BGP: Hydrogen: Release Notes

Contents

Major Features

The Hydrogen release of BGP/LS and PCEP project delivers the baseline support for the two protocols and applications which tie the protocols to the controller's MD-SAL infrastructure.

BGP support

- Core Border Gateway Protocol
  - RFC4271 - A Border Gateway Protocol 4 (BGP-4)
  - RFC4724 - Graceful Restart Mechanism for BGP
  - RFC4760 - Multiprotocol Extensions for BGP-4
  - RFC1997 - BGP Communities Attribute
  - RFC4360 - BGP Extended Communities Attribute
  - RFC6793 - BGP Support for Four-Octet Autonomous System (AS) Number Space
- Extended AFI/SAFI support
  - draft-ietf-idr-ls-distribution-04 - North-Bound Distribution of Link-State and TE Information using BGP

PCEP support

- Core Path Computation Element Protocol
  - RFC5440 - Path Computation Element (PCE) Communication Protocol (PCEP)
  - RFC5541 - Encoding of Objective Functions in the Path Computation Element Communication Protocol (PCEP)
  - RFC5455 - Diffserv-Aware Class-Type Object for the Path Computation Element Communication Protocol
  - RFC5521 - Extensions to the Path Computation Element Communication Protocol (PCEP) for Route Exclusions
  - RFC5557 - Path Computation Element Communication Protocol (PCEP) Requirements and Protocol Extensions in Support of Global Concurrent Optimization
- Stateful extensions to the Patch Computation Element Protocol, December 2012
  - draft-ietf-pce-stateful-pce-02 - PCEP Extensions for Stateful PCE
  - draft-crabbe-pce-pce-initiated-lsp-00 - PCEP Extensions for PCE-initiated LSP Setup in a Stateful PCE Model
- Stateful extensions to the Patch Computation Element Protocol, December 2013
  - draft-ietf-pce-stateful-pce-07 - PCEP Extensions for Stateful PCE
  - draft-ietf-pce-pce-initiated-lsp-00 - PCEP Extensions for PCE-initiated LSP Setup in a Stateful PCE Model

MD-SAL applications

- BGP Local Routing Information Base export
- Export of BGP/LS-sourced information to Level 3 (L3) Interior Gateway Protocol (IGP) Topology
- Export of PCEP-sourced Label Switched Path information as a Network Topology and support for initiating them

Programming pipeline

- Proposal for a north-bound programming pipeline, which can perform optimistic instruction scheduling and parallel execution. Used in the PCEP initiation interface.

Target Environment

For Execution

A Java 7-compliant runtime environment is sufficient to run the protocol libraries. An MD-SAL enabled container, such as the OpenDaylight Controller is required for operation of the MD-SAL application.

For Development

In order to participate on development, you will need some standard Java development environment which supports Maven projects hosted in Git. Core developers use Eclipse on Linux, but also plain console with vim/mvn/git, so pretty anything you are comfortable should work reasonably well.

Known Issues and Limitations

This release focused on getting the basic protocol working, with BGP getting more testing. The implementation has been tested to inter-operate with one major router vendor and its topology export was examined for consistency with underlying network topology. PCEP has only been tested to establish a stateful connection with a single major router vendor, but no further testing was done, so your mileage may vary.

- The BGP stack cannot interoperate with OLD Speakers as defined by RFC6793

- The BGP stack supports only active sessions, i.e. it no support for listening on the BGP port is provided. This will be addressed in the next major release.
- The BGP stack does not support disseminating routes, i.e. it can only receive information. This will be addressed in the next major release.
- The BGP stack advertises the following AFI/SAFIs when establishing session, without the ability for end-user to change it. This will be addressed in the next bugfix release.
  - IPv4/Unicast
  - IPv6/Unicast
  - Linkstate/Linkstate
- The BGP topology application produces inconsistent termination point information. This will be addressed in the next bugfix release.
- The BGP topology application can present outdated node information. This will be addressed in the next bugfix release.
- The PCEP topology application works only with the December 2013 Stateful extensions. This will be addressed in the next bugfix release.