ROUTING INFORMATION PROTOCOL (RIP)

19L505 – COMPUTER NETWORKS

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ROUTING INFORMATION PROTOCOL (RIP)

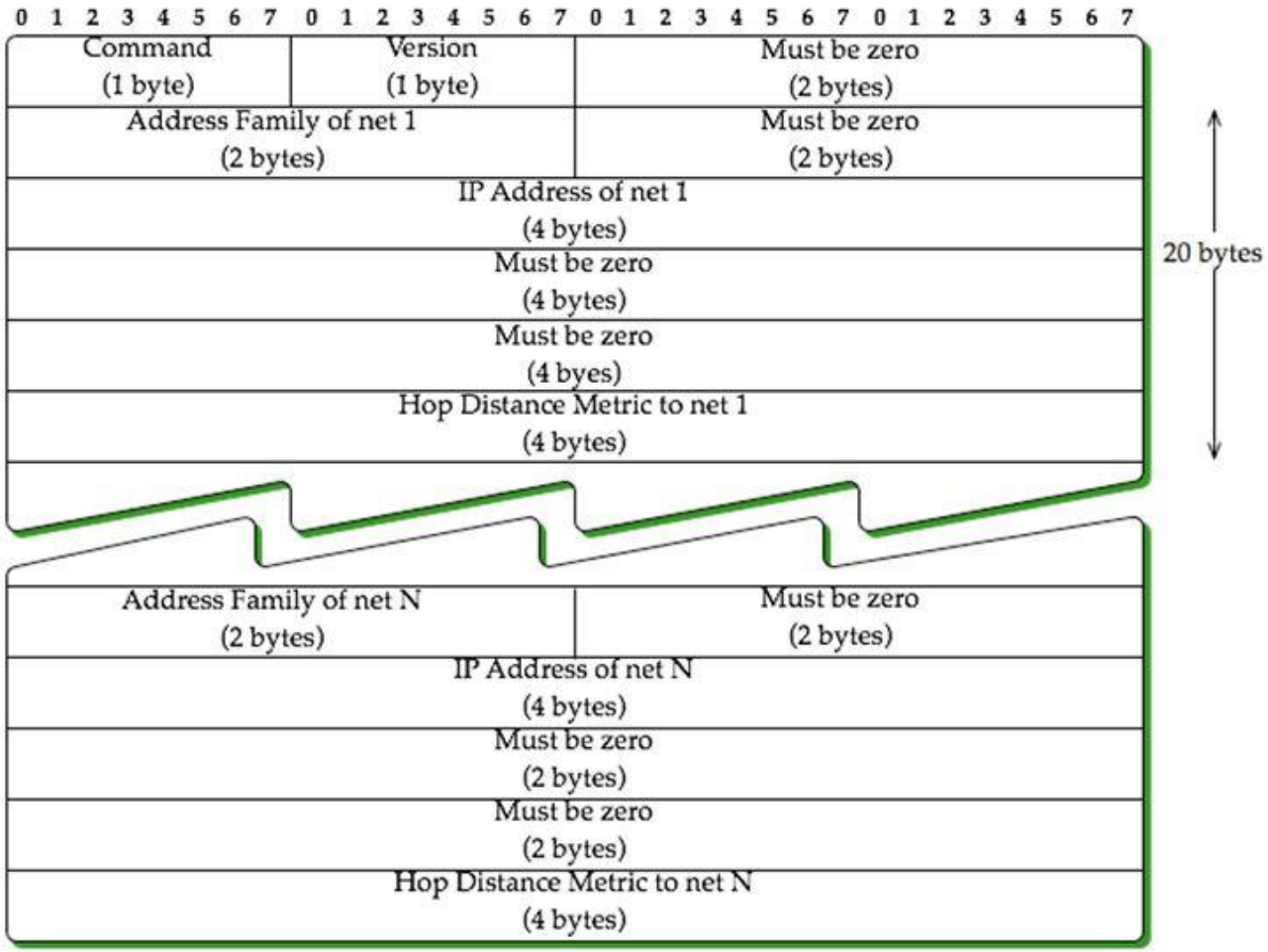
- Routing Information Protocol is a intradomain (interior) routing protocol.
- It is based on distance vector routing.
- The cost of metric in this protocol is hop count.
- RIP network cannot have more than 15 hops.
- So infinity is defined by a fixed number which is 16.

