

Arquitetura e Organização de Computadores I

Computador como um Sistema

Prof. Pedro Frosi Rosa, PhD

Professor Titular

Faculdade de Ciência da Computação
Universidade Federal de Uberlândia



Computer System

- Consiste dos seguintes componentes:
 - Processador;
 - Memória;
 - I/O; e,
 - Sistema de interconexão.
- Podemos entender seu funcionamento pelas:
 - interface dos componentes; e,
 - estrutura de interconexão destes componentes.

Computer Function

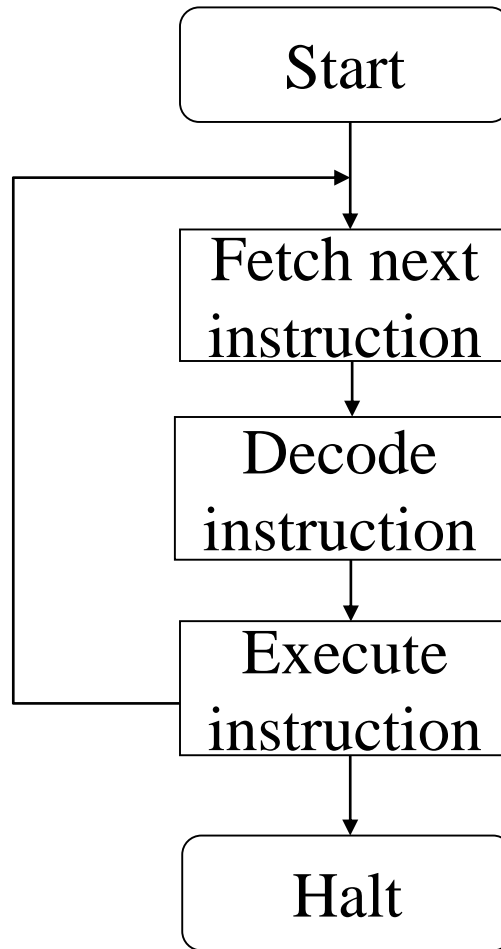
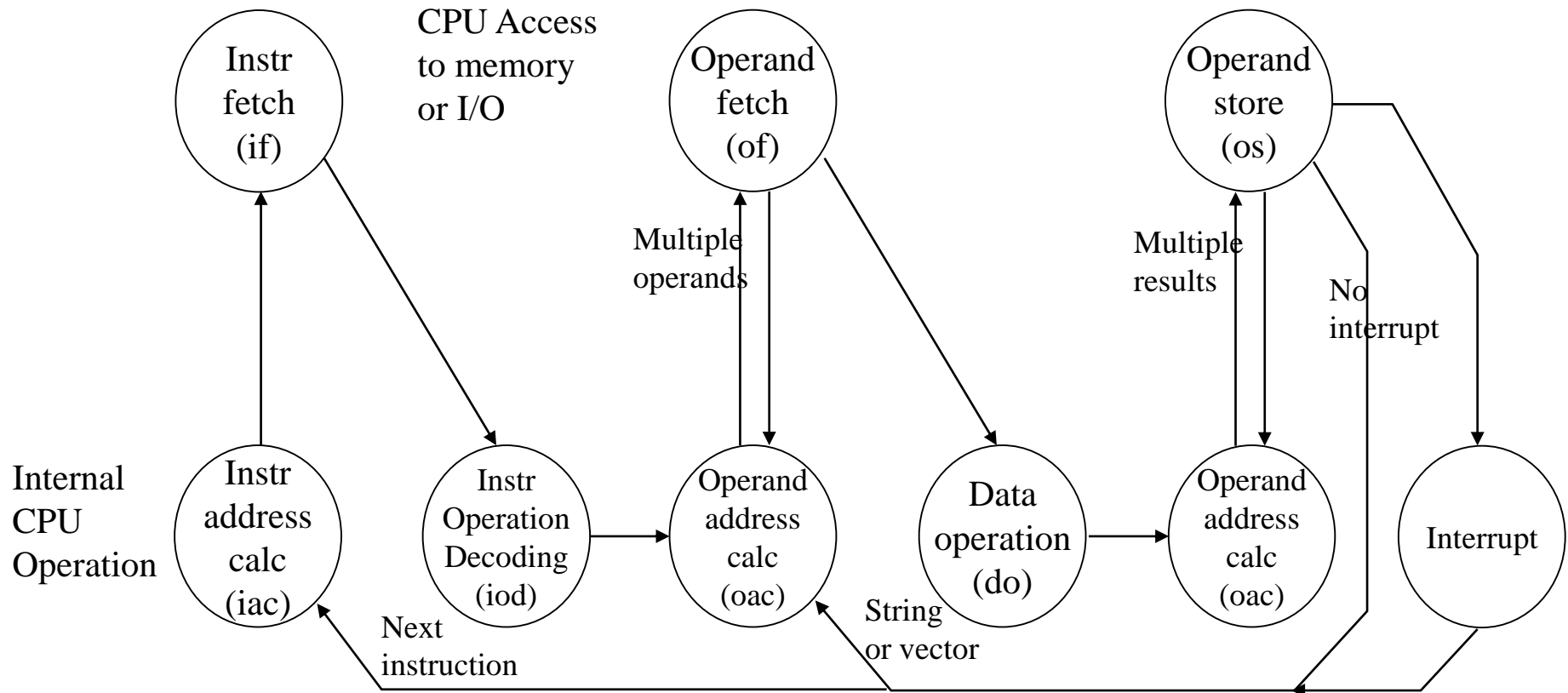
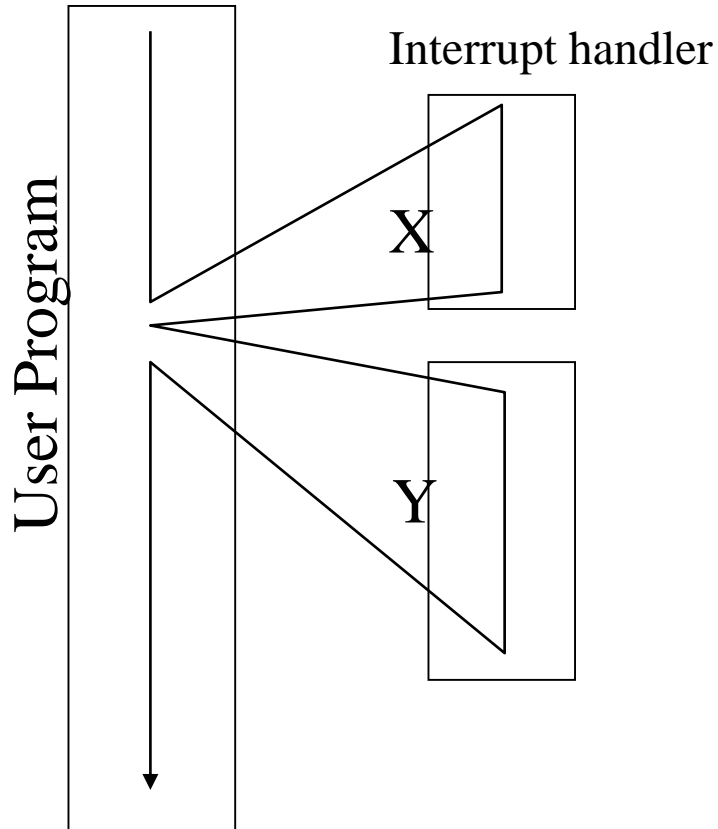


