## Report-4

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## **Install ALPHA in Gem5**

1. Download Gem5 file with ALPHA:

https://drive.google.com/file/d/1vCn1MoTMLBI-hO18BtJV6jI214LEfk3U/view

2. First go to new Gem5 file and install ALPHA to use this command:

build/ALPHA/gem5.opt -j9

- 3. We are installing alpha for runing –bench command.
- 4. Now we download benchmarks file to use this link

https://github.com/timberjack/Project1 SPEC.git

or, <a href="https://github.com/timberjack/Project1">https://github.com/timberjack/Project1</a> SPEC

- 5. After download this copy past the file in Gem5 file.
- 6. Then run this command for run.

build/ALPHA/gem5.opt configs/example/se.py -bench=namd

- 7. Successfully run the benchmarks with –bench command and ALPHA machine.
- 8. Answer:

Begin Simulation	on Statistics	
final_tick	2148839726500	# Number of ticks from
beginning of simulation	(restored from checkpoints	and never reset)
host_inst_rate	2304565	# Simulator instruction rate
(inst/s)		
host_mem_usage	670396	# Number of bytes of host
memory used		
host_op_rate	2304565	# Simulator op (including
micro ops) rate (op/s)		
host_seconds	1864.84	# Real time elapsed on the
host		
host_tick_rate	1152288904	# Simulator tick rate
(ticks/s)		
sim_freq	100000000000	# Frequency of simulated
ticks		
sim_insts	4297655713	# Number of instructions
simulated		
sim_ops	4297655713	# Number of ops (including
micro ops) simulated		
sim_seconds	2.148840	# Number of seconds
simulated		
sim_ticks	2148839726500	# Number of ticks
simulated		

system.cpu.Branches fetched	547769943	# Number of branches
system.cpu.committedInsts instructions committed	4297655713	# Number of
system.cpu.committedOps (including micro ops) committed	4297655713	# Number of ops
system.cpu.dtb.data_accesses	1125530860	# DTB accesses
system.cpu.dtb.data_acv	0	# DTB access violations
system.cpu.dtb.data_hits	1125507164	# DTB hits
system.cpu.dtb.data_misses	23696	# DTB misses
system.cpu.dtb.fetch_accesses	0	# ITB accesses
system.cpu.dtb.fetch_acv	0	# ITB acv
system.cpu.dtb.fetch_hits	0	# ITB hits
system.cpu.dtb.fetch_misses	0	# ITB misses
system.cpu.dtb.read_accesses	919357413	# DTB read
accesses	010007.110	1_ 1000
system.cpu.dtb.read_acv	0	# DTB read access
violations	- -	
system.cpu.dtb.read_hits	919341118	# DTB read hits
system.cpu.dtb.read_misses	16295	# DTB read misses
system.cpu.dtb.write_accesses	206173447	# DTB write
accesses		
system.cpu.dtb.write_acv	0	# DTB write access
violations		
system.cpu.dtb.write_hits	206166046	# DTB write hits
system.cpu.dtb.write_misses	7401	# DTB write misses
system.cpu.idle_fraction	0.000000	# Percentage of idle
cycles		S
system.cpu.itb.data_accesses	0	# DTB accesses
system.cpu.itb.data_acv	0	# DTB access violations
system.cpu.itb.data_hits	0	# DTB hits
system.cpu.itb.data_misses	0	# DTB misses
system.cpu.itb.fetch_accesses	4297679454	# ITB accesses
system.cpu.itb.fetch_acv	0	# ITB acv
system.cpu.itb.fetch_hits	4297679409	# ITB hits
system.cpu.itb.fetch_misses	45	# ITB misses
system.cpu.itb.read_accesses	0	# DTB read accesses
system.cpu.itb.read_acv	0	# DTB read access
violations		
system.cpu.itb.read_hits	0	# DTB read hits
system.cpu.itb.read_misses	0	# DTB read misses
system.cpu.itb.write_accesses	0	# DTB write accesses
system.cpu.itb.write_acv	0	# DTB write access
violations		
system.cpu.itb.write_hits	0	# DTB write hits

existen any ith verito misses	0	# DTB write misses
system.cpu.itb.write_misses system.cpu.not_idle_fraction	$0 \\ 1.000000$	# DTB write misses  # Percentage of non-
idle cycles	1,00000	" I ereentage of non
system.cpu.numCycles	4297679454	# number of cpu
cycles simulated		
system.cpu.numWorkItemsComplete	ed 0	# number of work
items this cpu completed system.cpu.numWorkItemsStarted	0	# number of work
items this cpu started system.cpu.num_busy_cycles of busy cycles	4297679453.9980	000 # Number
system.cpu.num_conditional_control instructions that are conditional cont		# number of
system.cpu.num_fp_alu_accesses float alu accesses	1463866422	# Number of
system.cpu.num_fp_insts instructions	1463866422	# number of float
system.cpu.num_fp_register_reads times the floating registers were read	1960764606	# number of
system.cpu.num_fp_register_writes times the floating registers were writ	1350308664	# number of
system.cpu.num_func_calls function call or return occured	29720310	# number of times a
system.cpu.num_idle_cycles	0.002000	# Number of idle
cycles system.cpu.num_int_alu_accesses	3177594591	# Number of
integer alu accesses		1
system.cpu.num_int_insts instructions	3177594591	# number of integer
system.cpu.num_int_register_reads times the integer registers were read	4259086606	# number of
system.cpu.num_int_register_writes times the integer registers were writt	2168009366	# number of
system.cpu.num_load_insts instructions	919357413	# Number of load
system.cpu.num_mem_refs memory refs	1125530860	# number of
system.cpu.num_store_insts instructions	206173447	# Number of store
system.cpu.num_vec_alu_accesses alu accesses	0	# Number of vector
system.cpu.num_vec_insts instructions	0	# number of vector
system.cpu.num_vec_register_reads vector registers were read	0	# number of times the

