HPS, A NEW MICROARCHITECTURE: RATIONALE AND INTRODUCTION

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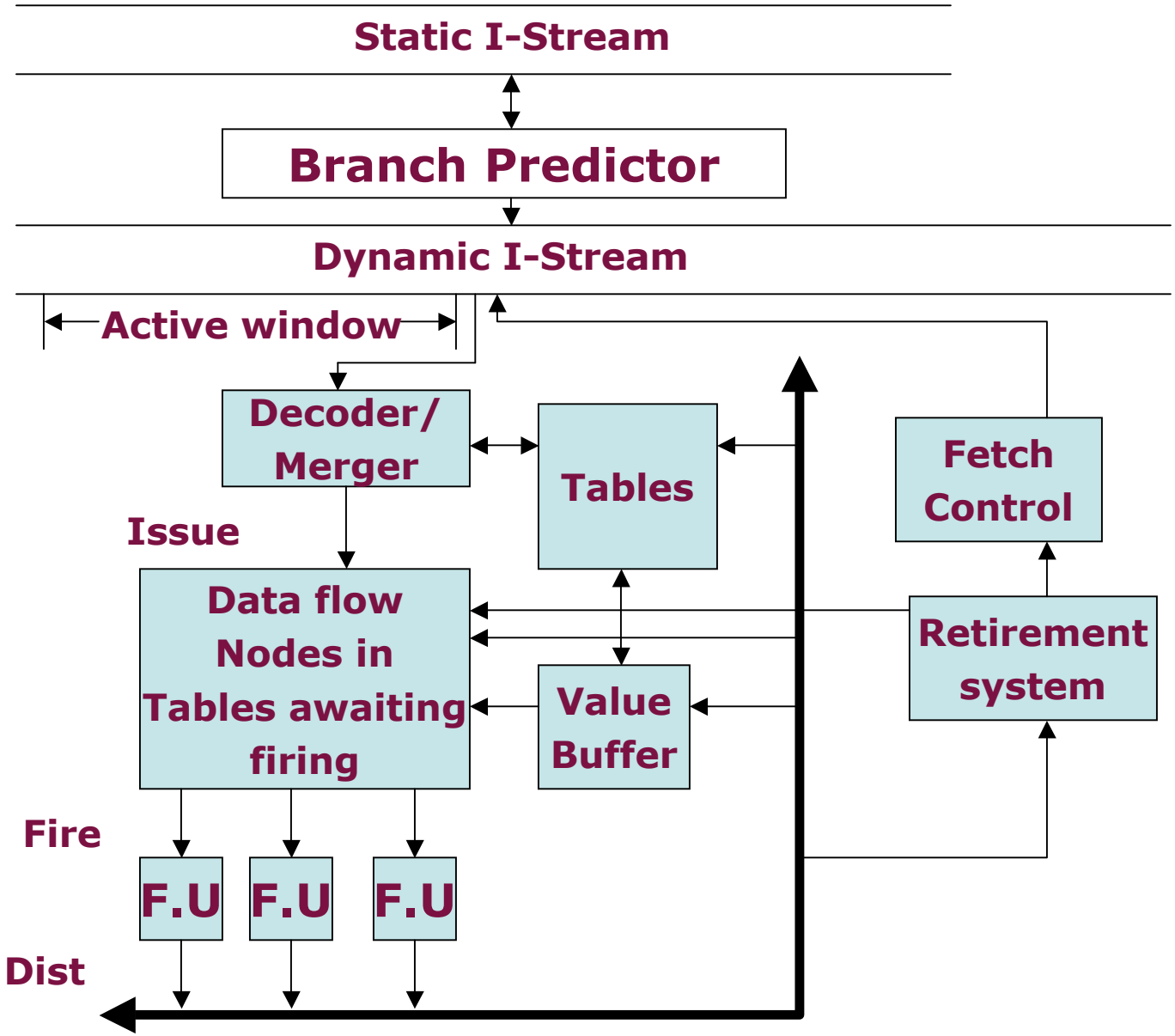
HPS (High Performance Substrate)

