

Anexos com tabelas/link
no final do pdf

Public IPr4

Calendár Inc

203.128.181.128/25

VLAN6

10000000 1281643211618141211

N 203.128.181.128/26

40

41 - 46

2^m-2>51-1

B 203.128.181.191

41 - 46

2^m>53

SM 255.255.255.192

2^m=64

VLAN4

203.128.181.192/27

2^m-2>21

B 203.128.181.223

2^m>23

SM 255.255.255.224

2^m=32

VLAN2

2^m-2>13

N 203.128.181.224/

2^m>15

B 203.128.181.239

2^m=16

SM 255.255.255.240

VLAN8

2^m-2>6

2^m>8

2^m=8

N 203.128.181.240/29

B 203.128.181.347

SM 255.255.255.248

VLAN12

2^m-2>2

2^m>4

N 203.128.181.248/30

B 203.128.181.351

SM 255.255.255.350

N 203.128.181.352

2^m-2>8

B 203.128.181.355

2^m>4

SM 255.255.255.352

} NAT/PAT

Raciocínio:

203.128.181.128/25

64 endereços

64 endereços

203.128.181.192/26

32 addrs

32 addrs

VLAN 6 - 203.128.181.128/26

VLAN 4 - 203.128.181.192/27

203.128.181.224/27

16 addrs

203.128.181.240/28

16 addrs

VLAN 2 - 203.128.181.224/28

203.128.181.240/28

HOROSCOPE INC

203.019.037.0125

NAT/PAT

2^m-2>3

2^m>5

2^m=8

SM 255.255.255.248

VLAN 24

2^m-2>2

N 203.019.037.120/30

B 203.019.037.123

SM 255.255.255.252

E 203.019.037.0125

1281643211678141211

VLAN 14

2^m-2>29

2^m>31

SM 255.255.255.224

2^m=32

VLAN 16

2^m-2>28

B 203.019.037.63

SM 255.255.255.224

2^m=30

VLAN 18

2^m-2>14

N 203.019.037.64/28

B 203.019.037.79

SM 255.255.255.240

2^m>16

VLAN 20

2^m-2>17

N 203.019.037.80/28

B 203.019.037.95

SM 255.255.255.240

2^m>18

VLAN 22

2^m-2>8

N 203.019.037.96/28

B 203.019.037.111

SM 255.255.255.240

2^m>10

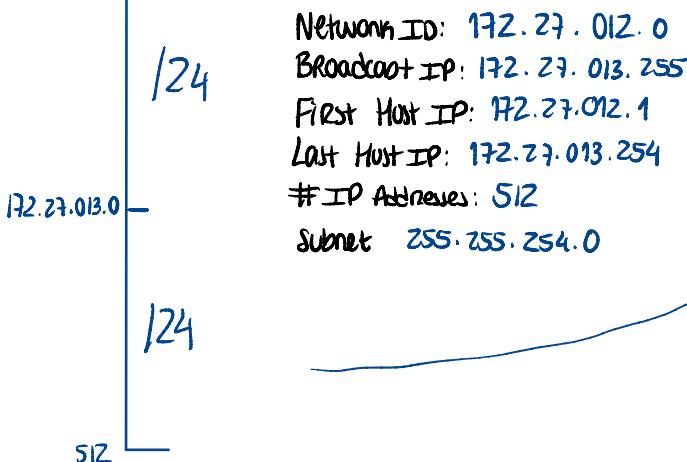
2^m>16

Private IPv4

Calendar Inc

172.27.012.0 /23

$$2^{32-23} = 2^9 = 512 \text{ IP addresses}$$



VLAN 2 → 200 endereços

- 1º N° bits necessários para os hosts
- $2^8 = 254$ hosts (suficiente)
- $2^7 = 128$ hosts (insuficiente)

2º Calcular o prefixo da subnet
 $32-8 = 24$

Logo a máscara será 255.255.255.0 (/24)

A Rede será 175.27.012.0 /24
(ou 175.27.013.0 /24)

