Hw #03 {Barrel Shifter y Flip-Flop tipo T}
Lenguajes de descripción de hardware

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En el presente documento se desarrolla un barrel shifter de 4 bits en alto nivel y un Flip-Flop tipo T con reinicio asincrono.

1 Barrel shifter de 4 bits

```
CASE S IS
 WHEN"001"=>Do<='0'& Di(3 DOWNTO 1);
 WHEN"010"=>Do<=Di(2 DOWNTO 0)&'0';
 WHEN"011"=>Do<=Di(0)&Di(3 DOWNTO 1);
 WHEN"100"=>Do<=Di(2 DOWNTO 0)&Di(3);
 WHEN"101"=>Do<=Di(3)&Di(3 DOWNTO 1);
 WHEN"110"=>Do<=Di(1 DOWNTO 0)& Di
(3 DOWNTO 2);
 WHEN OTHERS => Do<=Di;
END CASE;
```

2 Flip-Flop tipo T

```
PROCESS(clk,reset) BEGIN
IF(reset='0') THEN
    tmp<='0';
ELSIF(RISING_EDGE(clk)) THEN
    IF (t='0') THEN
        tmp<=tmp;
    ELSIF t='1' THEN
            tmp<= NOT(tmp);
    END IF;
END IF;
END PROCESS;
output<=tmp;
```

3 Simulación

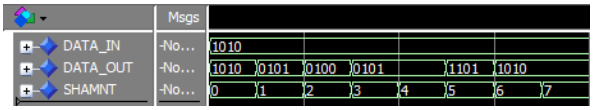

Figure 1: *Resultado de la simulación*

4 Simulación

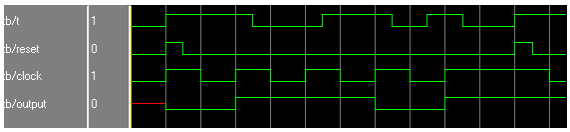

Figure 2: *Resultado de la simulación*

5 Diagrama RTL

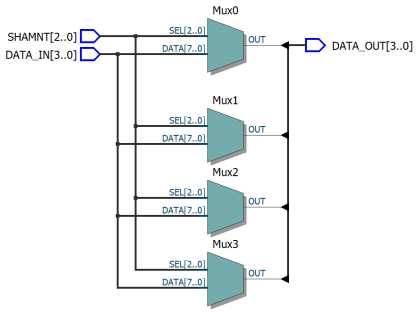

Figure 3: *Barrel shifter de 4 bits*

6 Diagrama RTL

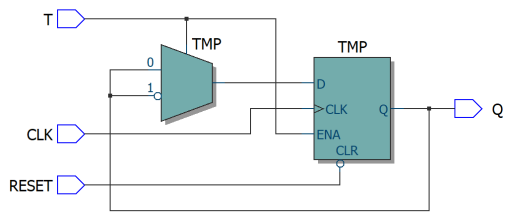

Figure 4: *Flip Flop tipo T con reinicio asincrono*