TOGORER : Architecure & Routage

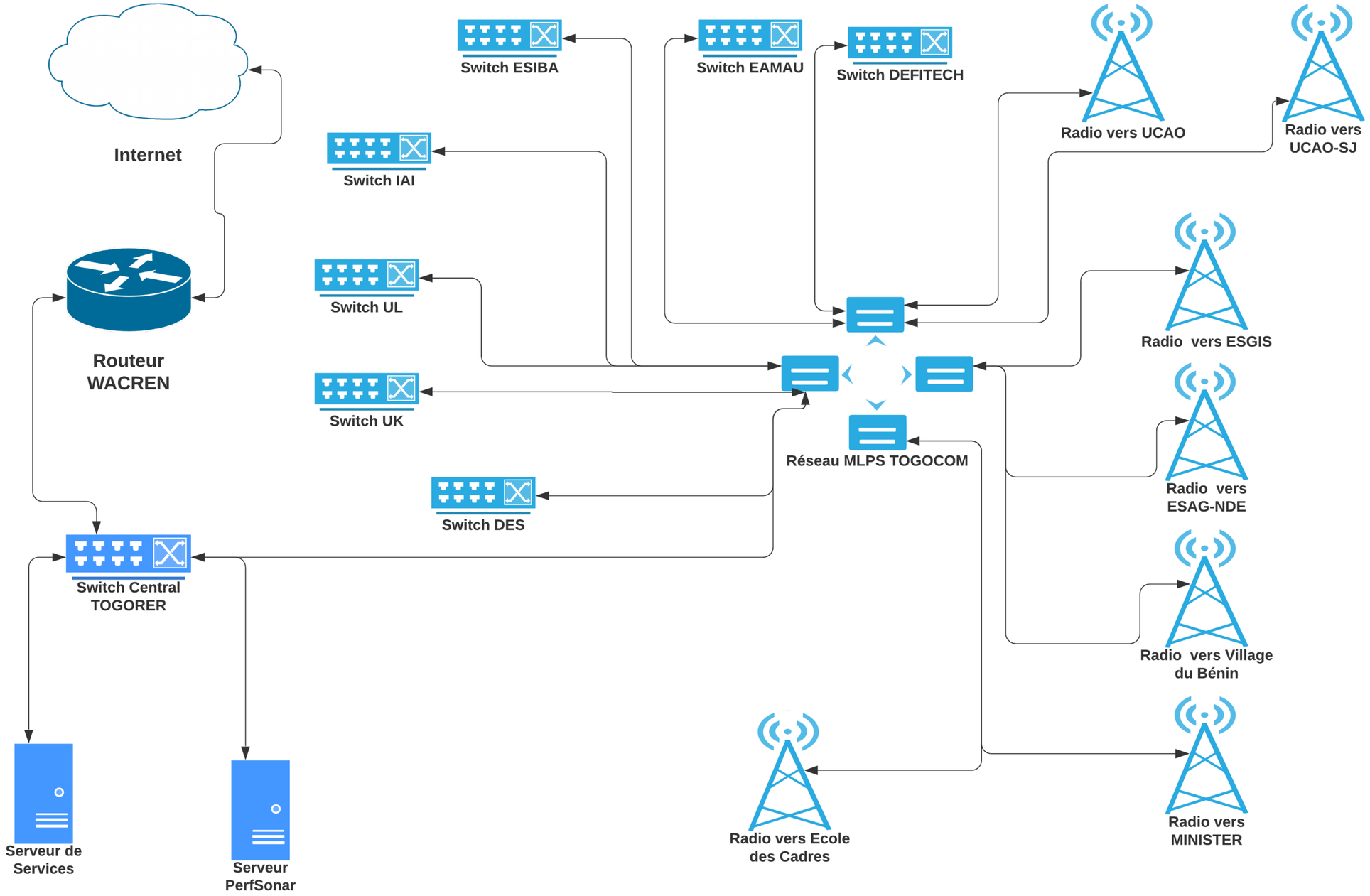
WACREN Webinar on REN : Architecture, Routing and Peering

