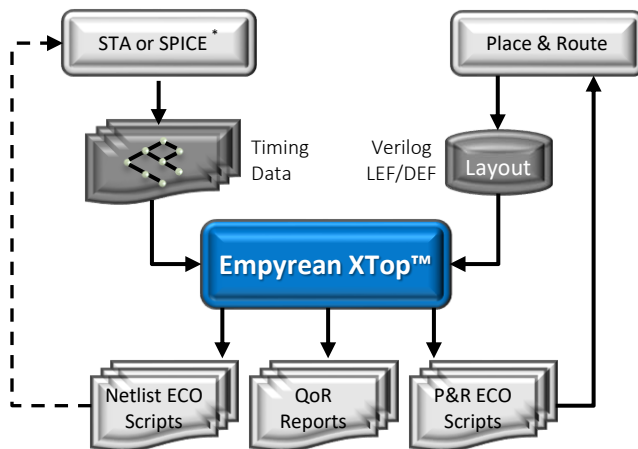


# Empyrean XTop™

## Efficiency-Driven, High Capacity Timing ECO



\*Empyrean XTime™ can provide SPICE accuracy timing calibration.

## Overview

Timing closure is a major challenge for SoC design, affecting both design quality and time to market. In advanced process nodes, very large-scale designs may contain hundreds of scenarios; dealing with huge timing data and making an optimization plan in a limited time is a challenge requiring intense focus and effort from designers. Advanced node SoC design 16nm and below, is exacerbated by process sensitivity. Automatic timing optimization cannot solve all timing problems completely, designers need to spend a lot of energy to implement timing ECOs manually.

Empyrean XTop™ provides a fast, high-capacity, and comprehensive ECO closure solution. XTop fixes timing violations in super large scale, multi-scenario, advance node designs. XTop provides an interactive ECO solution; through the analysis and localization of the bottleneck problem, designers can manually fix critical timing paths, greatly improving the efficiency of timing closure.

XTop has been adopted by leading international IC design companies as their sign-off timing closure solution and enabled hundreds of successful tape outs. XTop supports 16/14/10/7nm advanced processes nodes and are used in a variety of design types, such as mobile, PCs, servers, networks, media, IoT (Internet of things), mining machines, etc.

## Features and Benefits

- **Ultra Large Capacity**
  - ❑ Handle huge hierarchical design (100+M instances)
  - ❑ Handle timing closure with multi-scenario simultaneously (100+ MCMM)
- **High Efficiency Automated ECO Solution**
  - ❑ Fast ECO closure for setup and hold fixing, significantly reducing ECO iterations
  - ❑ Timing-aware DRC fixing for maximum transition, capacitance, fanout and wire length
  - ❑ Power reduction and area recovery without creating new timing violations
- **Flexible Interactive ECO Operation**
  - ❑ Built-in advanced timing analysis engine for quick identification of bottlenecks
  - ❑ Interactive ECO for fixing the last few critical paths
- **Strong Physically-Aware Engine**
  - ❑ Support 28/16/12/10/7nm processes
  - ❑ Good at complicated design with high density and high congestion

## Functionality

### High Efficiency Automated ECO Closure Solutions

#### ECO Solution

- Setup Timing
- Hold Timing
- Max Transition
- Max Capacitance
- Max Fanout
- Design Area
- Leakage Power

### Advanced Timing Analyzer

#### Main Function

- Refine bottleneck and efficient point
- Show more valid information on Path View
- Real-time cross-probing between timing path and layout

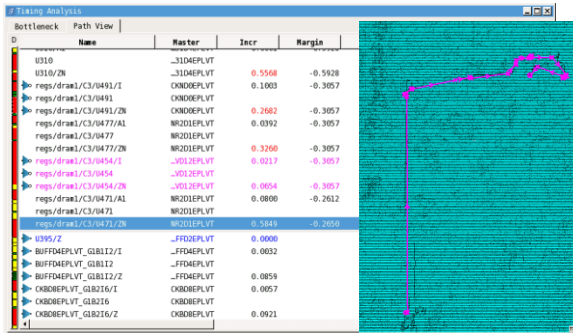


Fig1. Cross Viewer of Path View and Layout

### Flexible Interactive Graph-Based ECO Operation

#### Supports Manual ECO

- Insert buffer (chain)
- Remove buffer
- Size cell
- Move cell
- Split load/net
- Connect clock tree

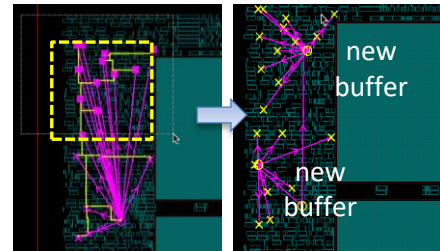


Fig2. ECO Action for Split load

## Specifications

### Input/Output

- Input: Verilog, DEF, LEF, Liberty, STA timing data
- Output: ECO scripts

### Flow Integration

- Industry leading EDA design environment
- Command line mode

### Supported Platforms

- X86 64-bit:
  - Red Hat Enterprise V4, V5, and V6

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