Assignment Name: Build and Test OSPF Routed Network

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Router configurations for question [1, 2, 4,5, 6, 7, 9, 10,]:
CoreRouter:

```
[admin@CoreRouter] > export
# nov/19/2023 13:39:40 by RouterOS 6.49.6
# software id =
#
#
#
/interface bridge
add name=Loopback
/interface ethernet
set [ find default-name=ether1 ] disable-running-check=no
set [ find default-name=ether2 ] disable-running-check=no
set [ find default-name=ether3 ] disable-running-check=no
set [ find default-name=ether4 ] disable-running-check=no
/interface wireless security-profiles
set [ find default=yes ] supplicant-identity=MikroTik
/routing ospf instance
set [ find default=yes ] distribute-default=if-installed-as-type-1 redistribute-connected=as-type-1 router-id=10.10.10.3
/ip address
add address=10.10.10.3 interface=Loopback network=10.10.10.3
add address=10.0.3.2/24 interface=ether2 network=10.0.3.0
add address=10.0.1.2/24 interface=ether3 network=10.0.1.0
/ip dhcp-client
add disabled=no interface=ether1
/ip firewall nat
add action=masquerade chain=srcnat out-interface=ether1
add action=masquerade chain=srcnat out-interface=ether1
/routing ospf interface
add dead-interval=5s hello-interval=1s interface=ether2
add dead-interval=5s hello-interval=1s interface=ether3
/routing ospf network
add area=backbone network=10.0.3.0/24
add area=backbone network=10.0.1.0/24
/system identity
set name=CoreRouter
[admin@CoreRouter] >
```

EngBuilding Router:

```
[admin@EngBuilding] > export
# nov/19/2023 13:00:35 by RouterOS 6.49.6
# software id =
#
#
#
/interface bridge
add name=Loopback
/interface ethernet
set [ find default-name=ether1 ] disable-running-check=no
set [ find default-name=ether2 ] disable-running-check=no
set [ find default-name=ether3 ] disable-running-check=no
set [ find default-name=ether4 ] disable-running-check=no
/interface vlan
add interface=ether4 name=VLAN101 vlan-id=101
/interface wireless security-profiles
set [ find default=yes ] supplicant-identity=MikroTik
/ip pool
add name=dhcp_pool0 ranges=192.168.100.2-192.168.100.254
/ip dhcp-server
add address-pool=dhcp_pool0 disabled=no interface=VLAN101 name=dhcp1
/routing ospf instance
set [ find default=yes ] distribute-default=if-installed-as-type-1 redistribute-connected=as-type-1 router-id=10.10.10.1
/ip address
add address=192.168.100.1/24 interface=VLAN101 network=192.168.100.0
add address=10.10.10.1 interface=Loopback network=10.10.10.1
add address=10.0.2.1/24 interface=ether1 network=10.0.2.0
add address=10.0.1.1/24 interface=ether3 network=10.0.1.0
/ip dhcp-client
add disabled=no interface=ether1
/ip dhcp-server network
add address=192.168.100.0/24 dns-server=8.8.8.8 gateway=192.168.100.1
/routing ospf interface
add dead-interval=5s hello-interval=1s interface=ether1
add dead-interval=5s hello-interval=1s interface=ether3
/routing ospf network
add area=backbone network=10.0.1.0/24
add area=backbone network=10.0.2.0/24
/system identity
set name=EngBuilding
[admin@EngBuilding] >
```

ITBuilding Router:

```
[admin@ITBuilding] > export
# nov/19/2023 13:17:40 by RouterOS 6.49.6
# software id =
#
#
#
/interface bridge
add name=Loopback
/interface ethernet
set [ find default-name=ether1 ] disable-running-check=no
set [ find default-name=ether2 ] disable-running-check=no
set [ find default-name=ether3 ] disable-running-check=no
set [ find default-name=ether4 ] disable-running-check=no
/interface vlan
add interface=ether4 name=VLAN202 vlan-id=202
/interface wireless security-profiles
set [ find default=yes ] supplicant-identity=MikroTik
/ip pool
add name=dhcp_pool0 ranges=192.168.200.2-192.168.200.254
/ip dhcp-server
add address-pool=dhcp_pool0 disabled=no interface=VLAN202 name=dhcp1
/routing ospf instance
set [ find default=yes ] distribute-default=if-installed-as-type-1 redistribute-connected=as-type-1 router-id=10.10.10.4
/ip address
add address=192.168.200.1/24 interface=VLAN202 network=192.168.200.0
add address=10.10.10.4 interface=Loopback network=10.10.10.4
add address=10.0.3.1/24 interface=ether2 network=10.0.3.0
add address=10.0.2.2/24 interface=ether1 network=10.0.2.0
/ip dhcp-client
add disabled=no interface=ether1
/ip dhcp-server network
add address=192.168.200.0/24 dns-server=8.8.8.8 gateway=192.168.200.1
/routing ospf interface
add dead-interval=5s hello-interval=1s interface=ether1
add dead-interval=5s hello-interval=1s interface=ether2
/routing ospf network
add area=backbone network=10.0.2.0/24
add area=backbone network=10.0.3.0/24
/system identity
set name=ITBuilding
[admin@ITBuilding] >
```