Arnaud AMELINA Décembre 2020

Infrastructure de TogoRER

Diagramme Réseau de TOGORER

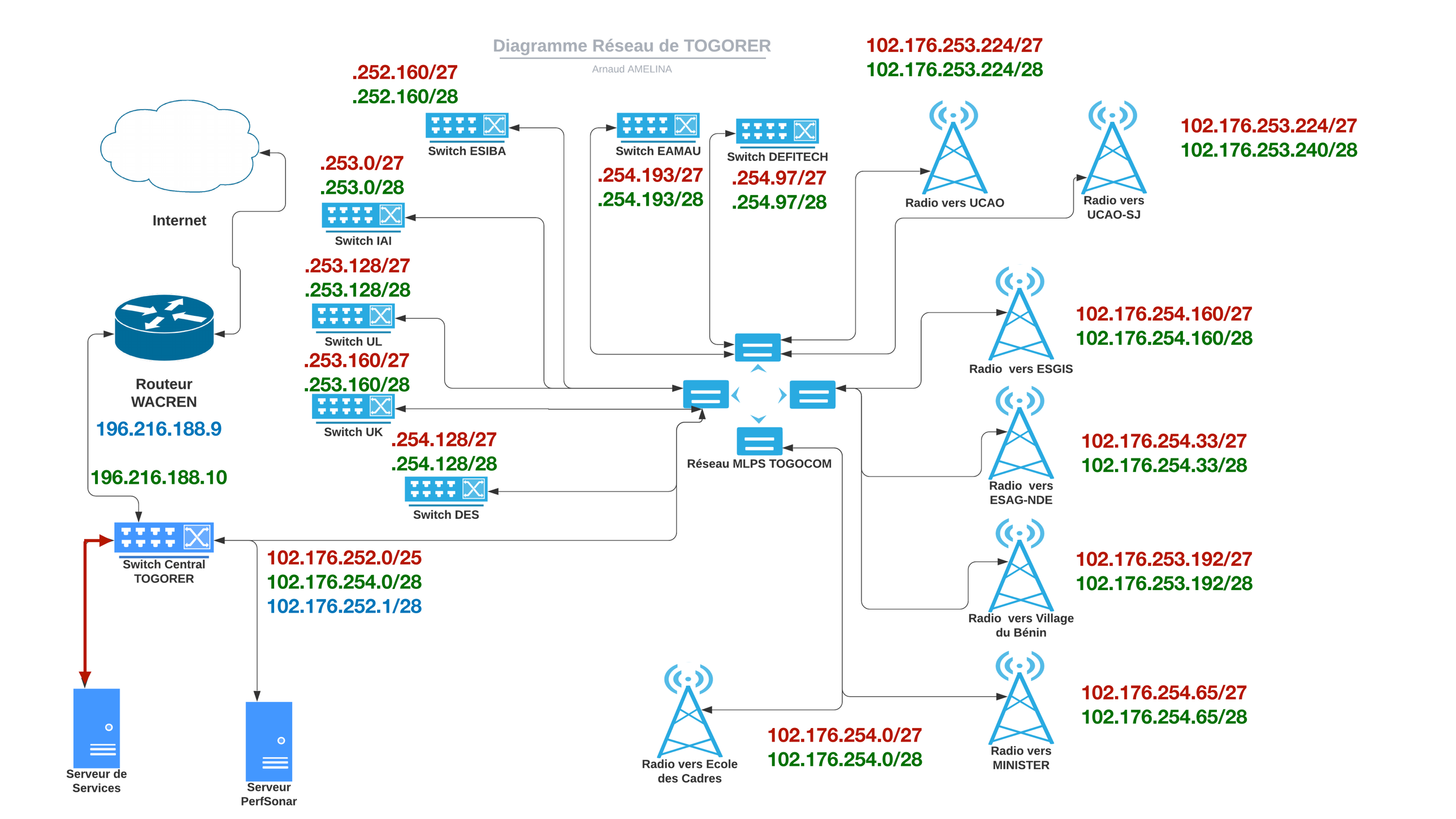
Arnaud AMELINA



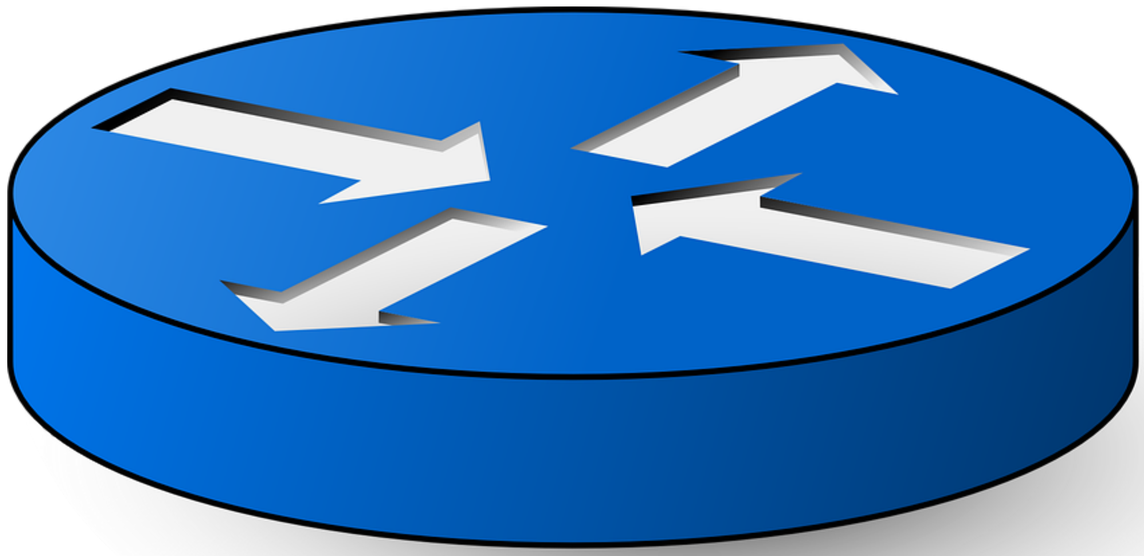
Plan d’adressage de TogoRER

Diagramme Réseau de TOGORER

Arnaud AMELINA



/27							
Subnet ID	Subnet Address	Host Address Range	Broadcast Address				
1	102.176.252.0	102.176.252.1 - 102.176.252.30	102.176.252.31	Ifrastructure			
2	102.176.252.32	102.176.252.33 - 102.176.252.62	102.176.252.63	Ifrastructure			
3	102.176.252.64	102.176.252.65 - 102.176.252.94	102.176.252.95	Ifrastructure			
4	102.176.252.96	102.176.252.97 - 102.176.252.126	102.176.252.127	Ifrastructure			
5	102.176.252.128	102.176.252.129 - 102.176.252.158	102.176.252.159	ESIBA	C2960	FO	Vlan136
6	102.176.252.160	102.176.252.161 - 102.176.252.190	102.176.252.191	ESIBA			
7	102.176.252.192	102.176.252.193 - 102.176.252.222	102.176.252.223	ESIBA			
8	102.176.252.224	102.176.252.225 - 102.176.252.254	102.176.252.255	ESIBA			
9	102.176.253.0	102.176.253.1 - 102.176.253.30	102.176.253.31	IAI	C3750	FO	Vlan137
10	102.176.253.32	102.176.253.33 - 102.176.253.62	102.176.253.63	IAI			
11	102.176.253.64	102.176.253.65 - 102.176.253.94	102.176.253.95	IAI			
12	102.176.253.96	102.176.253.97 - 102.176.253.126	102.176.253.127	IAI			
13	102.176.253.128	102.176.253.129 - 102.176.253.158	102.176.253.159	UL	C2960	FO	Vlan135
14	102.176.253.160	102.176.253.161 - 102.176.253.190	102.176.253.191	UK	C2960	FO 3750	Vlan51
