

Chapter 7

Result Analysis and Discussions

7.1 Introduction:

The simulation of Clustering is done in ns2. In the simulation model, we have considered an area in which 40 sensors are deployed. All the nodes are set as static nodes. The type of the wireless propagation model is TwoRayGround. Routing protocol which is used in this simulation is AODV. Table 7.1 shows the various parameters used for simulation.

7.2 Simulation Set Up:

Table 7.1: Simulation Parameters:

<i>Parameter</i>	<i>Value</i>
Number of nodes	40 nodes
Mac Layer Type	802.11
Routing protocol	AODV
Propagation model	TwoRayGround
Energy model	Energy Model

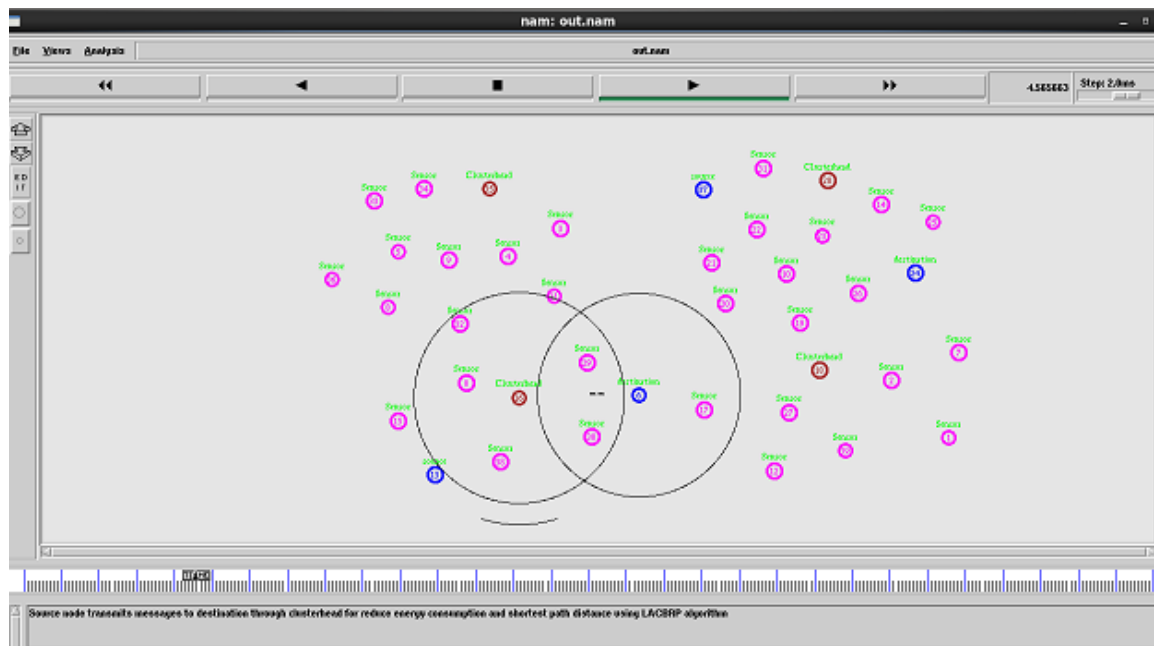


Figure 7.1: Simulation View

Table: 7.2: Simulation Results: LEACH

Time(Sec)	Energy Values	Latency Values	PDR Values	Residual Energy Values
10.000	814.754	121.494	0.8645	38185.2
15.000	831.400	79.9305	0.9188	38168.6
20.000	848.049	63.546	0.9421	38152.0
25.000	864.712	54.7296	0.9549	38135.3
30.000	881.358	49.2427	0.9631	38118.6

Table: 7.3: Simulation Results: BSP

Time(Sec)	Energy Values	Latency Values	PDR Values	Residual Energy Values
10.000	33.184	37.215	0.9889	38966.8
15.000	49.585	36.4202	0.9919	38950.7
20.000	65.996	35.9687	0.9961	38934.5
25.000	83.403	35.7532	0.9969	38917.3
30.000	98.808	35.5849	0.9974	38901.2

Table: 7.4: Simulation Results: BEC

Time(Sec)	Energy Values	Latency Values	PDR Values	Residual Energy Values
10.000	18.562	24.8182	0.9608	38981.1
15.000	35.123	24.8827	0.9756	38964.9
20.000	51.683	25.4729	0.9822	38948.3
25.000	68.253	25.4771	0.9861	38931.7
30.000	84.820	25.4303	0.9878	38915.2