0 # number of time	s the
40258538 0.94% 0.94% # Class	s of
2099591144 48.85% 49.79% # Class	of
3945352 0.09% 49.88% # Class of	!
0 0.00% 49.88% # Class of	
615847451 14.33% 64.21% # Class	of
102426638 2.38% 66.60% # Class	of
783766 0.02% 66.61% # Class of	
307613249 7.16% 73.77% # Class	of
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14296 0.00% 73.77% # Class of	
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	40258538       0.94%       0.94% # Class         2099591144       48.85%       49.79% # Class of         0       0.00%       49.88% # Class of         0       0.00%       49.88% # Class of         615847451       14.33%       64.21% # Class         102426638       2.38%       66.60% # Class         783766       0.02%       66.61% # Class of         307613249       7.16%       73.77% # Class of         0       0.00%       73.77% # Class of

system.cpu.op_class::SimdShiftAcc	0 0.00% 73.77% # Class of
executed instruction system.cpu.op_class::SimdDiv	0 0.00% 73.77% # Class of
executed instruction	0 0.00/0 /3.///0# Class 01
system.cpu.op_class::SimdSqrt	0 0.00% 73.77% # Class of
executed instruction	
system.cpu.op_class::SimdFloatAdd	0 0.00% 73.77% # Class of
executed instruction	
system.cpu.op_class::SimdFloatAlu	0 0.00% 73.77% # Class of
executed instruction	
system.cpu.op_class::SimdFloatCmp	0 0.00% 73.77% # Class of
executed instruction	0 000/ 50 550/ 4 6
system.cpu.op_class::SimdFloatCvt	0 0.00% 73.77% # Class of
executed instruction	0 0 000/ 72 770/ # Class of
system.cpu.op_class::SimdFloatDiv executed instruction	0 0.00% 73.77% # Class of
system.cpu.op_class::SimdFloatMisc	0 0.00% 73.77% # Class of
executed instruction	0 0.0070 75.7770 # Class 01
system.cpu.op_class::SimdFloatMult	0 0.00% 73.77% # Class of
executed instruction	o ologyo / Siv / yo ii Glass of
system.cpu.op_class::SimdFloatMultAcc	0 0.00% 73.77% # Class of
executed instruction	
system.cpu.op_class::SimdFloatSqrt	0 0.00% 73.77% # Class of
executed instruction	
system.cpu.op_class::SimdReduceAdd	0 0.00% 73.77% # Class of
executed instruction	
system.cpu.op_class::SimdReduceAlu	0 0.00% 73.77% # Class of
executed instruction	0 0004
system.cpu.op_class::SimdReduceCmp	0 0.00% 73.77% # Class of
executed instruction	0 0 000/ 72 770/ # Class of
system.cpu.op_class::SimdFloatReduceAdd executed instruction	0 0.00% 73.77% # Class of
system.cpu.op_class::SimdFloatReduceCmp	0 0.00% 73.77% # Class of
executed instruction	0 0.0070 73.7770 # Class 01
system.cpu.op_class::SimdAes	0 0.00% 73.77% # Class of
executed instruction	
system.cpu.op_class::SimdAesMix	0 0.00% 73.77% # Class of
executed instruction	
system.cpu.op_class::SimdSha1Hash	0 0.00% 73.77% # Class of
executed instruction	
system.cpu.op_class::SimdSha1Hash2	0 0.00% 73.77% # Class of
executed instruction	
system.cpu.op_class::SimdSha256Hash	0 0.00% 73.77% # Class of
executed instruction	