Network ID: 175.27.012.0

Broadcast IP: 175.27.012.255

First Host IP: 175.27.012.1

Last Host IP: 175.27.012.254

Next Network: 175.27.013.0

IP Addresses: 256 (254 para hosts) (2^{32-24})

Subnet: 255.255.255.0

Para a VLAN 4 são necessários 110 endereços

Nº de bits necessários:

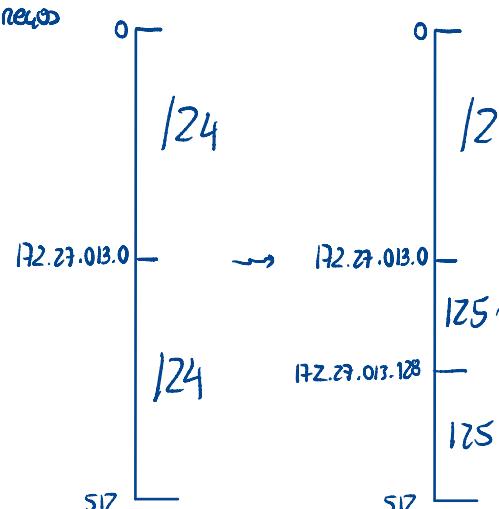
175.27.013.0 /24

$$2^7 - 2 = 126 \text{ endereços (suficientes)}$$

Prefixo subnet:

$$32-7 = 25$$

Másc: 255.255.255.128



Para os 100 endereços

Network ID: 172.27.013.0

Broadcast IP: 172.27.013.127

First Host IP: 172.27.013.1

Last Host IP: 172.27.013.126

Next Network: 172.27.013.128

IP Addresses: 128 (126 usáveis)

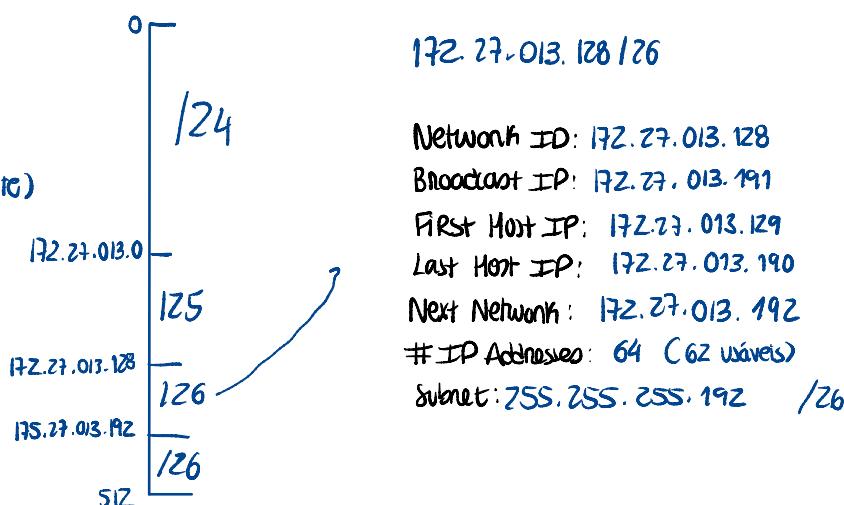
Subnet: 255.255.255.128

Para a VLAN 6 - 50 endereços

$$2^6 - 2 = 62 \text{ endereços usáveis (suficiente)}$$

Prefixo subnet:

255.255.255.192



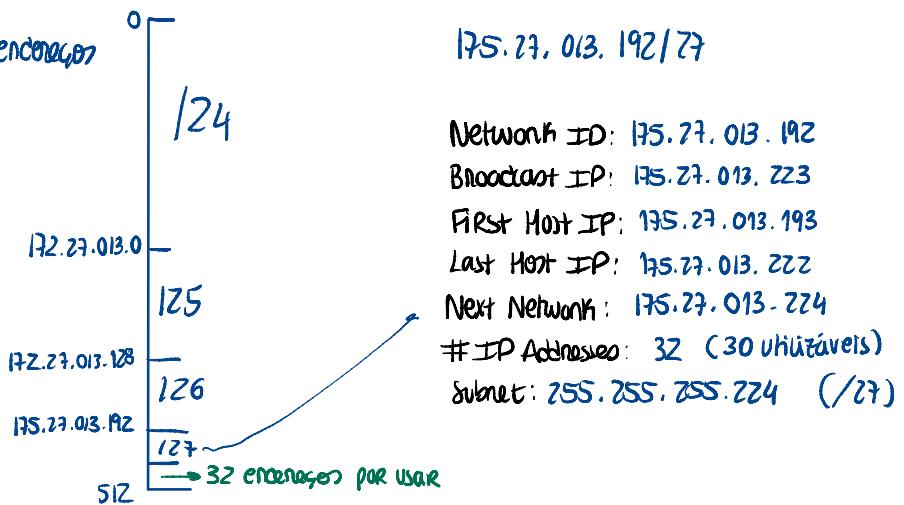
Para a VLAN 8 são necessários 25 endereços

Nº bits necessários

$$2^5 = 32$$

Subnet

$$127 - 255.255.255.224$$



Horoscope Inc - 172.29.082.0/23

172.29.082.0/23

Group size	128	64	32	16	8	4	2	1
Subnet	128	192	224	240	248	252	254	255
CDR	125	126	127	128	129	130	131	132
3rd Octet	118	119	120	121	122	123	124	

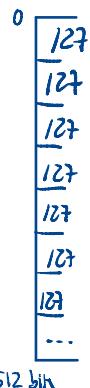
Para a VLAN 14 (25 endereços)

Nº de bits

$$2^5 - 2 = 30 \text{ endereços úteis}$$

Mask:

$$255.255.255.224 /27$$



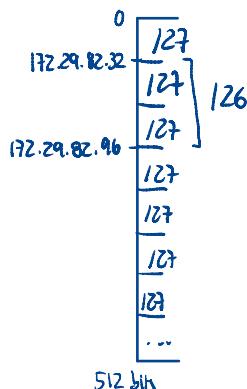
Para a VLAN 16: (55 endereços)

Nº bits:

$$2^6 - 2 = 62 \text{ (suficiente)}$$

Mask

$$255.255.255.192$$



Network ID: 172.29.082.32

Broadcast IP: 172.29.082.95

First Host IP: 172.29.082.33

Last Host IP: 172.29.082.94

Next Network: 172.29.082.96

IP Addresses: 64

Subnet: 255.255.255.192

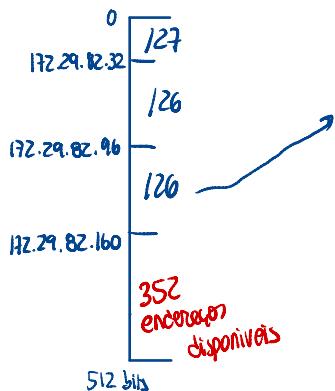
Para a VLAN 18 : (57 necesarios)

Nº bits:

$$2^6 - 2 = 62 \text{ (suficiente)}$$

Mask:

255.255.255.192



Network ID: 172.29.082.96

Broadcast IP: 172.29.082.159

First Host IP: 172.29.082.97

Last Host IP: 172.29.082.158

Next Network: 172.29.082.160

IP Addresses: 64

Subnet: 255.255.255.192 (126)

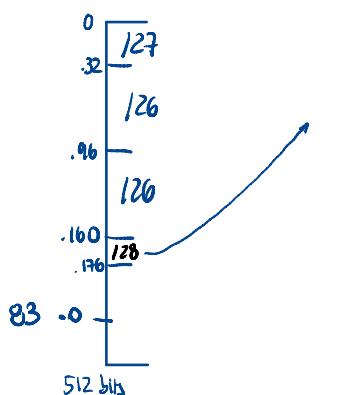
Para a VLAN 20 : (10 endereços)

Nº bits:

$$2^4 - 2 = 14 \text{ (suficiente)}$$

Mask:

255.255.255.240 128



Network ID: 172.29.082.160

Broadcast IP: 172.29.082.175

First Host IP: 172.29.082.161

Last Host IP: 172.29.082.174

Next Network: 172.29.082.176

IP Addresses: 16 (14 úteis)

