In this section, the Alloy model is given. Using it, some of the features of the system are specified and

explained in more details, with the focus being on the constraints:

Data4Help Constraints

* If status of request is “Received” no response should be created
* If request is approved or rejected there should be one response for this request. Status of response depends on the status of request.
* When request is approved response data should be the same with requested data
* Every response should be specific to a request.
* There can’t be more than one different user which has the same data record
* Every request should be peculiar to one third party.
* When a request is sent by a pre-confirmed third party, it should be approved, and requested data should be sent the third party.

Track4Run Constraints

* User can’t attend an organization as both runner and spectator.
* In order to attend runner individual must activate Track4Run. Also, third party must activate Track4Run service to organize a run.
* Organization must access the location data of it’s all runners.

AutomatedSOS

* Each AutomatedSOS user should have health and location data
* When health values are out of range a notification should be sent to a third party which serves AutomatedSOS service.
* For every exceed of threshold values one notification must be sent

It should be noted that in order to simplify modeling request time and respond time is excluded from modelling. Also, for monitoring health data we only model heartbeat. Heartbeat is modeled between 0 and 20 beats per minutes. Normal values are assumed as between 10 and 15 beats per minutes.

In order to increase readability of diagram we show three different model instances. First one focuses on Data4Help request response relation. The second one focuses on only Track4Run and the last one focuses on AutomatedSOS.