3: Verify that the routers can ping each other over the direct links between each router.

CoreRouter to ITBuilding, EngBuilding routers:

```
[admin@CoreRouter] > ping 10.0.3.2
  SEQ HOST                                     SIZE TTL TIME  STATUS
    0 10.0.3.2                                   56  64 0ms
    1 10.0.3.2                                   56  64 0ms
    2 10.0.3.2                                   56  64 0ms
    3 10.0.3.2                                   56  64 0ms
    sent=4 received=4 packet-loss=0% min-rtt=0ms avg-rtt=0ms max-rtt=0ms

[admin@CoreRouter] > ping 10.0.1.2
  SEQ HOST                                     SIZE TTL TIME  STATUS
    0 10.0.1.2                                   56  64 0ms
    1 10.0.1.2                                   56  64 0ms
    2 10.0.1.2                                   56  64 0ms
    3 10.0.1.2                                   56  64 0ms
    sent=4 received=4 packet-loss=0% min-rtt=0ms avg-rtt=0ms max-rtt=0ms

[admin@CoreRouter] > /ip address print
Flags: X - disabled, I - invalid, D - dynamic
 #   ADDRESS            NETWORK         INTERFACE
 0 D 192.168.110.133/24 192.168.110.0   ether1
 1   10.10.10.3/32      10.10.10.3      Loopback
 2   10.0.3.2/24        10.0.3.0        ether2
 3   10.0.1.2/24        10.0.1.0        ether3
```

ITBuilding to CoreRouter, EngBuilding:

```
[admin@ITBuilding] > /ip address print
Flags: X - disabled, I - invalid, D - dynamic
 #   ADDRESS            NETWORK         INTERFACE
 0   192.168.200.1/24   192.168.200.0   VLAN202
 1   10.10.10.4/32      10.10.10.4      Loopback
 2   10.0.3.1/24        10.0.3.0        ether2
 3   10.0.2.2/24        10.0.2.0        ether1
[admin@ITBuilding] > ping 10.0.3.2
  SEQ HOST                                     SIZE TTL TIME  STATUS
    0 10.0.3.2                                   56  64 1ms
    1 10.0.3.2                                   56  64 0ms
    2 10.0.3.2                                   56  64 0ms
    3 10.0.3.2                                   56  64 0ms
    sent=4 received=4 packet-loss=0% min-rtt=0ms avg-rtt=0ms max-rtt=1ms

[admin@ITBuilding] > ping 10.0.2.2
  SEQ HOST                                     SIZE TTL TIME  STATUS
    0 10.0.2.2                                   56  64 0ms
    1 10.0.2.2                                   56  64 0ms
    2 10.0.2.2                                   56  64 0ms
    3 10.0.2.2                                   56  64 0ms
    sent=4 received=4 packet-loss=0% min-rtt=0ms avg-rtt=0ms max-rtt=0ms
```