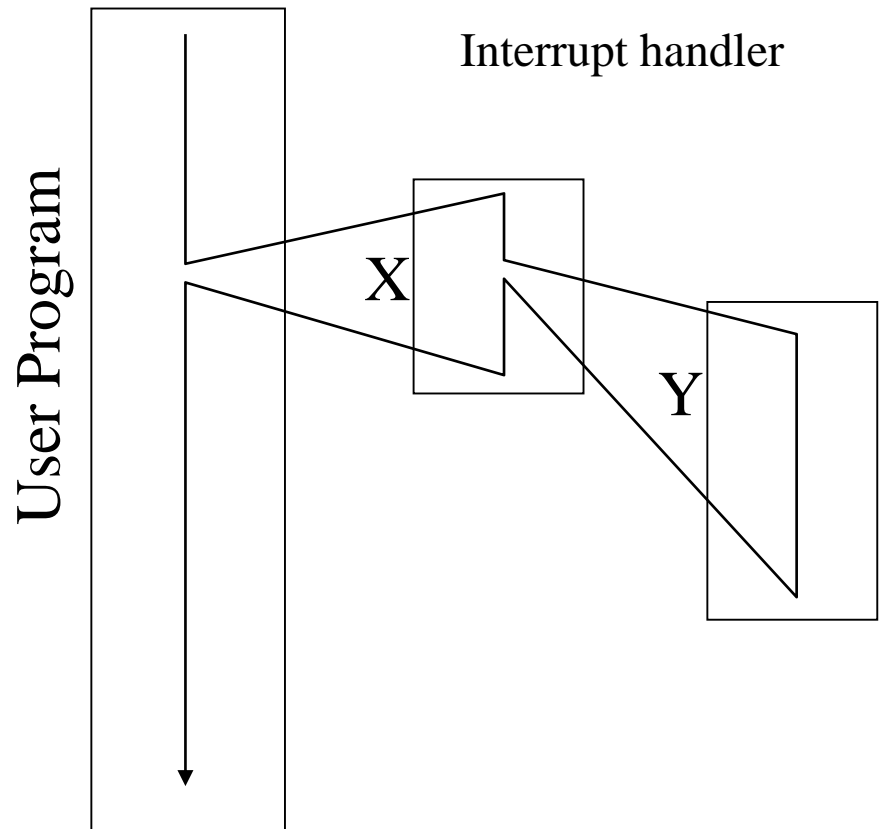
Diagrama de Estado de um ciclo de instrução



