

An oil painting of a coastal landscape. In the foreground, a sandy beach meets the water. A small boat with two masts is on the right, and a pier with a cross-shaped structure is on the left. The background shows a hazy coastline under a cloudy sky.

Instituto Federal do Ceará - IFCE

Campus Aracati

Disciplina: Arquitetura de Computadores

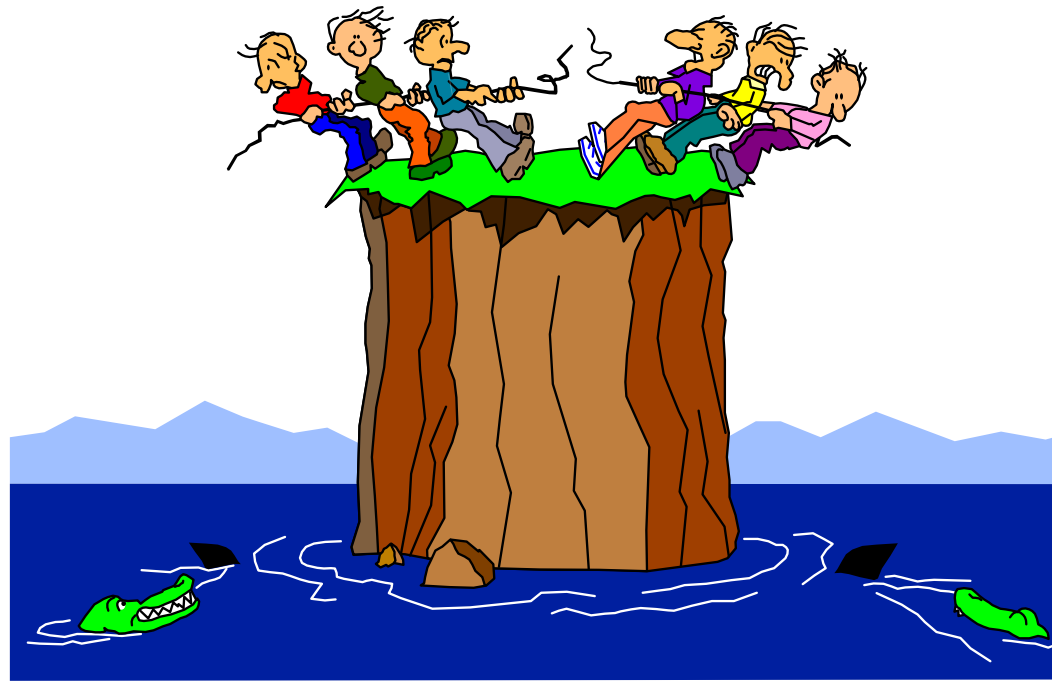
Chico Anysio
Óleo sobre tela 60x40 cm

PROGRAMA

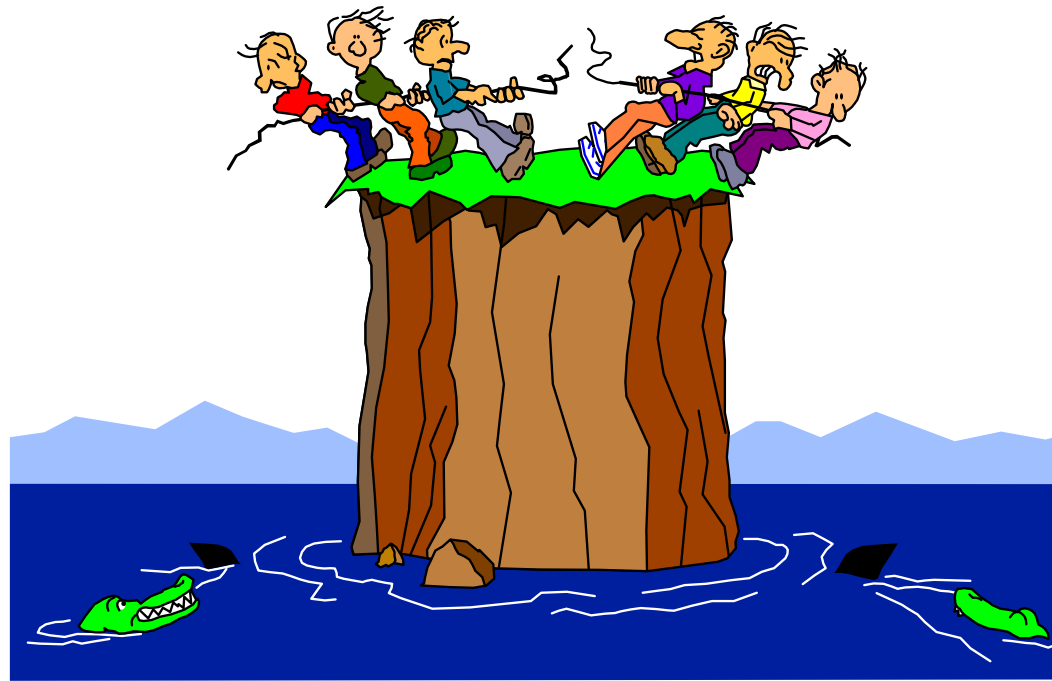
1. Modelo Von Neumann
2. Funcionamento de um computador.
3. Circuitos Combinacionais e Sequenciais.
4. Representação de dados.
5. Arquitetura clássica de um computador.
6. Memória e seus mecanismos de gerenciamento;
7. Evolução das Arquiteturas: x86, x64, etc.
8. Arquiteturas com processadores modernos.
9. Arquiteturas RISC, CISC, Pipeline.
10. Arquiteturas Paralelas e não Convencionais.