15	102.176.253.192	102.176.253.193 - 102.176.253.222	102.176.253.223	VB	C2960	BLR	Vlan140
16	102.176.253.224	102.176.253.225 - 102.176.253.254	102.176.253.255	UCAO	C3750G24	BLR/FO	Vlan139
17	102.176.254.0	102.176.254.1 - 102.176.254.30	102.176.254.31	ECOLCADRE		BLR	Vlan141
18	102.176.254.32	102.176.254.33 - 102.176.254.62	102.176.254.63	ESAG-NDE	C2960	BLR	Vlan142
19	102.176.254.64	102.176.254.65 - 102.176.254.94	102.176.254.95	MINISTER	C2960G	BLR	Vlan145
20	102.176.254.96	102.176.254.97 - 102.176.254.126	102.176.254.127	DEFITEC		FO	Vlan144
21	102.176.254.128	102.176.254.129 - 102.176.254.158	102.176.254.159	DES	3750G	FO	Vlan147
22	102.176.254.160	102.176.254.161 - 102.176.254.190	102.176.254.191	ESGIS	C2950	BLR/FO	Vlan143
23	102.176.254.192	102.176.254.193 - 102.176.254.222	102.176.254.223	EAMAU		FO	Vlan148
24	102.176.254.224	102.176.254.225 - 102.176.254.254	102.176.254.255				
25	102.176.255.0	102.176.255.1 - 102.176.255.30	102.176.255.31				
26	102.176.255.32	102.176.255.33 - 102.176.255.62	102.176.255.63				
27	102.176.255.64	102.176.255.65 - 102.176.255.94	102.176.255.95				
28	102.176.255.96	102.176.255.97 - 102.176.255.126	102.176.255.127				
29	102.176.255.128	102.176.255.129 - 102.176.255.158	102.176.255.159				
30	102.176.255.160	102.176.255.161 - 102.176.255.190	102.176.255.191				
31	102.176.255.192	102.176.255.193 - 102.176.255.222	102.176.255.223				
32	102.176.255.224	102.176.255.225 - 102.176.255.254	102.176.255.255				



