# ILDPUG i.MX Linux Distribution POC User Guide Rev. L5.15.71\_2.2.0-LDP — 10 February 2023

User guide

#### **Document information**

Information	Content
Keywords	i.MX, Linux, Linux distribution, L5.15.71_2.2.0-LDP
Abstract	The i.MX Linux distribution build uses a Yocto-based meta layer to generate a desktop Proof of Concept (POC) image.



#### i.MX Linux Distribution POC User Guide

# 1 Overview

The i.MX Linux distribution build uses a Yocto-based meta layer to generate a desktop Proof of Concept (POC) image. It works together with i.MX release layer (meta-imx). It reuses the Linux BSP release framework to manage and generate the U-Boot bootloader, Linux kernel image, and i.MX root file system in desktop image build.

The i.MX desktop layer is named as meta-nxp-desktop. It is available in Github under the nxp-imx project (<a href="https://github.com/nxp-imx">https://github.com/nxp-imx</a>). The release version is managed by the <a href="https://github.com/nxp-imx">i.MX Release Manifest</a>.

Similar to the i.MX release layer, to use the i.MX desktop layer, follow the instructions in the *Yocto Project Quick Start* found at <u>www.yoctoproject.org/docs/current/yocto-project-qs/yocto-project-qs.html</u>.

meta-nxp-desktop inherits most of layer configuration from the i.MX release layer (meta-imx) directly. It also includes the required host tools and the compatible binary toolchains targeting on the desktop image.

The following is the information for the meta-nxp-desktop layer structure:

- meta-nxp-desktop
  - classes: The auxiliary installation tools running on host OS
  - conf: Desktop specific layer configuration beyond meta-imx
  - dynamic-layer: NXP additional update on open source tools and components
  - recipe-xxx: NXP-specific update on open source tools, applications, and libraries
  - tools: NXP desktop layer setup tool
  - README . md: i.MX desktop layer build instructions
  - EULA.txt: i.MX desktop demo license file
  - SCR.txt: i.MX desktop package and patch license description

# 2 Image Build

The i.MX desktop image build uses a similar method as the i.MX Yocto Project. For detailed information, see the *i.MX Yocto Project User's Guide* (IMXLXYOCTOUG).

Desktop image build uses different DISTRO configurations. The syntax for the imx-setup-desktop.sh script is as follows:

```
$ DISTRO=<distro name> MACHINE=<machine name> source imx-setup-desktop.sh -b
<build dir>
```

The only DISTRO environment variable option is imx-desktop-xwayland. The MACHINE environment variable indicates the configuration file in the conf/machine/\${MACHINE}desktop.conf file in the meta-nxp-desktop repo.

#### 2.1 Installing the repository utility

To get the BSP, you need to install the repository.

```
$ mkdir ~/bin
$ curl https://storage.googleapis.com/git-repo-downloads/repo > ~/bin/repo
$ chmod a+x ~/bin/repo
$ PATH=${PATH}:~/bin
```

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# 2.2 Downloading the Yocto Project BSP

To download the Yocto Project BSP:

```
$ mkdir desktop
$ cd desktop
$ repo init -u https://github.com/nxp-imx/imx-manifest -b imx-linux-kirkstone -m
imx-5.15.71-2.2.0_desktop.xml
$ repo sync
```

# 2.3 Creating a new build folder

To create a *new* build folder:

```
$ DISTRO=imx-desktop-xwayland MACHINE=imx8mpevk source imx-setup-desktop.sh -b
build-desktop
```

#### Table 1. Target build machines

Build machine	Target board
imx8mpevk	i.MX 8M Plus EVK
imx8mqevk	i.MX 8M Quad EVK
imx8mmevk	i.MX 8M Mini EVK
imx8mnevk	i.MX 8M Nano EVK
imx8qmmek	i.MX 8QuadMax MEK
imx8qxpc0mek	i.MX 8QuadXPlus MEK with silicon revision C0 chip
imx8ulpevk	i.MX 8ULP EVK

