Introdução à Informática

Introdução aos Sistemas Operativos

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Conceitos introdutórios

- O sistema operativo é um programa de computador
- Programas são linhas de código com uma sequência lógica
- O código suporta acções como os clicks do rato
- O sistema operativa é constituído por três componentes:
  - A Kernel
  - Os Ficheiros
  - A shell
- Exemplos de sistemas operativos:
  - DOS
  - Windows
  - UNIX
  - LINUX
- Os computadores têm dois componentes:
  - Hardware
  - Software
- O SO é um interface entre o utilizador e o hardware

Tipos de Software

- Firmware BIOS (basic input/output system)
  - Controla as funções de input/output
- Sistemas Operativos (SO)
  - Fornece instruções para o hardware executar as tarefas
- Software de aplicação

Funções da BIOS e OS

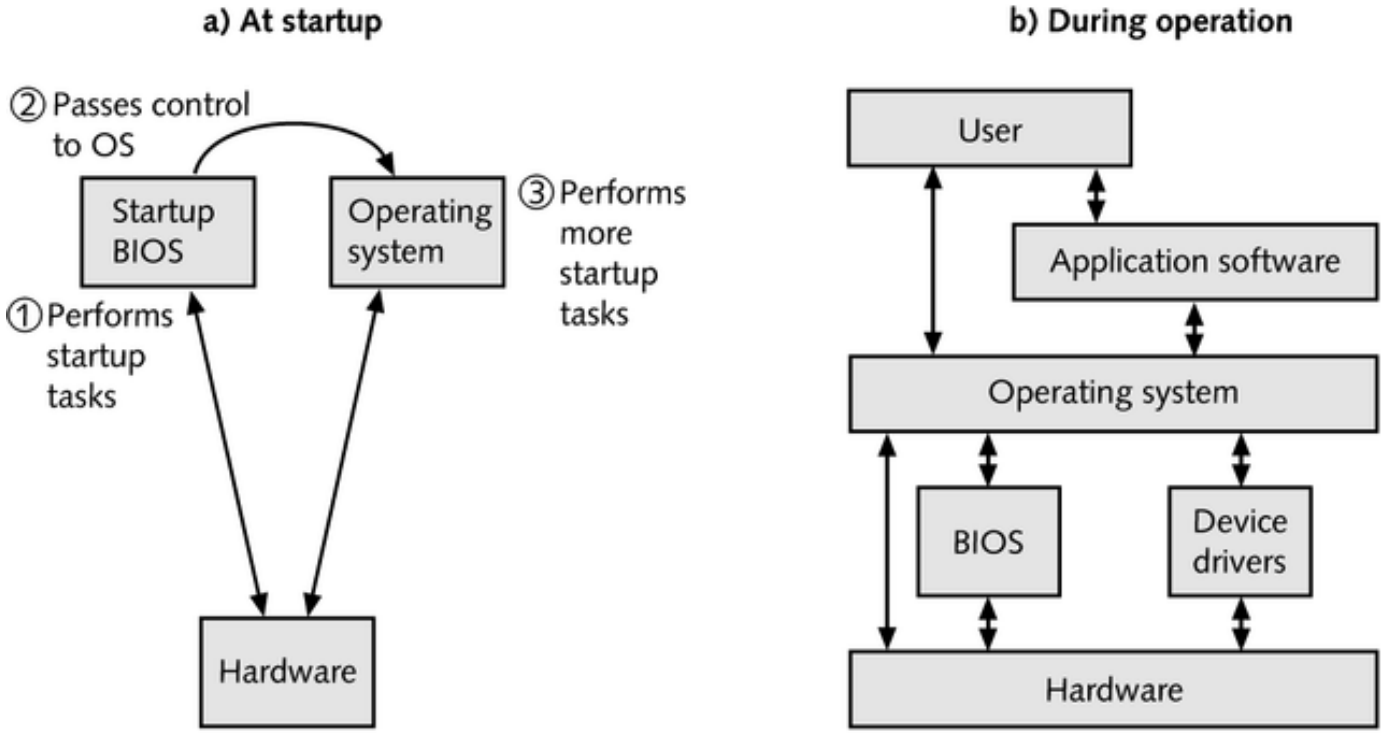

Figure 1-27 Not all software relates directly to hardware; some is dependent on other software to perform many basic functions

Camadas de Software

- A hierarquia determina como o software de alto nível depende do software de baixo nível para gerir o hardware
- software de aplicação depende do SO para ter um interface com o hardware
  - Envia instruções ao hardware directamente
  - utiliza a BIOS para fornecer as instruções
  - utiliza device drivers

Camadas de Software

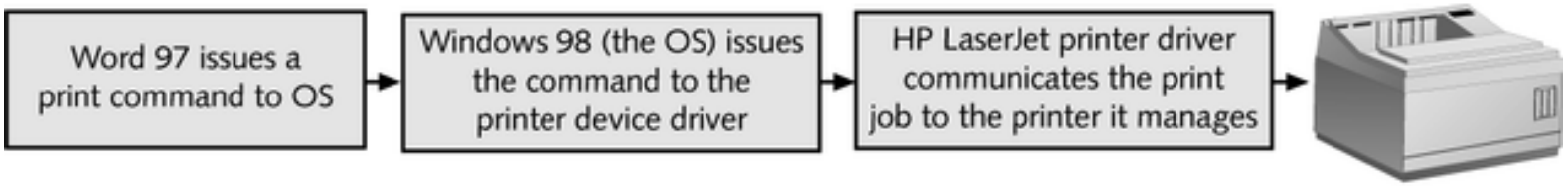

Figure 1-28 Any specific protocols and commands sent to the printer are the responsibility of the printer device driver

