BFD
Bidirectional Forwarding Detection

About Us

- Inter Projekt S.A.
  Networking equimpent distributor (not only WiFi)
- Idea4Pro
  Trainings, consulting, integrating
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  R&D Manager

Why BFD?

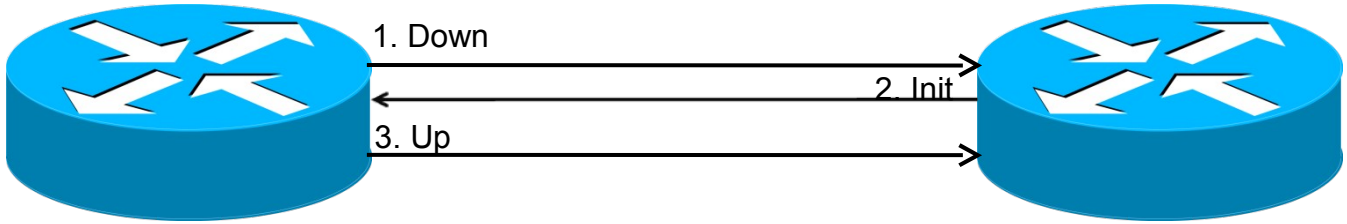
- Modern links have gigabits per second throughput
- One second of failure may cause huge amount of data lost/retransmission
- Not all low layer protocols have link failure detection mechanism (Ethernet, tunnels)

Yet another hello protocol? Yes, but...

- Much faster than typical hello signalling
- Failure detection in less than 50ms!
- One detection protocol for many routing/high availability protocols (OSPF, BGP, VRRP etc.)

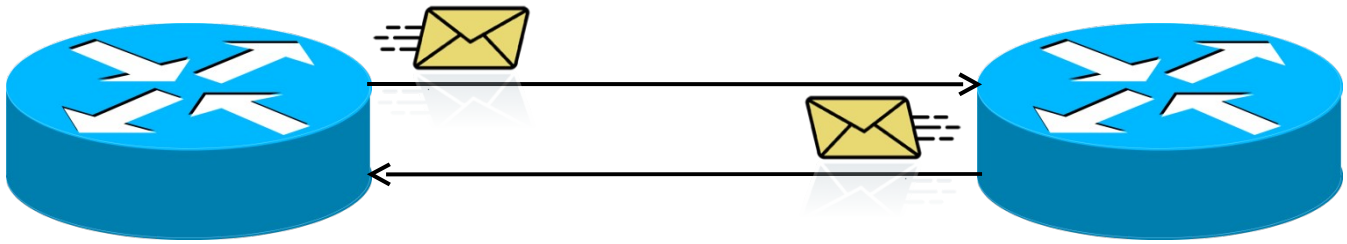
How it works

- BFD establishes a session (three way handshake)