Table: 7.5: Simulation Results: LACBRP

Time(Sec)	Energy Values	Latency Values	PDR Values	Residual Energy Values
10.000	8.777	12.7867	0.9976	38991.2
15.000	25.342	12.5031	0.9982	38973.3
20.000	44.595	11.8059	0.9989	38955.4
25.000	62.524	11.6385	0.9991	38937.5
30.000	80.417	11.5275	0.9993	38919.6

7.3 Results and Discussions:

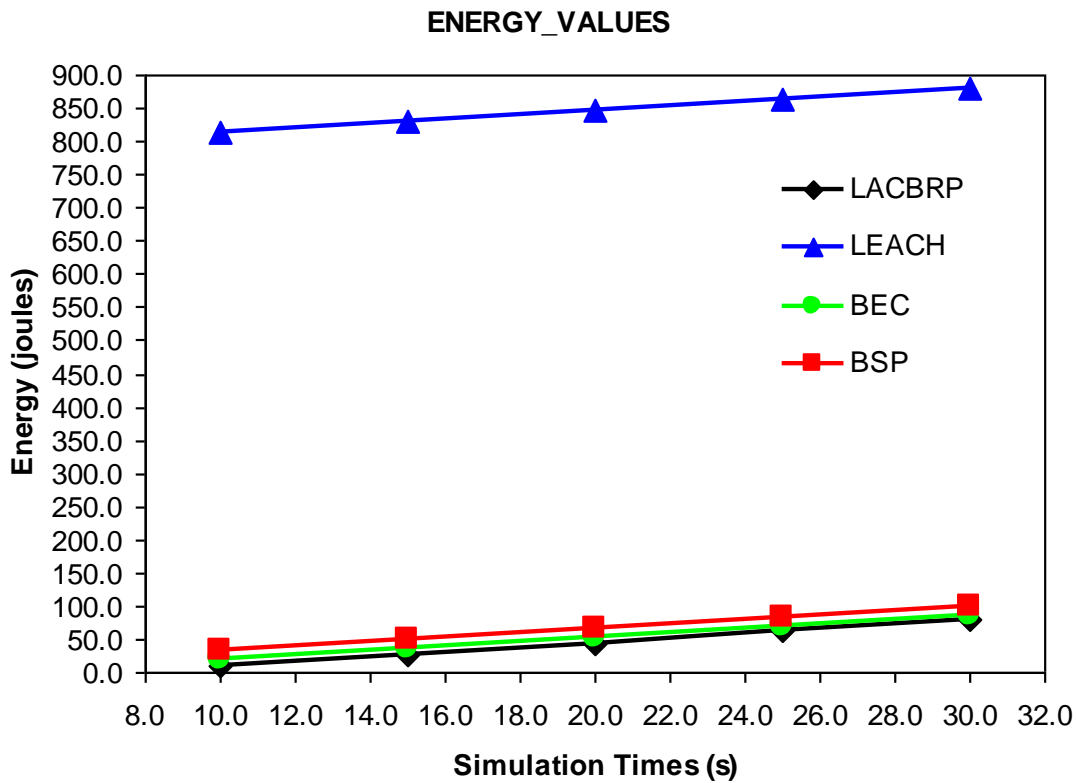


Figure 7.2: Simulation Time Vs Energy Values

The energy consumption value at 10 sec simulation time is observed to be 814.754 for LEACH, 33.184 for BSP, 18.562 for BEC and 8.777 for LACBRP respectively and at an interval of 30 sec, the values are 881.358, 98.808, 84.820 and 80.417 respectively. From this values it can be clearly observed that the LACBRP routing scheme consumes the lowest energy in comparison to the other routing scheme i.e. LEACH routing scheme, Base Station Position routing scheme and Energy-Balanced routing scheme.

