**Broadcom Corporation Technical Publication**

**BGP BFD**

**Test Plan**

**Arlo Release with SONIC 2.0**

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# Test Strategy Plan Revision History

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| **Rev** | **Date** | **Author** | **Change Description** |
| 0.01 | 04/05/2019 | Sonic Dev Test | Initial Draft |
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# List of Approvers

This section identifies the participants required to approve this document. Enter function title, name and once approved at the meeting or by email trail, update the date field with the date approved.

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| **Function** | **Name** | **Date Approved** |
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# List of Reviewers

Section identifies optional reviewers.

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| **Function** | **Name** |
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# Abbreviations and Glossary

Add Abbreviations and Glossary terms here.

This section describes any words that the reader may not be familiar with or abbreviations used that the reader may not be familiar with. Do not include definitions or abbreviations that should be generally known by your audience.

**AT** Acceptance Testing

**CLI** Command Line Interface

**DOR** Dead Office Recovery

**FCT** Feature Confidence Test

**FT** Functional Testing

**GUI** Graphical User Interface

**IEEE** Institute of Electrical and Electronics Engineers

**IT** Integration test or Component Integration testing (CIT)

**IP**  Internet Protocol (implies version 4)

**IPv4** Internet Protocol version 4

**IPv6**  Internet Protocol version 6

**MIB**  Management Information Base

**NMS** Network Management System

**QA** Quality Assurance

RFT Regression Functional Test

**RIT** Release Integration Testing

**RoR** Release over Release

**SCT** System Confidence Test

**ST** System Test

**TA** Test Automation

TAM Test Automation Manager

**TFP** Test First Pass

**UI** User Interface

**UT** Unit Testing

**VLAN** Virtual Local Area Network

Add additional Abbreviations as it applies to this project.

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# Document Revision History

|  |  |  |  |
| --- | --- | --- | --- |
| **Date** | **Revision** | **Name** | **Comments** |
| 04/26/2019 | 0.1 | Sonic Dev Test | Initial Version |

# Test Plan Review History

|  |  |  |  |
| --- | --- | --- | --- |
| **Date** | **Name** | **Department** | **Comments** |
|  |  |  |  |

# Introduction

## Objective

The main objective of this document is to cover the test cases that will be executed for BGP BFD feature in Arlo release using Sonic 2.0. Topologies and test cases for testing the feature will be discussed as part of this document.

## Scope or list of requirement IDs

BGP BFD test cases will be covered in this test plan.

|  |  |
| --- | --- |
| SONiC2.0\_BFD\_001 | Support monitoring of forwarding path failure for BGP protocol. |
| SONiC2.0\_BFD\_002 | Support BFD single hop sessions. |
| SONiC2.0\_BFD\_003 | Support BFD multi hop sessions. |
| SONiC2.0\_BFD\_004 | Support Asynchronous mode of operation. |
| SONiC2.0\_BFD\_005 | Support Echo mode of operation. |
| SONiC2.0\_BFD\_006 | Support IPv4 address family. |
| SONiC2.0\_BFD\_007 | Support IPv6 address family. |
| SONiC2.0\_BFD\_008 | Support LAG interface. |
| SONiC2.0\_BFD\_009 | Support ECMP paths for multi hop session. |
| SONiC2.0\_BFD\_010 | Support FRR container warm reboot. |
| SONiC2.0\_BFD\_011 | Support 64 BFD sessions. |
| SONiC2.0\_BFD\_012 | Support minimum timeout interval of 300 milliseconds. |
| SONiC2.0\_BFD\_013 | Support VRF. |

### Out-of Scope

# Feature Descriptions

## Legacy Software Support

BGP BFD is not supported in previous releases

## New Software Functionality Supported

BGP BFD is supported from the Arlo release in Sonic 2.0

## Other features enabled in this test plan

Various L2/L3 features will be enabled while testing the feature.

## Qualified Broadcom Platforms

|  |  |
| --- | --- |
| **Platform** | **Features under Test enabled** |
| AS7786/TH2 | BGP BFD |
| AS7712/TH1 | BGP BFD |
| vSONIC | BGP BFD |

## Upgrade-downgrade support details

## Customer Use Cases

# Test Environment

## Other Vendor Equipment

The following vendor equipment will be used as part of various tests in this test design:

|  |  |  |  |
| --- | --- | --- | --- |
| **Type** | **Vendor** | **Model** | **Note** |
| STC Traffic generator | Spirent |  |  |

## Monitoring

The following monitoring will be conducted in the background:

* SNMP MIB walks in the background: Need to check if supported
* SNMP MIB get and polling for statistics: Need to check if supported
* REST: Need to check if supported

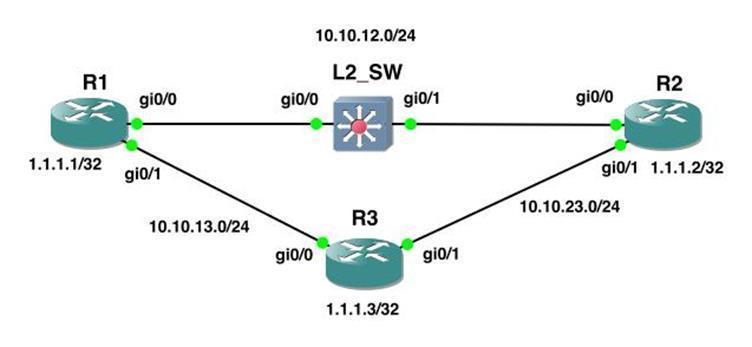
## Area that MUST be verified as part of expected results on each test

## Network Test Topology

Depicted below are the typical test scenario diagrams and actual Network Topologies used to execute this Test Plan.

The test scenarios depict the typical connections that will be used during test execution in respective Network Topologies.

Topology 1: Most of the test case planned to use this topology



# Detailed Description

This section covers all actual test cases. Please dedicate Section 4.x for each sub-feature and under each 4.x please have all following sections. If any sub-section is not relevant to the area, please still leave it there and mark content as “N/A” (Example: Some area won’t have RFC Conformance).

Each Sub-feature will have standard following sub-sections.

1. Functional Tests – Objective is to validate Sub-features in a recommended use-case based topology.
2. Scalability – This section validates Uni-dimensional and Multi-dimensional Scale testing.
3. Stress – Repeated tests to stress the system.
4. Soak – Longevity tests
5. Performance (RFC Conformance and Other metric collection for Prod mgmt)
6. FIST – Feature Integration and Stability Tests.
7. Interoperability specific tests
8. Memory Leak and CPU Profiling
9. Config Management (CLI)
10. Upgrade-downgrade Considerations
11. Monitoring

Almost all these test cases executed with the following feature enabled unless otherwise mentioned

* L3 protocol config like BGP
* IPv4 and IPv6 config on L3 interfaces

All types of interfaces supported and 4X10G Breakout interfaces are used as edge port either directly connected to Traffic Generator or one Layer 2 Switche. And most test cases are executed on dual stack interfaces

Almost all these Test cases will have these standard triggers unless otherwise mentioned.

* Docker restart
* Uplink and Downlink interface flaps

## Functional Tests

All following functional tests will be executed on above topologies with following configurations enabled. Please note that even basic feature verification may be done with other variables in place such IP traffic, background monitoring etc as listed below.