RIP Version-1:

- It is an open standard protocol.
- It is classful routing protocol.
- Its administrative distance value is 120.
- Its metric is hop count and max hop count is 15.
- There will be a total of 16 routers in the network.

- Load balancing is performed by RIP when there are same no of hops to reach destination.
- Load balancing - if there are n ways to reach the destination and each way has same number of routers then each packets will be sent to each path to reach the destination.
- This reduces traffic and also the load is balanced.
- In this protocol routing tables are updated in each 30 sec.
- It is one of the slowest protocol.

RIPv1 packet format: details



Advantages of RIP version 1

- Easy to configure.
- Less overhead
- No complexity.

Disadvantages of RIP version 1

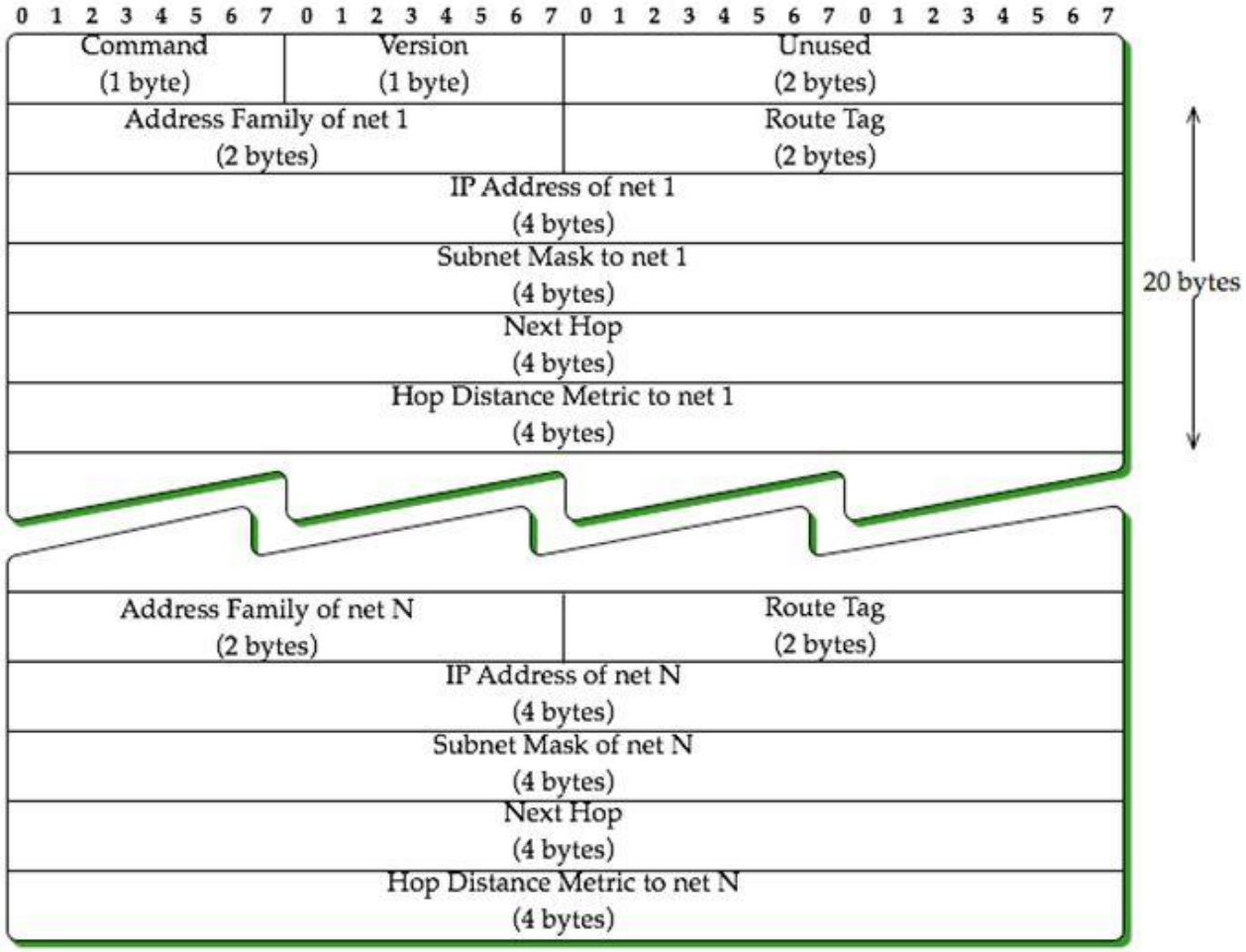
- Bandwidth utilization is very high as broadcast for every 30 seconds.
- It works only on hop count.
- It is not scalable as hop count is only 15. If there will be requirement of more routers in the network it would be a problem .
- Convergence is very slow, wastes a lot of time in finding alternate path.

