Jim Blanco

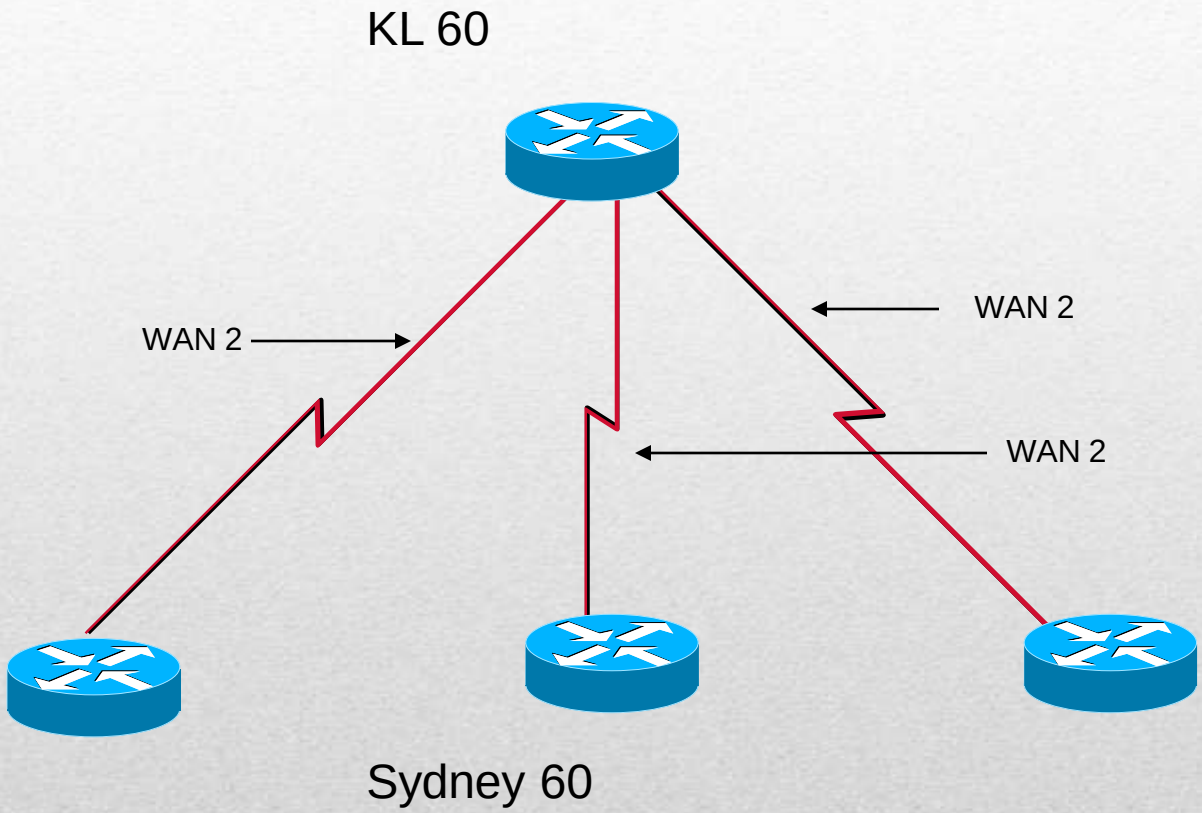
Aparicio-Levy Technical Center

Variable Length Subnetting

Variable Length Subnetting

- VLSM allows us to use one class C address to design a networking scheme to meet the following requirements:
- Perth 60 users
- Kuala Lumpur 28 users
- Sydney 12 users
- Singapore 12 users
- WAN links between each router

Networking Requirements



•Classful subnetting is very wasteful.

•In the example above, a /26 was used to provide the 60 addresses for Perth and the other LANs. There are no addresses left for WAN links

VLSM

- Forget everything you learned about classfull subnetting.
- Just remember you have 256 – 2 = 254 addresses to work with.

VLSM

Name/required addresses	Subnet address	Address range	Broadcast	Address/subnet
Perth/60	192.168.12.0			
KL/28				
Sydney/12				
Sing/12				
WAN1/2				
WAN2/2				
WAN3/2				

List your network requirements in descending order.

