Linus Torvalds

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Linus Torvalds is a Finish software engineer, who is perhaps best known for creating and maintaining the Linux kernel. The Linux kernel is now widely used on PCs, with distributions such as Ubuntu and Red Hat, mobile phones, the Android operating system, web servers, and embedded systems. He also developed arguably the most popular version control system in the world, Git. The creation of these systems, both of which are fundamental in most software engineers' toolsets, would be enough to make him an admirable and inspirational figure in the world of software engineering. I, however, find that his dedication to the open-source model of distribution to be equally admirable to his development achievements.

Torvalds was born in Helsinki in 1969. His mother and father separated when he was at a young age. After this, he lived in a small apartment in Helsinki with his mother and younger sister.

Torvalds was first introduced to computing by his grandfather Leo Tornqvist, a professor of statistics at Helsinki University. In 1981, Tornqvist bought a Commodore VIC-20. The VIC-20 didn’t have a GUI nor any commercial software at that point. So, all there was to do on the VIC-20 was to program with BASIC.

Torvalds would act as a typist for his grandfather, who used the computer as a calculator. When it came time to write his own programs, Torvalds started by executing the sample programs found in the VIC-20’s manual. For example, there was a program that would print “HELLO” indefinitely. He then moved on to making his own games.

By the time he was in his late teens, Torvalds bought his second computer, a Sinclair QL. It was with this computer that his programming ability began to develop considerably. He began to write his own programming tools and added them to an EEPROM card so he could access them without loading them into RAM.

It was also this computer that got him into operating systems. He bought a floppy controller for the computer. He, however, didn’t like the driver that came with the floppy controller, so he decided to make his own. It was while doing this that he found bugs in the operating system of the Sinclair.

It was around this time that Torvalds enrolled in Helsinki University. After he completed his first year in university, he served his mandatory seven months in the Finish military. He returned to university for the academic starting in autumn of 1990. It was this year that Helsinki University first have Unix machines. In anticipation of this, Torvalds bought his first PC. This was a custom-built computer, that he bought from a local computer shop. On this PC, he installed Minix, a Unix-like operating system, developed as a teaching tool by Andrew Tanenbaum.

While Torvalds greatly appreciated Minix, he did have issues with it. One such issue was that he found that the terminal emulator was not good at connecting to the Unix machines at his university. So, he decided to develop his own terminal emulator. This terminal would not be developed under Minix, but bare hardware. The terminal emulator would be built out of two threads, one to read from the modem to the screen and the other would read from the keyboard and write to the modem. It used task switching to switch between the two tasks. The earliest version of this terminal emulator simply printed “AAAAAA”, and after a time delay it switched to “BBBBBBB”. It didn’t seem like much, but Torvalds says this is when Linux was born.

Using his terminal emulator, Torvalds could now connect to the Unix machines in his university, however, he wanted to upload and download things. For this, he would need to develop a disk driver and a file driver. It was at this point he realised what he was developing was an operating system.

In the early stages of the development, Torvalds tried to implement all of the POSIX system calls. With this method, however, it was difficult for him to see any progress. So he settled get enough of them implemented to be able to run the shell. He didn’t develop his own shell, instead, he downloaded bash from the internet. He managed to run bash successfully for the first time on Linux in September of 1991. This was the version of Linux that he released on the internet, version 0.01.

In the following couple of months, more updates followed. The first major update, version 0.1, came in November 1991. Up until that point, to run Linux, you need to have Minix as a host environment, but this update meant that this was no longer a requirement. The next big improvement came a couple of months later, in January 1992. This introduced page-to-disk, a feature that allowed users to run programs that

required more memory than their machine had. This was an important update because this was a feature that Minix didn't have.

Linux 1.0 was released in March 1995. This release featured networking and it supported X windows, this meant that Linux supported graphical user interfaces. This release caused a massive growth in the stature and popularity of Linux. Within a few short years, major companies like IBM, Sun Microsystems, and Oracle supported Linux.

While it meant in an increase in the stature of Linux, A growth in the user base of Linux also meant a growth in the number of developers contributing to Linux. This is because Linux is open source. When Linus released version 0.01, he released it with its source code. This allowed other users and developers to suggest bug fixes and additional features. Torvalds would have the final say what code was added to the Linux source code. This was Linux development functioned.

It is clear that the open source model held as much importance to Torvalds as Linux itself. When he talked at conferences during the early days of Linux, he mostly talked about open source, not the technology behind Linux.

I find his decision to make Linux open source to be a very noble one. I have no doubt he would have been to monitise Linux very easily, if that was his desire. But it was not. Infact, the first time he truly gained financially was after Red Hat's successful IPO on 11th August 1999. Red Hat had given Torvalds stock options years prior that were worth around $1 million after the IPO.

Torvalds did not desire money, what he wanted was Linux to be a great operating system. He felt that open source was the best way to achieve this as it combine the talents and expertise of anybody who wished to contribute, whether it be an individual or a large company. Torvalds loved the idea of a global colaberative effort dedicated to making Linux as good as possibaly could be.

In February of 1997, Torvalds was employeed by Transmeta, a company that developed programmable, low power, x86 microporcessors. While there wer concerns that this new found employments would lead to Linux being neglected, Transmeta allowed Torvalds to maintain the Linux on their hours. Torvalds continued to work there until June 2003. He then moved to Open Source Deleopment Labs

(OSDL) to continue maintaining the Linux kernel. In 2007 OSDL would become the Linux Foundation, who continue to sponsore Torvalds work on the Linux kernel to this day.

In 2005, many of Linux's developers stop using BitKeeper, the source control system that they had been using since 2002. This is because BitKeeper withdrew free use of its system. Since, there were no free source control systems that met his needs, Torvalds decided to develop his own system. This would become Git. While Git is massively influential piece of software, and being the person who developed it would rightly earn you an extraordinary amount of acclaim, it is Torvalds work with Linux that I am most interested in. This is because I feel that it was a project born of passion, not necessity or cynicisam. He, as a university student, believed in the technology he was developing and dedicated himself to insuring that it was best operating system it could be.