Chapter 2 The System Unit, Processing, and Memory Key Topics o Binary, Bits & Bytes o System Unit o Processing Devices o Memory 1 Binary, Bits & Bytes o All types of data must be converted into a form which can be processed by a computer.> Dual Core CPUs contain two cores Quad Core CPUs contain four cores Octa Core CPUs contain eight cores CPUs for servers can contain up to 64 cores 14 Processing Devices Components of a CPU Core 15 Processing Devices o Processing performance of a computer mainlydepends on: CPU's Clock Speed – measured in Hz (typically in GHz) CPU's Word Size – amount of data which can be handled at once – measured it bits (typically 32 bits or 64 bits) Bus Width – number of wires/paths in a bus – measured in bits (typically 8, 16, 32 or 64 bits) Memory Size– RAM and Cache – measured in Bytes (typically in GBs) 16 Processing Devices o Since processing related to graphics (images and videos) is very intensive, most computers have a separate processing device for graphics known as Graphics Processing Unit (GPU).Common prefixes are: Kilo – Thousand (1,000) Mega –Million (1,000,000) Giga –Billion (1,000,000,000) Tera– Trillion (1,000,000,000,000) Peta – Quadrillion (1,000,000,000,000,000) Exa–Quintillion (1,000,000,000,000,000,000) 3 Encoding Data into Binary 1) Text data is encoded into binary using coding systems like ASCII and Unicode.Examples of compression include: For graphics, BMP files can be compressed into JPG For audio, WAV files can be compressed into MP3 For video, AVI files can be compressed into MP4 6 System Unit.2) Graphics data (images and drawings) is encoded into binary by converting colour value of each pixel into binary. 4 Encoding Data into Binary 3) Audio data is encoded into binary by first converting sound waves into numerical form and then converting the numbers into binary.19 Memory o In addition to RAM, other common types of memory include: > Registers– volatile – fastest type of memory built into the CPU needed for storing data during processing.o Compression mostly involves removing unnecessary bits from the file while keeping quality at an acceptable level.> External hardware connects using Portsor wireless technologies.o Ports are used by devices which use wires to connect to the motherboard, Examples: HDMI port is used to connect a monitor.o CPU consists of circuitry and components packaged together and connected directly to the motherboard.They contain processing components (cores) of multiple independent processors on a single chip.17 Processing Devices o Processing devices and other circuits can generate a lot of heat and require suitable cooling arrangements.Prefixes: o Prefixes are often used to express larger quantities of bits and bytes.o System Unit houses the processing hardware for a computer and also contains other components such as storage devices.> Internal hardware is connected through electronic paths called Buseswhich are built into the motherboard.> USB ports connect USB devices.Questions ???21