Como o software gere e partilha a informação

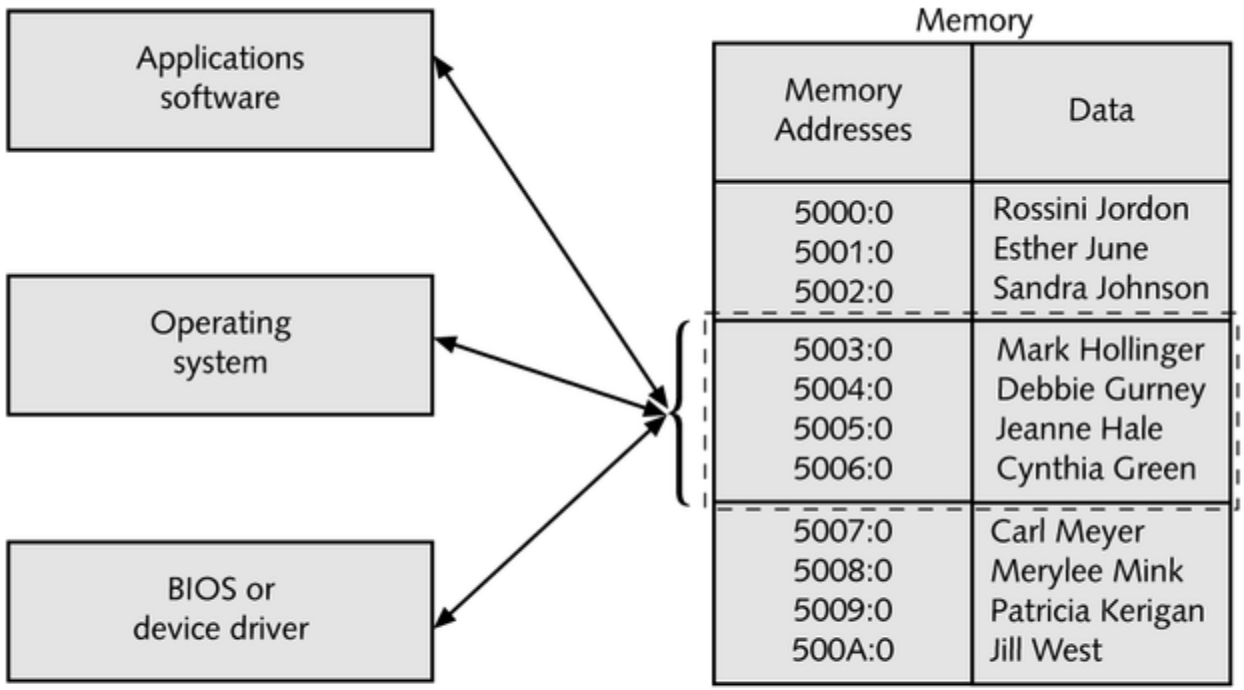

Figure 1-29 Software can exchange information by storing data in RAM that has been assigned memory addresses. Memory addresses can then be communicated to other software layers.

Funções do Sistema Operativo

- Gerir BIOS
- Gerir ficheiros em dispositivos de armazenamento secundário
- Gerir memória principal (RAM)
- Dianosticar problemas de software e hardware
- Interface entre hardware e software
- Realiza tarefas solicitadas pelo utilizador

Arranque do Sistema Operativo

- Os programas do SO devem ser copiados da memória secundária para a RAM
- CPU lê de uma localização da RAM para outra para receber e seguir instruções

Arranque do Sistema Operativo

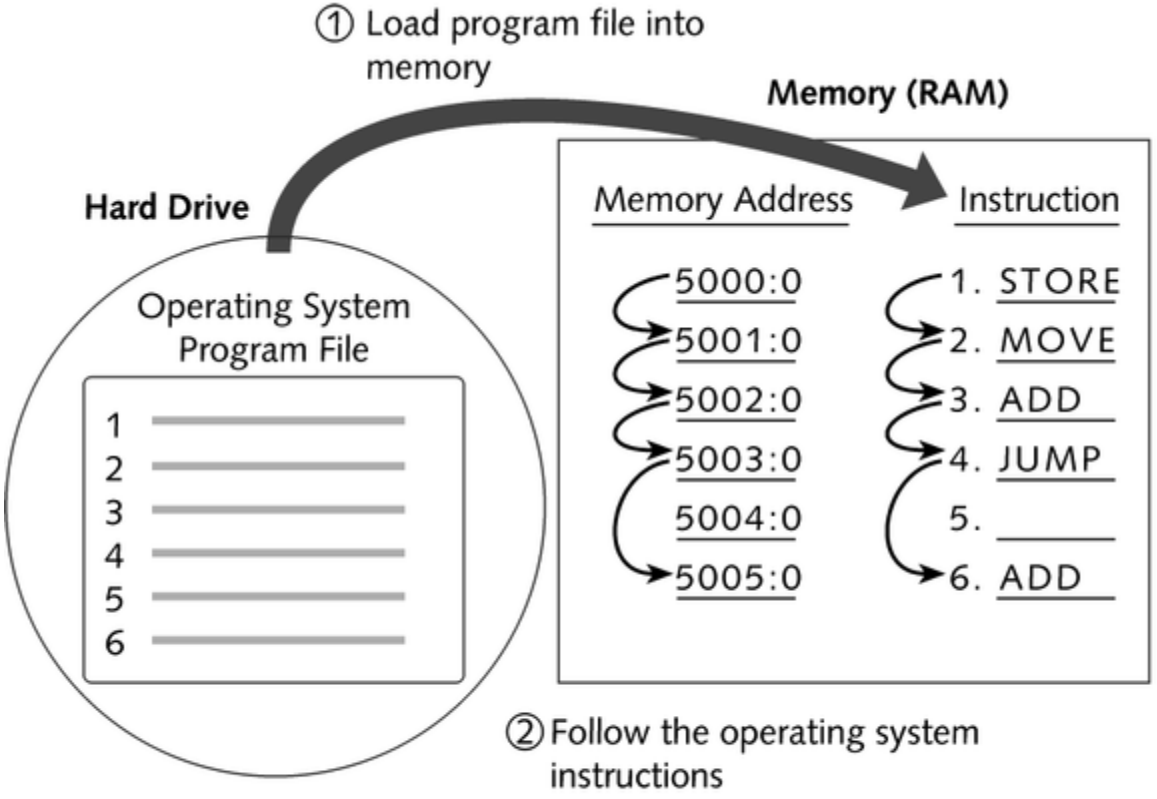

Figure 1-30 The operating system is stored in files on the hard drive but is executed from memory

Tipos de Sistemas Operativos

- Noções
  - Multitasking
  - Cooperative multitasking (task switching)
  - Preemptive multitasking

