

APPENDIX A

RESULTS OF THE WILCOXON RANK-SUM TEST ON THE
RUNNING TIME OF THE BENCHMARKS

The *adj.pvalue* column contains the corrected p-values. The *shift* refers to the location shift estimator.

nas_bench	mechanism	freq	pvalue	adj.pvalue	shift
ep.E	msr	0.10	0.85	1.00	-0.22
ep.E	msr	1.00	0.96	1.00	-0.39
ep.E	msr	10.00	0.88	1.00	-0.29
ep.E	msr	100.00	< 0.01	0.22	1.08
ep.E	msr	1000.00	< 0.01	< 0.01	1.94
ep.E	powercap	0.10	0.80	1.00	-0.20
ep.E	powercap	1.00	0.25	1.00	0.18
ep.E	powercap	10.00	0.53	1.00	-0.02
ep.E	powercap	100.00	< 0.01	< 0.01	2.97
ep.E	powercap	1000.00	< 0.01	< 0.01	1.47
ep.E	perf-events	0.10	0.03	1.00	0.45
ep.E	perf-events	1.00	0.89	1.00	-0.25
ep.E	perf-events	10.00	0.54	1.00	-0.02
ep.E	perf-events	100.00	0.02	1.00	0.54
ep.E	perf-events	1000.00	0.01	0.51	0.75
ep.E	eBPF	0.10	0.91	1.00	-0.26
ep.E	eBPF	1.00	0.47	1.00	0.01
ep.E	eBPF	10.00	0.95	1.00	-0.48
ep.E	eBPF	100.00	< 0.01	0.10	1.26
ep.E	eBPF	1000.00	< 0.01	< 0.01	3.43
cg.D	msr	0.10	0.87	1.00	-2.24
cg.D	msr	1.00	0.44	1.00	0.50
cg.D	msr	10.00	0.76	1.00	-1.18
cg.D	msr	100.00	0.65	1.00	-0.77
cg.D	msr	1000.00	0.63	1.00	-0.78
cg.D	powercap	0.10	0.79	1.00	-1.65
cg.D	powercap	1.00	0.77	1.00	-2.01
cg.D	powercap	10.00	0.47	1.00	0.16
cg.D	powercap	100.00	0.02	0.97	5.69
cg.D	powercap	1000.00	0.39	1.00	0.45
cg.D	perf-events	0.10	0.47	1.00	0.21
cg.D	perf-events	1.00	0.28	1.00	1.22
cg.D	perf-events	10.00	0.21	1.00	2.43
cg.D	perf-events	100.00	0.45	1.00	0.55
cg.D	perf-events	1000.00	0.39	1.00	0.72
cg.D	eBPF	0.10	0.24	1.00	1.74
cg.D	eBPF	1.00	0.62	1.00	-0.73
cg.D	eBPF	10.00	0.66	1.00	-0.88
cg.D	eBPF	100.00	0.90	1.00	-3.06
cg.D	eBPF	1000.00	0.12	1.00	2.61
bt.D	msr	0.10	0.22	1.00	1.37
bt.D	msr	1.00	0.33	1.00	0.71
bt.D	msr	10.00	0.77	1.00	-1.45
bt.D	msr	100.00	0.07	1.00	2.75
bt.D	msr	1000.00	0.10	1.00	2.21
bt.D	powercap	0.10	0.04	1.00	3.02
bt.D	powercap	1.00	0.36	1.00	0.83
bt.D	powercap	10.00	0.86	1.00	-1.52
bt.D	powercap	100.00	0.04	1.00	3.04
bt.D	powercap	1000.00	0.17	1.00	1.65
bt.D	perf-events	0.10	0.96	1.00	-2.58
bt.D	perf-events	1.00	0.52	1.00	-0.09
bt.D	perf-events	10.00	0.67	1.00	-0.73
bt.D	perf-events	100.00	0.54	1.00	-0.17
bt.D	perf-events	1000.00	0.01	0.30	4.05
bt.D	eBPF	0.10	0.41	1.00	0.32
bt.D	eBPF	1.00	0.24	1.00	1.10
bt.D	eBPF	10.00	0.69	1.00	-0.76
bt.D	eBPF	100.00	0.14	1.00	1.88
bt.D	eBPF	1000.00	0.06	1.00	2.61

