

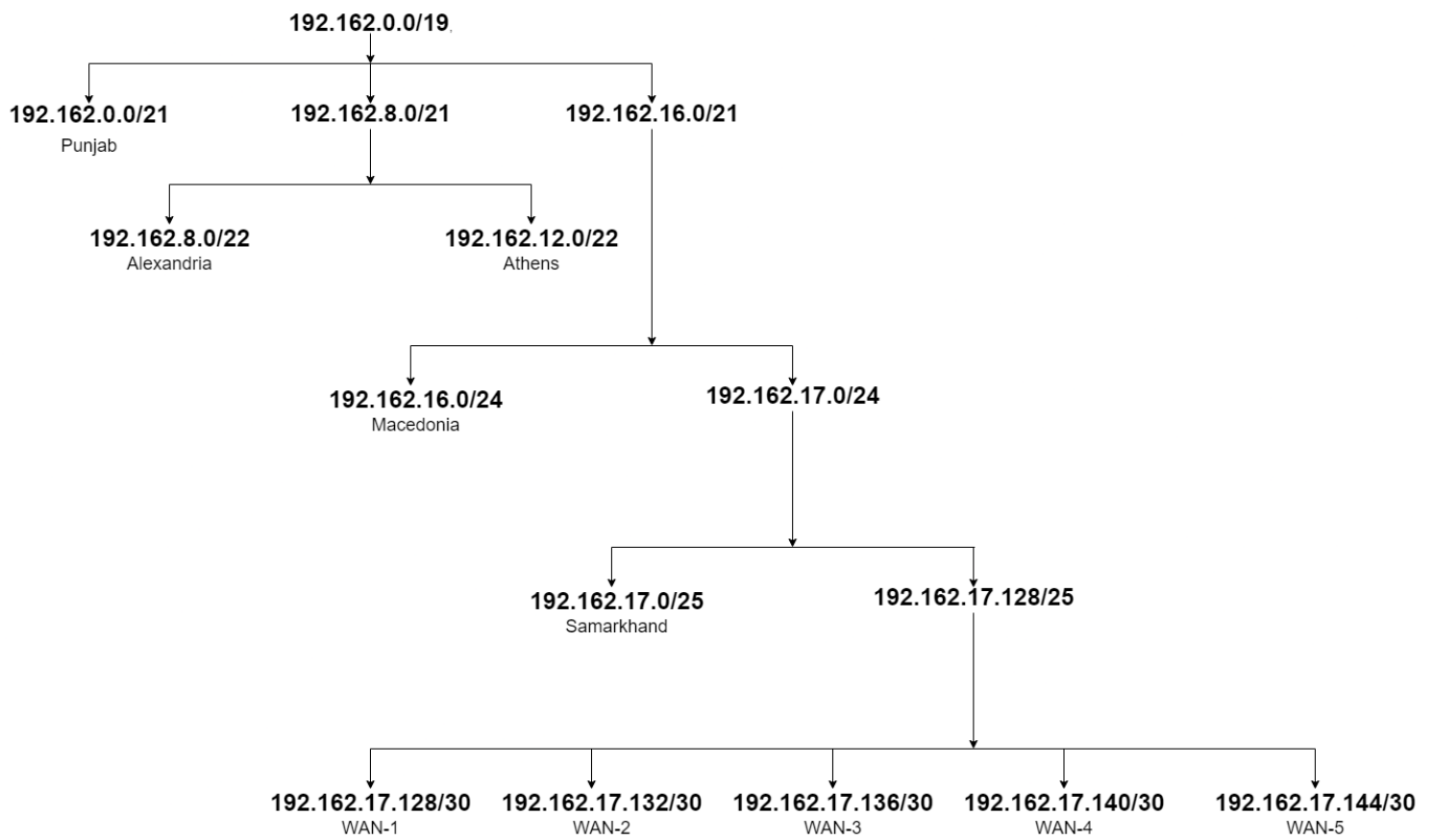
VLSM

VLSM Table

Major Network Address Assumed: 192.162.0.0/19

Host Name	Host Requirement	+2	IP Address Block	Host Bit	Network Bit
Punjab	1789	1791	2048	11	21
Alexandria	900	902	1024	10	22
Athens	512	514	1024	10	22
Macedonia	234	236	256	8	24
Samarkhand	72	74	128	7	25
WAN_1	2	4	4	2	30
WAN_2	2	4	4	2	30
WAN_3	2	4	4	2	30
WAN_4	2	4	4	2	30
WAN_5	2	4	4	2	30

