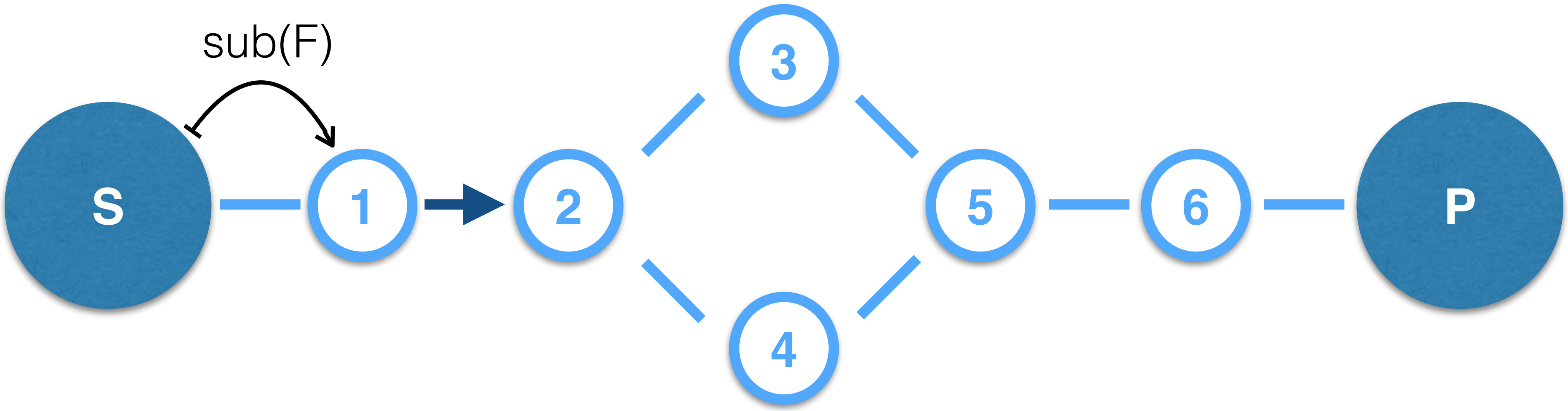
Task 1.1



Router 1	
D	Filter

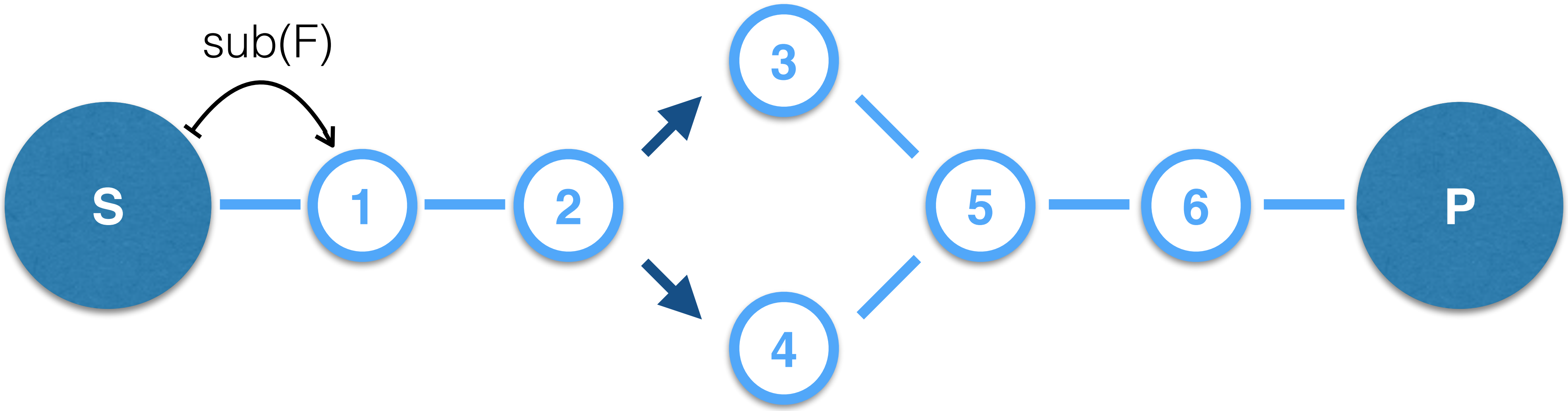
Router 2	
D	Filter
1	F

Router 3	
D	Filter

Router 4	
D	Filter

Router 5	
D	Filter

Router 6	
D	Filter



Router 1	
D	Filter

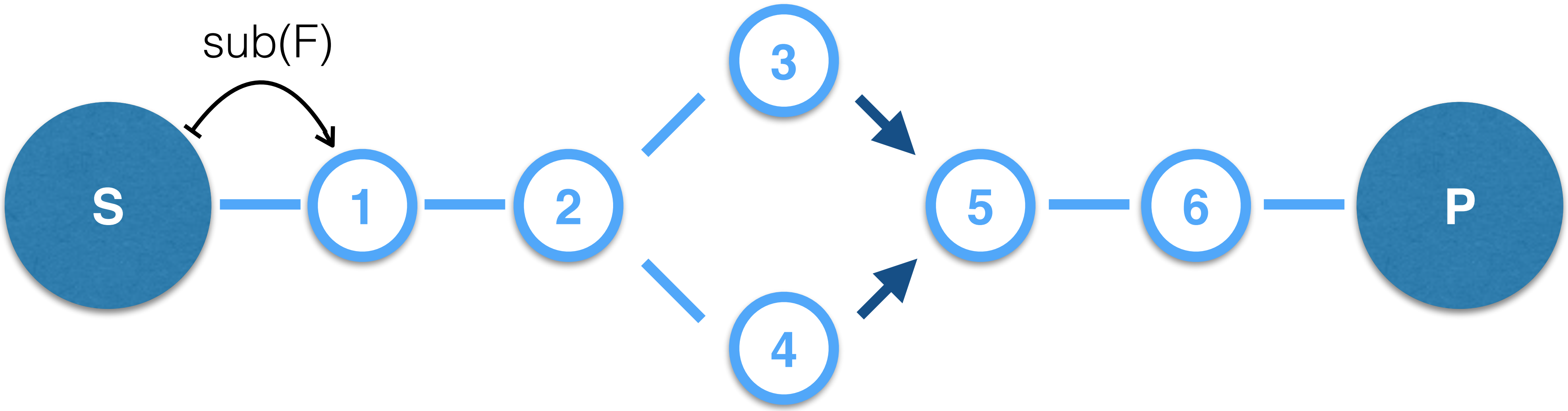
Router 2	
D	Filter
1	F

Router 3	
D	Filter
2	F

Router 4	
D	Filter
2	F

Router 5	
D	Filter

Router 6	
D	Filter



Router 1	
D	Filter

Router 2	
D	Filter
1	F

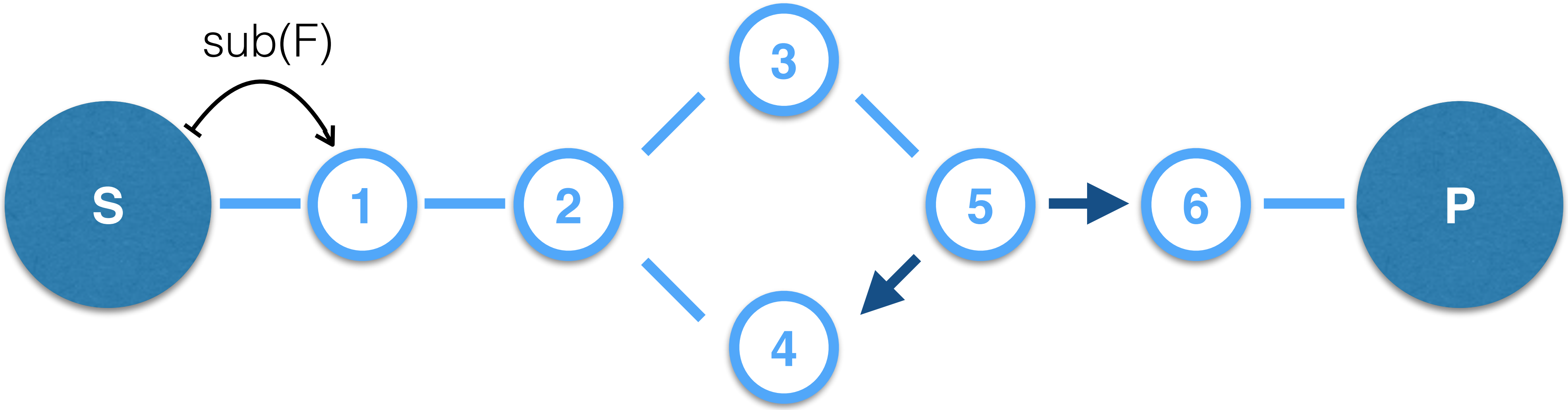
Router 3	
D	Filter
2	F

Router 4	
D	Filter
2	F

Router 5	
D	Filter
3	F
4	F

Router 6	
D	Filter

Assumes that subscription from router 3 arrives at router 5 first …



Router 1	
D	Filter

Router 2	
D	Filter
1	F