EngBuilding to CoreRouter, ITBuilding routers:

```
[admin@EngBuilding] > ping 10.0.2.2
  SEQ HOST                                     SIZE TTL TIME  STATUS
    0 10.0.2.2                                   56  64 0ms
    1 10.0.2.2                                   56  64 0ms
    2 10.0.2.2                                   56  64 0ms
    3 10.0.2.2                                   56  64 0ms
    sent=4 received=4 packet-loss=0% min-rtt=0ms avg-rtt=0ms max-rtt=0ms

[admin@EngBuilding] > ping 10.0.1.2
  SEQ HOST                                     SIZE TTL TIME  STATUS
    0 10.0.1.2                                   56  64 1ms
    1 10.0.1.2                                   56  64 0ms
    2 10.0.1.2                                   56  64 0ms
    3 10.0.1.2                                   56  64 0ms
    sent=4 received=4 packet-loss=0% min-rtt=0ms avg-rtt=0ms max-rtt=1ms

[admin@EngBuilding] > /ip address print
Flags: X - disabled, I - invalid, D - dynamic
 #   ADDRESS            NETWORK         INTERFACE
 0   192.168.100.1/24   192.168.100.0   VLAN101
 1   10.10.10.1/32      10.10.10.1      Loopback
 2   10.0.2.1/24        10.0.2.0        ether1
 3   10.0.1.1/24        10.0.1.0        ether3
```

8: Verify that each router can then ping the Loopback address on each other's routers and that the two PCs can ping each other.

Ping Loopback:

From CoreRouter:

```
[admin@CoreRouter] > ping 10.10.10.4
  SEQ HOST                                     SIZE TTL TIME  STATUS

    0 10.10.10.4                                 56  64 1ms
    1 10.10.10.4                                 56  64 2ms
    2 10.10.10.4                                 56  64 2ms
    sent=3 received=3 packet-loss=0% min-rtt=1ms avg-rtt=1ms max-rtt=2ms

[admin@CoreRouter] > ping 10.10.10.1
  SEQ HOST                                     SIZE TTL TIME  STATUS

    0 10.10.10.1                                 56  64 1ms
    1 10.10.10.1                                 56  64 1ms
    2 10.10.10.1                                 56  64 1ms
    sent=3 received=3 packet-loss=0% min-rtt=1ms avg-rtt=1ms max-rtt=1ms
```

From ITBuilding Router:

```
[admin@ITBuilding] > ping 10.10.10.3
  SEQ HOST                                     SIZE TTL TIME  STATUS

    0 10.10.10.3                                 56  64 0ms
    1 10.10.10.3                                 56  64 1ms
    2 10.10.10.3                                 56  64 1ms
    sent=3 received=3 packet-loss=0% min-rtt=0ms avg-rtt=0ms max-rtt=1ms

[admin@ITBuilding] > ping 10.10.10.1
  SEQ HOST                                     SIZE TTL TIME  STATUS

    0 10.10.10.1                                 56  64 0ms
    1 10.10.10.1                                 56  64 2ms
    2 10.10.10.1                                 56  64 1ms
    sent=3 received=3 packet-loss=0% min-rtt=0ms avg-rtt=1ms max-rtt=2ms
```

From EngBuilding Router:

```
[admin@EngBuilding] > ping 10.10.10.3
  SEQ HOST                                     SIZE TTL TIME  STATUS

    0 10.10.10.3                                 56  64 0ms
    1 10.10.10.3                                 56  64 0ms
    2 10.10.10.3                                 56  64 3ms
    sent=3 received=3 packet-loss=0% min-rtt=0ms avg-rtt=1ms max-rtt=3ms

[admin@EngBuilding] > ping 10.10.10.4
  SEQ HOST                                     SIZE TTL TIME  STATUS

    0 10.10.10.4                                 56  64 0ms
    1 10.10.10.4                                 56  64 1ms
    2 10.10.10.4                                 56  64 1ms
    sent=3 received=3 packet-loss=0% min-rtt=0ms avg-rtt=0ms max-rtt=1ms
```

Ping PCs:

```
PC1-VLAN101> ip dhcp
DDORA IP 192.168.100.253/24 GW 192.168.100.1

PC1-VLAN101> ping  192.168.200.254

84 bytes from 192.168.200.254 icmp_seq=1 ttl=62 time=4.900 ms
84 bytes from 192.168.200.254 icmp_seq=2 ttl=62 time=3.004 ms
84 bytes from 192.168.200.254 icmp_seq=3 ttl=62 time=4.556 ms
```

```
PC2-VLAN202> ip dhcp
DDORA IP 192.168.200.253/24 GW 192.168.200.1

PC2-VLAN202> ping  192.168.100.253

84 bytes from 192.168.100.253 icmp_seq=1 ttl=62 time=6.402 ms
84 bytes from 192.168.100.253 icmp_seq=2 ttl=62 time=7.473 ms
84 bytes from 192.168.100.253 icmp_seq=3 ttl=62 time=4.096 ms
```

11: Verify that the internet is reachable from all devices and explain the meaning of each entry in the routing table of the CoreRouter.

