

TP - IP Networks

<https://beta.computer-networking.info/syllabus/default/exercises/ipv6.html#design-questions>

Longest-match

A router contains this forwarding table

```
2001:db8:1341::/48, via nexthop1
2001:db8:1341:2000/51, via nexthop5
2001:db8:1341:2000/64, interface1
2001:db8:1341:4000/50, via nexthop2
2001:db8:1341:5000/52, nexthop3
2001:db8:1341:7000/64, interface2
2001:db8:1341:5555/64, interface3
2001:db8::/32 via nexthop4 ::/0 via
nexthop0
```

Which Next-Hop or Interface
is used to forward a packet
with destination:

```
2001:bad:cafe::1234
2001:db8:1342:5555::1
2001:db8:1341:3000::1234
2001:db8:1341:6000::cafe:beef
2001:db8:1341:5000::f00f:beef
```

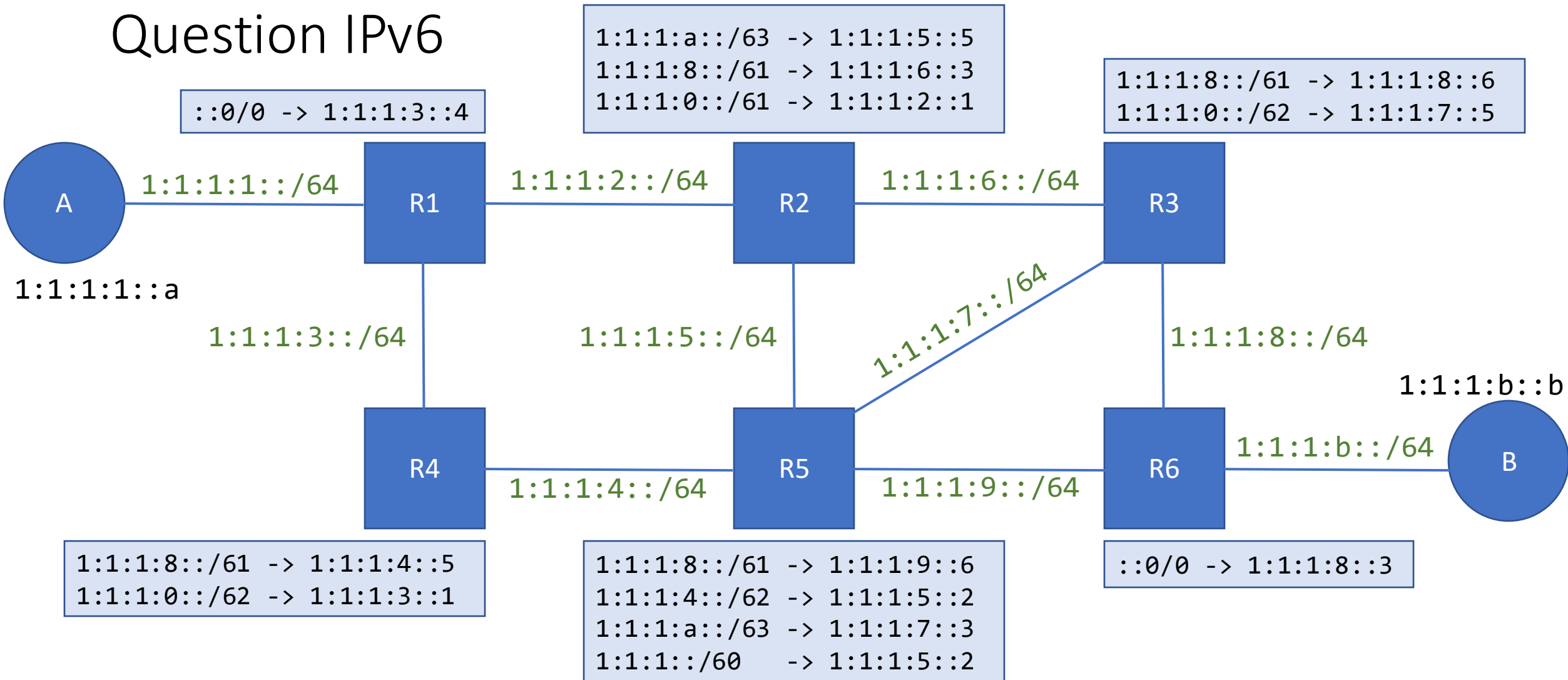
The TP

The following questions refer to the exercises available at

<https://beta.computer-networking.info/syllabus/default/exercises/ipv6.html#design-questions>