Subnet: 255.255.255.240

Para a VLAN 22 (155 endereços)

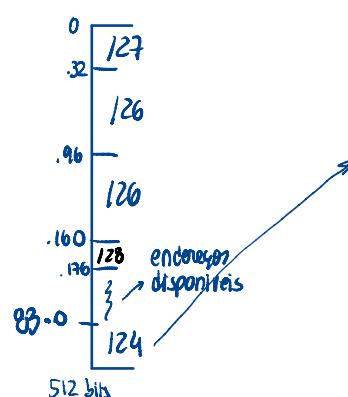
Nº bits:

$$2^7 - 2 = 126 \text{ (insuficiente!)}$$

$$2^8 = 256 \text{ (suficiente)}$$

Mask:

255.255.255.0 128



Network ID: 172.29.83.0

Broadcast IP: 172.29.83.255

First Host IP: 172.29.83.1

Last Host IP: 172.29.83.254

Next Network: 172.29.84.0

IP Addresses: 256

Subnet: 255.255.255.0 128

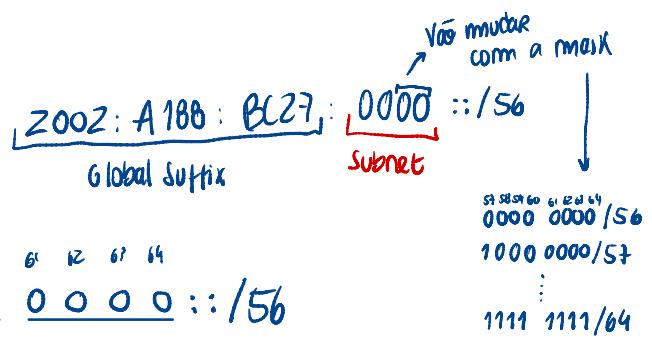
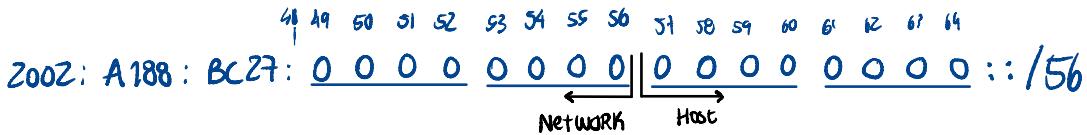
Starts with 2 → Global
Unicast Address

IPv6

Calendár Inc : 2002: A188: BC27::/48

Marsolope Inc : 2002: A193: BC78::/48

$56 - 48 = 8 \rightarrow 8$ subnets /56 dentro do /48



Calendar

156 para cada Router (incluindo o SW L3)

Router 2 : 2002: A188: BC27: 0000 ::/56

Router 1 : 2002: A188: BC78: 0000 ::/56
Poderia ir até

2002: A188: BC78: FF00 ::/56

- cada VLAN deve ter 164 dentro do 156 de cada Router

VLANs
ligadas
diretamente
à interface
do Router

VLAN 6 - 2002: A188: BC27: 0000 ::/64
VLAN 8 - 2002: A188: BC27: 0001 ::/64

VLAN 4 - 2002: A188: BC78: 0000 ::/64
VLAN 16 - 2002: A188: BC78: 0001 ::/64
VLAN 24 - 2002: A188: BC78: 0002 ::/64

VLANs
ligadas
pelo SW L3

VLAN 2 - 2002: A188: BC27: 0100 ::/64
VLAN 4 - 2002: A188: BC27: 0101 ::/64
VLAN 12 - 2002: A188: BC27: 0102 ::/64

VLAN 18 - 2002: A188: BC78: 0100 ::/64
VLAN 20 - 2002: A188: BC78: 0101 ::/64
VLAN 22 - 2002: A188: BC78: 0102 ::/64

- As interconexões entre Routers e SW L3 deve usar /126 global, a partir de um 156