system.cpu.op_class::SimdSha256Hash2	0 0.00% 73.77% # Class of
executed instruction	
system.cpu.op_class::SimdShaSigma2	0 0.00% 73.77% # Class of
executed instruction system.cpu.op_class::SimdShaSigma3	0 0.00% 73.77% # Class of
executed instruction	0 0.00/0 /3.77/0 π Class 01
system.cpu.op_class::SimdPredAlu	0 0.00% 73.77% # Class of
executed instruction	
system.cpu.op_class::MemRead	494965373 11.52% 85.29% # Class of
executed instruction	
system.cpu.op_class::MemWrite	195052580 4.54% 89.83% # Class of
executed instruction	40.005.0006 0.0407 00.5407 H.C.
system.cpu.op_class::FloatMemRead	426059896 9.91% 99.74% # Class
of executed instruction	11120000 0 200/ 100 000/ # Class
system.cpu.op_class::FloatMemWrite of executed instruction	11120869 0.26% 100.00% # Class
system.cpu.op_class::IprAccess	0 0.00% 100.00% # Class of
executed instruction	0 0.0070 100.0070 # Class 01
system.cpu.op_class::InstPrefetch	0 0.00% 100.00% # Class of
executed instruction	0 0.0070 100.0070 // Class 01
	7679409 # Class of executed
instruction	
system.cpu.workload.numSyscalls	1055 # Number of system
calls	
system.membus.snoop_filter.hit_multi_re	equests 0 # Number of
system.membus.snoop_filter.hit_multi_re	equests 0 # Number of ultiple (>1) holders of the requested data.
system.membus.snoop_filter.hit_multi_rerequests hitting in the snoop filter with may system.membus.snoop_filter.hit_multi_si	nultiple (>1) holders of the requested data.  noops 0 # Number of
system.membus.snoop_filter.hit_multi_rerequests hitting in the snoop filter with management system.membus.snoop_filter.hit_multi_strong snoops hitting in the snoop filter with multi_strong snoops hitting in the snoop filter.hit_multi_rerequests hitting in the snoop filter.hit_multi_strong snoops hitting snoops h	nultiple (>1) holders of the requested data.  noops 0 # Number of altiple (>1) holders of the requested data.
system.membus.snoop_filter.hit_multi_rerequests hitting in the snoop filter with management system.membus.snoop_filter.hit_multi_strong snoops hitting in the snoop filter with management system.membus.snoop_filter.hit_single_respectively.	nultiple (>1) holders of the requested data.  noops 0 # Number of altiple (>1) holders of the requested data.  requests 0 # Number of
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system.membus.snoop_filter.hit_multi_re requests hitting in the snoop filter with m system.membus.snoop_filter.hit_multi_si snoops hitting in the snoop filter with mu system.membus.snoop_filter.hit_single_n requests hitting in the snoop filter with a system.membus.snoop_filter.hit_single_s snoops hitting in the snoop filter with a s system.membus.snoop_filter.tot_requests requests made to the snoop filter. system.membus.snoop_filter.tot_snoops snoops made to the snoop filter. system.membus.pwrStateResidencyTicks # Cumulative time (in ticks) in various per	nultiple (>1) holders of the requested data. noops 0 # Number of altiple (>1) holders of the requested data. requests 0 # Number of single holder of the requested data. noops 0 # Number of ingle holder of the requested data. noops 0 # Total number of  0 # Total number of  3::UNDEFINED 2148839726500  wer states
system.membus.snoop_filter.hit_multi_re requests hitting in the snoop filter with m system.membus.snoop_filter.hit_multi_si snoops hitting in the snoop filter with mu system.membus.snoop_filter.hit_single_n requests hitting in the snoop filter with a system.membus.snoop_filter.hit_single_s snoops hitting in the snoop filter with a s system.membus.snoop_filter.tot_requests requests made to the snoop filter. system.membus.snoop_filter.tot_snoops snoops made to the snoop filter. system.membus.pwrStateResidencyTicks # Cumulative time (in ticks) in various pe system.membus.trans_dist::ReadReq	nultiple (>1) holders of the requested data. noops 0 # Number of altiple (>1) holders of the requested data. requests 0 # Number of single holder of the requested data. noops 0 # Number of ingle holder of the requested data. noops 0 # Total number of  0 # Total number of s::UNDEFINED 2148839726500
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system.membus.snoop_filter.hit_multi_re requests hitting in the snoop filter with m system.membus.snoop_filter.hit_multi_si snoops hitting in the snoop filter with m system.membus.snoop_filter.hit_single_re requests hitting in the snoop filter with a system.membus.snoop_filter.hit_single_si snoops hitting in the snoop filter with a s system.membus.snoop_filter.tot_requests requests made to the snoop filter. system.membus.snoop_filter.tot_snoops snoops made to the snoop filter. system.membus.pwrStateResidencyTicks # Cumulative time (in ticks) in various per system.membus.trans_dist::ReadReq distribution system.membus.trans_dist::ReadResp distribution	nultiple (>1) holders of the requested data. noops 0 # Number of altiple (>1) holders of the requested data. requests 0 # Number of single holder of the requested data. noops 0 # Number of ingle holder of the requested data. noops 0 # Total number of ingle holder of the requested data. noops 0 # Total number of ingle holder of the requested data. noops 0 # Total number of  10 # Total number of 11 # Transaction 12 # Transaction 13 # Transaction 14 # Transaction 15 # Transaction 15 # Transaction
system.membus.snoop_filter.hit_multi_re requests hitting in the snoop filter with m system.membus.snoop_filter.hit_multi_si snoops hitting in the snoop filter with mu system.membus.snoop_filter.hit_single_n requests hitting in the snoop filter with a system.membus.snoop_filter.hit_single_s snoops hitting in the snoop filter with a s system.membus.snoop_filter.tot_requests requests made to the snoop filter. system.membus.snoop_filter.tot_snoops snoops made to the snoop filter. system.membus.pwrStateResidencyTicks # Cumulative time (in ticks) in various pe system.membus.trans_dist::ReadReq distribution system.membus.trans_dist::ReadResp	nultiple (>1) holders of the requested data. noops 0 # Number of altiple (>1) holders of the requested data. requests 0 # Number of single holder of the requested data. noops 0 # Number of ingle holder of the requested data. noops 0 # Total number of  0 # Total number of  3::UNDEFINED 2148839726500  Swer states 5215352671 # Transaction

