Memory Bus Bit Transition Statistics for 505-mcf-r-181008-150815-5541651

October 8, 2018

1 Scalar Statistics

Elapsed time: 27008.8
Cache size: 16777216 B
Associativity: 8 ways
Line size: 64 B
DRAM bus width: 8 B
Instructions cache simulation: on
LLC Load Miss Count: 13916646346
LLC Load Hit Count: 1280070231396
LLC Load Miss Ratio: 1.07549%
LLC Store Miss Count: 1337627975
LLC Store Hit Count: 106367282204
LLC Store Evict Count: 2903865545
LLC Store Miss Ratio: 1.24194%
LLC Total Miss Count: 1.52543e+10
LLC Total Hit Count: 1.38644e+12
LLC Total Miss Ratio: 1.08828%
Total number of bit transitions: 2334098397813
Bit entropy: 0.286926

2 Graphs

The graphs give the data either **transfer-wise** or **bus-wise**. Bus-wise refers to data sent within the same transfer (i.e. as part of the same bus transfer, as defined by bus-width). Transfer-wise refers to data from different bus transfers, which cause the bit transitions to occur.

2.1 Distribution of all byte values transmitted over the bus

Figure 1 and Figure 2 give the distribution of all transmitted bytes, either through a memory read or a memory write. The first one (pareto chart) is in terms of total number of occurrences, while at the same time showing the accumulation in the total percentage of transmitted byte values. The second one displays the absolute percentage of the most popular values transferred over the bus.

