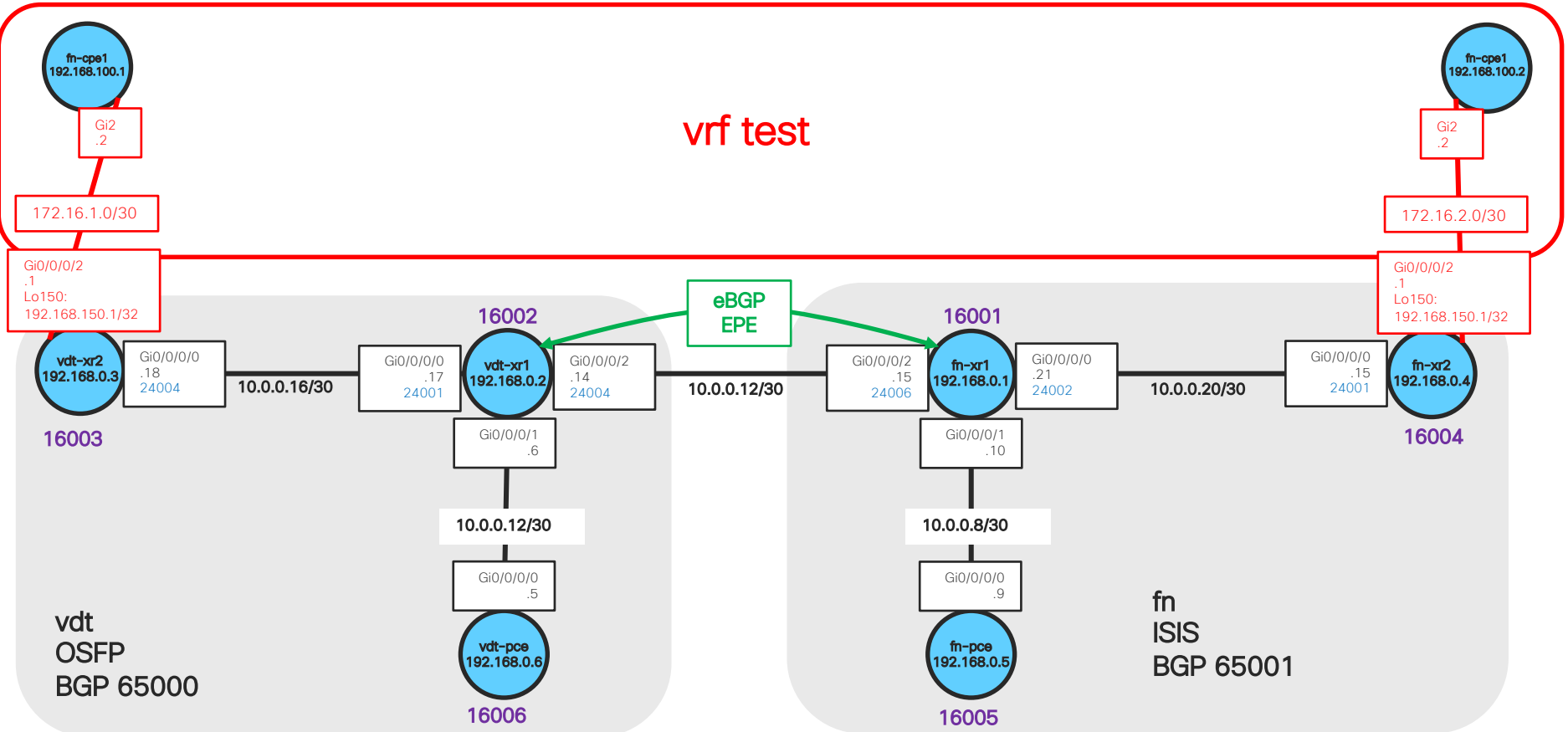


## vrf test



# Configuration vdt-xr2

```
vrf test
address-family ipv4 unicast
import route-target
100:1
!
export route-policy set-vdt-fn-pass
export route-target
100:1
!
route-policy set-vdt-fn-pass
  set extcommunity color color10
  pass
end-policy
!
extcommunity-set opaque color10
  10
end-set
```

Policy pour ajouter un community aux routes BGP en export dans le vrf. Community contient le color "10" qui est utilisé par ODN

# Configuration vdt-xr2

```
router bgp 65000
  bgp router-id 192.168.0.3
  address-family ipv4 unicast
    network 192.168.0.3/32
  !
  address-family vpnv4 unicast
  !
  neighbor 192.168.0.6
    remote-as 65000
    update-source Loopback0
    address-family vpnv4 unicast
    route-policy bgp_in in
    route-policy bgp_out out
  !
  !
vrf test
  rd auto
  address-family ipv4 unicast
    redistribute connected
  !
  neighbor 172.16.1.2
    remote-as 65100
    address-family ipv4 unicast
    route-policy set-vdt-fn-pass in
    route-policy bgp_out out
  as-override
```

Ajouter le couleur "10" à toutes les routes du neighbor

# Configuration vdt-xr2

```
segment-routing
traffic-eng
on-demand color 10
dynamic
pcep
!
metric
type igp
```

Initier un policy SRTE ODN pour indiquer les routes avec color "10" doit avoir la route indiqué par le pcep.

