IDA Gossip Experiment Results

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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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## Warning: `guides(<scale> = FALSE)` is deprecated. Please use `guides(<scale> =
## "none")` instead.
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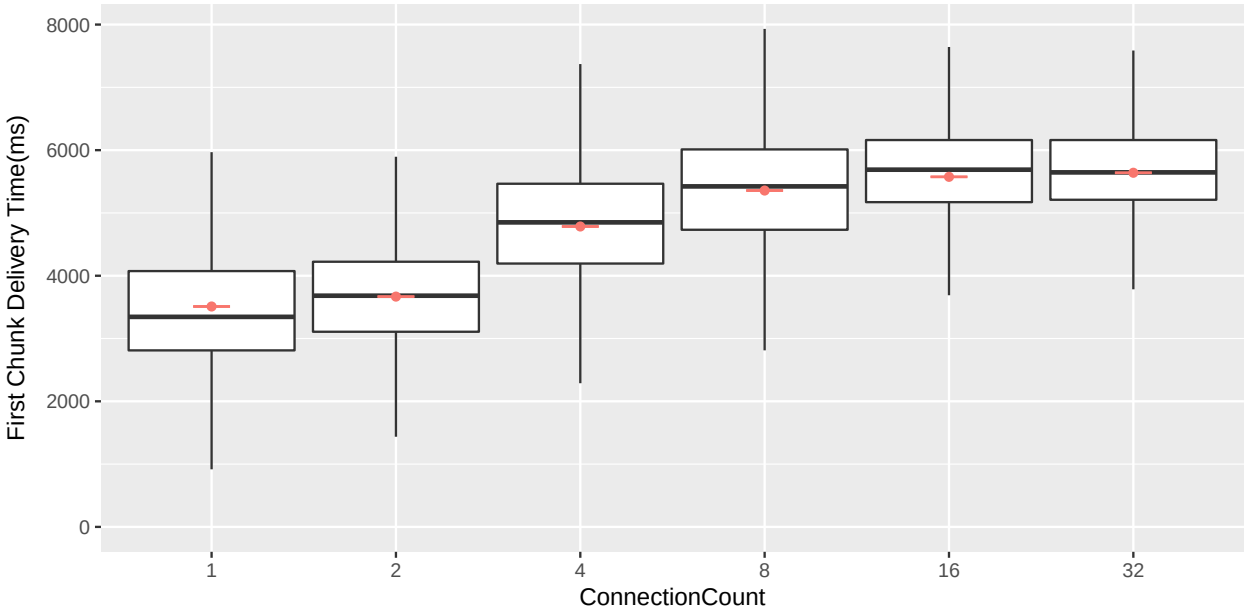

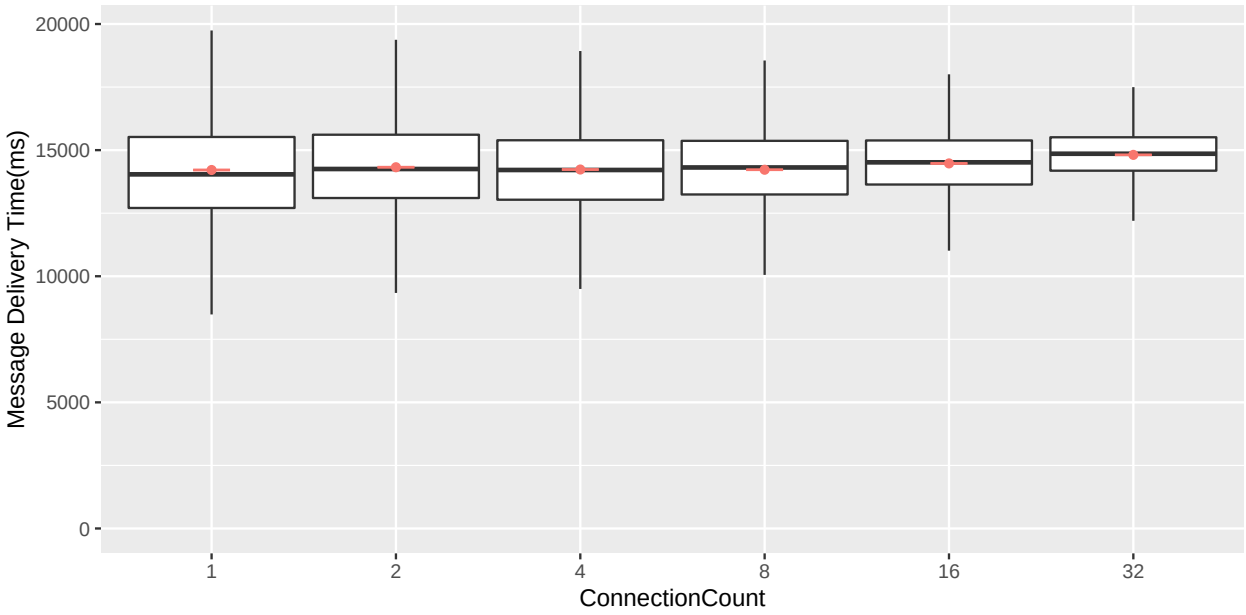

Table 1: First Chunk Delivery Time(ms)

ConnectionCount	Min	FirstQuartile	Median	ThirdQuartile	Max	Mean	RowCount
1	917	2811	3345	4074	5968	3510.249	245760
2	1436	3108	3682	4223	5895	3667.654	245760
4	2288	4194	4850	5465	7371	4784.123	245760
8	2812	4732	5423	6012	7931	5356.933	245760
16	3689	5172	5689	6161	7643	5575.187	245760
32	3784	5210	5646	6161	7587	5639.860	245760

Table 2: Message Delivery Time(ms)

ConnectionCount	Min	FirstQuartile	Median	ThirdQuartile	Max	Mean	RowCount
1	8485	12707	14040	15522	19744	14212.44	245760
2	9339	13102	14252	15611	19374	14321.93	245760
4	9497	13034	14213	15392	18929	14231.66	245760
8	10053	13242	14313	15368	18554	14222.46	245760
16	11014	13636	14517	15384	18006	14473.36	245760
32	12198	14185	14857	15510	17497	14812.03	245760