

Textbook: VLSI ARRAY PROCESSORS
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開發圖書

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Chapter 6 **System and Software Design**

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- 6.1 Introduction
- 6.2 System Organization
- 6.3 Matching Algorithms to Arrays
- 6.4 Fault-Tolerance on VLSI Array Processors
- 6.5 Programming Languages for Array Processors
- 6.6 CAD for Array Processors
- 6.7 Concluding Remarks
- 6.8 Problems

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■ In Chapter 6

1. We will address: **“How to incorporate these arrays into an overall computing system.”**
2. An array processor may be used either as a **accelerator** attached to a compatible host machine or as a **stand-alone machine** equipped with a global control processor.

■ A Desirable Features of an Array Processor System

1. High-Speed Performance
2. Cost-Effectiveness
3. Flexibility: Programmability and Configurability
4. Reliability: Fault-Tolerance System
5. Software Support

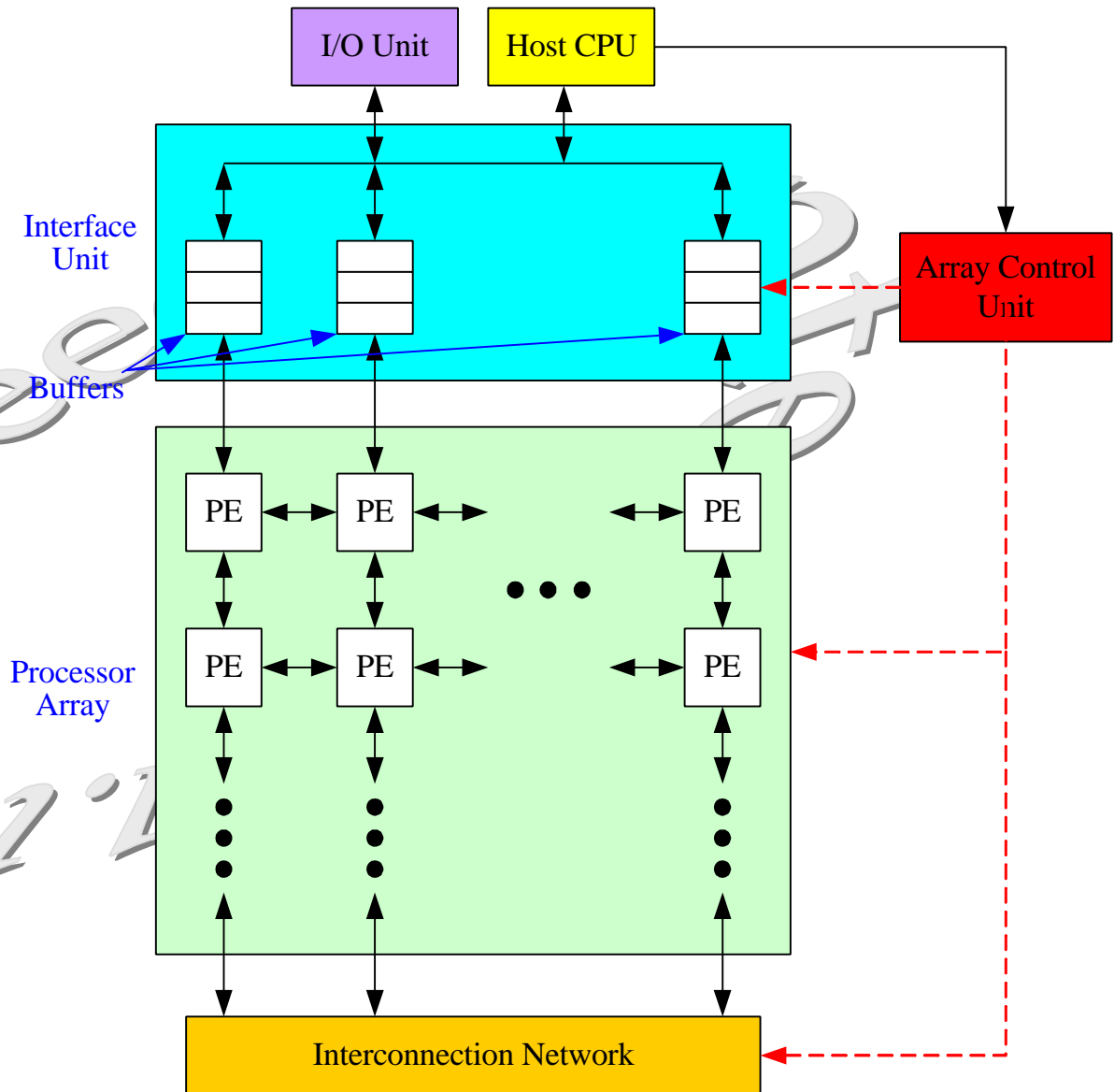
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■ Four Major Components of a System

1. Host Computer and/or array control unit
2. Interface Unit
3. PE Array(s)
4. Interconnection Network(s)

6.2 System Organization

■ Configuration of a System



- **Host Computer and Array Control Unit:**

The host computer should provide system monitoring, data storage, management, and formatting, determine the schedule program that controls all the system units, and generate global control codes and object codes of PEs.

■ Host Computer and Array Control Unit:

- 1. Array Control Unit:** The host computer generates control codes to coordinate all system units. The ACU follows the schedule commands to perform data rearrangement and direct data-transfer traffic, so that parallel processing tasks are timely assigned to the appropriate array processor modules.
- 2. Data Formatting/Storage Management:** Conversion and Transfer the Data Types. Management Data Storage.

- **Host Computer and Array Control Unit:**

3. Operation System: In order to provide a complete programming environment for the user, there is need for disk I/O support, terminal I/O support, resource management (CPU, arrays, memory, I/O device), protection form unauthorized accesses, multi-user and multitasking capability and virtual memory management.

- **Development a application program on a operation system must support:**
 1. **Software Development:** Programming Language, Compiler
 2. **Test and Debugging:** Target Array Architecture Simulator, Debugger
 3. **Code Downloading**
 4. **Run Time Support**