2002: A188: BC27: FF00 ::/56



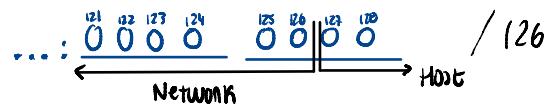
R2 e ESW2: 2002: A188: BC27: FF00 ::/126

→ Interface R2 (f1/0) : 2002: A188: BC27: FF00 ::/1
→ Interface ESW2 (f0/0) : 2002: A188: BC27: FF00 ::/2

Ainda temos outros

2 endereços disponíveis (:0 e ::3)

2002: A188: BC78: FF00 ::/56

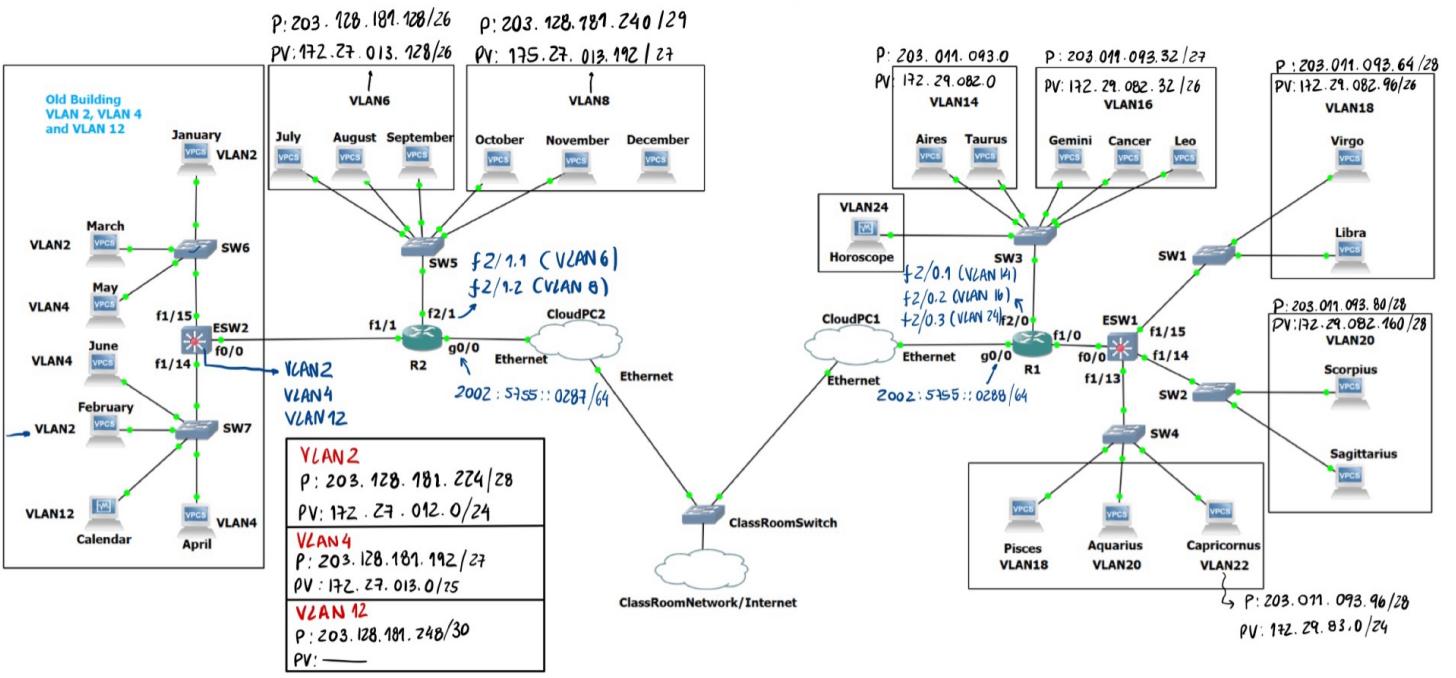


R1 e ESW1: 2002: A188: BC78: FF00 ::/126

→ Interface R1 (f1/0) : 2002: A188: BC78: FF00 ::/1
→ Interface ESW1 (f0/0) : 2002: A188: BC78: FF00 ::/2

