

# IDA Gossip Experiment Results

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7/1/2022

## Experimental Setup

4096 process deployed on 32 machines—128 process per machine—from Gros cluster(G5K). The bandwidth of each process capped at 20Mbps(Upload Bandwidth). One way latency of 15ms added to each communication link(RTT is 30ms).

In this set of experiments, a large message—2MB— chunked in to 128 chunks and disseminated over different number of sources usin IDA gossip. 1 source means that the full message is disseminated by the single source. 2 source means that the message disseminated over 2 source each disseminate 64 chunks.

Each experiment run for 120 rounds to collect enough data.

A rounds ends for a node when it collects all of the 128 chunks disseminated in that round. At the end of a round, a node calculates a sleep time and sleeps. ***The sleep time is implemented to see the best possible performance of the IDA gossip.***

Currently, IDA gossip implementation does not add redundancy chunks because the number of redundancy chunks are calculated according to the percentage of faulty nodes in the system.

Currently, we have measured 3 metrics:

- First Chunk Delivery Time (ms)
- Message Delivery Time (ms)
- Queue Length

First Chunk Delivery Time is the measure of how early a node can contribute to the dissemination, and the smaller value is desirable. Message Delivery Time is the time needed to collect all 128 chunks disseminated for that round. Each message contains a time field, and this field is used to calculate elapsed time by a node. Queue length is the average number of messages on peers waiting to be forwarded. Queue length could be the precursor of contention: chunks are competing for the same resources and queue size could be helpful to understand the extend of this contention.

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Page 2 contains the plots, and page 3 contains data used in plots.

