ABSTRACT

SPECULATIVE HISTORY MECHANISM IN A BRANCH TARGET BUFFER

A branch prediction mechanism that maintains both speculative history and actual history for each branch instruction in a branch target buffer. The actual branch history contains the branch history for fully resolved occurrences of the branch instruction. The speculative branch history contains the actual history plus the "history" of recent branch predictions for the branch. If the speculative branch history contains any recent predictions, then a speculation bit is set. When the speculation bit is set, this indicates that there is speculative history for a branch. Therefore, when the speculation bit is set the speculative history is used to make branch predictions. If a misprediction is made for the branch, the speculation bit is cleared since the speculative history contains inaccurate branch history.

(Figure 6)