TK1 Exercise 6

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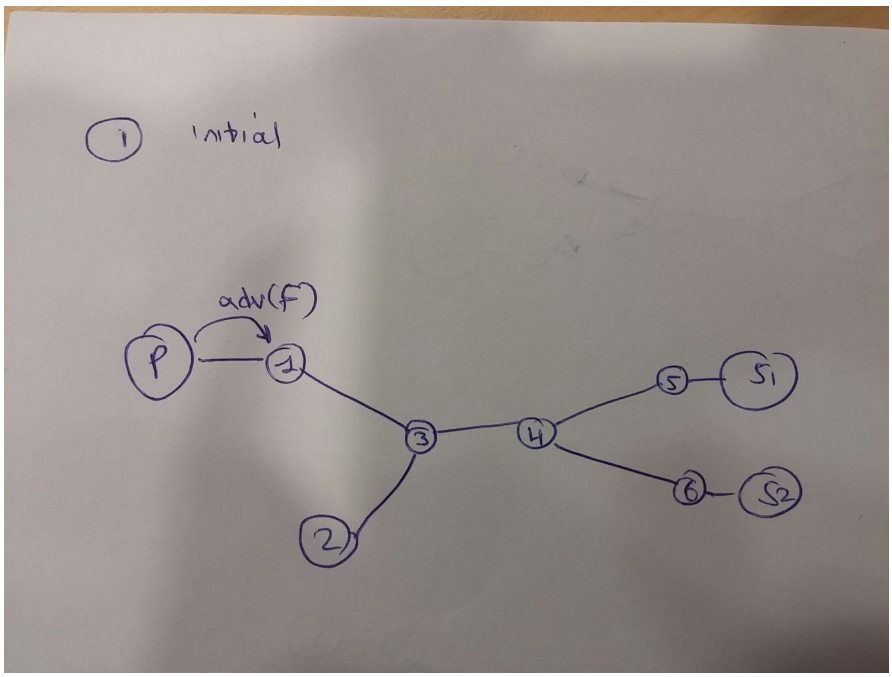
Task 1 : Routing with Advertisements

1. Publisher P sends an advertisement to router 1.

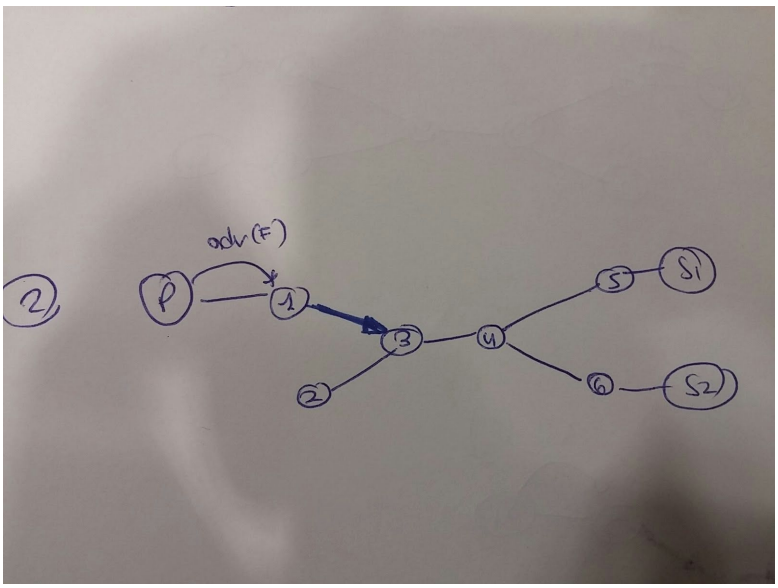
Initial Message flow :

Source	Destination	Request	Filter



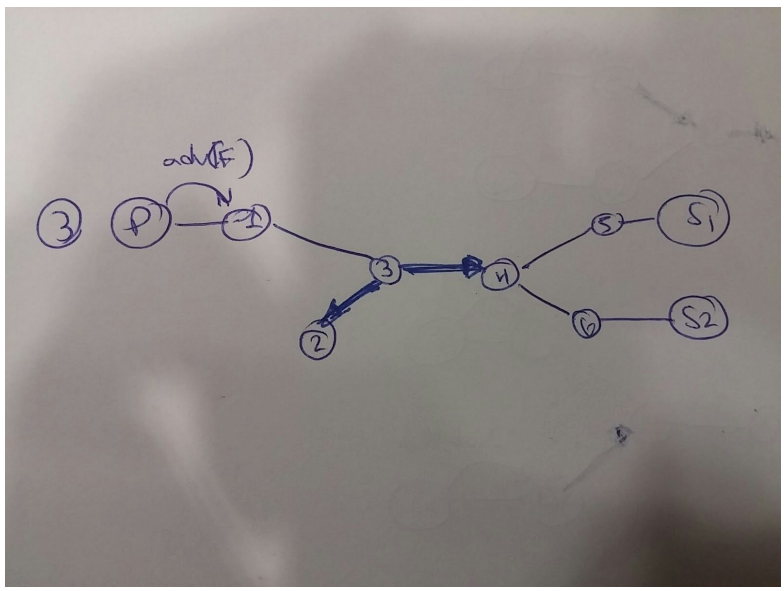
State 1:

Source	Destination	Request	Filter
1	3	adv	F



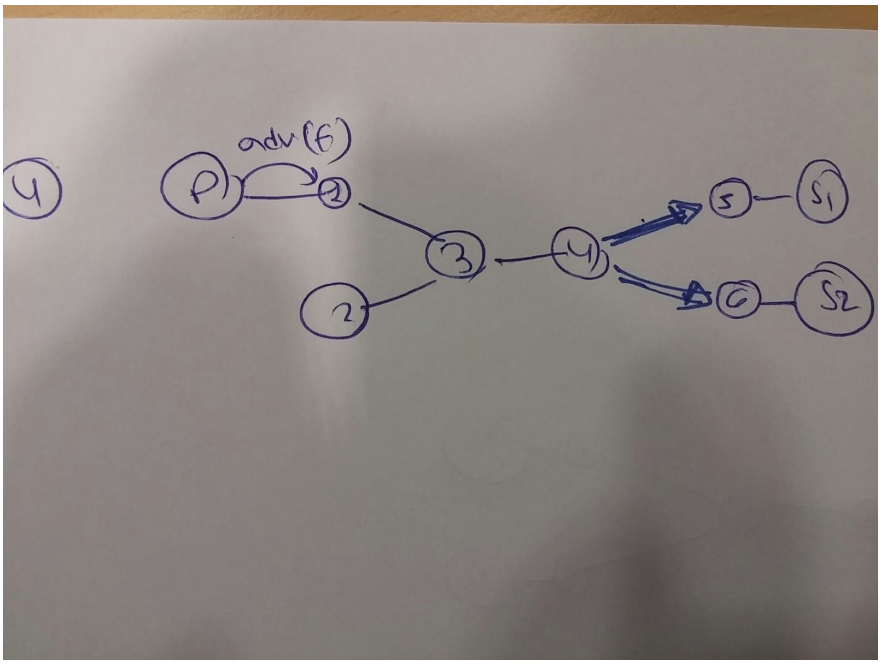
State 2:

Source	Destination	Request	Filter
1	3	adv	F
3	4	adv	F
3	2	adv	F



State 3:

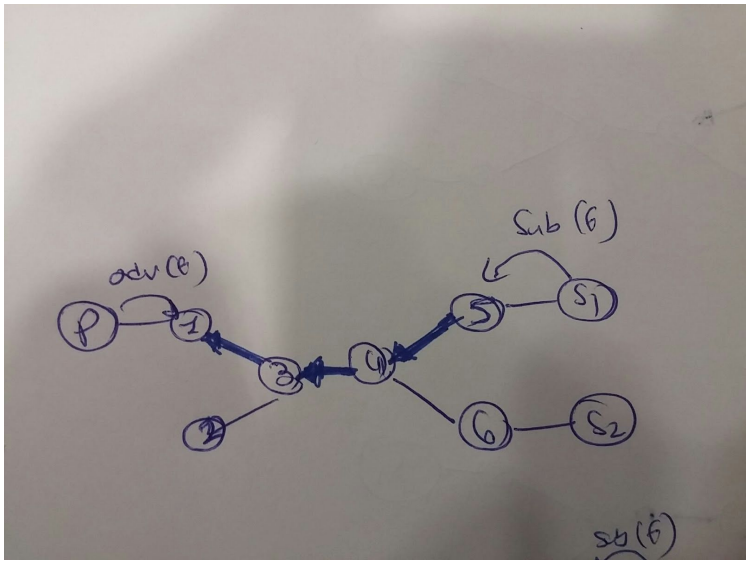
Origin	Destination	Request	Filter
1	3	adv	F
3	4	adv	F
3	2	adv	F
4	5	adv	F
4	6	adv	F