Multiple Interrupts

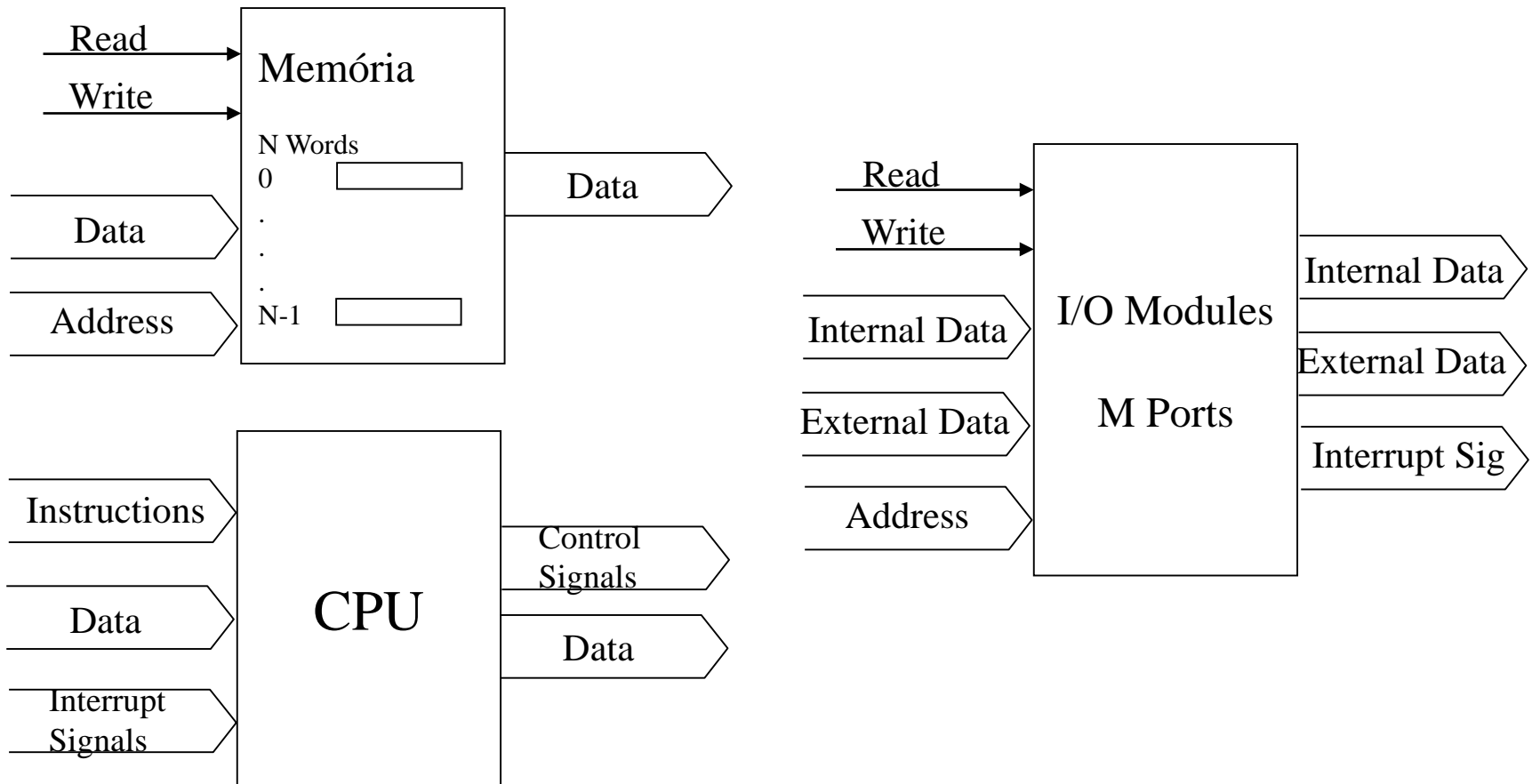


a) sequential

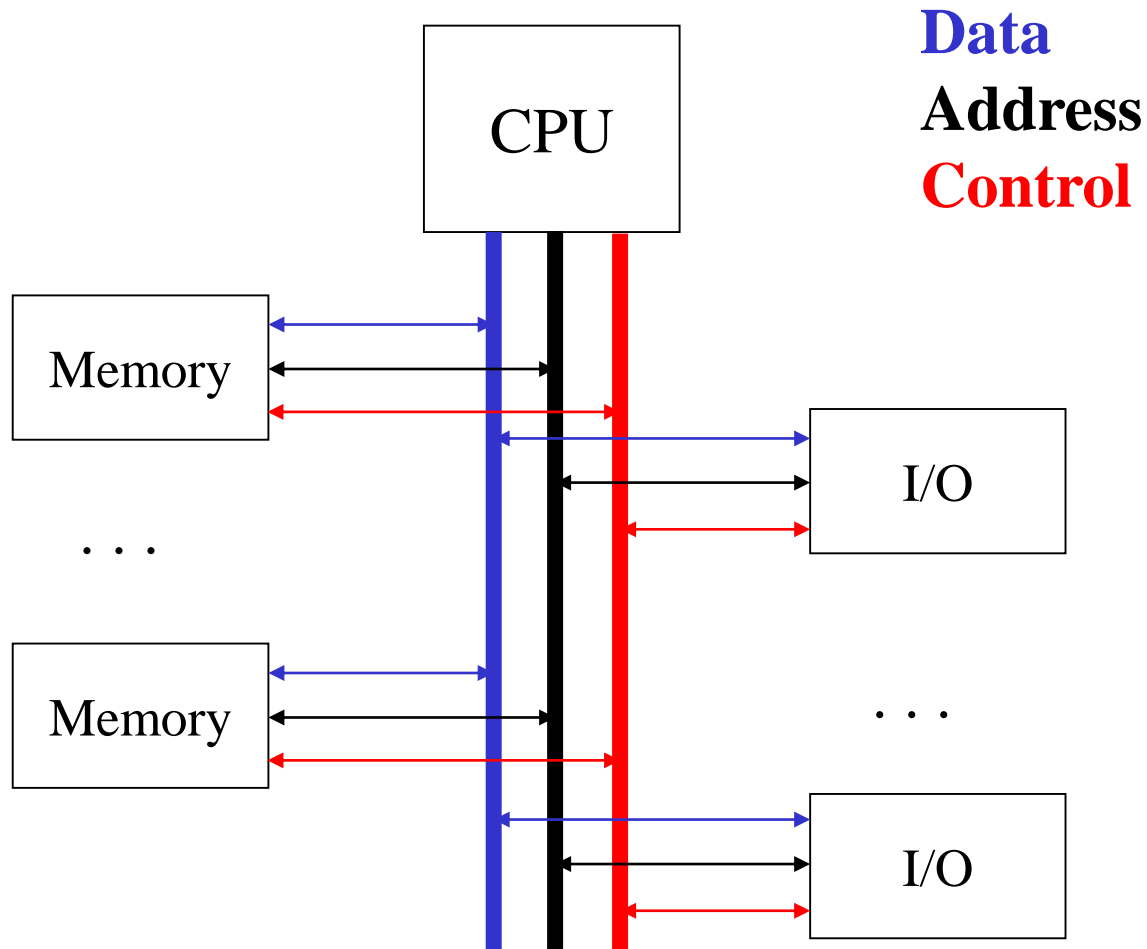


b) nested