Modelo de Von Neumann

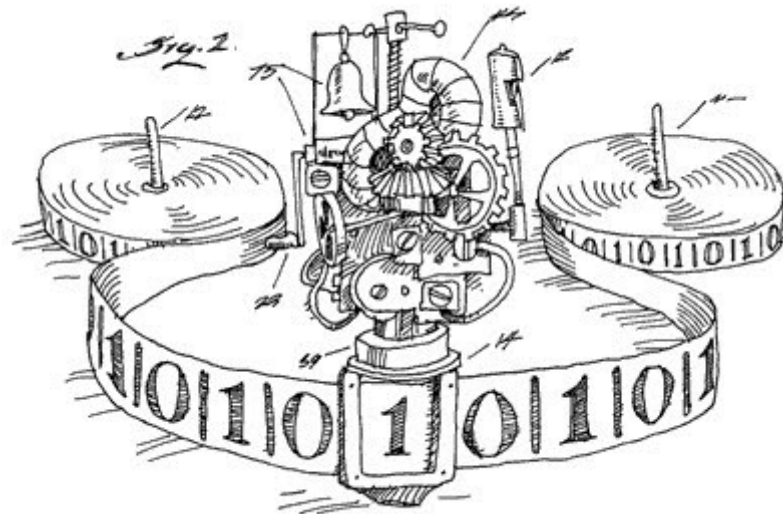
Aula 1



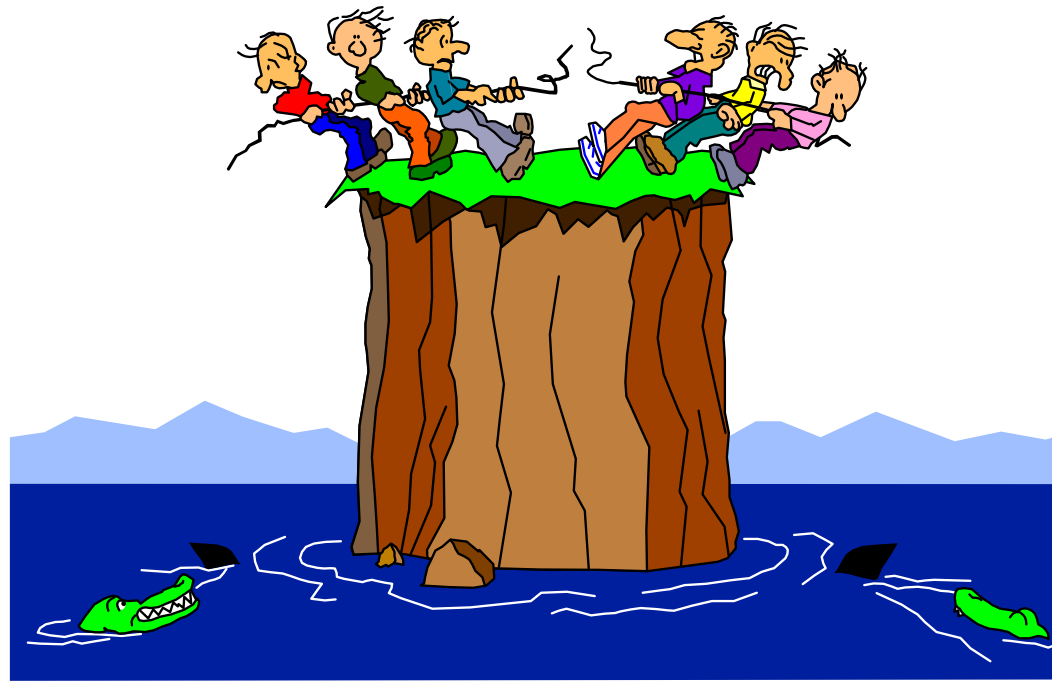
1.1 Alan Turing

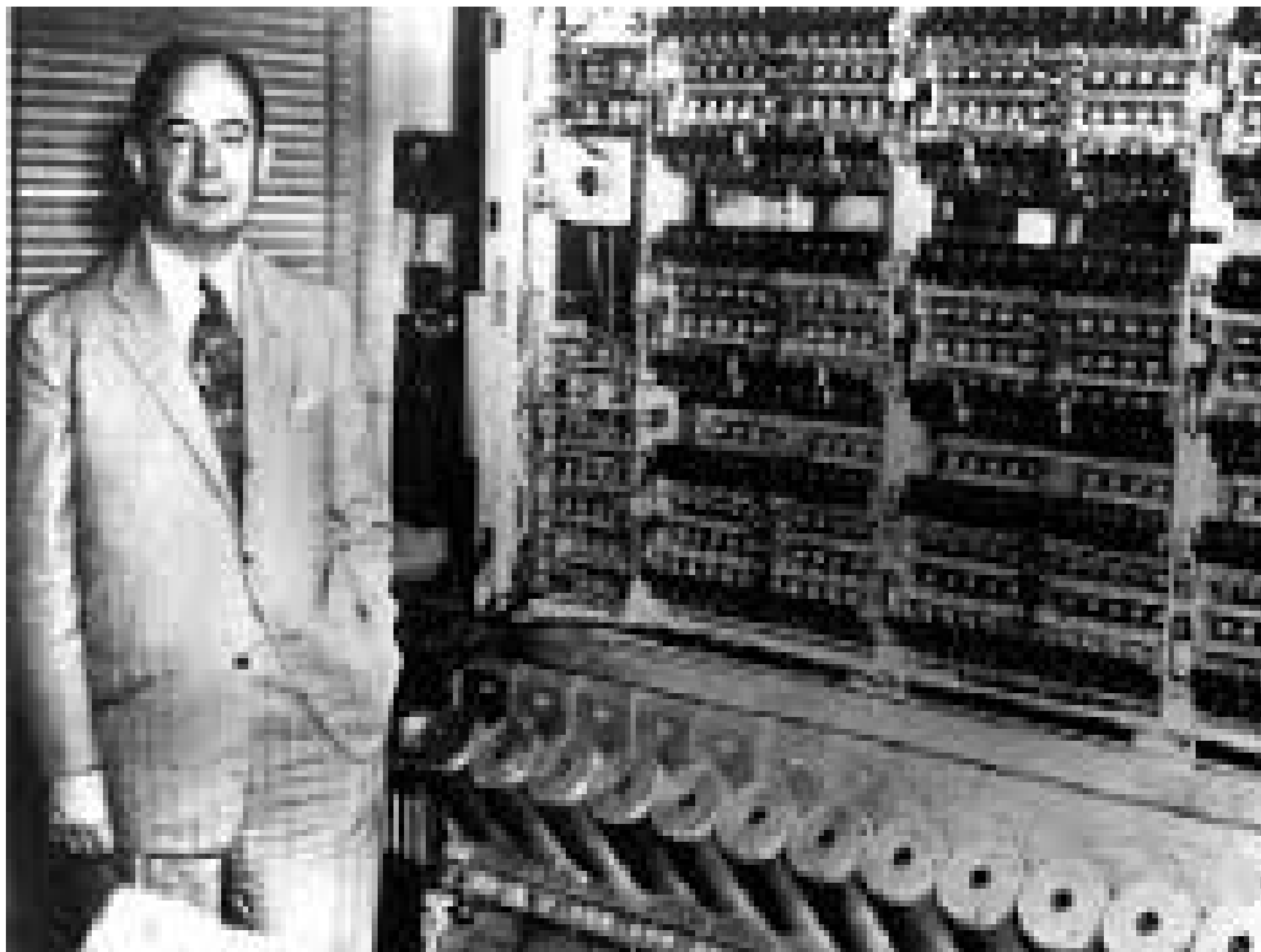


1.1 Alan Turing



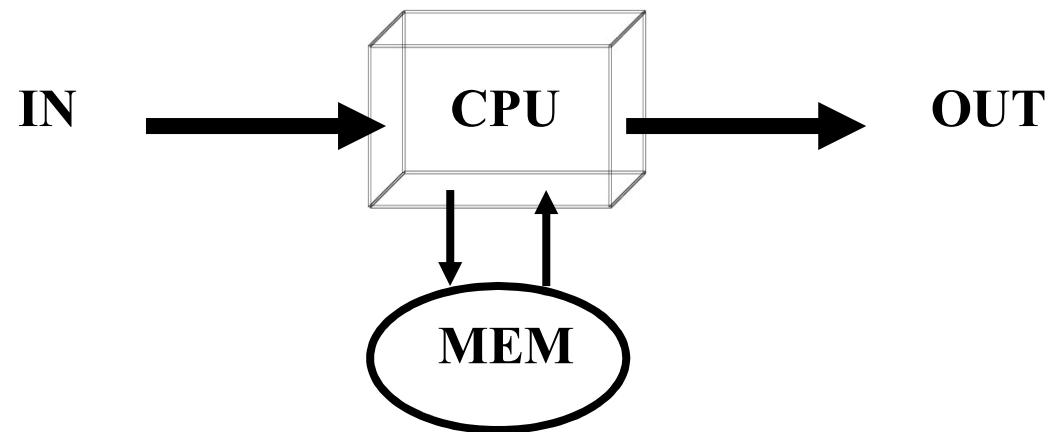
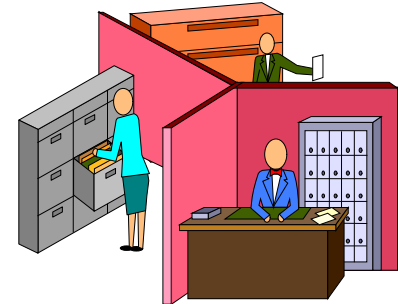
1.2 Modelo de Von Neumann





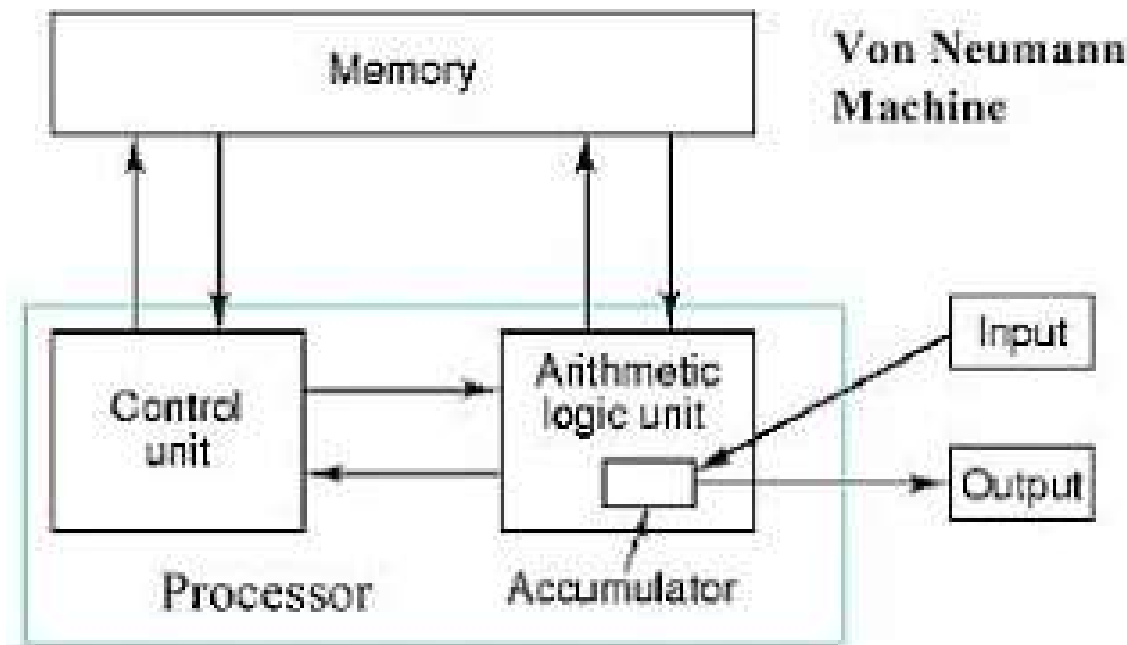
Modelo de Von Neumann

- **CARACTERÍSTICA PRINCIPAL**
 - **Conceito de Programa Armazenado**



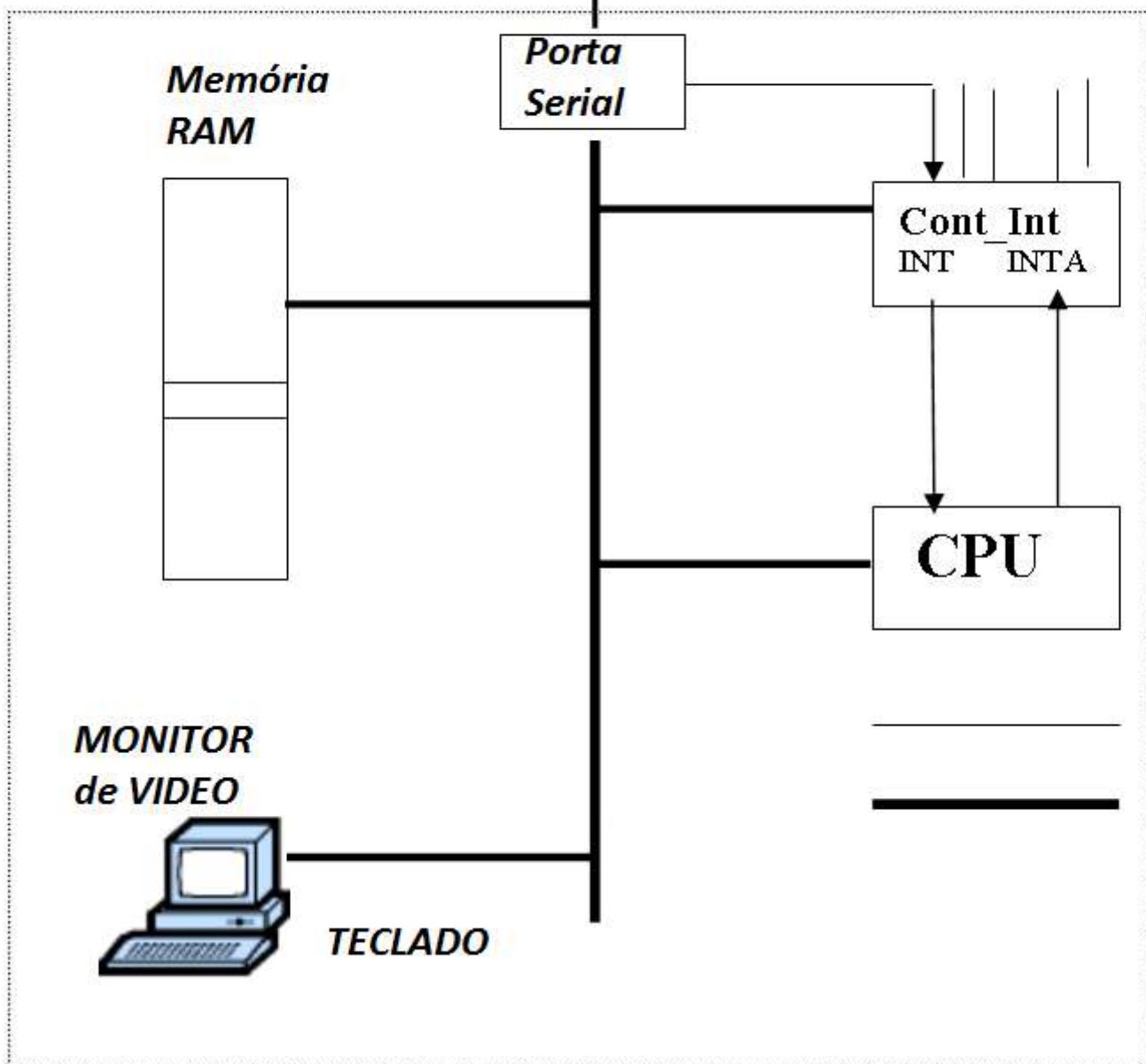
Modelo de Von Neumann

- **Conceito de Programa Armazenado**
- **BUSCA / DECODIFICA / EXECUTA**



«Caractère : 'a' »

'0 1 0 0 0 0 0 1'

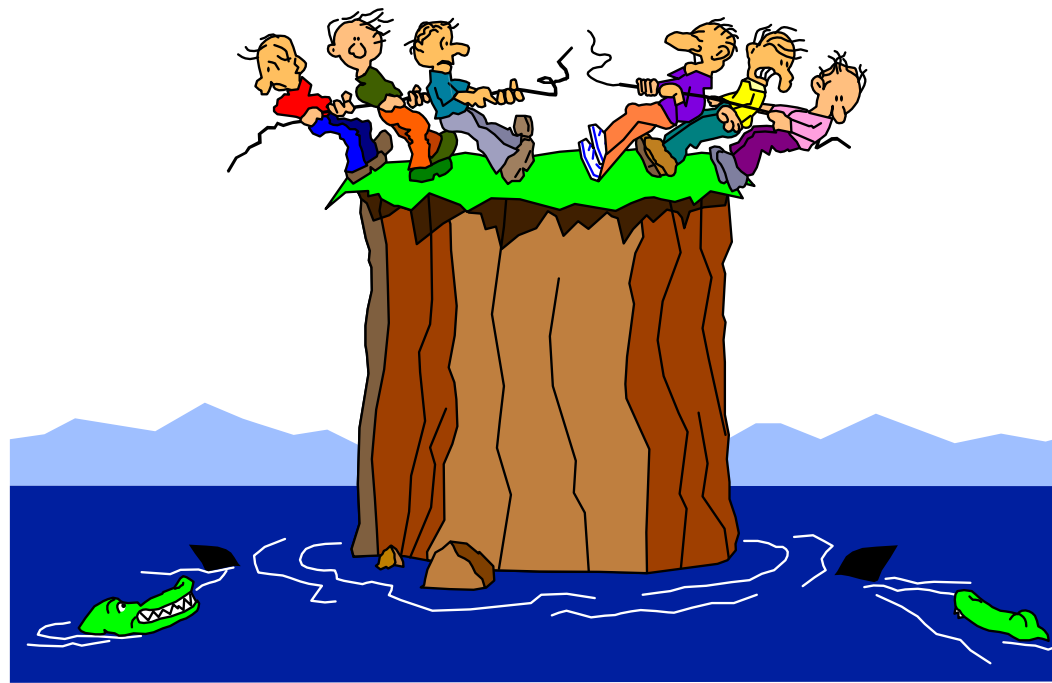


*Controlador de
INTERRUPÇÕES*

*Barra de CONTROLE
Barra de DADOS*

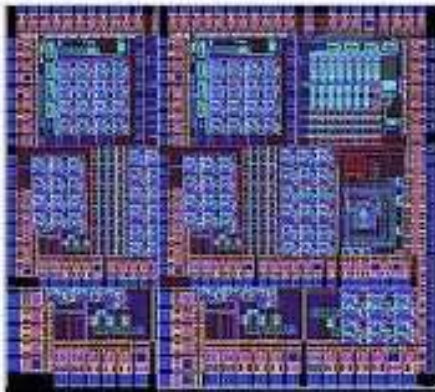
Funcionamento do Computador

Aula 2



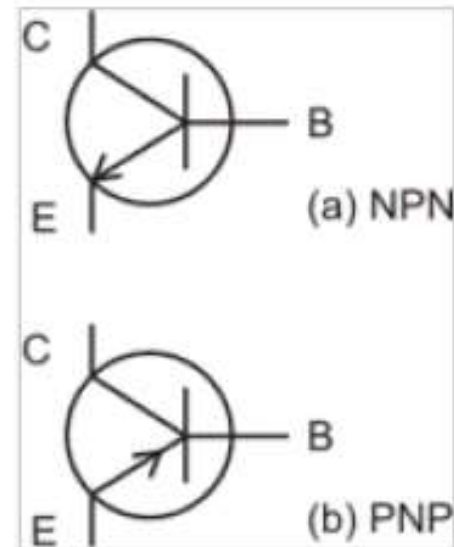
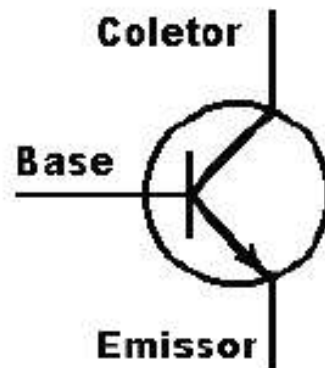
Funcionamento dos circuitos lógicos

O Transistor e o Circuito Integrado



Funcionamento dos circuitos lógicos

O Transistor



O transistor foi desenvolvido em 1948 nos laboratórios da Bell Telephone, nos EUA, pelos físicos Walter Brattain, John Bardeen e William Shockley, que receberam o Premio Nobel de 1956 pela descoberta.