system.membus.trans_dist::WriteResp distribution	204498190	# Transaction
system.membus.trans_dist::LoadLockedR distribution	eq 1667856	# Transaction
system.membus.trans_dist::StoreCondReq distribution	1667856	# Transaction
system.membus.trans_dist::StoreCondRes distribution	р 1667856	# Transaction
system.membus.pkt_count_system.cpu.ica 8595358818  # Packet count system.membus.pkt_count_system.cpu.dc 2251014328  # Packet count system.membus.pkt_count::total 10 per connected master and slave (bytes) system.membus.pkt_size_system.cpu.icac 17190717636  # Cumulative (bytes) system.membus.pkt_size_system.cpu.dcac 7920399347  # Cumulative p (bytes) system.membus.pkt_size::total 251 packet size per connected master and slave system.membus.snoops	per connected master a ache_port::system.mer per connected master a 0846373146  he_port::system.mem_packet size per connected pe	and slave (bytes) m_ctrls.port and slave (bytes) # Packet count  ctrls.port ted master and slave  _ctrls.port ed master and slave  # Cumulative al snoops (count)
system.membus.snoopTraffic (bytes)	0 # T	otal snoop traffic
system.membus.snoop_fanout::samples fanout histogram	5423186573	# Request
system.membus.snoop_fanout::mean histogram	0	# Request fanout
system.membus.snoop_fanout::stdev histogram	0	# Request fanout
system.membus.snoop_fanout::underflows fanout histogram	s 0 0.00%	0.00% # Request
system.membus.snoop_fanout::0 5 Request fanout histogram	5423186573 100.00%	6 100.00% #
system.membus.snoop_fanout::1 fanout histogram	0 0.00% 100	.00% # Request
system.membus.snoop_fanout::overflows fanout histogram	0 0.00%	100.00% # Request
system.membus.snoop_fanout::min_value	0	# Request fanout
histogram system.membus.snoop_fanout::max_value	e 0	# Request fanout
histogram system.membus.snoop_fanout::total fanout histogram	5423186573	# Request

system.voltage_domain.voltage	1	# Voltage in Volts
system.clk_domain.clock	1000	# Clock period in ticks
system.cpu_voltage_domain.voltage	1	# Voltage in Volts
system.mem_ctrls.pwrStateResidencyT	icks::UNDEFINED	2148839726500
# Cumulative time (in ticks) in various	power states	
system.mem_ctrls.bytes_read::.cpu.inst	-	# Number of
bytes read from this memory		
system.mem_ctrls.bytes_read::.cpu.data	a 6404316561	# Number of
bytes read from this memory		
system.mem_ctrls.bytes_read::total	23595034197	# Number of
bytes read from this memory		
system.mem_ctrls.bytes_inst_read::.cpu	Linst 17190717636	# Number
of instructions bytes read from this mer		n i (dinser
system.mem_ctrls.bytes_inst_read::tota		# Number of
instructions bytes read from this memor		With the state of
system.mem_ctrls.bytes_written::.cpu.d	_	# Number of
bytes written to this memory	1010002700	" Ivanibel of
system.mem_ctrls.bytes_written::total	1516082786	# Number of
bytes written to this memory	1510002700	" I valider of
system.mem_ctrls.num_reads::.cpu.inst	4297679409	# Number of
read requests responded to by this mem		# INdiliber of
system.mem_ctrls.num_reads::.cpu.data	=	# Number of
read requests responded to by this mem		# INUITIBET OF
system.mem_ctrls.num_reads::total	5217020527	# Number of
read requests responded to by this mem		# Number of
system.mem_ctrls.num_writes::.cpu.da	_	# Number of
5		# Nulliber of
write requests responded to by this men	206166046	# Number of
system.mem_ctrls.num_writes::total		# Number of
write requests responded to by this men	-	# Total road
system.mem_ctrls.bw_read::.cpu.inst	799999918	# Total read
bandwidth from this memory (bytes/s)	2000260276	#Total was d
system.mem_ctrls.bw_read::.cpu.data	2980360276	# Total read
bandwidth from this memory (bytes/s)	10000760104	# Total was d
system.mem_ctrls.bw_read::total	10980360194	# Total read
bandwidth from this memory (bytes/s)	700000010	// <b>T</b> / · / ·
system.mem_ctrls.bw_inst_read::.cpu.ir		# Instruction
read bandwidth from this memory (byte	•	// Table 21.
system.mem_ctrls.bw_inst_read::total	7999999918	# Instruction
read bandwidth from this memory (byte	•	11 5 4 7 * .
system.mem_ctrls.bw_write::.cpu.data	705535535	# Write
bandwidth from this memory (bytes/s)	<b>7055255</b>	# <b>5.7</b> • 1 1 • 1.1
system.mem_ctrls.bw_write::total	705535535	# Write bandwidth
from this memory (bytes/s)	<b>7</b> 000000010	##
system.mem_ctrls.bw_total::.cpu.inst	799999918	# Total
bandwidth to/from this memory (bytes/	s)	

system.mem_ctrls.bw_total::.cpu.data	3685895811	# Total
bandwidth to/from this memory (bytes/s) system.mem_ctrls.bw_total::total 1 to/from this memory (bytes/s)	1685895729	# Total bandwidth
system.mem_ctrls.priorityMinLatency priority minimum request to response lat	0.000000000000000000000000000000000000	# per QoS
system.mem_ctrls.priorityMaxLatency priority maximum request to response latency	0.000000000000	# per QoS
system.mem_ctrls.numReadWriteTurnArturnarounds from READ to WRITE		# Number of
system.mem_ctrls.numWriteReadTurnArturnarounds from WRITE to READ	rounds 0	# Number of
system.mem_ctrls.numStayReadState bus staying in READ state	0	# Number of times
system.mem_ctrls.numStayWriteState bus staying in WRITE state	0	# Number of times
system.mem_ctrls.readReqs requests accepted	0	# Number of read
system.mem_ctrls.writeReqs requests accepted	0	# Number of write
system.mem_ctrls.readBursts read bursts, including those serviced by t	0 the write queue	# Number of DRAM
system.mem_ctrls.writeBursts write bursts, including those merged in the	0	# Number of DRAM
system.mem_ctrls.servicedByWrQ read bursts serviced by the write queue	0	# Number of DRAM
system.mem_ctrls.mergedWrBursts write bursts merged with an existing one	0	# Number of DRAM
system.mem_ctrls.neitherReadNorWritel requests that are neither read nor write	Reqs 0	# Number of
system.mem_ctrls.perBankRdBursts::0 bursts	0	# Per bank write
system.mem_ctrls.perBankRdBursts::1 bursts	0	# Per bank write
system.mem_ctrls.perBankRdBursts::2 bursts	0	# Per bank write
system.mem_ctrls.perBankRdBursts::3 bursts	0	# Per bank write
system.mem_ctrls.perBankRdBursts::4 bursts	0	# Per bank write
system.mem_ctrls.perBankRdBursts::5 bursts	0	# Per bank write
system.mem_ctrls.perBankRdBursts::6 bursts	0	# Per bank write

