Operating System - PDF Note - computeroperatorexam.com

Part 1 — Introduction to Operating System

An **Operating System (OS)** is system software that manages computer hardware, software resources, and provides services for computer programs. It acts as an **intermediary between users and hardware**.

Types of OS — Quick Reference

OS Type	Key Feature	Example
Batch	Processes jobs in batches without user interaction	IBM Mainframes
Time-Sharing	Divides CPU time among multiple users (round-robin)	UNIX, Multics
Distributed	Multiple computers appear as one system	Amoeba, Plan 9
Real-Time (RTOS)	Hard = strict deadlines; Soft = slight delay tolerated	VxWorks, QNX
Network (NOS)	Manages network resources, file/printer sharing	Novell NetWare
Multiprocessing	Multiple CPUs work in parallel	Linux, Windows
Multitasking	Multiple apps run simultaneously (one user)	Windows, macOS
Embedded	Lightweight, specific-purpose for embedded devices	Android, iOS
Mobile	Touchscreen-optimized, power-efficient	Android, iOS
Cloud-Based	Applications run via browser; data stored in cloud	Chrome OS

Part 2 — Functions of the Operating System

14 core functions:

1. **Process Management** — scheduling, multitasking, synchronization, IPC
2. **Memory Management** — allocation, virtual memory, protection, swapping

3. **File System Management** — organization, access control, file operations
4. **Device Management** — drivers, allocation, buffering/spooling
5. **Security & Access Control** — authentication, encryption, monitoring
6. **User Interface** — CLI, GUI, I/O handling
7. **Job Scheduling** — CPU scheduling, job queues
8. **Resource Allocation** — monitoring, deadlock handling, multithreading
9. **Networking** — TCP/IP, data transfer, network security
10. **Error Detection** — monitoring, logging, recovery
11. **Multitasking / Multiprocessing** — concurrent apps, multi-CPU distribution
12. **Boot Management** — boot loader, kernel loading, driver initialization
13. **Disk Management** — partitioning, file systems (NTFS/FAT32/ext4), backup
14. **Virtualization** — hypervisor support, VM resource sharing

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Part 3 — DOS (Disk Operating System)

- Released as **MS-DOS in 1981** by Microsoft for IBM PCs
- **CLI-based**, single-tasking, supports batch files (`.bat`)
- Command interpreter: `COMMAND.COM`

Internal vs External Commands

	Internal	External
Location	In memory (COMMAND.COM)	On disk (.COM / .EXE)
Speed	Immediate	Requires loading
Examples	DIR, CD, COPY, DEL, CLS, MD, RD, REN, TYPE	FORMAT, CHKDSK, XCOPY, DISKCOPY, EDIT

Key DOS Concepts

Concept	Description	Example
Absolute Path	Full path from root drive	`C:\Users\Anil\file.txt`
Relative Path	Path from current directory	`Documents\file.txt`
Wildcard `*`	Matches any number of characters	`*.txt` = all text files
Wildcard `?`	Matches exactly one character	`file?.doc`

Part 4 — Windows OS

Versions Timeline (key milestones)

- **Windows 95** (1995) — Start menu, taskbar, Plug and Play
- **Windows XP** (2001) — Most stable, widely adopted
- **Windows 7** (2009) — Popular, improved performance
- **Windows 10** (2015) — Cortana, Edge browser
- **Windows 11** (2021) — Redesigned UI, gaming focus

Window Management — Quick Keys

Action	Shortcut
Minimize	`Win + ↓`
Maximize	`Win + ↑`
Close	`Alt + F4`
Open File Explorer	`Win + E`
Lock Computer	`Win + L`
Task Manager	`Ctrl + Shift + Esc`

Part 5 — Windows File Management and Performance

File Search Methods

- **Basic**: Type name in search box
- **Exact**: Use quotes `"filename.txt"`

- **Wildcard**: `.pdf`, `data?.txt`
- **Content**: `content:keyword`

Performance Tools

Tool	Command / Path	Purpose
Check disk errors	`chkdsk C: /f`	Fix file system errors
Recover bad sectors	`chkdsk C: /r`	Scan + recover bad sectors
Defragment	Optimize Drives tool	Reorganize HDD (not SSD!)
Disk Cleanup	Search "Disk Cleanup"	Delete temp files

Part 6 — Windows Security

User Management Summary

- **Add user**: Settings → Accounts → Family & other users
- **Create group**: Computer Management → Local Users and Groups → Groups
- **Add to group**: User Properties → Member Of → Add
- **Change permissions**: File/Folder Properties → Security tab → Edit

NTFS Permissions

Allow or Deny: Read, Write, Modify, Full Control for specific users/groups.