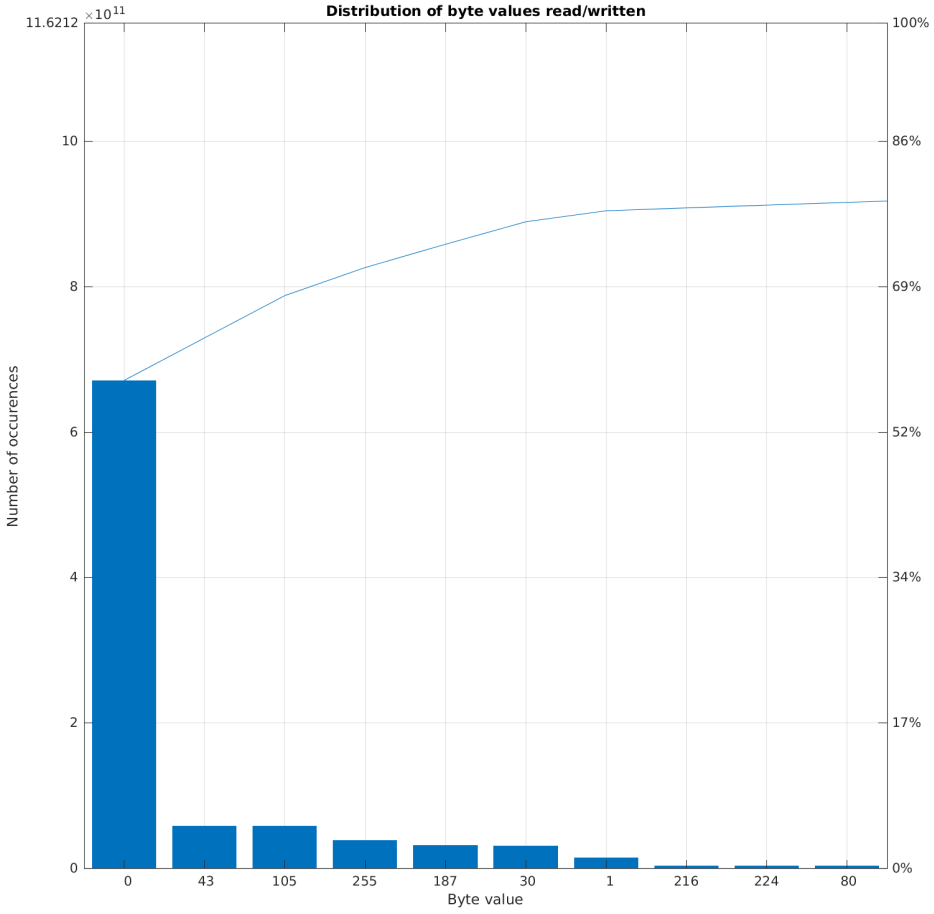

Figure 1: Distribution of all bytes transmitted over the bus - pareto chart

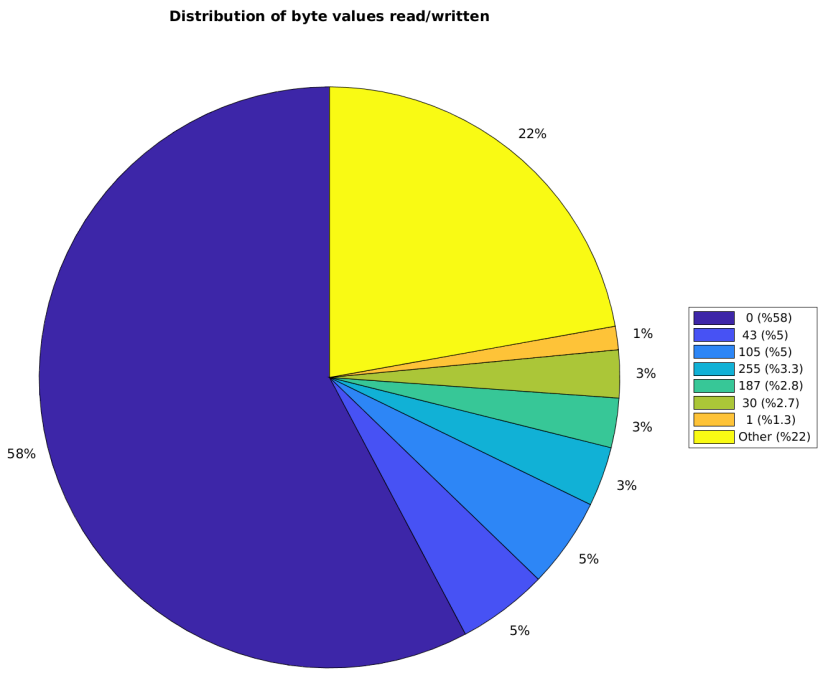

Figure 2: Distribution of all bytes transmitted over the bus - pie chart

2.2 Distribution of transitions (transfer-wise)

2.2.1 All transfers (transfer-wise)

Figure 3 illustrates the distribution of all transitions. Tuples (n, n) have been used as (old_value, new_value) to show the transition.

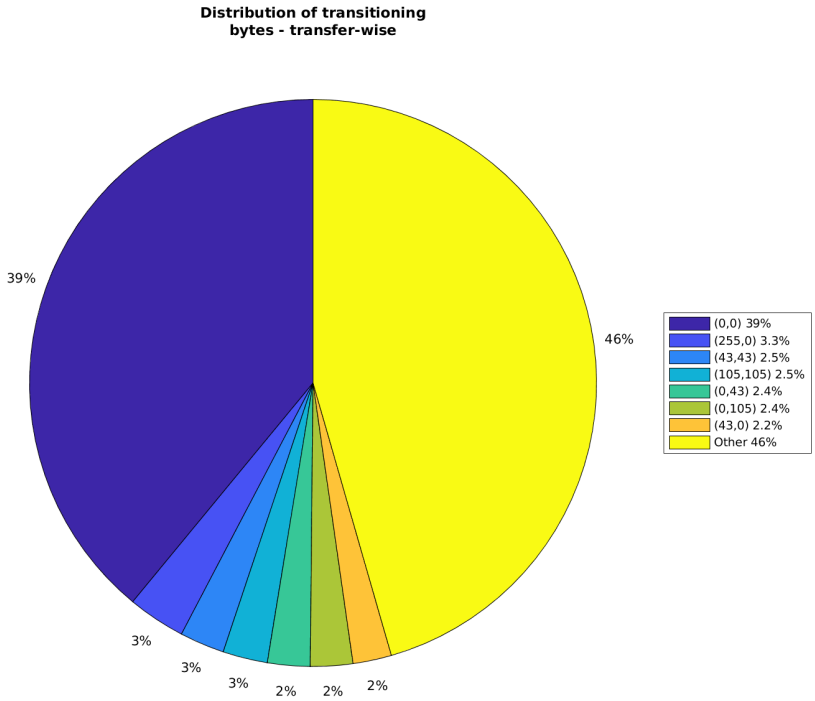

Figure 3: Distribution of transitioning bytes - transfer-wise

2.2.2 Only differing byte transfers (hamming distance > 0)(transfer-wise)

Figure 4 illustrates the distribution of transitions, filtered only to show differing byte transitions. Tuples (n, n) have been used as (old_value, new_value) to show the transition.

