1. **Trends and Innovations:**

There’s been massive shifts. In the late 1990s and early 2000s broadband was becoming more widespread, and e-commerce continued to grow. This meant that IT infrastructure needed to become more robust to handle the increased traffic. I remember a time when downtime in the evening was accepted and expected for a site. As more people came online through the 2000s via laptop, desktop, mobile phone, tablet, etc, we now need apps to be available 24/7. Even if it’s just entertainment. The recent PlayStation Network (PSN) outage was met with widespread disdain amongst consumers, even though the service is almost never down for maintenance.

Circling back to high-speed internet, even that has been changed. Streaming services, widely available UHD (4K) content, the rise of content creation as a career, and normalized usage of cloud services for storage has driven bandwidth requirements up significantly over just the last decade. In 2024, the Federal Communications Commission (FCC) redefined high-speed internet to be 100 mbps download and 20 mbps upload, which is up from the standard of 25 mbps download, 3 mbps upload set in 2015. Many major Internet service providers (ISPs) offer gigabit internet (1000+ mbps) download AND upload for residential customers.

I’m curious to see how high-speed internet evolves over the next 5-10 years, and how IT infrastructure evolves to make use of however many gigabits of bandwidth we have access to while waiting in line at Starbucks.

1. **Personal Devices:**

As personal computing devices grew in popularity and market share, manufacturers ran into numerous engineering problems. How do we make these things faster without killing battery life? How do we keep them cool? How do we cram more features like multiple front and rear cameras or bigger screens or more sensors without making these things as big and heavy as bricks?

A big part of that was ARM processors. They utilize something called RISC (Reduced Instruction Set Architecture). Instruction Set architecture (ISA) is how a CPU interprets instructions from machine code. This dictates how the CPU performs math, how it handles memory, etc. RISC basically eliminates edge-case instructions that are rarely used, so there is a smaller pool of valid instructions to use logic on, hence the name. The result is a processor that is smaller, generates less heat, and uses much less power than other ISAs like x86, common in desktops and laptops, though most Apple products notably use ARM processors.

When it comes to devices like smartphones, wearables, tablets, and even some ultrathin laptops, space, battery life, and cooling are at a premium. A CPU that can provide benefits for all of these design constraints is a huge advantage, which is why ARM processors are so widely used in these products.

References:

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