**Sample configuration:**

**Under /etc/sonic/frr/frr.conf**

router bgp 65100

neighbor 50.1.1.11 remote-as 11

neighbor 50.1.1.11 bfd

neighbor 5000::11 remote-as 11

neighbor 5000::11 bfd

!

address-family ipv6 unicast

neighbor 5000::11 activate

exit-address-family

bfd

peer 5000::11 local-address 5000::10 interface Ethernet100

detect-multiplier 4

receive-interval 101

transmit-interval 100

no shutdown

!

peer 50.1.1.11 interface Ethernet100

detect-multiplier 5

receive-interval 201

transmit-interval 200

no shutdown

**Under /etc/sonic/config\_db.json**

"INTERFACE": {

"Ethernet80|10.0.0.40/31": {},

"Ethernet84|10.0.0.42/31": {},

**"Ethernet100|50.1.1.10/24": {},**

"Ethernet100|60.1.1.10/24": {},

"Ethernet100|5000::10/64": {},

"Ethernet124|10.0.0.62/31": {}

},

**sonic#** **sh bfd peers**

BFD Peers:

peer 5000::11 local-address 5000::10 interface Ethernet100

ID: 2

Remote ID: 3

Status: up

Uptime: 3 hour(s), 2 minute(s), 42 second(s)

Diagnostics: ok

Remote diagnostics: ok

Local timers:

Receive interval: 101ms

Transmission interval: 100ms

Echo transmission interval: disabled

Remote timers:

Receive interval: 200ms

Transmission interval: 200ms

Echo transmission interval: 0ms

peer 50.1.1.11 interface Ethernet100

ID: 1

Remote ID: 5

Status: up

Uptime: 1 hour(s), 13 minute(s), 11 second(s)

Diagnostics: ok

Remote diagnostics: ok

Local timers:

Receive interval: 201ms

Transmission interval: 200ms

Echo transmission interval: disabled

Remote timers:

Receive interval: 200ms

Transmission interval: 200ms

Echo transmission interval: 0ms

sonic#

**sonic# show bfd peers counters**

BFD Peers:

peer 5000::11 local-address 5000::10 interface Ethernet100

Control packet input: 16861 packets

Control packet output: 17125 packets

Echo packet input: 0 packets

Echo packet output: 0 packets

Session up events: 1

Session down events: 0

Zebra notifications: 2

peer 50.1.1.11 interface Ethernet100

Control packet input: 15919 packets

Control packet output: 16960 packets

Echo packet input: 0 packets

Echo packet output: 0 packets

Session up events: 3

Session down events: 2

Zebra notifications: 7

**sonic#**

### BFD CLI test cases

##### Verify BFD config is present in /etc/sonic/frr/frr.conf

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn001 | |
| **Title / Test Name** | Verify BFD config is present in /etc/sonic/frr/frr.conf | |
| **Description** | Verify BFD config is present in /etc/sonic/frr/frr.conf | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**   * Verify the interface specific config like vlan and ve and router port config is present under /etc/sonic/config\_db.json. * Verify the BGP and BFD specific config is present under /etc/sonic/frr/frr.conf * Verify the structure of JSON file in proper order for BGP and BFD config. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

##### Verify BFD config help string and error messages

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn002 | |
| **Title / Test Name** | Verify BFD config help string and error messages. | |
| **Description** | Verify BFD config help string and error messages | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**   * Verify that valid error message is displayed when we apply invalid BFD command. * Verify if help string is displayed for BFD specific commands when we apply -? or --help in the end. * Exact CLI need to be updated here. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

### BFD configured on IPv4 BGP neighbors

##### BFD on iBGP neighborship in Spine to leaf topology

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn003 | |
| **Title / Test Name** | Verify BFD on iBGP neighborship in Spine to leaf topology | |
| **Description** | Verify BFD on iBGP neighborship in Spine to leaf topology | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**   * Establish iBGP neighborship between two nodes connected via an L2 switch to simulate remote link down events * Configure BFD between these neighbors * Have an alternate less preferred path learned via BGP between the same set of peers * Establish traffic across two end points through this BGP session. Also have alternate path between the end points through other means * Simulate link down events between the peer and the L2 switch * On link failure verify that BFD kicks in and informs BGP to teardown the session immediately. * Retrieve the routes learned via the above iBGP neighbor and verify that the above next hop is removed and alternate next hop is shown if there is a path. * Monitor the traffic and observe that traffic is redirected through alternate path | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

##### BFD on multi-hop iBGP neighborship between spine and leaf

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn004 | |
| **Title / Test Name** | Verify BFD on multi-hop iBGP neighborship between spine and leaf | |
| **Description** | Verify BFD on multi-hop iBGP neighborship between spine and leaf | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**   * Establish multi-hop iBGP neighborship between two or more nodes using IGP as static route to reach the end points. Use ipv4 address for the BGP session. * Configure BFD between these neighbors * Have an alternate less preferred path learned via BGP between the same set of peers * Bring down one of the links between the peers * Verify that BFD brings down the BGP peer between these nodes. * Retrieve the next hop of routes learned via this BGP neighbor and verify that neighbor is no more shown * Repeat the test with iBGP through loopback and then silently removing the loopback ip address * Also repeat the test with enabling BFD on the underlying IGP static route in combination with BFD on BGP peer themselves. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

##### BFD on multi-hop eBGP neighborship between spine and leaf

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn005 | |
| **Title / Test Name** | Verify BFD on multi-hop eBGP neighborship between spine and leaf | |
| **Description** | Verify BFD on multi-hop eBGP neighborship between spine and leaf | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**   * Configure and Establish eBGP neighborship between two routers. Use ipv4 address for BGP session. * Configure BFD between these BGP Peers * Have an alternate less preferred path learned via BGP between the same set of peers * Connect a L2 switch between the peers to simulate intermediate link failures * Bring the link down and verify that BFD brings down the BGP neighborship between these nodes immediately * Retrieve routes learned via this BGP peer and verify that the next hop pointing to this neighbor is not mire shown in next hop table. * Check traffic streams and verify that traffic is redirected to alternate path if exists. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

##### BFD on multi-hop IPv4 iBGP with update source

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn006 | |
| **Title / Test Name** | Verify BFD on multi-hop IPv4 iBGP with update source | |
| **Description** | Verify BFD on multi-hop IPv4 iBGP with update source | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**   * Establish multi-hop iBGP neighborship between two nodes using loopback address as end points. Use update source command. * Configure BFD between these neighbors * Have an alternate less preferred path learned via BGP between the same set of peers * Bring down one of the link between the peers * Verify that BFD brings down the BGP peer between these nodes. * Retrieve the next hop of routes learned via this BGP neighbor and verify that neighbor is no more shown | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

##### BFD on multi-hop IPv4 eBGP with update source

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn007 | |
| **Title / Test Name** | Verify BFD on multi-hop IPv4 eBGP with update source | |
| **Description** | Verify BFD on multi-hop IPv4 eBGP with update source | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**   * Configure and Establish multi-hop eBGP neighborship between two routers with Static routing as IGP * Use update source command to select either loopback or interface IP as the source/destination IP address used for the BGP session * Configure BFD between these BGP Peers choosing the above IP address used for update source * Verify that BGP and BFD sessions are established * Have an alternate less preferred path learned via BGP between the same set of peers * Connect a L2 switch between the peers to simulate intermediate link failures * Bring the link down and verify that BFD brings down the BGP neighborship between these nodes immediately * Retrieve routes learned via this BGP peer and verify that the next hop pointing to this neighbor is not mire shown in next hop table. * Check traffic streams and verify that traffic is redirected to alternate path if exists * Repeat the test with update source for loopback, VE and physical router ports. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

##### BFD functionality along with IPv4 eBGP Fast Failover

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn008 | |
| **Title / Test Name** | Verify BFD functionality along with IPv4 eBGP Fast Failover | |
| **Description** | Verify BFD functionality along with IPv4 eBGP Fast Failover | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** | , , | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**   * Configure and Establish IPv4 eBGP neighborship between two nodes connected via a L2 switch * Configure and establish BFD sessions through across the same neighbors * Configure BGP Fast failover against the above neighbor where BFD is configured * Simulate link down between these neighbors through the L2 switch and Verify that BFD and BGP fast failover works together – BGP Fast failover takes precedence over BFD for directly connected eBGP neighbors. * Verify BFD functionality on multiple primary IPv4 address. * Verify BFD functionality over neighborship established through secondary address | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