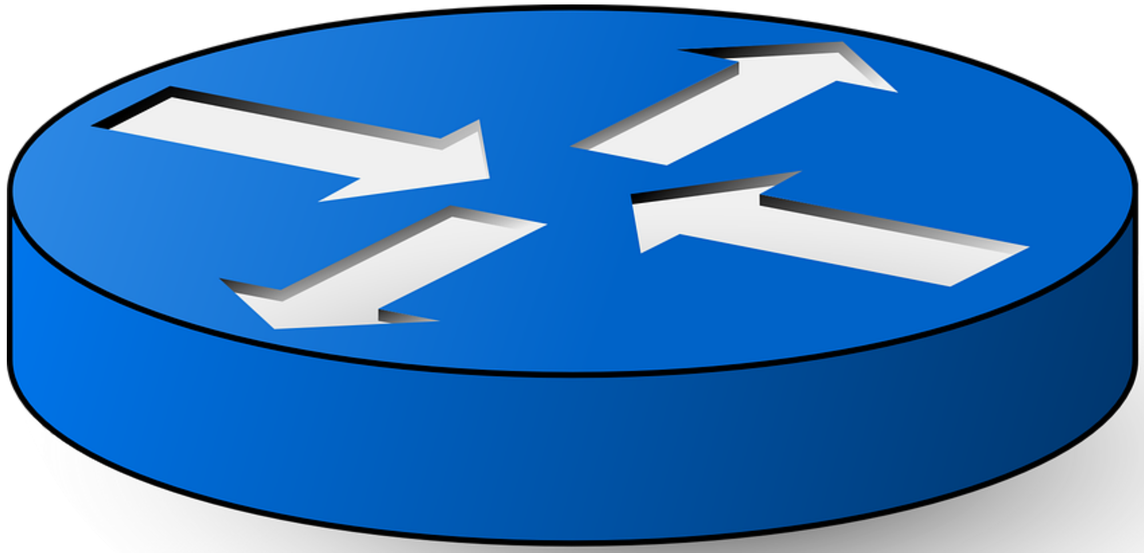
SWITCH 3750G - 48
NOC - TOGORER

Extrait de la table de routage

```
102.176.252.0/22 is directly connected, Null0
102.176.252.1/32 is directly connected, Loopback0

102.176.252.64/28 is directly connected, Vlan100
102.176.253.160/28 is directly connected, Vlan138
102.176.253.192/28 is directly connected, Vlan140
102.176.253.224/28 is directly connected, Vlan139
102.176.253.240/28 is directly connected, Vlan149
102.176.254.0/28 is directly connected, Vlan141
102.176.254.64/28 is directly connected, Vlan145
102.176.254.96/28 is directly connected, Vlan144
102.176.254.128/28 is directly connected, Vlan147
102.176.254.160/28 is directly connected, Vlan143
102.176.254.192/28 is directly connected, Vlan148

196.216.188.6/32 [1/0] via 196.216.188.9
196.216.188.8/30 is directly connected, Vlan50
196.216.188.10/32 is directly connected, Vlan50
```

