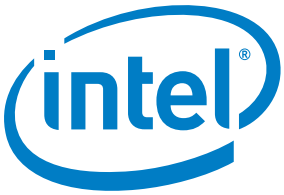

Intel® Unified 3D Library for Intel® Atom™ E3900 SoC Family/Intel® Celeron® Processor N3350/Intel® Pentium® Processor N4200 for Yocto Project*

Release Notes

August 2017

MR3.1 Release

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Revision History

Date	Revision	Description
February 2017	001	MR2 release
May 2017	002	MR3 realease
August 2017	003	MR3.1 release

§

1.0 Introduction

This document describes the typical hardware system requirements, features, testing, and use of the driver for Intel® Unified 3D Library.

The Intel® Unified 3D Library driver is available for 64-bit systems for the Intel® Atom™ E3900 SoC Family, Intel® Celeron® Processor N3350, and Intel® Pentium® Processor N4200 for Yocto Project*.

1.1 Terminology

Table 1. Terminology

Term	Description
BSP	Board Support Package
DRI	Direct Rendering Infrastructure
IOTG	Internet of Things Group
OS	Operating System
RPM	RPM Package Manager
SoC	System-on-a-Chip

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2.0 Driver Information

The Intel® Unified 3D Library driver is available for 64-bit systems and is part of the release package. The details of the Linux* drivers are as follows:

Intel® Unified 3D Library Driver: intel-linux-ufo-yocto_<version>-64bit.tar.gz

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3.0 System Requirements

The Intel® Unified 3D Library driver supports the following platforms:

- Intel® Atom™ E3900 SoC Family
- Intel® Celeron® Processor N3350
- Intel® Pentium® Processor N4200

3.1 Prerequisites and Constraints

The Intel® Unified 3D Library driver is part of Intel proprietary software.

To integrate the driver, you must obtain the board support package (BSP) and add the meta-intel-proprietary recipe along with the RPM binary.

1. Download the BSP for Yocto Project* from GitHub to your host machine
   - HTTPS directly from https://github.com/01org/iotg-yocto-bsp-public/tree/e3900/master by selecting the appropriate tag version, for example, E3900-MR2, from the top left menu or
   - SSH using the following command:

     ```
     git clone https://github.com/01org/iotg-yocto-bsp-public.git -b e3900/master
     ```

     This git tree is maintained as single product branch. To get code base from the previous release, for example the PV release, check out to the specific tag.
   - For PV release: git checkout E3900-PV
   - For Maintenance Release Version 1: git checkout E3900-MR1
   - For Maintenance Release Version 2: git checkout E3900-MR2
   - For Maintenance Release Version 3: git checkout E3900-MR3
   - For Maintenance Release Version 3.1: git checkout E3900-MR3.1 (use this tag for this release)

     ```
     $cd /home/user/development
     ```

Note: The directory path mentioned here is an example for demonstration purposes. You can use any convenient directory location for the build.

2. Extract the Intel® Unified 3D Library DRI proprietary meta layer.

   ```
   $ tar xvf meta-intel-proprietary-<component>.tar.bz2
   ```

3. Download the Intel® Unified 3D Library RPM compressed tar ball and put the content in one location. The Intel® Unified 3D Library DRI RPM binary is provided with this package.

```
Example Download path: /home/user/rpm-binaries

$cd /home/user/rpm-binaries
```

Refer to Section 4.0 for instructions on integrating and building with Intel® Unified 3D Library.

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4.0 Using Intel® Unified 3D Library

This section describes how to integrate, build, and verify the Intel® Unified 3D Library driver.

4.1 Integrating the Intel® Unified 3D Library Driver in the Yocto* Build

The Intel® Unified 3D Library driver is available with the release package provided.

As mentioned in the previous section, the proprietary meta layer and the Intel® Unified 3D Library DRI RPM packages must be extracted to a particular location.