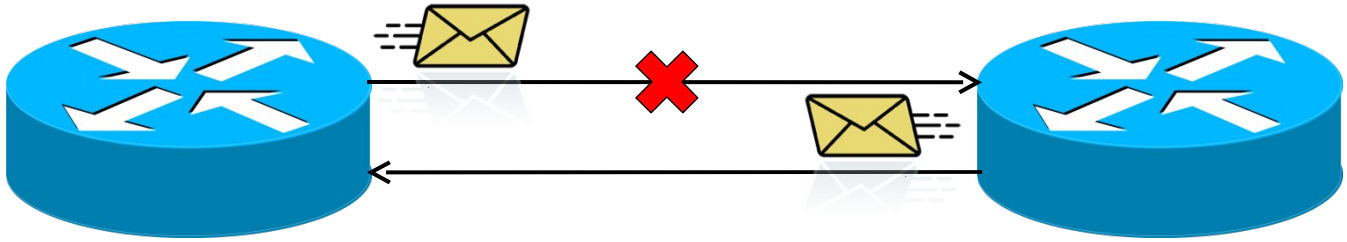
How it works

- BFD sends periodically small control packets
- Asynchronus mode



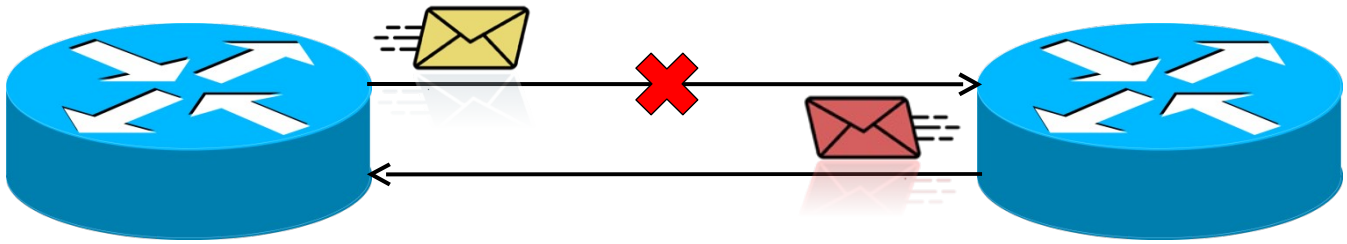
How it works

- If a BFD packet is not received for a certain period the link is declared dead

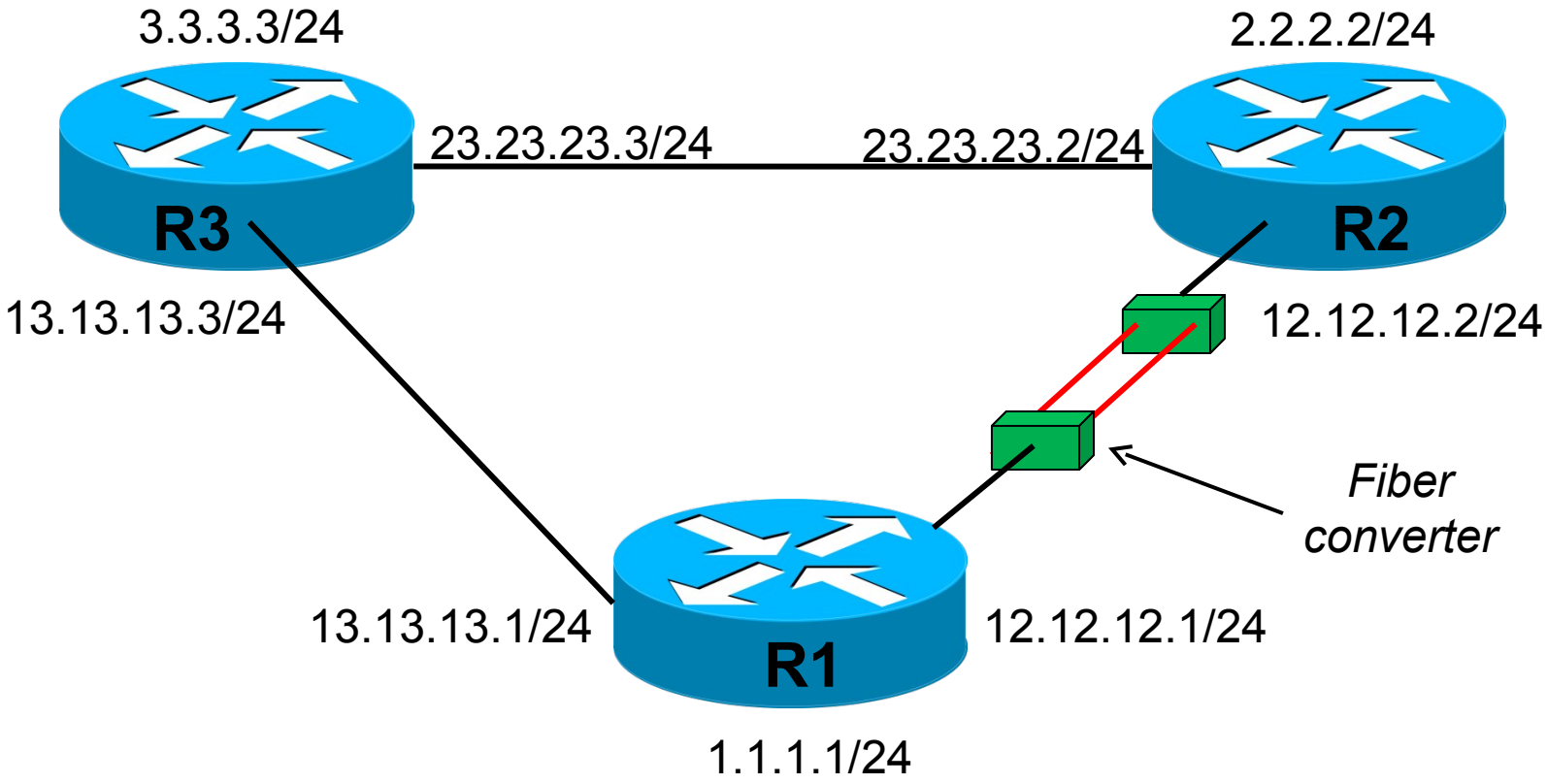


How it works

- BFD neighbour is told that the link is dead
- Routing protocols start to reconverge



Lab


3.3.3.3/24
2.2.2.2/24
23.23.23.3/24
23.23.23.2/24
R3
R2
13.13.13.3/24