system.mem_ctrls.perBankRdBursts::7	0	# Per bank write
bursts system.mem_ctrls.perBankRdBursts::8 bursts	0	# Per bank write
system.mem_ctrls.perBankRdBursts::9 bursts	0	# Per bank write
system.mem_ctrls.perBankRdBursts::10 bursts	0	# Per bank write
system.mem_ctrls.perBankRdBursts::11 bursts	0	# Per bank write
system.mem_ctrls.perBankRdBursts::12 bursts	0	# Per bank write
system.mem_ctrls.perBankRdBursts::13 bursts	0	# Per bank write
system.mem_ctrls.perBankRdBursts::14 bursts	0	# Per bank write
system.mem_ctrls.perBankRdBursts::15 bursts	0	# Per bank write
system.mem_ctrls.perBankWrBursts::0 bursts	0	# Per bank write
system.mem_ctrls.perBankWrBursts::1 bursts	0	# Per bank write # Per bank write
system.mem_ctrls.perBankWrBursts::2 bursts system.mem_ctrls.perBankWrBursts::2	0	# Per bank write
system.mem_ctrls.perBankWrBursts::3 bursts system.mem_ctrls.perBankWrBursts::4	0	# Per bank write
bursts system.mem_ctrls.perBankWrBursts::5	0	# Per bank write
bursts system.mem_ctrls.perBankWrBursts::6	0	# Per bank write
bursts system.mem_ctrls.perBankWrBursts::7	0	# Per bank write
bursts system.mem_ctrls.perBankWrBursts::8	0	# Per bank write
bursts system.mem_ctrls.perBankWrBursts::9	0	# Per bank write
bursts system.mem_ctrls.perBankWrBursts::10	0	# Per bank write
bursts system.mem_ctrls.perBankWrBursts::11	0	# Per bank write
bursts system.mem_ctrls.perBankWrBursts::12	0	# Per bank write
bursts		

system.mem_ctrls.perBankWrBursts::13 bursts	0	# Per bank write
system.mem_ctrls.perBankWrBursts::14 bursts	0	# Per bank write
system.mem_ctrls.perBankWrBursts::15 bursts	0	# Per bank write
system.mem_ctrls.avgRdQLen length when enqueuing	0.00	# Average read queue
system.mem_ctrls.avgWrQLen queue length when enqueuing	0.00	# Average write
system.mem_ctrls.totQLat	0	# Total ticks spent
queuing system.mem_ctrls.totBusLat databus transfers	0	# Total ticks spent in
system.mem_ctrls.totMemAccLat from burst creation until serviced by the I	0 DRAM	# Total ticks spent
system.mem_ctrls.avgQLat delay per DRAM burst	nan	# Average queueing
system.mem_ctrls.avgBusLat per DRAM burst	nan	# Average bus latency
system.mem_ctrls.avgMemAccLat access latency per DRAM burst	nan	# Average memory
system.mem_ctrls.numRdRetry read queue was full causing retry	0	# Number of times
system.mem_ctrls.numWrRetry	0	# Number of times
write queue was full causing retry system.mem_ctrls.readRowHits	0	# Number of row
ouffer hits during reads system.mem_ctrls.writeRowHits ouffer hits during writes	0	# Number of row
system.mem_ctrls.readRowHitRate rate for reads	nan	# Row buffer hit
system.mem_ctrls.writeRowHitRate rate for writes	nan	# Row buffer hit
system.mem_ctrls.readPktSize::0 log2)	0	# Read request sizes
system.mem_ctrls.readPktSize::1 log2)	0	# Read request sizes
system.mem_ctrls.readPktSize::2 log2)	0	# Read request sizes
system.mem_ctrls.readPktSize::3 (log2)	0	# Read request sizes
system.mem_ctrls.readPktSize::4 (log2)	0	# Read request sizes