VLSM Tree



IP Addressing Table

Device	Interface	IPv4 Address	Subnet Mask	Default Gateway
Samarkhand Router	Fa1/0	192.162.17.1	255.255.255.128	N/A
	Se2/0	192.162.17.129	255.255.255.252	N/A
Punjab Router	Se6/0	192.162.17.137	255.255.255.252	N/A
	Se3/0	192.162.17.133	255.255.255.252	N/A
	Se2/0	192.162.17.130	255.255.255.252	N/A
	Fa0/0	192.162.0.1	255.255.248.0	N/A
Athens Router	Se6/0	192.162.17.145	255.255.255.252	N/A
	Se3/0	192.162.17.134	255.255.255.252	N/A
	Se2/0	192.162.17.141	255.255.255.252	N/A
	Fa0/0	192.162.12.1	255.255.252.0	N/A
Alexandria Router	Se6/0	192.162.17.138	255.255.255.252	N/A
	Se2/0	192.162.17.142	255.255.255.252	N/A
	Fa0/0	192.162.8.1	255.255.252.0	N/A
Macedonia Router	Se6/0	192.162.17.146	255.255.255.252	N/A
	Fa0/0	192.162.16.1	255.255.255.0	N/A
PC0	NIC	192.162.0.2	255.255.248.0	192.162.0.1
PC1	NIC	192.162.0.3	255.255.248.0	192.162.0.1
PC2	NIC	192.162.12.2	255.255.252.0	192.162.12.1
PC3	NIC	192.162.12.3	255.255.252.0	192.162.12.1
PC4	NIC	DHCP assigned	DHCP assigned	DHCP assigned
PC5	NIC	DHCP assigned	DHCP assigned	DHCP assigned
PC6	NIC	DHCP assigned	DHCP assigned	DHCP assigned
PC7	NIC	DHCP assigned	DHCP assigned	DHCP assigned
PC8	NIC	DHCP assigned	DHCP assigned	DHCP assigned

PC9	NIC	DHCP assigned	DHCP assigned	DHCP assigned
Samarkhand Web Server	Fa0	192.162.17.2	255.255.255.128	192.162.17.1
Macedonia Web Server	Fa0	192.162.16.3	255.255.255.0	192.162.16.1
Alexandria DHCP Server	Fa0	192.162.8.2	255.255.252.0	192.162.8.1
Samarkhand DHCP Server	Fa0	192.162.17.3	255.255.255.128	192.162.17.1
Macedonia DHCP Server	Fa0	192.162.16.4	255.255.255.0	192.162.16.1
Athens Email Server	Fa0	192.162.12.4	255.255.252.0	192.162.12.1
Macedonia DNS Server	Fa0	192.162.16.2	255.255.255.0	192.162.16.1

Commands

Samarkand Router

Router Configuration

```

Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname Samarkhand
Samarkhand(config)#int Fa1/0
Samarkhand(config-if)#ip address 192.162.17.1 255.255.255.128
Samarkhand(config-if)#no shutdown
Samarkhand(config-if)#
%LINK-5-CHANGED: Interface FastEthernet1/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1/0, changed state to up

Samarkhand(config-if)#exit
Samarkhand(config)#int Se2/0

```

```
Samarkhand(config-if)#ip address 192.162.17.129 255.255.255.252
Samarkhand(config-if)#clock rate 64000
Samarkhand(config-if)#no shutdown
%LINK-5-CHANGED: Interface Serial2/0, changed state to down
Samarkhand(config-if)#end
Samarkhand#
%SYS-5-CONFIG_I: Configured from console by console
Samarkhand#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
```

Routing Configuration (Static, Dynamic Routing)

```
Samarkhand>enable
Samarkhand#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Samarkhand(config)#ip route 192.162.0.0 255.255.248.0 Se2/0
Samarkhand(config)#ip route 192.162.12.0 255.255.252.0 Se2/0
Samarkhand(config)#ip route 192.162.16.0 255.255.255.0 Se2/0
Samarkhand(config)#ip route 192.162.17.144 255.255.255.252 Se2/0
Samarkhand(config)#router rip
Samarkhand(config-router)#version 2
Samarkhand(config-router)#no auto-summary
Samarkhand(config-router)#network 192.162.17.0
Samarkhand(config-router)#network 192.162.17.128
Samarkhand(config-router)#passive-interface Fa1/0
Samarkhand(config-router)#redistribute static
Samarkhand(config-router)#end
Samarkhand#
%SYS-5-CONFIG_I: Configured from console by console
Samarkhand#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
```

Punjab Router

Router Configuration

Router>enable

Router#configure terminal

Enter configuration commands, one per line. End with CNTL/Z.

