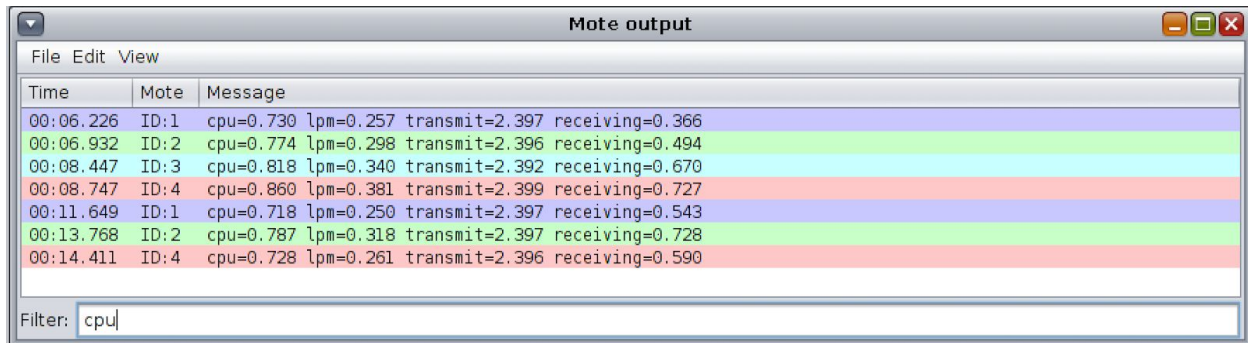


Task1

The energy dissipation for the three rates

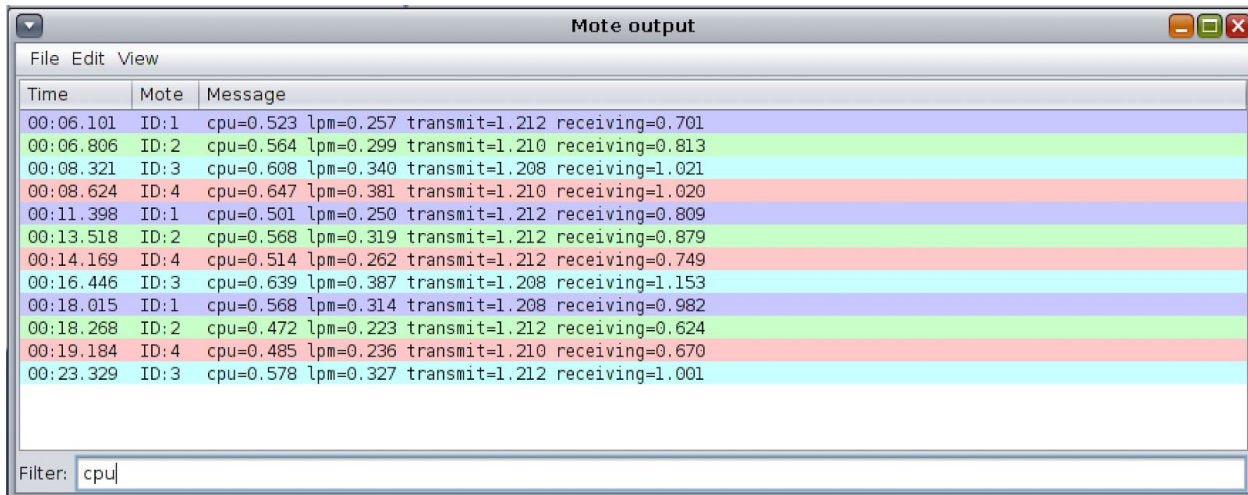
ContikiMAC 4Hz



Time	Mote	Message
00:06.226	ID:1	cpu=0.730 lpm=0.257 transmit=2.397 receiving=0.366
00:06.932	ID:2	cpu=0.774 lpm=0.298 transmit=2.396 receiving=0.494
00:08.447	ID:3	cpu=0.818 lpm=0.340 transmit=2.392 receiving=0.670
00:08.747	ID:4	cpu=0.860 lpm=0.381 transmit=2.399 receiving=0.727
00:11.649	ID:1	cpu=0.718 lpm=0.250 transmit=2.397 receiving=0.543
00:13.768	ID:2	cpu=0.787 lpm=0.318 transmit=2.397 receiving=0.728
00:14.411	ID:4	cpu=0.728 lpm=0.261 transmit=2.396 receiving=0.590