Multitasking

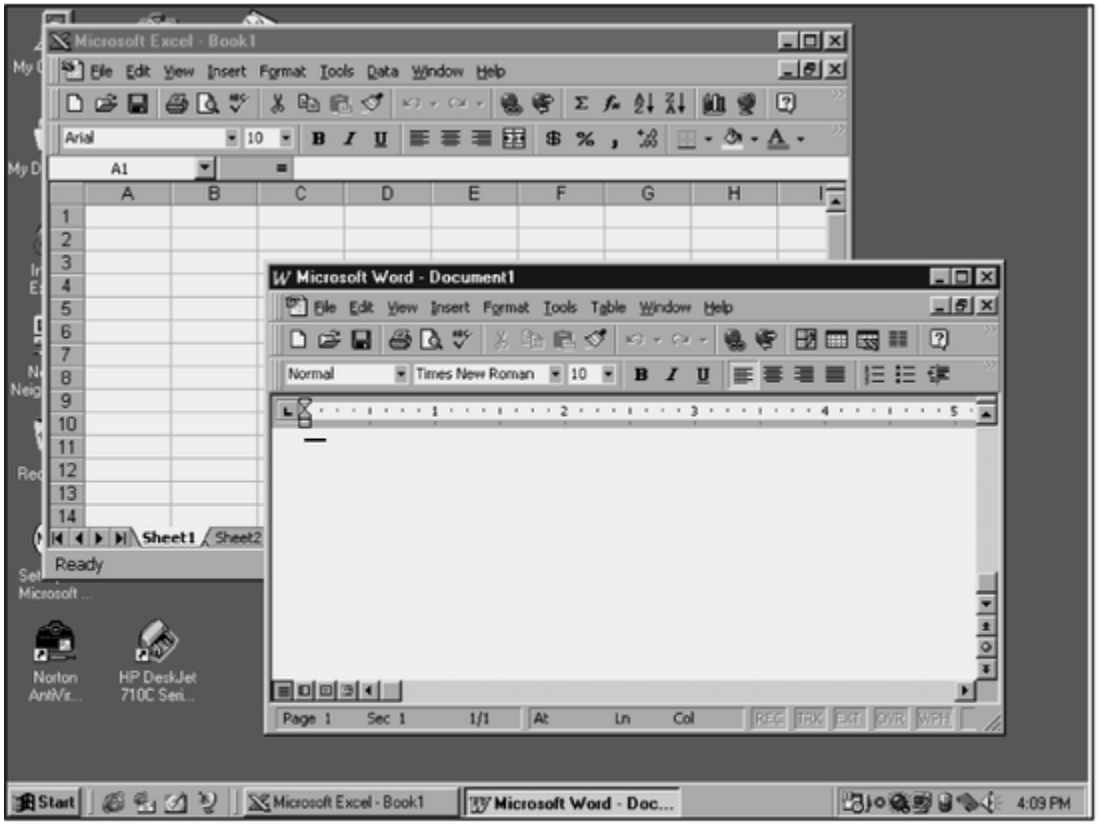

Figure 1-35 A multitasking environment allows two or more applications to run simultaneously

Sistemas Operativos

- DOS (disk operating system)
- DOS com Windows 3.1 e 3.11
- Windows 95 e Windows 98
- UNIX operating system
- Linux
- Windows NT
- OS/2
- Macintosh OS

Disk Operating System (DOS)

Table 1-1 Advantages and disadvantages of DOS

Advantages	Disadvantages
•DOS runs on small, inexpensive micro-computers with a minimum amount of memory and hard drive space. •Some older applications are still in use today that were written for DOS and older hardware. DOS is used today only to support this older software and hardware.	•Memory management is awkward and sometimes slow. •DOS has no icon-driven interface. •DOS does only single-tasking, that is, it supports only one application running at a time. •DOS was not designed for use on networks. A separate applications software program is necessary for a DOS machine to access a network. •The last standalone version is DOS 6.22, which does not take advantage of the many new CPU features now available. (However, Windows 9x has a newer DOS core.) •Hardly any new software is being written for DOS.

Windows

Table 1-3 Advantages and disadvantages of Windows 9x

Advantages	Disadvantages
•Windows 9x offers a very user-friendly and intuitive GUI interface. •Windows 9x offers almost complete backward compatibility for applications written for DOS and earlier versions of Windows. •Windows 9x is a mix of older and newer OS technology and allows both older and newer software and hardware to run. •Windows 9x offers the ability for one PC to talk with another over phone lines without additional software. It works well for lowend network use, such as when two users want to exchange files. •Disk access time under Windows 9x is improved over DOS and Windows 3.x. •Plug and Play features make installing some new hardware devices easier than with earlier OSs. •Windows 9x supports preemptive multitasking. While the hourglass is showing on the window of an application, you can make another application active by clicking on its window.	•Windows 9x requires at least a 386 CPU, 8 MB of RAM, and 30 MB of hard drive space, thus prohibiting its use on some older PCs. •Because of the attempt to bridge older and newer technology, there are some problems with failures and errors created in this hybrid environment.

Linux


Programs
System
Help
4:15 PM
root's Home
My Computer
Trash
Escola Superior de Desporto de Rio Maior,Desporto,Rio Maior,Mestrado,Licenciatura,Pós-Graduação,Fc
File
Edit
View
Web
Go
Bookmarks
Tabs
Help
Back
Forward
Stop
Refresh
Home
http://www.esdrm.pt/
Instituto Politécnico de Santarém
Escola Superior de Desporto de Rio Maior
Organização
Ensino
Investigação
Alunos
Congressos e Eventos
Links
Pesquisas
Regulamentos
Apresentação
Boletins Informativos
Edições
Instalações
Contactos
Escola Superior de Desporto de Rio Maior
Rua José Pedro Inês Canadas, Lt. 1 - R/c
2040-326 Rio Maior
Tel. +351 243 999 280 Fax +351 243 999 289
E-Mail:geral@esdrm.pt
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Escola Superior de Desp

UNIX

Table 1-4 Advantages and disadvantages of UNIX

Advantages	Disadvantages
•UNIX was written for powerful microcomputer systems and has strong multitasking capability, including preemptive multitasking. •UNIX manages large quantities of memory well. •UNIX performs very well in a networking environment.	•UNIX industry standards are not uniform, making it difficult for UNIX developers, administrators, and users to move from one UNIX vendor to another. •UNIX requires a powerful, large microcomputer system. •Few business applications software packages have been written for UNIX for PCs, although there are several very powerful database packages available under UNIX, such as Informix and Oracle.

Windows NT

Table 1-5 Advantages and disadvantages of Windows NT

Advantages	Disadvantages
•Windows NT is designed to run in powerful client-server environments and targets both the client and the server market. •Windows NT offers a completely new file management system, different from earlier Windows OSs. •Windows NT Workstation offers both networking over a LAN and dial-up connections over phone lines. •Windows NT Server offers powerful security both as a file server and for network administration. •Windows NT supports preemptive multitasking and multiprocessing.	•Windows NT requires at least a 486 CPU, 16 MB of RAM, and 120 MB of hard drive space, thus eliminating it as a plausible option for older, low-end PCs. •Windows NT is not compatible with some older hardware and software.

