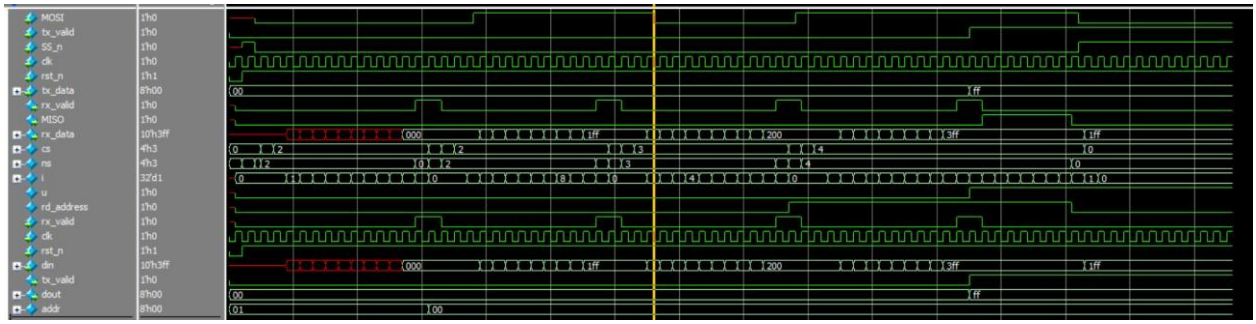
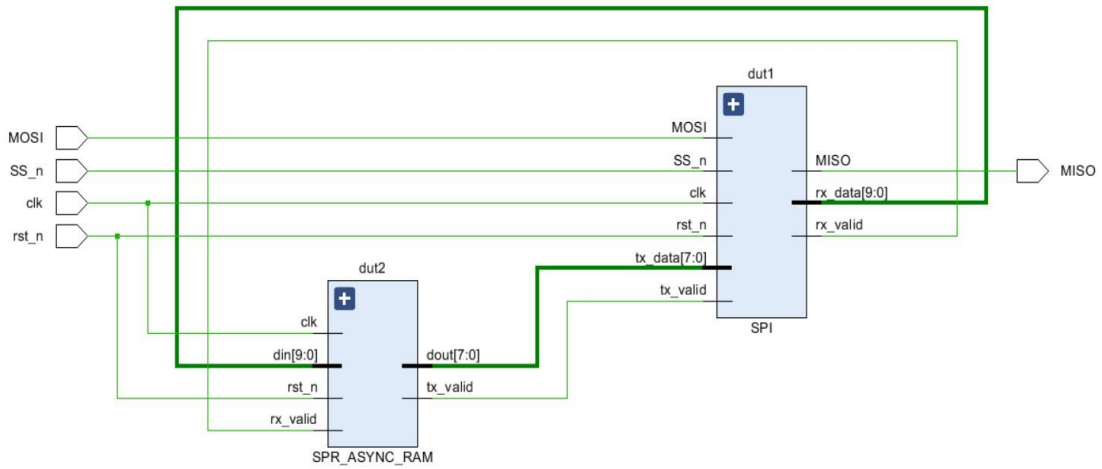
- *Questasim snippets*

