

# PCEP Extension for Native IP Network

[draft-ietf-pce-pcep-extension-native-ip](#)

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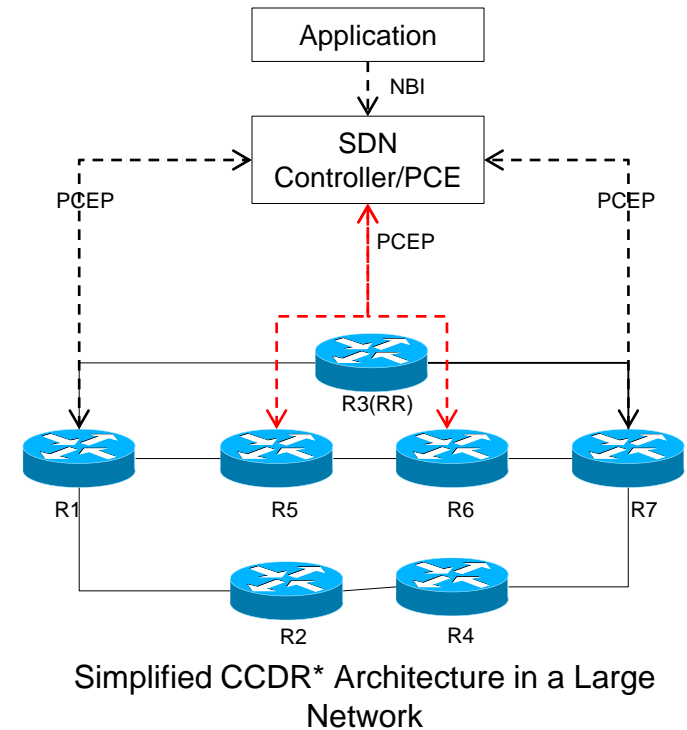
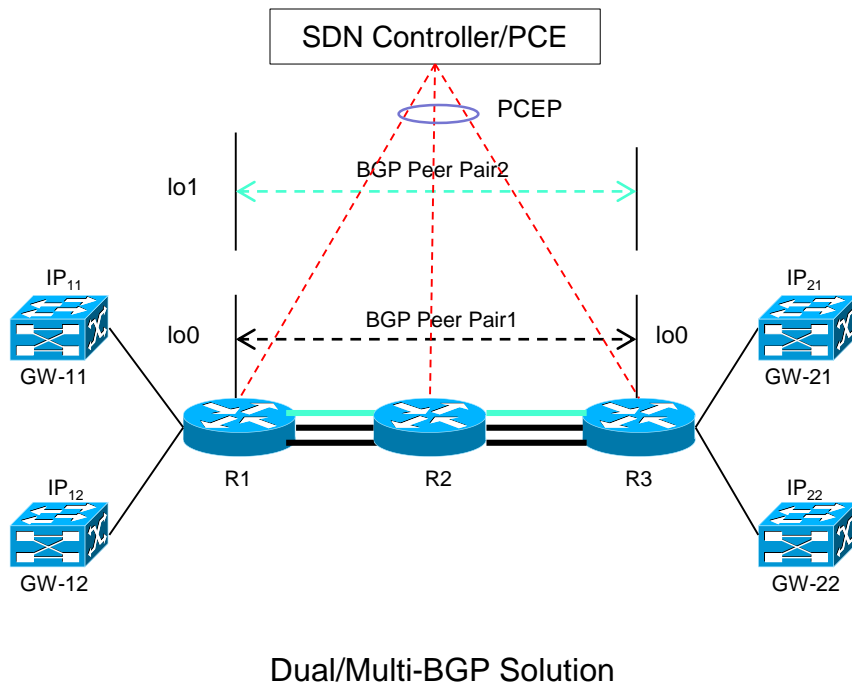
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# Motivation

- [RFC8735](#) describes the scenarios and simulation results for TE in Native IP network
- [RFC8821](#) describes an architecture for providing traffic engineering in a native IP network by using multiple BGP sessions and a PCE-based central control mechanism.
- This document describes the PCEP extensions and procedures to practically build such architecture.
- Prepare for the cross-posting of WGLC within PCE and IDR WG(BGP related part).

