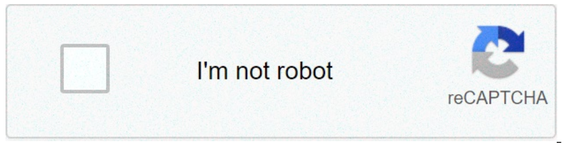

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Vliw architecture in computer architecture

Advertisement When talking about a cloud computing system, it's helpful to divide it into two sections: the front end and the back end. They connect to each other through a network, usually the Internet. The front end is the side the computer user, or client, sees. The back end is the "cloud" section of the system.The front end includes the client's computer (or computer network) and the application required to access the cloud computing system. Not all cloud computing systems have the same user interface. Services like Web-based e-mail programs leverage existing Web browsers like Internet Explorer or Firefox. Other systems have unique applications that provide network access to clients.On the back end of the system are the various computers, servers and data storage systems that create the "cloud" of computing services. In theory, a cloud computing system could include practically any computer program you can imagine, from data processing to video games. Usually, each application will have its own dedicated server.A central server administers the system, monitoring traffic and client demands to ensure everything runs smoothly. It follows a set of rules called protocols and uses a special kind of software called middleware. Middleware allows networked computers to communicate with each other. Most of the time, servers don't run at full capacity. That means there's unused processing power going to waste. It's possible to fool a physical server into thinking it's actually multiple servers, each running with its own independent operating system. The technique is called server virtualization. By maximizing the output of individual servers, server virtualization reduces the need for more physical machines.If a cloud computing company has a lot of clients, there's likely to be a high demand for a lot of storage space. Some companies require hundreds of digital storage devices. Cloud computing systems need at least twice the number of storage devices it requires to keep all its clients' information stored. That's because these devices, like all computers, occasionally break down. A cloud computing system must make a copy of all its clients' information and store it on other devices. The copies enable the central server to access backup machines to retrieve data that otherwise would be unreachable. Making copies of data as a backup is called redundancy.What are some of the applications of cloud computing? Keep reading to find out. While most '50s and '60s imaginings of future architecture didn't pan out, there are some futuristic-looking modern buildings that fit the bill. We'll show you some amazing examples of "future-tecture" in this gallery.By Shanna FreemanFrank Lloyd Wright likely is best known for his architectural stylings and his eye for detail. But there was much more to the man: He liked fast cars, he loved women and he drew inspiration from Japanese art. How did that translate to his architecture?By Jessika ToothmanMichelangelo was not only a great sculptor; he was also a master builder. He loved cities over nature and although had many architectural feats under his name, he often declared that he was not an architect. See the famous buildings of Michelangelo.By Lauren Mitchell RuehringIf you've ever seen a construction site, you may have noticed that the general plans for construction are drawn out in the form of blueprints. What exactly are blueprints, though, and how are they made? Find out in this article. Microprocessors are an incredibly useful tool because they are cheap, flexible, and allow you to control physical systems in powerful ways. In this class, you will learn to build microprocessors as well as to program and build systems from them.Institution: HarveyMuddXSubject: EngineeringLevel: IntroductoryPrerequisites: This courses assumes you have taken ENGR85A or an equivalent course on Digital Design covering combinational and sequential logic design, Verilog, and building blocks such as multiplexers, ALUs, and memories. It assumes you have the lab kit from ENGR85A (Syllabus -> Hardware and Software Requirements).Language: EnglishVideo Transcript: EnglishBy the end of this course, you should be able to: Write simple programs in C and assembly language Build embedded systems involving software and hardware Design single-cycle, multicycle, and pipelined microprocessors Getting a new PC is exciting and well worth the hassles of planning and organization, but the last thing you probably want to do is haul your old workhorse to the trash bin. You can breath some new life into it. Here are a few ideas for making your old computer more useful.Turn it into a file and backup server. If you have a home network, your old PC might be perfect for storing and backing up important files. Outfit it with a big hard drive and a backup device, such as a DVD+/-RW drive or even a tape drive. Then, create network shares for each computer on the network, and instruct everyone to save important data to their shares. Run nightly backups on the server, and you've now got office-level file