Filter: cpu

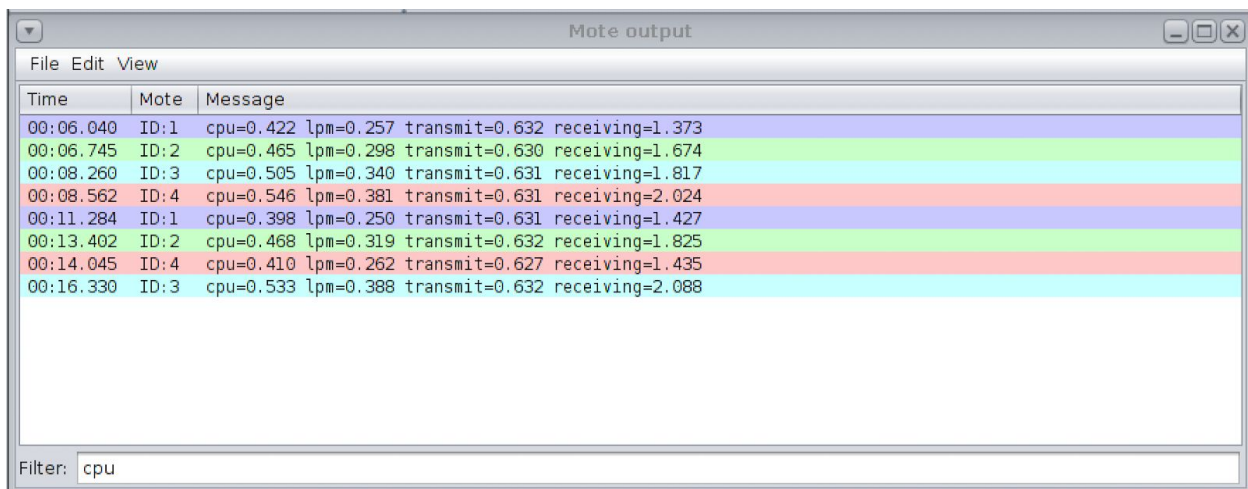
ContikiMAC 8Hz



Time	Mote	Message
00:06.101	ID:1	cpu=0.523 lpm=0.257 transmit=1.212 receiving=0.701
00:06.806	ID:2	cpu=0.564 lpm=0.299 transmit=1.210 receiving=0.813
00:08.321	ID:3	cpu=0.608 lpm=0.340 transmit=1.208 receiving=1.021
00:08.624	ID:4	cpu=0.647 lpm=0.381 transmit=1.210 receiving=1.020
00:11.398	ID:1	cpu=0.501 lpm=0.250 transmit=1.212 receiving=0.809
00:13.518	ID:2	cpu=0.568 lpm=0.319 transmit=1.212 receiving=0.879
00:14.169	ID:4	cpu=0.514 lpm=0.262 transmit=1.212 receiving=0.749
00:16.446	ID:3	cpu=0.639 lpm=0.387 transmit=1.208 receiving=1.153
00:18.015	ID:1	cpu=0.568 lpm=0.314 transmit=1.208 receiving=0.982
00:18.268	ID:2	cpu=0.472 lpm=0.223 transmit=1.212 receiving=0.624
00:19.184	ID:4	cpu=0.485 lpm=0.236 transmit=1.210 receiving=0.670
00:23.329	ID:3	cpu=0.578 lpm=0.327 transmit=1.212 receiving=1.001

Filter: cpu

ContikiMAC 16Hz



Time	Mote	Message
00:06.040	ID:1	cpu=0.422 lpm=0.257 transmit=0.632 receiving=1.373
00:06.745	ID:2	cpu=0.465 lpm=0.298 transmit=0.630 receiving=1.674
00:08.260	ID:3	cpu=0.505 lpm=0.340 transmit=0.631 receiving=1.817
00:08.562	ID:4	cpu=0.546 lpm=0.381 transmit=0.631 receiving=2.024
00:11.284	ID:1	cpu=0.398 lpm=0.250 transmit=0.631 receiving=1.427
00:13.402	ID:2	cpu=0.468 lpm=0.319 transmit=0.632 receiving=1.825
00:14.045	ID:4	cpu=0.410 lpm=0.262 transmit=0.627 receiving=1.435
00:16.330	ID:3	cpu=0.533 lpm=0.388 transmit=0.632 receiving=2.088