12.12.12.2/24
Fiber converter
13.13.13.1/24
12.12.12.1/24
R1
1.1.1.1/24

BFD – few more facts

- BFD packets are unicast
- BFD knows how to find a peer from routing protocol

BFD – few more facts

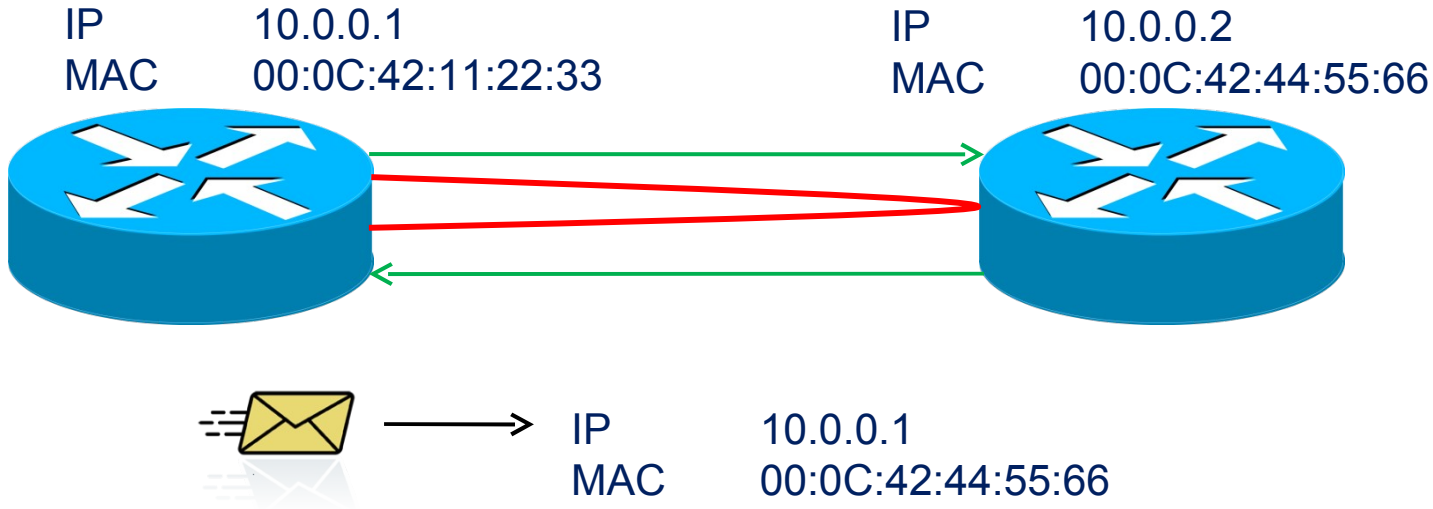
- BFD for IPv4 uses UDP port 3784
- Remember not to drop such packets (input chain)

BFD – on demand mode

- A mode when a link is checked with BFD only when needed.
- The problem is that the router may not know when is the appropriate moment.

