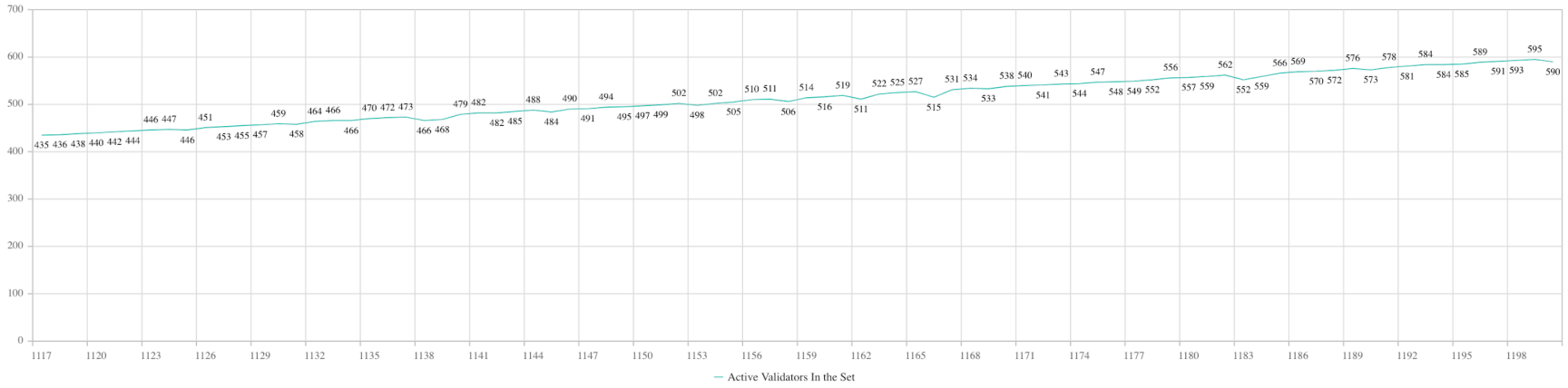
Performance Report II: 600 validators milestone, Kusama metrics and next steps

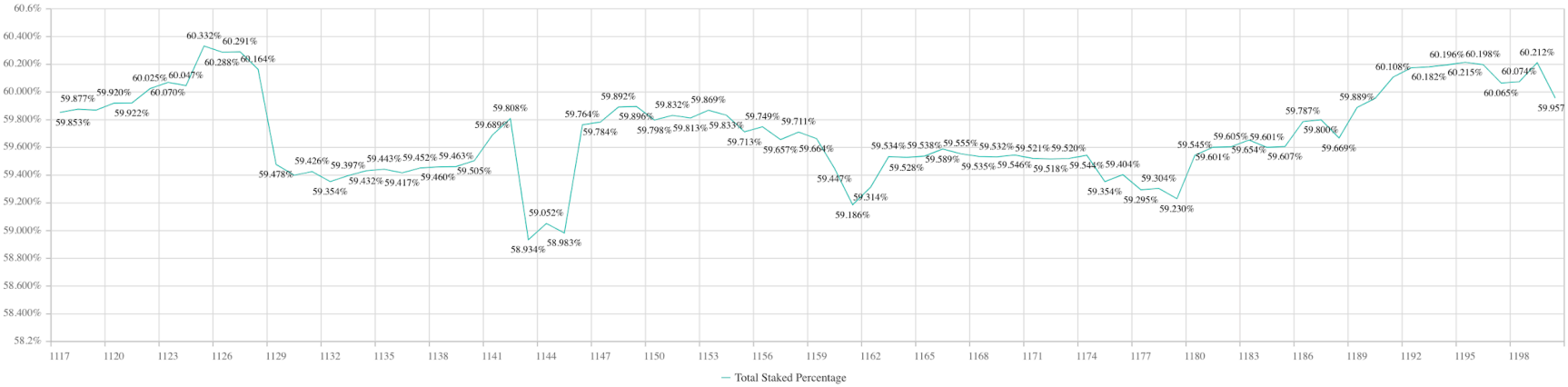
Kusama is now operating at 600 validators slots. 171 validators are waiting to be included and the total stake percentage is approximately 60,00%. Referendum 76 is cancelled as agreed by Referendum 80.



