

Branches are Always a Problem!

- Even unconditional branches must be decoded!
- If branch is taken, some delay
 - New address must be computed, fetched
 - New instruction stream must be decoded
- If branch is not taken, maybe no delay

More Techniques

- Fetch down both paths?
 - Too much bandwidth
- Special cache for branch targets (BTB)

Predicting Branch

- Predicting a branch decision
 - Software hint (instruction type)
 - History

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PRESENTATION

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- If branch is predicted taken
 - fetch down new path
 - execute instructions, with ability to abort
- If branch is predicted not taken
 - Continue as if no branch
 - Execute instructions, with ability to abort

Branch Prediction

- Static Prediction
 - Hardware
 - Software Hint
- Dynamic Prediction
 - Recent history of this branch
 - Including how we got here (Correlation)