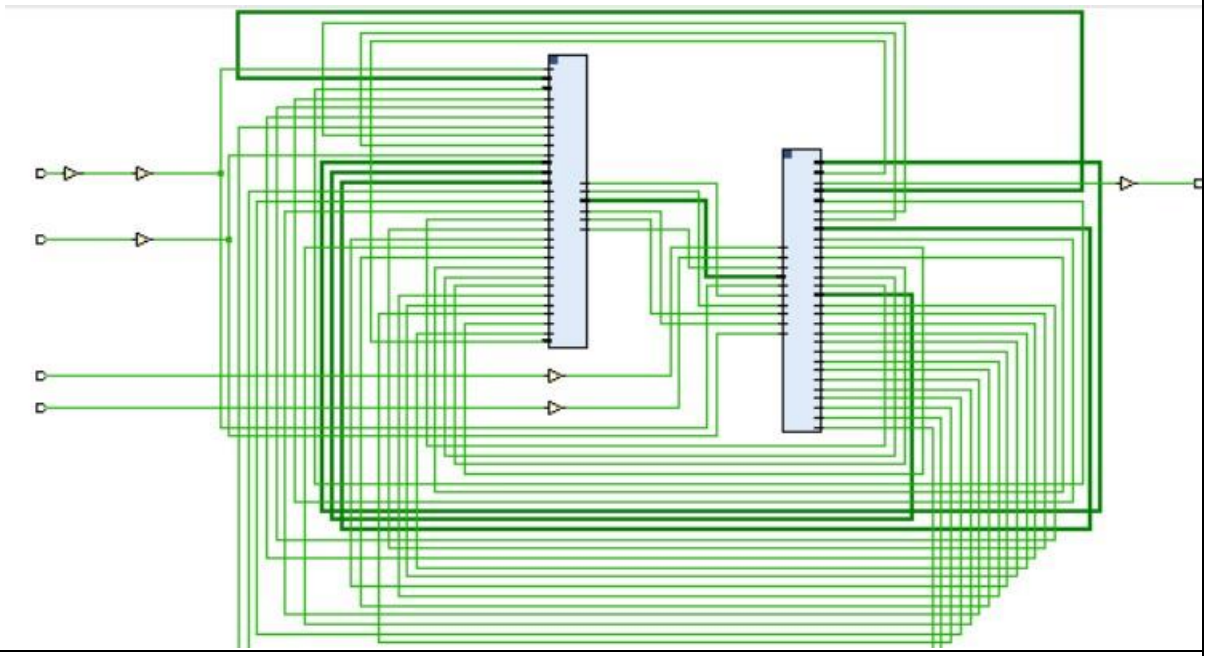


- ***Gray encoding***

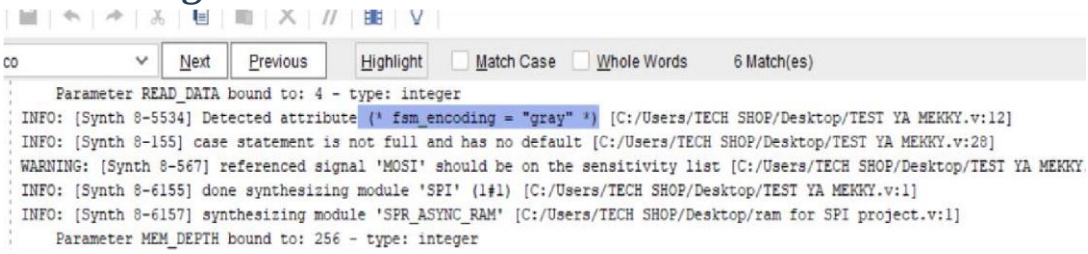


Elaboration:

Synthesis:

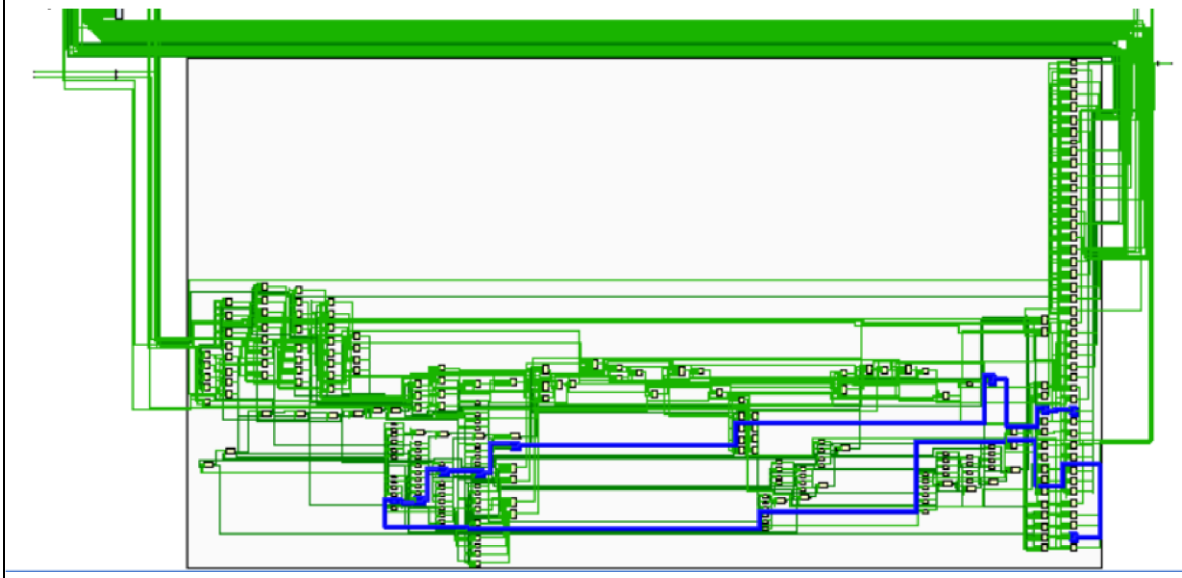


The encoding



timing report

The critical path:



Utilization report:

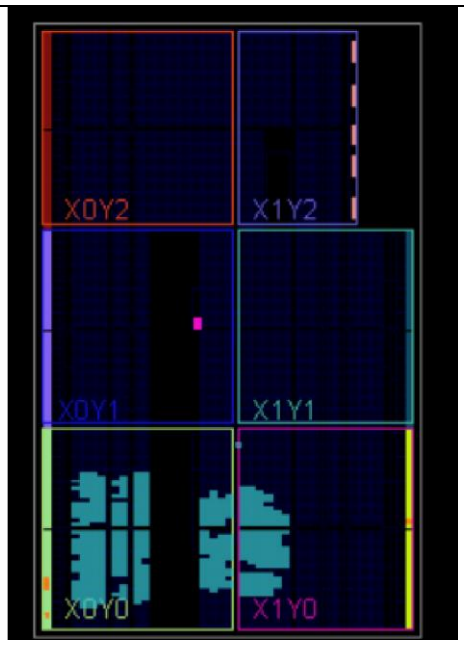
Name	Slice LUTs (20800)	Slice Registers (41600)	F7 Muxes (16300)	F8 Muxes (8150)	Slice (8150)	LUT as Logic (20800)	LUT Flip Flop Pairs (20800)	Bonded IOB (106)	BUFGCTRL (32)
N SPI_WRAPPER	1001	2126	268	134	797	1001	48	5	1
dut1 (SPI)	157	58	0	0	71	157	39	0	0
dut2 (SPR_ASYNC_RA...	844	2068	268	134	746	844	8	0	0

Timing report (after implementation):

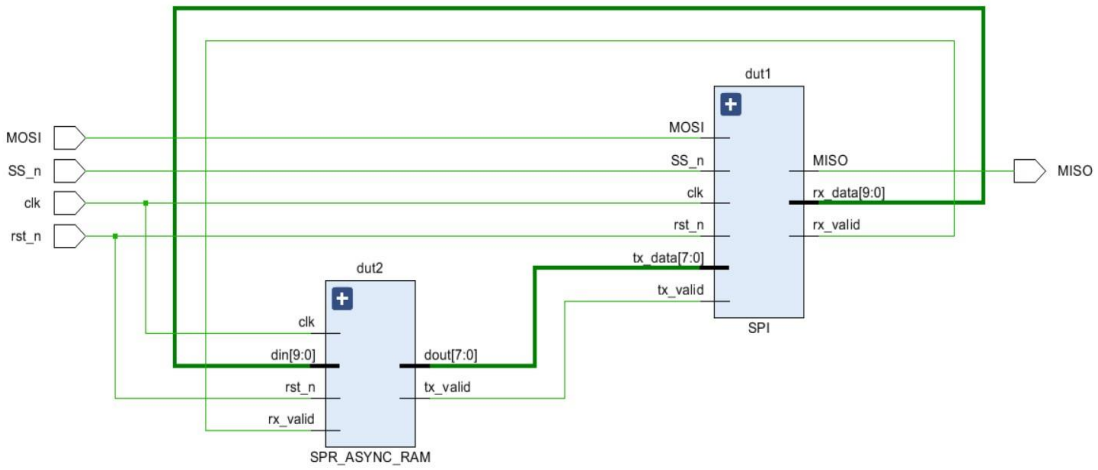
Setup		Hold		Pulse Width	
Worst Negative Slack (WNS):	2.024 ns	Worst Hold Slack (WHS):	0.058 ns	Worst Pulse Width Slack (WPWS):	4.500 ns
Total Negative Slack (TNS):	0.000 ns	Total Hold Slack (THS):	0.000 ns	Total Pulse Width Negative Slack (TPWS):	0.000 ns
Number of Failing Endpoints:	0	Number of Failing Endpoints:	0	Number of Failing Endpoints:	0
Total Number of Endpoints:	4252	Total Number of Endpoints:	4252	Total Number of Endpoints:	2124

All user specified timing constraints are met.