##### BFD functionality for single-hop with echo mode enabled

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn009 | |
| **Title / Test Name** | Verify BFD functionality with echo mode enabled | |
| **Description** | Verify BFD functionality with echo mode enabled | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** | , , | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  **sonic(config)# bfd**  **sonic(config-bfd)# peer 50.1.1.11**  **sonic(config-bfd-peer)# echo-mode**   * Configure and Establish single hop IPv4 iBGP/eBGP neighborship between two nodes connected via a L2 switch * Verify BFD session gets established * Enable BFD echo mode with default transmission interval and verify BFD echo packets are sent out and received it back again by peer * Configure different transmission interval and verify * Verify echo packets rx timeout due to link failure * Verify echo mode not supported for multihop bgp session | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

##### BFD functionality under BGP peer-group

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn010 | |
| **Title / Test Name** | Verify BFD functionality under BGP peer-group | |
| **Description** | Verify BFD functionality under BGP peer-group | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** | , | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**   * Configure BGP peer-group and have 5 bgp ipv4 neighbors under peer-group * Enable BFD under BGP peer-group and verify all neighbors under BGP have BFD session enabled * Verify BFD sessions are established and it goes down if there is a link failure | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

##### BFD Tx and Rx stats for IPv4 BGP session

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn011 | |
| **Title / Test Name** | Verify BFD Tx and Rx stats for IPv4 BGP session | |
| **Description** | Verify BFD Tx and Rx stats for IPv4 BGP session | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** | , | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**   * Verify the Tx and Rx BGP BFD control packet for IPv4 BGP session. * Check if the stats are correctly populated or not. * Check the stats are shown for multiple IPv4 BGP sessions. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

### BFD configured on Ipv6 BGP neighbors

#### BFD on Ipv6 iBGP neighborship in Spine to leaf topology

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn012 | |
| **Title / Test Name** | Verify BFD on Ipv6 iBGP neighborship in Spine to leaf topology | |
| **Description** | Verify BFD on Ipv6 iBGP neighborship in Spine to leaf topology | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** | , | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**   * Configure some interfaces in default vrf. * Configure and setup BGP neighborship using the interface IPv6 address. * Configure BFD between the neighbors * Simulate link down events between the peer and the L2 switch * On link failure verify that BFD kicks in and informs BGP to teardown the session immediately. * Retrieve the routes learned via the above iBGP neighbor and verify that the above next hop is removed and alternate next hop is shown if there is a path. * Monitor the traffic and observe that traffic is redirected through alternate path * Repeat the test with multi-hop iBGP through loopback. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

#### BFD on multi-hop iBGP neighborship between spine and leaf

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn013 | |
| **Title / Test Name** | Verify BFD on multi-hop iBGP neighborship between spine and leaf | |
| **Description** | Verify BFD on multi-hop iBGP neighborship between spine and leaf | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** | , | |
| **Basic feature Sanity** | Sanity | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**   * Establish multi-hop iBGP neighborship between two or more nodes using IGP as static route to reach the end points. Use ipv6 address for the BGP session. * Configure BFD between these neighbors * Have an alternate less preferred path learned via BGP between the same set of peers * Bring down one of the links between the peers * Verify that BFD brings down the BGP peer between these nodes. * Retrieve the next hop of routes learned via this BGP neighbor and verify that neighbor is no more shown * Repeat the test with iBGP through loopback and then silently removing the loopback ip address * Also repeat the test with enabling BFD on the underlying IGP static route in combination with BFD on BGP peer themselves. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

#### BFD on multi-hop eBGP neighborship between spine and leaf

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn014 | |
| **Title / Test Name** | Verify BFD on multi-hop eBGP neighborship between spine and leaf | |
| **Description** | Verify BFD on multi-hop eBGP neighborship between spine and leaf | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** | , | |
| **Basic feature Sanity** | Sanity | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**   * Configure and Establish eBGP neighborship between two routers. Use ipv6 address for BGP session. * Configure BFD between these BGP Peers * Have an alternate less preferred path learned via BGP between the same set of peers * Connect a L2 switch between the peers to simulate intermediate link failures * Bring the link down and verify that BFD brings down the BGP neighborship between these nodes immediately * Retrieve routes learned via this BGP peer and verify that the next hop pointing to this neighbor is not mire shown in next hop table. * Check traffic streams and verify that traffic is redirected to alternate path if exists. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

#### BFD functionality under BGP peer-group

|  |  |
| --- | --- |
| **Test Case Details** | |
| **Test case ID** | FtRtBfdFn015 |
| **Title / Test Name** | Verify BFD functionality under BGP peer-group |
| **Description** | Verify BFD functionality under BGP peer-group |
| **Test Setup** | Topology 1 |
| **Manual Execution** | No |
| **Automation Status** | Yes |
| **Automation Priority** | High |
| **Interface Mode** | , |
| **Basic feature Sanity** | Functional |
| **High Availability** | No |
| **New in Release** | Sonic 2.0 |
| **Platform Dependent** | No |
| **RCA Numbers** |  |
| **Test Procedure:**   * Configure BGP peer-group and have 5 bgp ipv6 neighbors under peer-group * Enable BFD under BGP peer-group and verify all neighbors under BGP have BFD session enabled * Verify BFD sessions are established and it goes down if there is a link failure | |

#### BFD on multi-hop IPv6 iBGP with update source

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn016 | |
| **Title / Test Name** | Verify BFD on multi-hop IPv6 iBGP with update source | |
| **Description** | Verify BFD on multi-hop IPv6 iBGP with update source | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**   * Simulate link down events between the peer and the L2 switch * On link failure verify that BFD kicks in and informs BGP to teardown the session immediately. * Retrieve the routes learned via the above iBGP neighbor and verify that the above next hop is removed and alternate next hop is shown if there is a path. * Monitor the traffic and observe that traffic is redirected through alternate path. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

#### BFD on multi-hop IPv6 eBGP with update source

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn017 | |
| **Title / Test Name** | Verify BFD on multi-hop IPv6 eBGP with update source | |
| **Description** | Verify BFD on multi-hop IPv6 eBGP with update source | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**   * Configure and Establish multi-hop eBGP neighborship between two routers with Static routing as IGP * Use update source command to select either loopback or interface IPv6 as the source/destination IPv6 address used for the BGP session * Configure BFD between these BGP Peers choosing the above IPv6 address used for update source * Verify that BGP and BFD sessions are established * Have an alternate less preferred path learned via BGP between the same set of peers * Connect a L2 switch between the peers to simulate intermediate link failures * Bring the link down and verify that BFD brings down the BGP neighborship between these nodes immediately * Retrieve routes learned via this BGP peer and verify that the next hop pointing to this neighbor is not mire shown in next hop table. * Check traffic streams and verify that traffic is redirected to alternate path if exists * Repeat the test with update source for loopback, VE and physical router ports. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

#### BFD functionality along with IPv6 eBGP Fast Failover

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn018 | |
| **Title / Test Name** | Verify BFD functionality along with IPv6 eBGP Fast Failover | |
| **Description** | Verify BFD functionality along with IPv6 eBGP Fast Failover | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**   * Configure and Establish IPv6 eBGP neighborship between two nodes connected via a L2 switch * Configure and establish BFD sessions through across the same neighbors * Configure BGP Fast failover against the above neighbor where BFD is configured * Simulate link down between these neighbors through the L2 switch and Verify that BFD and BGP fast failover works together – BGP Fast failover takes precedence over BFD for directly connected eBGP neighbors * Repeat the test with IPv6 link local address configured as eBGP peers. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

#### BFD functionality through link local BGP sessions

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn019 | |
| **Title / Test Name** | Verify BFD functionality through link local BGP sessions | |
| **Description** | Verify BFD functionality through link local BGP sessions | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**   * Configure and Establish BGP neighborship over link local IPv6 address * Configure and establish BFD over link local neighbors * Have a L2 switch between the peers and simulate a link down event and verify that BFD is bringing down * Simulate link down using the L2 switch and verify that protocol neighborship is brought down as per BFD timer and instead of waiting for BGP timer. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