Módulos do Computador



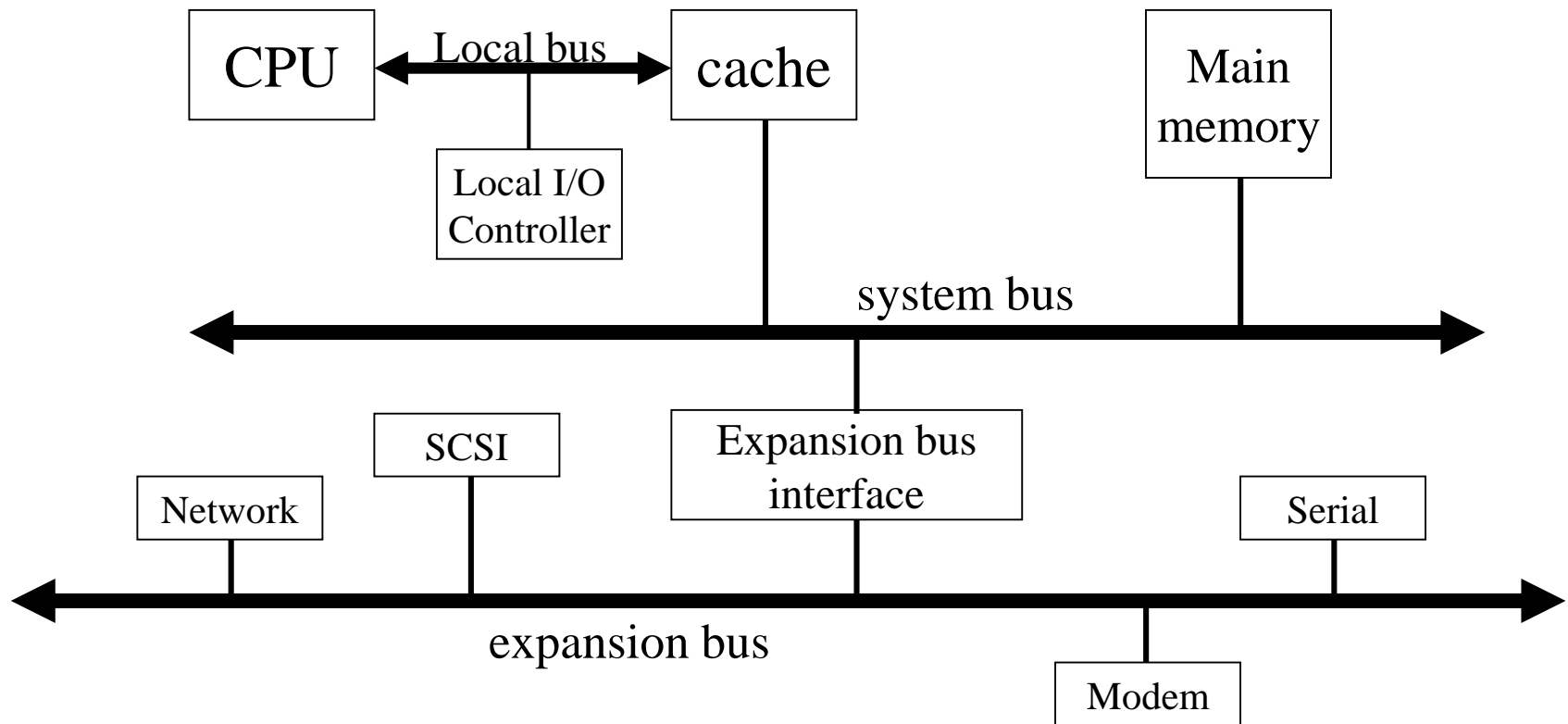
Bus interconnection scheme



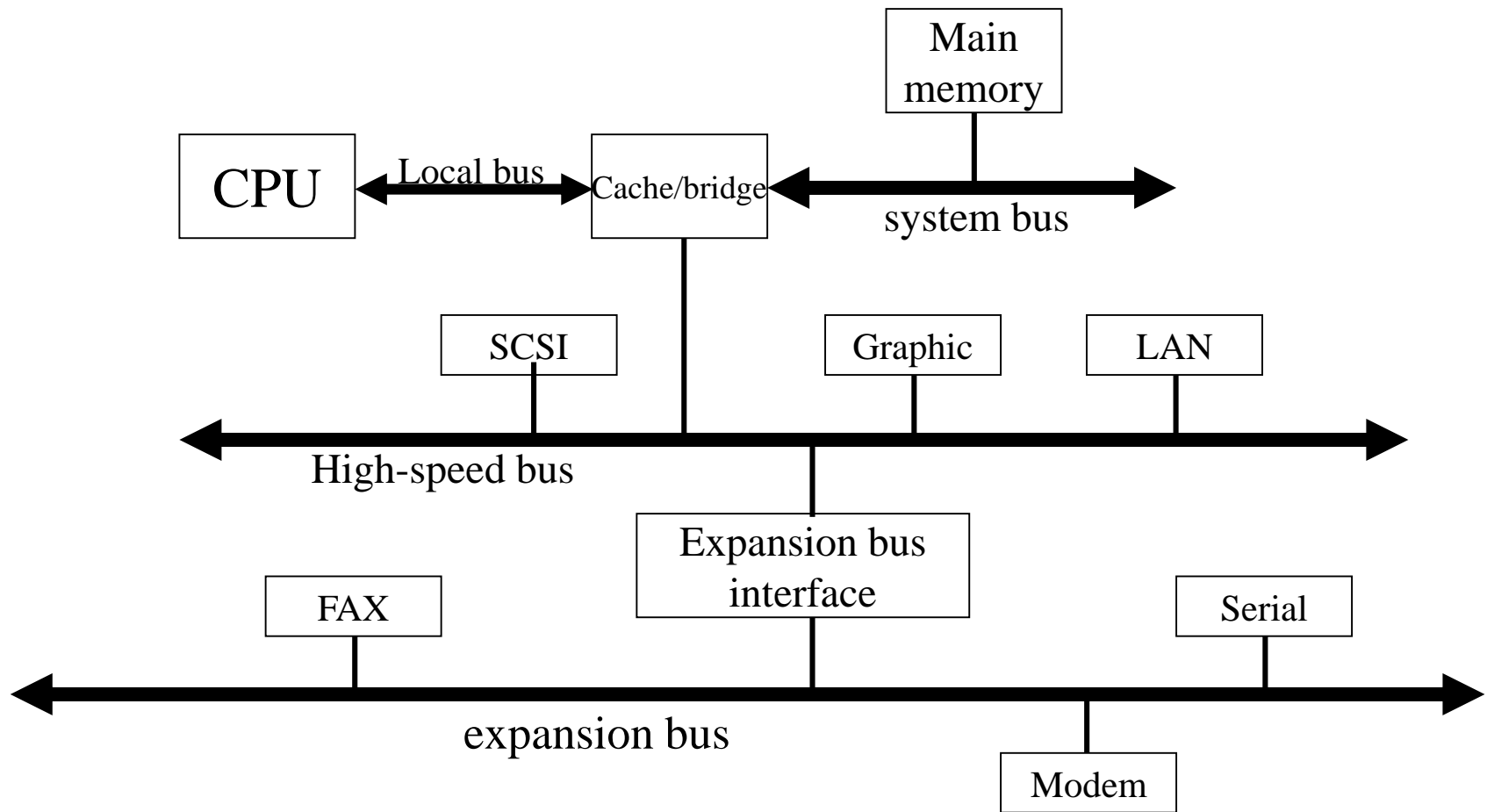
Operações Típicas

- Memory write
- Memory read
- I/O write
- I/O read
- Transfer ack
- Bus request
- Bus grant
- Interrupt request
- Interrupt ack
- Clock
- Reset