Router(config)#hostname Punjab

Punjab(config)#int Fa0/0

Punjab(config-if)#ip address 192.162.0.1 255.255.248.0

Punjab(config-if)#no shutdown

Punjab(config-if)#

%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up

Punjab(config-if)#exit

Punjab(config)#int Se2/0

Punjab(config-if)#ip address 192.162.17.130 255.255.255.252

Punjab(config-if)#no shutdown

Punjab(config-if)#

%LINK-5-CHANGED: Interface Serial2/0, changed state to up

Punjab(config-if)#exit

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up

Punjab(config)#int Se3/0

Punjab(config-if)#ip address 192.162.17.133 255.255.255.252

Punjab(config-if)#clock rate 64000

Punjab(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial3/0, changed state to down

Punjab(config-if)#exit

Punjab(config)#int Se6/0

Punjab(config-if)#ip address 192.162.17.137 255.255.255.252

Punjab(config-if)#clock rate 64000

Punjab(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial6/0, changed state to down

Punjab(config-if)#end

Punjab#

%SYS-5-CONFIG_I: Configured from console by console

```
Punjab#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
```

Routing Configuration (Static, Dynamic Routing)

```
Punjab>enable
Punjab#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Punjab(config)#ip route 192.162.12.0 255.255.252.0 Se6/0
Punjab(config)#ip route 192.162.12.0 255.255.252.0 Se3/0 5
Punjab(config)#ip route 192.162.16.0 255.255.255.0 Se6/0
Punjab(config)#ip route 192.162.16.0 255.255.255.0 Se3/0 5
Punjab(config)#ip route 192.162.17.144 255.255.255.252 Se6/0
Punjab(config)#ip route 192.162.17.144 255.255.255.252 Se3/0 5
Punjab(config)#router rip
Punjab(config-router)#version 2
Punjab(config-router)#no auto-summary
Punjab(config-router)#network 192.162.0.0
Punjab(config-router)#network 192.162.17.128
Punjab(config-router)#network 192.162.17.132
Punjab(config-router)#network 192.162.17.136
Punjab(config-router)#passive-interface Fa0/0
Punjab(config-router)#redistribute static
Punjab(config-router)#end
Punjab#
%SYS-5-CONFIG_I: Configured from console by console
Punjab#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
```

Athens Router

Router Configuration

```
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname Athens
Athens(config)#int Fa0/0
Athens(config-if)#ip address 192.162.12.1 255.255.252.0
Athens(config-if)#no shutdown
Athens(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
Athens(config-if)#exit
Athens(config)#int Se3/0
Athens(config-if)#ip address 192.162.17.134 255.255.255.252
Athens(config-if)#no shutdown
Athens(config-if)#
%LINK-5-CHANGED: Interface Serial3/0, changed state to up
Athens(config-if)#exit
Athens(config)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to up
Athens(config)#int Se2/0
Athens(config-if)#ip address 192.162.17.141 255.255.255.252
Athens(config-if)#clock rate 64000
Athens(config-if)#no shutdown
%LINK-5-CHANGED: Interface Serial2/0, changed state to down
Athens(config-if)#
Athens(config-if)#exit

Athens(config)#int Se6/0
Athens(config-if)#ip address 192.162.17.145 255.255.255.252
Athens(config-if)#clock rate 64000
Athens(config-if)#no shutdown
%LINK-5-CHANGED: Interface Serial6/0, changed state to down
Athens(config-if)#end
Athens#
%SYS-5-CONFIG_I: Configured from console by console
Athens#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
```


Routing Configuration (Static, Dynamic Routing)

```
Athens>enable
Athens#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Athens(config)#ip route 192.162.17.128 255.255.255.252 Se2/0
Athens(config)#ip route 192.162.17.128 255.255.255.252 Se3/0 5
Athens(config)#ip route 192.162.0.0 255.255.248.0 Se2/0
Athens(config)#ip route 192.162.0.0 255.255.248.0 Se3/0 5
Athens(config)#ip route 192.162.16.0 255.255.255.0 Se6/0
Athens(config)#router rip
Athens(config-router)#version 2
Athens(config-router)#no auto-summary
Athens(config-router)#network 192.162.12.0
Athens(config-router)#network 192.162.17.132
Athens(config-router)#network 192.162.17.140
Athens(config-router)#network 192.162.17.144
Athens(config-router)#passive-interface Fa0/0
Athens(config-router)#redistribute static
Athens(config-router)#end
Athens#
%SYS-5-CONFIG_I: Configured from console by console
Athens#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
```

