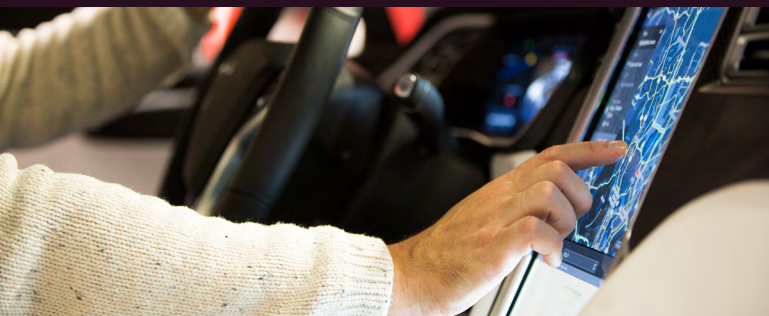


Mir for fast, modern and secure graphical IoT deployments

Mir is an open-source display server for fast, secure, and flexible deployments of graphical solutions designed for Internet of Things (IoT) devices. Originally built to power a whole range of devices, from desktops to mobile phones, it is also being used to power a new wave of graphical experiences in the IoT.



A powerful display, with security built in

Historically, graphical user interfaces on Linux have been powered by the X windowing system. X has a long and successful history and it has served the purposes of both system level and application level UI well for more than 3 decades. However, users nowadays expect a more consistent, integrated and secure user experience than is possible to offer on top of the X windowing system.

The X11 protocol (used by X) was not designed with security in mind and a malicious application can obtain information from other running X11 applications. For instance, X11 servers do not protect sensitive information like keystrokes between applications using them.

Mir was designed from the ground-up with security in mind. To meet the needs of today's users Mir avoids the X11 protocol and uses Wayland for a more modern and secure approach to graphics. Each application talks exclusively to the Mir server through its own socket that is both secure and robust against attack. Wayland is the de facto successor to X11 and is designed to address the problems that have proved intractable with the X windowing system.

Like Ubuntu itself, Mir is free to use, and Canonical backs it up with optional support, consulting and management services. Canonical makes it easy to deploy your graphical solutions using the power of Ubuntu.

Whether you want an information kiosk, digital signage display, in-car entertainment stack, or home automation interface, Mir on Ubuntu is your fast path to deployment.

Easy to deploy, fast to update, proven technology

The [Mir display server](#) is available as a Snap, the next generation package format for Linux. [Snaps](#) are containerised software packages, designed to work securely within any Linux environment across desktop, the cloud and IoT devices and with Mir, installing the full graphical stack is as simple as one single command. In addition, Snaps have enhanced features built in such as automatic updates, rollback on failure, and security sandboxing meaning your IoT device will be as secure and robust as possible. Updates are handled seamlessly in the cloud and full software rollouts are possible within hours, regardless of where the devices are installed.

Mir has been in development for over 6 years and in production for 4 years, using state-of-the-art techniques, and deployed in production to Linux desktop and mobile users. As such, Mir is one of the most mature graphical servers available today.

Next-generation features, backwards-compatibility

Mir uses the Wayland protocol as the primary display language with applications that talk Wayland able to run natively, benefiting from the built-in security that brings. Applications that can use Wayland directly and will work with Mir include those built with GTK3/4, Qt5 and SDL2.

But, not all applications are Wayland-compatible today. This isn't a problem as Mir has a solution for all types of application, whether they be based on GTK, QT, Electron, HTML5, Java or any other framework. For backwards-compatibility, Mir supports the X11 server protocol in a more secure way. Applications that expect X11 to be available are given a sandboxed, self-contained X windows server called Xwayland, that is wrapped up together with the application. Xwayland allows the non-Wayland application to communicate using the Wayland protocol.