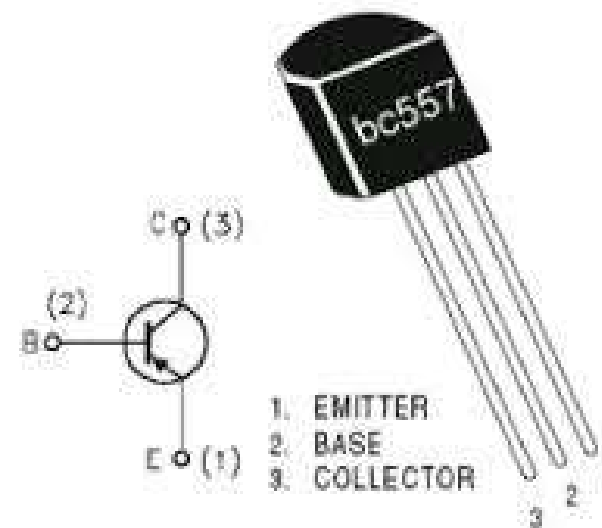
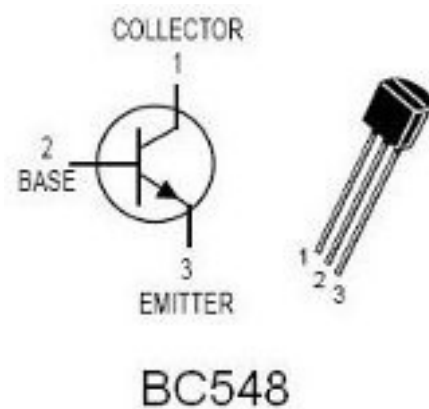
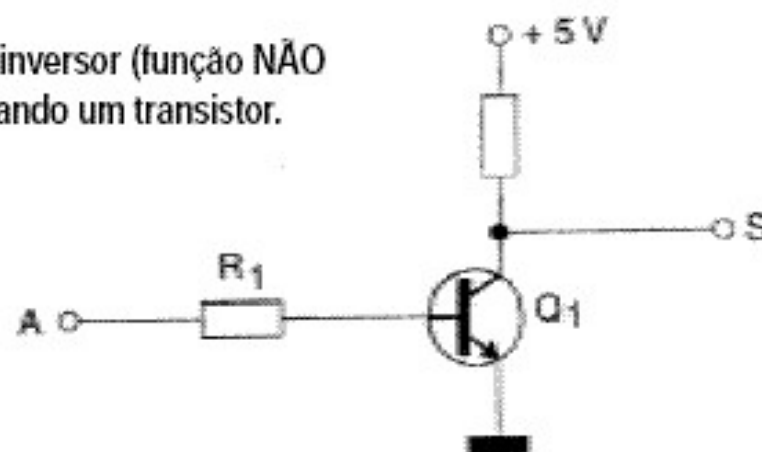


Figura 1 - Um inversor (função NÃO ou NOT) usando um transistor.

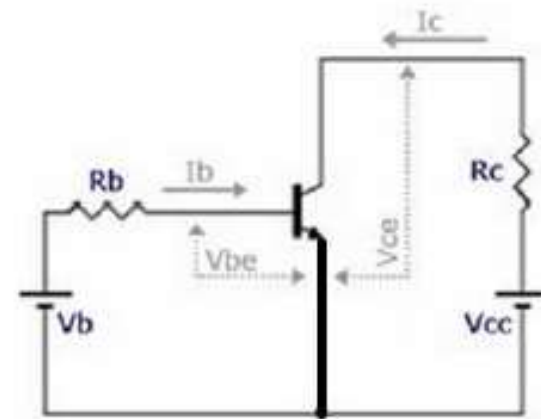
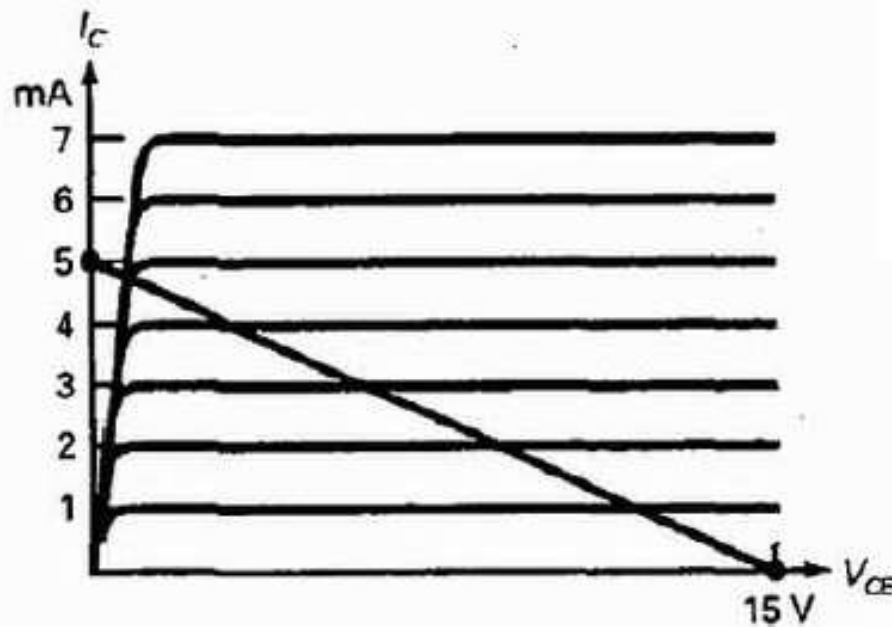


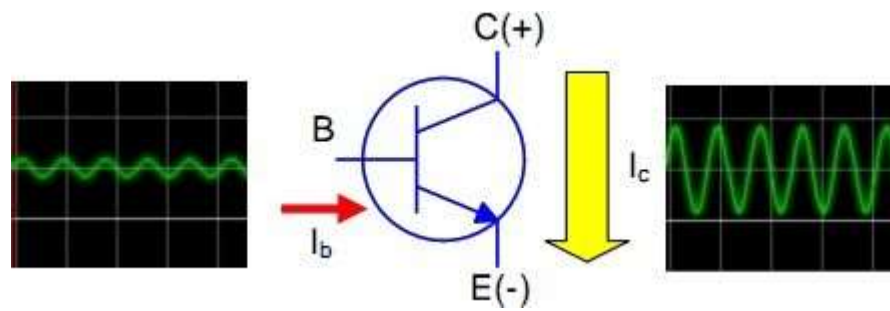
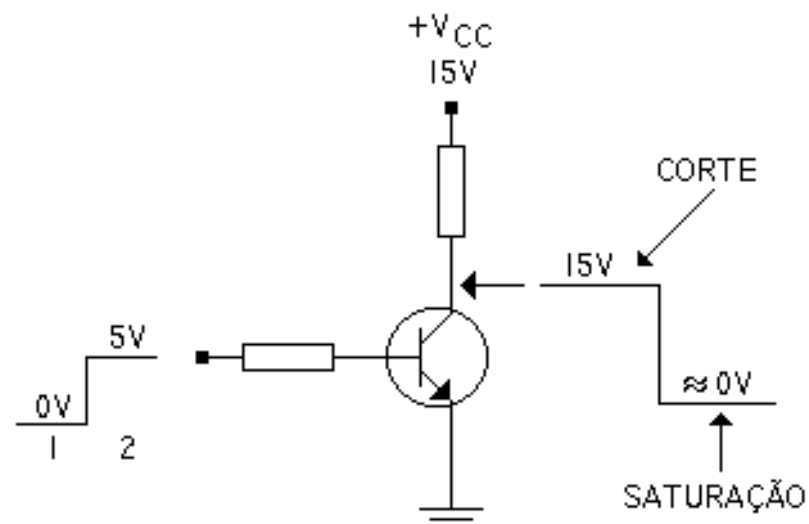
E	S
0	5 V
5 V	0

Funcionamento dos circuitos lógicos

O Transistor

$$V_{cc} = R_c I_c + V_{ce}$$





Circuito lógico NOT

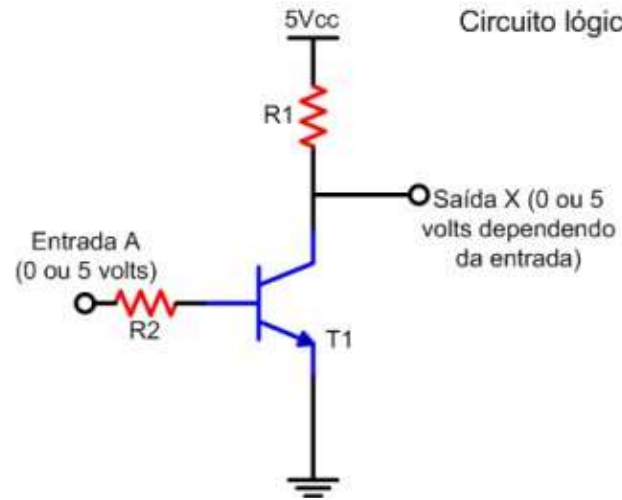
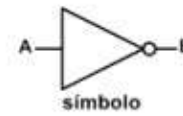


Tabela Verdade NOT	
A	X
0	1
1	0



Circuito lógico NAND

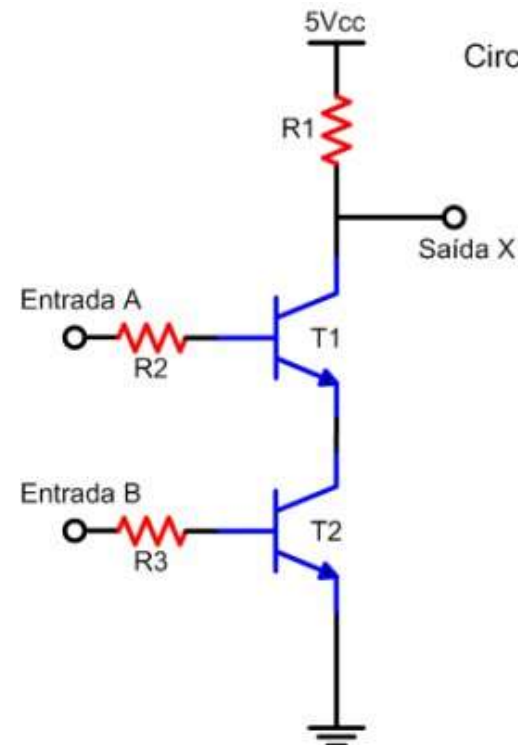
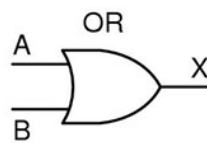
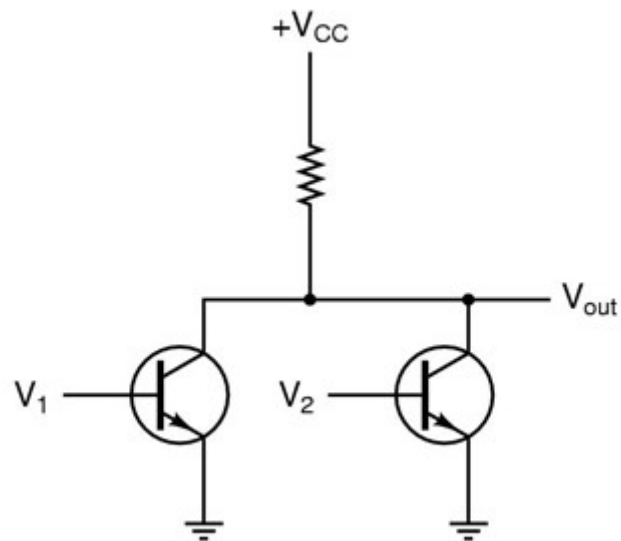
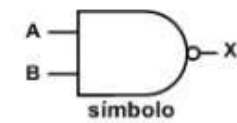
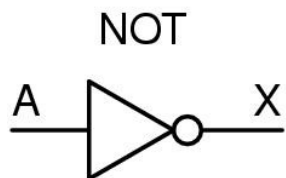


