

How BGP works

Author	Date	Revision
Samuel Knoppe	04/19/2024	1.3

Related product (if any):	N/A
Description:	Describes what Border Gateway Protocol (BGP) is and what it does, and goes into detail about Exterior Gateway Protocols (EGPs) and how they relate to Interior Gateway Protocols (IGPs).
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Files Needed:	N/A

Information:

What is BGP?

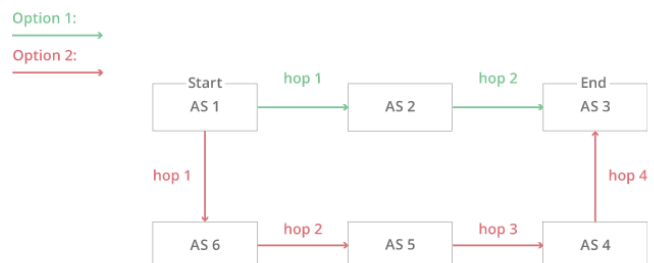
Border Gateway Protocol (BGP) is an Exterior Gateway Protocol (EGP) that makes the Internet work by enabling data routing between *autonomous systems (AS)*. BGP can be seen as the postal service for the Internet. When someone submits data via the Internet, BGP is responsible for looking at all of the available paths that data could travel and picking the best route.

BGP is generally considered a path-vector routing protocol, which sends peers information on which path traffic on a network will go. This includes which ASes that traffic will travel through. Distance-vector protocols like the IGP RIPv2 only counts hops, and is unable to know which exact path traffic will take.

BGP relies on path-vector route discovery due to the visibility it provides. This is also the reason why it's not a link-state routing protocol, since link-states do not have complete visibility and may introduce unwanted traffic via its LSU (link state update) packets, and so on. The IGP OSPF uses link-state routing.

Because BGP uses path-vector discovery, convergence times for BGP is the slowest among the routing protocols used today.

The Internet is a network of networks. It is broken up into hundreds of thousands of smaller networks known as **autonomous systems (AS)**. Each of these networks is essentially a large pool of routers run by a single organization. If we see BGP as the postal service of the Internet, ASes are like individual post office branches. A town may have hundreds of mailboxes. They forward outbound transmissions to the AS, which then uses BGP routing to get these transmissions to their destinations.



The above example illustrates a simplified version of BGP where there are only six ASes on the Internet. If AS1 needs to reach AS3, it has two different options:

1. Hopping from AS2 and then to AS3.
2. Or hopping to AS6, then to AS5, AS4, and finally to AS3.

This simplified version makes the decision seem straightforward. The first option has fewer hops

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