OS/2

Table 1-6 Advantages and disadvantages of OS/2

Advantages	Disadvantages
•OS/2 supports preemptive multitasking. •OS/2 can handle large quantities of memory directly and quickly. •OS/2 has an icon-driven interface. •OS/2 works well in a networking environment.	•Relatively few applications software packages are written for OS/2. Some consider it a dead or dying OS, although it is still used by some. •Many microcomputer users are not familiar with OS/2 and avoid it for that reason. •OS/2 requires a powerful computer system and large amounts of RAM and hard drive space to run efficiently.

Mac OS

Table 1-7 Advantages and disadvantages of the Macintosh operating system

Advantages	Disadvantages
•The Mac OS has an excellent icon-driven interface, and it is easy to learn and use. •The Mac OS supports cooperative multitasking. •The Mac OS manages large quantities of memory.	•Historically, the Macintosh was not viewed as a professional's computer but rather was relegated to education and game playing. Then the Mac gained a significant place in the professional desktop publishing and graphics markets. Most recently, the availability of more powerful IBM-compatible PCs and OSs able to handle the high demands of graphics has reduced the demand for the Mac.

Software de aplicação

- Oito categorias: Processamento de texto, folha de cálculo, base de dados, gráficos, comunicações, jogos, modelação matemática, e ferramentas de desenvolvimento de software
- Desenvolvidos para trabalhar com um SO
- vêm em floppy disks ou CD-ROMs;

Execução de aplicações

- SO recebe um comando para executar a aplicação
- SO localiza o ficheiro do program para a aplicação
- SO carrega o ficheiro do programa na memória
- SO dá o controle ao programa
- Programa pede endereços de memória ao SO para os seus dados
- Programa inicializa-se; pode pedir que os dados de um dispositivo de armazenamento secundário sejam carregados na memória
- Programa espera uma instrução do utilizador

Organização dos programas

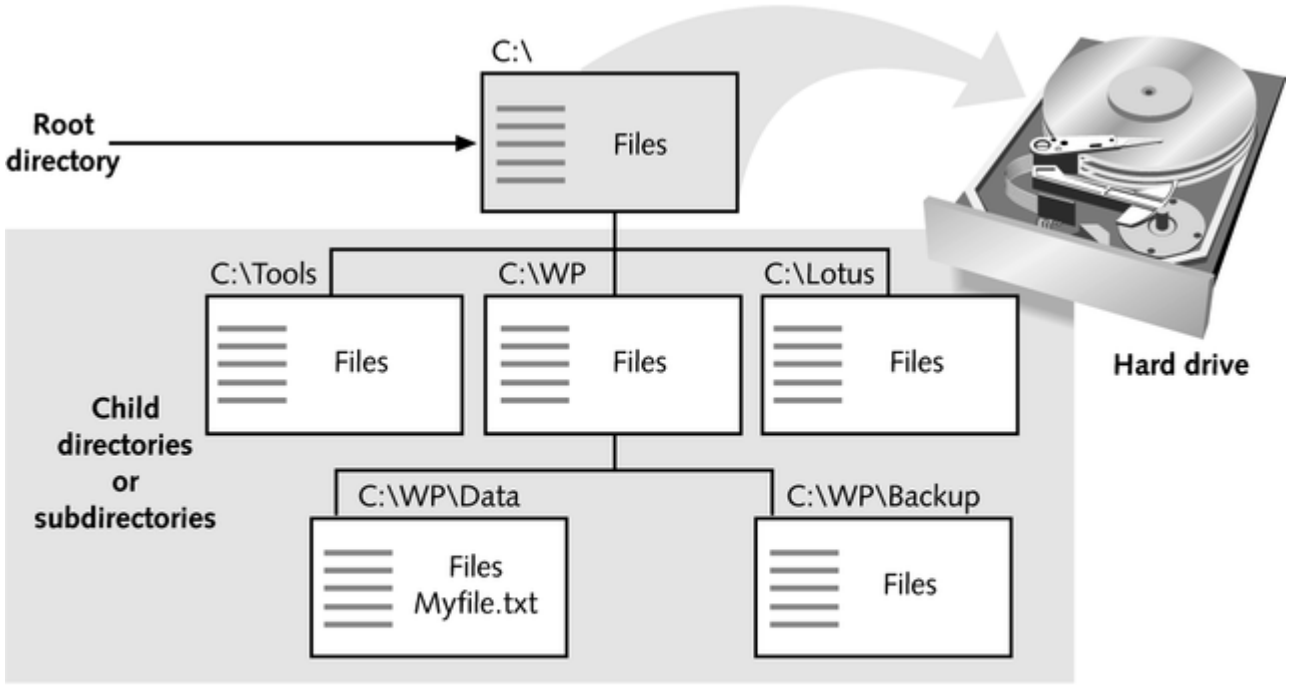


Figure 1-40 A hard drive is organized into groups of files stored in directories. The first directory is called the root directory. All directories can have sub- or child directories. Under Windows, a directory is called a folder.