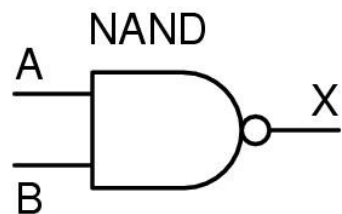
Tabela Verdade NAND		
A	B	X
0	0	1
0	1	1
1	0	1
1	1	0





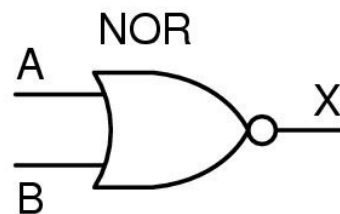
A	X
0	1
1	0

(a)



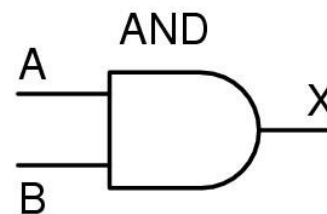
A	B	X
0	0	1
0	1	1
1	0	1
1	1	0

(b)



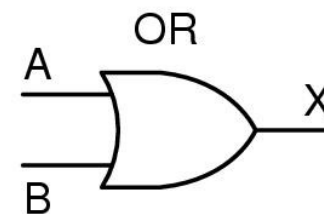
A	B	X
0	0	1
0	1	0
1	0	0
1	1	0

(c)



A	B	X
0	0	0
0	1	0
1	0	0
1	1	1

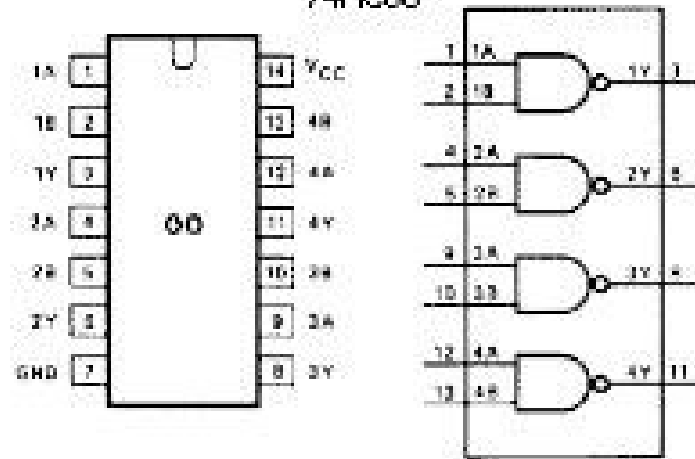
(d)



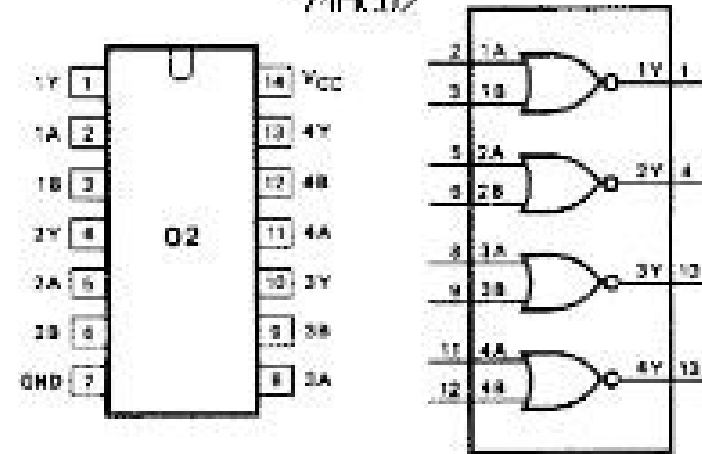
A	B	X
0	0	0
0	1	1
1	0	1
1	1	1

(e)

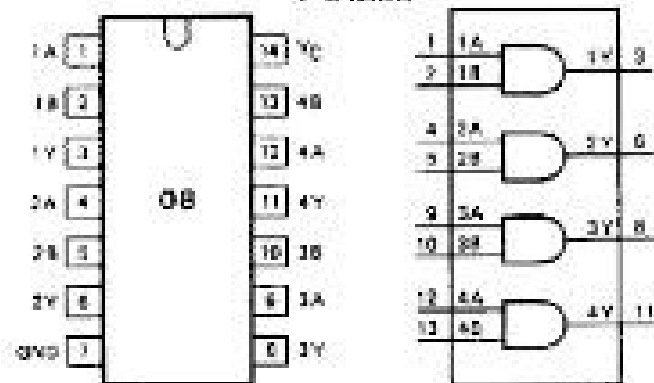
74HC00



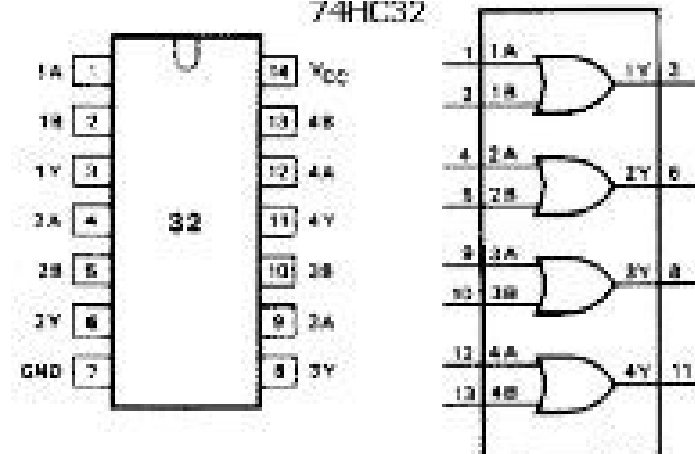
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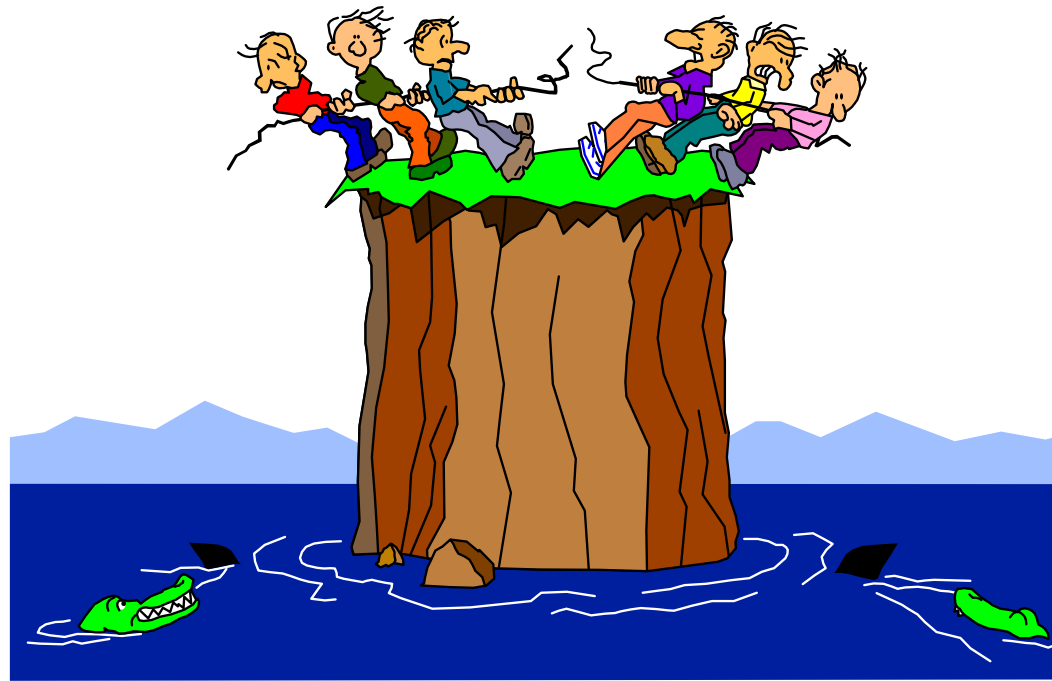
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74HC32



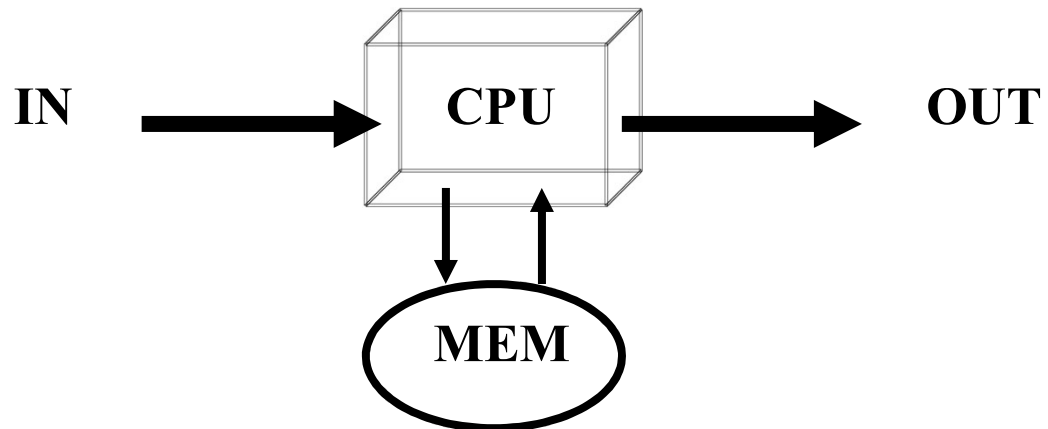
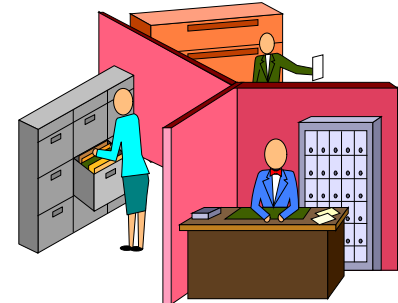
1.2 Sistemas Centralizados



Modelo de Von Neumann

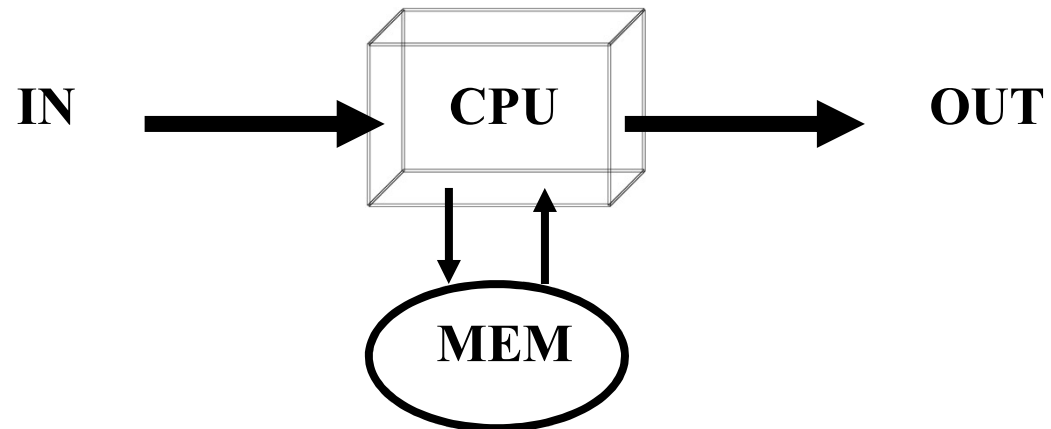
•RESTRIÇÕES DO MODELO

- Linguagem de Baixo Nível
- Memória Linear e Uniforme
- Processamento Seqüencial e Centralizado

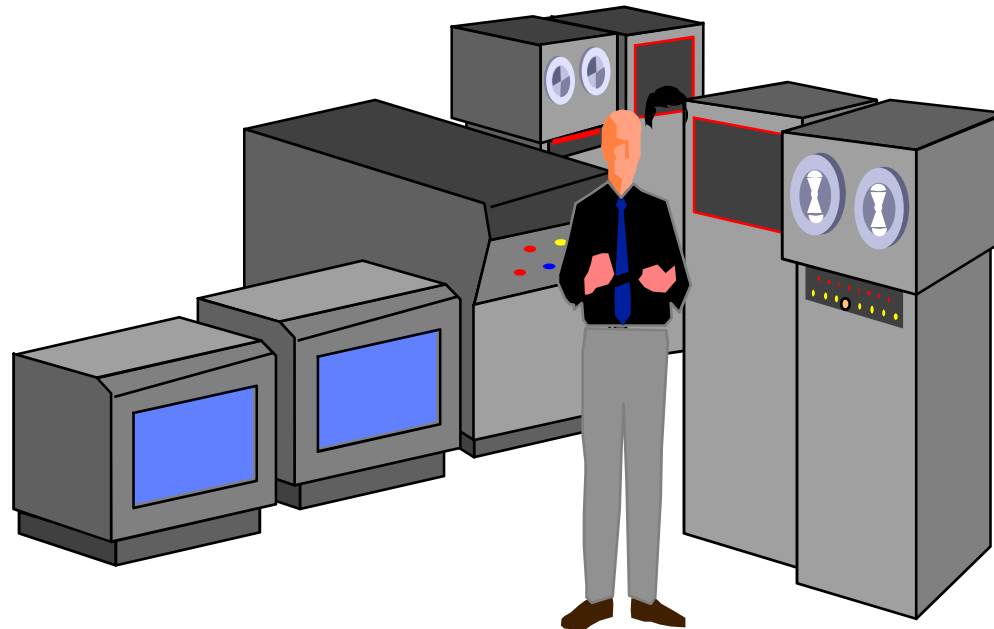


Modelo de Von Neumann

COMO EVOLUIU O MODELO DE VON NEUMANN ?