Table I

WILCOXON RANK-SUM TESTS COMPARING THE RUNNING TIME WITH A MEASUREMENT AT A GIVEN FREQUENCY TO THE RUNNING TIME OF THE BENCHMARKS WITHOUT ANY MEASUREMENT (AMD SERVER).

nas_bench	mechanism	freq	pvalue	adj.pvalue	shift
ep.E	msr	0.10	0.19	1.00	1.59
ep.E	msr	1.00	0.17	1.00	1.67
ep.E	msr	10.00	0.12	1.00	2.14
ep.E	msr	100.00	0.51	1.00	-0.03
ep.E	msr	1000.00	0.26	1.00	1.13
ep.E	powercap	0.10	0.30	1.00	0.87
ep.E	powercap	1.00	0.94	1.00	-2.56
ep.E	powercap	10.00	0.13	1.00	2.09
ep.E	powercap	100.00	0.17	1.00	1.67
ep.E	powercap	1000.00	0.04	1.00	3.24
ep.E	perf-events	0.10	0.32	1.00	0.77
ep.E	perf-events	1.00	0.02	1.00	3.75
ep.E	perf-events	10.00	0.28	1.00	0.96
ep.E	perf-events	100.00	0.12	1.00	2.18
ep.E	perf-events	1000.00	0.05	1.00	3.00
ep.E	eBPF	0.10	0.15	1.00	1.98
ep.E	eBPF	1.00	0.68	1.00	-0.68
ep.E	eBPF	10.00	0.31	1.00	0.79
ep.E	eBPF	100.00	0.64	1.00	-0.56
ep.E	eBPF	1000.00	0.02	0.94	3.94
cg.D	msr	0.10	0.07	1.00	1.99
cg.D	msr	1.00	0.04	1.00	2.66
cg.D	msr	10.00	0.31	1.00	0.73
cg.D	msr	100.00	0.07	1.00	1.60
cg.D	msr	1000.00	< 0.01	< 0.01	5.58
cg.D	powercap	0.10	0.35	1.00	0.56
cg.D	powercap	1.00	0.48	1.00	0.07
cg.D	powercap	10.00	0.80	1.00	-0.97
cg.D	powercap	100.00	0.35	1.00	0.52
cg.D	powercap	1000.00	< 0.01	0.09	4.17
cg.D	perf-events	0.10	0.38	1.00	0.41
cg.D	perf-events	1.00	0.39	1.00	0.34
cg.D	perf-events	10.00	0.53	1.00	-0.16
cg.D	perf-events	100.00	0.19	1.00	1.09
cg.D	perf-events	1000.00	0.01	0.42	3.07
cg.D	eBPF	0.10	0.40	1.00	0.39
cg.D	eBPF	1.00	0.69	1.00	-0.60
cg.D	eBPF	10.00	0.36	1.00	0.44
cg.D	eBPF	100.00	0.31	1.00	0.49
cg.D	eBPF	1000.00	0.03	1.00	1.97
bt.D	msr	0.10	0.93	1.00	-2.48
bt.D	msr	1.00	0.28	1.00	0.90
bt.D	msr	10.00	0.83	1.00	-1.38
bt.D	msr	100.00	1.00	1.00	-4.38
bt.D	msr	1000.00	0.16	1.00	1.94
bt.D	powercap	0.10	0.82	1.00	-1.64
bt.D	powercap	1.00	0.81	1.00	-1.56
bt.D	powercap	10.00	0.58	1.00	-0.27
bt.D	powercap	100.00	0.41	1.00	0.35
bt.D	powercap	1000.00	0.01	0.82	3.21
bt.D	perf-events	0.10	0.69	1.00	-0.76
bt.D	perf-events	1.00	0.67	1.00	-0.87
bt.D	perf-events	10.00	0.28	1.00	0.87
bt.D	perf-events	100.00	0.12	1.00	1.89
bt.D	perf-events	1000.00	0.03	1.00	3.11
bt.D	eBPF	0.10	0.53	1.00	-0.12
bt.D	eBPF	1.00	0.84	1.00	-1.58
bt.D	eBPF	10.00	0.08	1.00	2.10
bt.D	eBPF	100.00	0.17	1.00	1.65
bt.D	eBPF	1000.00	< 0.01	0.02	5.71