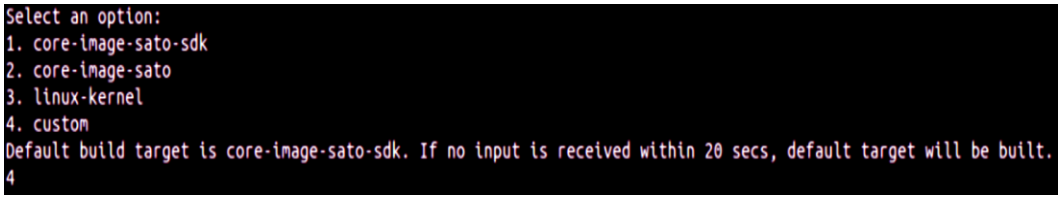
1. Go to the directory location where the Yocto BSP meta layer is cloned in the host (Ubuntu*) machine.

   `bsp-apollolake-i`

   Refer to the Yocto BSP Gold release for more details on Yocto BSP cloning and building.
2. Run the `setup.sh` script to initiate the build.

   `$./setup.sh`
3. When prompted for the image type, choose option 4 to build a custom image.

Figure 1. Choosing the Custom Build



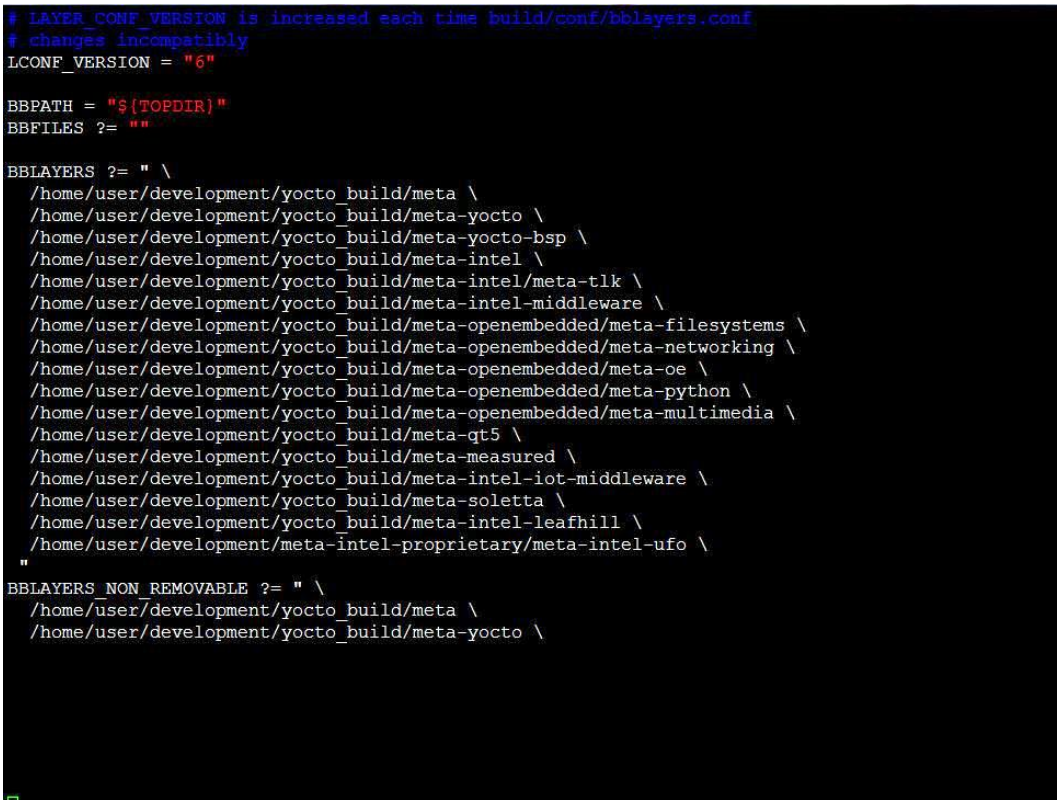
   When the `setup.sh` script has completed, a new folder named `yocto_build` appears under `/home/user/development/`.
4. Change the directory to `yocto_build/build/conf`.

   `$cd /home/user/development/yocto_build/build/conf`
5. Edit `bblayers.conf` to include the meta-intel-proprietary layer. This layer was previously downloaded.

   `$ vim bblayers.conf`
6. Add the path `meta-intel-proprietary/meta-intel-ufo` as shown in Figure 2. Save and exit.

Note: The path is an example for demonstration purposes. Your path might differ based on the location of the meta layers.