Ainda temos outros

2 endereços disponíveis (:0 e ::3)



Calendar Inc 203.128.181.128/25							
	NAT/PAT	VLAN 2	VLAN 4	VLAN 6	VLAN 8	VLAN 12	
Num Adrs Needed*	2	12 + 1	20 + 1	50 + 1	5 + 1	1 + 1	
Network IP	203.128.181.252	203.128.181.224	203.128.181.192	203.128.181.128	203.128.181.240	203.128.181.248	
Broadcast IP	203.128.181.255	203.128.181.239	203.128.181.223	203.128.181.191	203.128.181.247	203.128.181.251	
First Host IP	203.128.181.253	203.128.181.225	203.128.181.193	203.128.181.129	203.128.181.241	203.128.181.249	
Last Host IP	203.128.181.254	203.128.181.238	203.128.181.222	203.128.181.190	203.128.181.246	203.128.181.250	
Gateway	203.128.181.254	203.128.181.238	203.128.181.222	203.128.181.190	203.128.181.246	203.128.181.250	
# IP Addresses	4	16	32	64	8	4	
# IP Addresses Available for use	2	14	30	62	6	2	
Submask	255.255.255.252 (/30)	255.255.255.240 (/28)	255.255.255.224 (/27)	255.255.255.192 (/26)	255.255.255.248 (/29)	255.255.255.252 (/30)	

Horoscope Inc 203.019.037.0/25							
	NAT/PAT	VLAN 14	VLAN 16	VLAN 18	VLAN 20	VLAN 22	VLAN 24
Num Adrs Needed*	3	28 + 1	27 + 1	13 + 1	10 + 1	7 + 1	1 + 1
Network IP	203.019.037.112	203.019.037.0	203.019.037.32	203.019.037.64	203.019.037.80	203.019.037.96	203.019.037.120
Broadcast IP	203.019.037.119	203.019.037.31	203.019.037.63	203.019.037.79	203.019.037.95	203.019.037.111	203.019.037.123
First Host IP	203.019.037.113	203.019.037.1	203.019.037.33	203.019.037.65	203.019.037.81	203.019.037.97	203.019.037.121
Last Host IP	203.019.093.118	203.019.037.30	203.019.037.62	203.019.037.78	203.019.037.94	203.019.037.110	203.019.037.122
Gateway	203.019.093.118	203.019.037.30	203.019.037.62	203.019.037.78	203.019.037.94	203.019.037.110	203.019.037.122
# IP Addresses	8	32	32	16	16	16	4
# IP Addresses Available for use	6	30	30	14	14	14	2
Submask	255.255.255.248 (/29)	255.255.255.224 (/27)	255.255.255.224 (/27)	255.255.255.240 (/28)	255.255.255.240 (/28)	255.255.255.240 (/28)	255.255.255.252 (/30)

Calendar Inc 172.27.012.0/23					
	VLAN 2	VLAN 4	VLAN 6	VLAN 8	VLAN 12
Num Adrs Needed*	200 + 1	110 + 1	50 + 1	25 + 1	0
Network IP	172.27.012.0	172.27.013.0	172.27.013.128	175.27.013.192	-
Broadcast IP	175.27.012.255	172.27.013.127	172.27.013.191	175.27.013.223	-
First Host IP	175.27.012.1	172.27.013.1	172.27.013.129	175.27.013.193	-
Last Host IP	175.27.012.254	172.27.013.126	172.27.013.190	175.27.013.222	-
Gateway	175.27.012.254	172.27.013.126	172.27.013.190	175.27.013.222	-
# IP Addresses	256	128	64	32	-
# IP Addresses Available for use	254	126	62	30	-
Submask	255.255.255.0 (24)	255.255.255.128 (25)	255.255.255.192 (26)	255.255.255.224 (27)	-