Macedonia Router

Router Configuration

```
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname Macedonia
Macedonia(config)#int Fa0/0
Macedonia(config-if)#ip address 192.162.16.1 255.255.255.0
Macedonia(config-if)#no shutdown
Macedonia(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
Macedonia(config-if)#exit
Macedonia(config)#int Se6/0
```

```
Macedonia(config-if)#ip address 192.162.17.146 255.255.255.252
Macedonia(config-if)#no shutdown
Macedonia(config-if)#
%LINK-5-CHANGED: Interface Serial6/0, changed state to up
Macedonia(config-if)#end
Macedonia#
%SYS-5-CONFIG_I: Configured from console by console
copy run start
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial6/0, changed state to up
Destination filename [startup-config]?
Building configuration...
[OK]
```

Routing Configuration (Static, Dynamic Routing)

```
Macedonia>enable
Macedonia#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Macedonia(config)#ip route 192.162.17.128 255.255.255.252 Se6/0
Macedonia(config)#ip route 192.162.0.0 255.255.248.0 Se6/0
Macedonia(config)#ip route 192.162.12.0 255.255.252.0 Se6/0
Macedonia(config)#router rip
Macedonia(config-router)#version 2
Macedonia(config-router)#no auto-summary
Macedonia(config-router)#network 192.162.16.0
Macedonia(config-router)#network 192.162.17.144
Macedonia(config-router)#passive-interface Fa0/0
Macedonia(config-router)#redistribute static
Macedonia(config-router)#end
Macedonia#
%SYS-5-CONFIG_I: Configured from console by console
Macedonia#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
```

Alexandria Router

Router Configuration

```
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname Alexandria
Alexandria(config)#int Fa0/0
Alexandria(config-if)#ip address 192.162.8.1 255.255.252.0
Alexandria(config-if)#no shutdown
Alexandria(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up

Alexandria(config)#int Se6/0
Alexandria(config-if)#ip address 192.162.17.138 255.255.255.252
Alexandria(config-if)#no shutdown
Alexandria(config-if)#
%LINK-5-CHANGED: Interface Serial6/0, changed state to up
Alexandria(config-if)#exit

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial6/0, changed state to
Alexandria(config)#int Se2/0
Alexandria(config-if)#ip address 192.162.17.142 255.255.255.252
Alexandria(config-if)#no shutdown
Alexandria(config-if)#
%LINK-5-CHANGED: Interface Serial2/0, changed state to up
Alexandria(config-if)#end
Alexandria#
%SYS-5-CONFIG_I: Configured from console by console
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
Alexandria#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
```

Routing Configuration (Static, Dynamic Routing)

```
Alexandria>enable
Alexandria#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Alexandria(config)#ip route 192.162.17.128 255.255.255.252 Se6/0
```

```
Alexandria(config)#ip route 192.162.0.0 255.255.248.0 Se6/0
Alexandria(config)#ip route 192.162.12.0 255.255.252.0 Se2/0
Alexandria(config)#ip route 192.162.17.144 255.255.255.252 Se2/0
Alexandria(config)#ip route 192.162.16.0 255.255.255.0 Se2/0
Alexandria(config)#router rip
Alexandria(config-router)#version 2
Alexandria(config-router)#no auto-summary
Alexandria(config-router)#network 192.162.8.0
Alexandria(config-router)#network 192.162.17.136
Alexandria(config-router)#network 192.162.17.140
Alexandria(config-router)#passive-interface Fa0/0
Alexandria(config-router)#redistribute static
Alexandria(config-router)#end
Alexandria#
%SYS-5-CONFIG_I: Configured from console by console
Alexandria#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
```

Assumptions

1. WAN_1, WAN_5, Punjab LAN, Athens LAN, Macedonia LAN are configured as static routes and the rest of the half networks are configured as dynamic routes using RIP V2 configuration.
2. Samarkand, Alexandria and Macedonia have their own DHCP servers in their respective networks to assign dynamic IP addresses.
3. The Email Server is placed in Athens LAN for email communication between Athens and Alexandria as they will be communicating more.