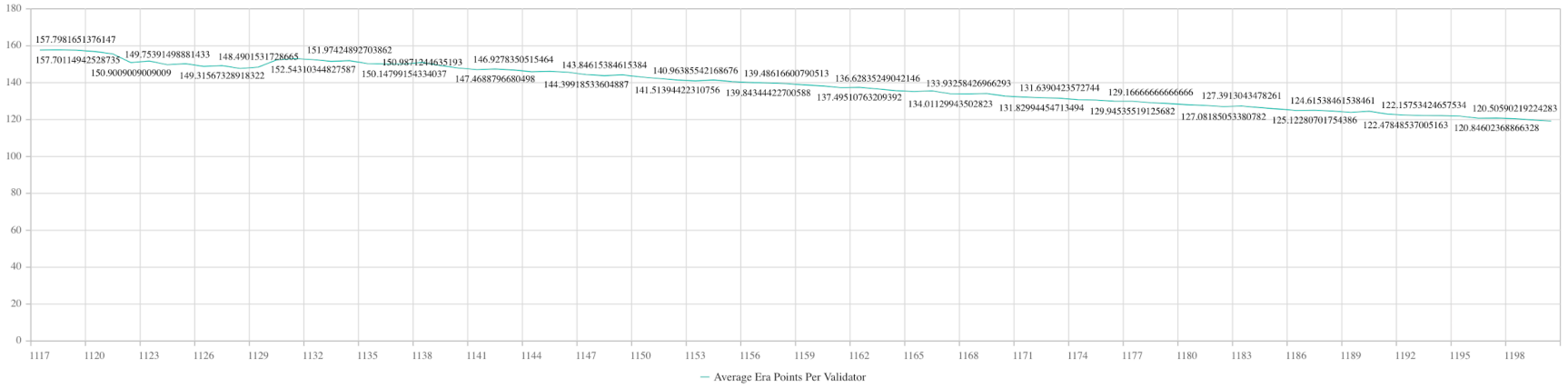
As we reached the 600 validators milestone, an increase of the bandwidth and in the number of GrandPa messages exchanged has been noticed, which results in an increase in the cost of running a validator. The graphs below show a slight increase in bandwidth, in a stable manner, as expected. Please keep in mind that the graphs are reflecting around 3 times what a normal validator would observe, given that Parity's sentry nodes are configured for a higher number of peers than the default. **As the number of validators increases, along with the number of peers per validator, we expect bandwidth to increase. It might be advisable to lower the number of peers in the future to keep bandwidth stable.**