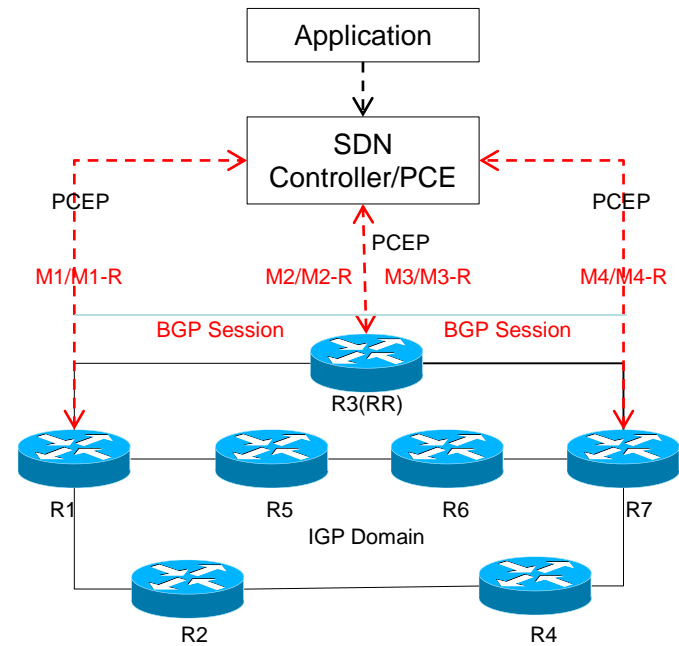
# Overview of the Solution



- Building Dual/Multi BGP sessions between edge routers upon request via PCEP
- Advertises different prefixes via different BGP sessions, w/PCEP-based setup
- Steer traffic towards particular routes via BGP next-hop w/PCEP-based setup

# CCDR Native IP Procedures(1/3)

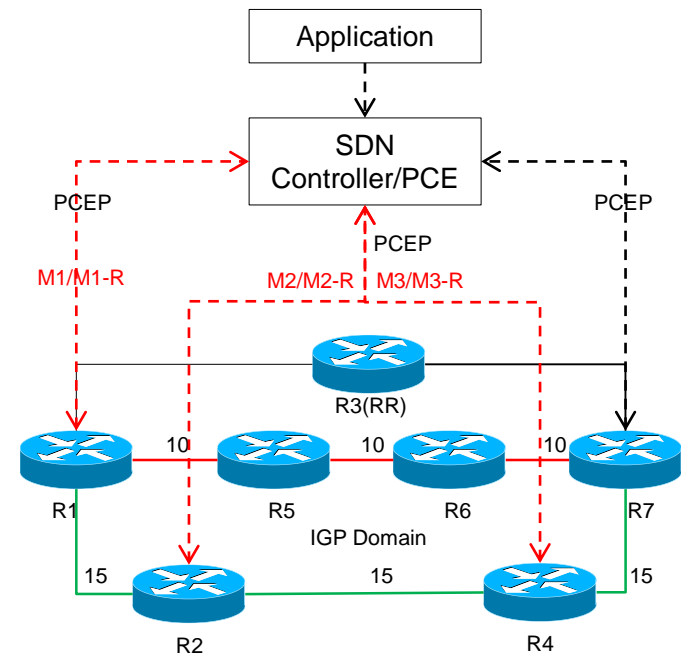
- PCEP messages (PCInitiate/PCRep) are sent to R1、 R3(RR)、 R7 respectively, to build/remove the BGP sessions between R1/R3(RR) and R3(RR)/R7
- BGP Peer Information Object (BPI) is included.
- The main information of “BGP Peer Information” Object are the followings:
  - ✓ Peer AS Number
  - ✓ Local/Peer Address
  - ✓ Tunnel Source/Destination Address



BGP Session Establishment Procedures

# CCDR Native IP Procedures(2/3)

- PCEP messages (PCInitiate/PCRpt) are sent to on-path routers R1、 R2、 R4 respectively, to install/remove the explicit route to the BGP nexthop
- Explicit Peer Route Object (EPR) is included.
- The main information of “Explicit Peer Route” Object are the followings:
  - ✓ Route Priority
  - ✓ Peer/Tunnel Destination Address
  - ✓ Next Hop to the Peer/Tunnel Destination
- Reverse Path is built similarly from R7/R4/R2