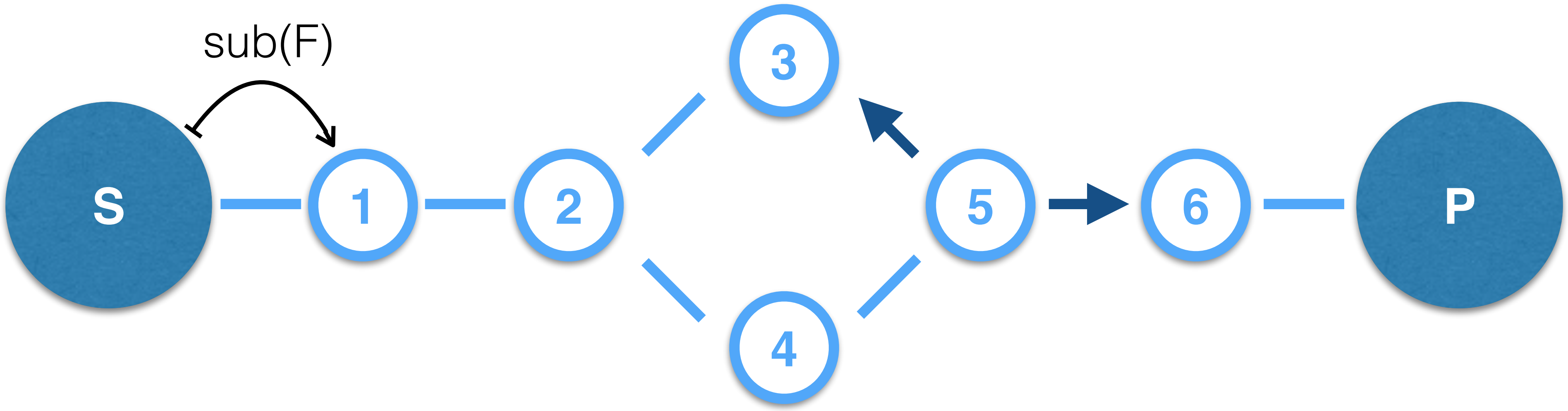
Router 3	
D	Filter
2	F

Router 4	
D	Filter
2	F
5	F

Router 5	
D	Filter
3	F
4	F

Router 6	
D	Filter
5	F

Assumes that subscription from router 4 arrives at router 5 later …



Router 1	
D	Filter

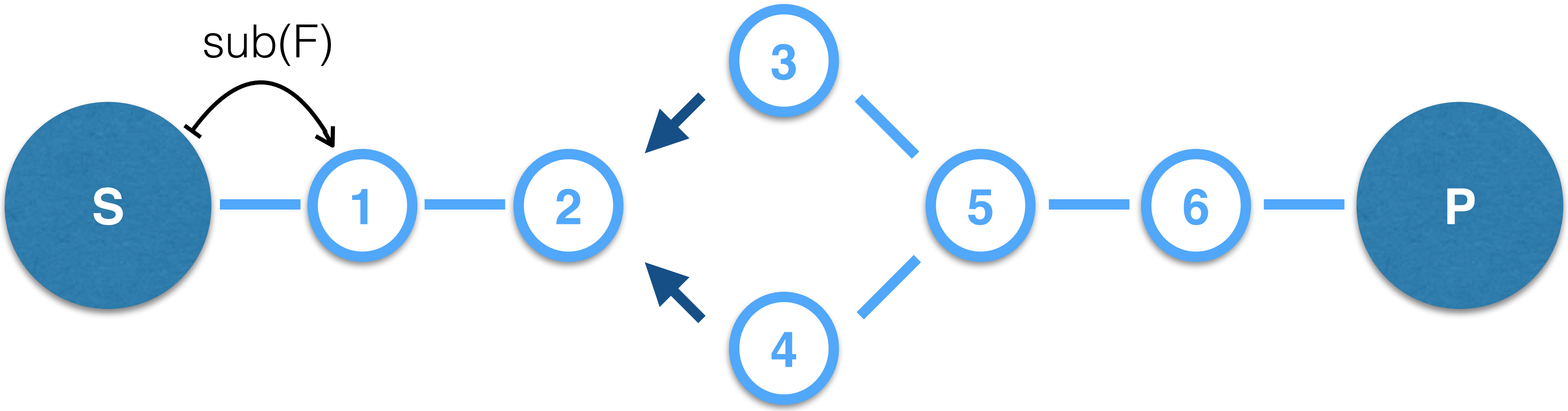
Router 2	
D	Filter
1	F

Router 3	
D	Filter
2	F
5	F

Router 4	
D	Filter
2	F
5	F

Router 5	
D	Filter
3	F
4	F

Router 6	
D	Filter
5	F



Router 1	
D	Filter

Router 2	
D	Filter
1	F
3	F
4	F

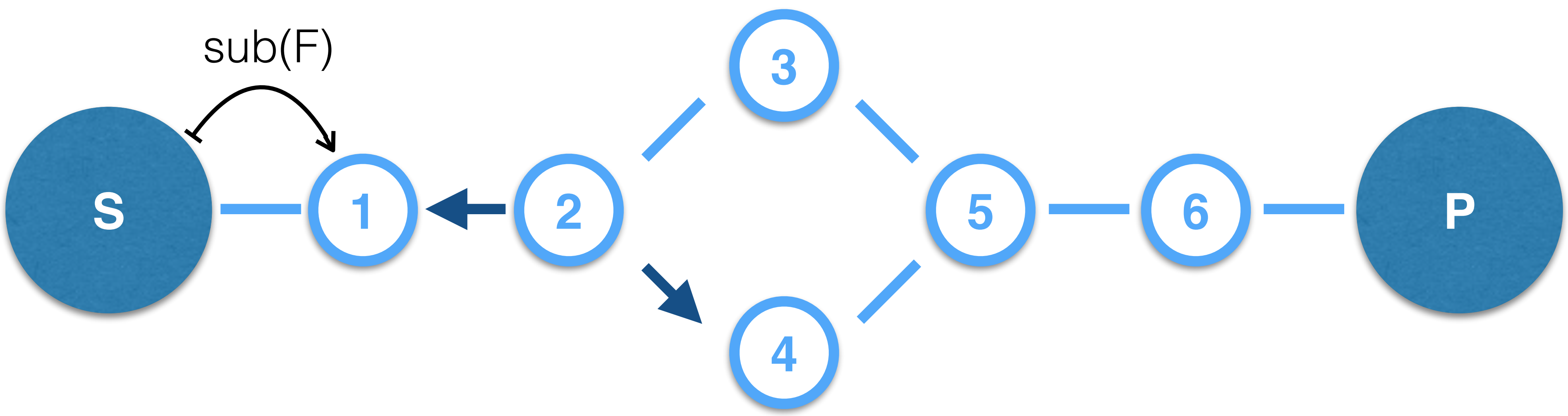
Router 3	
D	Filter
2	F
5	F

Router 4	
D	Filter
2	F
5	F

Router 5	
D	Filter
3	F
4	F

Router 6	
D	Filter
5	F

Assumes that subscription from router 3 arrives at router 2 first …



Router 1	
D	Filter
2	F

Router 2	
D	Filter