#### BFD stats for IPv6 BGP session

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn020 | |
| **Title / Test Name** | Verify BFD Tx and Rx stats for IPv6 BGP session | |
| **Description** | Verify BFD Tx and Rx stats for IPv6 BGP session | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**   * Verify the Tx and Rx BGP BFD control packet for IPv6 BGP session. * Check if the stats are correctly populated or not. * Check the stats are shown for multiple IPv6 BGP sessions. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

### BFD on a dual stack interface

#### Enable BFD on both Ipv4 & V6 BGP session, flapping either one of it shouldn't affect the other

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn021 | |
| **Title / Test Name** | Enable BFD on both Ipv4 & V6 BGP session, flapping either one of it shouldn't affect the other | |
| **Description** | Verify BFD on both Ipv4 & V6 BGP session, flapping either one of it shouldn't affect the other | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Sanity | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**   * Configure and Establish BGP neighbors on a dual stack interface * Configure and Establish BFD on both IPv4 and IPv6 peers with different BFD parameters like Tx interval, Rx interval and timer for IPv4 and IPv6 peers. * Simulate link down through the L2 switch and verify that BFD works independently for address family based on the configured parameters. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

#### BFD on dual stack with each address family requesting different BFD timers

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn022 | |
| **Title / Test Name** | Verify BFD on dual stack with each address family requesting different BFD timers | |
| **Description** | Verify BFD on dual stack with each address family requesting different BFD timers | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Sanity | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**   * Configure and Establish BGP neighbors on a dual stack interface * Configure and Establish BFD on both IPv4 and IPv6 peers with different BFD parameters like Tx interval, Rx interval and timer for IPv4 and IPv6 peers. * Simulate link down through the L2 switch and verify that BFD works independently for address family based on the configured parameters. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

#### Verify single-hop BFD session with two L2-swithces between BGP neighbors

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn023 | |
| **Title / Test Name** | Enabling BGP BFD session using two L2 switch b/w two DUTs. | |
| **Description** | Verify BGP BFD session using two L2 switch b/w two DUTs. | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Mode** | Bare metal mode | |
| **Interface Mode** | , MLAG | |
| **Basic feature Sanity** | Sanity | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**   * Connect two DUTs via L2 switch link, mapped to a VLAN and configured VE on that * Configure and Establish BGP neighborship over VE over this L2 switch port and verify neighborship is established * Connect two L2 devices between these two DUTs * Configure BFD between these neighbors and verify BFD sessions is established * Bring down the link between the two L2 switches * Verify that BFD brings down the BGP session * Retrieve the routes learned via this neighbor * Verify that the above BGP neighbor is no longer shown as a valid next hop. * Check the traffic and verify that it is redirected towards alternate path if exists. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

#### Configuring BFD on BGP over LAG interfaces along with min link feature enabled on LAG

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn024 | |
| **Title / Test Name** | Configuring BFD on BGP over LAG interfaces along with min link feature enabled on LAG | |
| **Description** | Verify Configuring BFD on BGP over LAG interfaces along with min link feature enabled on LAG | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**   * Connect two DUTs via LAG interface over Ve interface, and map to a VLAN and configured VE on that * Configure and Establish BGP neighborship over VE over this LAG and verify neighborship is established * Connect a L2 device between these two DUTs on the link having the primary link. * Configure minimum link feature for LAG to be up. * Configure BFD between these neighbors and verify BFD sessions is established * Bring down the link between L2 switch and one of the Rbridge * Verify that BFD brings down the BGP session * Retrieve the routes learned via this neighbor * Verify that the above BGP neighbor is no longer shown as a valid next hop. * Check the traffic and verify that it is redirected towards alternate path if exists. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

#### Enable BFD peering with a neighbor undergoing state changes from Active/open to establish

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn025 | |
| **Title / Test Name** | Enable BFD peering with a neighbor undergoing state changes from Active/open to establish | |
| **Description** | Verify Enable BFD peering with a neighbor undergoing state changes from Active/open to establish | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** | , MLAG | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**   * Configure and Establish BGP sessions between two DUTs with default timers * Configure and Establish BFD sessions for a BGP neighbor pair with default timer values * Bring down the BGP session using the neighbor shutdown and verify that BFD session is still active * Perform various other transition to the BGP neighbor via BGP parameter modification and verify that BFD sessions stays up | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

#### Verify change in interface IP address used for BFD session

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn026 | |
| **Title / Test Name** | Verify changing the interface IP address used for BFD session | |
| **Description** | Verify changing the interface IP address used for BFD session | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Sanity | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  Verify the change in interface ip address used for existing BGP BFD session will flap the BGP BFD session.  Verify BFD source ip address is updated with the new ip IPv4 or IPv6 address. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

#### Verify BGP BFD on L3 LAG interface

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn027 | |
| **Title / Test Name** | Verify BGP BFD on L3 LAG interface | |
| **Description** | Verify BGP BFD on L3 LAG interface | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Sanity | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  Verify BFD session is established using the L3 interface as LAG interface. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

### Flapping the ECMP link between spine and leaf using following triggers and make sure BFD sessions are re-established

#### Flapping ECMP link by unbinding ve with vlan interface

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn028 | |
| **Title / Test Name** | Flapping ECMP link by unbinding ve with vlan interface | |
| **Description** | Verify Flapping ECMP link by unbinding ve with vlan interface | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Sanity | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**   * Configure and establish ECMP via VE interfaces between two DUTs * Configure and Establish BFD between these end points * Verify BFD functionality through ECMP through VE path. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

#### Shutting down the ECMP link and verify the BGP is session is up if any one of the links is up

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn029 | |
| **Title / Test Name** | Shutting down the ECMP link and verify the BGP is session is up if any one of the links is up | |
| **Description** | Verify Shutting down the ECMP link and verify the BGP is session is up if any one of the links is up | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Sanity | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**   * Configure ECMP static route * Configure and establish BFD sessions between these neighbors on all ECMP paths * Verify that static routes are installed in routing table * Bring down the router links between the nodes and retrieve the BFD sessions and static route. * Verify that BGP is session is up if any one of the link is up * Verify that BFD session is tear down and static route is removed from ribmgr if all the links goes down. * Verify the BFD packet will choose one of the next hop IP as BFD source address. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

#### Reduce the max-ecmp paths under BGP address-family and verify BFD session is up

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn030 | |
| **Title / Test Name** | Verify BFD session is up after reducing max ecmp paths under BGP | |
| **Description** | Verify BFD session is up after reducing max ecmp paths under BGP | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Sanity | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**   * Configure ECMP static route * Configure and establish BFD sessions between these neighbors on all ECMP paths * Verify that static routes are installed in routing table * Reduce the max ecmp paths from 4 to 2 under BGP ipv4/ipv6 address families * Verify that BGP is session is up if any one of the link is up * Verify that BFD session is tear down and static route is removed from ribmgr if all the links goes down. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

#### Shutting down vlan interface used for BFD session

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn031 | |
| **Title / Test Name** | Verify Shutting down vlan interface used for BFD session | |
| **Description** | Verify Shutting down vlan interface used for BFD session | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Sanity | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**   * Configure ECMP static route * Configure and establish BFD sessions between these neighbors on all ECMP paths * Verify that static routes are installed in routing table * Bring down the VLAN link between the nodes and retrieve the BFD sessions and static route. * Verify that BGP is session is up if any one of the link is up * Verify that BFD session is tear down and static route is removed from ribmgr if all the links goes down. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

#### Verify Removing the port from vlan

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn032 | |
| **Title / Test Name** | Verify Removing the port from vlan | |
| **Description** | Verify Removing the port from vlan | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  We will verify the vlan to port association change when L2 port is not LAG.  We will also verify the port move from vlan A to VlanB.  Verify the BFD session flaps with correct reason code for this trigger. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

