Figure 6: Simulation output of 16-bit Regular CSLA.

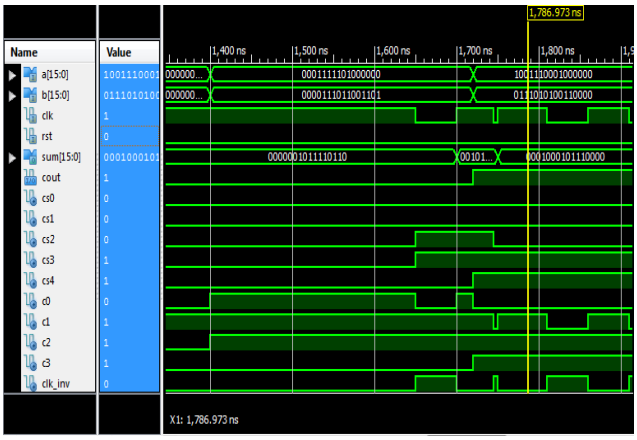

Figure 7: Simulation output of 16-bit Modified CSLA.

After the observation of simulation waveforms, synthesis is performed for the calculation of delay and thereby the power of the CSLA's are calculated. Table 1 exhibits the simulation results of both CSLA structures in terms of delay and power.

Table 1: Comparison of Regular and Modified CSLA

Parameters	*Regular CSLA*	*Modified CSLA*
Delay (ns)	19.853	10.464
Power(mW)	185	143

From the above table, we can say that delay and power of an Modified CSLA is reduced by 9.389 ns and 42 mW respectively as compared to Regular CSLA. Thus, a CSLA with D-latch is a High Speed Carry Select Adder.

We now analysis the performance of the CSLA by implementing an FIR filter using Regular Carry Select Adder and Modified Carry Select Adder in the adder part of filter and then both results of filter are compared in term of delay and power.

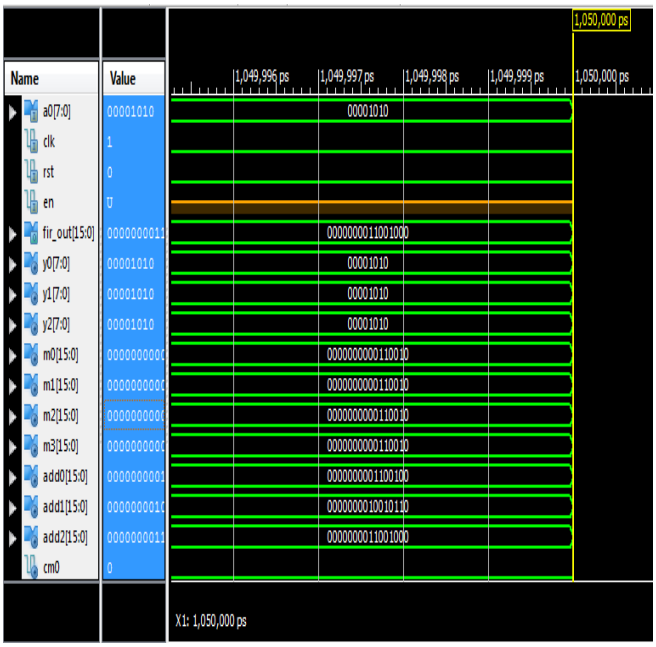

Figure 8: Simulation output of FIR Filter using Regular CSLA

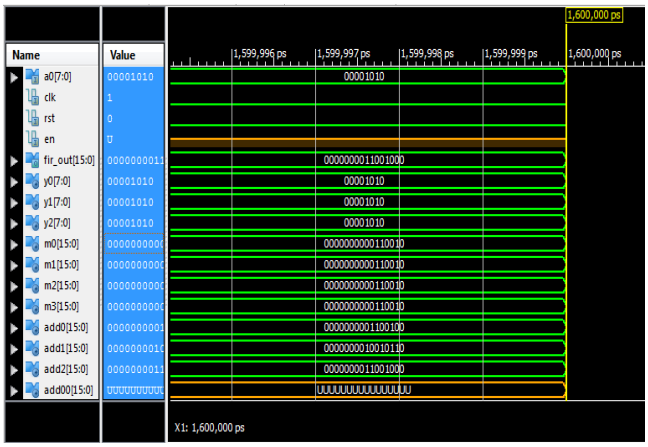

Figure 9: Simulation output of FIR Filter using Modified CSLA

Table 2: Comparison of Regular and Modified CSLA implemented in FIR filter

Parameters	*FIR filter using Regular CSLA*	*FIR filter using Modified CSLA*
Delay(ns)	22.539	13.778
Power(mW)	114	110s

From the above table, we can see that delay and power are reduced when the FIR Filter is implemented with an Modified CSLA with D-latch rather than an FIR Filter that is implemented with a Regular CSLA. Thus a high speed and low power FIR filter can be designed using a Modified CSLA with D-latch. Thus a CSLA designed with a D-latch is a High Speed Carry Select Adder.

6. Conclusion

This paper presented a unique approach to reduce the delay and power of CSLA architecture. Here, we show the design of CSLA implemented by using D-Latch and compared with Regular CSLA. The result shows that CSLA with D-Latch is

a high speed and low power carry select adder. All these adders are implemented on Spartan 3E Kit and performance of this CSLA is evaluated in terms of delay and power by using CSLA in the adder part of FIR filter and it proves to be high speed and low power carry select adder .

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