system.mem_ctrls.readPktSize::5	0	# Read request sizes
(log2)	-	
system.mem_ctrls.readPktSize::6	0	# Read request sizes
(log2)		
system.mem_ctrls.writePktSize::0	0	# Write request sizes
(log2)		
system.mem_ctrls.writePktSize::1	0	# Write request sizes
(log2)		
system.mem_ctrls.writePktSize::2	0	# Write request sizes
(log2)	0	11 7 47 **
system.mem_ctrls.writePktSize::3	0	# Write request sizes
(log2)	0	# Write request sizes
system.mem_ctrls.writePktSize::4	0	# Write request sizes
(log2) system.mem_ctrls.writePktSize::5	0	# Write request sizes
(log2)	U	# Write request sizes
system.mem_ctrls.writePktSize::6	0	# Write request sizes
(log2)	U	" Write request sizes
system.mem_ctrls.rdQLenPdf::0	0	# What read queue
length does an incoming req see	Ü	" " " " " " " " " " " " " " " " " " "
system.mem_ctrls.rdQLenPdf::1	0	# What read queue
length does an incoming req see	· ·	w white rough quote
system.mem_ctrls.rdQLenPdf::2	0	# What read queue
length does an incoming req see		1
system.mem_ctrls.rdQLenPdf::3	0	# What read queue
length does an incoming req see		1
system.mem_ctrls.rdQLenPdf::4	0	# What read queue
length does an incoming req see		
system.mem_ctrls.rdQLenPdf::5	0	# What read queue
length does an incoming req see		
system.mem_ctrls.rdQLenPdf::6	0	# What read queue
length does an incoming req see		
system.mem_ctrls.rdQLenPdf::7	0	# What read queue
length does an incoming req see		
system.mem_ctrls.rdQLenPdf::8	0	# What read queue
length does an incoming req see	0	U T . T ]
system.mem_ctrls.rdQLenPdf::9	0	# What read queue
length does an incoming req see	0	// TA71 / 1
system.mem_ctrls.rdQLenPdf::10	0	# What read queue
length does an incoming req see	0	# IAThat wood group
system.mem_ctrls.rdQLenPdf::11	0	# What read queue
length does an incoming req see	0	# What road guara
system.mem_ctrls.rdQLenPdf::12	U	# What read queue
length does an incoming req see		

system.mem_ctrls.rdQLenPdf::13	0	# What read queue
length does an incoming req see		
system.mem_ctrls.rdQLenPdf::14	0	# What read queue
length does an incoming req see		
system.mem_ctrls.rdQLenPdf::15	0	# What read queue
length does an incoming req see		
system.mem_ctrls.rdQLenPdf::16	0	# What read queue
length does an incoming req see		
system.mem_ctrls.rdQLenPdf::17	0	# What read queue
length does an incoming req see		
system.mem_ctrls.rdQLenPdf::18	0	# What read queue
length does an incoming req see		
system.mem_ctrls.rdQLenPdf::19	0	# What read queue
length does an incoming req see		
system.mem_ctrls.rdQLenPdf::20	0	# What read queue
length does an incoming req see		
system.mem_ctrls.rdQLenPdf::21	0	# What read queue
length does an incoming req see		
system.mem_ctrls.rdQLenPdf::22	0	# What read queue
length does an incoming req see		
system.mem_ctrls.rdQLenPdf::23	0	# What read queue
length does an incoming req see		
system.mem_ctrls.rdQLenPdf::24	0	# What read queue
length does an incoming req see		
system.mem_ctrls.rdQLenPdf::25	0	# What read queue
length does an incoming req see		
system.mem_ctrls.rdQLenPdf::26	0	# What read queue
length does an incoming req see		
system.mem_ctrls.rdQLenPdf::27	0	# What read queue
length does an incoming req see		
system.mem_ctrls.rdQLenPdf::28	0	# What read queue
length does an incoming req see		
system.mem_ctrls.rdQLenPdf::29	0	# What read queue
length does an incoming req see		
system.mem_ctrls.rdQLenPdf::30	0	# What read queue
length does an incoming req see		
system.mem_ctrls.rdQLenPdf::31	0	# What read queue
length does an incoming req see		
system.mem_ctrls.wrQLenPdf::0	0	# What write queue
length does an incoming req see		
system.mem_ctrls.wrQLenPdf::1	0	# What write queue
length does an incoming req see		
system.mem_ctrls.wrQLenPdf::2	0	# What write queue
length does an incoming req see		

system.mem_ctrls.wrQLenPdf::3	0	# What write queue
length does an incoming req see		
system.mem_ctrls.wrQLenPdf::4	0	# What write queue
length does an incoming req see		
system.mem_ctrls.wrQLenPdf::5	0	# What write queue
length does an incoming req see		
system.mem_ctrls.wrQLenPdf::6	0	# What write queue
length does an incoming req see		-
system.mem_ctrls.wrQLenPdf::7	0	# What write queue
length does an incoming req see		-
system.mem_ctrls.wrQLenPdf::8	0	# What write queue
length does an incoming req see		•
system.mem_ctrls.wrQLenPdf::9	0	# What write queue
length does an incoming req see		•
system.mem_ctrls.wrQLenPdf::10	0	# What write queue
length does an incoming req see		1
system.mem_ctrls.wrQLenPdf::11	0	# What write queue
length does an incoming req see		•
system.mem_ctrls.wrQLenPdf::12	0	# What write queue
length does an incoming req see		•
system.mem_ctrls.wrQLenPdf::13	0	# What write queue
length does an incoming req see		1
system.mem_ctrls.wrQLenPdf::14	0	# What write queue
length does an incoming req see		1
system.mem_ctrls.wrQLenPdf::15	0	# What write queue
length does an incoming req see		1
system.mem_ctrls.wrQLenPdf::16	0	# What write queue
length does an incoming req see		1
system.mem_ctrls.wrQLenPdf::17	0	# What write queue
length does an incoming req see		1
system.mem_ctrls.wrQLenPdf::18	0	# What write queue
length does an incoming req see		1
system.mem_ctrls.wrQLenPdf::19	0	# What write queue
length does an incoming req see		1
system.mem_ctrls.wrQLenPdf::20	0	# What write queue
length does an incoming req see		1
system.mem_ctrls.wrQLenPdf::21	0	# What write queue
length does an incoming req see		1
system.mem_ctrls.wrQLenPdf::22	0	# What write queue
length does an incoming req see		1
system.mem_ctrls.wrQLenPdf::23	0	# What write queue
length does an incoming req see		1
system.mem_ctrls.wrQLenPdf::24	0	# What write queue
length does an incoming req see		1
0 -1		