#### Removing the port from LAG

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn033 | |
| **Title / Test Name** | Verify Removing the port from LAG | |
| **Description** | Verify Removing the port from LAG | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  We will verify the vlan to port association change when L2 port is LAG.  We will also verify the port move from vlan A to VlanB. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

#### Deleting the LAG used for Ve in BFD session

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn034 | |
| **Title / Test Name** | Verify deleting the LAG used for Ve in BFD session | |
| **Description** | Verify deleting the LAG used for Ve in BFD sessio | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  Verify the port-channel creations/removals single time which is used for ve.  Verify the BFD session flaps with correct reason code for this trigger. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

#### Deleting IP address from Physical/Vlan interface

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn035 | |
| **Title / Test Name** | Verify deleting IP address from Physical/Vlan interface | |
| **Description** | Verify deleting IP address from Physical/Vlan interface | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  Verify the delete and addition of same IP address on physical/Vlan port.  Verify the BFD session flaps with correct reason code for this trigger. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

### BFD session is torn down and BGP loses adjacency under the below given conditions and than BFD session will come up when BGP neighbor is adjacent again

#### Removing BGP configuration on global level

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn036 | |
| **Title / Test Name** | Verify removing BGP configuration on global level | |
| **Description** | Verify removing BGP configuration on global level | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Sanity | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**   * Configure single-hop and multi-hop BFD sessions over BGP * Configure BFD sessions for both ipv4 and ipv6 on default and non-default VRFs * Disable BFD globally under BGP and verify BFD sessions goes down. * Enable BFD back at global level and verify all BFD sessions comes up. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

#### Deleting and adding BFD under the BGP neighbor level

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn037 | |
| **Title / Test Name** | Verify deletion and addition BFD under the BGP neighbor level | |
| **Description** | Verify deletion and addition BFD under the BGP neighbor level | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Sanity | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  Verify deletion and addition of BF under BGP should be successful. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

#### Authentication key mismatch

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn038 | |
| **Title / Test Name** | Verify authentication key mismatch | |
| **Description** | Verify authentication key mismatch | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  Verify the BGP session goes down due to authentication mis-match.  Verify that BGP session goes down causes BFD session down. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

#### BGP session down due to multi-hop mis-match causes BFD down

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn039 | |
| **Title / Test Name** | BGP session down due to multi-hop mis-match causes BFD down | |
| **Description** | Verify session down due to multi-hop mis-match causes BFD down | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Sanity | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  Verify session down due to multi-hop mis-match causes BFD down. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

#### clear ip bgp & bgp neighbor shut

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn040 | |
| **Title / Test Name** | Verify clear ip bgp, bgp neighbor shut | |
| **Description** | Verify clear ip bgp, bgp neighbor shut | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  Apply the “clear ip/ipv6 bgp neighbor <neighbor-ip>/all” command.  Verify BGP goes down and it notifies BFD via Zebra and BFD session also goes down.  After BGP session comes up, BFD session also should come up | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

### BGP BFD On user VRF

#### BFD functionality on IPv4 iBGP neighborship in non-default VRF

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn041 | |
| **Title / Test Name** | BFD functionality on IPv4 iBGP neighborship in non-default VRF | |
| **Description** | Verify BFD functionality on IPv4 iBGP neighborship in non-default VRF | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Sanity | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  · Configure some non-default VRF and configure some interfaces  · Configure and setup BGP neighborship through the above VRF  · Configure BFD between the neighbors  · Simulate link down events and verify that BFD brings the BGP session in user VRF  · Repeat the test with multi-hop iBGP neighborship. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

#### BFD functionality on IPv4 eBGP neighborship in non-default VRF

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn042 | |
| **Title / Test Name** | BFD functionality on IPv4 eBGP neighborship in non-default VRF | |
| **Description** | Verify BFD functionality on IPv4 eBGP neighborship in non-default VRF | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Sanity | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  · Configure some non-default VRF and configure some interfaces  · Configure and setup BGP neighborship through the above VRF  · Configure BFD between the neighbors  · Simulate link down events and verify that BFD brings the BGP session in user VRF. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

#### BFD functionality on multi-hop IPv4 eBGP neighborship in non-default VRF

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn043 | |
| **Title / Test Name** | BFD functionality on multi-hop IPv4 eBGP neighborship in non-default VRF | |
| **Description** | Verify BFD functionality on multi-hop IPv4 eBGP neighborship in non-default VRF | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** | , MLAG | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  · Configure some non-default VRF and configure some interfaces  · Configure and setup multi-hop eBGP neighborship through the above VRF  · Configure BFD between the neighbors  · Simulate link down events and verify that BFD brings the BGP session in user VRF. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

#### BFD functionality on IPv6 iBGP neighborship in non-default VRF

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn044 | |
| **Title / Test Name** | Verify BFD functionality on IPv6 iBGP neighborship in non-default VRF | |
| **Description** | Verify BFD functionality on IPv6 iBGP neighborship in non-default VRF | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** | , MLAG | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  · Configure some non-default VRF and configure some interfaces  · Configure and setup BGP neighborship through the above VRF  · Configure BFD between the neighbors  · Simulate link down events and verify that BFD brings the BGP session in user VRF  · Repeat the test with multi-hop iBGP through loopback. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

#### BFD functionality on IPv6 eBGP neighborship in non-default VRF

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn045 | |
| **Title / Test Name** | Verify BFD functionality on IPv6 eBGP neighborship in non-default VRF | |
| **Description** | Verify BFD functionality on IPv6 eBGP neighborship in non-default VRF | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** | , MLAG | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  · Configure some non-default VRF and configure some interfaces  · Configure and setup BGP neighborship through the above VRF  · Configure BFD between the neighbors  · Simulate link down events and verify that BFD brings the BGP session in user VRF. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

#### BFD functionality on multi-hop IPv6 eBGP neighborship in non-default VRF

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn046 | |
| **Title / Test Name** | BFD functionality on multi-hop IPv6 eBGP neighborship in non-default VRF | |
| **Description** | Verify BFD functionality on multi-hop IPv6 eBGP neighborship in non-default VRF | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Sanity | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  · Configure some non-default VRF and configure some interfaces  · Configure and setup multi-hop eBGP neighborship through the above VRF  · Configure BFD between the neighbors  · Simulate link down events and verify that BFD brings the BGP session in user VRF. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

#### BFD session is up when BGP adjacency is established over LAG in non-default VRF

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn047 | |
| **Title / Test Name** | BFD session is up when BGP adjacency is established over LAG in non-default | |
| **Description** | Verify BFD session is up when BGP adjacency is established over LAG in non-default | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Sanity | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  Need to clarify how to bring up topology for BFD test with LAG and L2 SW in b/w ?  Is topology like below ?  TG P1 ---- DUT 1 ---Trunk --- L2 SW [LAG] ==Trunk== [LAG] DUT 2 ------ TG P2 | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

#### BGP BFD holdover interval- BFD session goes Down and UP with in the configured holdover interval in non-default VRF

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn048 | |
| **Title / Test Name** | BGP BFD holdover interval- BFD session goes Down and UP with in the configured holdover interval in non-default VRF | |
| **Description** | Verify BGP BFD holdover interval- BFD session goes Down and UP with in the configured holdover interval in non-default VRF | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Sanity | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  · Configure and Establish BGP neighborship between two DUTs  · Configure and Establish BFD session between these two peers  · Configure holdover-interval time interval between these pairs  · Simulate link down event and verify that BFD session is down  · Check the BGP neighborship and observe that BGP neighborship is not down immediately and takes holdover time to bring down. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

#### Different holdover interval between DUTs in non-default VRF

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn049 | |
| **Title / Test Name** | Verify Different holdover interval between DUTs in non-default VRF | |
| **Description** | Verify Different holdover interval between DUTs in non-default VRF | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** | , MLAG | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  Configure different holdover interval between DUTs in non-default VRF | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

#### Delete and add BGP config under VRF with BFD configured at global level

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn050 | |
| **Title / Test Name** | Delete and add VRF at global level with BFD configured | |
| **Description** | Verify delete and add BGP configuration under VRF with BFD configured at global level. | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** | , MLAG | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  Delete and add BGP configuration under VRF with BFD configured at global level. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