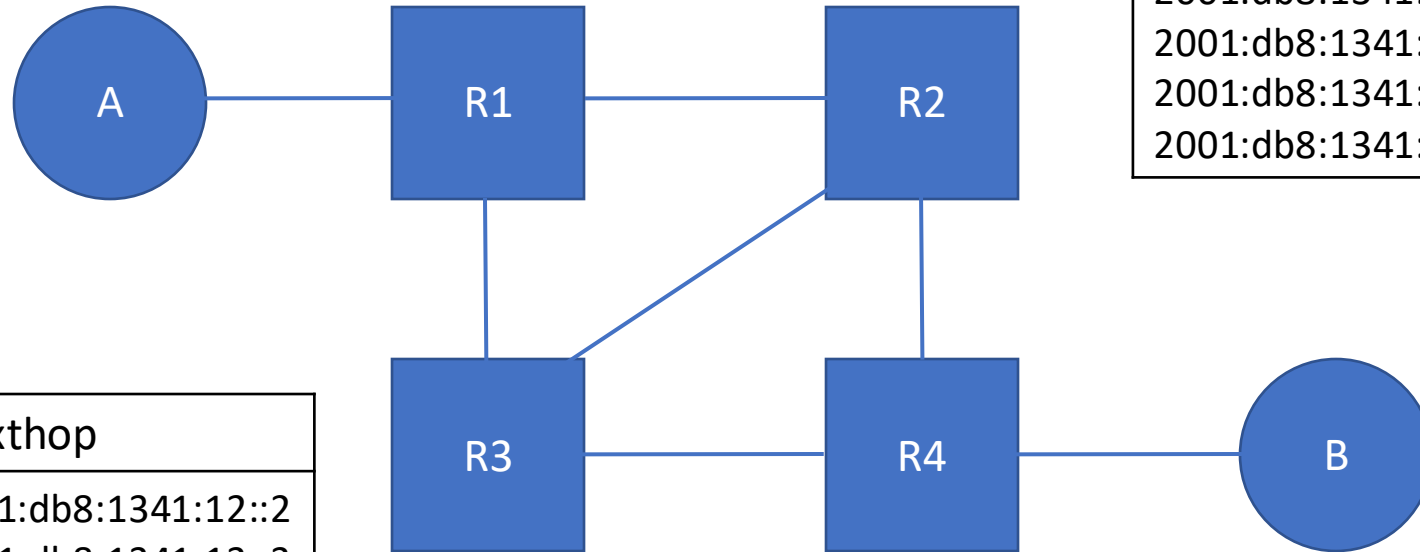
The following slides help you write an answer, but the full information is available at the provided URL

Question IPv6



In subnet $w:x:y:z/64$, router **R1** has IP $w:x:y:z::1$ and router **R2** has IP $w:x:y:z::2$.
 What is the path followed by packets sent from A ($1:1:1:1::a$) to B ($1:1:1:b::b$) ?
 What is the path followed by packets sent from B to A ?