Copiar um programa para a memória

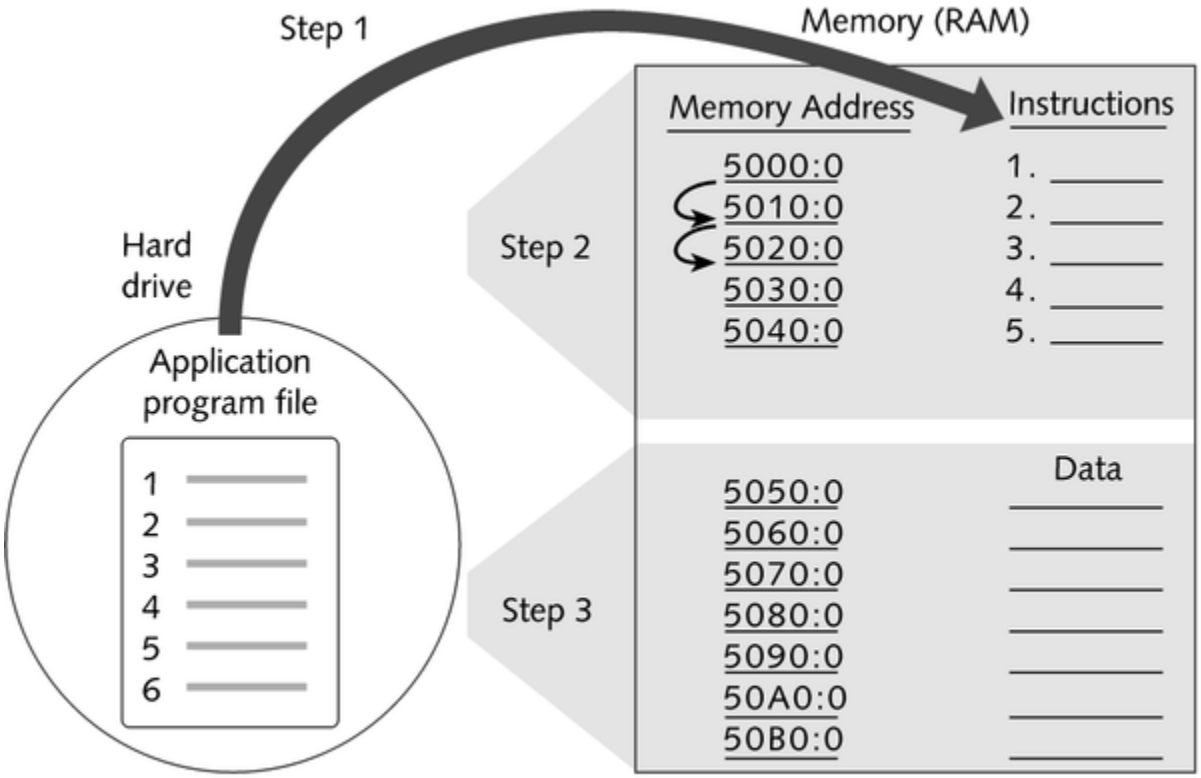
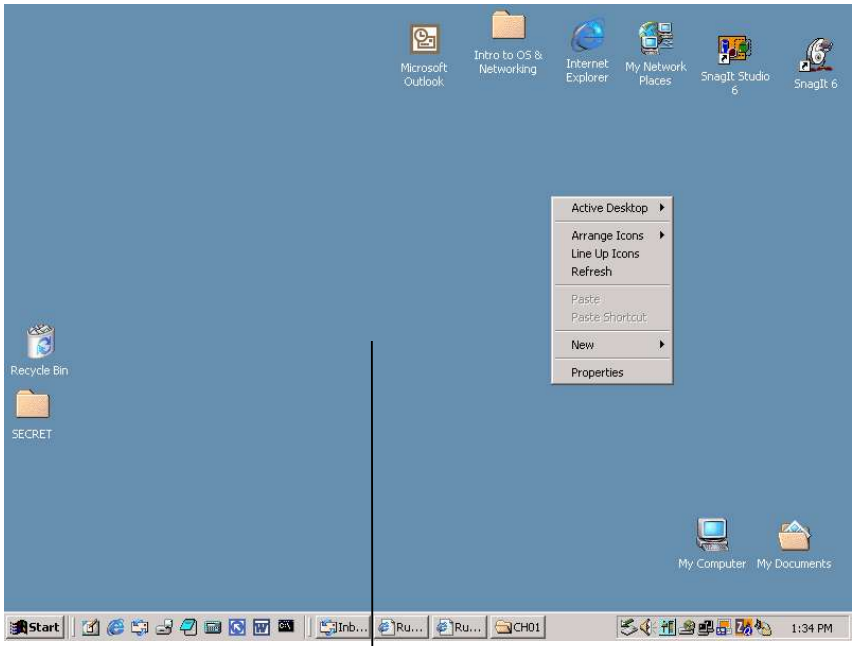


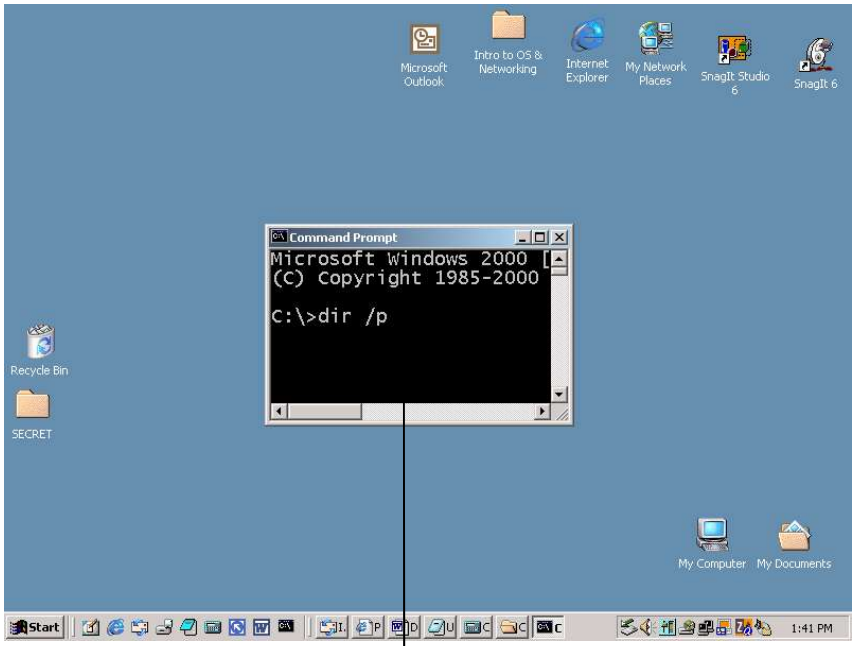
Figure 1-42 Applications software is stored in files but executed from memory

Conceitos

- Números Binários
- Código
- DOS
- Sistema Ficheiros
- GUI
- Kernel
- Orientado a Objectos
- Sistema Operativo
- Shell
- Source code