### BGP BFD Timer test cases

#### BFD functionality BGP Hold timer less than BFD timer

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn051 | |
| **Title / Test Name** | BFD functionality BGP Hold timer less than BFD timer | |
| **Description** | Verify BFD functionality BGP Hold timer less than BFD timer | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  · Configure and Establish BGP session between two DUTs  · Configure Keepalive timer and Holdtimer to the lowest value (like 1 second of keepalive and 3 seconds of hold timer) and re-establish the BGP neighborship  · Configure and Establish BFD session between these peers with BFD tx/rx timer value of 5 seconds  · Simulate a link down event between the peers and verify that BGP neighborship goes down before BFD triggers the neighborship down event – verify this functionality using raslog message that BFD sessions went down  · Repeat the test with various timer values.  ·. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

#### BFD timer modification for already established sessions

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn052 | |
| **Title / Test Name** | BFD timer modification for already established sessions | |
| **Description** | Verify BFD timer modification for already established sessions | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  · Configure and Establish BGP sessions between two DUTs with default timers  · Configure and Establish BFD sessions for a BGP neighbor pair with default timer values  · Now modify the BFD timers like tx-interval, min-rx interval etc  · Verify that BFD timer modification should not reset already established BFD sessions  · Verify that BFD timer modification change should not reset the already established BGP sessions. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

#### BFD with default timer values

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn053 | |
| **Title / Test Name** | BFD with default timer values | |
| **Description** | Verify BFD with default timer values | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**   * Configure and Establish BGP between two DUTs * Configure BFD session between these peers with default values for all timers * Simulate link down event and verify that BFD is triggering neighborship down for BGP protocol. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

#### BFD with global BGP level timer values

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn054 | |
| **Title / Test Name** | BFD with global BGP level timer values | |
| **Description** | Verify BFD with global BGP level timer values | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  · Configure and Establish BGP neighborship between two DUTs  · Configure non-default rx/tx –intervals  · Configure and establish BFD neighborship between these peers . Verify BFD uses timer values configured under neighbor  . Remove the timers configured under neighbor and verify it inherits the global default timer values of 300 ms  · Simulate link down and verify that BFD tears down BGP sessions as per the timer config. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

#### BFD with neighbor level parameter values

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn055 | |
| **Title / Test Name** | BFD with neighbor level parameter values | |
| **Description** | Verify BFD with neighbor level parameter values | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  · Configure and Establish multiple BGP neighborship between two DUTs  · Configure different non-default BFD parameters for each peer for the BGP sessions  · Verify each BFD peer uses its own timer configuration  . Moidfy the timer values for few peer and reset to default timer value for few peers  · Simulate link down and verify that BFD tears down BGP peer as per the timer value. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

#### BFD timer parameter hierarchy for IPv4 sessions

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn056 | |
| **Title / Test Name** | BFD timer parameter hierarchy for IPv4 sessions | |
| **Description** | Verify BFD timer parameter hierarchy for IPv4 sessions | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  · Configure and Establish BGP neighborship between two DUTs  · Simulate link down and verify that BFD picks default timer values  · Simulate link down and verify that BFD picks the default timer configured at the global level  · Configure non-default BFD parameters at the neighbor group level for the BGP sessions  · Simulate link down and verify that BFD picks the non-default timer configured at the neighbor groups level  · Configure non-default BFD parameters at the neighbor level  · Simulate link down and verify that BFD picks the non-default timer configured at the neighbor level  · Unconfigure the timers above and verify that the timers are picked in the opposite order. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

#### BFD timer parameter hierarchy for IPv6 sessions

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn057 | |
| **Title / Test Name** | BFD timer parameter hierarchy for IPv6 sessions | |
| **Description** | Verify BFD timer parameter hierarchy for IPv6 sessions | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  · Configure and Establish BGP neighborship between two DUTs  · Simulate link down and verify that BFD picks default timer values  · Configure non-default BFD parameters at the global level  · Simulate link down and verify that BFD picks the non-default timer configured at the global level  · Configure non-default BFD parameters at the neighbor group level for the BGP sessions  · Simulate link down and verify that BFD picks the non-default timer configured at the neighbor groups level  · Configure non-default BFD parameters at the neighbor level  · Simulate link down and verify that BFD picks the non-default timer configured at the neighbor level  · Unconfigure the timers above and verify that the timers are picked in the opposite order. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

### RestAPI ,SNMP Test Cases

#### BFD configurations using REST methods

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn058 | |
| **Title / Test Name** | Verify BGP BFD with REST API | |
| **Description** | Verify BGP BFD with REST API | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  Configure all BFD configurations under BGP neighbors using REST methods POST,PUT,PATCH,GET and DELETE | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

#### Verify SNMP operations for BFD configurations

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn059 | |
| **Title / Test Name** | Verify BGP BFD with SNMP operations | |
| **Description** | Verify BGP BFD with SNMP operations | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  Configure BGD over BGP for both ipv4 and ipv6.  Perform SNMP operations GET,GET-NEXT,GET-BULK,WALK operations and verify BFD OID returns correct values | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

### Cold Boot

#### Verify BFD after config Save and Reload

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn060 | |
| **Title / Test Name** | config reload | |
| **Description** | Verify config reload | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  Verify the config replay of the BFD configuration across cold reboot.  Verify the BFD session flaps with correct reason code for this trigger in the partner box when local box undergone reload. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

### BGP Container restart

#### Verify BFD session after warm reboot OR BGP container restart

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn061 | |
| **Title / Test Name** | Verify BFD session after BGP container restart | |
| **Description** | Verify BFD session after BGP container restart | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  Verify the config replay of the BFD configuration across container restart.  Verify the BFD session flaps with correct reason code for this trigger in the partner box when local box undergone container restart.  Verify that this BGP container restart should result warm reboot. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

### Debugging aspect of BGP BFD session

##### BGP BFD raslog

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn062 | |
| **Title / Test Name** | Verify BGP BFD raslog | |
| **Description** | Verify BGP BFD raslog | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  Verify why BFD session goes down in case negative scenarios.  Verify if the RASLOG generated or not showing valid output/drop reason. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

##### BGP BFD packet drop reason

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn063 | |
| **Title / Test Name** | Verify BGP BFD packet drop reason | |
| **Description** | Verify BGP BFD packet drop reason | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  Verify why BFD session goes down.  Verify if the BFD control packet drop reason.  Check if drop reason showing is correct or not as per practical observation. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

##### BGP BFD packet error stats

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn064 | |
| **Title / Test Name** | Verify BGP BFD packet error stats incrementing or not | |
| **Description** | Verify BGP BFD packet error stats incrementing or not | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  Verify BGP BFD error counter increments when invalid BFD packets are Rx. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

##### BGP BFD internal debug command

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn065 | |
| **Title / Test Name** | Verify BGP BFD internal debug command | |
| **Description** | Verify BGP BFD internal debug command | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  Verify why BFD session goes down.  Verify the system internal commands if available. Check if it helps in identifying why BFD session went down. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

##### show tech support shows BFD debug symbols

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn066 | |
| **Title / Test Name** | Verify show tech support shows enough BFD debug symbols | |
| **Description** | Verify show tech support shows enough BFD debug symbols | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  Verify show tech support shows enough BGP BFD debug symbols both in positive and negative scenarios.  admin@sonic:~$ show techsupport | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

### Static BFD without BGP client

##### Verify static IPv4 single hop peer

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn067 | |
| **Title / Test Name** | Verify static ipv4 BFD session for single hop peer | |
| **Description** | Verify static ipv4 BFD session for single hop peer | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  Configure L3 interface between DUTs and make sure they are reachable  Configure static BFD for the peers under “BFD” and verify BFD session comes up.  Bring down the link and verify BFD session goes down after default timer values timeout  Configure different rx/tx time intervals and validate the behavior for static BFD session | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