Figure 2. Adding the meta-intel-ufo Path in bblayers.conf



7. Edit `local.conf` located in the same directory to include the path where the downloaded RPM binaries are located.

   ```
   $vim local.conf
   ```

   Add the following line at the top of the `local.conf` file.

   ```
   export RPM_PATH=''<full_path_to_the_downloaded_rpm>''
   ```

Example: If the RPM binaries are in `/home/user/rpm-binary/`, insert the following command in `local.conf`:

```
export RPM_PATH=/home/user/rpm-binary''
```

8. Further edit `local.conf` to let the compiler know to install the RPM binaries during the build.

   Add the following line:

   ```
   IMAGE_INSTALL_append = `` ufo-dri''
   ```

   Figure 3 shows the RPM path and `ufo-dri` appended in `local.conf`.

Note: There is a <space> in front of `ufo-dri` as shown in Figure 3.

Figure 3. Adding the RPM Binary and Appending ufo-dri in local.conf

```
export RPM_PATH="/home/user/rpm-binary"

IMAGE_INSTALL_append = " ufo-dri"
```

9. OpenCL and ufo-nano are also provided with the UFO RPM release package. Follow these steps to install OpenCL and ufo-nano as part of the binary package:
   a. Copy the `ufo-openCL` and `ufo-nano` RPMs provided with the UFO binaries into the RPM-binary directory in the build system.
   b. Append the following line in `local.conf` to add `ufo-opencl`

      ```
      IMAGE_INSTALL_append = " ufo-opencl"
      ```

Figure 4. Appending ufo-opencl in local.conf

```
export RPM_PATH="/home/user/rpm-binary"

IMAGE_INSTALL_append = " ufo-dri"
IMAGE_INSTALL_append = " ufo-opencl"
```

10. If ufo-nano is needed, append the following line in `local.conf` to add `ufo-nano`

    ```
    IMAGE_INSTALL_append = " ufo-nano"
    ```

11. Go up one level to `yocto_build`.

    ```
    $ cd ../..
    ```

12. Prepare the environment to run the bitbake command.

```
$ source oe-init-build-env
$ cd build
```

13. Start the image compilation.

```
$ bitbake core-image-sato-sdk
```

Note: It is recommended to start with a new image build. However, if the previous build is being used, execute the following commands before image compilation.

```
$ bitbake linux-firmware -c cleanall
$ bitbake libva -c cleanall && bb virtual/libva -c cleanall
$ bitbake libva -c cleansstate && bb virtual/libva -c
cleansstate
$ bitbake core-image-sato-sdk
```

Note: Refer to *Intel® Atom™ E3900 SoC Family Yocto BSP Media-SDK Getting Started Guide* provided with the IOTG Yocto BKC document for the procedure to integrate UFO DRI with closed Source Media Stack.

4.1.1 Verifying the Installation of the Intel® Unified 3D Library Driver

To verify that the Intel® Unified 3D Library driver is installed and being used:

1. If ufo-nano is not installed, execute the following command in the terminal.

```
$ glxinfo | grep -i OpenGL
```

The output should contain the following library description.

```
'OpenGL renderer string: Intel(R) Unified 3D Library'
```

2. If ufo-nano is installed, execute the following command in the terminal.

```
$ es2_info
```

The output should contain the following library description.

```
'GL_VERSION: OpenGL ES 3.1 - Build <version>-nano-production'
'GL_RENDERER: Intel(R) Unified 3D Library '
```

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5.0 Enabled Features

This section is not applicable to the current release.

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6.0 Disabled Features

This section is not applicable to the current release.

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7.0 Fixed Issues

This section describes the fixed issues that affect the Intel® Unified 3D Library driver.

7.1 Fixed Issues

Refer to the graphics section in *Intel® Atom™ E3900 SoC Family/Intel® Celeron® Processor N3350/Intel® Pentium® Processor N4200 Board Support Package for Yocto Project* Release Notes* for details.

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8.0 Known Issues and Limitations

This section describes the known issues and limitations that affect the Intel® Unified 3D Library driver.

8.1 Known Issues

Refer to the graphics section in *Intel® Atom™ E3900 SoC Family/Intel® Celeron® Processor N3350/Intel® Pentium® Processor N4200 Board Support Package for Yocto Project* Release Notes* for details.

8.2 Limitations

None

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