Question 1



R1

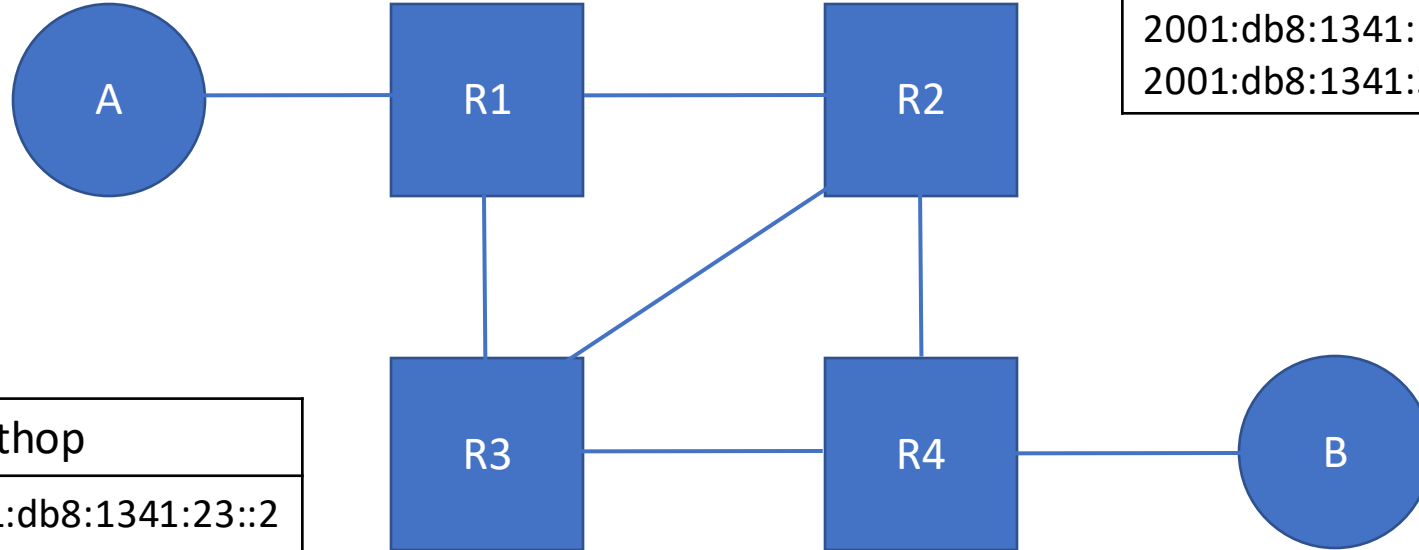
Dest.	Nexthop
2001:db8:1341:4/64	2001:db8:1341:12::2
2001:db8:1341:23/64	2001:db8:1341:13::3
2001:db8:1341:34/64	2001:db8:1341:13::3
2001:db8:1341:24/64	2001:db8:1341:12::2

R4

Dest.	Nexthop
2001:db8:1341:1/64	2001:db8:1341:34::3
2001:db8:1341:23/64	2001:db8:1341:24::2
2001:db8:1341:13/64	2001:db8:1341:34::3
2001:db8:1341:12/64	2001:db8:1341:24::2

Forwarding tables for R2 and R3 to ensure A and B can exchange packets in both directions?