## 2.4 Restarting a build environment

If a new terminal window is opened or the machine is rebooted after a build directory is set up, the setup environment script should be used to set up the environment variables and run a build again. The full imx-setupdesktop.sh is not needed.

```
$ cd desktop
$ source setup-environment <build-dir>
```

## 2.5 Building the image

To build the image:

```
$ bitbake imx-image-desktop
```

## 2.6 Building imx-boot and UUU

The build method is the same as the i.MX Yocto Project. For detailed information, see the *i.MX Linux User's Guide* (IMXLUG).

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# **3** Feature Integration

The i.MX desktop image integrates the following components (not limited to):

- i.MX kernel/boot-loader/connectivity integration All the information about the Linux Standard BSP features can be found in the *i.MX Linux User Guide* (IMXLUG).
- GPU hardware integration for desktop graphics Includes OpenGL ES, OpenGL, Vulkan, DRM, and GPU profiling and memory tool.
- GPU/NPU integration for compute, vision, and ML Includes OpenCL, OpenVX, and TensorFlow-Lite
- VPU/GStreamer integration for video player
- · Audio codec integration
- ISP integration

# 4 Questions & Answers

#### 4.1 How to obtain the desktop build image?

NXP does not release desktop images due to the license. Users can build it with meta-nxp-desktop.

#### 4.2 How to solve the failure of fetching image or Git source?

Check if the host build machine can connect to the external website, or can export a proxy as follows:

```
$ export http_proxy=<your proxy address:port >
$ export https proxy=<your proxy address:port >
```

## 4.3 How to update the SD image size in Yocto configuration?

You can add the following setting in <build dir>/conf/local.conf to specify the image size:

IMAGE ROOTFS SIZE = "8388608"

#### 4.4 How to log in to the desktop system?

The default build creates the "user" account with the password "user". To change the account or password, uncomment and update APTGET ADD USERS in <build dir>/conf/local.conf.

#### 4.5 How to enable Wi-Fi connection on desktop image?

Currently, Wi-Fi needs manual enablement with the following command:

sudo modprobe moal mod para=nxp/wifi mod para.conf

After that, the user can configure Wi-Fi connection in desktop setting.

## 4.6 How to test GPU integration?

The test procedure is as follows:

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1. Synchronize the board time. For example, to set new data to 12 May 2022 18:00:00, execute the following command as root user:

\$ sudo date -s "12 MAY 2022 18:00:00"

2. Add an apt proxy if needed. Add the following two lines to /etc/apt/apt.conf.d/proxy.conf.

```
Acquire::http::Proxy "http://username:password@address:port/";
Acquire::https::Proxy "https://username:password@address:port/";
```

3. Use apt to install the OpenCL demo, and then perform it. Check the output from the terminal.

```
sudo apt install clinfo -y && clinfo
```

4. Use apt to install the OpenGLES demo, and then perform it. The display then shows the 3D object.

sudo apt install glmark2-es2-wayland -y && glmark2-es2-wayland

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## **Revision History**

This table provides the revision history.

Table 2. Revision History					
Revision number	Date	Substantive changes			
L5.10.9_1.0.0-desktop-alpha	05/2021	Initial release			
L5.10.35_2.0.0-desktop-beta1	07/2021	Desktop Beta1 release			
L5.10.52_2.1.0-desktop-beta2	11/2021	Desktop Beta2 release			
L5.10.72_2.2.0-desktop	01/2022	Desktop GA release			

Table 2. Revision History

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Revision number	Date	Substantive changes			
L5.15.5_1.0.0-desktop	05/2022	Desktop GA release			
L5.15.32_2.0.0-desktop	08/2022	Desktop GA release			
L5.15.52_2.1.0-LDP	11/2022	Linux distribution POC GA release			
L5.15.71_2.2.0-LDP	02/2023	Linux distribution POC GA release			

#### Table 2. Revision History...continued

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