##### Verify static IPv4 multi hop peer

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn068 | |
| **Title / Test Name** | Verify static ipv4 BFD session for multi hop peer | |
| **Description** | Verify static ipv4 BFD session for multi hop peer | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  Configure L3 interface between multihop DUTs and make sure they are reachable  Configure static BFD for the peers under “BFD” and verify BFD session comes up.  Bring down the link and verify BFD session goes down after default timer values timeout  Configure different rx/tx time intervals and validate the behavior for static BFD session | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

##### Verify static IPv4 single hop peer with local address

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn069 | |
| **Title / Test Name** | Verify static ipv4 BFD session for single hop peer with local address | |
| **Description** | Verify static ipv4 BFD session for single hop peer with local address | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  Configure L3 interface between DUTs and make sure they are reachable  Configure static BFD for the peers under “BFD” and verify BFD session comes up with local-address configured  Verify BFD packets are sent out with Source-ip as local-address  Bring down the link and verify BFD session goes down after default timer values timeout  Configure different rx/tx time intervals and validate the behavior for static BFD session | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

##### Verify static IPv4 single hop peer with interface

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn070 | |
| **Title / Test Name** | Verify static ipv4 BFD session for single hop peer with interface | |
| **Description** | Verify static ipv4 BFD session for single hop peer with interface | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  Configure L3 interface between DUTs and make sure they are reachable  Configure static BFD for the peers under “BFD” with outgoing interface configured and verify BFD session comes up.  Bring down the link and verify BFD session goes down after default timer values timeout  Configure different rx/tx time intervals and validate the behavior for static BFD session | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

##### Verify static IPv4 single hop peer with VRF

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn071 | |
| **Title / Test Name** | Verify static ipv4 BFD session for single hop peer with VRF | |
| **Description** | Verify static ipv4 BFD session for single hop peer with VRF | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  Configure L3 interface between DUTs and make sure they are reachable  Configure static BFD for the peers under “BFD” and specify VRF to be used  verify BFD session comes up on correct VRF instance specified  Bring down the link and verify BFD session goes down after default timer values timeout  Configure different rx/tx time intervals and validate the behavior for static BFD session | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

##### Verify static IPv4 multi hop peer with local address

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn072 | |
| **Title / Test Name** | Verify static ipv4 BFD session for multi hop peer with local address | |
| **Description** | Verify static ipv4 BFD session for multi hop peer with local address | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  Configure L3 interface between multihop DUTs and make sure they are reachable  Configure static BFD for the peers under “BFD” and verify BFD session comes up with local-address configured  Verify BFD packets are sent out with Source-ip as local-address  Bring down the link and verify BFD session goes down after default timer values timeout  Configure different rx/tx time intervals and validate the behavior for static BFD session | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

##### Verify static IPv4 multi hop peer with interface

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn073 | |
| **Title / Test Name** | Verify static ipv4 BFD session for multi hop peer with interface | |
| **Description** | Verify static ipv4 BFD session for multi hop peer with interface | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  Configure L3 interface between multihop DUTs and make sure they are reachable  Configure static BFD for the peers under “BFD” with outgoing interface configured and verify BFD session comes up.  Bring down the link and verify BFD session goes down after default timer values timeout  Configure different rx/tx time intervals and validate the behavior for static BFD session | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

##### Verify static IPv4 multi hop peer with VRF

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn074 | |
| **Title / Test Name** | Verify static ipv4 BFD session for multi hop peer with VRF | |
| **Description** | Verify static ipv4 BFD session for multi hop peer with VRF | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  Configure L3 interface between multihop DUTs and make sure they are reachable  Configure static BFD for the peers under “BFD” and specify VRF to be used  verify BFD session comes up on correct VRF instance specified  Bring down the link and verify BFD session goes down after default timer values timeout  Configure different rx/tx time intervals and validate the behavior for static BFD session | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

##### Verify echo mode functionality for ipv4 single-hop static BFD

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn075 | |
| **Title / Test Name** | Verify echo mode on static ipv4 BFD session for single hop peer | |
| **Description** | Verify echo mode on static ipv4 BFD session for single hop peer | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  Configure L3 interface between DUTs and make sure they are reachable  Configure static BFD peer for the peer and enable echo mode  Verify BFD echo packets are sent and received back from peer  Verify if echo packet rx timedout because of a link failure and verify BFD session goes down  Configure different retransmission interval for echo packets and verify BFD session. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

##### Verify static IPv6 single hop peer

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn076 | |
| **Title / Test Name** | Verify static ipv6 BFD session for single hop peer | |
| **Description** | Verify static ipv6 BFD session for single hop peer | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  Configure L3 interface between DUTs and make sure they are reachable  Configure static BFD for the peers under “BFD” and verify BFD session comes up.  Bring down the link and verify BFD session goes down after default timer values timeout  Configure different rx/tx time intervals and validate the behavior for static BFD session. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

##### Verify static IPv6 multi hop peer

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn077 | |
| **Title / Test Name** | Verify static ipv6 BFD session for multi hop peer | |
| **Description** | Verify static ipv6 BFD session for multi hop peer | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  Configure L3 interface between multihop DUTs and make sure they are reachable  Configure static BFD for the peers under “BFD” and verify BFD session comes up.  Bring down the link and verify BFD session goes down after default timer values timeout  Configure different rx/tx time intervals and validate the behavior for static BFD session | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

##### Verify static IPv6 single hop peer with local address

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn078 | |
| **Title / Test Name** | Verify static ipv6 BFD session for single hop peer with local address | |
| **Description** | Verify static ipv6 BFD session for single hop peer with local address | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  Configure L3 interface between DUTs and make sure they are reachable  Configure static BFD for the peers under “BFD” and verify BFD session comes up with local-address configured  Verify BFD packets are sent out with Source-ip as local-address  Bring down the link and verify BFD session goes down after default timer values timeout  Configure different rx/tx time intervals and validate the behavior for static BFD session  Repeat the step with local address as “link-local” address | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

##### Verify static IPv6 single hop peer with interface

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn079 | |
| **Title / Test Name** | Verify static ipv6 BFD session for single hop peer with interface | |
| **Description** | Verify static ipv6 BFD session for single hop peer with interface | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  Configure L3 interface between DUTs and make sure they are reachable  Configure static BFD for the peers under “BFD” with outgoing interface configured and verify BFD session comes up.  Bring down the link and verify BFD session goes down after default timer values timeout  Configure different rx/tx time intervals and validate the behavior for static BFD session | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

##### Verify static IPv6 single hop peer with VRF

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn080 | |
| **Title / Test Name** | Verify static ipv6 BFD session for single hop peer with VRF | |
| **Description** | Verify static ipv6 BFD session for single hop peer with VRF | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  Configure L3 interface between DUTs and make sure they are reachable  Configure static BFD for the peers under “BFD” and specify VRF to be used  verify BFD session comes up on correct VRF instance specified  Bring down the link and verify BFD session goes down after default timer values timeout  Configure different rx/tx time intervals and validate the behavior for static BFD session | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

##### Verify static IPv6 multi hop peer with local address

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn081 | |
| **Title / Test Name** | Verify static ipv6 BFD session for multi hop peer with local address | |
| **Description** | Verify static ipv6 BFD session for multi hop peer with local address | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  Configure L3 interface between multihop DUTs and make sure they are reachable  Configure static BFD for the peers under “BFD” and verify BFD session comes up with local-address configured  Verify BFD packets are sent out with Source-ip as local-address  Bring down the link and verify BFD session goes down after default timer values timeout  Configure different rx/tx time intervals and validate the behavior for static BFD session  Repeat the step with local-address as “link-local” address. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