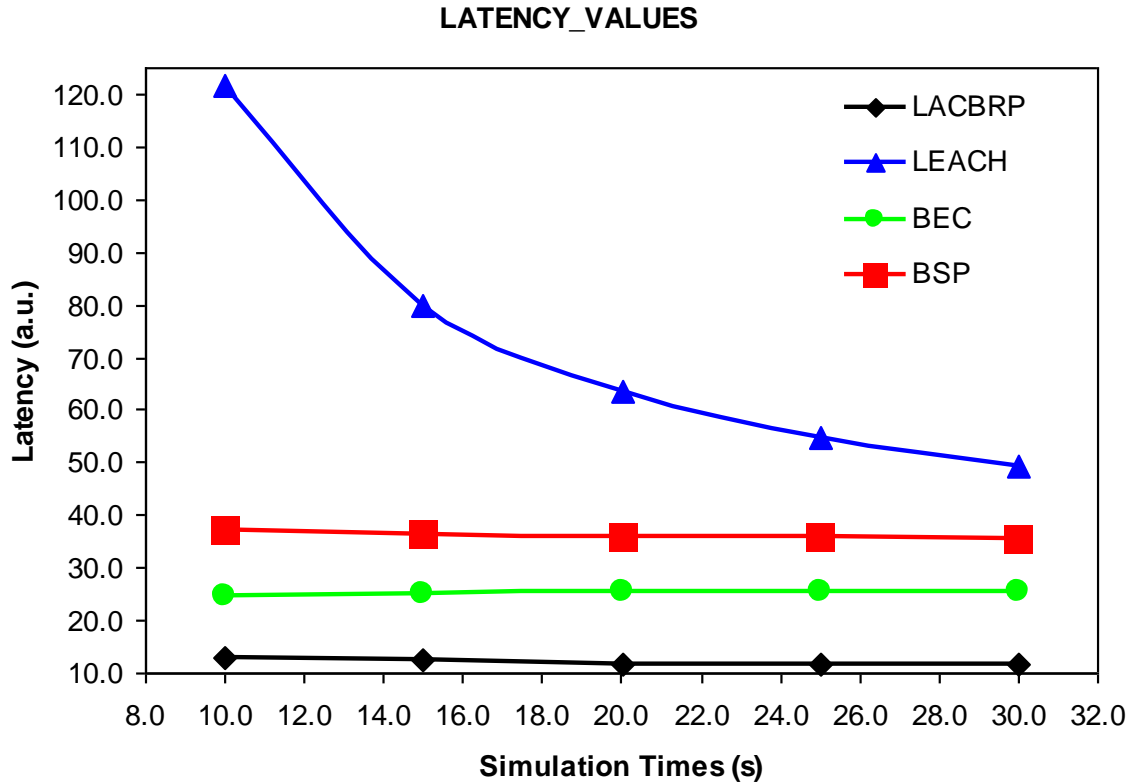


Figure 7.3: Simulation Time Vs Latency Values

Figure 7.3 shows the variation of Latency values with time from 10 sec to 30 sec at an interval of 5 secs. The Latency Values is observed to be 121.494 for LEACH, 37.215 for BSP, 24.8182 for BEC and 12.7867 for LACBRP respectively and at an interval of 30 sec, the values are 49.2427, 35.5849, 25.4303 and 11.5275 respectively. From these values it can be clearly observed that the LACBRP routing scheme respond at a faster rate means it has the minimum latency value in comparison to the other routing scheme i.e. LEACH routing scheme, Base Station Position routing scheme and Energy-Balanced routing scheme.