system.mem_ctrls.wrQLenPdf::25	0	# What write queue
length does an incoming req see		
system.mem_ctrls.wrQLenPdf::26	0	# What write queue
length does an incoming req see		
system.mem_ctrls.wrQLenPdf::27	0	# What write queue
length does an incoming req see		
system.mem_ctrls.wrQLenPdf::28	0	# What write queue
length does an incoming req see		
system.mem_ctrls.wrQLenPdf::29	0	# What write queue
length does an incoming req see		_
system.mem_ctrls.wrQLenPdf::30	0	# What write queue
length does an incoming req see		
system.mem_ctrls.wrQLenPdf::31	0	# What write queue
length does an incoming req see		
system.mem_ctrls.wrQLenPdf::32	0	# What write queue
length does an incoming req see		_
system.mem_ctrls.wrQLenPdf::33	0	# What write queue
length does an incoming req see		
system.mem_ctrls.wrQLenPdf::34	0	# What write queue
length does an incoming req see		
system.mem_ctrls.wrQLenPdf::35	0	# What write queue
length does an incoming req see		
system.mem_ctrls.wrQLenPdf::36	0	# What write queue
length does an incoming req see		
system.mem_ctrls.wrQLenPdf::37	0	# What write queue
length does an incoming req see		
system.mem_ctrls.wrQLenPdf::38	0	# What write queue
length does an incoming req see		
system.mem_ctrls.wrQLenPdf::39	0	# What write queue
length does an incoming req see		
system.mem_ctrls.wrQLenPdf::40	0	# What write queue
length does an incoming req see		
system.mem_ctrls.wrQLenPdf::41	0	# What write queue
length does an incoming req see		
system.mem_ctrls.wrQLenPdf::42	0	# What write queue
length does an incoming req see		
system.mem_ctrls.wrQLenPdf::43	0	# What write queue
length does an incoming req see		
system.mem_ctrls.wrQLenPdf::44	0	# What write queue
length does an incoming req see		
system.mem_ctrls.wrQLenPdf::45	0	# What write queue
length does an incoming req see		
system.mem_ctrls.wrQLenPdf::46	0	# What write queue
length does an incoming req see		

system.mem_ctrls.wrQLenPdf::47	0	# What write queue
length does an incoming req see		
system.mem_ctrls.wrQLenPdf::48	0	# What write queue
length does an incoming req see		
system.mem_ctrls.wrQLenPdf::49	0	# What write queue
length does an incoming req see		
system.mem_ctrls.wrQLenPdf::50	0	# What write queue
length does an incoming req see		
system.mem_ctrls.wrQLenPdf::51	0	# What write queue
length does an incoming req see		-
system.mem_ctrls.wrQLenPdf::52	0	# What write queue
length does an incoming req see		•
system.mem_ctrls.wrQLenPdf::53	0	# What write queue
length does an incoming req see		1
system.mem_ctrls.wrQLenPdf::54	0	# What write queue
length does an incoming req see	-	www.aaaa qaaaa
system.mem_ctrls.wrQLenPdf::55	0	# What write queue
length does an incoming req see	· ·	" " " queue
system.mem_ctrls.wrQLenPdf::56	0	# What write queue
length does an incoming req see	Ü	" What write queue
system.mem_ctrls.wrQLenPdf::57	0	# What write queue
length does an incoming req see	O	" What write queue
system.mem_ctrls.wrQLenPdf::58	0	# What write queue
length does an incoming req see	O	# What write queue
system.mem_ctrls.wrQLenPdf::59	0	# What write queue
length does an incoming req see	U	# What write queue
system.mem_ctrls.wrQLenPdf::60	0	# What write queue
•	U	# What write queue
length does an incoming req see	0	# Mhat write guess
system.mem_ctrls.wrQLenPdf::61	0	# What write queue
length does an incoming req see	0	# XA71
system.mem_ctrls.wrQLenPdf::62	0	# What write queue
length does an incoming req see	0	U \$471
system.mem_ctrls.wrQLenPdf::63	0	# What write queue
length does an incoming req see		
system.mem_ctrls.bytesReadDRAM	0	# Total number of
bytes read from DRAM	•	
system.mem_ctrls.bytesReadWrQ	0	# Total number of
bytes read from write queue	_	
system.mem_ctrls.bytesWritten	0	# Total number of bytes
written to DRAM		
system.mem_ctrls.bytesReadSys	0	# Total read bytes from
the system interface side		
system.mem_ctrls.bytesWrittenSys	0	# Total written bytes
from the system interface side		