Internet is reachable from:

PC1

```
PC1-VLAN101> ping 8.8.8.8

84 bytes from 8.8.8.8 icmp_seq=1 ttl=126 time=16.248 ms
84 bytes from 8.8.8.8 icmp_seq=2 ttl=126 time=13.380 ms
84 bytes from 8.8.8.8 icmp_seq=3 ttl=126 time=14.910 ms
^C
```

PC2

```
PC2-VLAN202> ping 8.8.8.8

84 bytes from 8.8.8.8 icmp_seq=1 ttl=126 time=17.649 ms
84 bytes from 8.8.8.8 icmp_seq=2 ttl=126 time=12.569 ms
84 bytes from 8.8.8.8 icmp_seq=3 ttl=126 time=16.152 ms
```

CoreRouter

```
[admin@CoreRouter] > ping 8.8.8.8
  SEQ HOST                                     SIZE TTL TIME  STATUS

    0 8.8.8.8                                    56 128 15ms
    1 8.8.8.8                                    56 128 12ms
    2 8.8.8.8                                    56 128 14ms
    3 8.8.8.8                                    56 128 13ms
    sent=4 received=4 packet-loss=0% min-rtt=12ms avg-rtt=13ms max-rtt=15ms
```

EngBuilding router

```
[admin@EngBuilding] > ping 8.8.8.8
  SEQ HOST                                     SIZE TTL TIME  STATUS
    0 8.8.8.8                                    56 127 13ms
    1 8.8.8.8                                    56 127 13ms
    2 8.8.8.8                                    56 127 20ms
    3 8.8.8.8                                    56 127 15ms
    sent=4 received=4 packet-loss=0% min-rtt=13ms avg-rtt=15ms max-rtt=20ms
```

ITBuilding router

```
[admin@ITBuilding] > ping 8.8.8.8
  SEQ HOST                                     SIZE TTL TIME  STATUS
    0 8.8.8.8                                    56 127 13ms
    1 8.8.8.8                                    56 127 15ms
    2 8.8.8.8                                    56 127 13ms
    3 8.8.8.8                                    56 127 11ms
    sent=4 received=4 packet-loss=0% min-rtt=11ms avg-rtt=13ms max-rtt=15ms
```

Routing Table:

To display the routing table command used: [/ip route print].

```
[admin@CoreRouter] > /ip route print
Flags: X - disabled, A - active, D - dynamic, C - connect, S - static, r -
f, m - mme,
B - blackhole, U - unreachable, P - prohibit
 #      DST-ADDRESS        PREF-SRC        GATEWAY            DISTANCE
 0 ADS  0.0.0.0/0                          192.168.110.2             1
 1 ADC  10.0.1.0/24        10.0.1.2        ether3                    0
 2 ADo  10.0.2.0/24                        10.0.3.1                110
                                           10.0.1.1
 3 ADC  10.0.3.0/24        10.0.3.2        ether2                    0
 4 ADo  10.10.10.1/32                      10.0.1.1                110
 5 ADC  10.10.10.3/32      10.10.10.3      Loopback                  0
 6 ADo  10.10.10.4/32                      10.0.3.1                110
 7 ADo  192.168.100.0/24                   10.0.1.1                110
 8 ADC  192.168.110.0/24   192.168.110.133 ether1                    0
 9 ADo  192.168.200.0/24                   10.0.3.1                110
```

Row No.	Meaning of each entry in the routing table of the CoreRouter
0	Flag - Active, Dynamic, Static. 0.0.0.0/0 represents all routes and is set as a default route. Gateway to 192.168.110.2 indicates the next hop IP address (internet) and the administrative distance is set to 1 indicating hop cost (lower = preferred).
1	Flag - Active, Directly Connected signalis that the route is recognised by the router as directly connected to router's interface - ether3. The destination network is 10.0.2.0/24. The preferred source address for traffic sent to this network is 10.0.1.2. The distance for this route is 0.