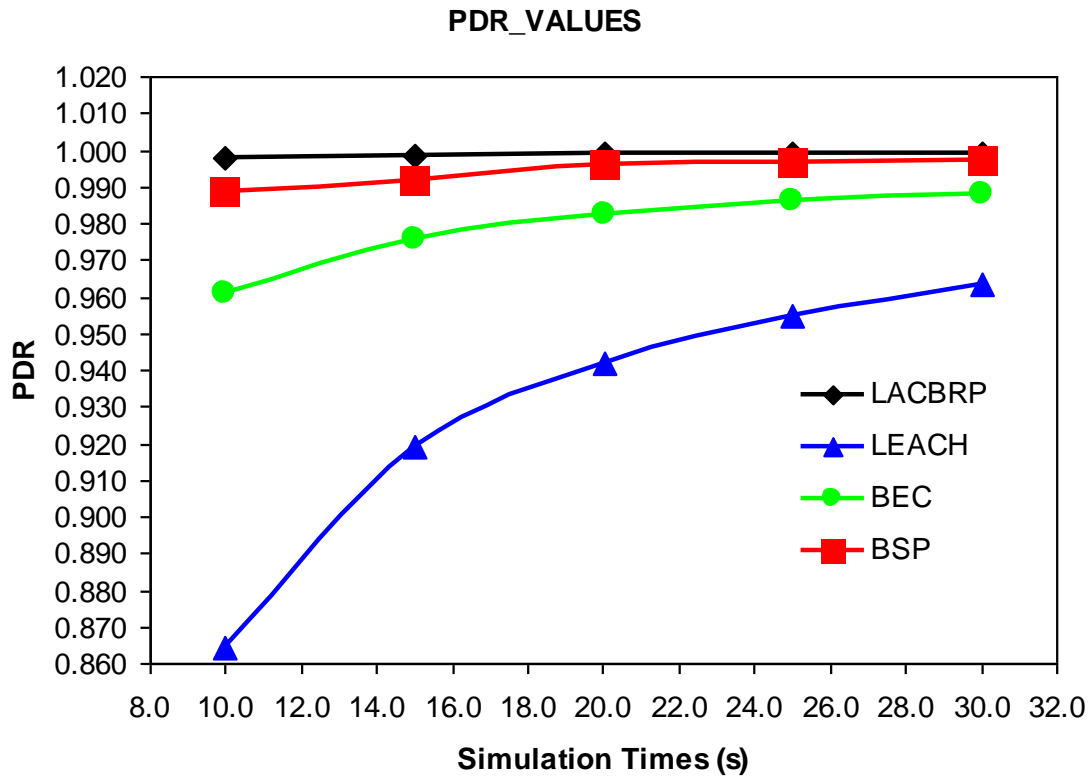


Figure 7.4: Simulation Time Vs PDR Values

Figure 7.4 shows the variation of PDR values with time from 10 sec to 30 sec at an interval of 5 sec. The PDR Values is observed to be 0.8645 for LEACH, 0.9889 for BSP, 0.9608 for BEC and 0.9976 for LACBRP respectively and at an interval of 30 sec, the values are 0.9631, 0.9631, 0.9974 and 0.9993 respectively. From these values it can be clearly observed that the LACBRP routing scheme has the maximum Packet delivery Ratio (the ratio of no. of packet received to the no of packet send) in comparison to the other routing scheme i.e. LEACH routing scheme, Base Station Position routing scheme and Energy-Balanced routing scheme.

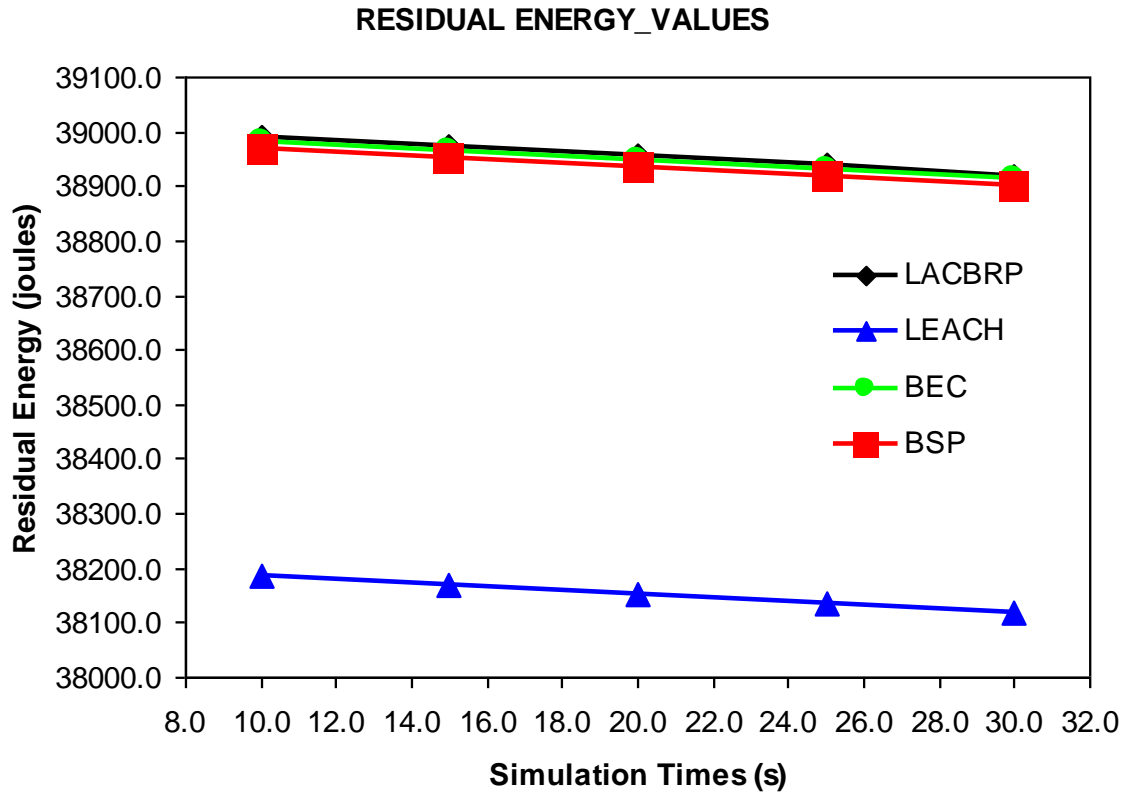


Figure 7.5: Simulation Time Vs Residual Energy Values

Figure 7.5 show that LACBRP achieves higher Residual Energy Values after the 30 sec time which is taken in this simulation work. LACBRP starts the higher level at the beginning and maintains this level upto the last. All other routing schemes i.e. LEACH routing scheme, Base Station Position routing scheme and Energy-Balanced routing scheme maintain a certain level of Residual Energy, lower than the LACBRP scheme, due to the energy dissipation in different simulation time.