Arquitetura tradicional



Arquitetura de alto desempenho



Elementos do Projeto de Barramento

Tipo

Dedicado

Multiplexado

Método de arbitragem

Centralizado

Distribuído

Temporização

Síncrono

Assíncrono

Tipo da Transferência Dados

Read

Write

Read-modify-write

Read-after-write

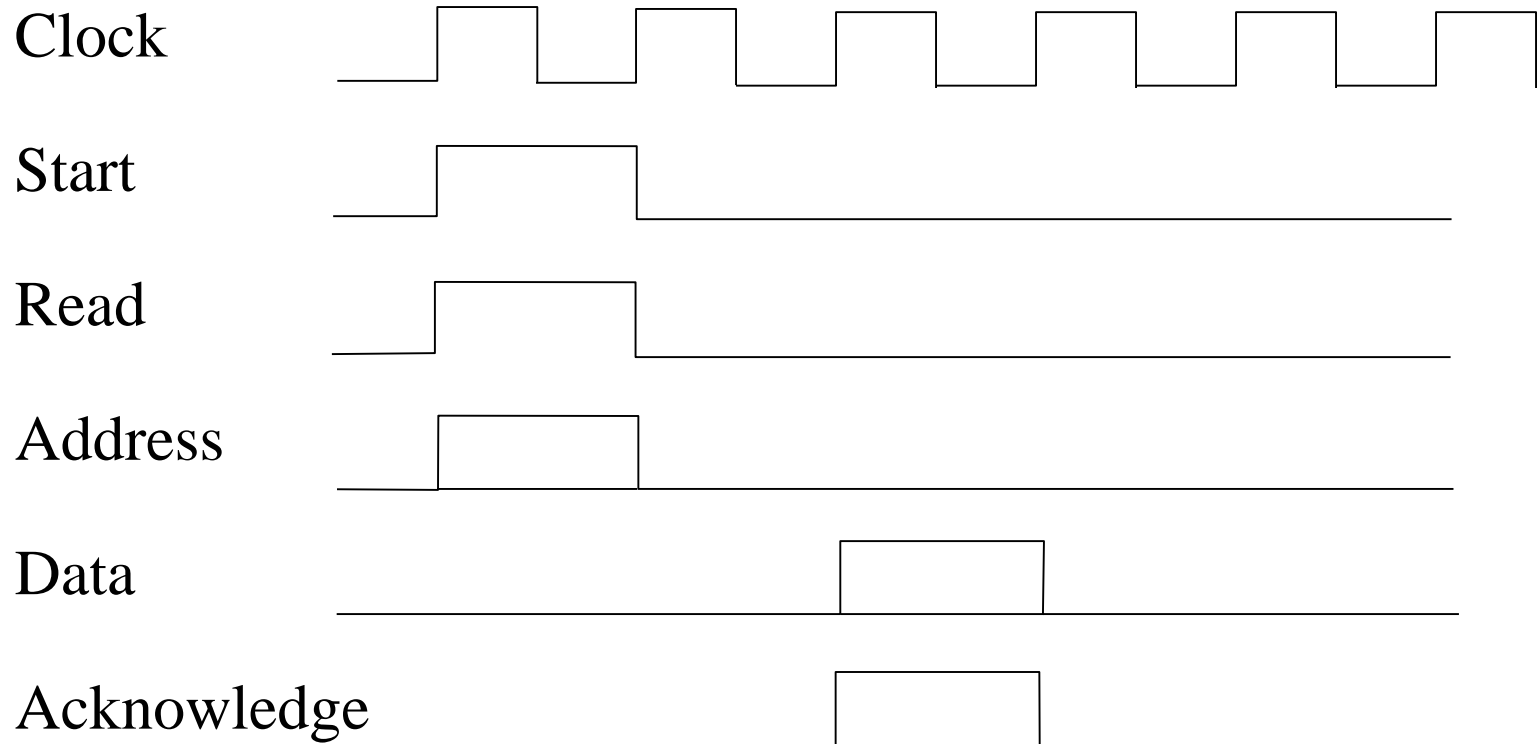
Block

Largura das vias

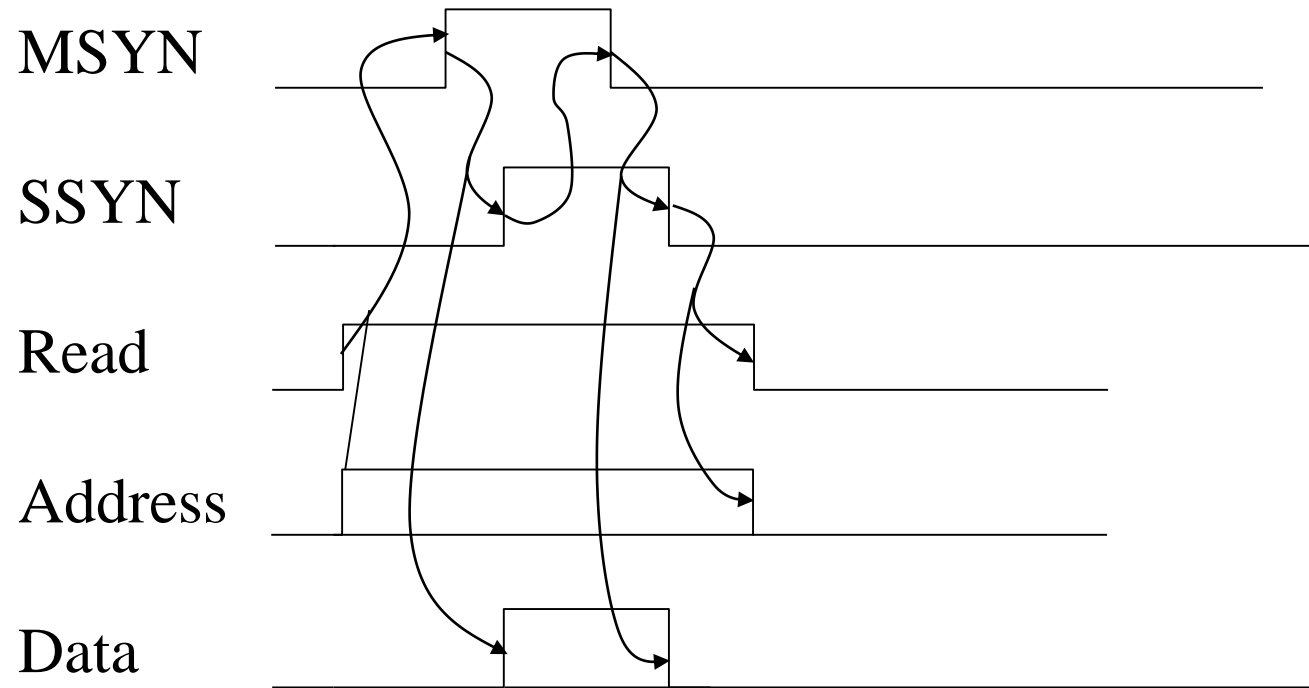
Endereço

Dados

Synchronous Timing



Asynchronous Timing



Data Transfer

Address (1st cycle)	Data (2nd cycle)
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Write (multiplex) operation