RIP Version-2

- RIP version 2 was developed in 1993.
- It supports classless Inter-Domain Routing (CIDR) and has the ability to carry subnet information.
- Its metric is also hop count, and max hop count is also 15.
- It supports authentication and does subnetting and multicasting.
- Auto summary can be done on every router, but it’s not recommended.

- In RIPv2 Subnet masks are included in the routing update.
- RIPv2 multicasts the entire routing table to all adjacent routers at the address 224.0.0.9, as opposed to RIPv1 which uses broadcast (255.255.255.255).
- RIPv2 provides authentication support so that RIP links can require authentication keys (passwords) before they become active.
- Authentication provides an additional layer of security on the network beyond the other security features.
- By default, this authentication is disabled.

RIPv2: packet format



Advantages of RIP version 2

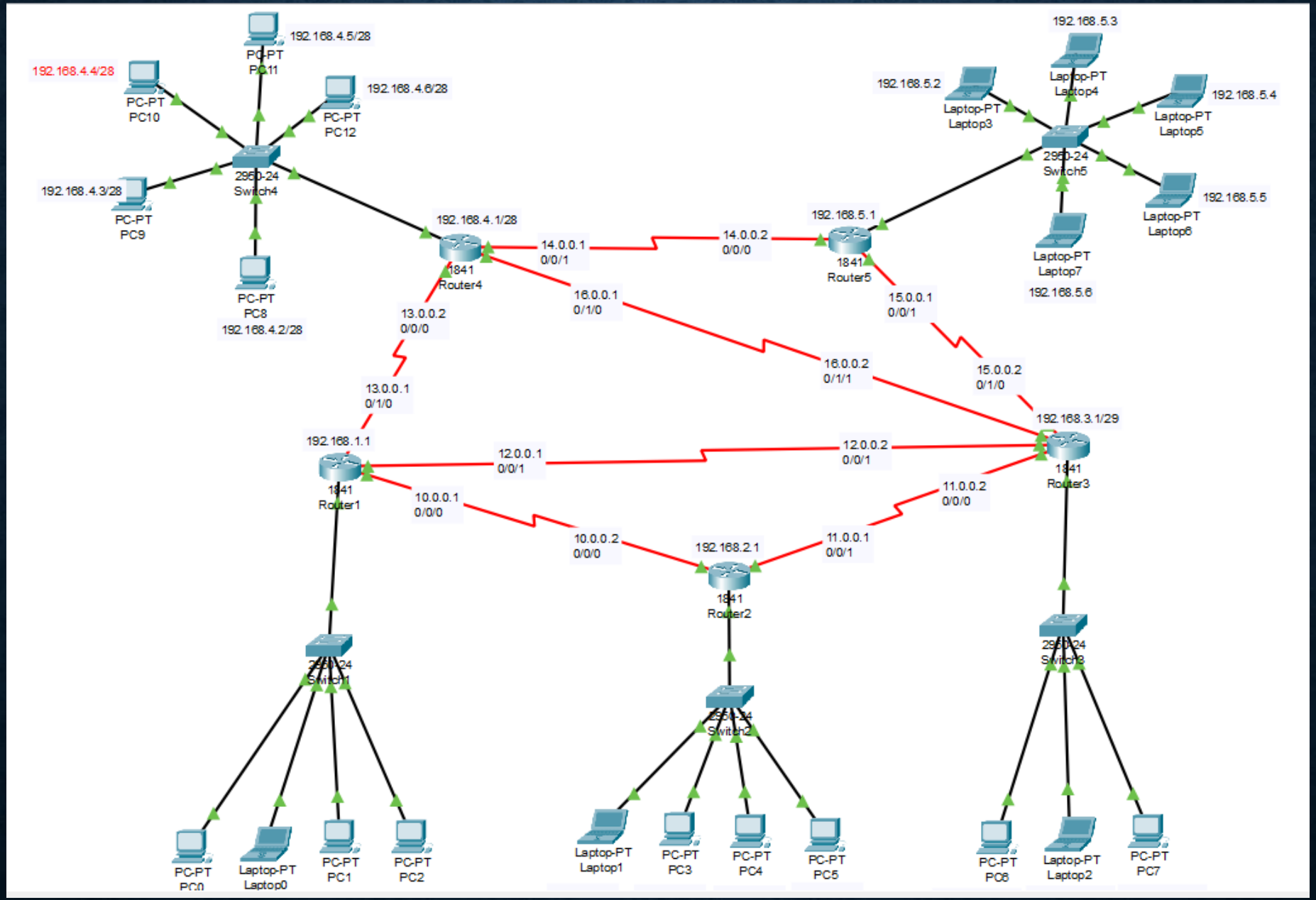
- It’s a standardized protocol.
- It’s VLSM (Variable Length Subnet Masking)compliant.
- Provides fast convergence.
- It sends triggered updates when the network changes.
- Works with snapshot routing – making it ideal for dial networks.