2. Subscription flow graph and routing tables

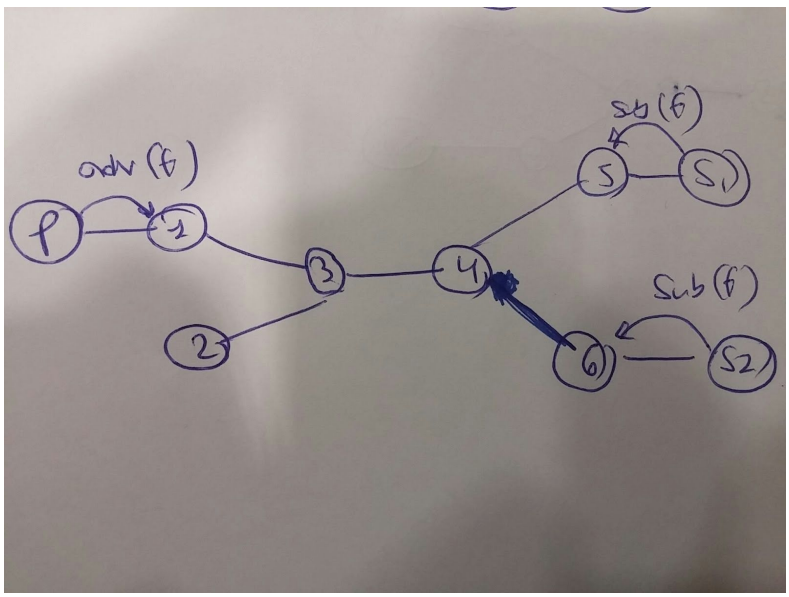
S1 sends subscription to router 5

Source	Destination	Request	Filter
5	4	sub	F
4	3	sub	F
3	1	sub	F



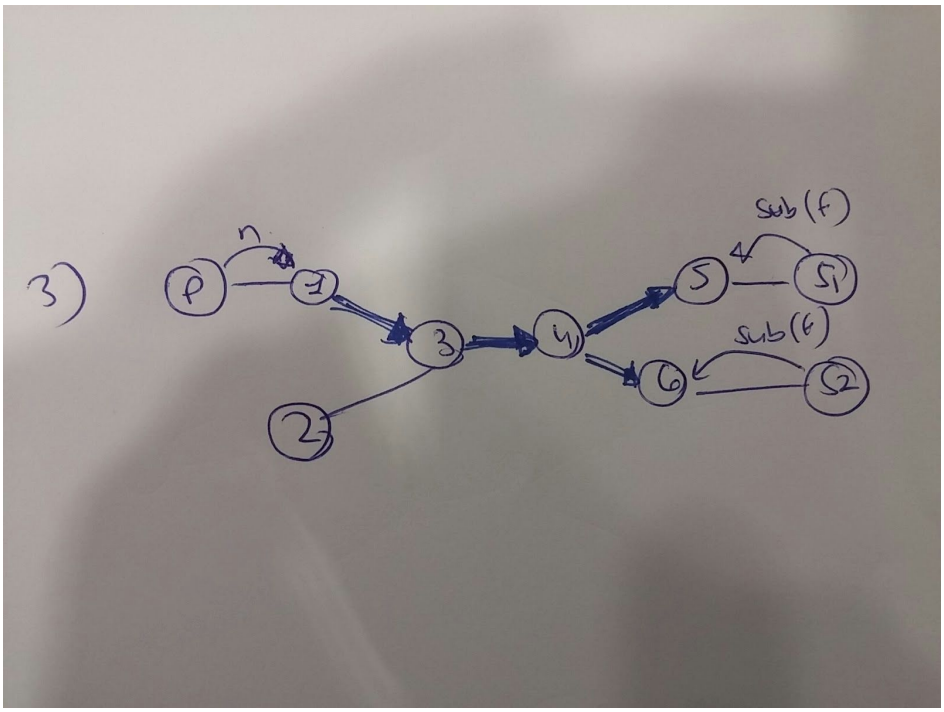
S2 sends subscription to router 6

Source	Destination	Request	Filter
5	4	sub	F
4	3	sub	F
3	1	sub	F
6	4	sub	F



3. **Publisher P sends a notification to router 1.**

Source	Destination	Message
1	3	Notification n (n matches F)
3	4	Notification n (n matches F)
4	5	Notification n (n matches F)
4	6	Notification n (n matches F)



Task 2: Routing in Publish/Subscribe Systems

1. **Pros and cons about “Routing with Advertisements” and “Routing with Subscriptions” in the context of a matchmaking system of a video game.**

   Routing with subscriptions
   Pros:
   - All routers are delivered with same super set of subscriptions, which means, subscriptions are more stable - higher reliability at finding matches since players may join and leave randomly.

- Since advertisements don’t exist, there won’t be any notification drop offs - minimizes the chances of missing a potential match.

Cons:

- This routing is not efficient, especially when there are too many subscriptions from different game sessions

Routing with advertisment

Pros:

- This is more efficient when subscriptions take place very often. Each game session subscription only affects the routers on the path to the publisher and not the whole network of routers

Cons:

- Notifications may not follow a way to the subscriber, in case the subscription has not reached yet. For example when a game client just starts a session and sends out a notification, some potential subscribers would miss it.

2. **Which type of routing is more suitable for which type of application?**

Routing with subscriptions:
Suitable for smaller networks with fewer number of subscriptions in total.

Reason:
Since every router broadcasts subscriptions - except to the source and after performing set covering on filters, a higher overall subscriptions would increase the overall load on the routers in the network - on an average most routers would have to update their subscription tables.

Routing with advertisement
For large networks with frequent subscriptions and fix numbers of publishers

Reason:
Subscriptions travel only through a rendezvous path so, the number of routers involved per subscription are very few compared to the total number of routers in the network. Advertisements are broadcasted - except to the source but since the number of publishers are fixed, this would be a constant and predictable load.