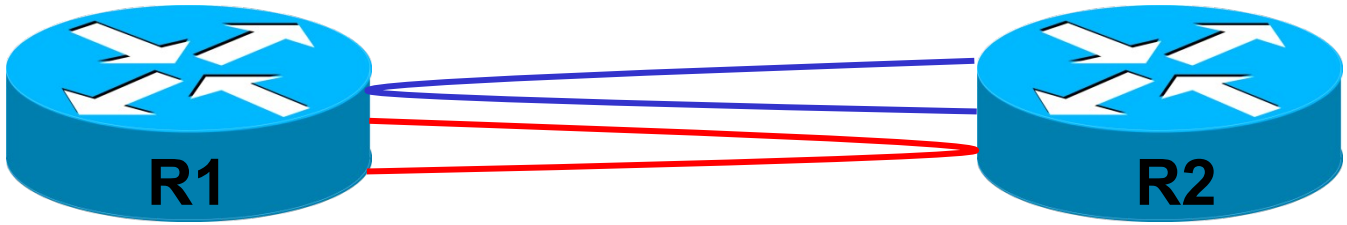
BFD – echo mode

1. BFD session is established
2. Router starts sending BFD packets to itself through its neighbour



BFD – echo mode

- R1 echoes BFD packets to itself
- R2 echoes BFD packets to itself
- Only forwarding plane of neighbouring router is involved

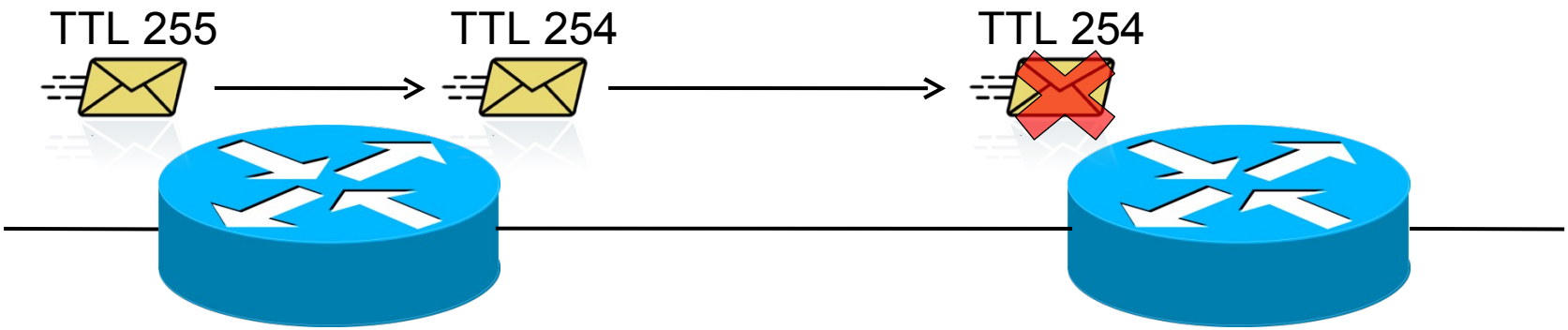


Authentication

- BFD packets support authentication with:
  - Clear text
  - MD5
  - Meticulous Keyed MD5
  - SHA1
  - Meticulous Keyed SHA1
- TTL of 255 is a security measure as well

Authentication

- TTL of 255 is the highest possible
- When a packet is routed once or more, TTL no longer is 255
- Single hop BFD accepts only TLL of 255



BFD is multipurpose

- BFD may work on top of Layer2 or higher
- BFD packets may be a payload of any encapsulating protocol
- BFD should not be used across the Internet for checking higher layers (i.e applications)

BFD and MikroTik RouterOS

- No authentication
- Support for OSPF and BGP (so far)
- No echo mode
- No support for VRRP and static routes
- Aggressive timers are not recommended

BFD is still a draft

- *http://tools.ietf.org/id/draft-ietf-bfd-base-11.txt*

BFD, January 2010

- *http://www.ietf.org/id/draft-ietf-bfd-v4v6-1hop-11.txt*

One hop BFD for IPv4 and IPv6, January 2010

Thank you

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- www.idea4pro.pl
- www.interprojekt.pl