\*\*Cette configuration est le template qui est utilisé par ODN pour la communication à la destination des routes BGP taggé avec le color "10". Le même template pourrait être utilisé pour toutes les destinations.

# vdt-xr2

RP/0/RP0/CPU0:vdt-xr2#**sh bgp vrf test**

Fri Dec 6 15:46:43.911 UTC

BGP VRF test, state: Active

BGP Route Distinguisher: 192.168.0.3:0

VRF ID: 0x60000001

BGP router identifier 192.168.0.3, local AS number 65000

Non-stop routing is enabled

BGP table state: Active

Table ID: 0xe0000001 RD version: 176

BGP main routing table version 176

BGP NSR Initial initsync version 4 (Reached)

BGP NSR/ISSU Sync-Group versions 0/0

Status codes: s suppressed, d damped, h history, \* valid, > best

i - internal, r RIB-failure, S stale, N Nexthop-discard

Origin codes: i - IGP, e - EGP, ? - incomplete

Network	Next Hop	Metric	LocPrf	Weight	Path
---------	----------	--------	--------	--------	------

Route Distinguisher: 192.168.0.3:0 (default for vrf test)

*> 172.16.1.0/30	0.0.0.0	0		32768	?
------------------	---------	---	--	-------	---

* 172.16.1.2	0	0	65100	?	
--------------	---	---	-------	---	--

*>i172.16.2.0/30	192.168.0.4 C:10	100	0	65001	?
------------------	------------------	-----	---	-------	---

			0	65001	?
--	--	--	---	-------	---

*> 192.168.100.1/32	172.16.1.2	0	0	65100	?
---------------------	------------	---	---	-------	---

*>i192.168.100.2/32	192.168.0.4 C:10	100	0	65001	65101 ?
---------------------	------------------	-----	---	-------	---------

			0	32768	?
--	--	--	---	-------	---

*> 192.168.150.1/32	0.0.0.0	0		32768	?
---------------------	---------	---	--	-------	---

*>i192.168.150.2/32	192.168.0.4 C:10	100	0	65001	?
---------------------	------------------	-----	---	-------	---

			100	0	65001 ?
--	--	--	-----	---	---------

RP/0/RP0/CPU0:vdt-xr2#**sh run router static**

Fri Dec 6 15:47:53.625 UTC

router static

address-family ipv4 unicast

0.0.0.0/0 10.85.171.254

**192.168.0.0/16 Null0**

Le NH pour 192.168.150.2 dans vrf test est 192.168.0.4 qui est fn-xr2. Comme qu'on ne fait aucune redistribution des routes entre les domaines IGP et le chemin est donné par le PCE, il faut quand même avoir une route dans le RIB pour la destination. Dans ce cas, j'ai créé un aggregate pour 192.168.0.0/16 vers Null0

# vdt-xr2

RP/0/RP0/CPU0:vdt-xr2#**sh bgp vrf test 192.168.150.2/32 detail**

Fri Dec 6 15:38:39.935 UTC

BGP routing table entry for 192.168.150.2/32, Route Distinguisher: 192.168.0.3:0

Versions:

Process bRIB/RIB SendTblVer

Speaker 165 165

Flags: 0x00003001+0x00000000;

Last Modified: Dec 4 18:14:50.508 for 1d21h

Paths: (1 available, best #1)

Advertised to CE peers (in unique update groups):

172.16.1.2

Path #1: Received by speaker 0

Flags: 0x4000000005060005, import: 0x80

Advertised to CE peers (in unique update groups):

172.16.1.2

65001

**192.168.0.4 C:10 (bsid:24007) from 192.168.0.6 (192.168.0.6)**

Received Label 24003

Origin incomplete, localpref 100, valid, internal, best, group-best, import-candidate, imported

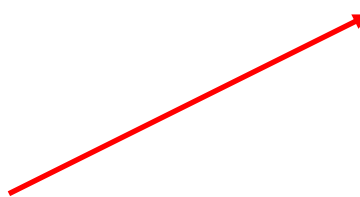
Received Path ID 0, Local Path ID 1, version 161

**Extended community: Color:10 RT:100:1**

**SR policy color 10, up, registered, bsid 24007, if-handle 0x00000024**

Source AFI: VPNv4 Unicast, Source VRF: default, Source Route Distinguisher: 192.168.0.4:0