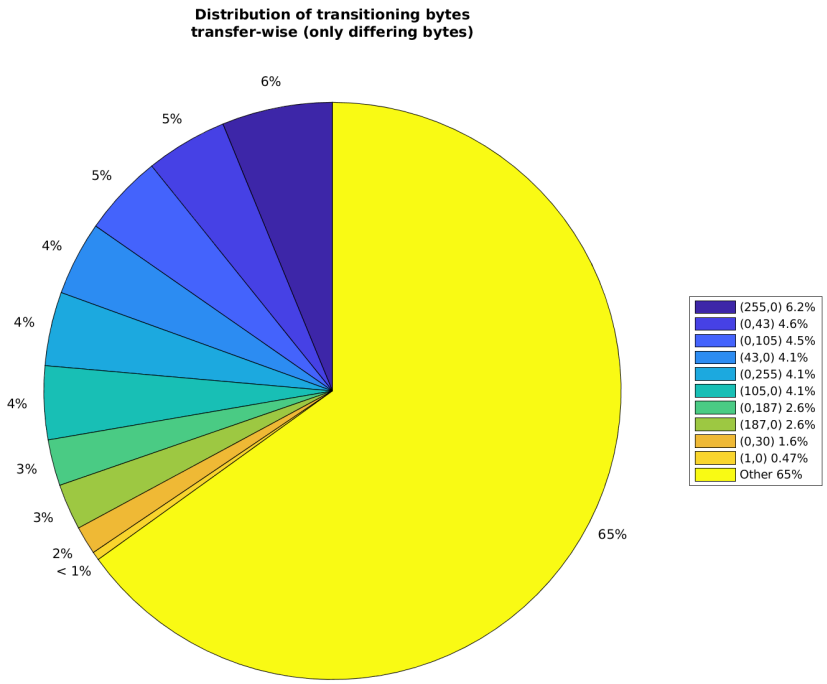

Figure 4: Distribution of transitioning bytes - transfer-wise (only differing bytes)

2.2.3 Only same byte transfers (hamming distance = 0)(transfer-wise)

Figure 5 illustrates the distribution of transitions, filtered only to show non-changing byte transfers. Tuples (n, n) have been used as (old_value, new_value) to show the transition.

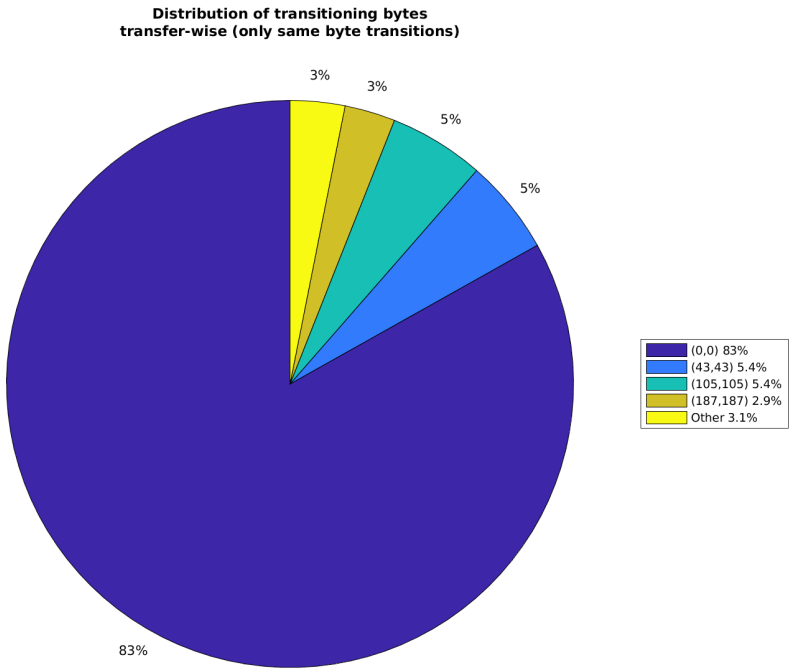

Figure 5: Distribution of transitioning bytes - transfer-wise (only same byte transitions)

2.2.4 Number of consecutive "n" zeros encountered (transfer-wise)

Figure 6 illustrates the distribution of consecutive "n" zeros encountered, transfer-wise. The x axis is the "n" value, and the y axis is the frequency.