VLSM

Name/required addresses	Subnet address	Address range	Broadcast	Address/subnet
Perth/60	192.168.12.0	.1 - 62	.63	192.168.12.0/26
KL/28				
Sydney/12				
Sing/12				
WAN1/2				
WAN2/2				
WAN3/2				

Calculate the subnet mask to meet largest requirement - Perth

VLSM

Name/required addresses	Subnet address	Address range	Broadcast	Address/subnet
Perth/60	192.168.12.0	.1 - 62	.63	192.168.12.0/26
KL/28	192.168.12.64	.65 - .94	.95	192.168.12.64/27
Sydney/12				
Sing/12				
WAN1/2				
WAN2/2				
WAN3/2				

Keep track of subnet and broadcast addresses. Use the next available Address .64 to calculate a subnet mask for the next largest requirement - KL Lumpur.

VLSM

Name/required addresses	Subnet address	Address range	Broadcast	Address/subnet
Perth/60	192.168.12.0	.1 - 62	.63	192.168.12.0/26
KL/28	192.168.12.64	.65 - .94	.95	192.168.12.64/27
Sydney/12	192.168.12.96	.97- .110	.111	192.168.12.96/28
Sing/12				
WAN1/2				
WAN2/2				
WAN3/2				

Sydney needs 12 addresses. Use the next available address .96 to calculate a subnet for Sydney's requirement for 12

VLSM

Name/required addresses	Subnet address	Address range	Broadcast	Address/subnet
Perth/60	192.168.12.0	.1 - 62	.63	192.168.12.0/26
KL/28	192.168.12.64	.65 - .94	.95	192.168.12.64/27
Sydney/12	192.168.12.96	.97- .110	.111	192.168.12.96/28
Sing/12	192.168.12.112	.113 - .126	.127	192.168.12.112/28
WAN1/2				
WAN2/2				
WAN3/2				

Singapore also requires 12

VLSM

Name/required addresses	Subnet address	Address range	Broadcast	Address/subnet
Perth/60	192.168.12.0	.1 - 62	.63	192.168.12.0/26
KL/28	192.168.12.64	.65 - .94	.95	192.168.12.64/27
Sydney/12	192.168.12.96	.97- .110	.111	192.168.12.96/28
Sing/12	192.168.12.112	.113 - .126	.127	192.168.12.112/28
WAN1/2	192.168.12.128	.129 - .130	.131	192.168.12.128/30
WAN2/2				
WAN3/2				