Address (1st cycle)	Access time	Data (2nd cycle)
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Read (multiplex) operation

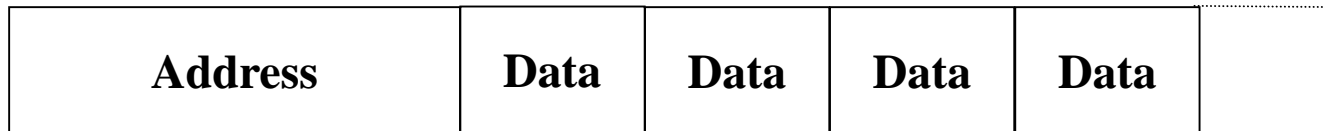
Address	Access time	Data Read	Data Write
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Read-modify-write operation

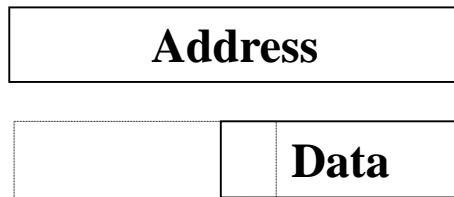
Address	Data Write	Access time	Data Read
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Read-after-write operation

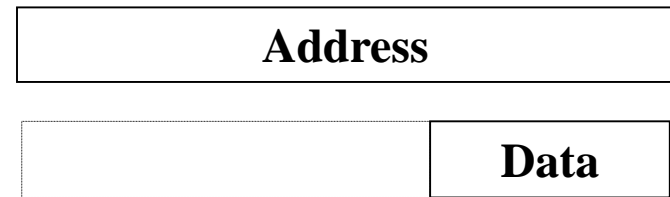
Data Transfer



Block (multiplex) data transfer



Write (non multiplex) operation



Read (non multiplex) operation