GUI vs. CUI

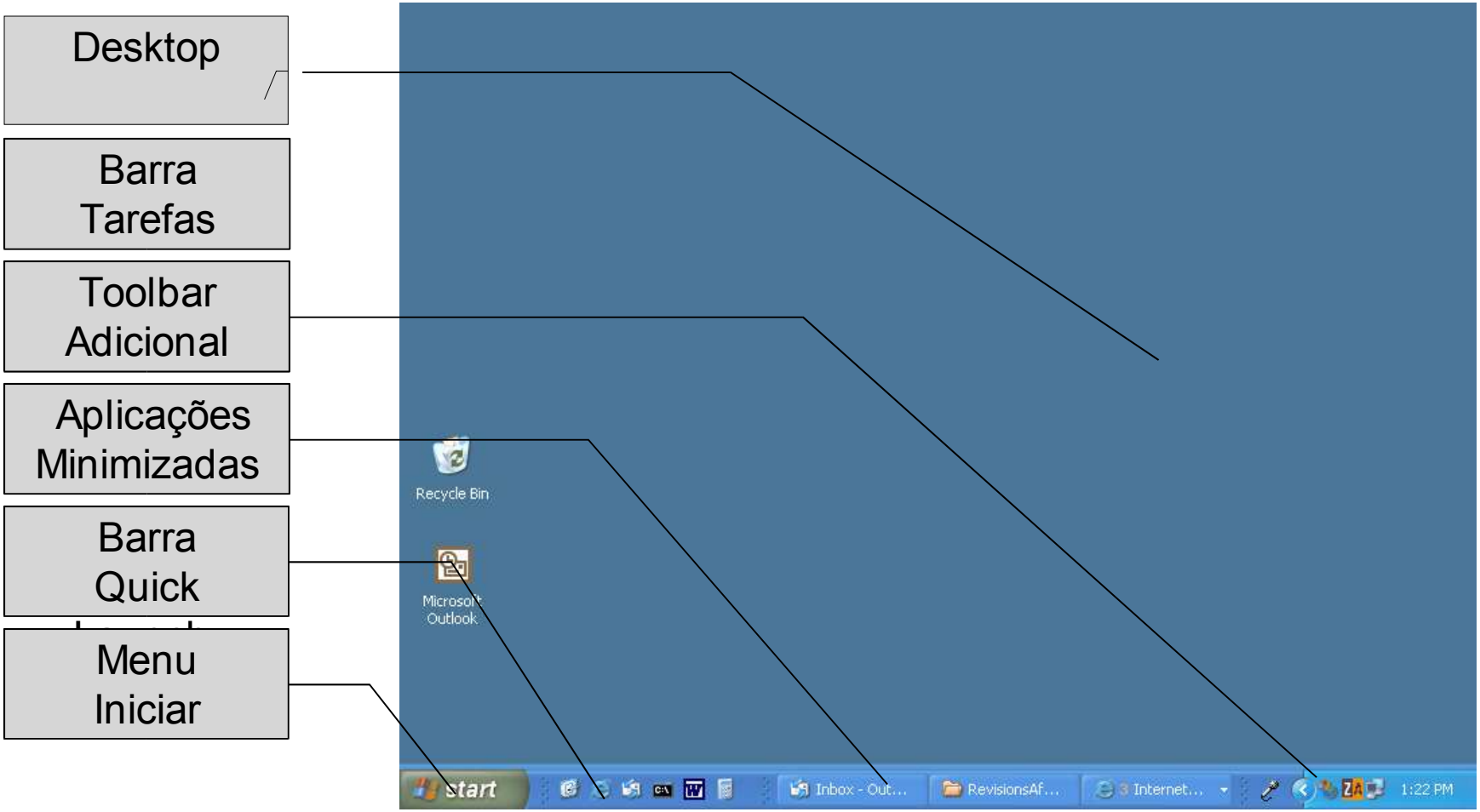




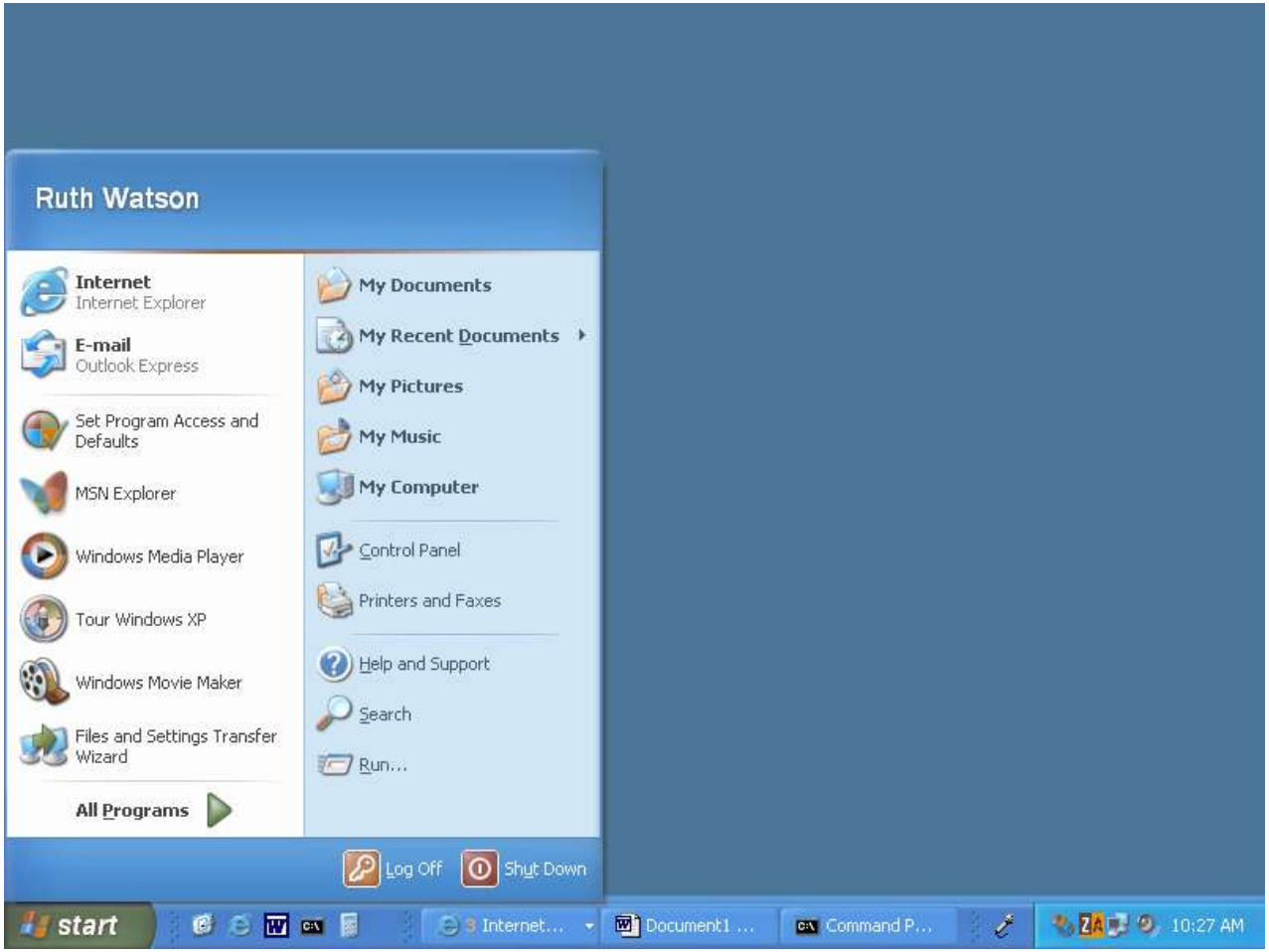
Windows: Graphical User Interface:
Point & Click
Drag & Drop

