**A Brief History of Linux: Structured Notes**

**1. The Origin of UNIX (1969)**

* Developed by **Ken Thompson** and **Dennis Ritchie** at Bell Laboratories.
* Initial purpose: A portable, multi-tasking, multi-user system for mainframes.
* **Rewritten in C**:
  + Made UNIX highly portable across different systems.
* UNIX became the foundation for many operating systems.

**2. The GNU Project (1983)**

* **Founder**: Richard Stallman.
* **Objective**: Develop a free, open-source UNIX-like operating system.
* Key Developments:
  + **GNU Tools and Utilities**: Free replacements for UNIX tools.
  + **GNU General Public License (GPL)**:
    - A free software license ensuring freedom to use, modify, and distribute software.
  + **GNU Hurd Kernel**:
    - Intended as the GNU operating system's kernel.
    - Development stalled and never fully completed.

**3. Early UNIX-Like Systems**

* **BSD (Berkeley Software Distribution)**:
  + Developed at the University of California, Berkeley.
  + Enhanced UNIX by adding networking capabilities (e.g., TCP/IP stack).
* **MINIX**:
  + Developed by Andrew S. Tanenbaum as a teaching tool.
  + Lightweight and simple, but limited for general-purpose use.
* **Common Challenge**:
  + Lack of a unified, widely adopted kernel across these systems.

**4. The Birth of the Linux Kernel (1991)**

* **Linus Torvalds**, a student at the University of Helsinki, started developing the Linux kernel.
  + Initially as a personal project to create a free and open operating system.
  + Inspired by MINIX but intended to be more practical for personal use.
* **Initial Announcement**:
  + Shared on the comp.os.minix Usenet group.
  + Quickly gained support and contributions from developers worldwide.

**5. The Importance of the Kernel**

* **Definition**: The kernel is the core component of an operating system.
* **Responsibilities**:
  + Facilitates communication between hardware and software.
  + Manages resources (CPU, memory, I/O devices).
  + Handles processes, memory allocation, and system security.
* **Linux Kernel**:
  + Modular and supports a wide range of hardware architectures.
  + Continually developed and maintained by a global community.

**6. Combining GNU and Linux**

* GNU project provided essential tools (compilers, libraries, shells) but lacked a functioning kernel.
* Linux kernel filled this gap, leading to a fully functional free operating system.
* **Common Misconception**:
  + People refer to the entire operating system as “Linux.”
  + Correct term: **GNU/Linux**, acknowledging GNU’s contributions.

**7. Evolution and Impact**

* **Adoption**:
  + Linux became popular for servers, desktops, and embedded systems.
  + Used in various fields: cloud computing, supercomputers, mobile devices (Android), and more.
* **Community-Driven Development**:
  + Open-source nature allowed contributions from individuals, organizations, and corporations.
* **Enterprise Support**:
  + Companies like Red Hat, Canonical, and SUSE provide commercial support for Linux distributions.

**Key Takeaways**

* **UNIX** laid the groundwork for modern operating systems.
* The **GNU Project** promoted free software but lacked a kernel.
* **Linus Torvalds**’ Linux kernel unified the free software ecosystem.
* Today, Linux powers a significant portion of the world’s technology infrastructure.

**Quiz**

Who developed the Linux kernel?