Timing-Driven Compilation Improvements in MAX+PLUS II Version 8.2

Timing-driven compilation has improved significantly in the MAX+PLUS® II version 8.2 development software. This technical brief discusses specific design performance improvements.

Timing-Driven Compilation Improves Design Performance

Altera Applications compiled over 40 customer designs of varying complexity using MAX+PLUS II version 8.2 and found that when timing-driven compilation was enabled, average design performance increased by 25%. However, improvement in design performance is dependent on device utilization. Table 1 summarizes the expected design performance improvements for different levels of device utilization.

Table 1. Expected Design Performance Improvements with Timing-Driven Compilation

Device Utilization	Expected Performance Improvement
Less than 50%	30%
More than 50%	15 to 20%

Table 2 below shows average design performance improvements using different versions of the MAX+PLUS II development software.

Table 2. Average Design Performance Improvements with Timing-Driven Compilation

MAX+PLUS II Version	Expected Design Performance Increase *Note (1)*
8.1	8%
8.2	25%

Note:
(1)　Baseline performance (without timing-driven compilation enabled) is the same in MAX+PLUS II version 8.1 and 8.2.

Feature Enhancements Improve Efficiency

The following features, added to MAX+PLUS II version 8.2, improve timing-driven compilation:

■　Enhanced critical path estimation and selection
■　Dynamic weight allocation during partitioning

Compilation Times

In general, designs with higher device utilization take longer to compile. When devices are fully utilized (i.e., device utilization is high), the MAX+PLUS II software works harder to fit the design while ensuring that all timing constraints are met. When timing-driven compilation is enabled, the average compilation time increases by a factor of 10.

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