Filter: cpu

CSMA 4Hz

Mote output

File Edit View

Time	Mote	Message
00:05.967	ID:1	cpu=0.300 lpm=0.257 transmit=0.000 receiving=0.318
00:06.672	ID:2	cpu=0.350 lpm=0.298 transmit=0.000 receiving=0.454
00:08.187	ID:3	cpu=0.391 lpm=0.340 transmit=0.000 receiving=0.530
00:08.488	ID:4	cpu=0.442 lpm=0.381 transmit=0.000 receiving=0.643
00:11.132	ID:1	cpu=0.719 lpm=0.237 transmit=2.398 receiving=0.521
00:13.251	ID:2	cpu=0.796 lpm=0.305 transmit=2.395 receiving=0.733
00:13.895	ID:4	cpu=0.728 lpm=0.248 transmit=2.393 receiving=0.522
00:16.181	ID:3	cpu=0.847 lpm=0.375 transmit=2.399 receiving=0.630
00:17.530	ID:1	cpu=0.778 lpm=0.297 transmit=2.399 receiving=0.623
00:20.126	ID:2	cpu=0.810 lpm=0.320 transmit=2.397 receiving=0.739
00:21.723	ID:4	cpu=0.847 lpm=0.366 transmit=2.402 receiving=0.683
00:22.562	ID:1	cpu=0.711 lpm=0.230 transmit=2.399 receiving=0.521

Filter: cpu

CSMA 8Hz

Mote output				
File Edit View				
Time	Mote	Message		
00:05.967	ID:1	cpu=0.300	lpm=0.257	transmit=0.000 receiving=0.318
00:06.672	ID:2	cpu=0.341	lpm=0.299	transmit=0.000 receiving=0.366
00:08.187	ID:3	cpu=0.401	lpm=0.339	transmit=0.000 receiving=0.633
00:08.488	ID:4	cpu=0.433	lpm=0.381	transmit=0.000 receiving=0.554
00:11.132	ID:1	cpu=0.709	lpm=0.237	transmit=2.398 receiving=0.443
00:13.251	ID:2	cpu=0.787	lpm=0.305	transmit=2.395 receiving=0.627
00:13.895	ID:4	cpu=0.719	lpm=0.249	transmit=2.398 receiving=0.470
00:16.181	ID:3	cpu=0.856	lpm=0.374	transmit=2.399 receiving=0.703
00:17.530	ID:1	cpu=0.770	lpm=0.297	transmit=2.399 receiving=0.521
00:20.126	ID:2	cpu=0.800	lpm=0.320	transmit=2.396 receiving=0.641
00:21.723	ID:4	cpu=0.839	lpm=0.367	transmit=2.402 receiving=0.614
00:22.562	ID:1	cpu=0.695	lpm=0.231	transmit=2.396 receiving=0.350
00:23.532	ID:3	cpu=0.833	lpm=0.343	transmit=2.399 receiving=0.771

Filter:

CSMA 16Hz

Mote output				
File Edit View				
Time	Mote	Message		
00:05.969	ID:1	cpu=0.300 lpm=0.257 transmit=0.000 receiving=1.323		
00:06.672	ID:2	cpu=0.350 lpm=0.298 transmit=0.000 receiving=1.626		
00:08.187	ID:3	cpu=0.402 lpm=0.339 transmit=0.000 receiving=2.050		
00:08.487	ID:4	cpu=0.434 lpm=0.381 transmit=0.000 receiving=2.061		
00:11.132	ID:1	cpu=0.415 lpm=0.246 transmit=0.632 receiving=1.551		
00:13.251	ID:2	cpu=0.489 lpm=0.314 transmit=0.632 receiving=1.971		
00:13.895	ID:4	cpu=0.414 lpm=0.258 transmit=0.629 receiving=1.481		

Filter: cpu

Task2

I used Contiki 3.0 instead of 2.6, but 3.0 does not have LPP and X-MAC drivers

ContikiMAC (instead of LPP)

Mote output				
Time	Mote	Message		
00:05.967	ID:1	cpu=0.300	lpm=0.257	transmit=0.000 receiving=0.653
00:06.672	ID:2	cpu=0.350	lpm=0.298	transmit=0.000 receiving=0.852
00:08.187	ID:3	cpu=0.401	lpm=0.339	transmit=0.000 receiving=1.079
00:08.488	ID:4	cpu=0.424	lpm=0.381	transmit=0.000 receiving=0.972
00:11.132	ID:1	cpu=0.513	lpm=0.243	transmit=1.213 receiving=0.877
00:13.251	ID:2	cpu=0.580	lpm=0.312	transmit=1.210 receiving=1.068
00:13.895	ID:4	cpu=0.505	lpm=0.255	transmit=1.210 receiving=0.718
00:16.181	ID:3	cpu=0.650	lpm=0.381	transmit=1.210 receiving=1.205
00:17.532	ID:1	cpu=0.572	lpm=0.303	transmit=1.212 receiving=1.002
00:20.126	ID:2	cpu=0.596	lpm=0.326	transmit=1.213 receiving=1.048
00:21.723	ID:4	cpu=0.625	lpm=0.373	transmit=1.213 receiving=1.020