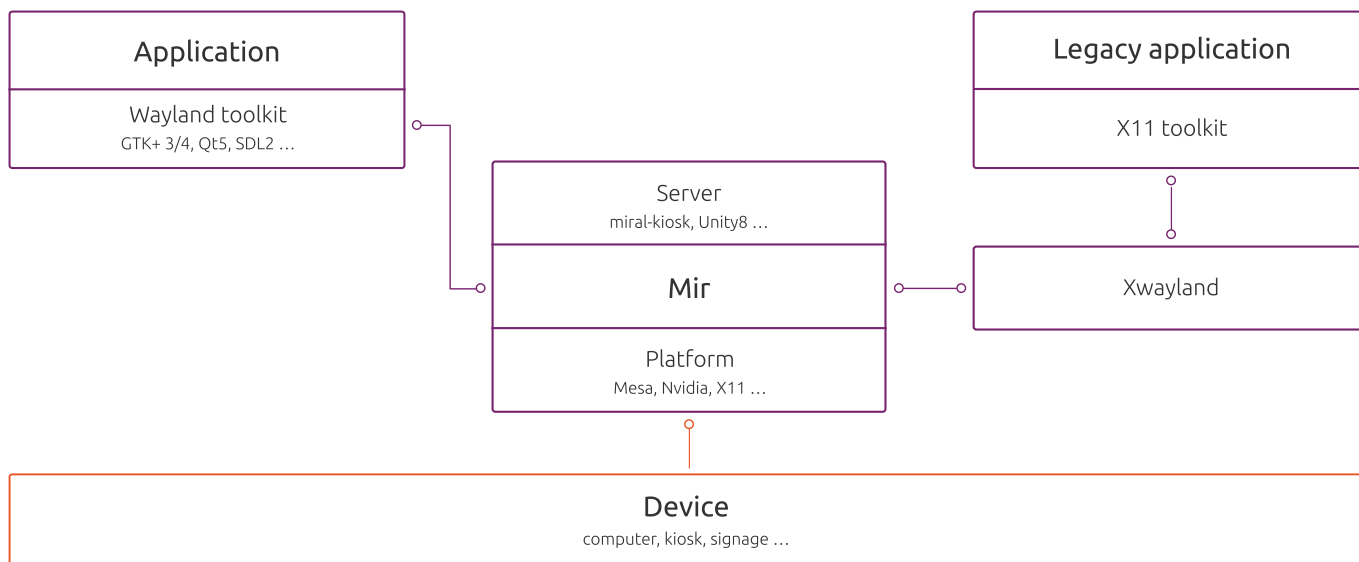


Figure 1: Mir architecture diagram

Mir and Ubuntu for all your IoT needs

The Mir display server is ready to power the next generation of graphical IoT devices, and when used in conjunction with Ubuntu, provides a complete solution for device makers.

Spotlight on the Mir display server

- Support for the latest Wayland protocol and associated technologies
- Touchscreen, keyboard and mouse support
- Security updates by Canonical, makers of Ubuntu
- Upgrades guaranteed, giving you freedom to consume the latest Mir fixes and enhancements
- Full confinement using kernel-level mandatory access controls through the power of Snaps
- Consulting for custom use cases, enhancements or other integrations
- Available for Ubuntu, Ubuntu Core, and other Linux Distributions
- When used in conjunction with Ubuntu Core, provides a fully Snap-based, secure solution
- Optional training, support and integration services available

Resource Requirements

- The minimum environment requirements are:
 - Support for Mesa-based EGL graphics
 - Snaps on Ubuntu (Server, Desktop or Core)
 - 512MB disk space
 - 2GB Memory

4 steps to your Mir-enabled device

- 1. Choose your device**
Mir works with many popular, off-the-shelf devices like the Raspberry Pi, Qualcomm Dragonboard, and most x86-based hardware. In addition, Mir runs well in a Virtual Machine which is especially useful during the development phase
- 2. Choose your OS**
Ubuntu is the best Linux-based operating system for the IoT and Mir works great with most flavours of Ubuntu including Server, Desktop, and Core. When used in conjunction with Ubuntu Core, the OS tailored for the IoT, the benefits include whole system containerisation, rollback, and auto updates. Mir also works on other Linux distributions
- 3. Bring your application**
Mir is able to work with most applications and toolkits including GTK2/3/4, QT4/5, Java, Electron, HTML5, Chromium, and many more. Using native Wayland, Xwayland, or some combination of the two, applications should be able to use the full features of the Mir display server
- 4. Deploy**
Once you have your device ready it's time to ship it. In the field updates to Mir and Ubuntu are taken care of by Canonical and if you use Snaps, these are automatic

Contact us

For more information about the Mir display server [contact us](#) or call direct (US Central) +1 888 986 1322 or (UK) +44 800 058 8704.