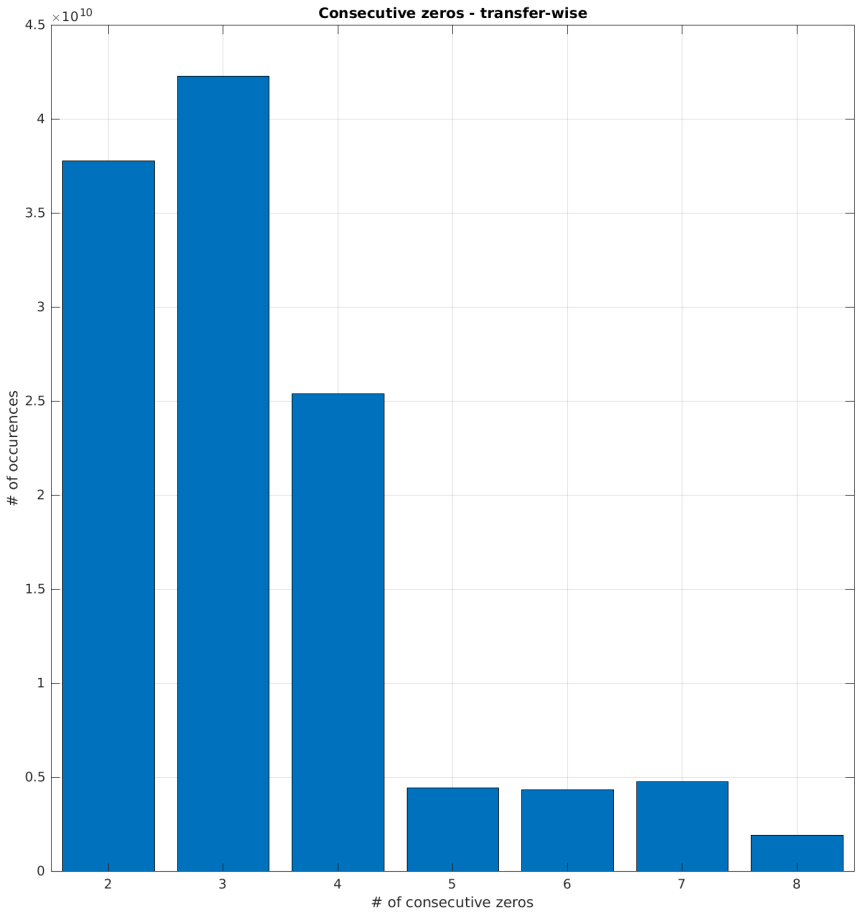

Figure 6: Number of consecutive `0` values encountered - transfer-wise

2.3 Distribution of transitions (bus-wise)

2.3.1 All transfers (bus-wise)

Figure 7 illustrates the distribution of all transitions happened during a whole benchmarking, bus-wise. Tuples (n, n) have been used as (old_value, new_value) to show the transition.