Question 2



R2

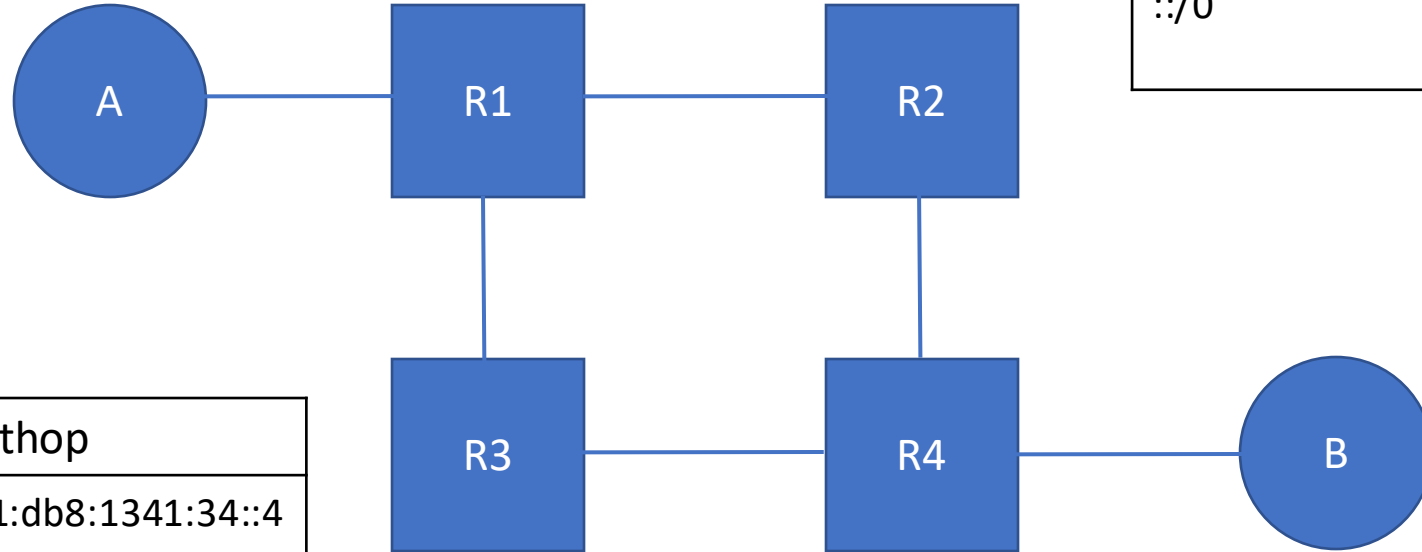
Dest.	Nexthop
2001:db8:1341:1/64	2001:db8:1341:12::1
2001:db8:1341:4/64	2001:db8:1341:23::3
2001:db8:1341:13/64	2001:db8:1341:23::3
2001:db8:1341:34/64	2001:db8:1341:23::3

R3

Dest.	Nexthop
2001:db8:1341:1/64	2001:db8:1341:23::2
2001:db8:1341:4/64	2001:db8:1341:34::4
2001:db8:1341:12/64	2001:db8:1341:23::2
2001:db8:1341:24/64	2001:db8:1341:23::2

Select rules for R2 and R3 to ensure A and B have same path in both directions?