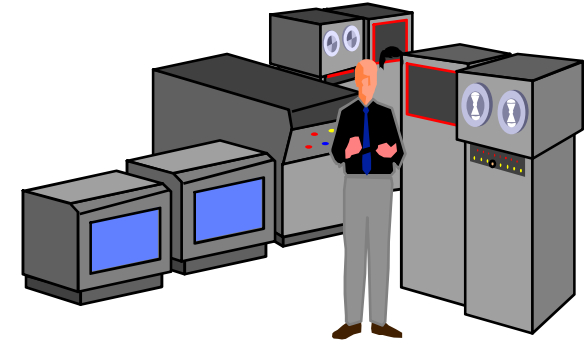
Sistemas Centralizados



MAINFRAME, UMA MÁQUINA VON NEUMANN !

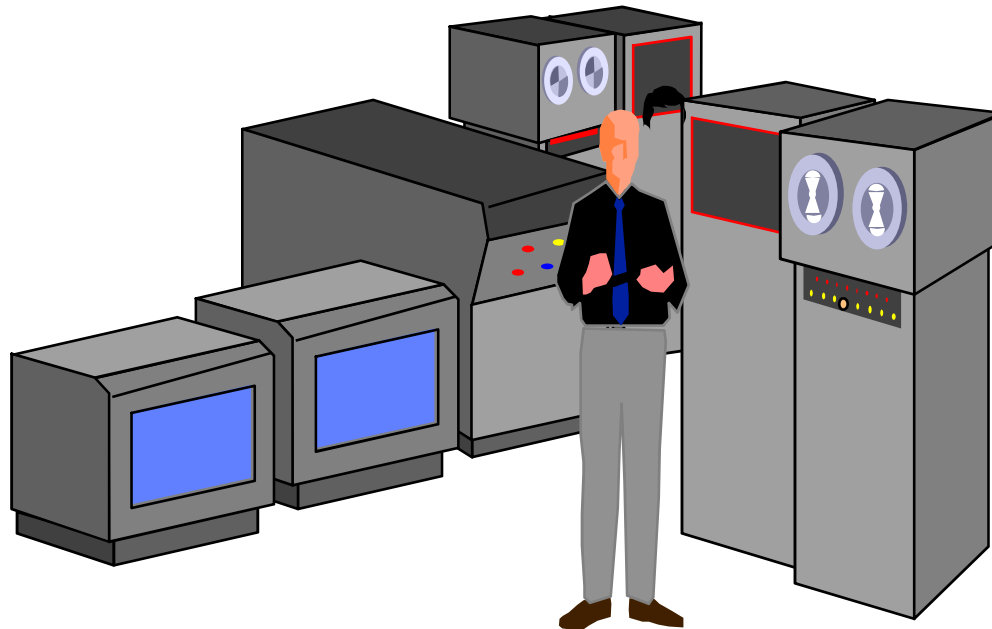
Sistemas Centralizados

Evolução em Software

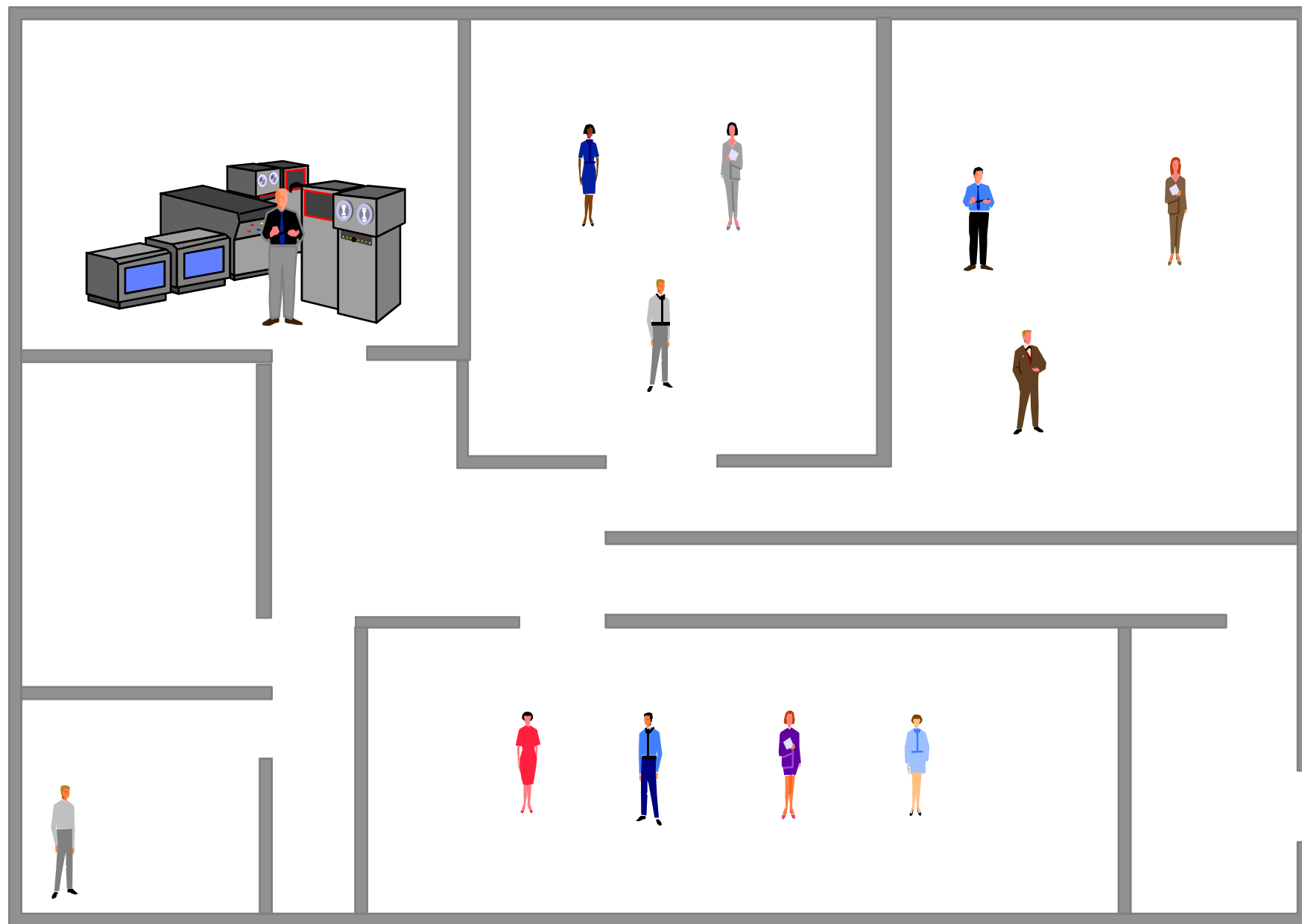


- Multiprogramação ou Multiprocessamento ?

Sistemas Centralizado em Batch

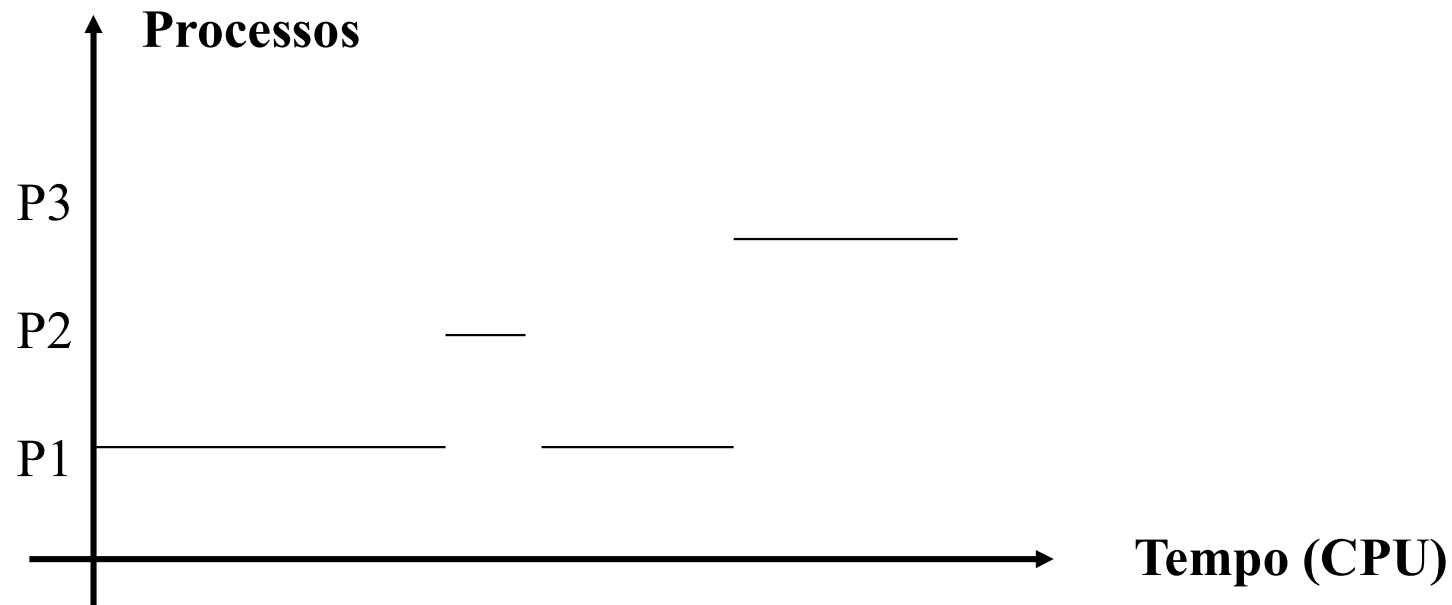
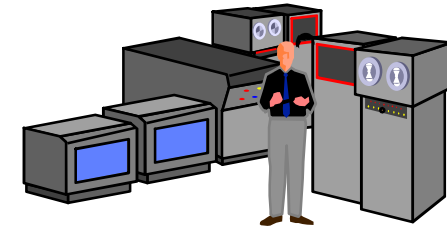