##### Verify static IPv6 multi hop peer with interface

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn082 | |
| **Title / Test Name** | Verify static ipv6 BFD session for multi hop peer with interface | |
| **Description** | Verify static ipv6 BFD session for multi hop peer with interface | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  Configure L3 interface between multihop DUTs and make sure they are reachable  Configure static BFD for the peers under “BFD” with outgoing interface configured and verify BFD session comes up.  Bring down the link and verify BFD session goes down after default timer values timeout  Configure different rx/tx time intervals and validate the behavior for static BFD session. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

##### Verify static IPv6 multi hop peer with VRF

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn083 | |
| **Title / Test Name** | Verify static ipv6 BFD session for multi hop peer with VRF | |
| **Description** | Verify static ipv6 BFD session for multi hop peer with VRF | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  Configure L3 interface between multihop DUTs and make sure they are reachable  Configure static BFD for the peers under “BFD” and specify VRF to be used  verify BFD session comes up on correct VRF instance specified  Bring down the link and verify BFD session goes down after default timer values timeout  Configure different rx/tx time intervals and validate the behavior for static BFD session | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

##### Verify echo mode functionality for ipv6 single-hop static BFD

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdFn084 | |
| **Title / Test Name** | Verify static ipv4 BFD session for single hop peer | |
| **Description** | Verify static ipv4 BFD session for single hop peer | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  Configure L3 interface between DUTs and make sure they are reachable  Configure static BFD for the peers under “BFD” and verify BFD session comes up.  Bring down the link and verify BFD session goes down after default timer values timeout  Configure different rx/tx time intervals and validate the behavior for static BFD session | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

### Scaling up of BGP BFD instances

#### Verify maximum supported BFD instances over BGP

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdSc085 | |
| **Title / Test Name** | Verify maximum supported BFD instances over BGP | |
| **Description** | Verify maximum supported BFD instances over BGP | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  Configure max supported 64 BFD sessions over BGP neighbors with 200\*3  Verify error thrown if max bfd limit is exceeded  Verify the BFD scale with below variations:-   1. BGP Single hop session 2. BGP Multi hop session 3. With LAG interface over Ve 4. With L3 ECMP | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

### Negative test case

#### Verify if invalid BFD control packets are dropped and going to correct queue

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdNe086 | |
| **Title / Test Name** | Verify if invalid BFD control packets are dropped and going in the correct queue | |
| **Description** | Verify if invalid BFD control packets are dropped and going in the correct queue | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  Verify if invalid BFD control packets are dropped and going in the correct queue.  Verify if the invalid BFD control packet are treated correctly. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

#### Verify enable/disabling of echo mode multiple times on ipv4/ipv6 BFD peers

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdNe087 | |
| **Title / Test Name** | Verify enabling/disabling of echo mode multiple times on ipv4/ipv6 BFD peers | |
| **Description** | Verify enabling/disabling of echo mode multiple times on ipv4/ipv6 BFD peer | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  Establish BFD session over ipv4 and ipv6 BGP sessions  Enable Echo mode and verify BFD echo packets sent are received back from peer  DIsable and enable multiple times and verify echo mode works accordingly | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

### Multi-D Testing

#### Verify BFD configured along with QOS,port-mirroring,ACL

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdMu088 | |
| **Title / Test Name** | Verify BFD configured with QOS,port-mirroring,ACl features | |
| **Description** | Verify BFD configured with QOS,port-mirroring,ACl features | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**  BGP BFD with interface QoS treatment on the same interface. Verify if BFD control packet are going on right control egress queue ?  Verify BGP BFD packet can be mirrored in both Rx and Tx direction.  Verify if L3 ACL hard drop can drop the BFD control packet. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

### Performance & Characterization

#### Verify BFD performance measurements with minimum RX/TX timer values

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdPe089 | |
| **Title / Test Name** | Verify performance measurements with minimum RX/TX timer values | |
| **Description** | Verify performance measurements with minimum RX/TX timer values | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**   * Enable BFD and send traffic from leaf to routes advertised from 2 spines * With BFD enabled, admin down the leaf-spine1 link and verify traffic convergence to alternate path via spine2 * Disable BFD and repeat the above step and verify the traffic convergence time via alternate path and measure the loss. * **Verify this characterization with aggressive BFD timer (min Rx and Tx timers)** | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

### Stress Test cases

#### BFD sessions after continuous link flaps

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdSt090 | |
| **Title / Test Name** | BFD sessions after continuous link flaps | |
| **Description** | Verify BFD sessions after continuous link flaps | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**   * Configure single-hop and multi-hop BFD sessions over BGP * Configure BFD sessions for both ipv4 and ipv6 on default and non-default VRFs * Do link flap continuously * Verify BFD and BGP sessions goes down whenever link goes down and comes up when link comes online. * **Verify the traffic convergence or traffic loss with BFD and without BFD. This should help us in deciding if test case pass of fail.** * We will verify the trigger - I hr random link flaps | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

#### BFD sessions after flapping LAG and LAG member ports

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdSt091 | |
| **Title / Test Name** | BFD sessions after flapping LAG and LAG member ports | |
| **Description** | Verify BFD sessions after flapping LAG and LAG member ports | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**   * Configure single-hop and multi-hop BFD sessions over BGP on LAG port * Configure BFD sessions for both ipv4 and ipv6 on default and non-default VRFs * Flap the LAG interface continuously for few iterations * Verify BFD and BGP sessions goes down whenever LAG goes down and comes up when LAG comes online * Repeat the above steps by flapping member ports of the lag. * We will cover the trigger - port-channel creations/removals. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

#### BFD disable and enable under BFD peer

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdSt092 | |
| **Title / Test Name** | BFD disable and enable under BFD peer | |
| **Description** | Verify BFD disable and enable under BFD peer | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**   * Configure single-hop and multi-hop BFD sessions over BGP * Configure BFD sessions for both ipv4 and ipv6 on default and non-default VRFs * Shutdown BFD under BFD peers and verify BFD sessions goes down. * No-Shut BFD back at global level and verify all BFD sessions comes up. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

#### BFD disable and enable at neighbor level continuously

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdSt093 | |
| **Title / Test Name** | BFD disable and enable at neighbor level | |
| **Description** | Verify BFD disable and enable at neighbor level | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**   * Configure multiple single-hop and multi-hop BFD sessions over BGP * Establish BFD for all neighbors * Disable BFD for each BGP neighbor and verify BFD sessions goes down. * Enable BFD for each BGP neighbor level and verify all BFD sessions comes up. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

#### Verify BFD control packets forwarding with data traffic flowing at line-rate

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdSt094 | |
| **Title / Test Name** | BFD control packet forwarding with data traffic at line rate | |
| **Description** | BFD control packet forwarding with data traffic at line rate | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | No | |
| **Automation Status** | Yes | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**   * Configure multiple single-hop and multi-hop BFD sessions over BGP * Pump routes from BGP neighbor and send L3 bidirectional traffic at line-rate. * Verify BFD control packets are not dropped due to line-rate traffic | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

#### Verify cable insertion and removal continuously with BGP BFD enabled

|  |  |  |
| --- | --- | --- |
| **Test Case Details** | | |
| **Test case ID** | FtRtBfdSt095 | |
| **Title / Test Name** | cable insertion and removal continuously with BGP BFD enabled | |
| **Description** | cable insertion and removal continuously with BGP BFD enabled | |
| **Test Setup** | Topology 1 | |
| **Manual Execution** | Yes | |
| **Automation Status** | No | |
| **Automation Priority** | High | |
| **Interface Mode** |  | |
| **Basic feature Sanity** | Functional | |
| **High Availability** | No | |
| **New in Release** | Sonic 2.0 | |
| **Platform Dependent** | No | |
| **RCA Numbers** |  | |
| **Test Procedure:**   * Configure multiple single-hop and multi-hop BFD sessions over BGP * Pump routes from BGP neighbor and send L3 bidirectional traffic at line-rate. * Apply the trigger cable insertion and removal and check if BFD session flap with correct reason code. | | |
| **Pass/Fail Criteria** | | Above verifications should PASS |

# Reference and Appendix

## Common configuration and verification procedures

## Debugging procedure

## Glossary