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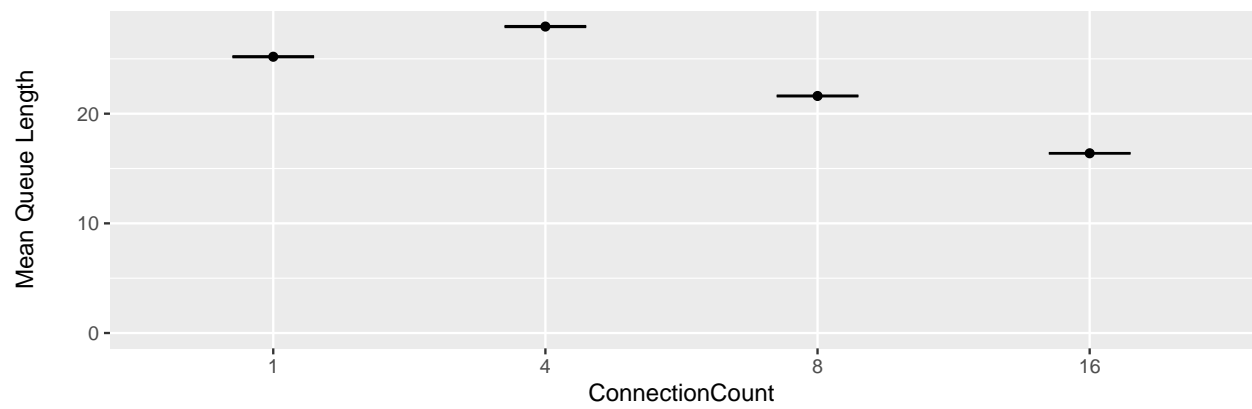
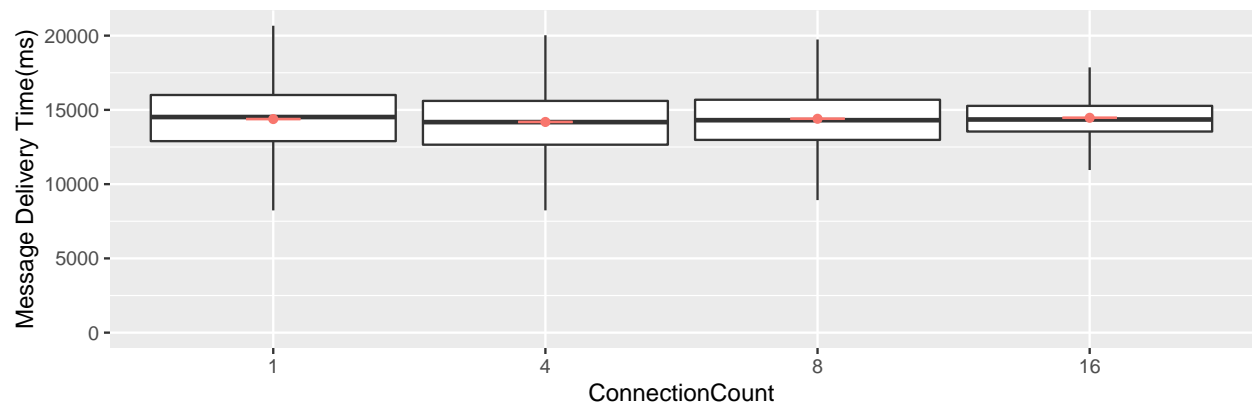
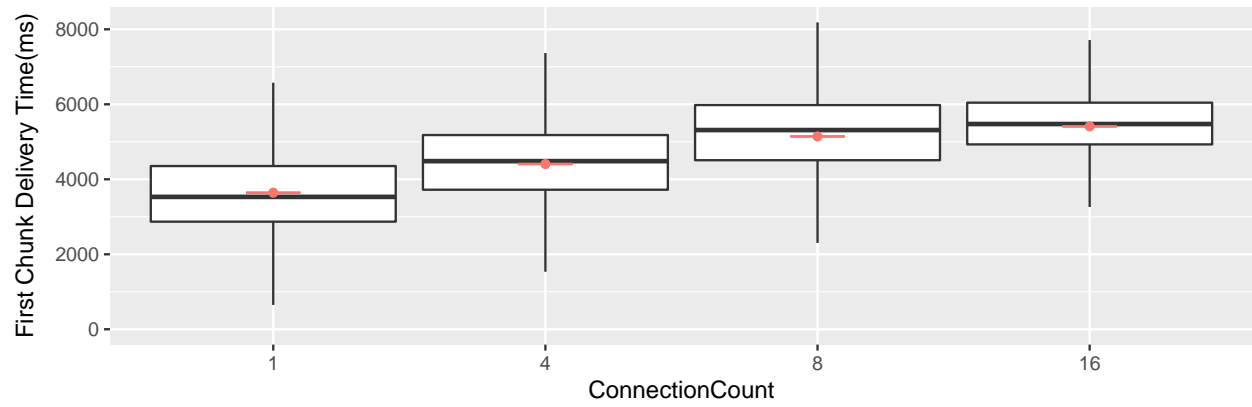


Table 1: First Chunk Delivery Time(ms)

ConnectionCount	Min	FirstQuartile	Median	ThirdQuartile	Max	Mean	RowCount
1	649	2870.0	3531	4353	6576	3641.907	491520
4	1535	3722.0	4484	5180	7367	4407.534	491520
8	2303	4509.0	5313	5980	8186	5143.394	491520
16	3261	4930.5	5474	6044	7714	5410.801	491520

Table 2: Message Delivery Time(ms)

ConnectionCount	Min	FirstQuartile	Median	ThirdQuartile	Max	Mean	RowCount
1	8232	12895	14519	16004	20667	14383.42	491520
4	8235	12657	14176	15605	20027	14187.85	491520
8	8925	12980	14306	15684	19740	14401.90	491520
16	10951	13543	14353	15271	17863	14467.40	491520

Table 3: Queue Length

ConnectionCount	LowerBound	Mean	UpperBound	RowCount
1	25.15325	25.19197	25.23069	491520
4	27.90519	27.94469	27.98419	491520
8	21.58473	21.61382	21.64290	491520
16	16.37513	16.39026	16.40540	491520