Question 3



R2

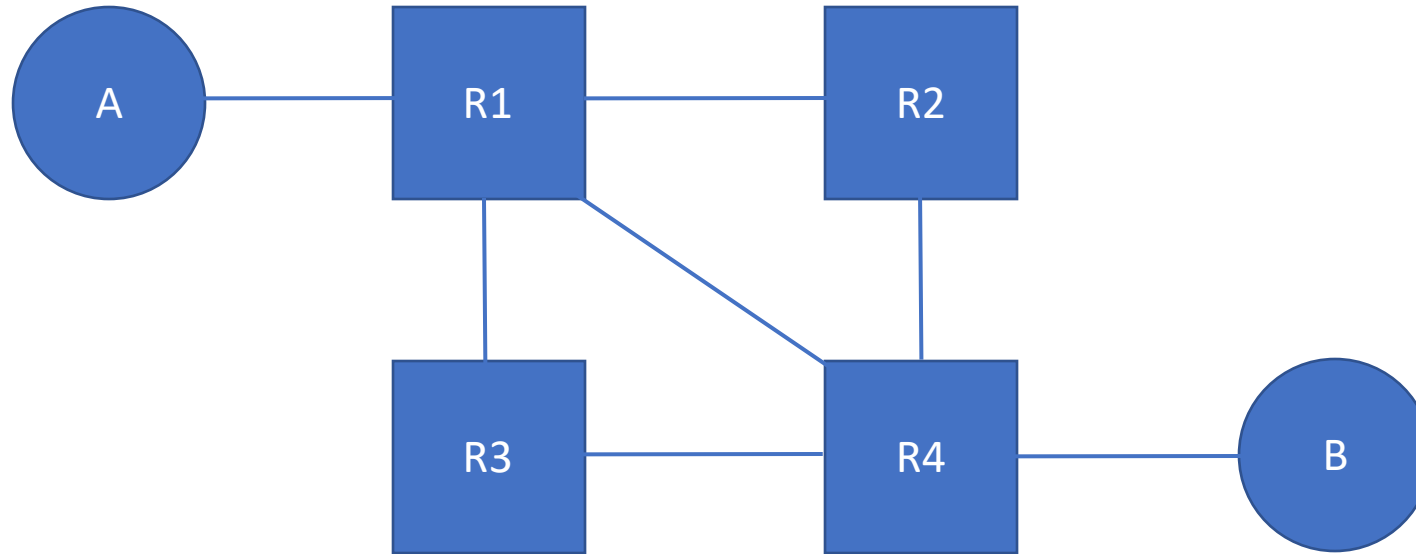
Dest.	Nexthop
::/0	2001:db8:1341:12::1

R3

Dest.	Nexthop
::/0	2001:db8:1341:34::4

Configure forwarding tables of R1 and R4 so that A can reach B and the reverse

Question 4



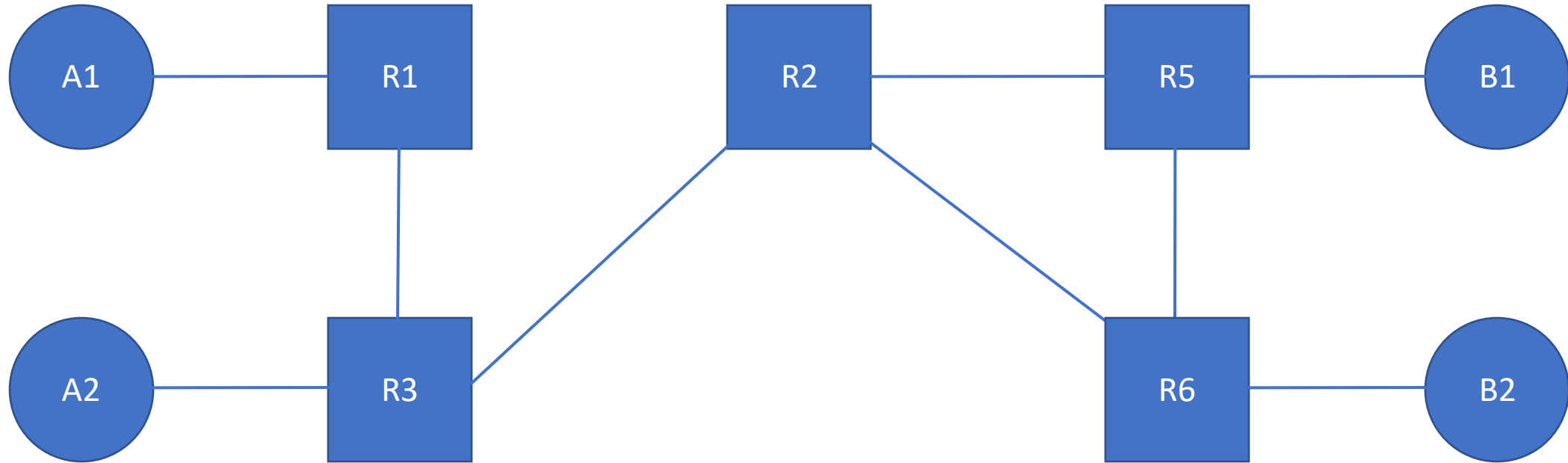
Can you configure the forwarding tables so that the following paths are used by packets sent by host A to reach one of the four addresses of router R4?

Do your forwarding tables impose the path used to reach host B which is attached to router R4 or do you need to configure an additional entry in these tables ?

Question 5

What do you think of the proposed network configuration?

Question 7



Assign IP subnets to all links in this network so that you can reduce the number of entries in the forwarding tables of all routers. Assume that you have received a `2001:ded1:cace:a0::/56` prefix that you can use as you want. Each subnet containing a host must be allocated a /64 subnet.