Processamento Batch

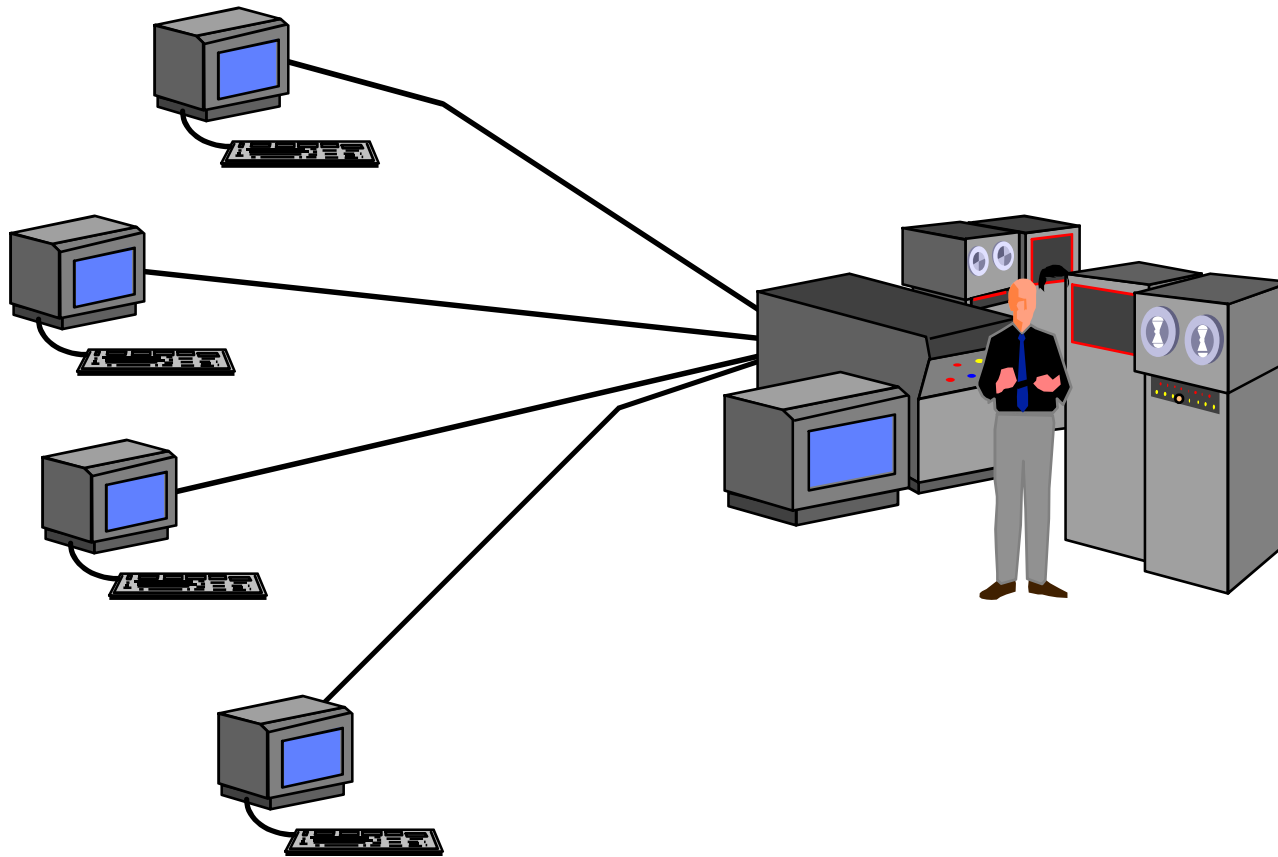


Multiprogramação

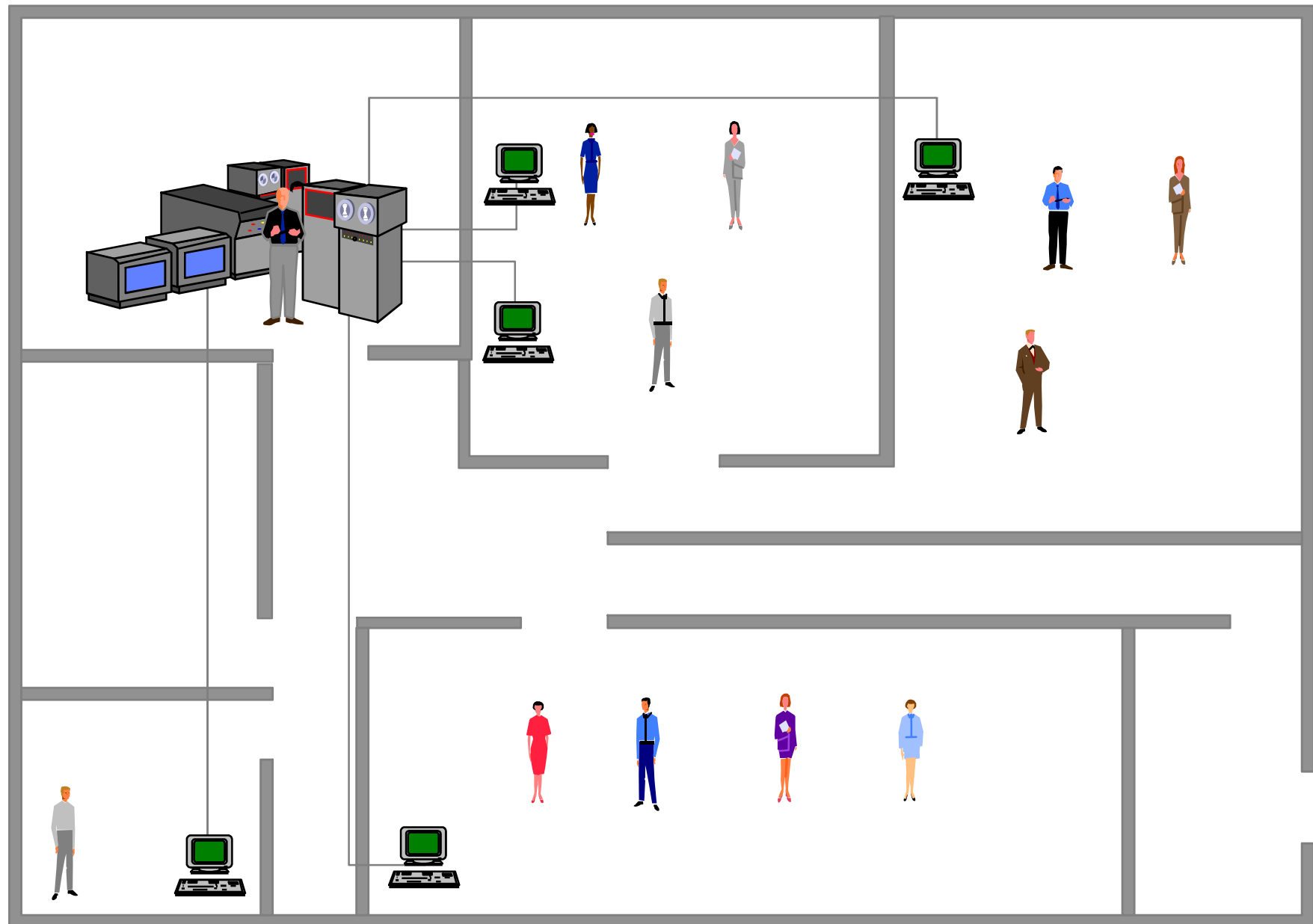
Processamento em Batch



Sistemas Centralizados on Line

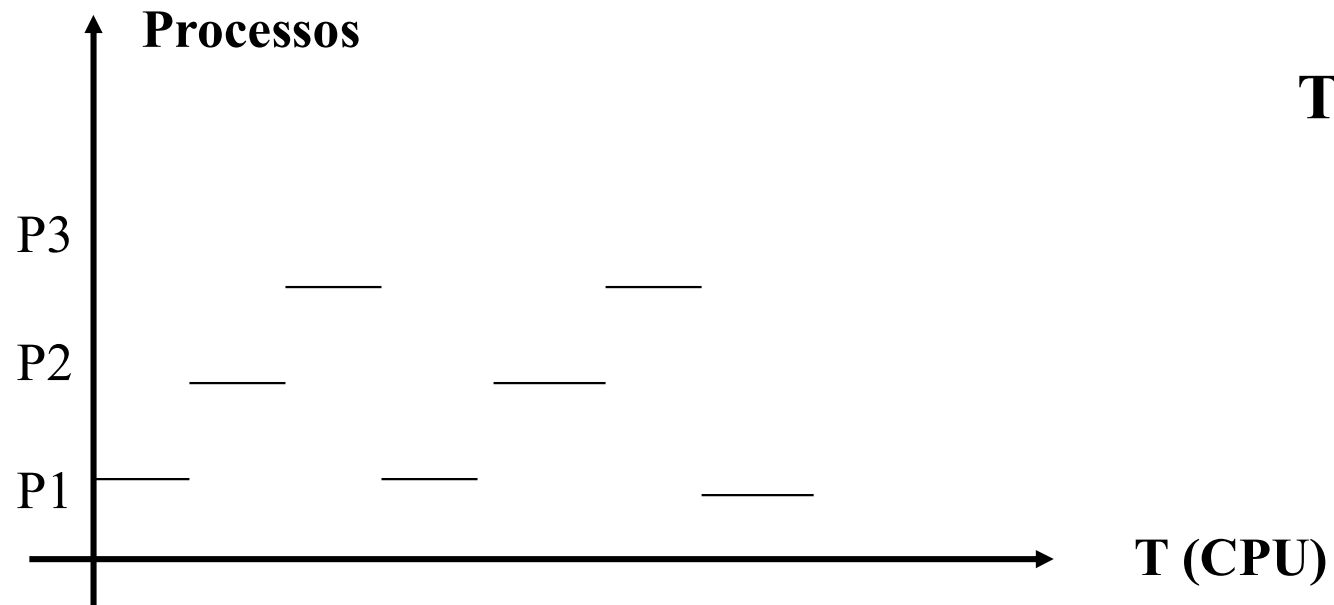
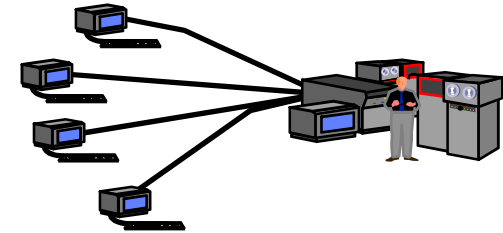


Processamento On-Line



Multiprogramação

Processamento On-line

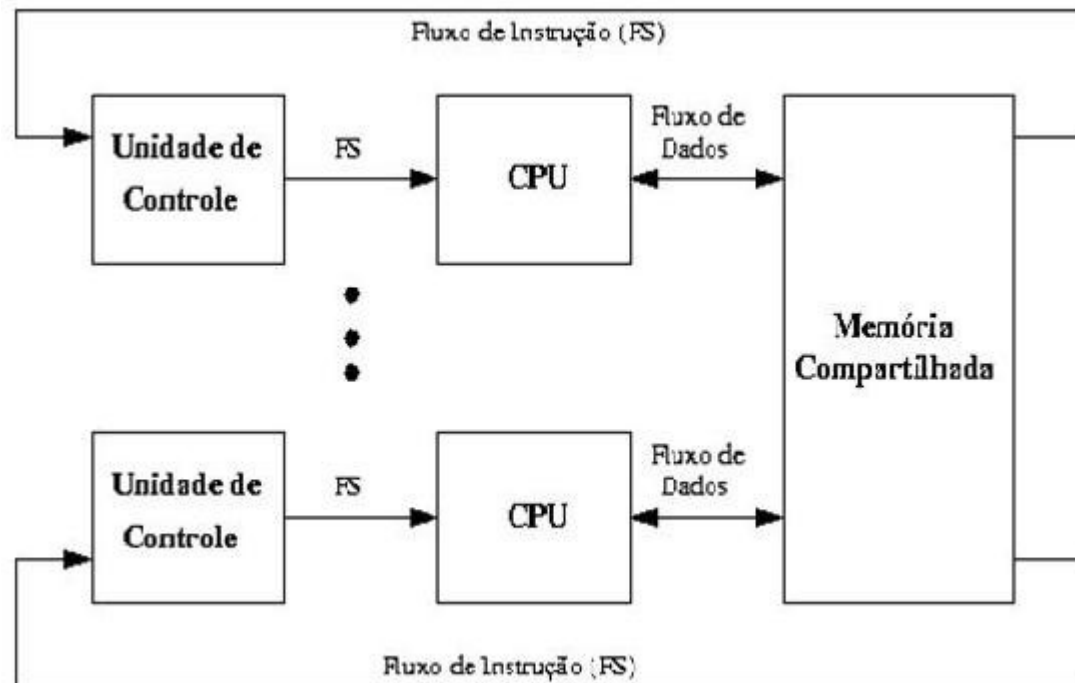
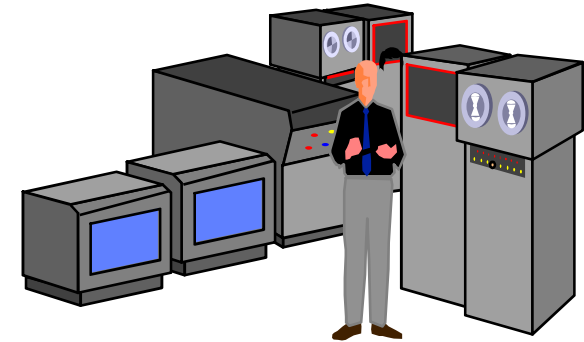