DOS: Character User Interface:
Escrever e Enter
Sintaxe Exacta

Ambiente de trabalho



Menu Iniciar



Meus Documentos

Abrir Documentos

Gestão Ficheiros

Ajuda Suporte

Abrir Programas

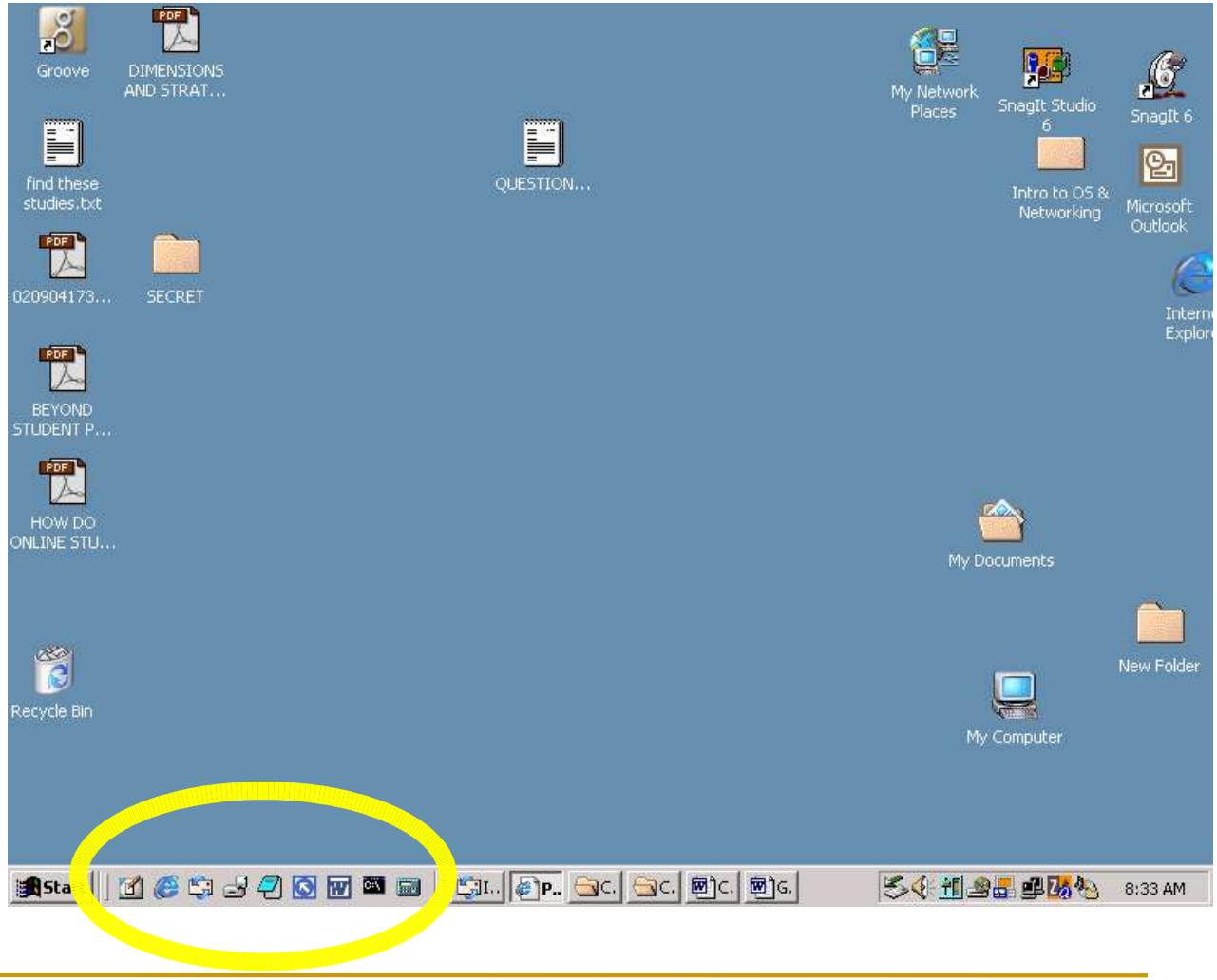
Menu Iniciar

Quick Launch Toolbar

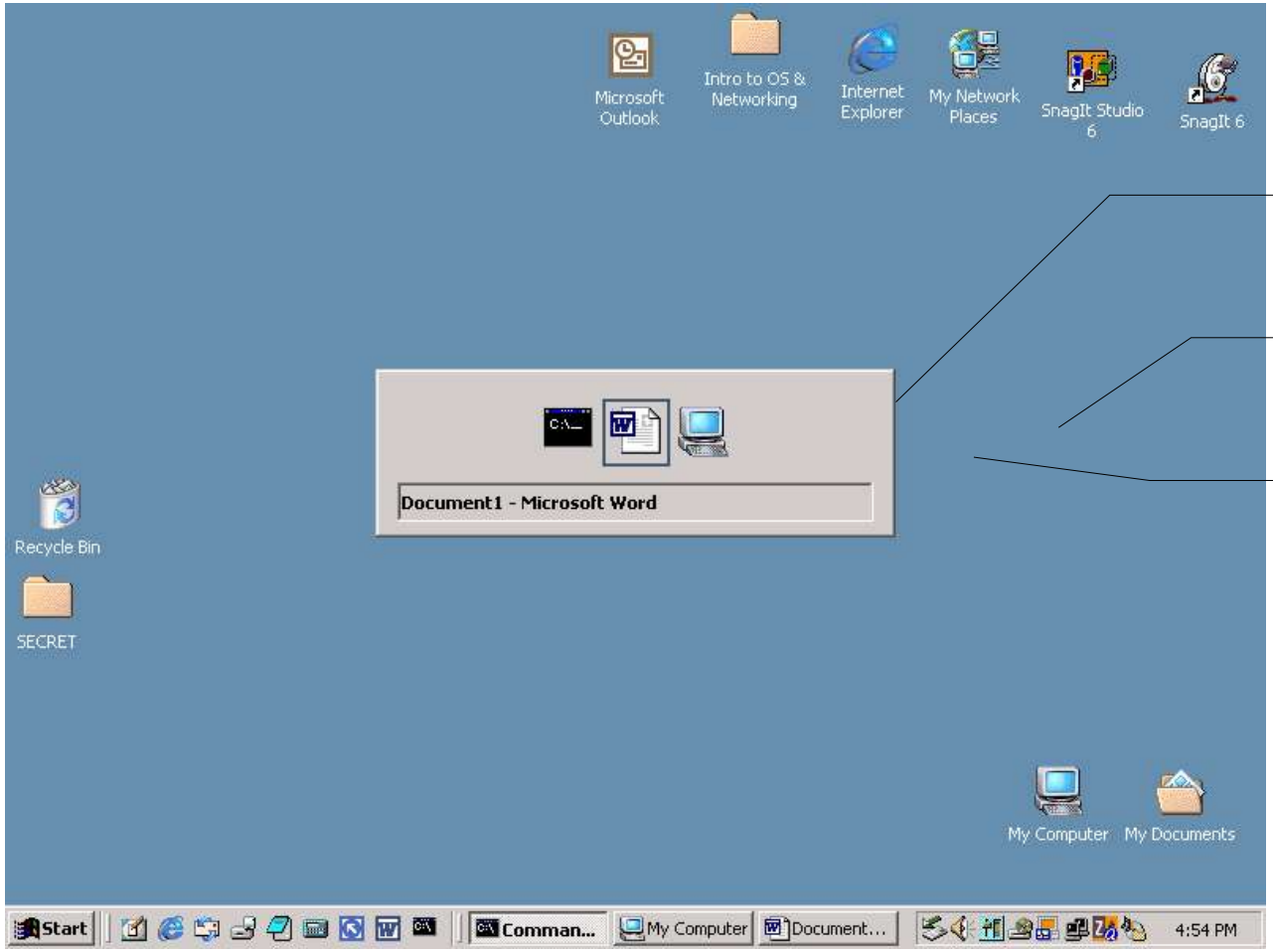
Atalhos para programas

Programas mais Utilizados

Pode ser personalizado



Barra de tarefas