protection.Use it as a dedicated game server. Game servers don't need to be as juiced up as clients, because they don't handle the graphics rendering that the clients do. When you host a game on the Web or throw a LAN party, use the old computer as a dedicated server for your games.Hand it down to a younger member of the family. Kids' software is generally very forgiving of older and less powerful systems. You can easily run the latest Reader Rabbit or Magic School Bus titles on a relatively modest PC. For the homework needs of older kids, any machine capable of e-mail, Web surfing and running DVD-ROM-based encyclopedias will suffice–even if the recipient insists on instant messaging.Dismantle it and learn more about building and upgrading computers. If you've never worked inside a computer before, you can make your old PC your first project. Tear it apart and see what you can remove, upgrade and generally fiddle with. Experiment with changing BIOS settings and see what kinds of effects they have. The Web is full of tutorials on building and upgrading computers, as well as performance tweaking various versions of Windows.Use it as a test bed for new software. If you're thinking of switching to, say, Mozilla Firefox or some other alternative application, but you're not ready to commit your main PC to a program with which you're not familiar, use your old PC to test new software.Keep it around to run your old games that won't run on Windows XP. If you're a longtime gamer, you'll find that some of your older titles won't run properly on the latest version of Windows. Instead of sacrificing those games to eBay, keep your old PC around for when you're feeling nostalgic enough to load them up.Donate it to a school, church or hospital. If you really want that old dog out of your house, don't throw it away. Institutions all over America accept donations of PCs and parts. Call your local Salvation Army outpost or another charitable organization and find out who needs what. Put the word out that you're in the market to donate a PC, and I guarantee you won't have it for long. TechRadar is supported by its audience. When you purchase through links on our site, we may earn an affiliate commission. Learn more Laptops, netbooks, Ultrabooks, PCs and Macs, peripherals and software TechRadar newsletter Sign up to get breaking news, reviews, opinion, analysis and more, plus the hottest tech deals! Thank you for signing up to TechRadar. You will receive a verification email shortly. There was a problem. Please refresh the page and try again. No spam, we promise. You can unsubscribe at any time and we'll never share your details without your permission. Short for Very Long Instruction Word, a microprocessor design technology. A chip with VLIW technology is capable of executing many operations within one clock cycle. Essentially, a compiler reduces program instructions into basic operations that the processor can perform simultaneously. The operations are put into a very long instruction word that the processor then takes apart and passes the operations off to the appropriate devices. Compare with RISC and CISC. Computer architecture provides an introduction to system design basics for most computer science students. This computer architecture study guide describes the different parts of a computer system and their relations. Students are typically expected to know the architecture of the CPU and the primary CPU components, the role of primary memory and differences between RAM and ROM. Other topics of study include the purpose of cache memory, the machine instruction cycle, and the role secondary memory plays in computer architecture. Computer Architecture Checklist Getting Started: Key Terms to Know The Architecture of the Central Processing Unit (CPU) Primary Components of a CPU Diagram: The relationship between the elements Primary Memory Explained RAM and ROM The Role of Secondary Memory Persistent Storage The Purpose of Cache Memory The Machine Instruction Cycle Webopedia study guides offer quick facts to help students prepare for computer science courses. Did you find this guide useful? Click to share it with friends and classmates on Twitter. 1. Getting Started: Key Terms to Know The following definitions will help you understand modern computer architecture: 2. The Architecture of the Central Processing Unit (CPU) The central processing unit (CPU) is where most calculations take place. It is an internal component of the computer that is often referred to as the "brains" of the computer. Modern CPUs are small and square and contain multiple metallic connectors or pins on the underside. The CPU is inserted directly into a CPU socket, pin side down, on the motherboard. The CPU is the most important element of a computer system in terms of computing power. 3. Primary Components of a CPU The Arithmetic Logic Unit The arithmetic logic unit (ALU) performs arithmetic and logical operations. It is where data is held temporarily and where calculations take place. The Control Unit The control unit (CU) controls and interprets the execution of instructions It extracts instructions from memory and decodes and executes them, calling on the ALU when necessary. 