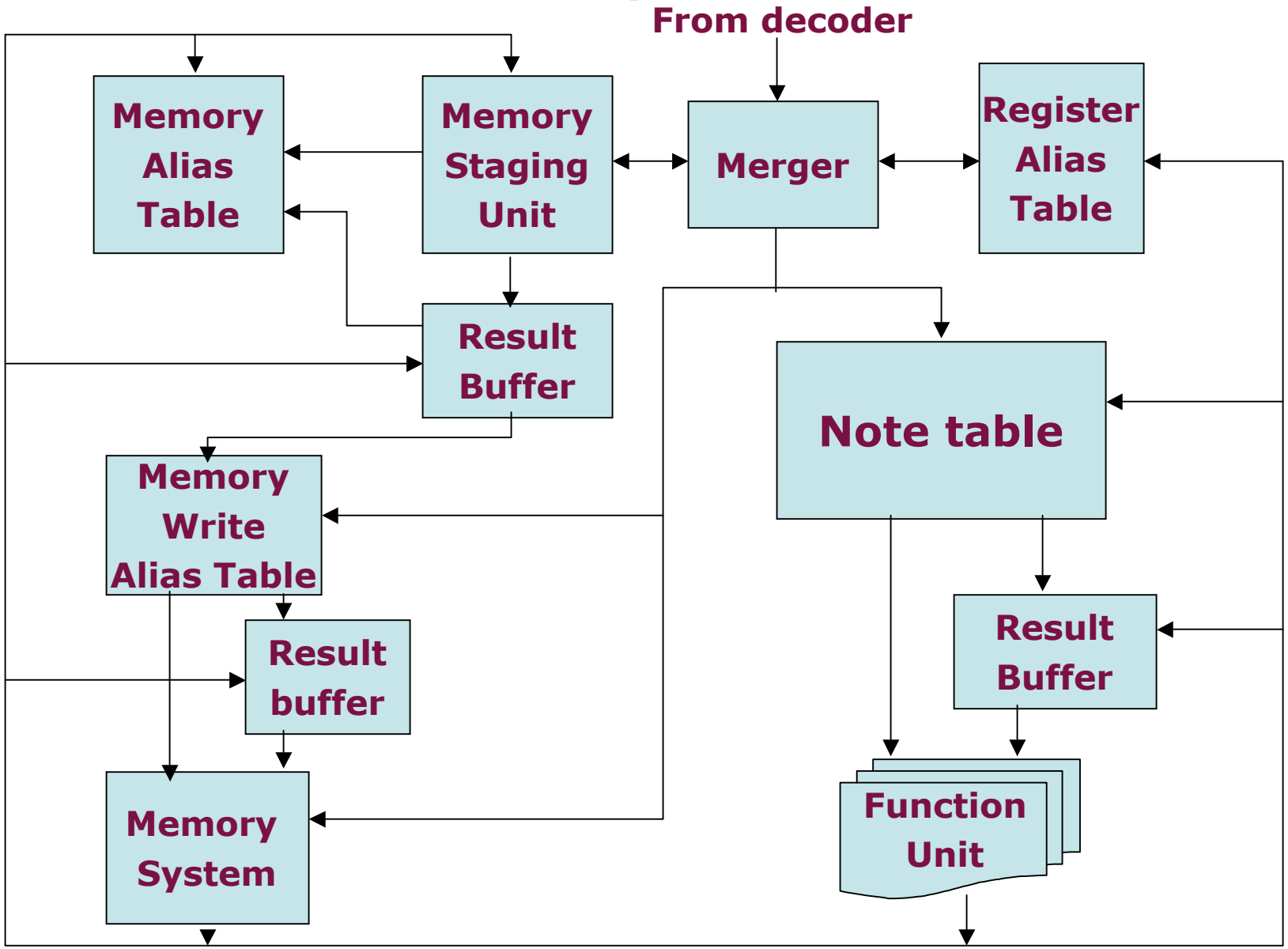
- A Micro-architecture for High Performance Computing
- Restricted Data Flow
  - Only a small subset of the entire program is in the HPS micro-engine at any one time
    - Active window