La route 192.168.150.2 (fn-xr2) est tagged avec le color 10 (C:10) et il y'a le SRTE policy 10



# vdt-xr2

RP/0/RP0/CPU0:vdt-xr2#sh segment-routing traffic-eng policy color 10  
Fri Dec 6 15:52:08.285 UTC

SR-TE policy database  
-----

## Color: 10, End-point: 192.168.0.4

Name: srte\_c\_10\_ep\_192.168.0.4

Status:

Admin: up Operational: up for 1d21h (since Dec 4 18:14:50.688)

Candidate-paths:

Preference: 200 (BGP ODN) (shutdown)

Requested BSID: dynamic

PCC info:

Symbolic name: bgp\_c\_10\_ep\_192.168.0.4\_discr\_200

PLSP-ID: 2

Dynamic (invalid)

## Preference: 100 (BGP ODN) (active)

Requested BSID: dynamic

PCC info:

Symbolic name: bgp\_c\_10\_ep\_192.168.0.4\_discr\_100

PLSP-ID: 1

Dynamic (pce 192.168.0.6) (valid)

Metric Type: IGP, Path Accumulated Metric: 2

16002 [Prefix-SID, 192.168.0.2]

24004 [Adjacency-SID, 10.0.0.14 - 10.0.0.13]

16004 [Prefix-SID, 192.168.0.4]

Attributes:

Binding SID: 24007

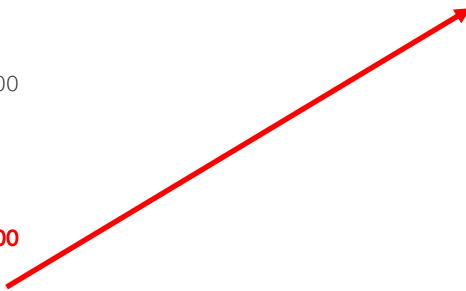
Forward Class: 0

Steering BGP disabled: no

IPv6 caps enable: yes

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Le policy SRTE envoyé par le PCE pour la destination 192.168.0.4 qui indique le stack de labels à imposer:



# vdt-pce

```
RP/0/RP0/CPU0:vdt-pce#sh pce ipv4 path source 192.168.0.3 destination 192.168.0.4  
Fri Dec 6 16:01:22.854 UTC
```

```
Path:  
----:  
Hop0: 10.0.0.18  
Hop1: 10.0.0.14  
Hop2: 10.0.0.21
```



Commande pour valider le chemin entre deux  
adresses sur le PCE



# vdt-pce

```
RP/0/RP0/CPU0:vdt-pce#sh pce lsp pcc ipv4 192.168.0.3 detail
Fri Dec 6 16:03:42.427 UTC
```

PCE's tunnel database:

-----  
PCC 192.168.0.3:

Tunnel Name: bgp\_c\_10\_ep\_192.168.0.4\_discr\_100

LSPs:

LSP[0]:

**source 192.168.0.3, destination 192.168.0.4, tunnel ID 1, LSP ID 1**

**State: Admin up, Operation up**

**Setup type: Segment Routing**

Binding SID: 24007

Maximum SID Depth: 10

Absolute Metric Margin: 0

Relative Metric Margin: 0%

Bandwidth: signaled 0 kbps, applied 0 kbps

PCEP information:

PLSP-ID 0x1, flags: D:1 S:0 R:0 A:1 O:1 C:0

LSP Role: Single LSP

State-sync PCE: None

PCC: 192.168.0.3

LSP is subdelegated to: None

**Reported path:**

**Metric type: IGP, Accumulated Metric 2**

**SID[0]: Node, Label 16002, Address 192.168.0.2**

**SID[1]: Adj, Label 24004, Address: local 10.0.0.14 remote 10.0.0.13**

**SID[2]: Node, Label 16004, Address 192.168.0.4**

**Computed path: (Local PCE)**

**Computed Time: Fri Dec 06 15:45:51 UTC 2019 (00:17:51 ago)**

**Metric type: IGP, Accumulated Metric 2**

**SID[0]: Node, Label 16002, Address 192.168.0.2**

**SID[1]: Adj, Label 24004, Address: local 10.0.0.14 remote 10.0.0.13**

**SID[2]: Node, Label 16004, Address 192.168.0.4**

Valider le policy sur PCE qui est envoyé à au client  
(pcc) 192.168.0.3 (vdt-xr2)

Connexion entre PCE et PCC est stateful. Donc, le  
computed path est le chemin calculé par le PCE et  
le reported path est le chemin que le pcc utilise. Il  
faut que les deux soient identique. Sinon, le PCE  
va calculer de nouveau et envoyer le chemin au  
PCC