Time sharing

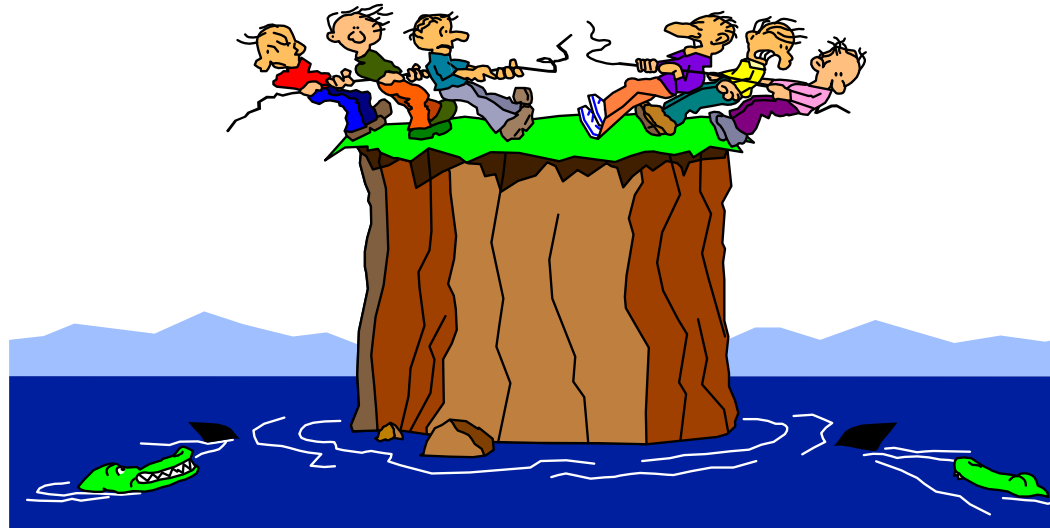
Sistemas Centralizados

Evolução em Hardware

- Multiprocessamento



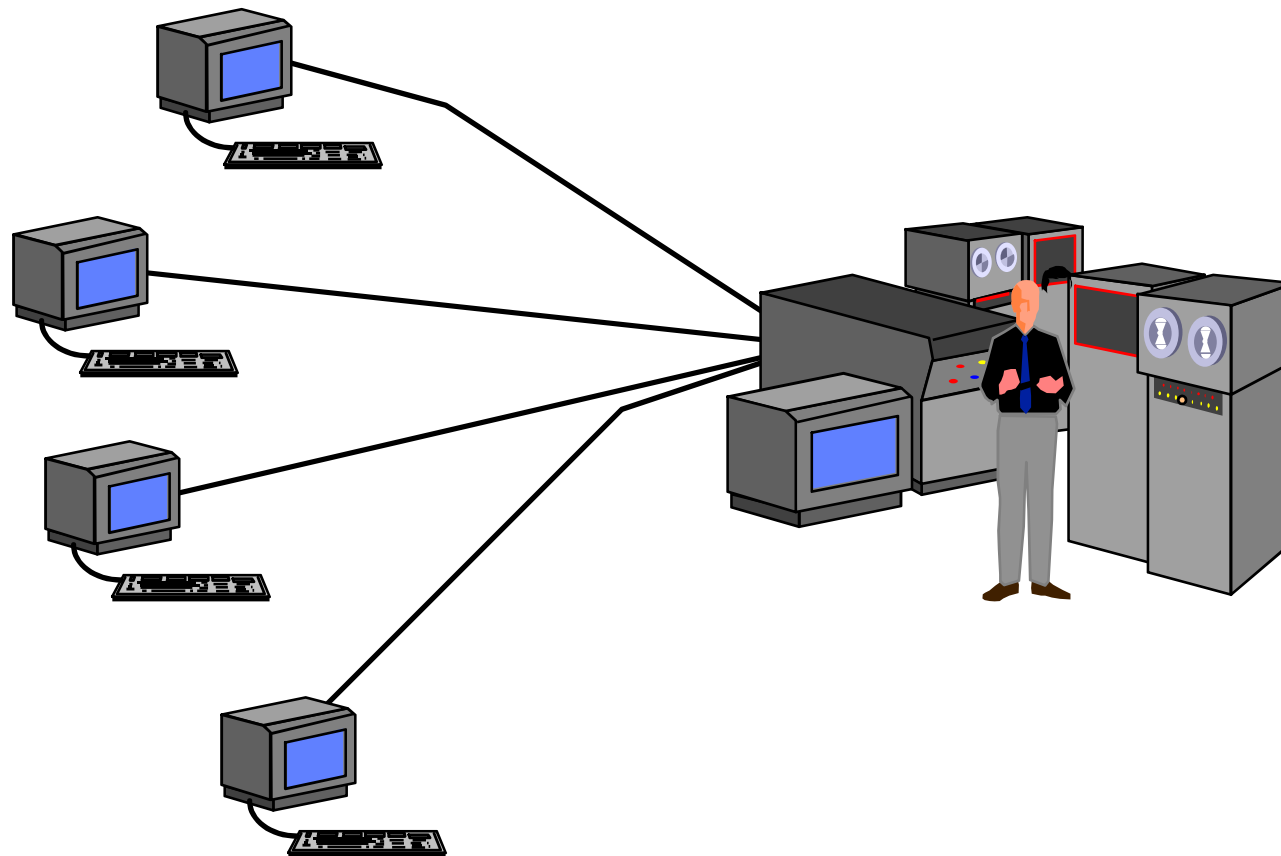
1.3 Sistemas Distribuídos



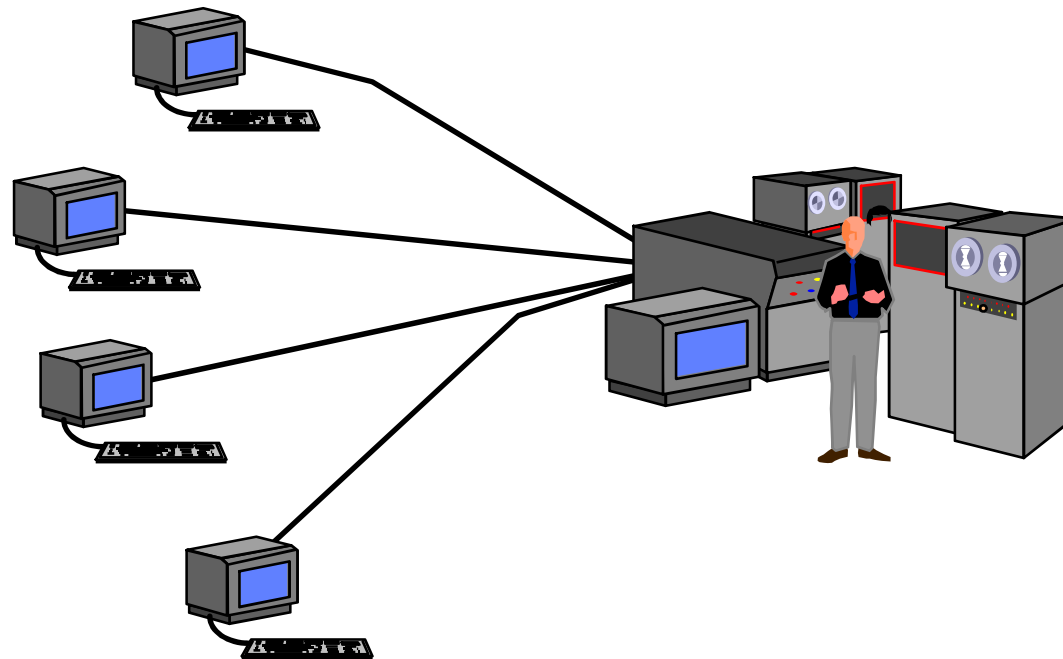
**UM SISTEMA CENTRALIZADO E SEUS TERMINAIS PODEM
SER CONSIDERADOS UMA REDE DE COMPUTADORES ?**