Abstract view of HPS



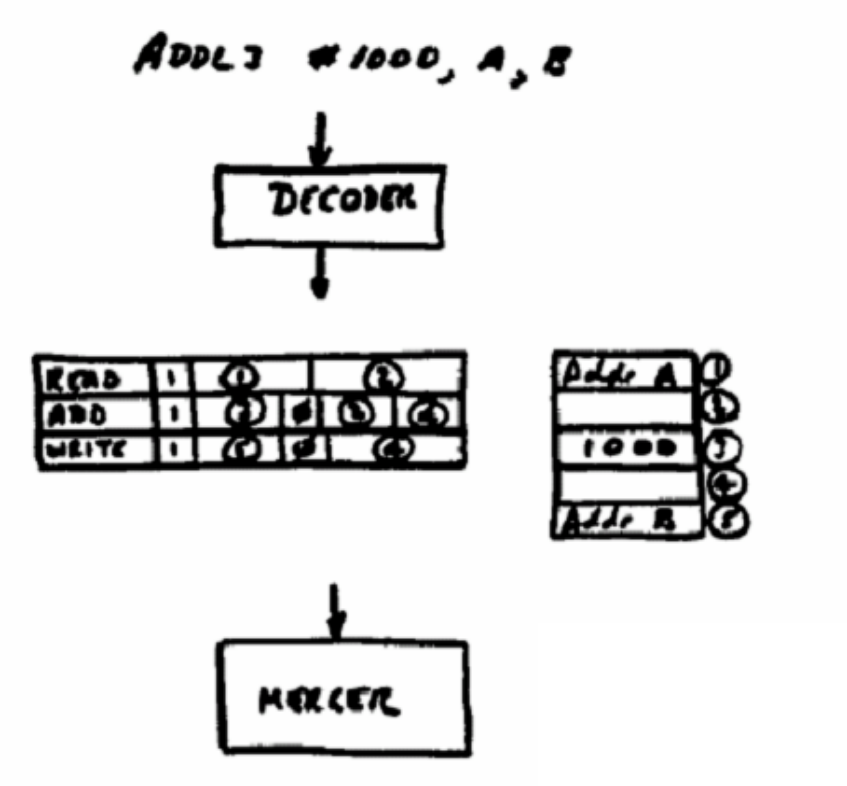
http://pplab.snu.ac.kr/courses/pa03/notes/HPS.**ppt**

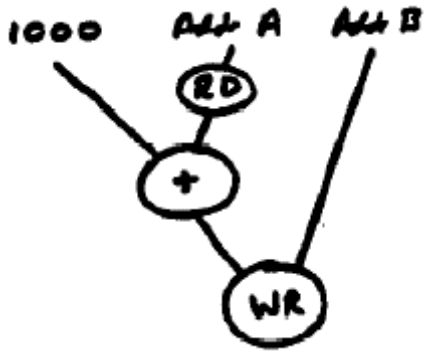
Global data path of HPS



http://pplab.snu.ac.kr/courses/pa03/notes/HPS.**ppt**

An Example From the VAX





Three kinds of Dependencies

- Data Dependency (RAW)
- Anti Dependency (WAR)
- Output Dependency (WAW)
- Solve the last two kinds of dependencies by using a modified Tomasulo algorithm

Critique

- Pros
  - Out-of-order execution capability
  - A modified Tomasulo algorithm is proposed
- Cons
  - Figures are very unclear
  - No experimental results

Question

- What is the performance?
- Is it still practical now or in the future?
- How to deal with the high bandwidth requirement?