Extrait de la table de routage

```
Gateway of last resort is 196.216.188.9 to network 0.0.0.0

B*    0.0.0.0/0 [20/0] via 196.216.188.9, 11:50:08
. . .
      102.0.0.0/8 is variably subnetted, 29 subnets, 3 masks
S        102.176.252.0/22 is directly connected, Null0
C        102.176.252.1/32 is directly connected, Loopback0
C        102.176.252.64/28 is directly connected, Vlan100
L        102.176.252.65/32 is directly connected, Vlan100
. . .
C        102.176.253.160/28 is directly connected, Vlan138
L        102.176.253.161/32 is directly connected, Vlan138
C        102.176.253.192/28 is directly connected, Vlan140
L        102.176.253.193/32 is directly connected, Vlan140
C        102.176.253.224/28 is directly connected, Vlan139
L        102.176.253.225/32 is directly connected, Vlan139
C        102.176.253.240/28 is directly connected, Vlan149
L        102.176.253.241/32 is directly connected, Vlan149
C        102.176.254.0/28 is directly connected, Vlan141
L        102.176.254.1/32 is directly connected, Vlan141
. . .
C        102.176.254.64/28 is directly connected, Vlan145
L        102.176.254.65/32 is directly connected, Vlan145
C        102.176.254.96/28 is directly connected, Vlan144
L        102.176.254.97/32 is directly connected, Vlan144
C        102.176.254.128/28 is directly connected, Vlan147
L        102.176.254.129/32 is directly connected, Vlan147
C        102.176.254.160/28 is directly connected, Vlan143
L        102.176.254.161/32 is directly connected, Vlan143
C        102.176.254.192/28 is directly connected, Vlan148
L        102.176.254.193/32 is directly connected, Vlan148
      196.216.188.0/24 is variably subnetted, 3 subnets, 2 masks
S        196.216.188.6/32 [1/0] via 196.216.188.9
C        196.216.188.8/30 is directly connected, Vlan50
L        196.216.188.10/32 is directly connected, Vlan50
```



SWITCH 3750G - 48
NOC - TOGORER

Session BGP avec WACREN

```
..# sh ip bgp summary

BGP router identifier 102.176.252.1, local AS number 328293
BGP table version is 5, main routing table version 5
2 network entries using 272 bytes of memory
2 path entries using 112 bytes of memory
2/2 BGP path/bestpath attribute entries using 256 bytes of memory
1 BGP AS-PATH entries using 24 bytes of memory
0 BGP route-map cache entries using 0 bytes of memory
0 BGP filter-list cache entries using 0 bytes of memory
BGP using 664 total bytes of memory
BGP activity 3/1 prefixes, 3/1 paths, scan interval 60 secs

Neighbor        V           AS MsgRcvd MsgSent   TblVer  InQ OutQ Up/Down  State/PfxRcd
196.216.188.9   4        37288   28802   28369        5    0    0 1w2d            1
```

```
..# sh ip route BGP

Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2
       i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, * - candidate default, U - per-user static route
       o - ODR, P - periodic downloaded static route, H - NHRP, l - LISP
       + - replicated route, % - next hop override

Gateway of last resort is 196.216.188.9 to network 0.0.0.0

B*    0.0.0.0/0 [20/0] via 196.216.188.9, 12:07:48
```

..# sh ip bgp 102.176.252.0/22

```
BGP routing table entry for 102.176.252.0/22, version 3
Paths: (1 available, best #1, table default)
  Advertised to update-groups:
     1
  Local
    0.0.0.0 from 0.0.0.0 (102.176.252.1)
      Origin IGP, metric 0, localpref 100, weight 32768, valid, sourced, local, best
```

..# sh ip bgp 102.176.252.0 255.255.252.0 longer

```
BGP table version is 5, local router ID is 102.176.252.1
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
              r RIB-failure, S Stale, m multipath, b backup-path, x best-external, f RT-Filter
Origin codes: i - IGP, e - EGP, ? - incomplete

   Network          Next Hop            Metric LocPrf Weight Path
*> 102.176.252.0/22 0.0.0.0                  0         32768 i
```

TogoRER Services aux Abonnés

Liste des Services aux abonnés prévus pour 24 décembre 2020

ÉDUROAM : Permettre aux acteurs d'un institut membre d'avoir accès au réseau TogoRER via le réseau d'un autre membre

MOODLE : Metre à la disposition des membres une plate-forme umtualisée de mise en ligne de cours et formation à distance

EDU-ID : Permettre aux membres de bénéficier de des services TogoRER via une fédérateur d'identité

WEBCONFERENCE : Mettre à la disposition des membres une plateforme de Webconférence et formation à distance

MESSAGERIE : Mettre à la disposition des membres qui ne l'ont pas un service de messagerie jusqu'à ce qu'il ait son propre service s'il le souhaite

DNS : Mettre à la disposition des membres un service de DNS secondaire ou Primaire en fonction de leur besoin jusque'à son autonomie

ToIP : Mettre à la disposition des membres une plateforme de ToIP