

BST Protocol

BGP Scalable Transport (BST) Reference Implementation

Overview

Packet Design's BGP Scalable Transport (BST) is a new transport protocol that streamlines communication of the BGP routing protocol, enhancing BGP's reliability, scalability and security. BST integrates into existing BGP implementations alongside of TCP. It is designed for network equipment vendors who want to provide dramatically enhanced BGP routers while maintaining compatibility with existing deployments.

As the Internet has grown, BGP has become a key limitation to achieving higher reliability and security of this critical infrastructure. Key BGP weaknesses addressed by BST are:

- Reliability
- Security
- Configuration
- Convergence
- Scalability

Transport Protocol: BGP's Central Issue

The crux of BGP's problem is that TCP, which is currently used as BGP's transport, does not scale to meet today's BGP transport requirements. As a point-to-point protocol, TCP sends data from one sender to one receiver. A connection must be kept open between every pair of routers (both external and internal peers), and many copies of the same information travel across the network simultaneously, rapidly consuming router resources. A full mesh of open TCP connections is highly inefficient even in a moderately-sized network of 10 or 20 routers. This large number of connections makes resource-intensive authentication and encryption a practical impossibility, and further leads to slow BGP convergence.

The BST Solution

BST eliminates the need for point-to-point communication by building on a technique called flooding to efficiently send messages between routers. An originating router sends a message to its immediate neighbors, which in turn, send it to their neighbors, and so on. No matter how large the network, there is at most one copy of a given message traversing a network link, and redundant links are efficiently and automatically exploited. Interior gateway protocols such as OSPF and EIGRP use flooding—long recognized as the fastest, most reliable way to disseminate information from one source to many destinations.

BST Benefits

Increased Reliability

- A flooding protocol that increases transport reliability and fault tolerance while reducing traffic
- BST implementation supports a variety of router failover schemes

Improved Scalability

- True linear scalability of peering capacity

Simplified Configuration

- Only BST neighbors need be configured rather than all peering pairs
- Eliminates the need for route reflectors or confederations (and can still enhance pre-existing route reflector configurations)

Speed Convergence

- Vastly reduces peering-loss and the churn this causes
- Flooding enables peers to synchronize faster after a failure or routing event

Security

- Simpler BST-enabled BGP topologies make IPSec processing practical
- Robust, per-packet authentication at the transport level

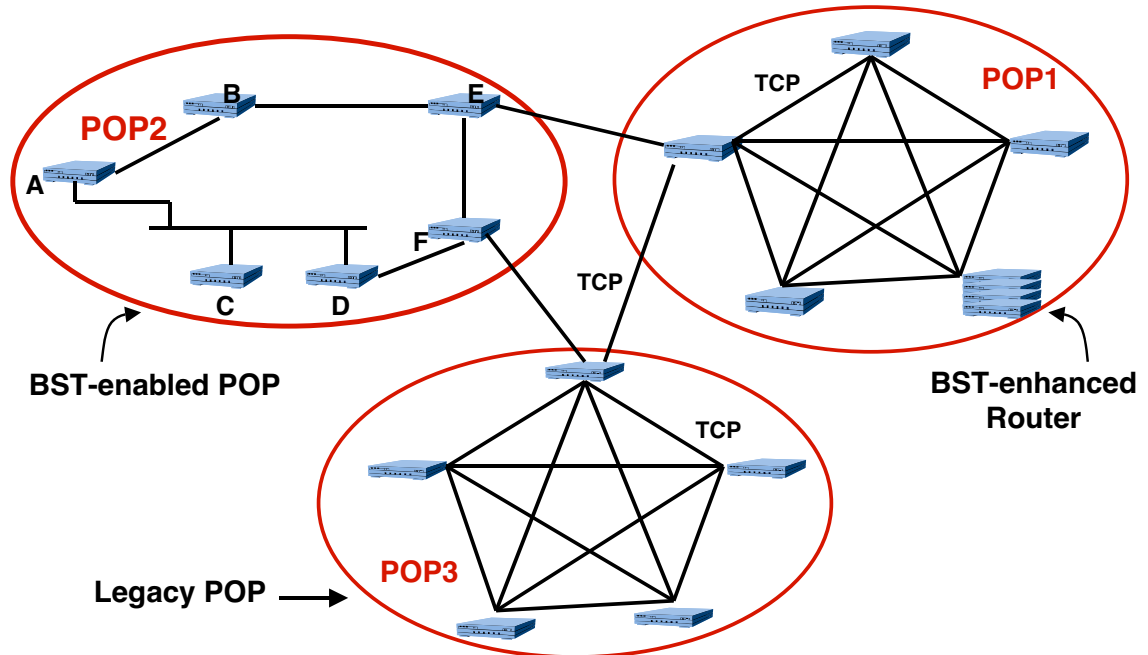
Compatibility

- No change to BGP protocol
- Fully compatible with routers running BGP over TCP
- BST is payload independent and can accommodate future BGP changes



Deploying BST

Network operators can deploy BST enhanced routers incrementally, maintaining complete compatibility with existing TCP-based BGP routers.



The diagram above illustrates how BST can be deployed:

- Between route processors in a single router
- Between routers in a POP
- Between POPs in an Autonomous System (AS)

Though not shown in this example, BST can also be used between ASes (EBGP)

Standard BST Deliverables

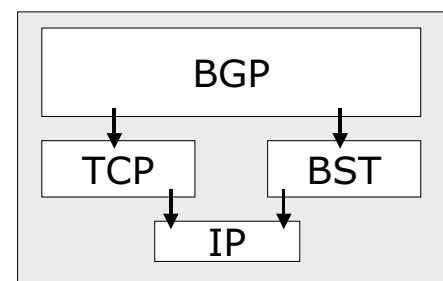
- ANSI-compliant C source
- Standard integration consulting package
- Modified GateD BGP implementation

Contact:

BST License Sales
Packet Design
3400 Hillview Avenue, Bldg. 3
Palo Alto, CA 94304
650.739.1850
email: bst-info@packetdesign.com

Implementing BST

Packet Design provides BST as a reference source code module. The reference product contains all of the tools necessary to build and test BST in a FreeBSD environment in conjunction with the GateD BGP stack.



The architectural relationship between BST and BGP is shown in the diagram above. While BST leaves the BGP protocol untouched, a router's BGP implementation will require a few changes to use BST for message passing instead of TCP. A BST license includes Packet Design consulting advice for this integration task.

BST technology has patents pending



Packet Design