Mini-Projeto: Fundamentos de Redes

Universidade de Aveiro

Lúcia Sousa 93086 (Turma P3), Raquel Pinto 92948 (Turma P1)

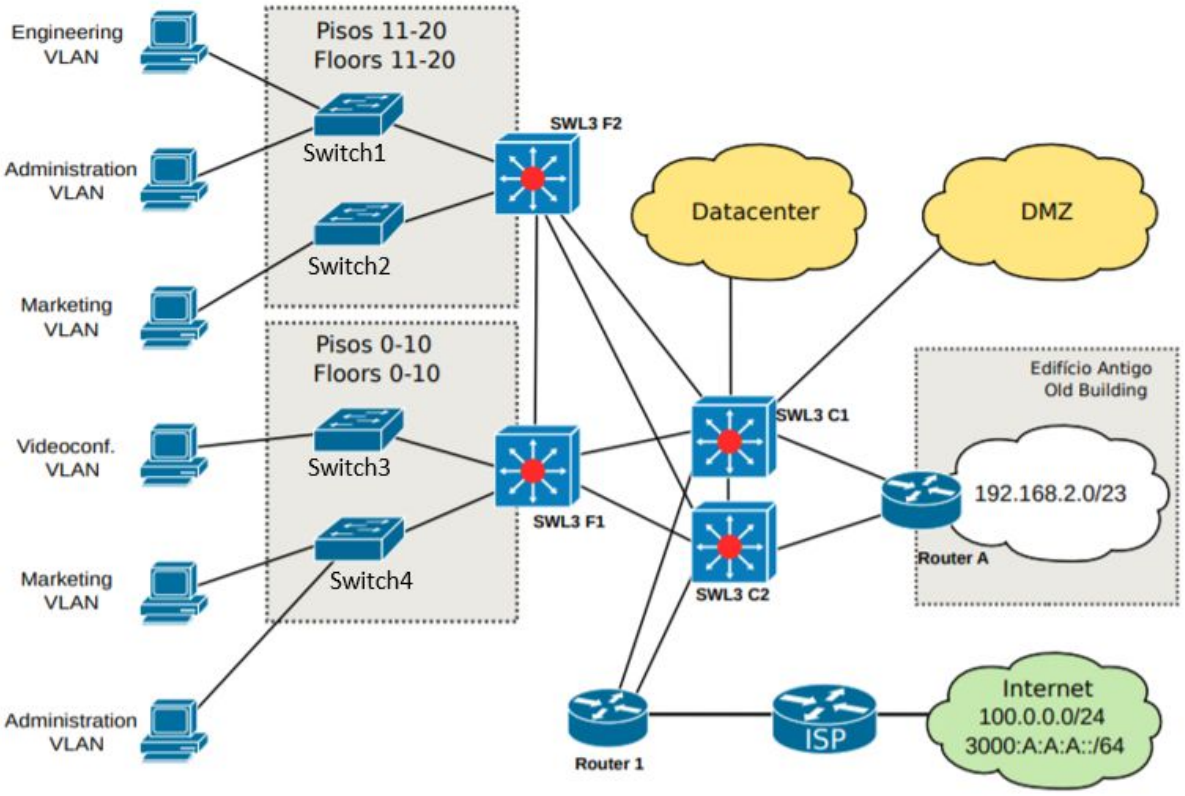
Endereços:

IPv4 Público → 200.148.186.0/25

IPv4 Privado → 10.186.0.0/16

IPv6 Global → 2100:0:0:9000::/60

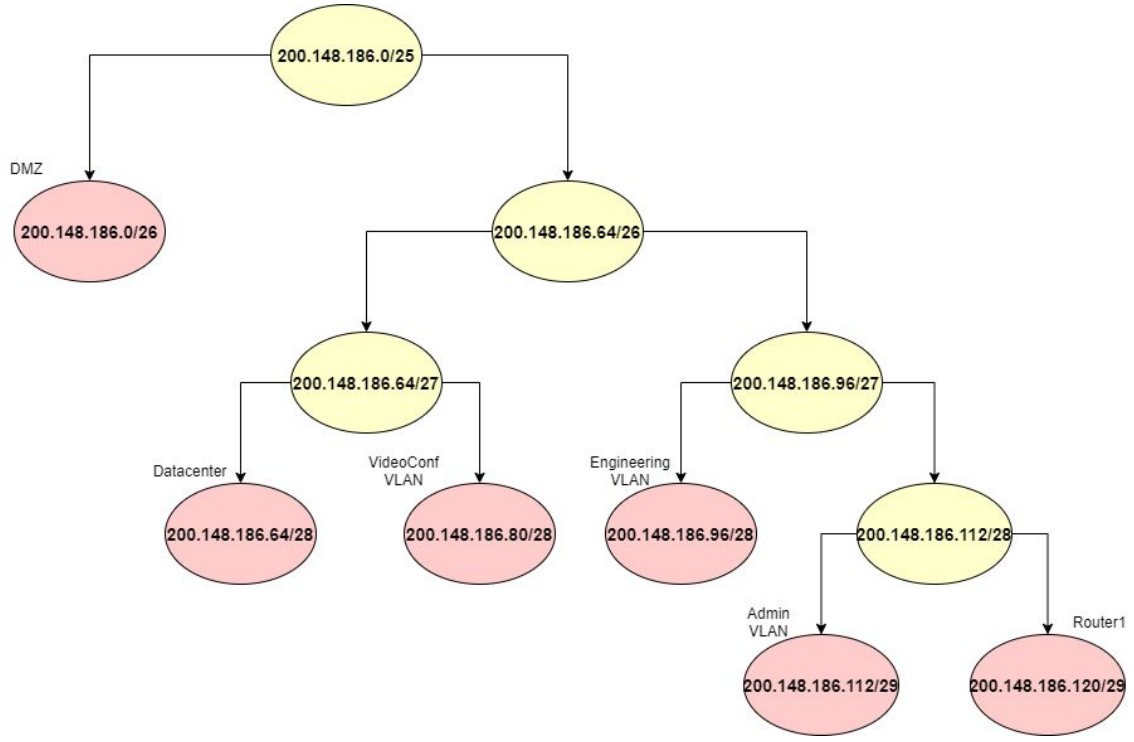
Esquema de uma rede de negócios:



IPv4 Público:

As máscaras permitem a criação de sub-redes(*subnets*). Para cada VLAN foram necessárias máscaras diferentes, para podermos obter o número mínimo de endereços, considerando o número de anfitriões, *gateways* e os endereços IP e *broadcast*.

DMZ: 32 (hosts) + 1 (gateway) + 2 = 35 → /26
Datacenter: 10 (hosts) + 1 (gateway) + 2 = 13 → /28
VideoConf VLAN: 7 (hosts) + 2 (gateways) + 2 = 11 → /28
Admin VLAN: 2 (hosts) + 2 (gateways) + 2 = 6 → /29
Engineering VLAN: 5 (hosts) + 2 (gateway) + 2 = 9 → /28

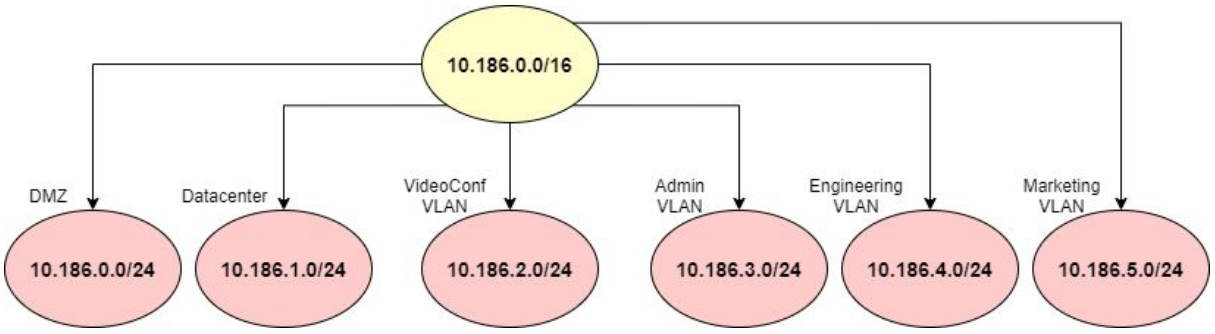


Local Network	Endereço IPv4 público	Intervalo dos terminais
DMZ	200.148.186.0/26	200.148.186.1/26 - 200.148.186.62/26
Datacenter	200.148.186.64/28	200.148.186.65/28 - 200.148.186.78/28
VideoConf VLAN	200.148.186.80/28	200.148.186.81/28 - 200.148.186.94/28
Admin VLAN	200.148.186.112/29	200.148.186.113/29 - 200.148.186.118/29
Engineering VLAN	200.148.186.96/28	200.148.186.97/28 - 200.148.186.110/28
Router1 NAT/PAT	200.148.186.120/29	200.148.186.121/29 - 200.148.186.126/29

IPv4 Privado:

Para atribuir um endereço IPv4 privado foi usada uma máscara /24, sendo assim teremos 256 redes possíveis, os endereços terminais serão 254.