Disadvantages of RIP version 2

There lies some disadvantages as well:

- Maximum hop count of 15, due to the ‘count-to-infinity’ vulnerability.
- No concept of neighbours.
- Exchanges entire table with all neighbours every 30 seconds (except in the case of a triggered update).

RIP Ver1	RIP Ver2
RIP v1 is a classful routing.	RIP v2 is a classless protocol.
The routing updates are broadcasted.	The routing updates are multicasted.
Has no authentication.	Supports authentication.
It does not carry mask in updates.	It does carry mask in updates, so it supports for VLSM.
It is an older version, no longer much used routing protocol.	It can be useful in small, flat networks or at the edge of larger networks because of its simplicity in configuration and usage.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PC-PT
PC11
192.168.4.4/28
PC-PT
PC10
192.168.4.6/28
PC-PT
PC12
2960-24
Switch4
192.168.4.3/28
PC-PT
PC9
PC-PT
PC8
192.168.4.2/28
192.168.4.1/28
1841
Router4
14.0.0.1
0/0/1
14.0.0.2
0/0/0
192.168.5.1
1841
Router5
192.168.5.3
Laptop-PT
Laptop4
192.168.5.2
Laptop-PT
Laptop3
192.168.5.4
Laptop-PT
Laptop5
2960-24
Switch5
192.168.5.5
Laptop-PT
Laptop6
Laptop-PT
Laptop7
192.168.5.6
16.0.0.1
0/1/0
15.0.0.1
0/0/1
13.0.0.2
0/0/0
16.0.0.2
0/1/1
15.0.0.2
0/1/0
13.0.0.1
0/1/0
192.168.3.1/29
1841
Router3
192.168.1.1
1841
Router1
12.0.0.1
0/0/1
12.0.0.2
0/0/1
10.0.0.1
0/0/0
11.0.0.2
0/0/0
10.0.0.2
0/0/0
192.168.2.1
11.0.0.1
0/0/1
1841
Router2
2960-24
Switch1
2960-24
Switch2
2960-24
Switch3
PC-PT
PC0
Laptop-PT
Laptop0
PC-PT
PC1
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PC2
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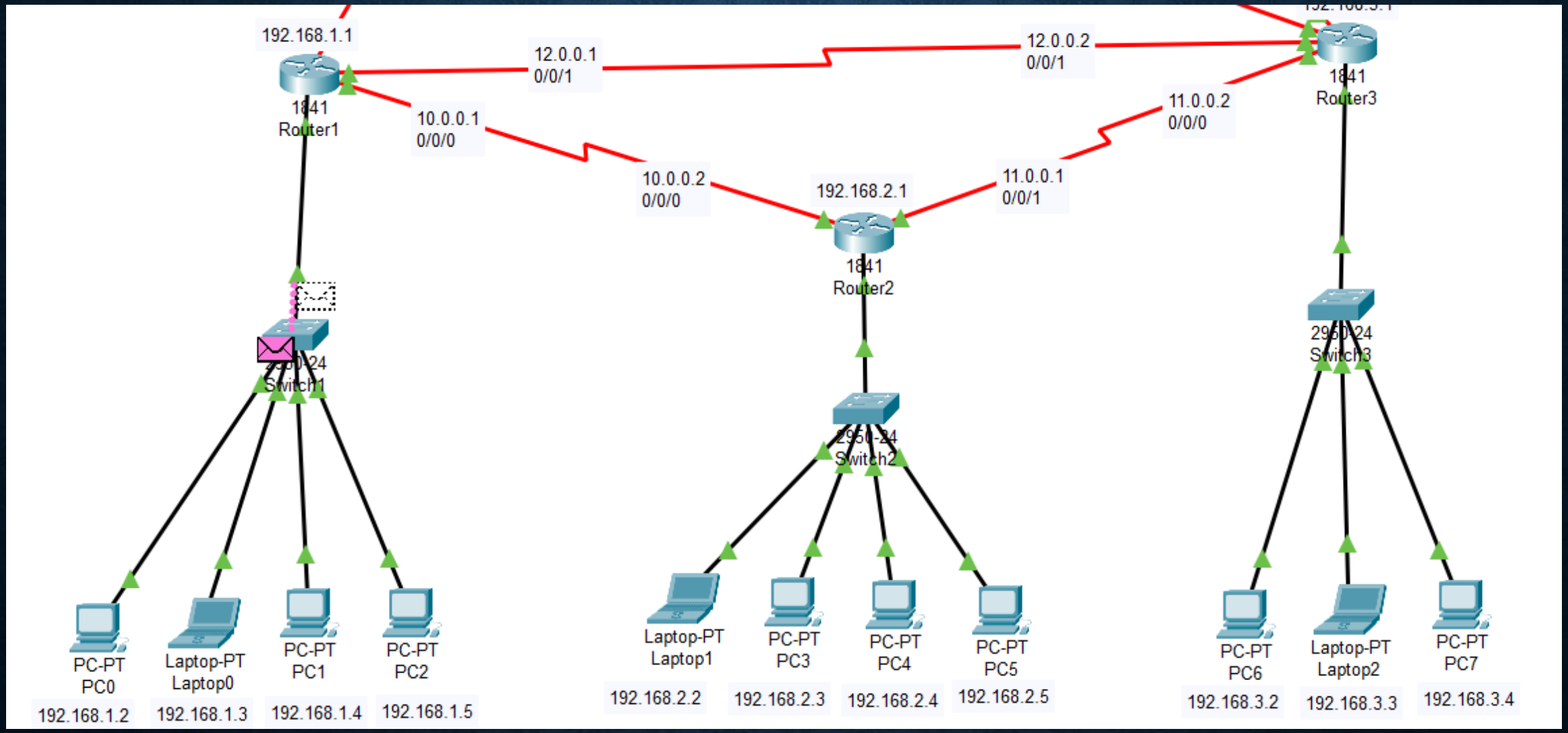
Laptop-PT
Laptop2
PC-PT
PC7


