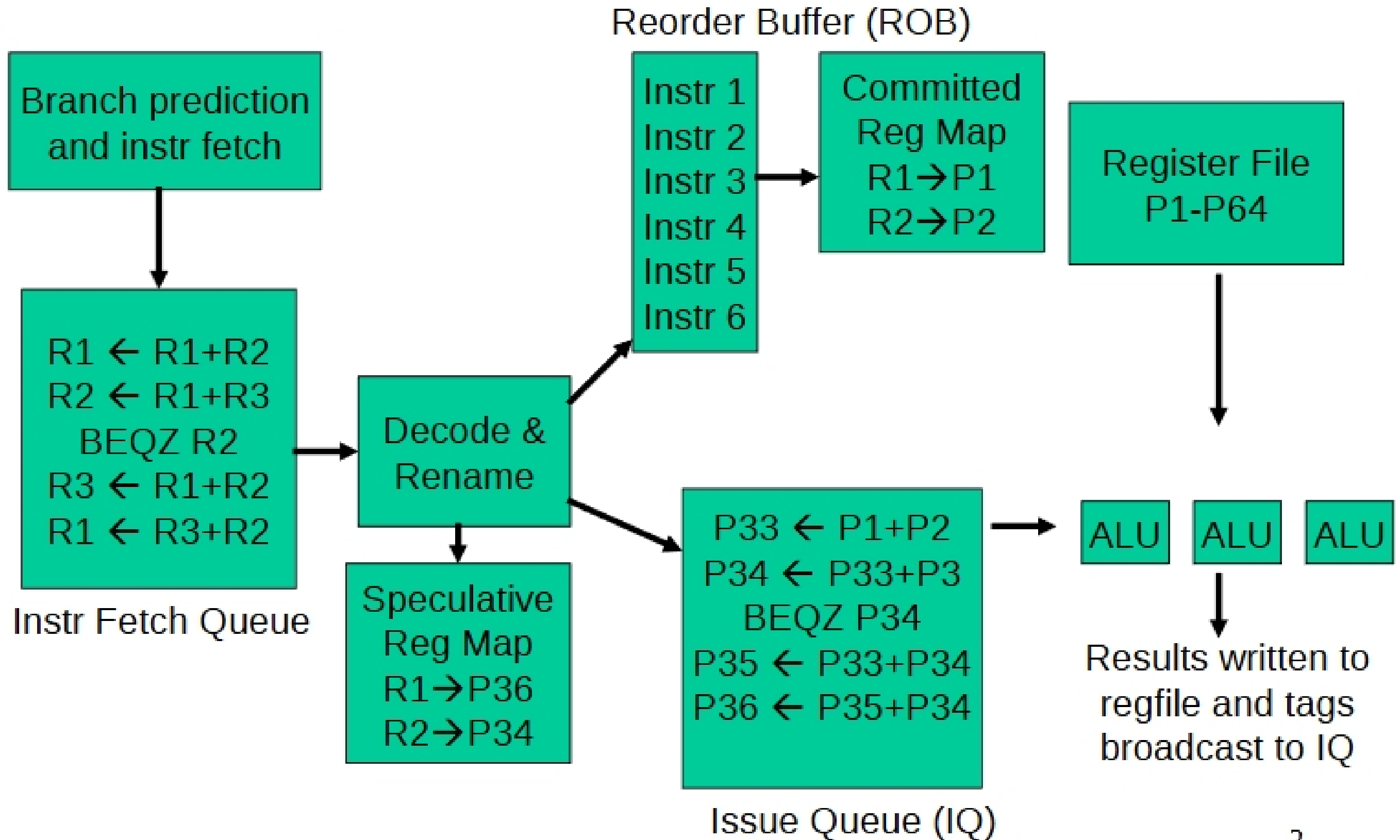


# Lecture 18: Core Design

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- Today: basics of implementing a correct ooo core:  
register renaming, commit, LSQ, issue queue

# The Alpha 21264 Out-of-Order Implementation



# Rename

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A  $lr1 \leftarrow lr2 + lr3$   
B  $lr2 \leftarrow lr4 + lr5$   
C  $lr6 \leftarrow lr1 + lr3$   
D  $lr6 \leftarrow lr1 + lr2$

RAR  $lr3$

RAW  $lr1$

WAR  $lr2$

WAW  $lr6$

A ; BC ; D

pr7  $\leftarrow pr2 + pr3$   
pr8  $\leftarrow pr4 + pr5$   
pr9  $\leftarrow pr7 + pr3$   
pr10  $\leftarrow pr7 + pr8$

RAR  $pr3$

RAW  $pr7$

WAR  $x$

WAW  $x$

AB ; CD