Sistemas Centralizados

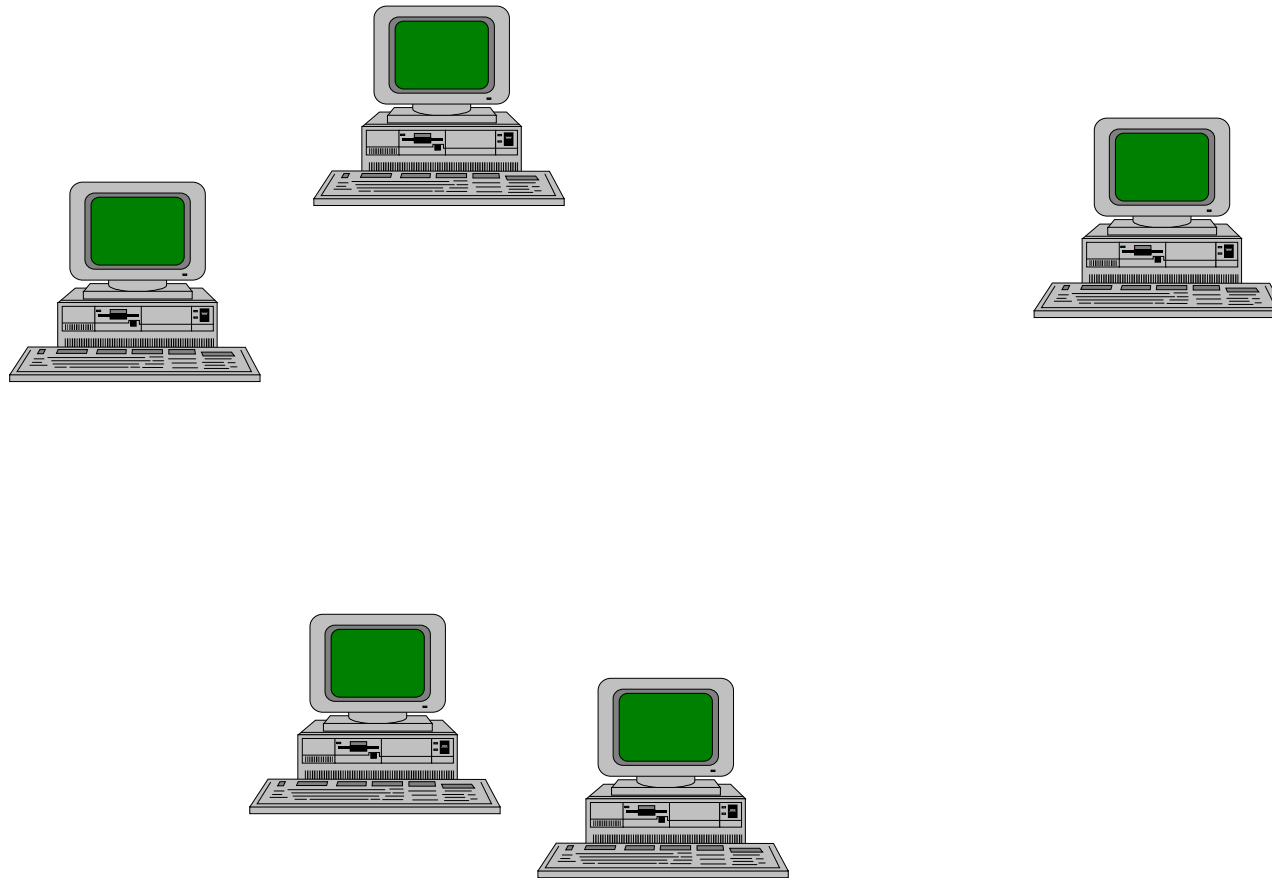


Sistemas Centralizados



**UM SISTEMA CENTRALIZADO E SEUS TERMINAIS PODEM
SER CONSIDERADOS UMA REDE DE COMPUTADORES ?**

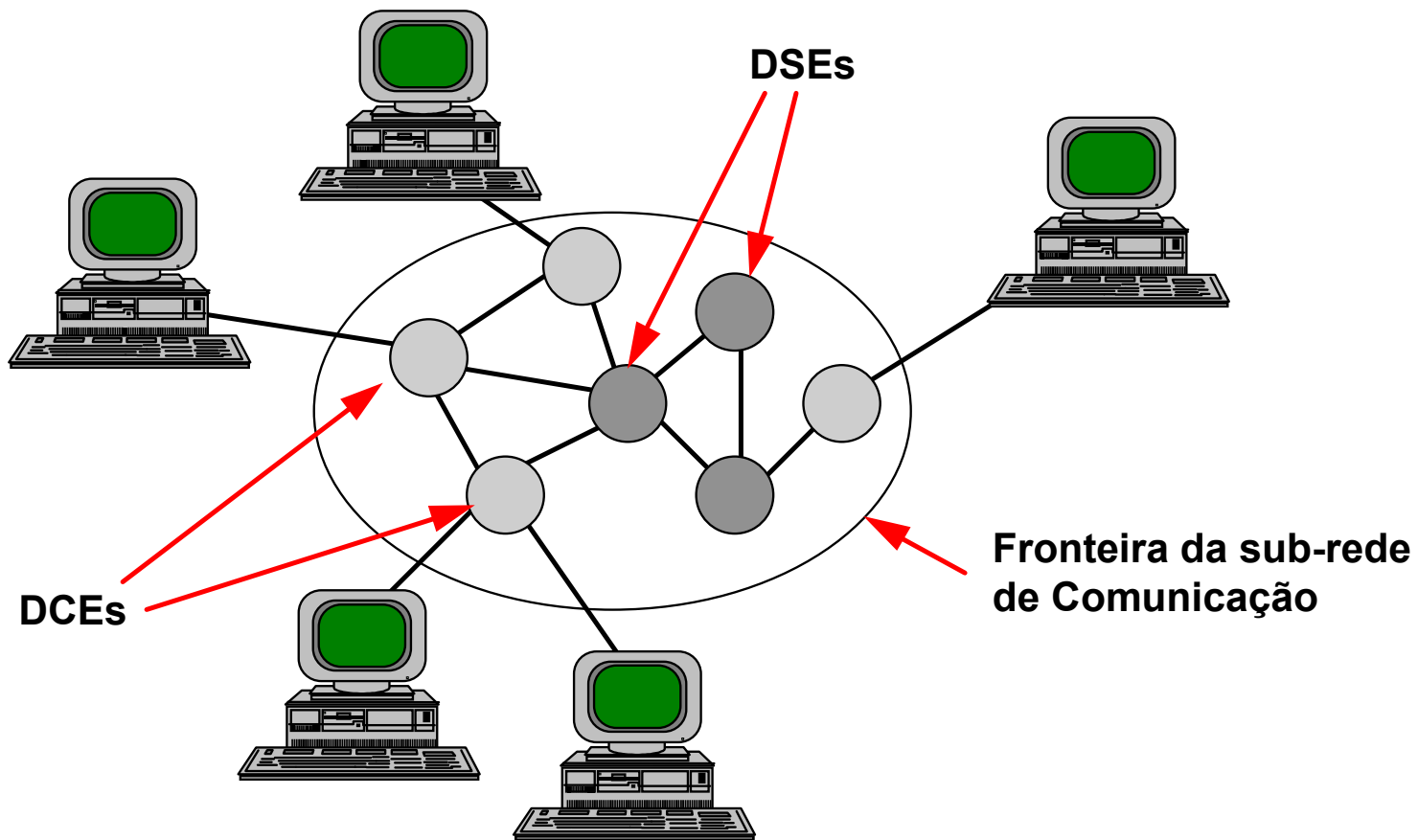
Surgem os Microcomputadores



Surtem as Redes de Computadores

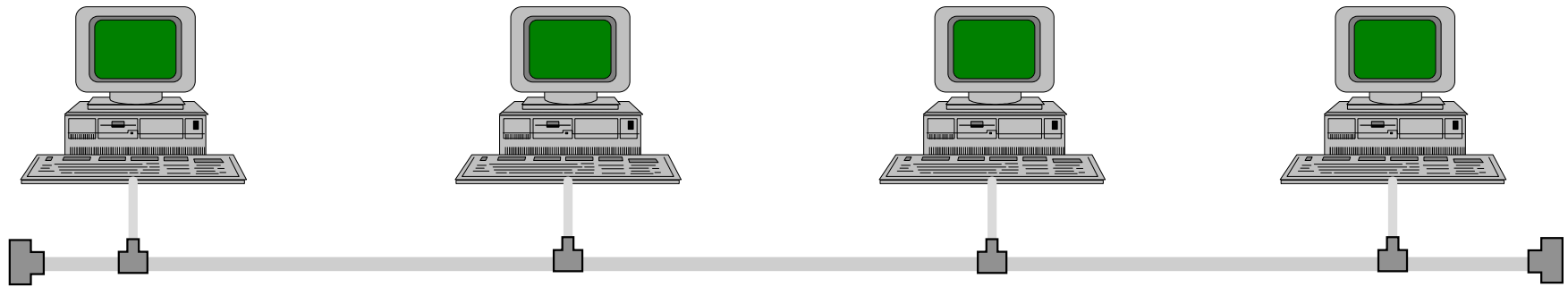


Redes de Longa Distância (WAN)



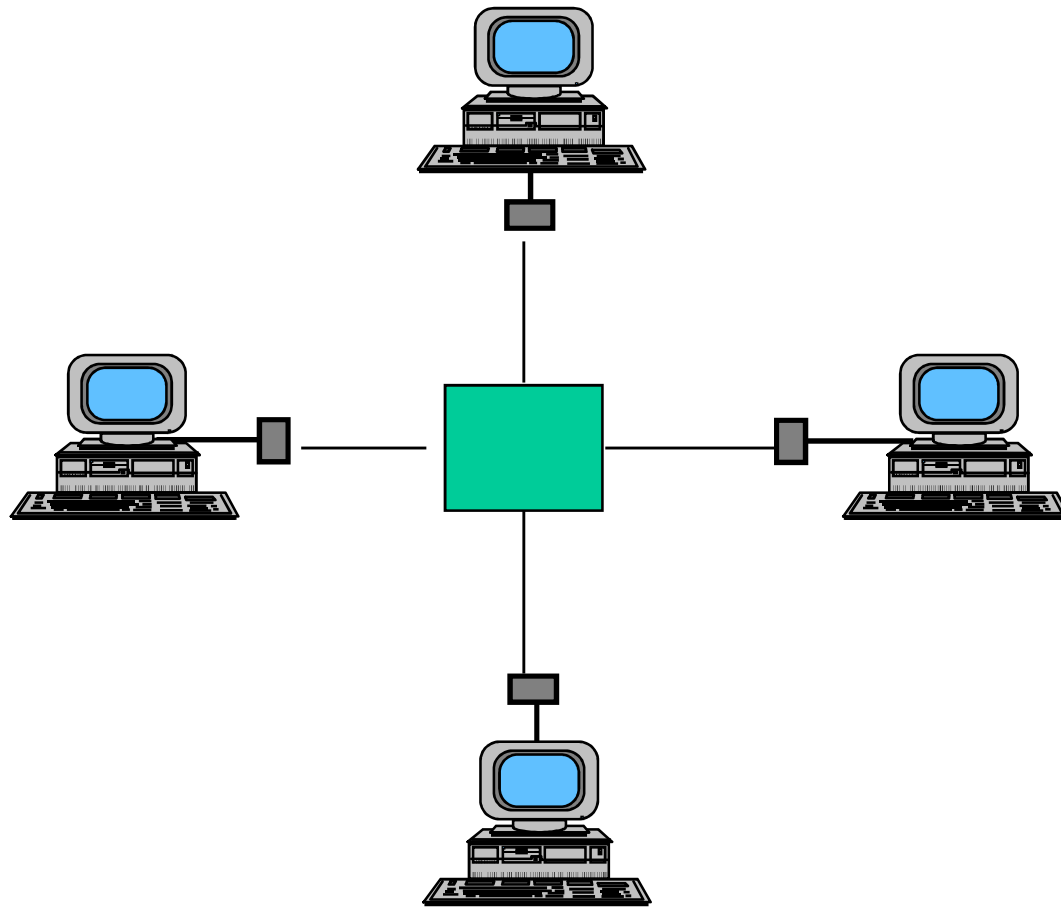
Rede Local (LAN)

Topologia em barra



Rede Local (LAN)

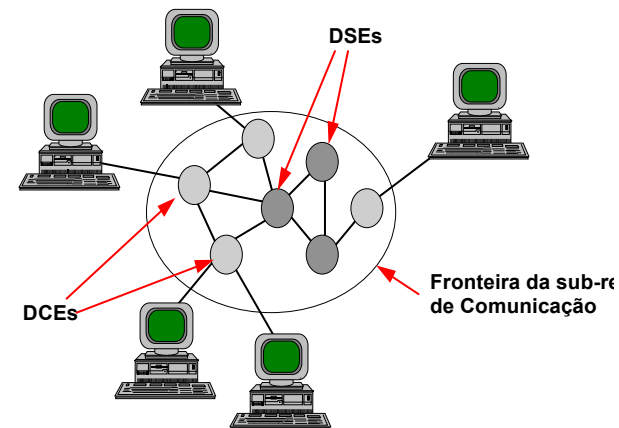
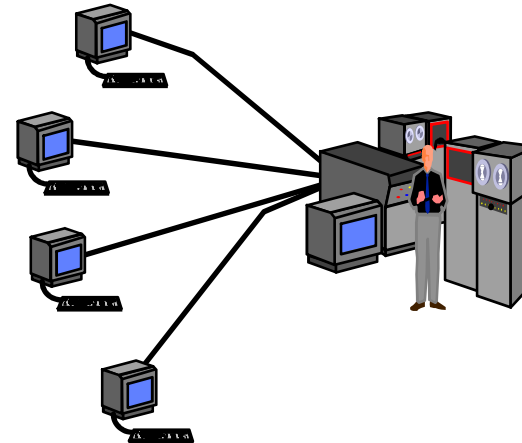
Topologia em Estrela



Processos em comunicação

Processo: programa que executa num hospedeiro

- processos no mesmo hospedeiro se comunicam usando **comunicação entre processos** definida pelo sistema operacional (SO)
- processos em hospedeiros distintos se comunicam trocando **mensagens através da rede**



Arquiteturas das aplicações

- Cliente-servidor
 - Peer-to-peer (P2P)
 - Híbrido de cliente-servidor e P2P

Processos em comunicação

Processo cliente: processo
que inicia a comunicação

Processo servidor: processo
que espera para ser
contatado

- Aplicações com arquiteturas P2P possuem processos clientes e processos servidores

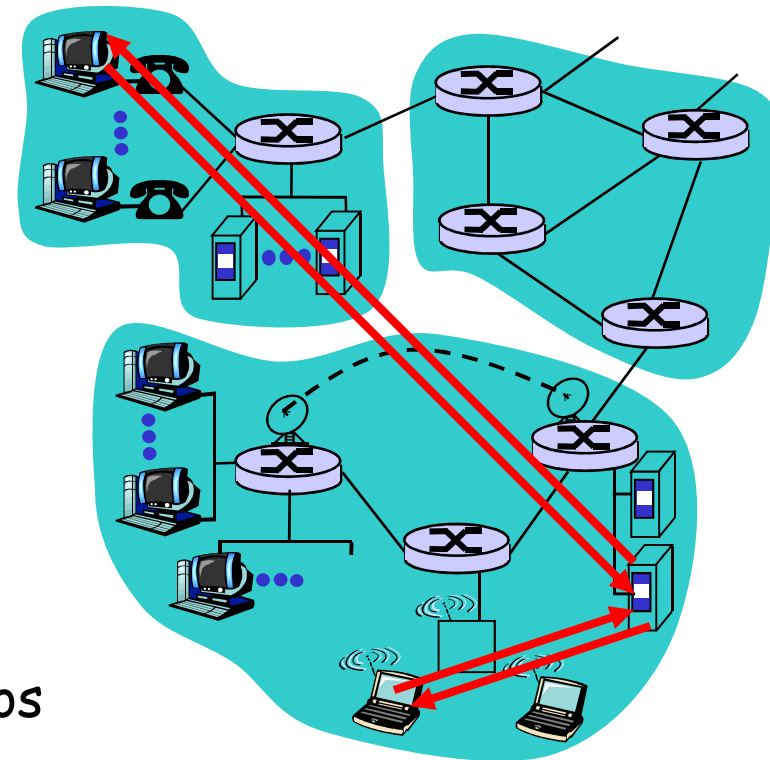
Arquitetura cliente-servidor

Servidor:

- ❑ Sempre ligado
- ❑ Endereço permanente

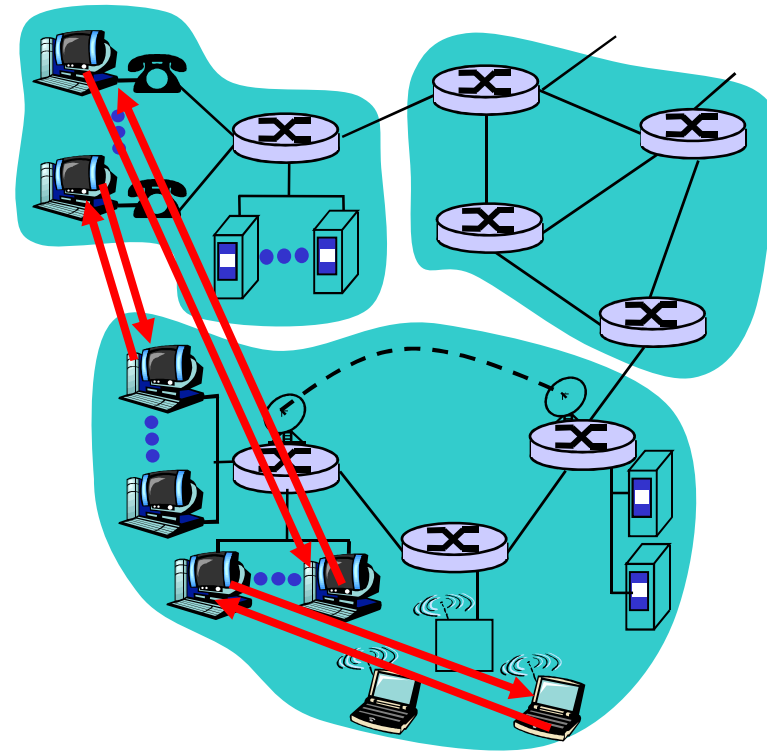
Cliente:

- ❑ Comunica-se com o servidor
- ❑ Pode estar conectado intermitentemente
- ❑ Pode ter endereços dinâmicos
- ❑ Não se comunica diretamente com outros clientes



Arquitetura P2P pura

- Não há servidor sempre ligado
- Sistemas finais arbitrários se comunicam diretamente
- Pares estão conectados intermitentemente e mudam endereços
- Exemplo: Gnutella



Altamente escalável

Porém, difícil de gerenciar

Internet das Coisas