WAN links require 2 addresses each

VLSM

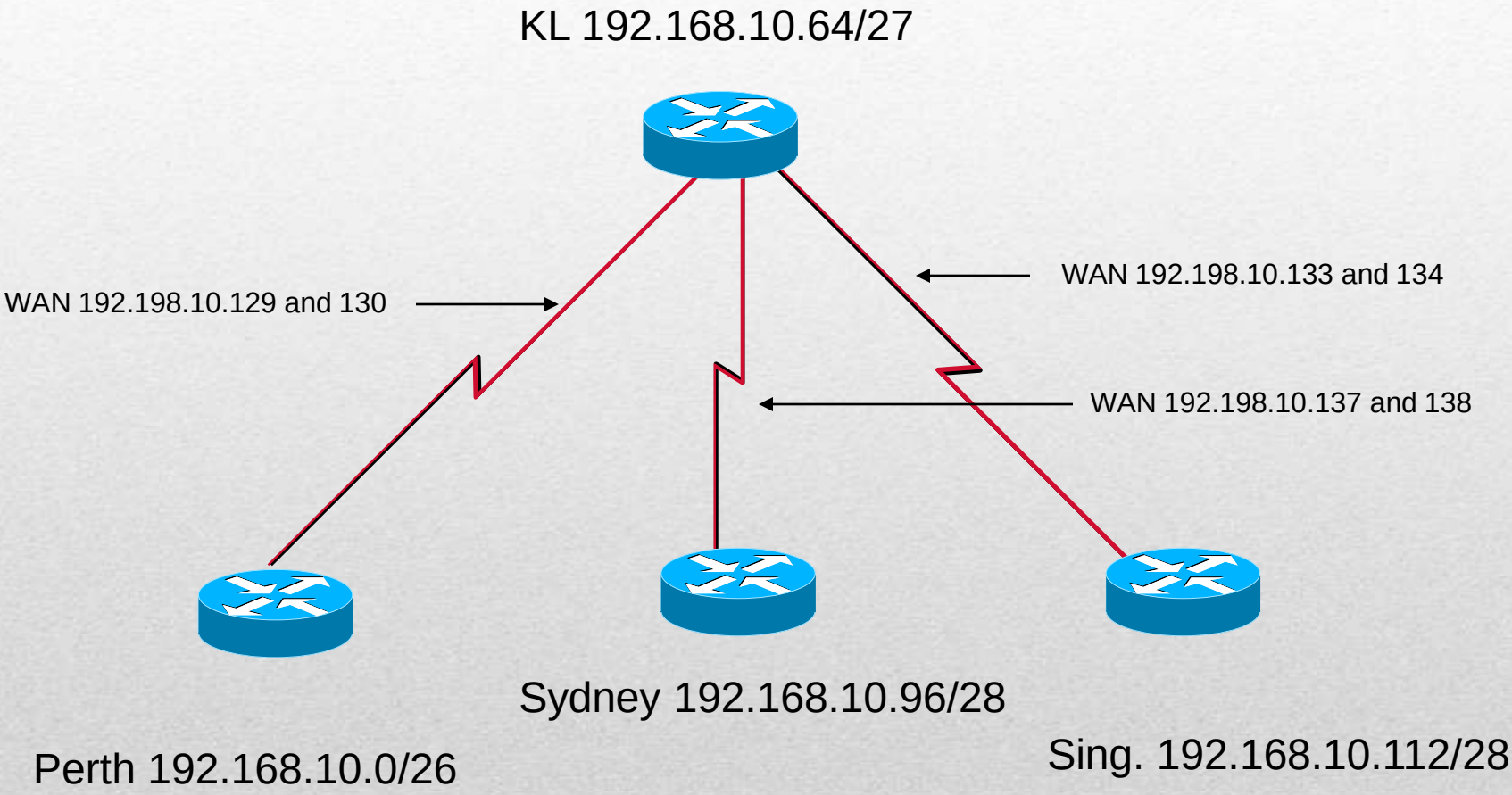
Name/required addresses	Subnet address	Address range	Broadcast	Address/subnet
Perth/60	192.168.12.0	.1 - 62	.63	192.168.12.0/26
KL/28	192.168.12.64	.65 - .94	.95	192.168.12.64/27
Sydney/12	192.168.12.96	.97- .110	.111	192.168.12.96/28
Sing/12	192.168.12.112	.113 - .126	.127	192.168.12.112/28
WAN1/2	192.168.12.128	.129 - .130	.131	192.168.12.128/30
WAN2/2	192.168.12.132	.133 - 134	.135	192.168.12.132/30
WAN3/2				

VLSM

Name/required addresses	Subnet address	Address range	Broadcast	Address/subnet
Perth/60	192.168.12.0	.1 - 62	.63	192.168.12.0/26
KL/28	192.168.12.64	.65 - .94	.95	192.168.12.64/27
Sydney/12	192.168.12.96	.97- .110	.111	192.168.12.96/28
Sing/12	192.168.12.112	.113 - .126	.127	192.168.12.112/28
WAN1/2	192.168.12.128	.129 - .130	.131	192.168.12.128/30
WAN2/2	192.168.12.132	.133 - 134	.135	192.168.12.132/30
WAN3/2	192.168.12.136	.137 - .138	.139	192.168.12.136/30

The networking problem is solved

Networking Scheme



Apply the address to the LAN or WAN link

- A class C address such as 192.168.12.0 contains 256 - 2 = 254 usable addresses
- You used only addresses .0 - .139