*The +1 is due to the addresses for the router/ESW interfaces

Horoscope Inc 172.29.082.0/23					
	VLAN 14	VLAN 16	VLAN 18	VLAN 20	VLAN 22
Num Adrs Needed*	25 + 1	55 + 1	57 + 1	10 + 1	155 + 1
Network IP	172.29.082.0	172.29.082.32	172.29.082.96	172.29.082.160	172.29.83.0
Broadcast IP	172.29.082.31	172.29.082.95	172.29.082.159	172.29.082.175	172.29.83.255
First Host IP	172.29.082.0	172.29.082.33	172.29.082.97	172.29.082.161	172.29.83.1
Last Host IP	172.29.082.30	172.29.082.94	172.29.082.158	172.29.082.174	172.29.83.254
Gateway	172.29.082.30	172.29.082.94	172.29.082.158	172.29.082.174	172.29.83.254
# IP Addresses	32	64	64	16	256
# IP Addresses Available for use	30	62	62	14	254
Submask	255.255.255.224 (27)	255.255.255.192 (26)	255.255.255.192 (26)	255.255.255.240 (28)	255.255.255.240 (24)

*The +1 is due to the addresses for the router/ESW interfaces

Public IPv4

Private IPv4

Calendar Inc							
2002:A188:BC27::/48							
	R2	ESW2	VLAN 2	VLAN 4	VLAN 6	VLAN 8	VLAN 12
Network IP	2002:A188:BC27:0000::	2002:A188:BC27:0100::	2002:A188:BC27:0100::	2002:A188:BC27:0101::	2002:A188:BC27:0000::	2002:A188:BC27:0001::	2002:A188:BC27:0102::
First Host IP	-	-	2002:A188:BC27:0100::	2002:A188:BC27:0101::	2002:A188:BC27:0000::	2002:A188:BC27:0001::	2002:A188:BC27:0102::
Last Host IP	-	-	2002:A188:BC27:0100::ffff:ffff:ffff:ffff	2002:A188:BC27:0101::ffff:ffff:ffff:ffff	2002:A188:BC27:0000::ffff:ffff:ffff:ffff	2002:A188:BC27:0001::ffff:ffff:ffff:ffff	2002:A188:BC27:0102::ffff:ffff:ffff:ffff
# IP Addresses	-	-	-	-	-	-	-
Submask	/56	/56	/64	/64	/64	/64	/64

Horoscope Inc								
2002:A188:BC78::/48								
	R1	ESW1	VLAN 14	VLAN 16	VLAN 18	VLAN 20	VLAN 22	VLAN 24
Network IP	2002:A188:BC78:0000::	2002:A188:BC78:0100::	2002:A188:BC78:0000::	2002:A188:BC78:0001::	2002:A188:BC78:0100::	2002:A188:BC78:0101::	2002:A188:BC78:0102::	2002:A188:BC78:0002::
First Host IP	-	-	2002:A188:BC78:0000::	2002:A188:BC78:0001::	2002:A188:BC78:0100::	2002:A188:BC78:0101::	2002:A188:BC78:0102::	2002:A188:BC78:0002::
Last Host IP	-	-	2002:A188:BC78:0000::ffff:ffff:ffff:ffff	2002:A188:BC78:0001::ffff:ffff:ffff:ffff	2002:A188:BC78:0100::ffff:ffff:ffff:ffff	2002:A188:BC78:0101::ffff:ffff:ffff:ffff	2002:A188:BC78:0102::ffff:ffff:ffff:ffff	2002:A188:BC78:0002::ffff:ffff:ffff:ffff
# IP Addresses	-	-	-	-	-	-	-	-
Submask	/56	/56	/64	/64	/64	/64	/64	/64

INTERCONNECT							
	R1	ESW1	R2	ESW2			
Network IP	2002:A188:BC78:FF00::		2002:A188:BC27:FF00::				
First Host IP	2002:A188:BC78:FF00::		2002:A188:BC27:FF00::				
Last Host IP	2002:A188:BC78:FF00::3		2002:A188:BC27:FF00::3				
# IP Addresses	-	-	-	-			
Submask	/126		/126				

https://docs.google.com/spreadsheets/d/1rwOR8qsjfZPyISzYk4yI31iZ5c7Gb_ugq-QueQSKBu4/edit?usp=sharing

IPv6