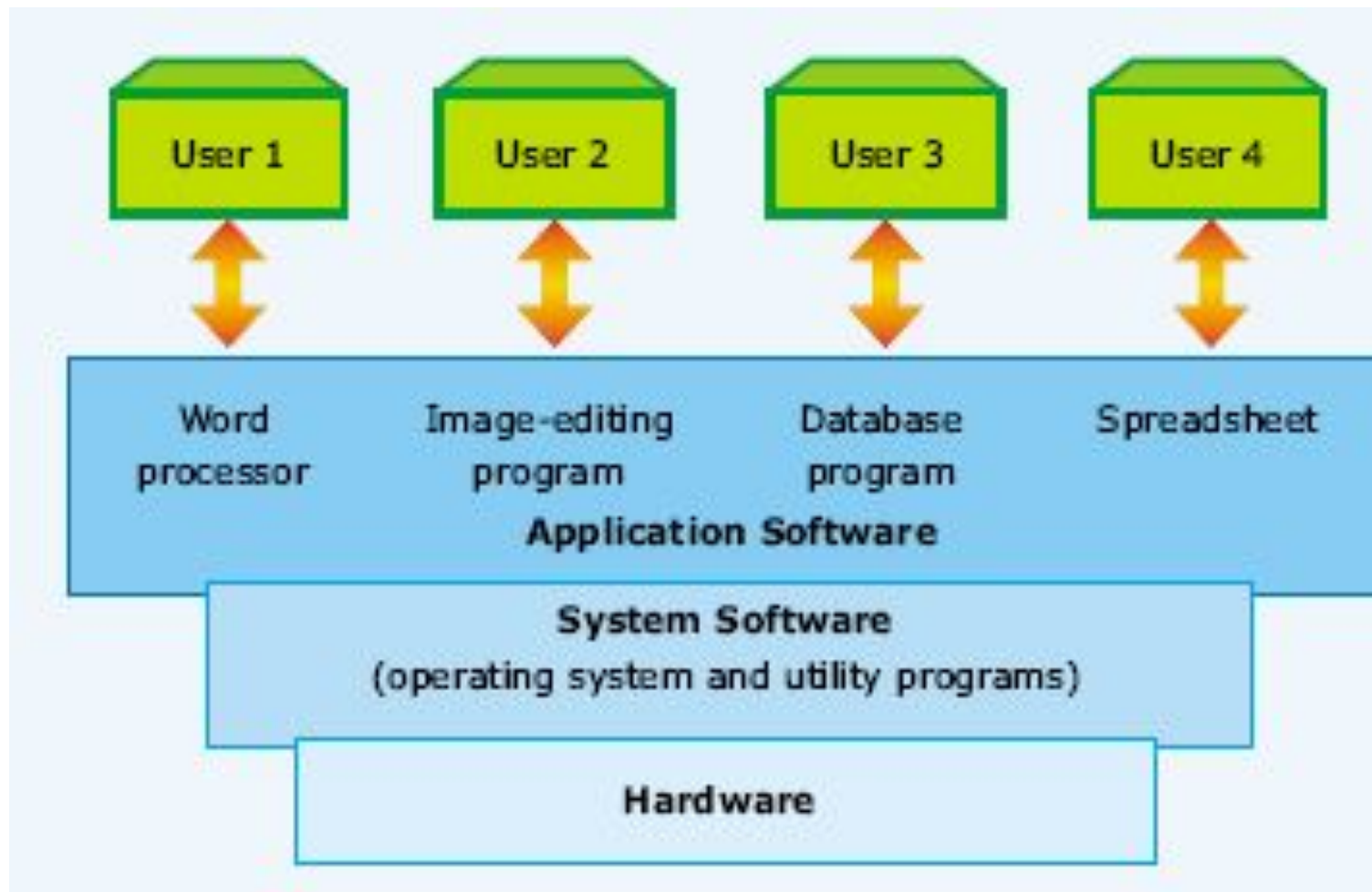


# Operating System

# Hierarchy of computer software



# Operating System

- a collection of programs which control the resources of a computer system
- written in low-level languages (i.e. machine-dependent)
- an interface between the users and the hardware
- when the computer is on, OS will first load into the main memory

# What is OS?

- Operating System is a software, which makes a computer to actually work.
- It is the software the enables all the programs we use.
- The OS organizes and controls the hardware.
- Examples: Windows, Linux, Unix and Mac OS, etc.,

# Basic functions of the operating system



## **Device configuration**

Controls peripheral devices connected to the computer

## **File management**

Transfers files between main memory and secondary storage, manages file folders, allocates the secondary storage space, and provides file protection and recovery

## **Memory management**

Allocates the use of random access memory (RAM) to requesting processes

## **Interface platform**

Allows the computer to run other applications

# Other function of Operating System

- best use of the computer resources
- provide a background for user's programs to execute
- display and deal with errors when it happens
- control the selection and operation of the peripherals
- act as a communication link between users
- system protection

# Common Operating Systems and Their Differences

- Network Operating System
  - UNIX / Linux / MS Windows2000 Server
- Desktop Operating System
  - MS Windows 9X/Me / Mac OS / DOS
- Mobile Operating System
  - Palm OS and Pocket PC