system.mem_ctrls.avgRdBW	0.00	# Average DRAM			
read bandwidth in MiByte/s system.mem_ctrls.avgWrBW	0.00	# Average achieved			
write bandwidth in MiByte/s	0.00	<i>u</i> . •			
system.mem_ctrls.avgRdBWSys read bandwidth in MiByte/s	0.00	# Average system			
system.mem_ctrls.avgWrBWSys	0.00	# Average system			
write bandwidth in MiByte/s	0.00	" Tiverage by stelli			
system.mem_ctrls.peakBW	12800.00	# Theoretical peak			
bandwidth in MiByte/s		•			
system.mem_ctrls.busUtil	0.00	# Data bus utilization in			
percentage					
system.mem_ctrls.busUtilRead	0.00	# Data bus utilization			
in percentage for reads					
system.mem_ctrls.busUtilWrite	0.00	# Data bus utilization			
in percentage for writes	0	" m . 1			
system.mem_ctrls.totGap	0	# Total gap between			
requests	non	# Average gap between			
system.mem_ctrls.avgGap	nan	# Average gap between			
requests system.mem_ctrls.pageHitRate	nan	# Row buffer hit rate,			
read and write combined	IIaII	# Now bullet lift late,			
system.mem_ctrls.rank1.actEnergy	0	# Energy for activate			
commands per rank (pJ)	, and the second	" = " = " = " = " = " = " = " = " = " =			
system.mem_ctrls.rank1.preEnergy	0	# Energy for			
precharge commands per rank (pJ)					
system.mem_ctrls.rank1.readEnergy	0	# Energy for read			
commands per rank (pJ)					
system.mem_ctrls.rank1.writeEnergy	0	# Energy for write			
commands per rank (pJ)					
system.mem_ctrls.rank1.refreshEnergy	0	# Energy for refresh			
commands per rank (pJ)	. 0	# F f			
system.mem_ctrls.rank1.actBackEnergy	0	# Energy for active			
<pre>background per rank (pJ) system.mem_ctrls.rank1.preBackEnergy</pre>	825154455360	# Energy for			
precharge background per rank (pJ)	023134433300	# Ellergy for			
system.mem_ctrls.rank1.actPowerDown	Energy 0	# Energy for			
active power-down per rank (pJ)	211618)	" Ellergy Tol			
system.mem_ctrls.rank1.prePowerDowr	nEnergy 0	# Energy for			
precharge power-down per rank (pJ)	00	53			
system.mem_ctrls.rank1.selfRefreshEne	ergy 0	# Energy for self			
refresh per rank (pJ)					
system.mem_ctrls.rank1.totalEnergy	825154455360	# Total energy			
per rank (pJ)					

system.mem_ctrls.rank1.averagePower	384.000000	1	#	Core power
per rank (mW) system.mem_ctrls.rank1.totalIdleTime	0		# Total	Idle time Per
DRAM Rank	. IDI E 24.40	000070	0000	11
system.mem_ctrls.rank1.memoryStateTime in different power states	ime::1DLE 2148	8839/2	(6500	#
system.mem_ctrls.rank1.memoryStateT	ime::REF	0		# Time in
different power states		Ü		111116 111
system.mem_ctrls.rank1.memoryStateT	ime::SREF	0		# Time in
different power states				
system.mem_ctrls.rank1.memoryStateT	ime::PRE_PDN		0	# Time
in different power states				
system.mem_ctrls.rank1.memoryStateT	ime::ACT	0		# Time in
different power states	A CEL DDAY		0	,,
system.mem_ctrls.rank1.memoryStateT	ime::ACT_PDN		0	#
Time in different power states	0		# Eporgs	, for activate
system.mem_ctrls.rank0.actEnergy commands per rank (pJ)	U		# Ellergy	for activate
system.mem_ctrls.rank0.preEnergy	0		# Energy	v for
precharge commands per rank (pJ)	O		" Lifeig	y 101
system.mem_ctrls.rank0.readEnergy	0		# Energ	y for read
commands per rank (pJ)	-			,,
system.mem_ctrls.rank0.writeEnergy	0		# Energ	gy for write
commands per rank (pJ)				
system.mem_ctrls.rank0.refreshEnergy	0		# Ener	gy for refresh
commands per rank (pJ)				
system.mem_ctrls.rank0.actBackEnergy	0		# Ene	rgy for active
background per rank (pJ)				
system.mem_ctrls.rank0.preBackEnergy	8251544553	660		# Energy for
precharge background per rank (pJ)	Enouge	`	_	L Engage for
system.mem_ctrls.rank0.actPowerDown active power-down per rank (pJ)	Energy (	,	H	Energy for
system.mem_ctrls.rank0.prePowerDowr	ıEnergy (	)	<del>1</del>	# Energy for
precharge power-down per rank (pJ)	illicigy	,	T	F Lifeigy 101
system.mem_ctrls.rank0.selfRefreshEne	ergy 0		# En	ergy for self
refresh per rank (pJ)				
system.mem_ctrls.rank0.totalEnergy	825154455360		#	Total energy
per rank (pJ)				
system.mem_ctrls.rank0.averagePower	384.000000		#	Core power
per rank (mW)	0		# Total	Idla tima Day
system.mem_ctrls.rank0.totalIdleTime DRAM Rank	0		# 10tal	Idle time Per
system.mem_ctrls.rank0.memoryStateT	ime::IDLE 2148	83972	26500	#
Time in different power states	-			
•				

system.mem_ctrls.rank0.memoryStateTim	e::REF	0		# Time in
different power states				
system.mem_ctrls.rank0.memoryStateTim	e::SREF	0		# Time in
different power states				
system.mem_ctrls.rank0.memoryStateTim	e::PRE_PDN		0	# Time
in different power states				
system.mem_ctrls.rank0.memoryStateTim	e::ACT	0		# Time in
different power states				
system.mem_ctrls.rank0.memoryStateTim	e::ACT_PDN	-	0	#
Time in different power states				
system.cpu_clk_domain.clock	500		# Clock p	eriod in ticks
system.cpu.numPwrStateTransitions	1		# Numb	er of power
state transitions				
system.cpu.pwrStateResidencyTicks::ON	2148839726	5500		#
Cumulative time (in ticks) in various power states				

----- End Simulation Statistics -----