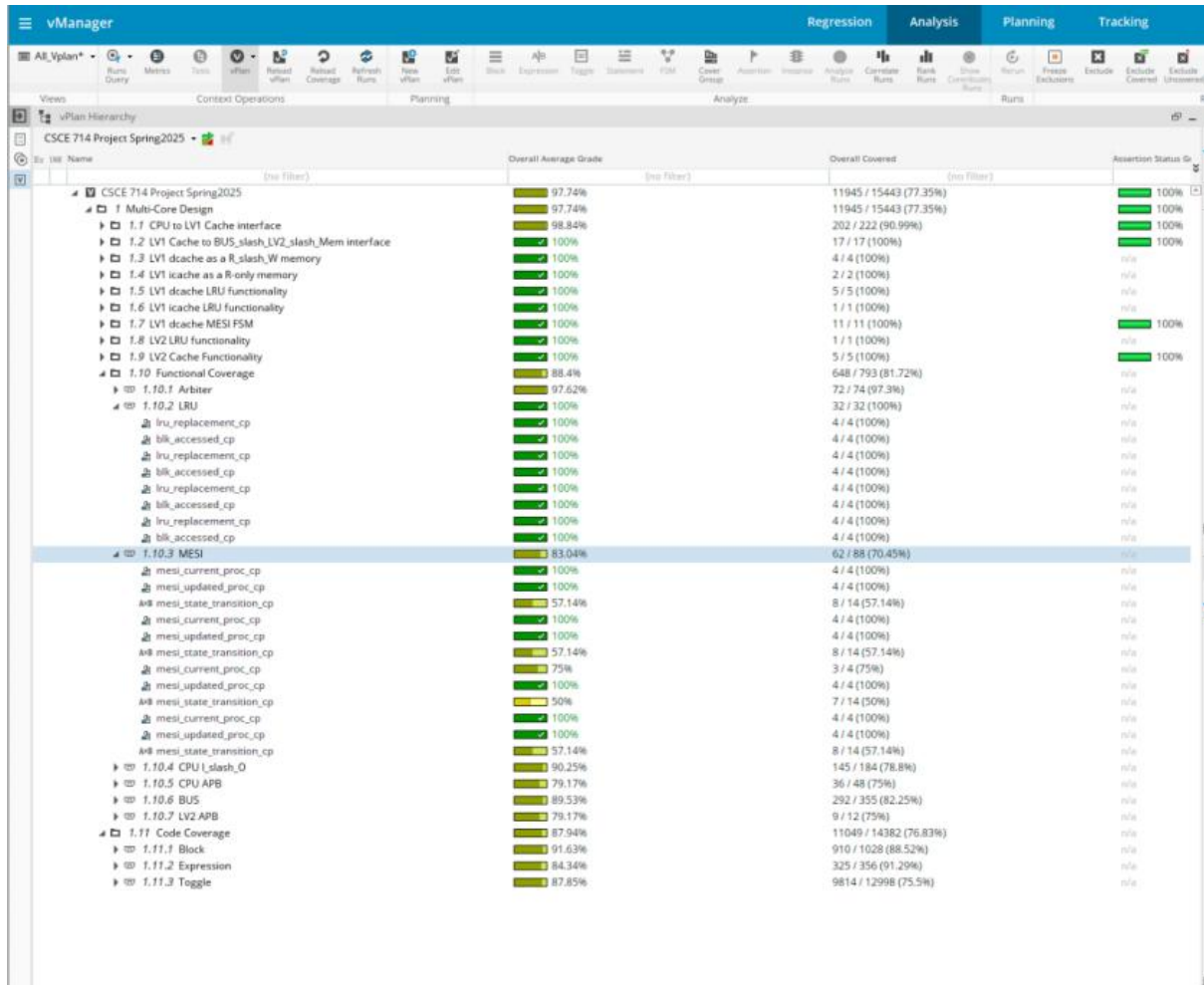


COVERAGE REPORT



Functional coverage was implemented to ensure all key behaviors of the MESI protocol and LRU replacement policy were thoroughly exercised.

For the LRU policy, **coverpoints** were defined for different LRU states across all four cores. Each of the four cache blocks was either accessed or evicted in every core, confirming full coverage of all possible LRU state transitions.

For the MESI protocol, coverpoints were written for both the current and updated MESI states within each core. A **cross coverage** between current and updated states was used to capture all valid state transitions. **Illegal bins** such as $M \rightarrow E$ and $S \rightarrow E$ were defined to exclude invalid transitions from the coverage metrics.

In addition to **functional coverage**, **code**, **toggle**, and **block coverage** were collected and mapped. The combined results demonstrate comprehensive verification of protocol behavior, as shown in the attached coverage summary screenshot.