

Cyber 180/990

- ECL gate arrays
- 65ish Mhz
- Commodity: 1-5Mhz
- Pipelining
 - Fetch: 6 cycles
 - Branch resolution 5 cycles
 - Integer execution < 5

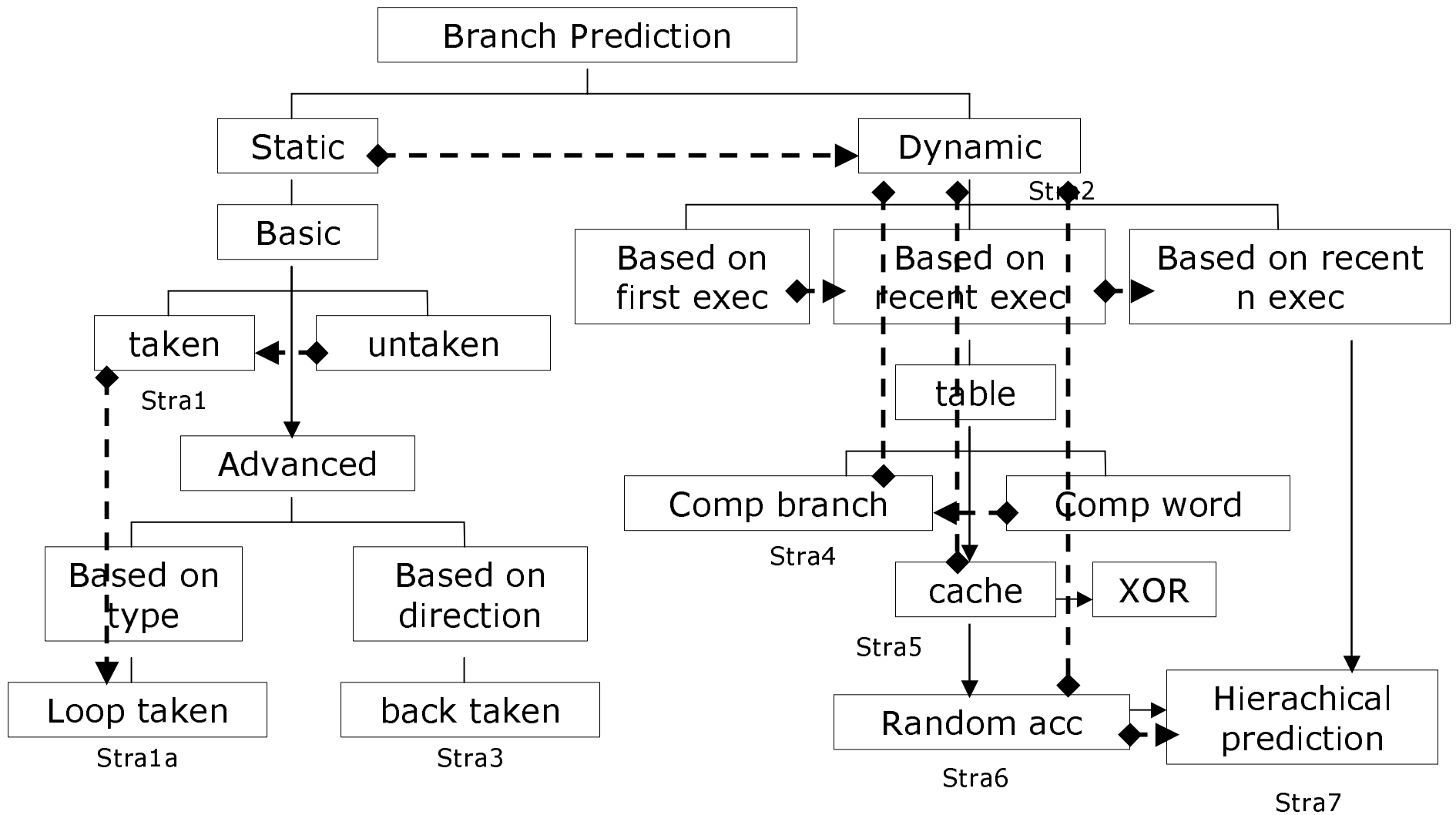
Branch prediction: what and why

- Why
 - Not stop fetching
 - Incomplete knowledge of branch outcome
- What
 - Guess
 - Statistical skews, set of rules, state
 - Known state (within reason)
 - Guess fast and with small state

What do you do on a mispredict?

- Flush and restart
 - 3-5 cycle penalty
 - Flush speculative stores

(swiped from Luna)



What else can we do besides predict?

- Stall
- Fetch down both sides
 - 2^n bad
 - Confidence estimation