Complete data set for the article:

E. Betti, D. P. Bovet, M. Cesati, R. Gioiosa

Hard real-time performances in multiprocessor embedded systems using ASMP-Linux

Eurasip Journal of Embedded Systems

The following tables show the results of the experiments performed with all workloads (idle, CPU, AIO, SIO, and MIX) on the three hardware configurations $S1$, $S2$, and $S3$.
The results of all tests are coherent on all platforms. However, a short note is due to explain why results of the SIO workload in all platforms show that the R_w test case is worse than the N test case.
The reason is that in the SIO workload the system is saturated by the interrupts from the disk. In the R_w test case these interrupts are always handled by the same CPU that executes the test program; conversely, in the N test case, the test program can run on any CPU, thus it is often not affected by the interrupts storm.

Proc	**Avg**	**StDev**	**Min**	**Max**
		IDL		
N	2.072	0.034	2.031	2.376
R_w	4.176	0.062	4.117	4.757
R_b	1.784	0.077	1.747	2.493
A_{on}	1.764	0.073	1.723	2.429
A_{off}	0.286	0.008	0.267	0.319
		CPU		
N	7199.851	606.625	6010.521	7610.221
R_w	12.769	1.203	9.790	18.527
R_b	9.872	1.403	6.782	14.023
A_{on}	10.472	1.014	7.022	13.905
A_{off}	8.849	0.957	5.670	11.992
		AIO		
N	6264.578	776.284	4793.751	9047.211
R_w	40.347	4.088	25.538	47.532
R_b	1.889	0.135	1.768	2.703
A_{on}	1.685	0.096	1.602	2.485
A_{off}	0.286	0.004	0.276	0.315
		SIO		
N	3.664	1.393	2.108	7.161
R_w	8.244	0.666	6.755	13.752
R_b	1.872	0.147	1.603	2.332
A_{on}	1.647	0.074	1.535	2.019
A_{off}	0.318	0.010	0.295	0.363
		MIX		
N	20275.784	6072.575	12.796	34696.051
R_w	28.459	12.945	10.721	48.837
R_b	27.461	9.661	3.907	42.213
A_{on}	30.262	8.306	8.063	41.099
A_{off}	27.847	7.985	6.427	38.207

Table 1: Operating system overhead on configuration S1 (in milliseconds).

Proc	**Avg**	**StDev**	**Min**	**Max**
		IDL		
N	1.481	0.190	1.447	7.277
R_w	3.707	0.188	3.643	9.581
R_b	1.360	0.025	1.326	1.516
A_{on}	1.420	0.021	1.392	1.558
A_{off}	0.000	0.000	0.000	0.000
		CPU		
N	7486.825	746.094	6399.201	7998.691
R_w	3.638	0.191	3.566	9.546
R_b	1.402	0.019	1.380	1.492
A_{on}	1.372	0.180	1.342	7.032
A_{off}	0.000	0.000	0.000	0.000
		AIO		
N	5967.168	1549.961	3001.521	16609.651
R_w	4.325	0.192	4.272	10.266
R_b	1.415	0.024	1.386	1.525
A_{on}	1.518	0.184	1.476	7.282
A_{off}	0.000	0.000	0.000	0.000
		SIO		
N	1.702	0.557	1.462	8.596
R_w	6.688	0.561	5.784	12.252
R_b	1.405	0.023	1.369	1.529
A_{on}	1.382	0.181	1.353	7.085
A_{off}	0.000	0.000	0.000	0.000
		MIX		
N	18513.615	5996.971	1.479	33993.351
R_w	4.215	0.226	3.913	10.146
R_b	1.420	0.029	1.393	1.554
A_{on}	1.490	0.044	1.362	1.624
A_{off}	0.000	0.000	0.000	0.000

Table 2: Operating system overhead on configuration S2 (in milliseconds).

Proc	Avg	StDev	Min	Max
		IDL		
N	3.552	0.048	3.519	4.325
R_w	3.534	0.042	3.514	4.066
R_b	0.561	0.071	0.547	1.663
A_{on}	0.577	0.068	0.548	1.541
A_{off}	0.001	0.000	0.001	0.001
		CPU		
N	8773.632	796.256	8001.631	9601.331
R_w	3.465	0.018	3.438	3.772
R_b	0.552	0.029	0.544	0.796
A_{on}	0.554	0.029	0.545	0.803
A_{off}	0.000	0.000	0.000	0.000
		AIO		
N	6953.769	1638.890	4430.931	17497.731
R_w	3.628	0.447	3.444	5.099
R_b	0.553	0.032	0.543	0.806
A_{on}	0.554	0.032	0.541	0.815
A_{off}	0.000	0.000	0.000	0.000
		SIO		
N	249.870	83.592	81.021	315.688
R_w	894.175	3.718	883.581	904.691
R_b	0.517	0.041	0.474	0.778
A_{on}	0.508	0.039	0.472	0.842
A_{off}	0.000	0.000	0.000	0.000
		MIX		
N	20065.194	6095.807	0.606	32472.931
R_w	3.477	0.024	3.431	3.603
R_b	0.554	0.031	0.525	0.807
A_{on}	0.556	0.032	0.505	0.811
A_{off}	0.000	0.000	0.000	0.000

Table 3: Operating system overhead on configuration S3 (in milliseconds).