2	Flag - Active, Dynamic, OSPF indicates that the route is currently active and in use, it was dynamically learned using OSPF. Destination network is 10.0.2.0/24. There are two gateways learned using OSPF to reach the 10.0.2.0/24 network. OSPF keeps track of multiple gateway IP addresses for redundancy purposes. Finally, the admin distance is 110.
3	Flag - Active, Directly Connected - recognized as a network directly connected to the router's interface - ether2. The destination network is 10.0.3.0/24 with preferred communication source address 10.0.3.2. And the admin distance is set to 0.
4	Flag - Active Dynamic, OSPF indicating that the route is currently active and is used, route was dynamically learned using OSPF protocol. Destination network is 10.10.10.1/32 indicative to be a loopback address(EngBuilding router). Router communication gateway address is set to 10.0.1.1 and admin distance is 110.
5	Flag - Active, Directly Connected. The destination network is 10.10.10.3/32 indicative of a loopback address (CoreRouter) with a referred source address for communication set to 10.10.10.3. The admin distance is set to 0.
6	Flag - Active Dynamic, OSPF indicating that the route is currently active and is used, route was dynamically learned using OSPF protocol. Destination network is 10.10.10.3/32 indicative to be a loopback address(ITBuilding router). Router communication gateway address is set to 10.0.3.1 and admin distance is 110.
7	Flag - Active, Dynamic, OSPF. Active and currently used, learned using OSPF protocol. Destination network is 192.168.100.0/24 (EngBuilding private networks) IP address indicative of private IP address range. Gateway for this network was set to 10.0.1.1 with the admin destination of 110.
8	Flag - Active, Dynamically Connected. The destination network is 192.168.110.0/24 indicative of private IP address range. Preferred source address is set to 192.168.110.133 on route interface ether1 which directly connects to the internet with admin distance 0.
9	Flag - Active, Dynamic, OSPF. Active and currently used, learned using OSPF protocol. Destination network is 192.168.200.0/24 (ITBuilding private networks) IP address indicative of private IP address range. Gateway for this network was set to 10.0.3.1 with the admin destination of 110.

```
[admin@CoreRouter] > /ip route print
Flags: X - disabled, A - active, D - dynamic, C - connect, S - static, r -
f, m - mme,
B - blackhole, U - unreachable, P - prohibit
 #      DST-ADDRESS        PREF-SRC        GATEWAY            DISTANCE
 0 ADS  0.0.0.0/0                          192.168.110.2             1
 1 ADC  10.0.1.0/24        10.0.1.2        ether3                    0
 2 ADo  10.0.2.0/24                        10.0.3.1                110
                                           10.0.1.1
 3 ADC  10.0.3.0/24        10.0.3.2        ether2                    0
 4 ADo  10.10.10.1/32                      10.0.1.1                110
 5 ADC  10.10.10.3/32      10.10.10.3      Loopback                  0
 6 ADo  10.10.10.4/32                      10.0.3.1                110
 7 ADo  192.168.100.0/24                   10.0.1.1                110
 8 ADC  192.168.110.0/24   192.168.110.133 ether1                    0
 9 ADo  192.168.200.0/24                   10.0.3.1                110
```

12: Explain what would happen if each router was not set up to redistribute connected networks, this was done in Step 7.

Without distributing connected networks, OSPF would end up with limited knowledge as OSPF by default knows the networks explicitly included in configuration. If connected networks are not redistributed, other routers with OSPF domain will not be aware of directly connected networks. Meaning, routers will not have the knowledge containing details of routes to other networks in the routing tables. Also, reduced network dynamics and resilience. OSPF protocol is able to adapt to network changes in a dynamic way, using redundant network connections. Without redistribution of connected networks, OSPF will not be able to adjust to potential changes.

Therefore, OSPF redistribution is crucial to ensure network segments are not isolated, maintain interconnectedness among different parts of the network, and allow the network to adapt dynamically to changes and potential issues.