# Examples

- Common operating systems
  - WINDOW
    - used in IBM compatible microcomputers  
(используется в IBM совместимых микрокомпьютерах)
  - UNIX
    - multi-user, multi-tasking OS used in minicomputers and microcomputers



# DOS interface

```
C:\>dir

Volume in drive C has no label
Volume Serial Number is 0F10-129C
Directory of C:\

DIRBLOG.DAT      BOOTLOG.TXT      FRMLOG.TXT      (SOURCE)      SETLOG.TXT
DIRMANG.COM      IO.SYS           HD000.SYS       DIRSQL         SETUPLOG.TXT
[KBANDS]        NETLOG.TXT       COMPIL.SYS      ROOTLOG.PW    [PROGA-1]
[SYSTEM.IST]    AUTOEXEC.NAL    [UNZIP.PSD]    [TBP]         [NETPUB]
FRONTPG.LOG     SCANDISK.LOG     [MP]           [DYNADOC]     [PHOOO-1]
PACADRM.SYS     OS078047.BIN    OS28775L.BIN   [PRDR]        OS004485.BIN
[JSDNG-1.D]     [DHMSI-1]       [P]            WEB1.DOC      [DESRM-1]
[GLOSSARY]      [XX]
                20 Files(s)      8,548,884 bytes
                17-dir(s)    272,877,920 bytes free

C:\>
```



# GUI



# Different Types of Operating System

UNIX	DOS	Mac OS	MS Windows	Linux	Palm OS/Pocket PC
Multi-user, multi-tasking	Single-user, single-tasking	Single-user, multi-tasking	Single-user, multi-tasking	Multi-user, multi-tasking	Single-user, multi-tasking
Command-line user interface	Command-line user interface	GUI	GUI	Command-line user interface, GUI	GUI
UNIX has several versions but they lack interoperability.	DOS has been replaced by MS Windows OS.	Mac OS has easy-to-use GUI.	The first true MS Windows OS is MS Windows 95.	Linux is an open-source software.	They are specifically designed for PDA.
Network OS	Desktop OS	Desktop OS	Desktop OS	Network OS	Mobile OS

# Types of OS:

Operating System can also be classified as

- **Single User Systems**
- **Multi User Systems**

# Single User Systems:

- Provides a platform for only one user at a time.
- They are popularly associated with Desktop operating system which run on standalone systems where no user accounts are required (настольные операционные системы, которые работают на автономных системах, в которых нет учетных записей пользователей).
- Example: DOS

# Multi-User Systems:

- Provides regulated access for a number of users by maintaining a database of known users (Обеспечивает регулируемый доступ для нескольких пользователей, поддерживая базу данных известных пользователей).
- Refers to computer systems that support two or more simultaneous users (Относится к компьютерным системам, которые поддерживают два или более пользователей одновременно).
- Another term for *multi-user* is *time sharing*.
- Example: Unix

# Good Operating System

- efficient
  - time spent to execute its programs should be short
- small in size
  - memory occupied should be as small as possible
- reliable (надежный)

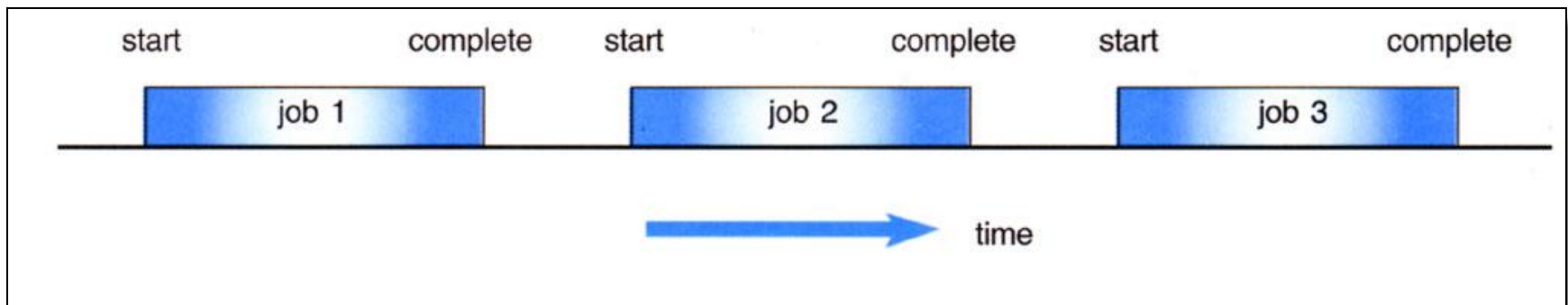
# Type of Operating System

- Batch processing
- Real time processing
- Time sharing processing



# Batch processing

- Jobs, together with input data, are fed into the system in a batch (входные данные, подаются в систему в пакетном режиме).
- The jobs are run one after another.
- No job can be started until previous job is completed



# Real time processing

- immediate response is needed (немедленного реагирования).
- For example
  - anti-missile defense system (в противоракетной обороне)
  - airplane landing control system (система управления посадки самолета)

# Time sharing processing

- Each user is given a time slice to interact with the CPU (Каждый пользователь получает время, чтобы взаимодействовать с процессором).
- The size of the time slice will depend on the system.
- Each user is served in sequence.