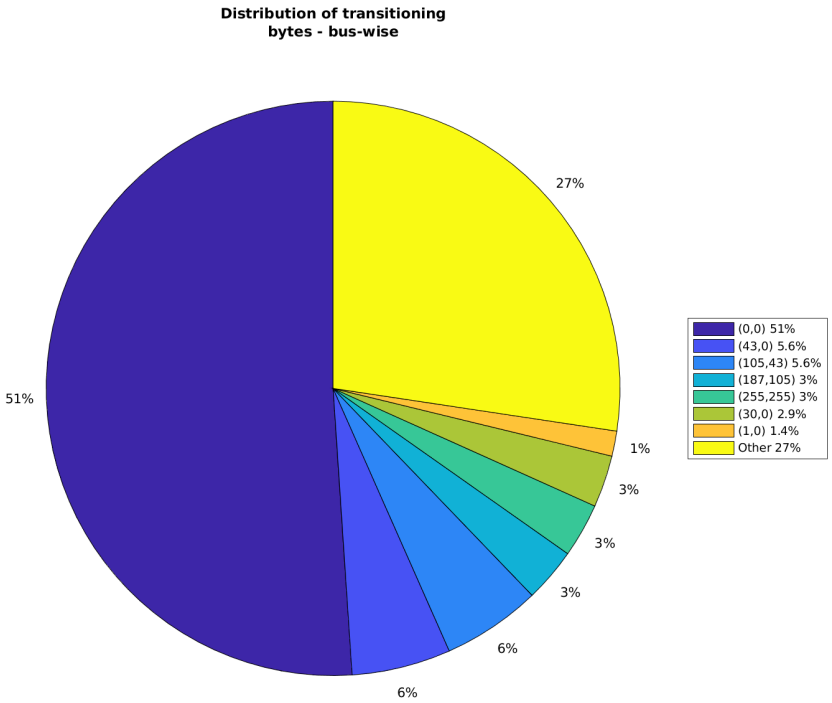

Figure 7: Distribution of transitioning bytes - bus-wise

2.3.2 Only differing byte transfers (hamming distance > 0)(bus-wise)

Figure 8 illustrates the distribution of transitions happened during the whole benchmarking. Tuples (n, n) have been used as (old_value, new_value) to show the transition.

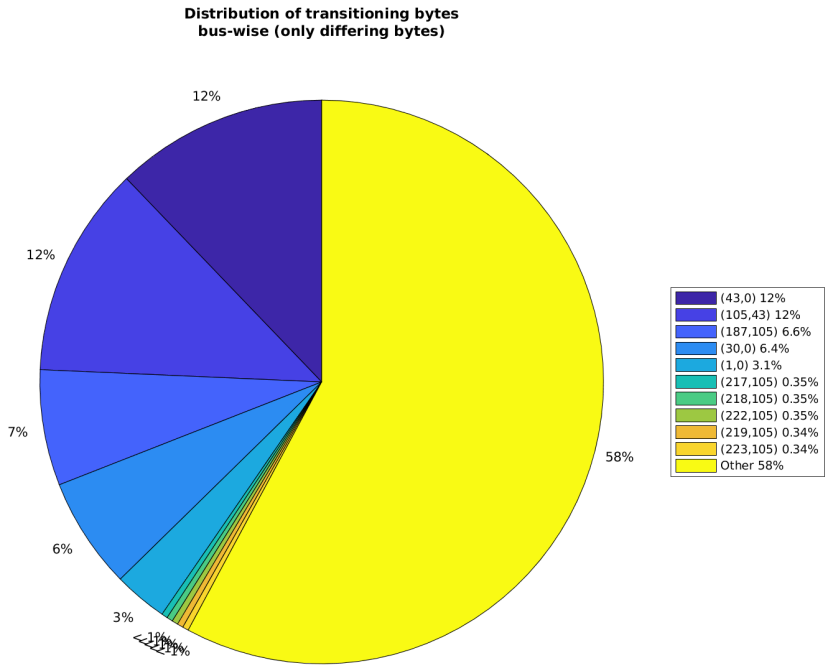

Figure 8: Distribution of transitioning bytes - bus-wise (only differing bytes)

2.3.3 Only same byte transfers (hamming distance = 0)(bus-wise)

Figure 9 illustrates the distribution of transitions, filtered only to show non-changing byte transfers. Tuples (n, n) have been used as (old_value, new_value) to show the transition.