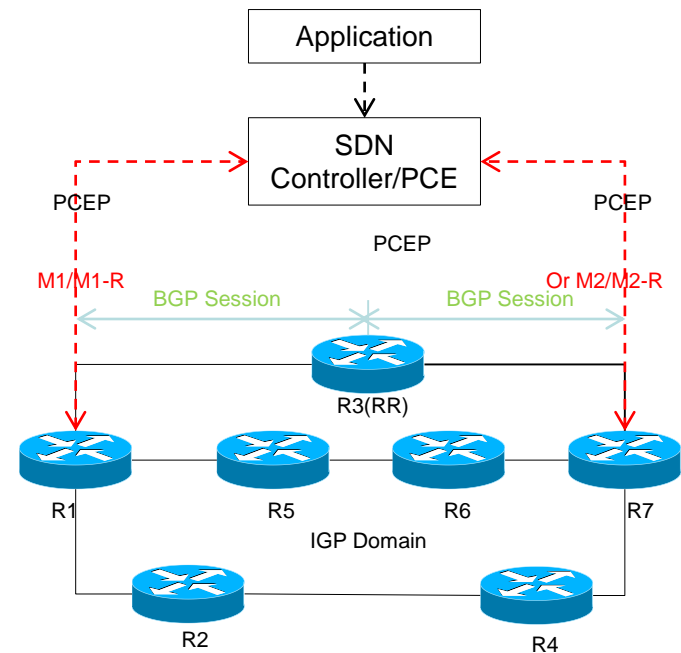


Explicit Route Establish Procedures  
(From R1 to R7))

Red Link represent congested path (IGP shortest path)  
Green Link represent idle path (explicit route from PCE)

# CCDR Native IP Procedures(3/3)

- PCEP messages (PCInitiate/PCRpt ) are sent only to edge routers R1 or R7, to advertise/revoke the prefixes that associated with different BGP sessions
- Peer Prefix Advertisement Object (PPA) is included
- The main information of “Peer Prefix Advertisement” Object are the followings:
  - ✓ Peer Address(IPv4/IPv6)
  - ✓ Advertised Prefix(IPv4/IPv6) Information



BGP Prefix Advertisement Procedures

# Operations Consideration

- The information transferred in this draft is mainly used for the light weight BGP session setup, explicit route deployment and the prefix distribution
- The planning, allocation and distribution of the peer addresses within IGP domain should be done in advance

# Next Step

1. Comments/Q&A
2. WG Last Call?

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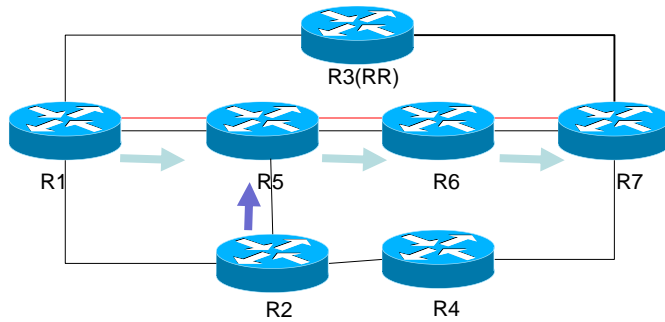
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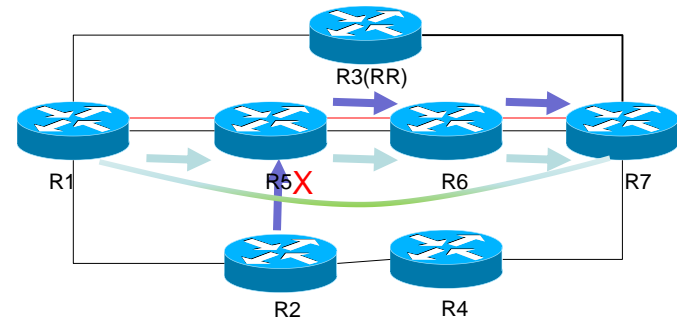
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# Tunnel Utilization



Native Traffic Forwarding



Tunneled Traffic Forwarding

- ✓ Destination of user traffic based
- ✓ Traffic from different sources to the same destination may share the priority path
- ✓ Moderate traffic path control

- ✓ Destination of tunnel based
- ✓ Traffic for different (source, address) tuple are put into different tunnel
- ✓ Strict traffic path control