Table II

WILCOXON RANK-SUM TESTS COMPARING THE RUNNING TIME WITH A MEASUREMENT AT A GIVEN FREQUENCY TO THE RUNNING TIME OF THE BENCHMARKS WITHOUT ANY MEASUREMENT (INTEL SERVER).

APPENDIX B
RESULTS OF THE WILCOXON RANK-SUM TEST ON THE
IDLE POWER CONSUMPTION

	mechanism	freq	pvalue	adj.pvalue	shift
1	powercap	0.10	0.45	1.00	0.04
2	powercap	1.00	0.64	1.00	-0.13
3	powercap	10.00	0.75	1.00	-0.24
4	powercap	100.00	0.26	1.00	0.24
5	powercap	1000.00	< 0.01	< 0.01	2.69
6	msr	0.10	0.51	1.00	-0.01
7	msr	1.00	0.91	1.00	-0.44
8	msr	10.00	0.73	1.00	-0.23
9	msr	100.00	0.17	1.00	0.30
10	msr	1000.00	< 0.01	< 0.01	2.88
11	perf-events	0.10	0.91	1.00	-0.48
12	perf-events	1.00	0.61	1.00	-0.11
13	perf-events	10.00	0.35	1.00	0.13
14	perf-events	100.00	0.10	1.00	0.46
15	perf-events	1000.00	< 0.01	< 0.01	2.77
16	eBPF	0.10	0.51	1.00	-0.01
17	eBPF	1.00	0.17	1.00	0.35
18	eBPF	10.00	0.51	1.00	-0.01
19	eBPF	100.00	0.61	1.00	-0.08
20	eBPF	1000.00	< 0.01	< 0.01	3.31

Table III

DETAILED RESULTS OF THE WILCOXON RANK-SUM TESTS THAT
COMPARES THE POWER OF THE MACHINE WITH A MEASUREMENT AT A
GIVEN FREQUENCY TO THE POWER WITHOUT ANY MEASUREMENT (AMD
SERVER).

	mechanism	freq	pvalue	adj.pvalue	shift
1	powercap	0.10	0.63	1.00	-0.06
2	powercap	1.00	0.14	0.95	0.27
3	powercap	10.00	< 0.01	< 0.01	1.44
4	powercap	100.00	< 0.01	< 0.01	4.63
5	powercap	1000.00	< 0.01	< 0.01	48.61
6	msr	0.10	0.67	1.00	-0.15
7	msr	1.00	0.73	1.00	-0.13
8	msr	10.00	< 0.01	< 0.01	1.64
9	msr	100.00	< 0.01	< 0.01	4.24
10	msr	1000.00	< 0.01	< 0.01	39.96
11	perf-events	0.10	0.14	0.95	0.27
12	perf-events	1.00	0.45	1.00	0.03
13	perf-events	10.00	0.06	0.56	0.35
14	perf-events	100.00	< 0.01	< 0.01	2.54
15	perf-events	1000.00	< 0.01	< 0.01	27.23
16	eBPF	0.10	0.33	1.00	0.09
17	eBPF	1.00	0.11	0.92	0.31
18	eBPF	10.00	0.05	0.47	0.44
19	eBPF	100.00	< 0.01	< 0.01	3.10
20	eBPF	1000.00	< 0.01	< 0.01	25.42

Table IV

DETAILED RESULTS OF THE WILCOXON RANK-SUM TESTS THAT
COMPARES THE POWER OF THE MACHINE WITH A MEASUREMENT AT A
GIVEN FREQUENCY TO THE POWER WITHOUT ANY MEASUREMENT (INTEL
SERVER).