Device:

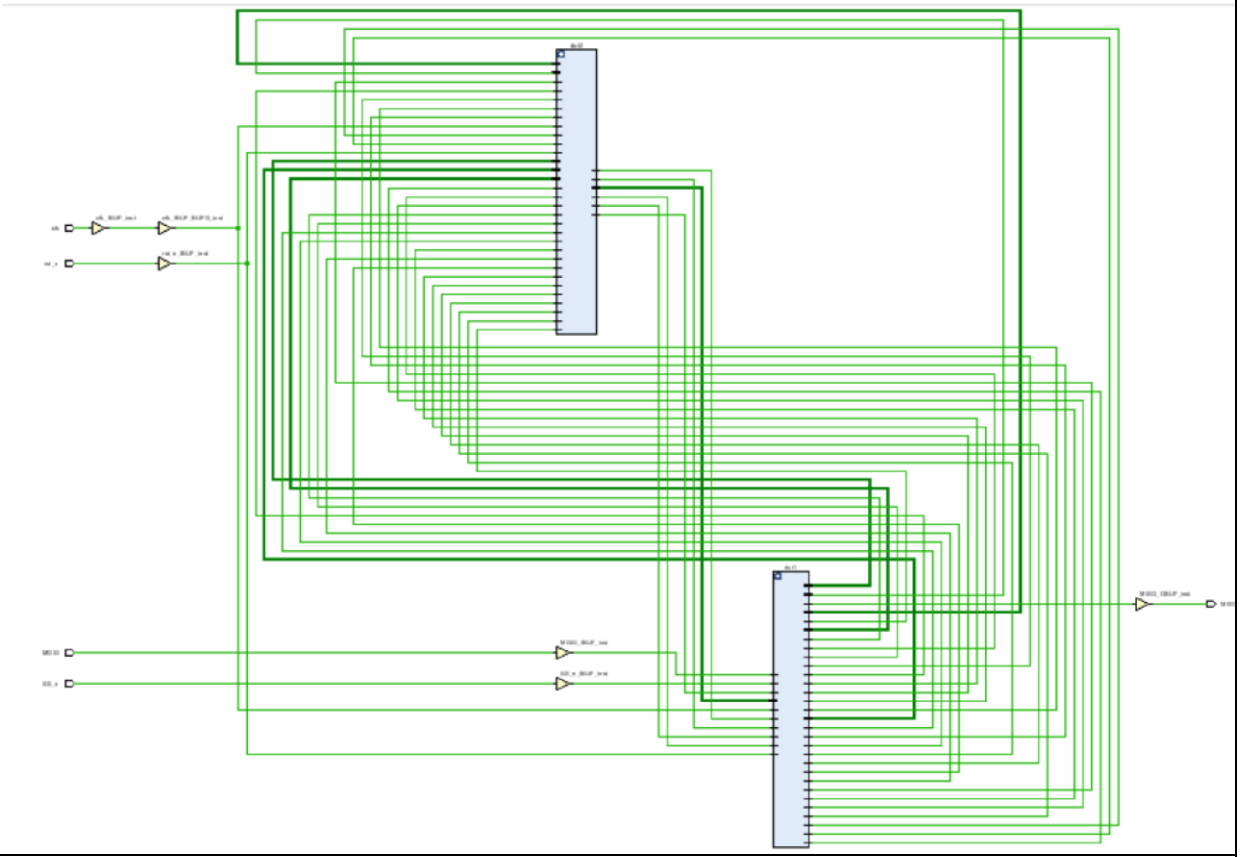


- ***<u>One-hot encoding</u>***



Elaboration:

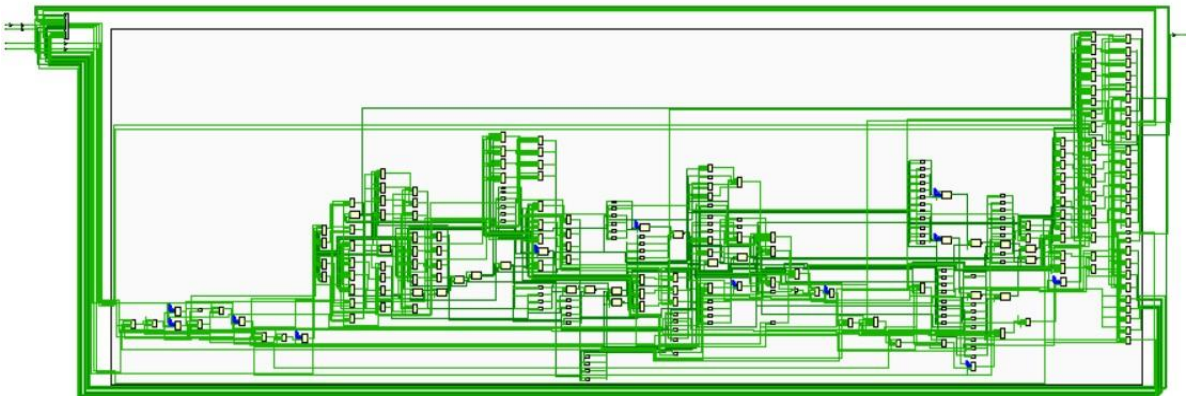
Synthesis:



The encoding

```
    Parameter READ_ADD bound to: 3 - type: integer
    Parameter READ_DATA bound to: 4 - type: integer
INFO: [Synth 8-5534] Detected attribute (* fsm_encoding = "one_hot" *) [C:/Users/TECH SHOP/Desktop/TEST YA MEKKY
INFO: [Synth 8-155] case statement is not full and has no default [C:/Users/TECH SHOP/Desktop/TEST YA MEKKY.v:28
WARNING: [Synth 8-567] referenced signal 'MOSI' should be on the sensitivity list [C:/Users/TECH SHOP/Desktop/TE
INFO: [Synth 8-6155] done synthesizing module 'SPI' (1#1) [C:/Users/TECH SHOP/Desktop/TEST YA MEKKY.v:1]
INFO: [Synth 8-6157] synthesizing module 'SPR_ASYNC_RAM' [C:/Users/TECH SHOP/Desktop/ram for SPI project.v:1]
```

timing report



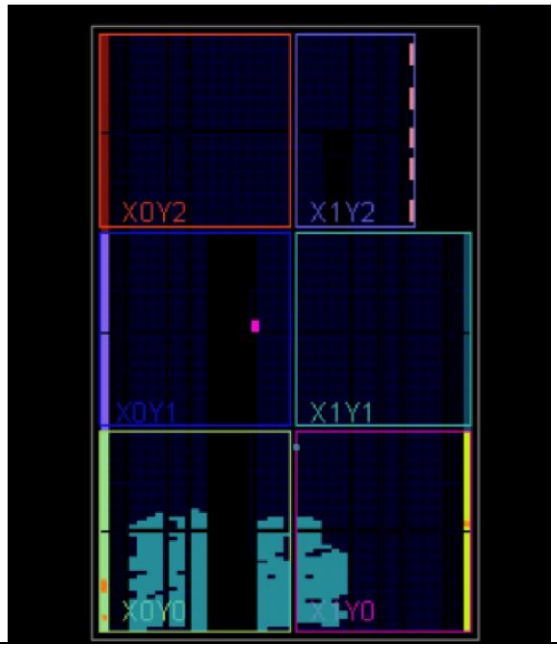
The critical path:

Name	Slice LUTs (20800)	Slice Registers (41600)	F7 Muxes (16300)	F8 Muxes (8150)	Slice (8150)	LUT as Logic (20800)	LUT Flip Flop Pairs (20800)	Bonded IOB (106)	BUFGCTRL (32)
SPI_WRAPPER	994	2129	273	136	798	994	45	5	1
dut1 (SPI)	150	62	1	0	57	150	37	0	0
dut2 (SPR_ASYNC_RA...	844	2067	272	136	747	844	8	0	0

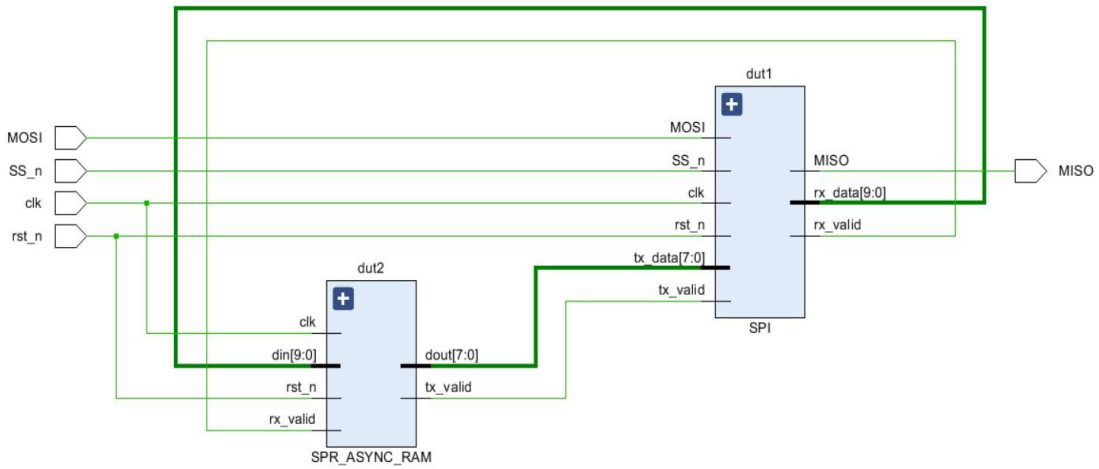
Utilization report:

Timing report (after implementation):

Device:

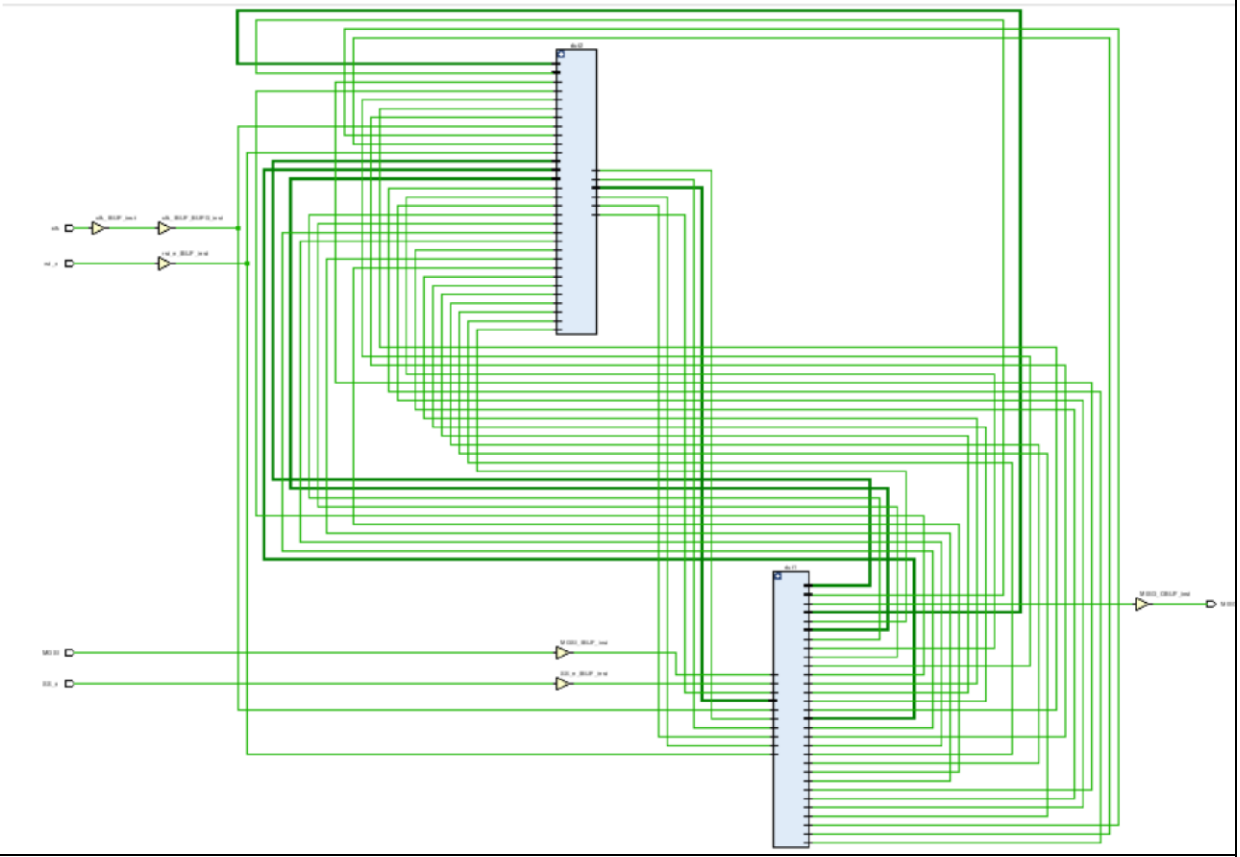


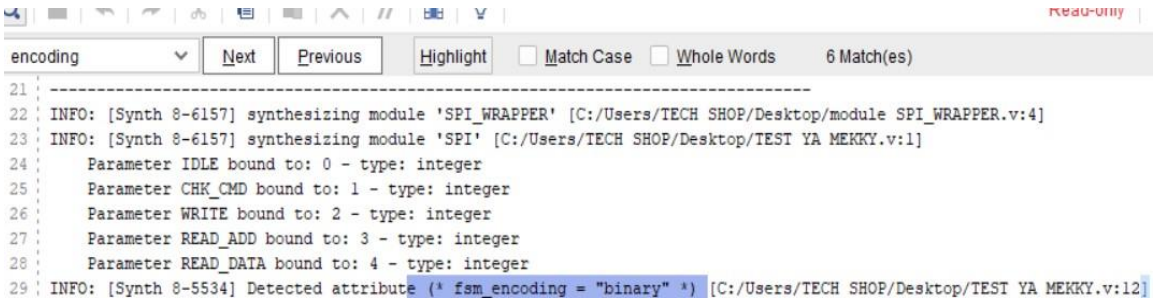
- ***binary***



Elaboration:

Synthesis:

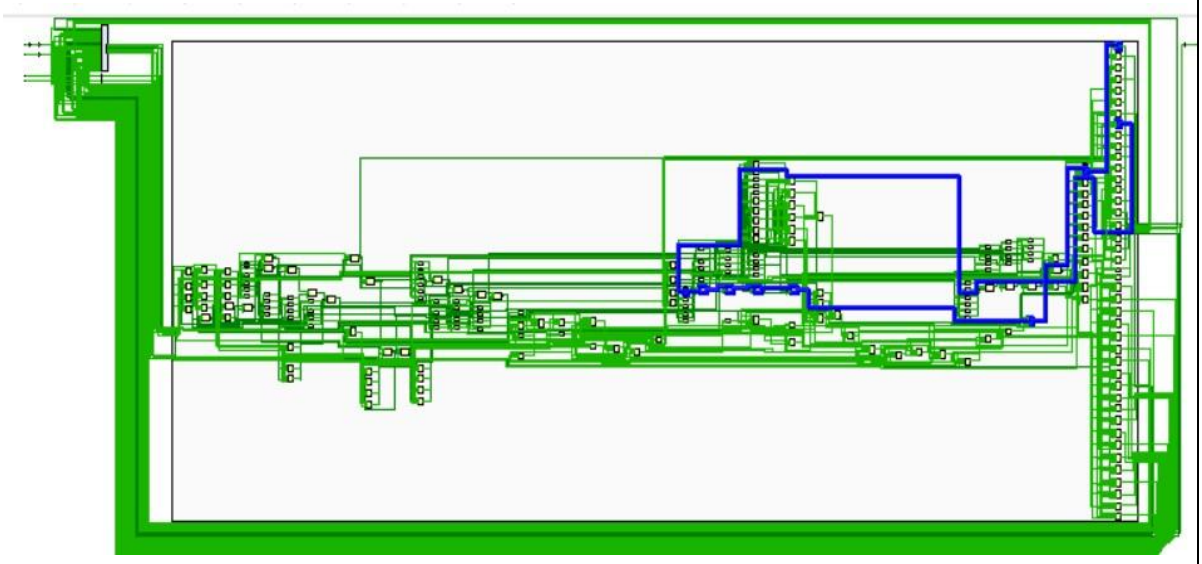




The encoding

timing report

The critical path:



Utilization report:

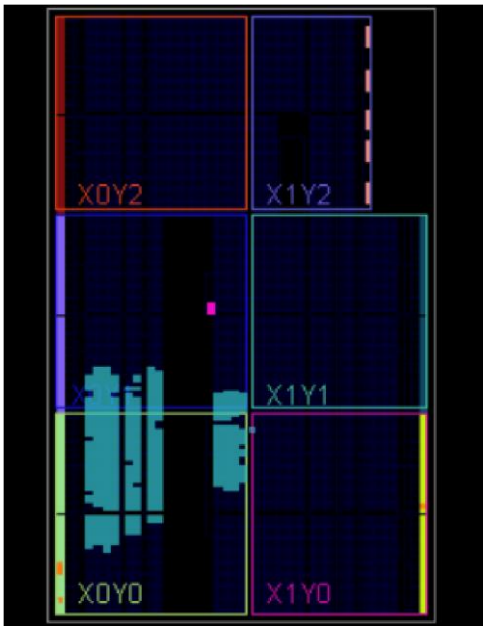
Name	Slice LUTs (20800)	Slice Registers (41600)	F7 Muxes (16300)	F8 Muxes (8150)	Slice (8150)	LUT as Logic (20800)	LUT Flip Flop Pairs (20800)	Bonded IOB (106)	BUFGCTRL (32)
SPI_WRAPPER	971	2124	268	134	756	971	14	5	1
dut1 (SPI)	128	58	0	0	53	128	5	0	0
dut2 (SPR_ASYNC_RA...	843	2066	268	134	720	843	8	0	0