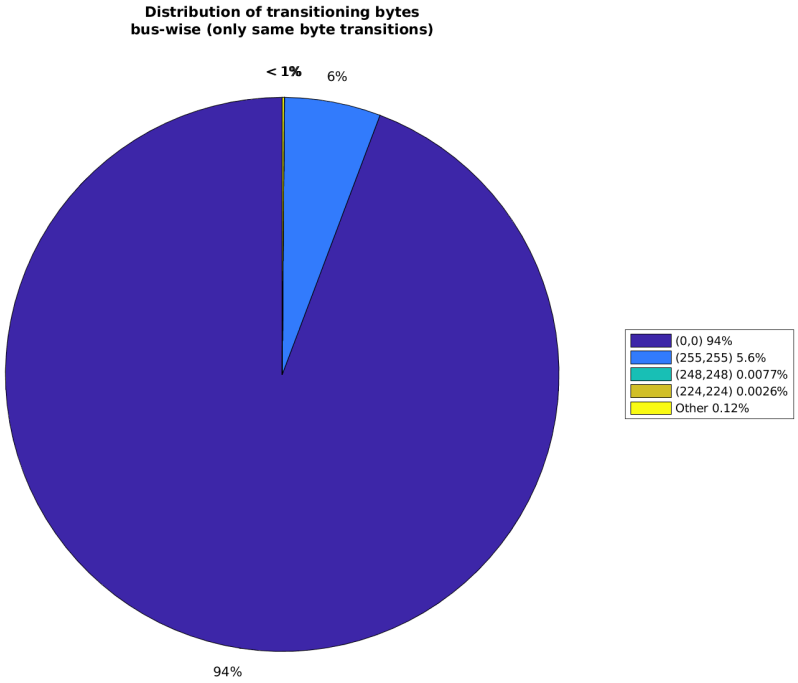

Figure 9: Distribution of transitioning bytes - bus-wise (only same byte transitions)

2.3.4 Number of consecutive "n" zeros encountered (bus-wise)

Figure 6 illustrates the distribution of consecutive "n" zeros encountered, transfer-wise. The x axis is the "n" value, and the y axis is the frequency.

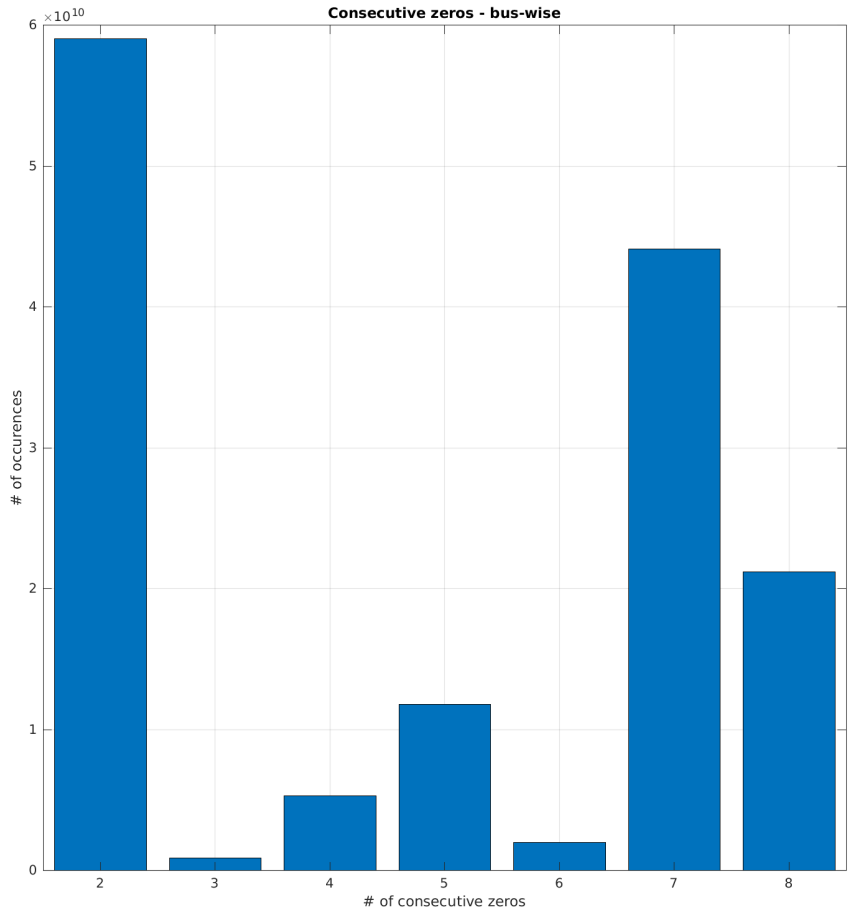

Figure 10: Number of consecutive `0` values encountered - bus-wise