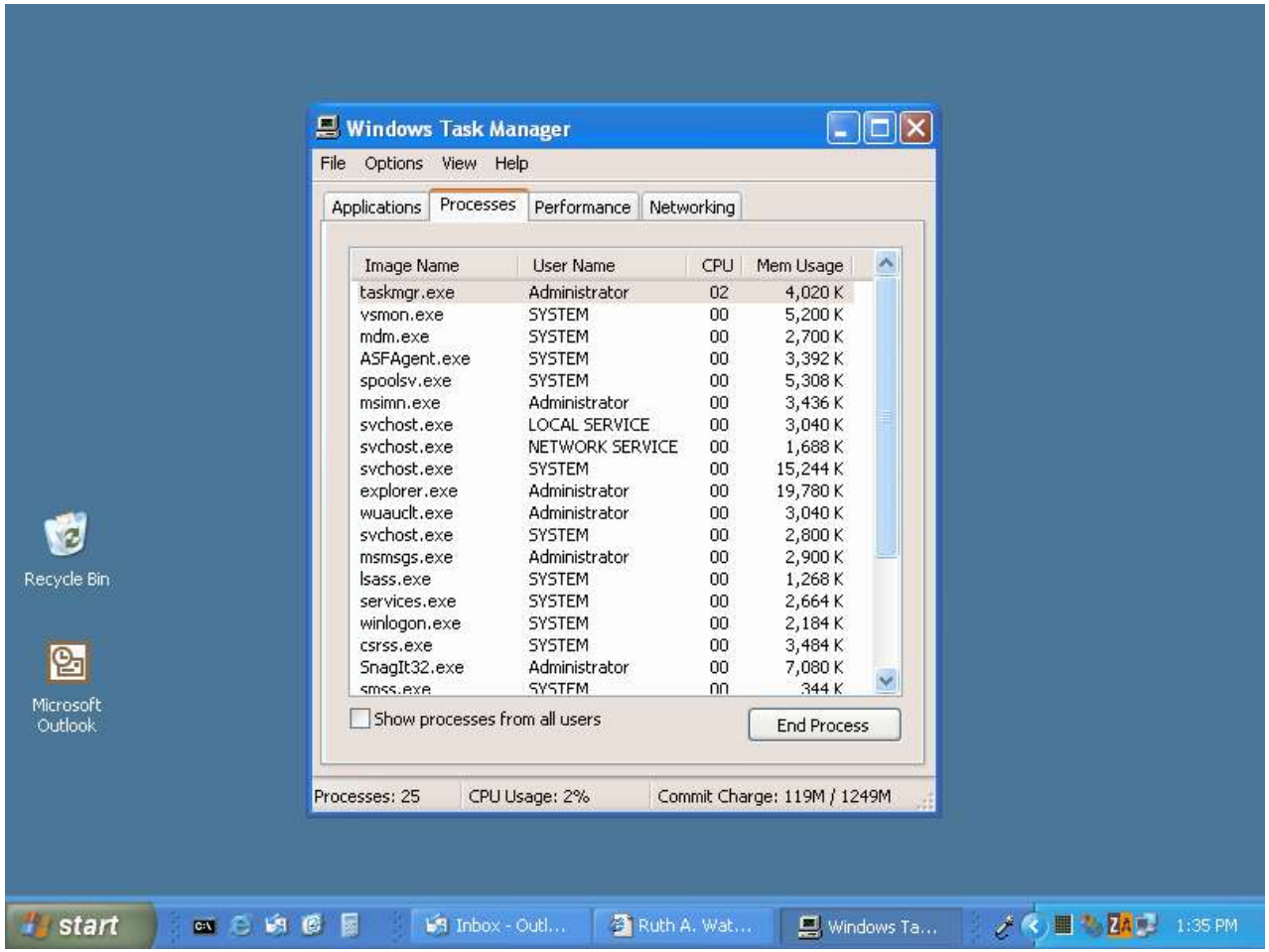


Move to Open Apps

ALT+TAB

TAB KEY

Gestor de tarefas



Bloquear Computador

CTRL+ALT+DEL

Seleccionar processo

Seleccionar aplicações

Terminar

Conclusão

- Os computadores necessitam do sistema operativo para funcionar
- Existem diversos tipos de sistemas operativos
- Componentes principais do sistema operativo:
  - Sistema de ficheiros
  - Kernel
  - Interface com o utilizador

Questões?