One-arm BFD Usecase

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- ## One-arm BFD Definition
  - Just local peer support BFD, remote peer doesn't support BFD
  - Local peer create BFD session with itself, remote peer doesn't aware BFD function, only normal IP forwarding (called one-arm echo)
  - Local peer BFD packets use the destination address of itself

- ## Usecase for Datacenter
  - Gateway support BFD, but the virtual machine doesn't support BFD
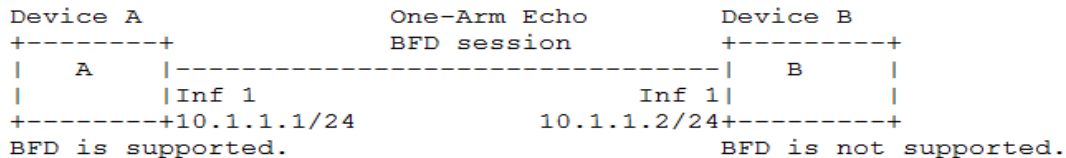 - Using one-arm BFD machanism, that can be a simply solution

```
Device A                        One-Arm Echo          Device B
+--------+                      BFD session           +--------+
|   A    |----------------------------------------|   B    |
|        |Inf 1                            Inf 1|        |
+--------+10.1.1.1/24          10.1.1.2/24+--------+
BFD is supported.                             BFD is not supported.



          Figure 1: One-Arm BFD deploying scenario
```

Relation to BFD Echo

- ## RFC 5880
  - Echo is an adjunct functon to both modes

- ## RFC 5881
  - Echo function is used on the two systems that employ BFD

An adjunct to both modes is the Echo function. When the Echo function is active, a stream of BFD Echo packets is transmitted in such a way as to have the other system loop them back through its forwarding path. If a number of packets of the echoed data stream are not received, the session is declared to be down. The Echo function may be used with either Asynchronous or Demand mode. Since the Echo function is handling the task of detection, the rate of periodic transmission of Control packets may be reduced (in the case of Asynchronous mode) or eliminated completely (in the case of Demand mode).

If the BFD Echo function is used, transmitted packets are immediately routed back towards the sender on the interface over which they were sent. This may interact with other mechanisms that are used on the two systems that employ BFD. In particular, ingress filtering [BCP38] is incompatible with the way Echo packets need to be sent. Implementations that support the Echo function MUST ensure that ingress filtering is not used on an interface that employs the Echo function or make an exception for ingress filtering Echo packets.

Relation to BBF TR-146

- ## Unidirectional IP session monitoring using BFD echo
  - BFD Echo (RFC 5880 [26]) can be used in a unidirectional mode and meets all of the above criteria. This uses a subset of the full BFD protocol. It allows the RG to detect failures in IP connectivity based on the periodic sending of BFD packets on its WAN interface addressed to one of the RG's dynamically assigned IP addresses, or the IPv6 subnet router address.
  - The process of sending a BFD packet that is intended to be sent back to the sender is known as BFD Echo. It should be noted that the only expectation of an IP Edge is for it to route the packet, which will naturally result in routing back towards the sender. Because the IP Edge sees all BFD Echo traffic as user IP traffic, no additional load is placed on the access node or IP Edge's control plane.

Issues

- About Echo Function

    - Does echo function require remote peer node to support BFD protocol? It seems like it is not clear in current RFC.

    - Whether does something else need to be considered with echo scenorios, such as BFD Yang model?

Next steps

- Solutions
    - It might be modified to clarify for BFD echo,
    - or it might give an infomational draft to descript BFD echo clearly

Thank you!