13: Do a trace (using ICMP) from PC1-VLAN101 to PC2-VLAN202 and explain the route that is taken.

```
PC1-VLAN101> trace  192.168.200.254 -P 1
trace to 192.168.200.254, 8 hops max (ICMP), press Ctrl+C to stop
 1   192.168.100.1   0.930 ms  0.522 ms  1.470 ms
 2   10.0.2.2   3.369 ms  1.168 ms  0.920 ms
 3   192.168.200.254   4.653 ms  1.570 ms  2.166 ms
```

Command [trace 192.168.200.254 -P 1]

1	From PC1-VLAN101 sends a packet to router (EngBuiling) via IP address 192.168.100.1 gateway.
2	Next hop is indicative of a multi-layered network topology, directly connecting

	(EngBuilding) router to (ITBuilding) router with IP address 10.0.2.2. Router receives the packet and handles inter-VLAN routing.
3	Finally, the packet has reached PC2-VALN202

14: Run a long ping (for 30 seconds) from the PC1-VLAN101 to PC2-VLAN202 and while this is running suspend the link (right click on the link to see this option) from the EngBuilding router to the ITBuilding router.

```
PC1-VLAN101> ping  192.168.200.254 -c 30

84 bytes from 192.168.200.254 icmp_seq=1 ttl=62 time=2.260 ms
84 bytes from 192.168.200.254 icmp_seq=2 ttl=62 time=2.344 ms
84 bytes from 192.168.200.254 icmp_seq=3 ttl=62 time=0.928 ms
84 bytes from 192.168.200.254 icmp_seq=4 ttl=62 time=1.107 ms
84 bytes from 192.168.200.254 icmp_seq=5 ttl=62 time=1.563 ms
84 bytes from 192.168.200.254 icmp_seq=6 ttl=62 time=2.110 ms
84 bytes from 192.168.200.254 icmp_seq=7 ttl=62 time=2.093 ms
84 bytes from 192.168.200.254 icmp_seq=8 ttl=62 time=1.156 ms
84 bytes from 192.168.200.254 icmp_seq=9 ttl=62 time=4.684 ms
192.168.200.254 icmp_seq=10 timeout
84 bytes from 192.168.200.254 icmp_seq=11 ttl=61 time=4.331 ms
84 bytes from 192.168.200.254 icmp_seq=12 ttl=61 time=3.785 ms
```

15: Are any pings dropped after the link is suspended? How long does it take for the ping to work again? Redo the trace, done in Step 13, and explain the results.

One ping (icmp_seq=10) was dropped after suspending the link. It seems that the network was able to quickly converge to an alternative path (using OSPF) to send packets.

Command [ping 192.168.200.254 -P 1]

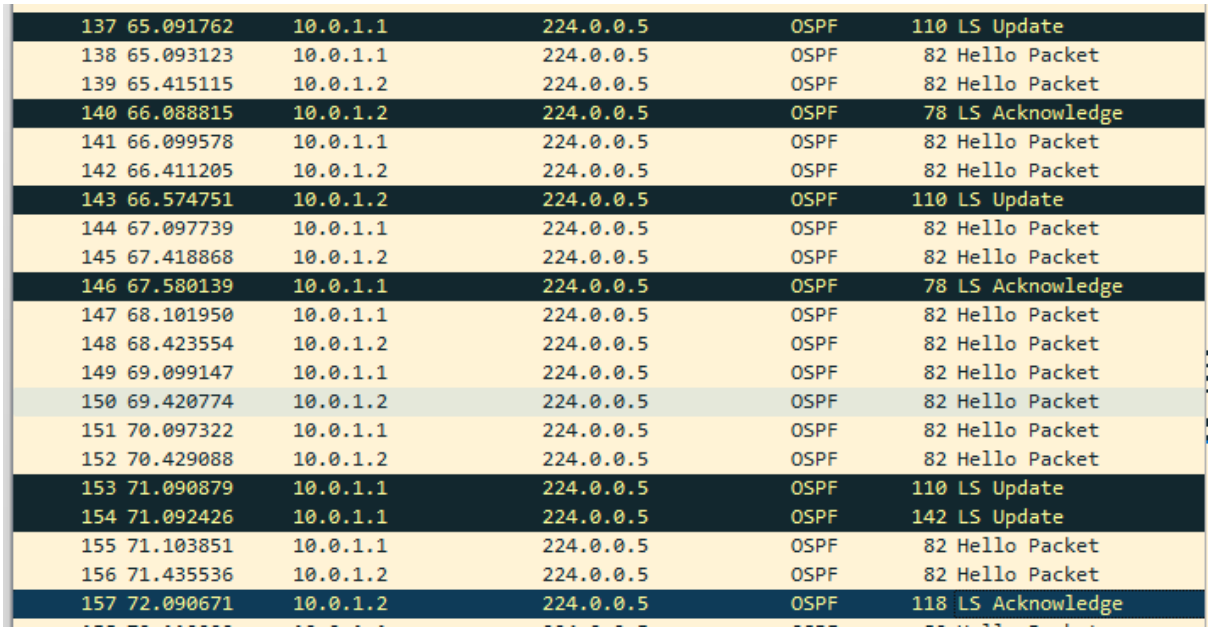
```
PC1-VLAN101> trace  192.168.200.254 -P 1
trace to 192.168.200.254, 8 hops max (ICMP), press Ctrl+C to stop
 1   192.168.100.1   1.018 ms  1.043 ms  0.897 ms
 2   10.0.1.2   7.126 ms  2.346 ms  2.348 ms
 3   10.0.3.1   8.452 ms  5.044 ms  3.616 ms
 4   192.168.200.254   3.112 ms  1.303 ms  1.735 ms

PC1-VLAN101>
```

