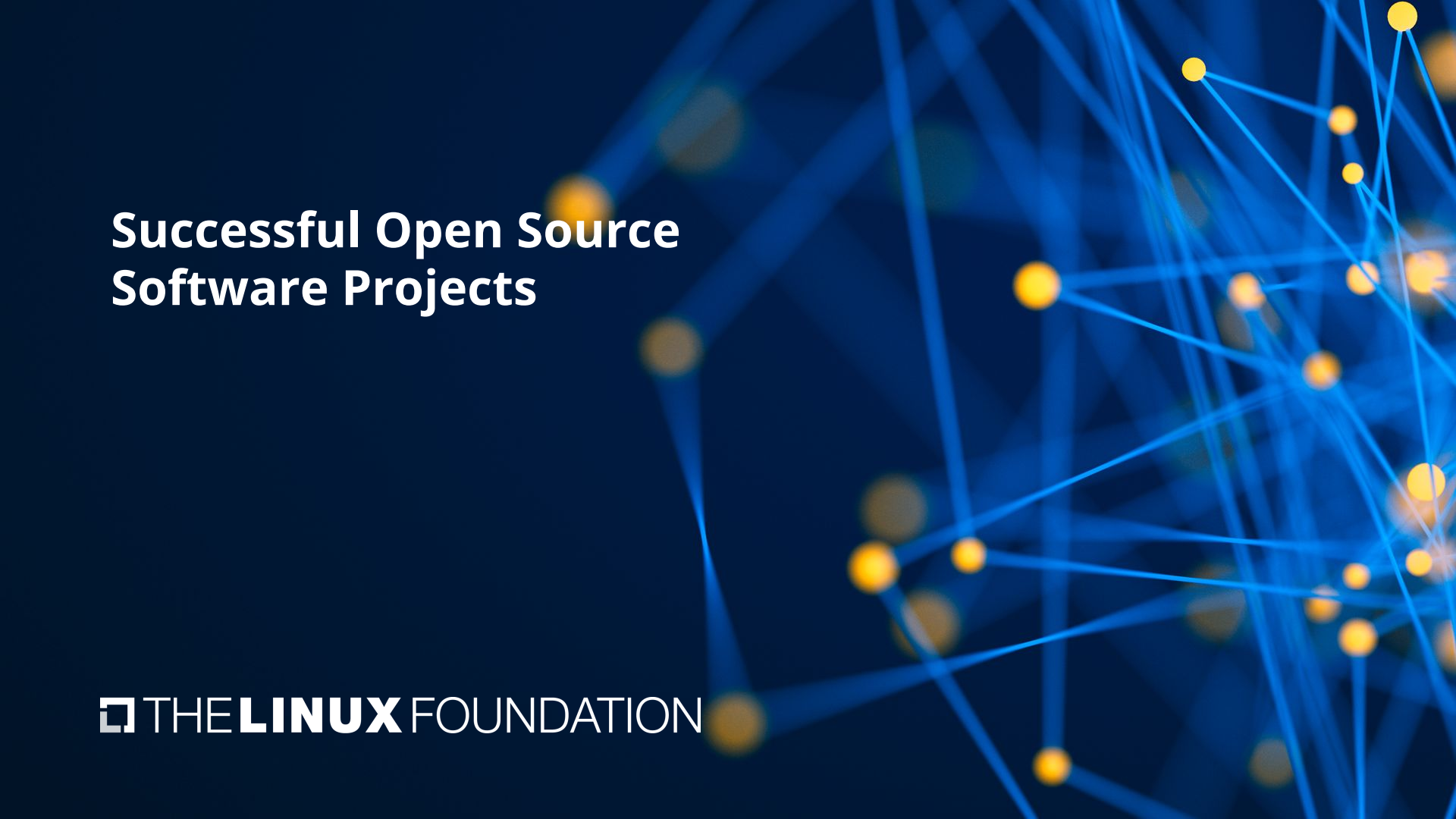
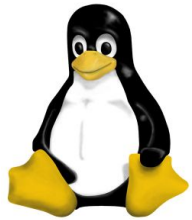
Successful Open Source Software Projects



THE LINUX FOUNDATION

Linux Kernel

- Open source project since its inception in 1991
- Basis of almost all of the world's computing infrastructure - from the most powerful supercomputers to the largest number of mobile devices (Android)
- Ubiquitous in an enormous range of devices and embedded products
- Large and mature development community
- New version is put out every 10-12 weeks
- Released under **General Public License** (GPL) v2



Git

- A distributed version control system that is used worldwide for an astounding number of collaborative products
- Created in 2005 to handle the increasingly difficult task of coordinating and consolidating the work of thousands of contributors to the Linux kernel
- Successfully handles its widely dispersed users
- Basis of **GitHub**
- Can be used in non-open source projects

Apache

- Work on the Apache HTTP Server began in 1995
- The most widely used web server with roughly 50% of the market share
- Operates under the umbrella of the Apache Software Foundation
- Hard to overestimate the importance of Apache; there are many related projects that permeate the entire international technical space
- Released under the **Apache Software License**, which has been adopted by many other projects; more permissive than the GPL

Python, Perl, Ruby and Other Computer Languages

- Many computing languages are developed using open source methods:
  - Python
  - Perl
  - Ruby
  - gcc and LLVM
  - Rust
  - and more
- Different licensing situations
- Language standards set by some kind of standards body - multiple implementations (e.g. C++) or closed/limited contributions (e.g. C#, Java)

TeX and LaTeX

- TeX released in 1978; typesetting system rather than a word processor program
- LaTeX - higher level version of TeX, more user-friendly; the most popular version of LaTeX is **texlive**
- Input is in plain text; markup tags and macros control the final appearance of the output
- First widely adopted by mathematicians (**amstex** and **AMS-LaTeX**), spread through academia
- LaTeX offers specialized versions, additions, and extensions for embedding it in other applications and computing languages
- Open source license

TEX LATEX

GNU: gcc, gdb, etc.

- The GNU Project started in 1983; GNU stands for **G**NU's **N**ot **U**nix; closely related to the Free Software Foundation (FSF); offers many essential ingredients for virtually all modern computer technologies under various versions of the GPL
- Some of the most prominent products emanating from the GNU umbrella include:
  - **gcc** (compiler for C, C++, Objective C, etc.)
  - **gdb** (primary debugger used with gcc)
  - **glibc** (most fundamental and widely used program library)
  - **bash** (most common command line shell)
  - **coreutils** (list of basic command line programs)
  - and more
- gcc and gdb were essential to the development of Linux
- GPL essential to the success of the Linux kernel

X and Desktop Managers

- There are a number of ingredients that are used to instantiate the graphical desktop interface seen on any Linux laptop or workstation:
  - **X Windows System** (the underlying software, handles basic screen, input device and other point operations; **Wayland** - newer more secure alternative)
  - **GNOME**, **KDE**, **XFCE** (Desktop Manager frameworks, control the operation of graphical operations, drag and drop between them, appearance of the desktop, etc.)
- Used and distributed under commonly used open source licenses

OpenStack, Kubernetes and Other Projects

- There are many other large scale (as well as small) collaborative projects that are based on open source software:
  - OpenStack
  - Kubernetes
  - ONAP
  - Hyperledger
  - Node.js
  - Xen
  - Core Infrastructure Initiative
  - Automotive Grade Linux