



## How to diagnose a boot failure



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## 1 Introduction

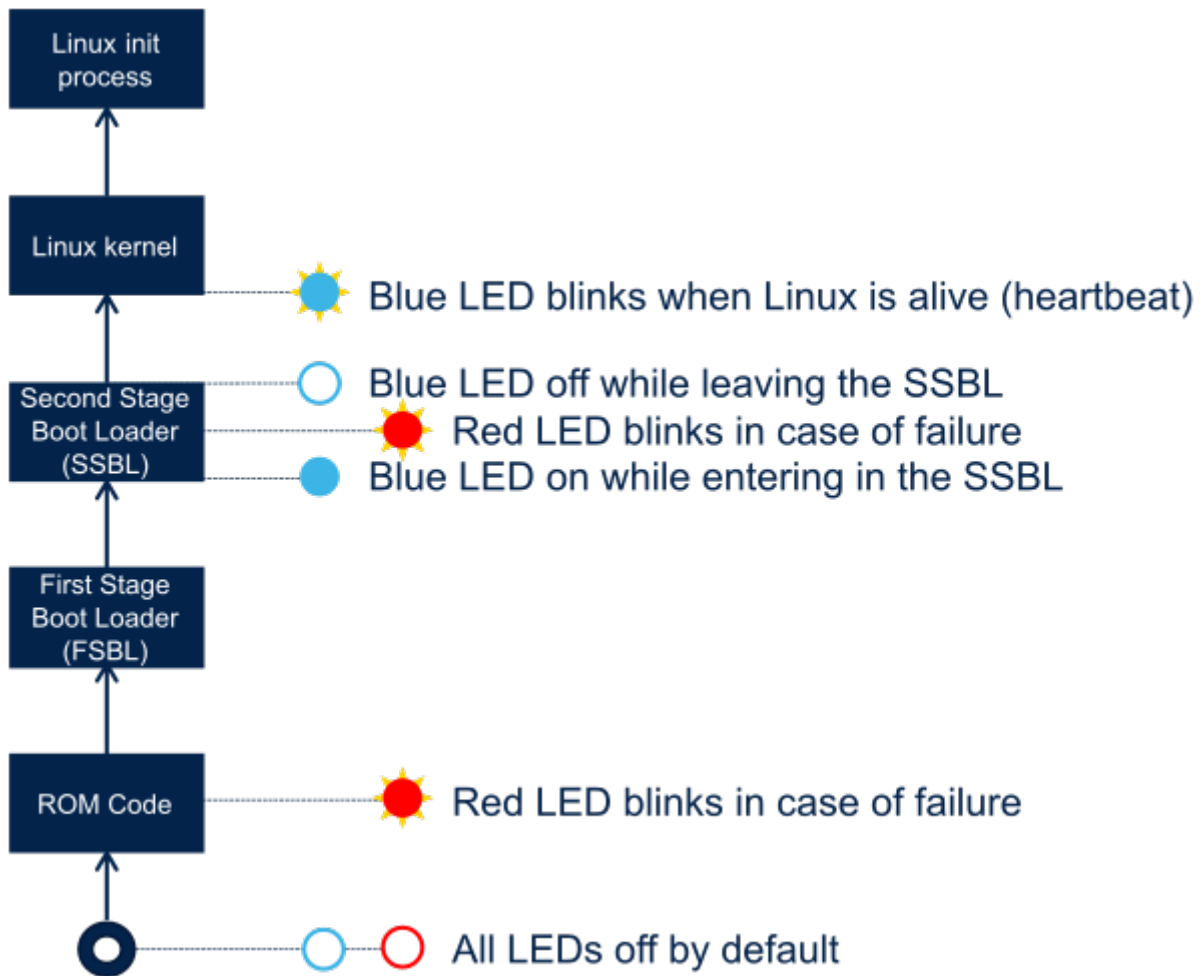
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The blue and red LEDs on STM32MP15 boards are used to notify the user in case of boot failure during the boot chain execution and at runtime.



## 2 Description and debug

The statuses of blue and red LEDs allow to see at which stage the execution failed: the diagram below shows how each boot component uses these LEDs while the table gives more information on the way to interpret the LED statuses when the boot fails. Among the boot components, the FSBL can be TF-A or U-Boot SPL and the SSBL is U-Boot, as explained in the [boot chains overview](#).



Blue LED	Red LED	System state	Action
	Blinking		Check that: <ul style="list-style-type: none"> <li>your microSD card is properly inserted in the board</li> <li>the <a href="#">boot pins</a> configuration selects the boot device</li> </ul>



Blue LED	Red LED	System state	Action
Off	On	The execution failed during ROM code execution	<ul style="list-style-type: none"> <li>your boot memory was well programmed with STM32CubeProgrammer</li> </ul>
On	Blinking	The execution failed during the second stage bootloader (SSBL)	See <a href="#">U-Boot - How to debug</a> to investigate the failure
Off	Off	The execution may have failed: <ol style="list-style-type: none"> <li>In FSBL execution</li> <li>After the SSBL execution but before the heartbeat (blue LED) started</li> </ol>	<ol style="list-style-type: none"> <li>See <a href="#">TF-A - How to debug</a> to investigate the failure</li> <li>See <a href="#">U-Boot - How to debug and how to trace and debug</a> to investigate the failure</li> </ol>
Off or on	Off	The execution may have failed during Linux <sup>®</sup> kernel execution between two heartbeat pulses (blue LED): a fatal error leading to a kernel panic might have occurred...	See <a href="#">How to debug a Linux kernel crash</a> to investigate the failure
Blinking	Off	Your platform is alive	Enjoy !

Light-emitting diode

First Stage Boot Loader

Trusted Firmware for Arm Cortex-A

Das U-Boot -- the Universal Boot Loader (see [U-Boot\\_overview](#))

Secondary Program Loader, *Also known as **U-Boot SPL***

Second Stage Boot Loader

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