Timing report (after implementation):

Setup		Hold		Pulse Width	
Worst Negative Slack (WNS):	2.042 ns	Worst Hold Slack (WHS):	0.170 ns	Worst Pulse Width Slack (WPWS):	4.500 ns
Total Negative Slack (TNS):	0.000 ns	Total Hold Slack (THS):	0.000 ns	Total Pulse Width Negative Slack (TPWS):	0.000 ns
Number of Failing Endpoints:	0	Number of Failing Endpoints:	0	Number of Failing Endpoints:	0
Total Number of Endpoints:	4248	Total Number of Endpoints:	4248	Total Number of Endpoints:	2122

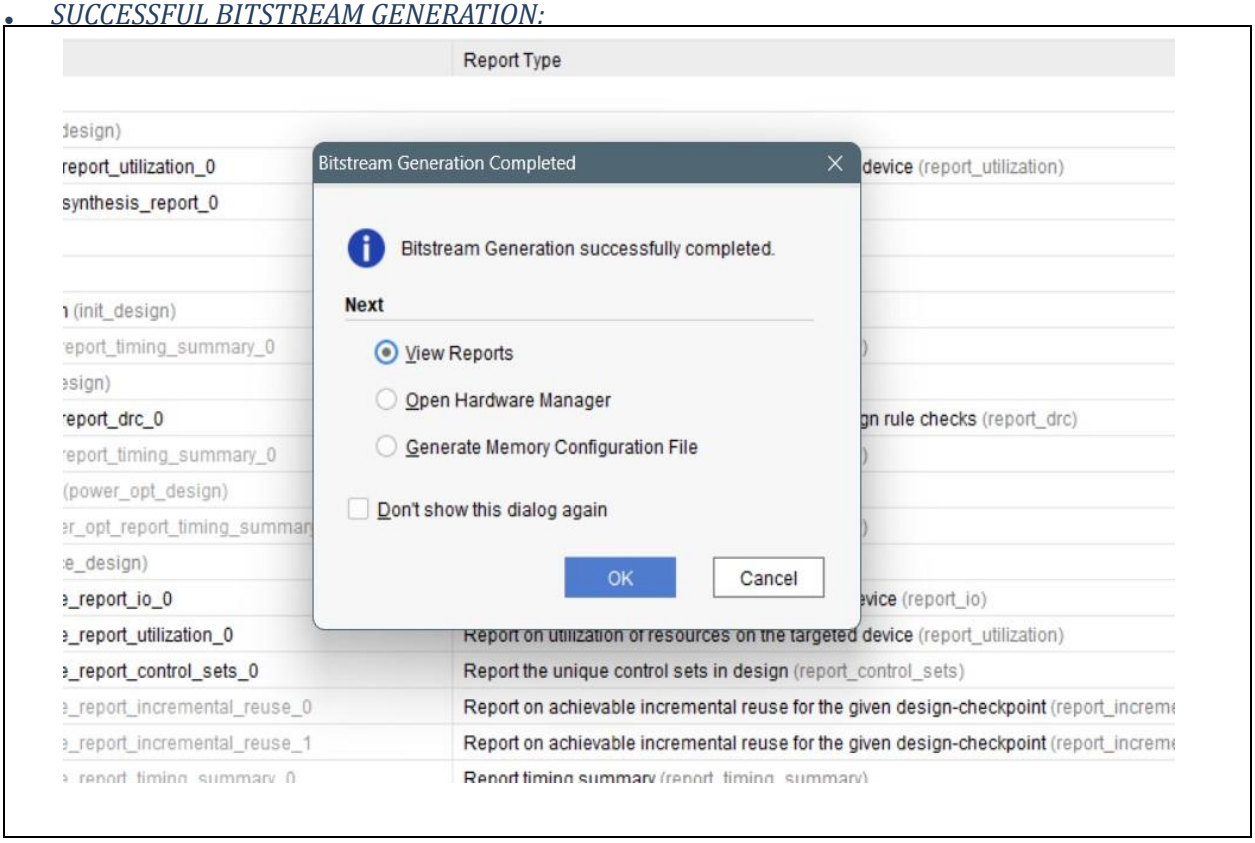
All user specified timing constraints are met.

Device:



- *MASSEGES:*

- *SUCCESSFUL BITSTREAM GENERATION:*



- *Setup and debugfor (one-hot) encoding (the best in timing report):*