192.168.1.1
12.0.0.1
0/0/1
12.0.0.2
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1841
Router1
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0/0/0
10.0.0.2
0/0/0
192.168.2.1
11.0.0.1
0/0/1
11.0.0.2
0/0/0
1841
Router3
1841
Router2
2950-24
Switch1
2950-24
Switch2
2950-24
Switch3
PC-PT
PC0
192.168.1.2
Laptop-PT
Laptop0
192.168.1.3
PC-PT
PC1
192.168.1.4
PC-PT
PC2
192.168.1.5
Laptop-PT
Laptop1
192.168.2.2
PC-PT
PC3
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PC-PT
PC4
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PC5
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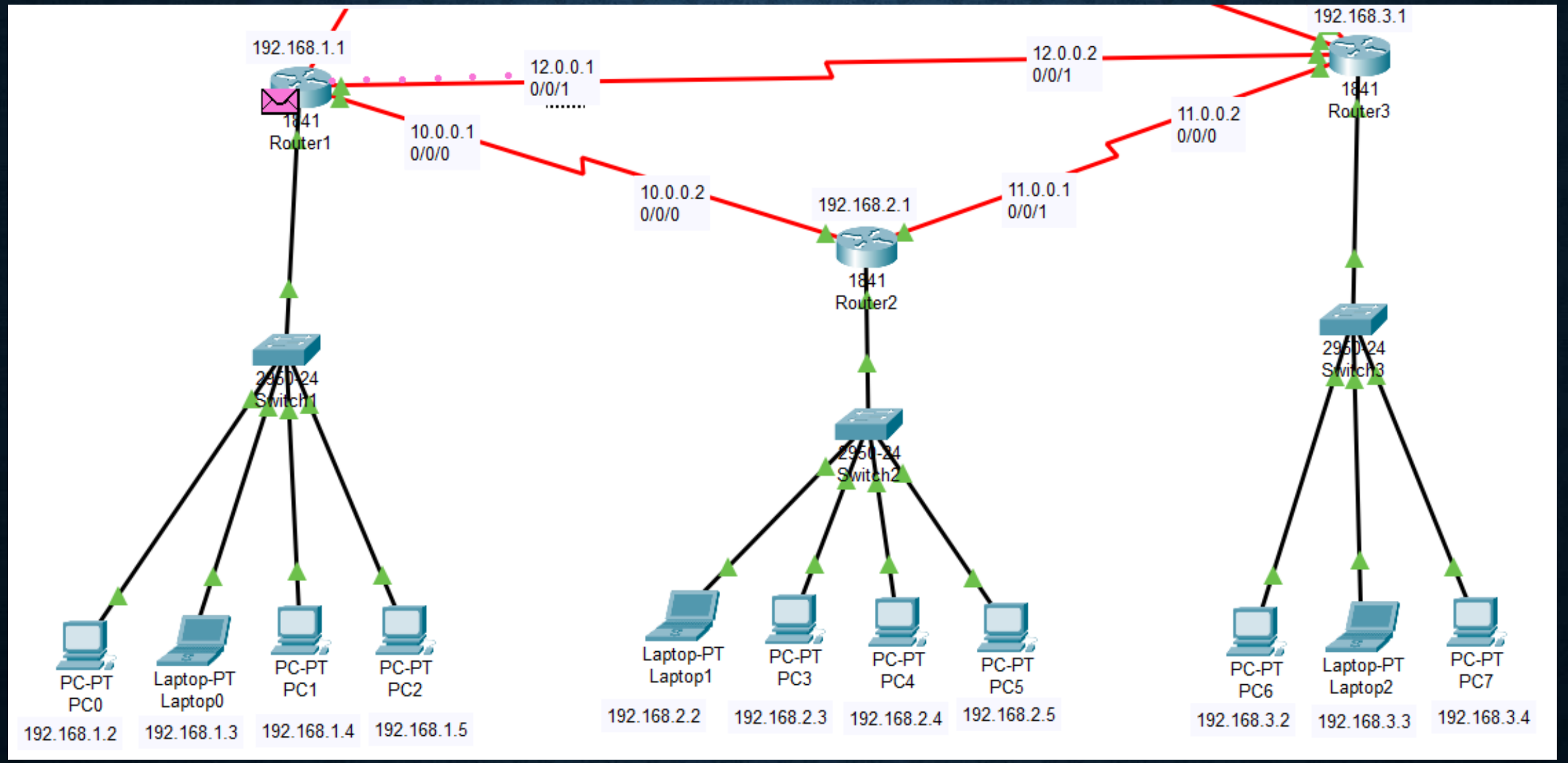
192.168.3.4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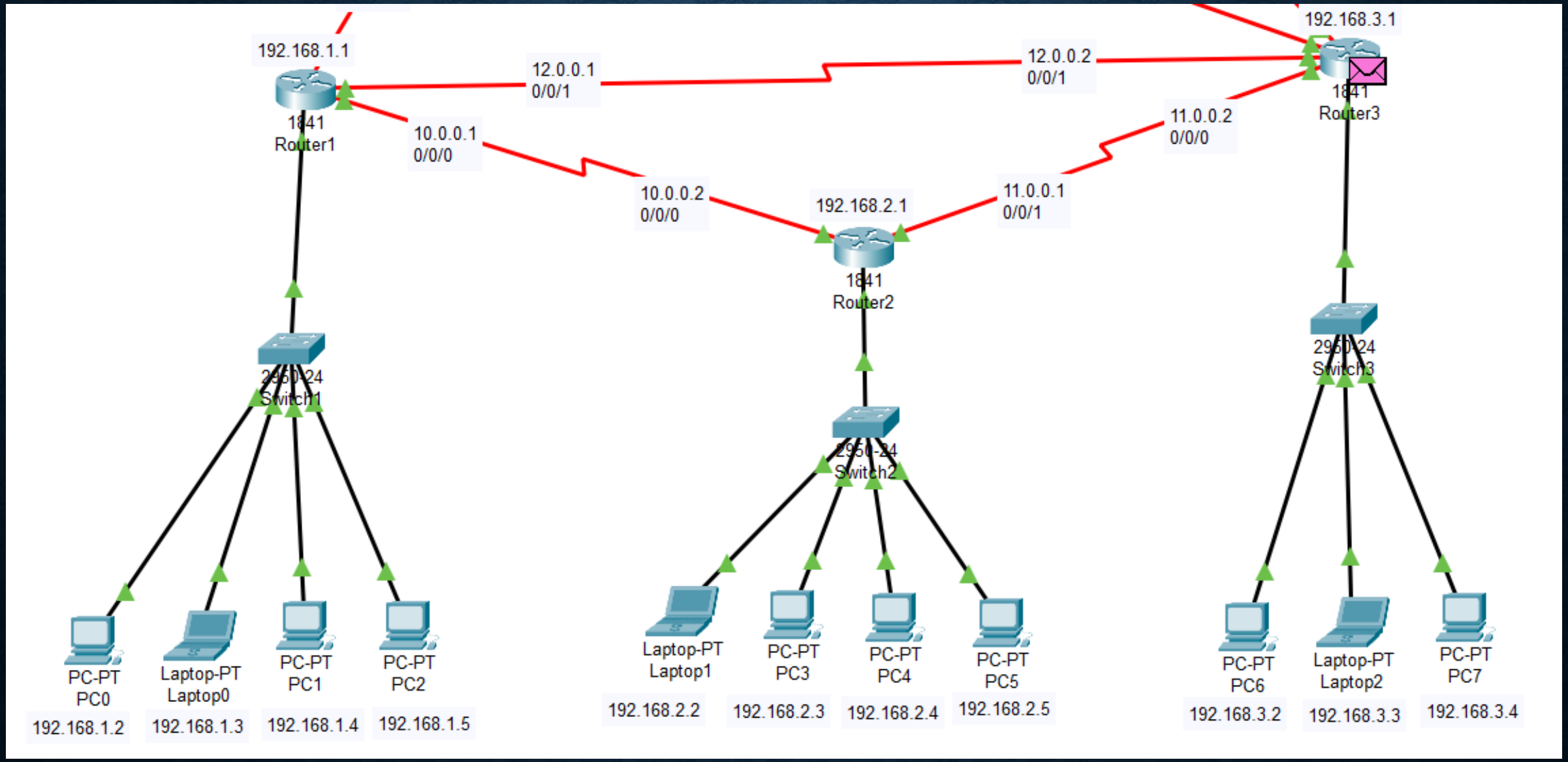
192.168.3.4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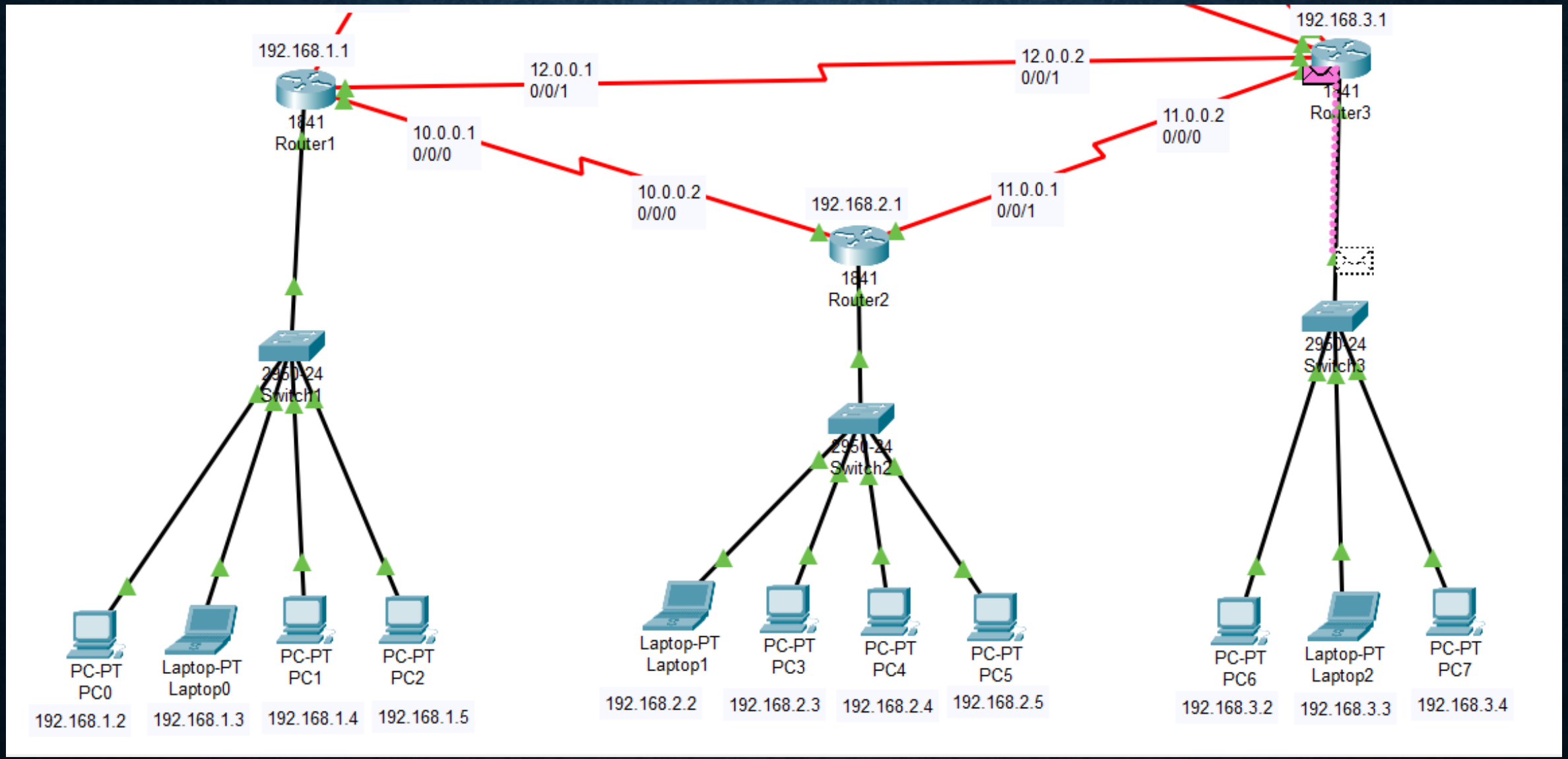