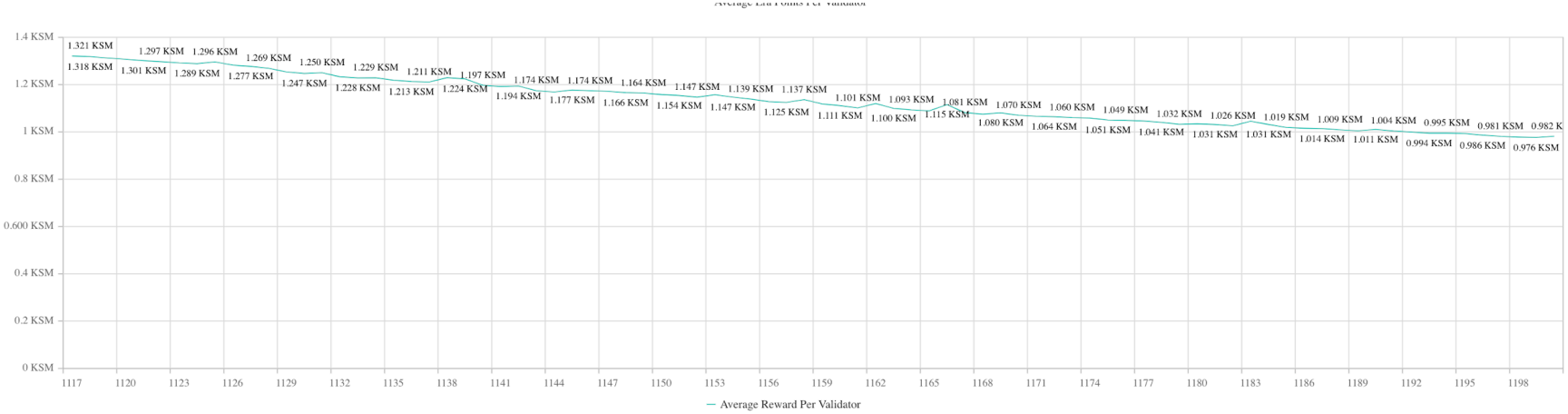
As far as QoS goes, it seems that so far the increases have not impacted time to finality. The network is still taking about 4 to 5 seconds to conclude a round, which is in line with the timeouts the team has in place and means we are not limited by networking.

From the last report, the total stake oscillated between 59% and 61%. In general, we see a small increase in the last periods before reaching 600 validators. This can be reflected in other metrics and affect **Average Staked Per Validator** and **Minimum Stake**.



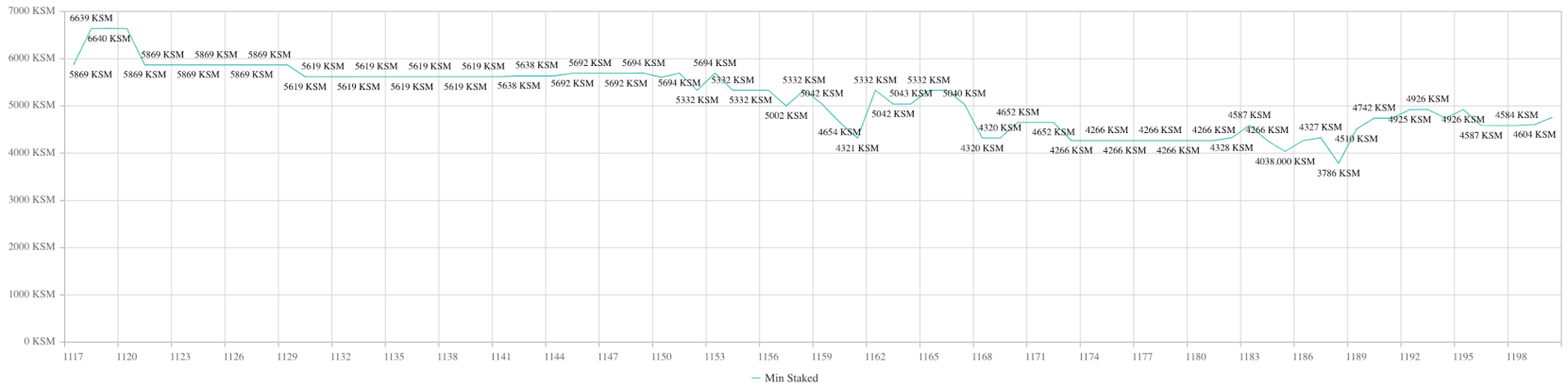
Average Era Points Per Validator decreased as the number of validators increased, along with the Average Reward Per Validator. This behaviour is expected as the number of validators grows. Further measures are to be taken in order to improve validators' sustainability in the future, including advocating for small validators' backup, nominators education and new nodes deployment.