1	F
3	F
4	F

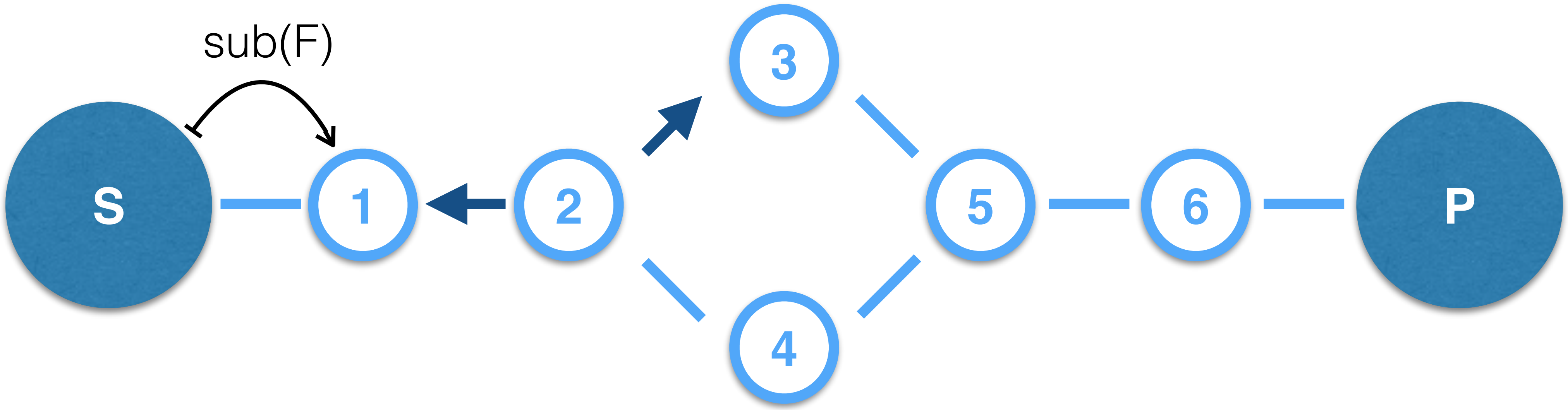
Router 3	
D	Filter
2	F
5	F

Router 4	
D	Filter
2	F
5	F

Router 5	
D	Filter
3	F
4	F

Router 6	
D	Filter
5	F

Assumes that subscription from router 4 arrives at router 2 later …



Router 1	
D	Filter
2	F

Router 2	
D	Filter
1	F
3	F
4	F

Router 3	
D	Filter
2	F
5	F

Router 4	
D	Filter
2	F
5	F

Router 5	
D	Filter
3	F
4	F

Router 6	
D	Filter
5	F

The flooding of subscriptions will never end even though routing table won’t be updated anymore …

Task 1.2

- Because of the ring structure inside the topology, subscription requests will keep circulating since there is always downstream routers to request to at entry points of the ring

- Solution to this problem is to stop forwarding the subscription request at each router if it does not update its routing table.

Task 1.3

- Yes, the publication request will also be trapped in the ring structure given the existing routing tables.

- Solution to this problem is to set a reasonable time to live constraint for the publication request according to the diameter of the topology.

Task 2.1

- Channel Based: subscription made against a channel ID.
- Type Based: subscription made against a type.
- Subject Based: subscriptions are expressions such as SQL queries or regular expressions.
- Content Based: subscriptions in extended form of subject based subscriptions, expressions are against the whole notification rather than just the subject.

Task 2.2

- Channel Based: notification with exactly the same channel ID will pass.
- Type Based: notification with exactly the same type or is a subtype of the subscribed type will pass.
- Subject Based: notification header will be filtered by the subscription expression.
- Content Based: whole notification will be filtered by the subscription expression.

Task 3.1

- a) Centralised Server: since all request directions eventually end at a single node

- b) Acyclic Peer-to-Peer: since all nodes don’t have specific request directions and there is no ring inside the topology

- c) Generic Peer-to-Peer: similar to acyclic p2p topology plus that it contains cycles