Filter:

Null_RDC

Mote output				
Time	Mote	Message		
00:05.967	ID:1	cpu=0.300	lpm=0.257	transmit=0.000 receiving=41.118
00:06.672	ID:2	cpu=0.341	lpm=0.299	transmit=0.000 receiving=58.222
00:08.187	ID:3	cpu=0.383	lpm=0.340	transmit=0.000 receiving=9.800
00:08.487	ID:4	cpu=0.432	lpm=0.381	transmit=0.000 receiving=26.903
00:11.131	ID:1	cpu=0.275	lpm=0.250	transmit=0.026 receiving=38.176
00:13.250	ID:2	cpu=0.352	lpm=0.319	transmit=0.026 receiving=1.054
00:13.894	ID:4	cpu=0.295	lpm=0.262	transmit=0.026 receiving=43.047
00:16.180	ID:3	cpu=0.412	lpm=0.388	transmit=0.025 receiving=29.460
00:17.530	ID:1	cpu=0.337	lpm=0.310	transmit=0.025 receiving=62.987
00:20.125	ID:2	cpu=0.367	lpm=0.333	transmit=0.026 receiving=7.020
00:21.722	ID:4	cpu=0.414	lpm=0.379	transmit=0.025 receiving=26.170
00:22.561	ID:1	cpu=0.270	lpm=0.244	transmit=0.026 receiving=35.514
00:23.531	ID:3	cpu=0.383	lpm=0.356	transmit=0.026 receiving=16.601
00:25.102	ID:2	cpu=0.275	lpm=0.241	transmit=0.026 receiving=34.421
00:26.569	ID:1	cpu=0.220	lpm=0.194	transmit=0.026 receiving=14.948
00:26.590	ID:4	cpu=0.270	lpm=0.235	transmit=0.026 receiving=32.223
00:28.453	ID:3	cpu=0.265	lpm=0.238	transmit=0.025 receiving=33.317

Filter:

CX-MAC (instead of X-MAC)

Mote output				
Time	Mote	Message		
00:05.967	ID:1	cpu=0.419	lpm=0.253	transmit=0.000 receiving=6.643
00:06.672	ID:2	cpu=0.480	lpm=0.294	transmit=0.000 receiving=7.750
00:08.187	ID:3	cpu=0.543	lpm=0.335	transmit=0.000 receiving=8.768
00:08.488	ID:4	cpu=0.604	lpm=0.376	transmit=0.000 receiving=9.724
00:11.132	ID:1	cpu=0.629	lpm=0.239	transmit=0.365 receiving=6.261
00:13.251	ID:2	cpu=0.735	lpm=0.307	transmit=0.369 receiving=8.071
00:13.895	ID:4	cpu=0.648	lpm=0.251	transmit=0.369 receiving=6.686

Filter:

The highest consume is CX-MAC and the lowest consumer is Null_RDC

Task3

ContikiMAC

Mote output		
File Edit View		
Time	Mote	Message
00:05.967	ID:1	cpu=0.300 lpm=0.257 transmit=0.000 receiving=0.653
00:11.132	ID:1	cpu=0.503 lpm=0.243 transmit=1.213 receiving=0.778
00:17.532	ID:1	cpu=0.564 lpm=0.303 transmit=1.213 receiving=0.920

Filter: ID:1 cpu\

CX-MAC

Mote output		
File Edit View		
Time	Mote	Message
00:05.967	ID:1	cpu=0.419 lpm=0.253 transmit=0.000 receiving=6.643
00:11.132	ID:1	cpu=0.631 lpm=0.239 transmit=0.365 receiving=6.243

Filter: ID:1 cpu\

NullRDC

Mote output		
File Edit View		
Time	Mote	Message
00:05.967	ID:1	cpu=0.300 lpm=0.257 transmit=0.000 receiving=41.118
00:11.131	ID:1	cpu=0.275 lpm=0.250 transmit=0.026 receiving=38.176
00:17.530	ID:1	cpu=0.337 lpm=0.310 transmit=0.025 receiving=62.987
00:22.561	ID:1	cpu=0.270 lpm=0.244 transmit=0.026 receiving=35.514
00:26.569	ID:1	cpu=0.220 lpm=0.194 transmit=0.026 receiving=14.948

Filter: ID:1 cpu\

Contiki 3.0 does not support X-MAC and LPP drivers. CX_MAC consumed more energy than Null_RDC and ContikiMAC. ContikiMAC consumer more energy than NullRDC.