4. Diagram: The Relationship Between the Elements The following diagram showing the relationship between the elements of the CPU, input and output, and storage. 5. Primary Memory Explained There are two types of physical memory: primary and secondary memory. Primary memory is volatile memory. Secondary memory (secondary storage) is non-volatile. Recommended Reading: Webopedia's volatile memory and non-volatile memory definitions. The main functions of primary memory (also called main memory or primary storage) is to execute program code and store temporary data. Primary memory is the memory that the processor accesses first. The memory is on chips located on the motherboard. The primary memory stores applications to run the operating system (OS), the user interface and installed software utilities. The computer can manipulate only the data that is in main memory. Every program executed and every file accessed must be copied from a storage device into main memory. The amount of main memory in a computer system determines how many programs can be executed at one time and how much data can be readily available to a program. Did You Know…? A small program (called a boot loader or bootstrap loader) is stored in primary memory. It loads the operating system into the computer's memory when the system is booted and the program also starts the operating system. This process is known as "booting up" the computer. 6. Primary Memory: RAM and ROM Examples of primary memory include RAM and ROM. What is RAM? Random access memory (RAM) is a type of volatile memory and is the most common type of memory found in computers and other devices, such as printers. RAM requires a flow of electricity to retain data (e.g., the computer is powered on). What is ROM? Read-only memory (ROM) is a type of non-volatile memory and is computer memory on which data has been prerecorded. ROM will retain data without the flow of electricity (e.g., when the computer is powered off). Recommended Reading: Tech FAQ: What is the Difference Between RAM and ROM? 7. The Role of Secondary Memory Secondary memory (also called auxiliary memory) is storage devices: hard drives, solid state drives, removable storage media — including flash drives and DVDs. Secondary memory is not accessed directly by the CPU as it is with primary memory. Instead, data from secondary memory is loaded into RAM then sent to the processor. It transfers the requested data to an intermediate area in primary storage. While secondary memory is much slower than primary memory, it offers greater storage capacity. 8. Persistent Storage Persistent storage (storage that doesn't lose its data after it loses its power supply) is extremely important in a computer system. It is needed to store data in a non-volatile device during and after the running of a program to keep files and data for later use. The hard disk drive is a common example of persistent storage. 9. The Purpose of Cache Memory Cache memory (also called CPU cache) is a high-speed storage mechanism that is a reserved section of main memory or an independent high-speed storage device. The CPU cache reduces the time required to access data from the main memory. Modern CPUs have different independent caches, such as instruction and data caches. There are two types of caching commonly used in computer systems: memory caching and disk caching. What is Memory Cache? Memory cache, sometimes called RAM cache, is a portion of memory made of high-speed static RAM (SRAM) instead of the slower and cheaper dynamic RAM (DRAM) used for main memory. Memory caching is effective because most programs access the same data or instructions over and over. What is Disk Caching? Disk caching works under the same principle as memory caching, but instead of using high-speed SRAM, a disk cache uses conventional main memory. Disk caching can dramatically improve the performance of applications, because accessing a byte of data in RAM can be thousands of times faster than accessing a byte on a hard disk. 10. The Machine Instruction Cycle The instruction cycle refers to the time period during which one instruction is fetched from memory and executed when a computer is given an instruction in machine language. The CPU carries out the following four stages of an instruction cycle: 1. Fetch the instruction from memory. This step brings the instruction into the instruction register, a circuit that holds the instruction so that it can be decoded and executed. 2. Decode the instruction. Mathematical and logical operations used in reference to data. 3. Read the effective address from memory if the instruction has an indirect address. 4. Execute the instruction. This combines all steps. Note: Steps 1 and 2 are called the fetch cycle and are the same for each instruction. Steps 3 and 4 are called the execute cycle and will change with each instruction. Recommended Reading: Webopedia's instruction cycle definition. Additional Resources for Learning Computer Architecture Courtesy of Carnegie Mellon Computer Architecture, the following lecture covers the introduction and basics of computer architecture. This article was last updated on August 07, 2018