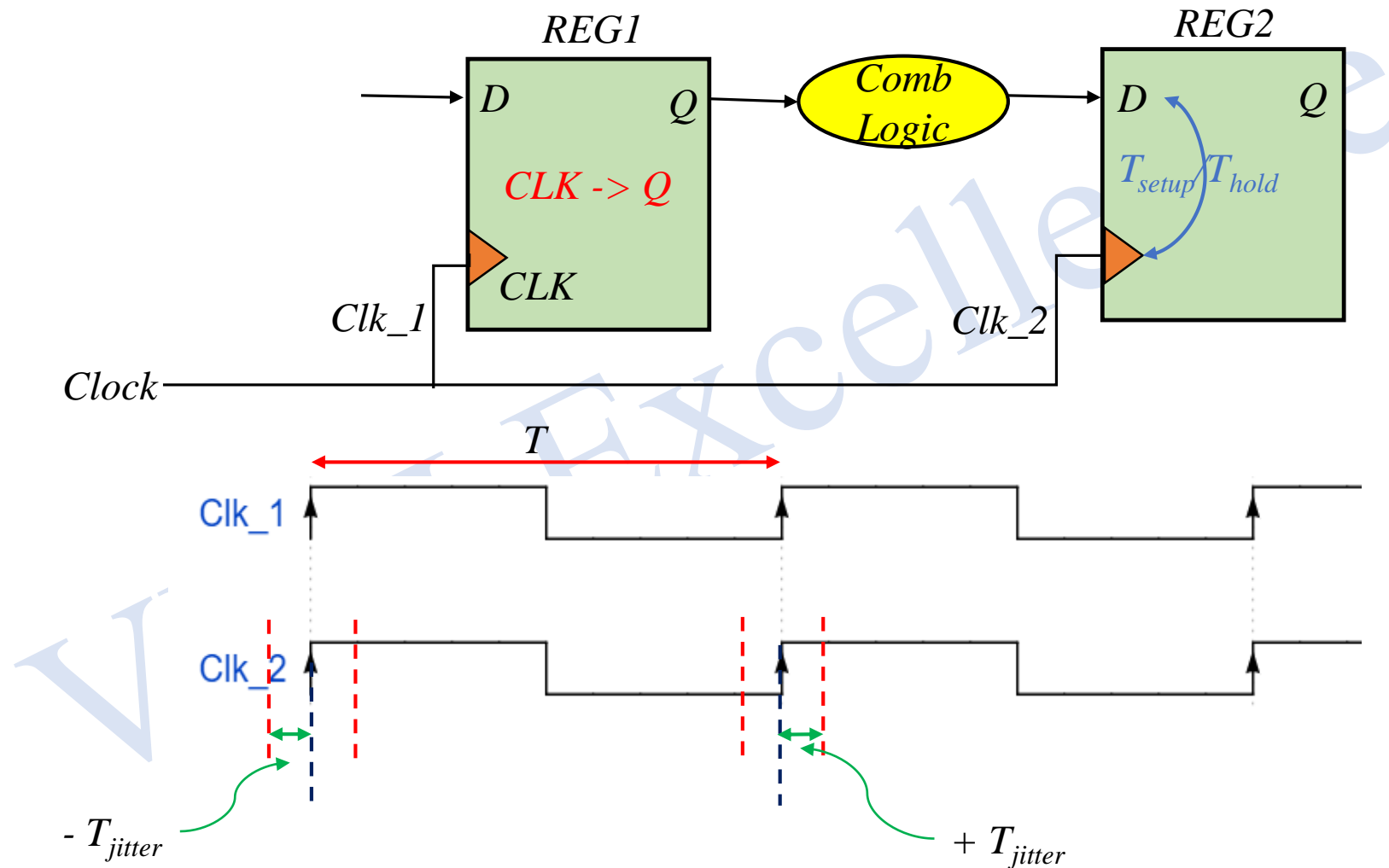


Static Timing Analysis (STA)

Lecture #14: Effect of Clock Jitter on Setup & Hold Timing Equations

Video Lecture [Link](#)

Static Timing Analysis (STA) – Setup & Hold Equations (with Clock Jitter)



Static Timing Analysis (STA) – Setup & Hold Equations (with Clock Jitter)

Setup Equation:

$$\text{Clk_to_Q [REG1]} + \text{Comb Delay} \leq \text{Clock Period} - 2T_{\text{jitter}} - T_{\text{setup}}[\text{REG2}]$$

$$\text{Clock Period} \geq \text{Clk_to_Q[REG1]} + \text{Comb Delay} + T_{\text{setup}}[\text{REG2}] + 2T_{\text{jitter}}$$

$$\text{Here, Required Time} = \text{Clock Period} - 2T_{\text{jitter}} - T_{\text{setup}}[\text{REG2}]$$

$$\text{Arrival Time} = \text{Clk_to_Q [REG1]} + \text{Comb Delay}$$

$$\text{Hence, Setup Slack} = \text{Required Time} - \text{Arrival Time}$$

Note: Clock Jitter Degrades the Performance (Setup)

Static Timing Analysis (STA) – Setup & Hold Equations (with Clock Jitter)

Hold Equation:

$$\text{Clk_to_Q [REG1]} + \text{Comb Delay} \geq \text{Hold_Check[0]} + T_{\text{hold}} [\text{REG2}] + 2T_{\text{jitter}}$$

$$\text{Here, Required Time} = \text{Hold_Check[0]} + T_{\text{hold}} [\text{REG2}] + 2T_{\text{jitter}}$$

$$\text{Arrival Time} = \text{Clk_to_Q [REG1]} + \text{Comb Delay}$$

$$\text{Hence, Hold Slack} = \text{Arrival Time} - \text{Required Time}$$

Note: Default Hold Check is at 0

Note: Clock Jitter **Degrades** the performance(T_{setup}) and also makes it **harder** to meet hold requirements

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Thanks !!