Proc	Avg	StDev	Min	Max
		IDL		
N	6.399	1.014	5.632	75.477
R_w	6.019	43.468	5.213	4352.040
R_b	5.811	0.450	5.341	12.826
A_{on}	6.277	0.415	5.723	12.869
A_{off}	6.424	0.236	5.962	15.802
		CPU		
N	3845.041	221531.315	6.712	$12.792 \cdot 10^6$
R_w	7.113	1.041	6.576	21.674
R_b	6.866	0.918	6.301	32.162
A_{on}	6.851	0.391	6.379	13.003
A_{off}	6.956	0.209	6.509	9.429
		AIO		
N	2474.152	34619.008	6.869	$1.504 \cdot 10^6$
R_w	13.172	9.050	7.120	841.115
R_b	10.649	10.469	7.029	1015.144
A_{on}	12.542	2.490	7.256	26.999
A_{off}	10.529	1.652	7.400	23.151
		SIO		
N	68.286	650.755	5.811	10882.761
R_w	8.998	40.020	5.433	1208.948
R_b	6.292	4.598	5.347	216.600
A_{on}	6.629	1.805	5.758	30.018
A_{off}	6.661	2.103	5.944	37.285
		MIX		
N	13923.606	220157.013	6.946	$5.001 \cdot 10^6$
R_w	10.970	8.458	6.405	603.272
R_b	10.027	5.292	6.506	306.497
A_{on}	8.074	1.601	6.683	20.877
A_{off}	8.870	1.750	6.839	23.230

Table 4: Operating system latency on configuration S1 (in microseconds).

Proc	Avg	StDev	Min	Max
		IDL		
N	5.346	0.592	4.879	15.655
R_w	5.206	0.666	4.898	15.151
R_b	5.284	0.297	5.015	9.948
A_{on}	5.290	0.267	5.056	9.785
A_{off}	5.289	0.056	5.172	6.459
		CPU		
N	680.058	95398.550	4.920	$13.491 \cdot 10^6$
R_w	5.331	0.577	5.061	15.428
R_b	5.313	0.321	4.869	9.312
A_{on}	5.020	0.233	4.845	8.841
A_{off}	5.102	0.094	4.966	5.863
		AIO		
N	13012.278	252843.297	4.768	$9.993 \cdot 10^6$
R_w	5.919	3.812	4.920	371.279
R_b	5.487	2.049	4.573	200.549
A_{on}	4.956	0.219	4.767	8.797
A_{off}	5.298	0.105	5.143	6.304
		SIO		
N	34.399	276.160	4.909	6161.732
R_w	6.865	20.038	5.033	758.550
R_b	6.065	14.296	5.040	732.543
A_{on}	5.479	0.279	5.145	10.354
A_{off}	5.361	0.113	5.141	7.134
		MIX		
N	24402.723	331861.500	4.904	$4.997 \cdot 10^6$
R_w	5.996	1.249	4.960	39.982
R_b	5.511	1.231	4.603	109.964
A_{on}	5.120	0.275	4.917	9.370
A_{off}	5.441	0.199	5.207	6.716

Table 5: Operating system latency on configuration S2 (in microseconds).

Proc	Avg	StDev	Min	Max
		IDL		
N	1.753	0.344	1.626	44.707
R_w	1.728	0.172	1.656	7.044
R_b	1.642	0.022	1.548	2.088
A_{on}	1.630	0.018	1.590	2.076
A_{off}	1.593	0.015	1.566	1.890
		CPU		
N	296.696	41677.046	1.614	$5.894 \cdot 10^6$
R_w	1.765	0.571	1.656	50.377
R_b	1.719	0.055	1.602	2.124
A_{on}	1.664	0.019	1.626	2.238
A_{off}	1.581	0.016	1.542	1.818
		AIO		
N	1.874	2.664	1.590	355.958
R_w	1.898	1.928	1.608	68.029
R_b	1.764	0.700	1.578	63.973
A_{on}	1.703	0.023	1.638	2.226
A_{off}	1.557	0.019	1.530	2.004
		SIO		
N	91.204	392.681	1.680	3974.279
R_w	28.172	23.220	1.788	83.521
R_b	1.837	0.231	1.578	9.966
A_{on}	1.779	0.088	1.626	3.648
A_{off}	1.613	0.059	1.554	2.628
		MIX		
N	182577.713	936480.576	1.554	$9.095 \cdot 10^6$
R_w	1.999	1.619	1.722	66.883
R_b	1.756	0.650	1.548	63.985
A_{on}	1.721	0.034	1.674	3.228
A_{off}	1.639	0.025	1.602	2.466

Table 6: Operating system latency on configuration S3 (in microseconds).