Para as ligações ponto a ponto entre Routers e Switches a máscara utilizada foi /30, por conseguinte, os endereços terminais serão apenas 2.



Local Network	Endereço IPv4 privado	Intervalo dos terminais
DMZ	10.186.0.0/24	10.186.0.1/24 - 10.186.0.254/24
Datacenter	10.186.1.0/24	10.186.1.1/24 - 10.186.1.254/24
VideoConf VLAN	10.186.2.0/24	10.186.2.1/24 - 10.186.2.254/24
Admin VLAN	10.186.3.0/24	10.186.3.1/24 - 10.186.3.254/24
Engineering VLAN	10.186.4.0/24	10.186.4.1/24 - 10.186.4.254/24
Marketing VLAN	10.186.5.0/24	10.186.5.1/24 - 10.186.5.254/24
SWL3C1 - Router1	10.186.6.0/30	10.186.6.1/30 - 10.186.6.2/30
SWL3C2 - Router1	10.186.6.4/30	10.186.6.5/30 - 10.186.6.6/30
SWL3C1 - RouterA	10.186.6.8/30	10.186.6.9/30 - 10.186.6.10/30
SWL3C2 - RouterA	10.186.6.12/30	10.186.6.13/30 - 10.186.6.14/30
SWL3C1 - SWL3C2	10.186.6.16/30	10.186.6.17/30 - 10.186.6.18/30
Router1 -ISP	10.186.6.20/30	10.186.6.21/30 - 10.186.6.22/30

IPv6 Global:

Foi atribuída uma máscara /64 para cada VLAN e uma máscara /126 para cada ligação ponto a ponto.

Local Network	Endereço IPv6 Global	Intervalo dos terminais
DMZ	2100:0:0:9000::/64	2100:0:0:9000:0:0:0:0001/64 - 2100:0:0:9000:EFFF:FFFF:FFFF:FFFF/64
Datacenter	2100:0:0:9001::/64	2100:0:0:9001:0:0:0:0001/64 - 2100:0:0:9001:EFFF:FFFF:FFFF:FFFF/64
VideoConf VLAN	2100:0:0:9002::/64	2100:0:0:9002:0:0:0:0001/64 - 2100:0:0:9002:EFFF:FFFF:FFFF:FFFF/64
Admin VLAN	2100:0:0:9003::/64	2100:0:0:9003:0:0:0:0001/64 - 2100:0:0:9003:EFFF:FFFF:FFFF:FFFF/64
Engineering VLAN	2100:0:0:9004::/64	2100:0:0:9004:0:0:0:0001/64 - 2100:0:0:9004:EFFF:FFFF:FFFF:FFFF/64
Marketing VLAN	2100:0:0:9005::/64	2100:0:0:9005:0:0:0:0001/64 - 2100:0:0:9005:EFFF:FFFF:FFFF:FFFF/64
SWL3C1-Router1	2100:0:0:9006::/126	2100:0:0:9006:0:0:0:0001/126 - 2100:0:0:9006:EFFF:FFFF:FFFF:FFFF/126
SWL3C2-Router1	2100:0:0:9007::/126	2100:0:0:9007:0:0:0:0001/126 - 2100:0:0:9007:EFFF:FFFF:FFFF:FFFF/126
SWL3C1-RouterA	2100:0:0:9008::/126	2100:0:0:9008:0:0:0:0001/126 - 2100:0:0:9008:EFFF:FFFF:FFFF:FFFF/126
SWL3C2-RouterA	2100:0:0:9009::/126	2100:0:0:9009:0:0:0:0001/126 - 2100:0:0:9009:EFFF:FFFF:FFFF:FFFF/126
SWL3C1-SWL3C2	2100:0:0:900A::/126	2100:0:0:900A:0:0:0:0001/126 - 2100:0:0:900A:EFFF:FFFF:FFFF:FFFF/126

Endereçamento dos Routers e Switches:

Consideramos SWL3C1 e SWL3C2 como *gateways*, as ligações entre SWL3Cx e SWL3Fx são ligações *layer* 2, ou seja, *switching*. As ligações SWL3Cx aos *routers* são de *routing*, layer 3, sendo, por isso, necessário atribuir um endereço IP.

