

LINUS TORVALDS

Talk is cheap. Show me the code.



INTRODUCTION

Linus Torvalds is widely seen as one of the most influential software engineers of all time. The creator of the operating system Linux and the version control service Git, he has had a huge impact on the software industry, and indeed the world.

EARLY LIFE

Linus Torvalds was born on December 28th, 1969 in Helsinki, Finland to Nils and Anna Torvalds. He was named after Linus Pauling, an American Nobel Prize-winning chemist. Nils and Anna were both radicals at the University of Helsinki in the 1960s and were later journalists, with Nils working as a radio journalist and Anna as an editor for the Finnish News Agency. Nils Torvalds is still politically active today, currently serving as a Member of the European Parliament for Finland. (Torvalds, 2010).

Linus first encountered programming while using his grandfather's Commodore Vic 20, one of the first personal computers, to program in BASIC. He had a huge interest in programming from then on, writing code for fun throughout his teens. He later enrolled in his parents' alma mater the University of Helsinki in 1998 to study computer science. His first class was in C, which is the code he would later use to write the Linux kernel. His studies were interrupted after his first year of college, when he took part in Finland's mandatory military service for 11 months. He held the rank of Second Lieutenant and the role of artillery observer. (Torvalds, 2010).

LINUX

While in college, Linus bought an IBM compatible PC with 4MB of memory and a 33MHz Intel 386 processor, a great PC for the time. He was very taken with the PC, as its hardware was a great improvement over the PCs he had previously owned. But where it excelled in hardware, Linus found it lacking in its operating system. The PC came with the MS-DOS operating system, and Torvalds felt it was not remotely optimised to be used on this PC. He would much rather use the stable UNIX OS he had gotten used to using while at the University of Helsinki. (Torvalds, 2010).

This sparked the creation of a brand-new OS after Torvalds tried and failed to find a relatively cheap version of UNIX for his PC (versions cost upwards of \$5,000 USD). He initially saw this as a small hobby, thinking just himself and a few internet strangers would find it useful. He based it on UNIX and MINIX. MINIX is itself a version of UNIX, created to teach university students, but with many flaws in Torvalds' view, one being its source code unavailability. (Linfo.org, 2020)

Torvalds took a break from college to work on this hobby-turned passion project and after months of work posted to a MINIX forum to alert like-minded people to his project. He noted it was free and provided the source code so people could study and modify it to their own needs. This led to people suggesting ideas and later, code, to Torvalds to improve the OS further. Torvalds wanted to name the OS Freax (combining free, freak, and MINIX/UNIX), but a friend of his had already created a directory with the working name Linux (a portmanteau of Linus and MINIX/UNIX) on a server. And so, Linux was born. (Linfo.org, 2020)

Torvalds decided to release Linux under the GNU General Public Licence, which allowed anyone to use, study, modify, improve and redistribute the code if they made the source code of their changes freely available. A lot of Linux's improvements came from this decision to take a more liberal licence. This led to a lot of people around the world submitting ideas and code to help with the development of the OS. Linux kernel version 1.0 was released in 1994. (Linfo.org, 2020)

While not the most user-friendly OS, especially for those not programming-proficient, Linux is used everywhere today. Many TVs and some laptops run on Linux or some version of it. Many social media sites, e.g. Twitter, Facebook, and YouTube run on Linux. Even NASA's supercomputer Pleiades and the International Space Station run Linux. Notably, the Android OS for mobiles is based on Linux. All in all, billions of devices today run Linux. (Opensource.com, 2020)

GIT

While known primarily for creating Linux, Torvalds is also known for creating the version control system Git.

While developing the Linux kernel, most of the changes were passed around through patches. The development community later used a free-to-use distributed revision control service (DRCS) called BitKeeper to keep track of changes in the code from 2002 to 2005. (Williams, 2020)

When the free version of BitKeeper was discontinued in 2005, Torvalds and the Linux development community tried to find a free alternative, but none met the needs of the Linux kernel, which could have hundreds of developers working on it concurrently. Torvalds decided to make his own DRCS, hoping to emulate the functionality BitKeeper provided, while keeping it free, guaranteeing security and prioritising speed. (Williams, 2020)

Torvalds named his DRCS 'Git', joking that all his projects are named after himself: "First 'Linus', now 'Git'". Git was developed in just a few days. Torvalds began development on Git on April 3rd, 2005 and the first merge of branches occurred on the 18th. Git handled the next update of the kernel in June. (Git, 2020)

Torvalds no longer maintains Git himself, having turned it over in July 2005 to Junio Hamano, a major contributor, who later handled the 1.0 release of Git and remains the maintainer today. (Git, 2020)

Today, Git is the most used version control system. It is used by millions of software developers each day, and thanks to its speed and ease of use it is still gaining new users.

LEGACY

Through both Linux and Git, Linus Torvalds has had one of the biggest impacts on the software engineering community and has been recognised for it. he has received multiple awards for his work, including the 2012 Millenium Technology Prize, the 2014 IEEE Computer Pioneer Award and the 2018 Masaru Ibuka Consumer Electronics Award. (Linus Torvalds, 2020)

He was also one of the 33 inaugural inductees into the Internet Hall of Fame in 2012 and was inducted into the Hall of Fellows of the Computer History Museum in California.

He has also been honoured by Time magazine multiple times, being named 17th in Time's list of the Most Important People of the Century in 2000 and being honoured again in 2004 and 2006. (Linus Torvalds, 2020)

After moving to California from Finland to work for Transmeta in Silicon Valley in 1997, Torvalds left Transmeta to work full time on the Linux kernel for Open Source Development Lab in 2003. He's still working on and maintaining the kernel to this day. (linfo.org)

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