP Router

Operators usually want to get necessary information from routing tables regarding an invalid route whenever invalid routes are flagged, as outlined below:

- When did the route become invalid?
- Why is it an invalid route?
- Who announced it as invalid?

This enables administrators to fix any problems. BGP requires a large amount of information to be exchanged periodically, causing significant overhead. Usually, this is handled within an Autonomous System utilizing route reflectors, as shown in (Figure 1).

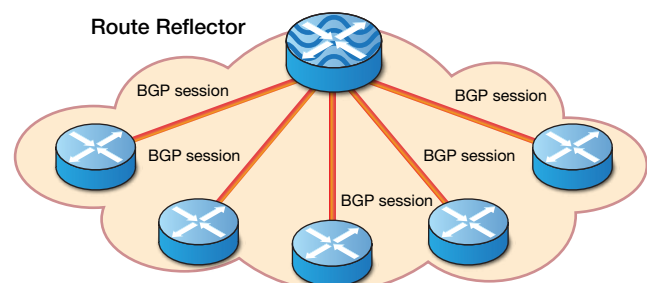


Figure 1

Expanding this concept to outside the AS when multiple ASs interact at IXPs, it is possible to have a single route server manage several route reflectors from various ASs, as shown in (Figure 2).

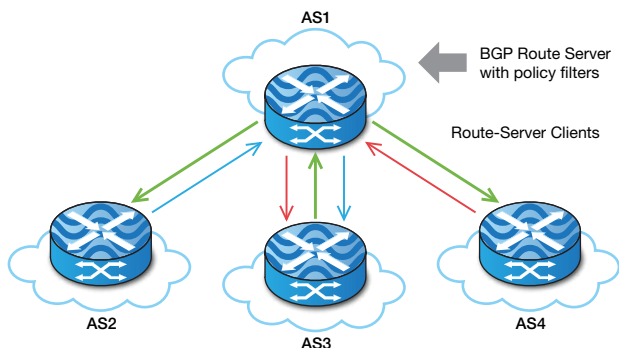


Figure 2

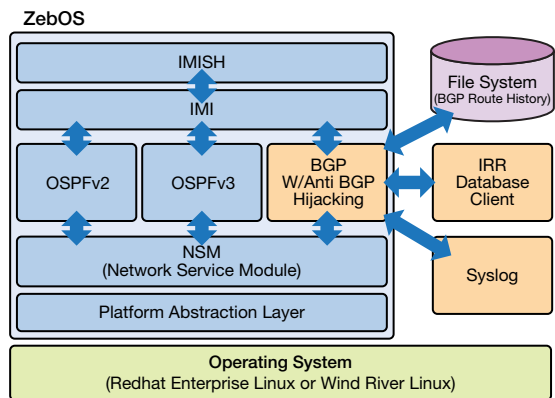


Figure 3: ZebOS Internet Route Server Solution Architecture with Anti-Hijack Module

**ZebOS Internet Route Server Solution Features**

- **BGP Passive Speaker**

The ZebOS Internet Route Server can receive all BGP routes by connecting this box to either a route reflector or route server in the network.

- **Route Validation Check**

When the ZebOS Internet Route Server receives BGP route updates, BGP checks the validation of all BGP routes by using the anti-BGP hijacking function.

- **Logging**

When the ZebOS Internet Route Server detects the status change of each BGP route, BGP can send the syslog message with prefix information and status information.

- **Route History**

The ZebOS Internet Route Server can dump the memory image of all BGP routes in the file either periodically or manually. BGP can also show the past routing information by parsing the memory image file.

- **BGP Route Scan**

BGP route update and IRR database update can occur asynchronously. In order to eliminate a mismatch, BGP can trigger the validation check of BGP routes periodically. In addition, BGP can trigger the validation check of BGP routes upon receiving the corresponding routing information from the IRR database client.

- **Best Match Prefix Search**

The prefix length for a BGP route might be different from the prefix length of the routing information in the IRR database. In order to find the corresponding routing information from the IRR database, BGP can search the best match prefix from the IRR database by changing the prefix length upon querying the IRR database.

- **IRR Database Client**

The IRR database client stores the route information locally retrieved from the public IRR database in the Internet. BGP communicates with this IRR database client in order to check the validation of each BGP route. In order to avoid traffic over the Internet caused by checking the validation of each BGP route, the IRR database client is launched locally and syncs up all routing information periodically.

For additional questions regarding the ZebOS Internet Route Server Solution, please contact IP Infusion sales directly at 1-877-699-3267 (877-MY-ZEBOS), or email: sales@ipinfusion.com



**About IP Infusion**

IP Infusion Inc. delivers advanced software solutions that power communications equipment for packet-based Next Generation Networks (NGN). With a unique modular architecture and the industry's broadest suite of communication protocols, IP Infusion enhances product differentiation and market agility for many of the world's leading network equipment vendors. Incorporated in Delaware in October 1999, IP Infusion is headquartered in Sunnyvale, California, and is a wholly owned and independently-operated subsidiary of ACCESS Systems Americas, Inc., a wholly owned U.S. subsidiary of ACCESS CO., LTD., of Tokyo, Japan. For more information about IP Infusion, please visit www.ipinfusion.com.

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