Sw/Rt	VLAN/Interface	IPv4 Público	IPv4 Privado	IPv6 Global
SWL3C1	DMZ	200.148.186.1/26	10.186.0.1/24	2100:0:0:9000:0:0:0:0001/64
	Datacenter	200.148.186.65/28	10.186.1.1/24	2100:0:0:9001:0:0:0:0001/64
	VideoConf VLAN	200.148.186.81/28	10.186.2.1/24	2100:0:0:9002:0:0:0:0001/64
	Admin VLAN	200.148.186.113/29	10.186.3.1/24	2100:0:0:9003:0:0:0:0001/64
	Engineering VLAN	200.148.186.97/28	10.186.4.1/24	2100:0:0:9004:0:0:0:0001/64
	Marketing VLAN	----	10.186.5.1/24	2100:0:0:9005:0:0:0:0001/64
	F0/0 - Router1	----	10.186.6.1/30	2100:0:0:9006:0:0:0:0001/126
	F0/1 - RouterA	----	10.186.6.9/30	2100:0:0:9008:0:0:0:0001/126
	F1/0 - SWL3C2	----	10.186.6.17/30	2100:0:0:900A:0:0:0:0001/126
	F1/2 - SWL3F1	----	Trunk	Trunk
	F1/3 - SWL3F2	----	Trunk	Trunk
SWL3C2	VideoConf VLAN	200.148.186.82/28	10.186.2.2/24	2100:0:0:9002:0:0:0:0002/64
	Admin VLAN	200.148.186.114/29	10.186.3.2/24	2100:0:0:9003:0:0:0:0002/64
	Engineering VLAN	200.148.186.98/28	10.186.4.2/24	2100:0:0:9004:0:0:0:0002/64
	Marketing VLAN	----	10.186.5.2/24	2100:0:0:9005:0:0:0:0002/64
	F0/1 - Router1	----	10.186.6.5/30	2100:0:0:9007:0:0:0:0001/126
	F0/0 - RouterA	----	10.186.6.13/30	2100:0:0:9009:0:0:0:0001/126
	F1/0 - SWL3C1	----	10.186.6.18/30	2100:0:0:900A:0:0:0:0002/126
	F1/1 - SWL3F1	----	Trunk	Trunk
	F1/2 - SWL3F2	----	Trunk	Trunk
SWL3F1	F1/2 - SWL3C1	----	Trunk	Trunk
	F1/1 - SWL3C2	----	Trunk	Trunk

SWL3F1	F1/0 - SWL3F2	----	Trunk	Trunk
	F1/3 - Switch3	----	Trunk	Trunk
	F1/4 - Switch4	----	Trunk	Trunk
SWL3F2	F1/3 - SWL3C1	----	Trunk	Trunk
	F1/2 - SWL3C2	----	Trunk	Trunk
	F1/0 - SWL3F1	----	Trunk	Trunk
	F1/1 - Switch1	----	Trunk	Trunk
	F1/4 - Switch2	----	Trunk	Trunk
Router1	F0/0 - SWL3C1	----	10.186.6.2/30	2100:0:0:9006:0:0:0:0002/126
	F0/1 - SWL3C2	----	10.186.6.6/30	2100:0:0:9007:0:0:0:0002/126
	F1/0 - ISP	----	101.0.0.1/24	3001:A:A:A::1/64
RouterA	F0/1 - SWL3C1	----	10.186.6.10/30	2100:0:0:9008:0:0:0:0002/126
	F0/0 - SWL3C2	----	10.186.6.14/30	2100:0:0:9009:0:0:0:0002/126
	F1/0 - Old Building	----	192.168.2.0/23	----

Gateways:

Local Network	**1ª Gateway SWL3 C1**	**2ª Gateway SWL3 C2**
DMZ	IPv4→10.186.0.254/24 IPv6→2100:0:0:9000:EFFF:FFFF:FFFF:FFFF/64	----------
Datacenter	IPv4→10.186.1.254/24 IPv6→2100:0:0:9001:EFFF:FFFF:FFFF:FFFF/64	----------
VideoConf VLAN	IPv4→10.186.2.254/24 IPv6→2100:0:0:9002:EFFF:FFFF:FFFF:FFFF/64	IPv4→10.186.2.253/24 IPv6→2100:0:0:9002:EEFF:FFFF:FFFF:FFFF/64
Admin VLAN	IPv4→10.186.3.254/24 IPv6→2100:0:0:9003:EFFF:FFFF:FFFF:FFFF/64	IPv4→10.186.3.253/24 IPv6→2100:0:0:9003:EEFF:FFFF:FFFF:FFFF/64
Engineering VLAN	IPv4→10.186.4.254/24 IPv6→2100:0:0:9004:EFFF:FFFF:FFFF:FFFF/64	IPv4→10.186.4.253/24 IPv6→2100:0:0:9004:EEFF:FFFF:FFFF:FFFF/64
Marketing VLAN	IPv4→10.186.5.254/24 IPv6->2100:0:0:9005:EFFF:FFFF:FFFF:FFFF/64	IPv4→10.186.5.253/24 IPv6->2100:0:0:9005:EEFF:FFFF:FFFF:FFFF/64