



STM32MP1 Platform trace and debug environment overview for Android

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A quality version of this page, approved on 12 December 2019, was based off this revision.

The block diagram below shows the **STM32MP1 Platform trace and debug environment for Android** components and their possible interfaces. Click the block diagram to directly jump to one of the sub-levels listed below:

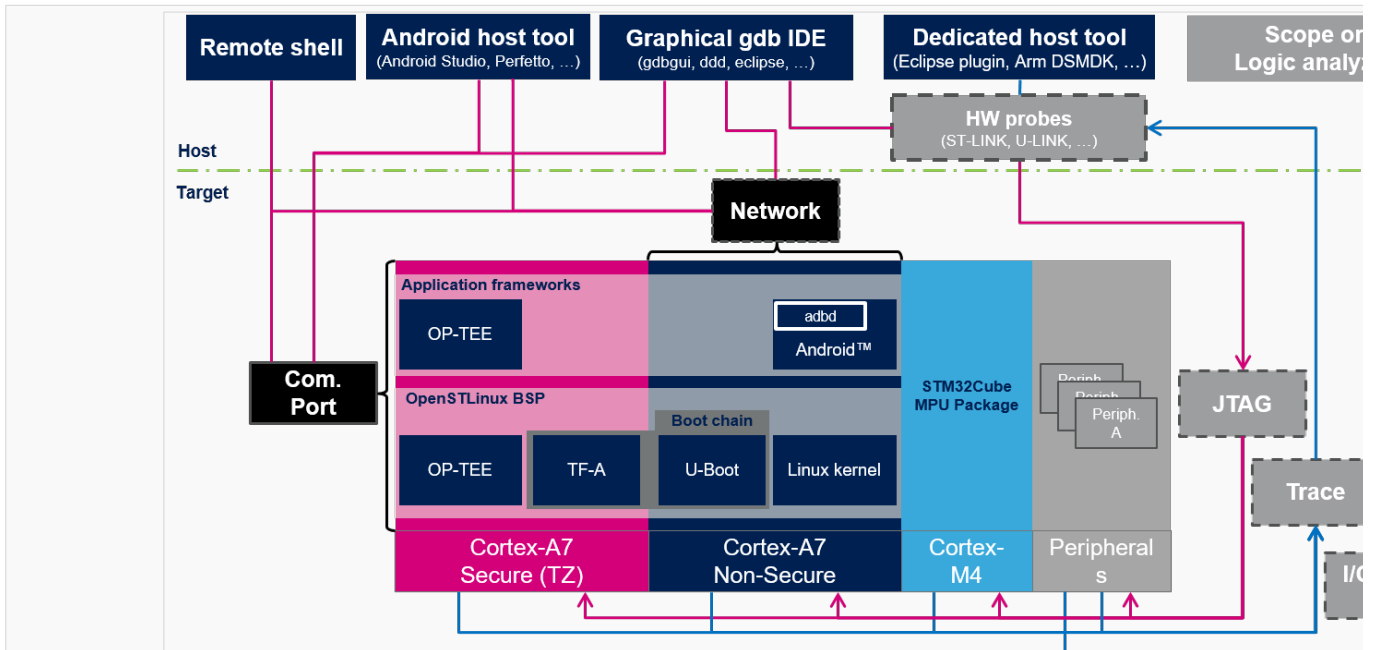
- The **STM32MPU Embedded Software** package (see STM32MPU Embedded Software for Android architecture overview) that comprises:
 - the **STM32MPU distribution for Android™** running on the Arm®Cortex®-A and including:
 - the **OpenSTLinux BSP** with:
 - the **boot chain** based on TF-A and U-Boot.
 - the **OP-TEE** secure OS running on the Arm®Cortex®-A core in Secure mode.
 - the **Linux® kernel** running on the Arm®Cortex®-A core in Non-secure mode.
 - the **application frameworks** composed of middleware components relying on the BSP and providing:
 - **OP-TEE** APIs to run **Trusted Applications (TA)** that allow manipulating secrets (not visible from the Linux® and STM32Cube MPU Package).
 - **Android** APIs to run **applications** that typically interact with the user via a display or a touchscreen.
 - the **STM32Cube MPU Package** runs on the Arm®Cortex®-M core: like other STM32 microcontrollers, it is based on HAL drivers and middleware components. It is completed with the **coprocessor management**.
- The **STM32MPU peripherals** shared between Cortex®-A and Cortex®-M cores (such as GPIO, I2C and SPI).
- The **user interfaces or tools**, which allow interacting with different trace and debug Tools, such as:
 - The **remote shell** using terminal console
 - The **Android host tools** (such as Android Studio)
 - The **debugger tools** (such as GDB)
 - The **graphical IDE** (such as GDBGUI or SystemWorkbench)
- The **trace and debug interfaces or hardware paths** that provide access to trace and debug components through:
 - the **network** interface (e.g. Ethernet)
 - the **communication port** (e.g. UART)
 - the hardware connector interfaces:
 - **JTag** port
 - **Trace** port to access ETM, STM, ITM and SWD
 - **I/O probes** to access HDP
- The **hardware probes** (such as ST-Link).

This block diagram also illustrates the Arm® debugging modes:

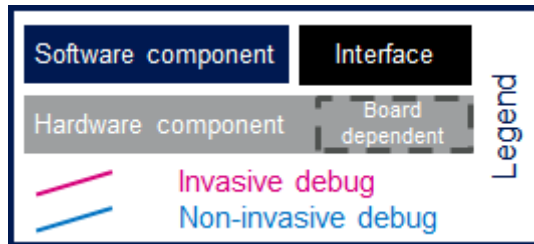
- **Invasive debug:** debug process that allows controlling and monitoring the processor. Most debug features are considered invasive because they enable you to halt the processor and modify its state.
- **Non-invasive debug:** debug process that allows monitoring the processor but not controlling it. The embedded trace macrocell (ETM) interface and the performance monitor registers are non-invasive debug features.

Click the figure below to directly jump to the component you want to trace, monitor or debug:

- Select a **hardware component** to be redirected to the corresponding hardware board article and check if the hardware connector is supported on your board.
- Select a **target software component** to be redirected to an article that explains in details how to trace, monitor or debug the corresponding component.
- Select a **host software component** to be redirected to an article that explains how to use the corresponding remote tool.



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Cortex®

Board support package

Operating System

Linux® is a registered trademark of Linus Torvalds.

Open Portable Trusted Execution Environment

Trusted Application

Microprocessor Unit

Hardware Abstraction Layer

General-Purpose Input/Output (A realization of open ended transmission between devices on an embedded level. These pins available on a processor can be programmed to be used to either accept input or provide output to external devices depending on user desires and applications requirements.)

Inter-Integrated Circuit (Bi-directional 2-wire bus standard for efficient inter-IC control.)

Serial Peripheral Interface



GNU dedugger, a portable debugger that runs on many Unix-like systems

(Software)Integrated development/design/debugging environment

Universal Asynchronous Receiver/Transmitter

Embedded Trace Macrocell

System Trace Module

Instruction Trace Macrocell

Serial Wire Debug

Hardware Debug Port

spelling for older versions of STLink, ST in-circuit debugger and programmer for the STM8 and STM32 microcontroller families