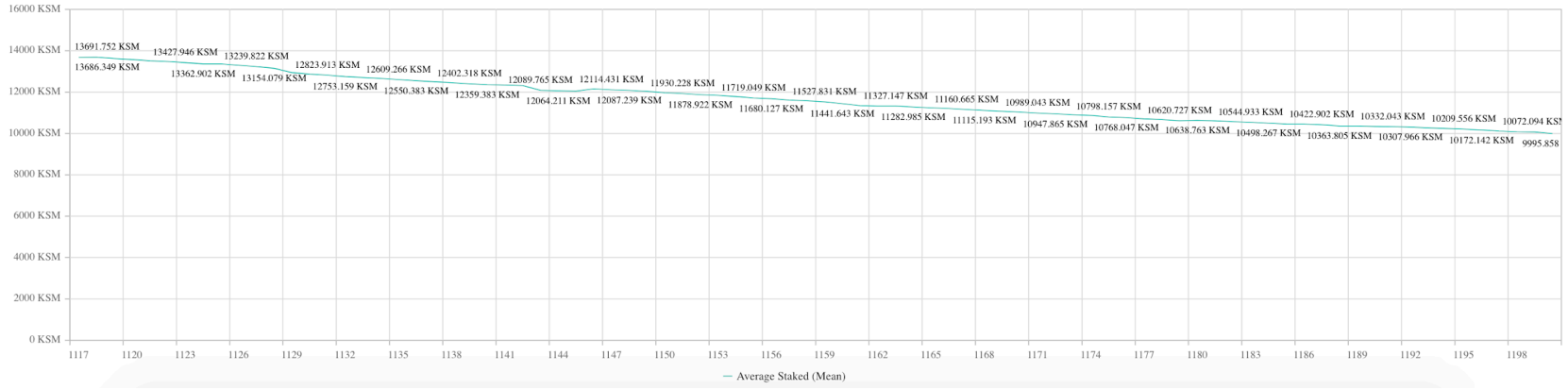




Much has been discussed about the ***MinStake/AvgStaked Ratio***: at the moment the ratio is approximately at 47% - we expect for a ratio below 30% to be dangerous for the network. The higher the ratio is, the more evenly distributed the total stake is: this is in general caused by an increase of the Minimum Stake as a result of a higher backup for small validators.

In general terms, the Minimum Stake has been stable: oscillating between 3,900KSM and 4,700KSM. The Average Stake has slightly decreased bringing the Ratio up. It is important to note that the number of nominators has been steadily increasing in the last days, most likely affecting this Ratio. It is also important to note that a low Minimum Stake can have serious security implications for the network.


7000 KSM
6000 KSM
5000 KSM
4000 KSM
3000 KSM
2000 KSM
1000 KSM
0 KSM
1117 1120 1123 1126 1129 1132 1135 1138 1141 1144 1147 1150 1153 1156 1159 1162 1165 1168 1171 1174 1177 1180 1183 1186 1189 1192 1195 1198
Min Staked


16000 KSM
14000 KSM
12000 KSM
10000 KSM
8000 KSM
6000 KSM
4000 KSM
2000 KSM
0 KSM
1117 1120 1123 1126 1129 1132 1135 1138 1141 1144 1147 1150 1153 1156 1159 1162 1165 1168 1171 1174 1177 1180 1183 1186 1189 1192 1195 1198
Average Staked (Mean)

Recommended Steps

- Closely monitor the MinStake/AvgStaked ratio as we increase the numbers of validators.
- Decide on an optimal value of the ratio for the network, to be used in the automatic validator increase mechanism designed by the team.
- Closely monitor bandwidth and finality as we enable Authority discovery.
- Set up a plan to produce and distribute educational resources for new nominators focusing on what to look for when choosing validators. The resources should review the differences between nominating new/small validators and established ones. Furthermore, encourage validators to produce reports and for nominators to those use as signals of confidence when staking.

Graphs and Metrics: https://wpank.github.io/kusama-rewards/