1	First hop remains unchanged, which is the gateway for VLAN101, the EngBuilding router's interface for VLAN101 (192.168.100.1).
2	This is a new hop that was not detected in the original trace route. This hop is the CoreRouter. After leaving the EngBuilding router, packets are routed to

	the CoreRouter (10.0.1.2).
3	This hop is the ITBuilding router which receives the packet and handles inter-VLAN routing sending packet to PC2-VLAN202.
4	The final destination, IP address (192.168.200.254) of PC2 in VLAN202.

The route traverses through three key routers: EngBuilding, CoreRouter, and ITBuilding, before reaching the final destination. This path is a result of the network's rerouting due to the suspended link, showing the dynamic advantages of OSPF protocol. Showcasing the resilience and redundancy in the network design in case of issues / failures in the network infrastructure.

16 - 18. Run a packet capture on the link from the EngBuilding router to the CoreRouter. Resume the link from the EngBuilding router to the ITBuilding router, ensure that OSPF has detected the topology change and reconverged. Stop the packet capture and apply a display filter in Wireshark to only display OSPF packets. Explain the contents of any Link State Announcement (LSA) packets captured.



137	65.091762	10.0.1.1	224.0.0.5	OSPF	110 LS Update
138	65.093123	10.0.1.1	224.0.0.5	OSPF	82 Hello Packet
139	65.415115	10.0.1.2	224.0.0.5	OSPF	82 Hello Packet
140	66.088815	10.0.1.2	224.0.0.5	OSPF	78 LS Acknowledge
141	66.099578	10.0.1.1	224.0.0.5	OSPF	82 Hello Packet
142	66.411205	10.0.1.2	224.0.0.5	OSPF	82 Hello Packet
143	66.574751	10.0.1.2	224.0.0.5	OSPF	110 LS Update
144	67.097739	10.0.1.1	224.0.0.5	OSPF	82 Hello Packet
145	67.418868	10.0.1.2	224.0.0.5	OSPF	82 Hello Packet
146	67.580139	10.0.1.1	224.0.0.5	OSPF	78 LS Acknowledge
147	68.101950	10.0.1.1	224.0.0.5	OSPF	82 Hello Packet
148	68.423554	10.0.1.2	224.0.0.5	OSPF	82 Hello Packet
149	69.099147	10.0.1.1	224.0.0.5	OSPF	82 Hello Packet
150	69.420774	10.0.1.2	224.0.0.5	OSPF	82 Hello Packet
151	70.097322	10.0.1.1	224.0.0.5	OSPF	82 Hello Packet
152	70.429088	10.0.1.2	224.0.0.5	OSPF	82 Hello Packet
153	71.090879	10.0.1.1	224.0.0.5	OSPF	110 LS Update
154	71.092426	10.0.1.1	224.0.0.5	OSPF	142 LS Update
155	71.103851	10.0.1.1	224.0.0.5	OSPF	82 Hello Packet
156	71.435536	10.0.1.2	224.0.0.5	OSPF	82 Hello Packet
157	72.090671	10.0.1.2	224.0.0.5	OSPF	118 LS Acknowledge

First packet, update, is sent by EngBuilding (10.0.1.1) router containing link state information of active links and current network topology, sent to multicast address 224.0.0.5 which is used by OSPF routers to exchange routing information. An acknowledgement is sent by CoreRouter(10.0.1.2) as a confirmation that LS update packets were received. This happens a few more times until network topology information is updated in each OSPF routing table. Furthermore, each router is keeping in contact with each other by sending “Hello Packets” to each other.