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PC7
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192.168.1.3
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192.168.1.5
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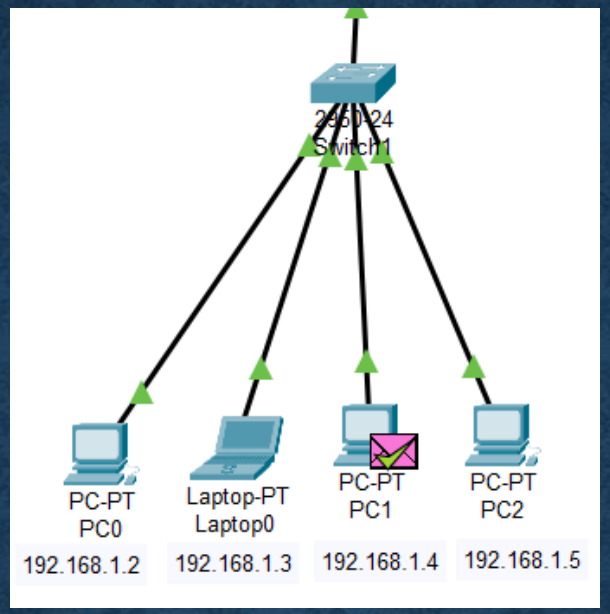

Scenario 0

New Delete

Toggle PDU List Window

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	PC1	Laptop2	ICMP		0.000	N	0	(edit)	(delete)

THANK YOU !!