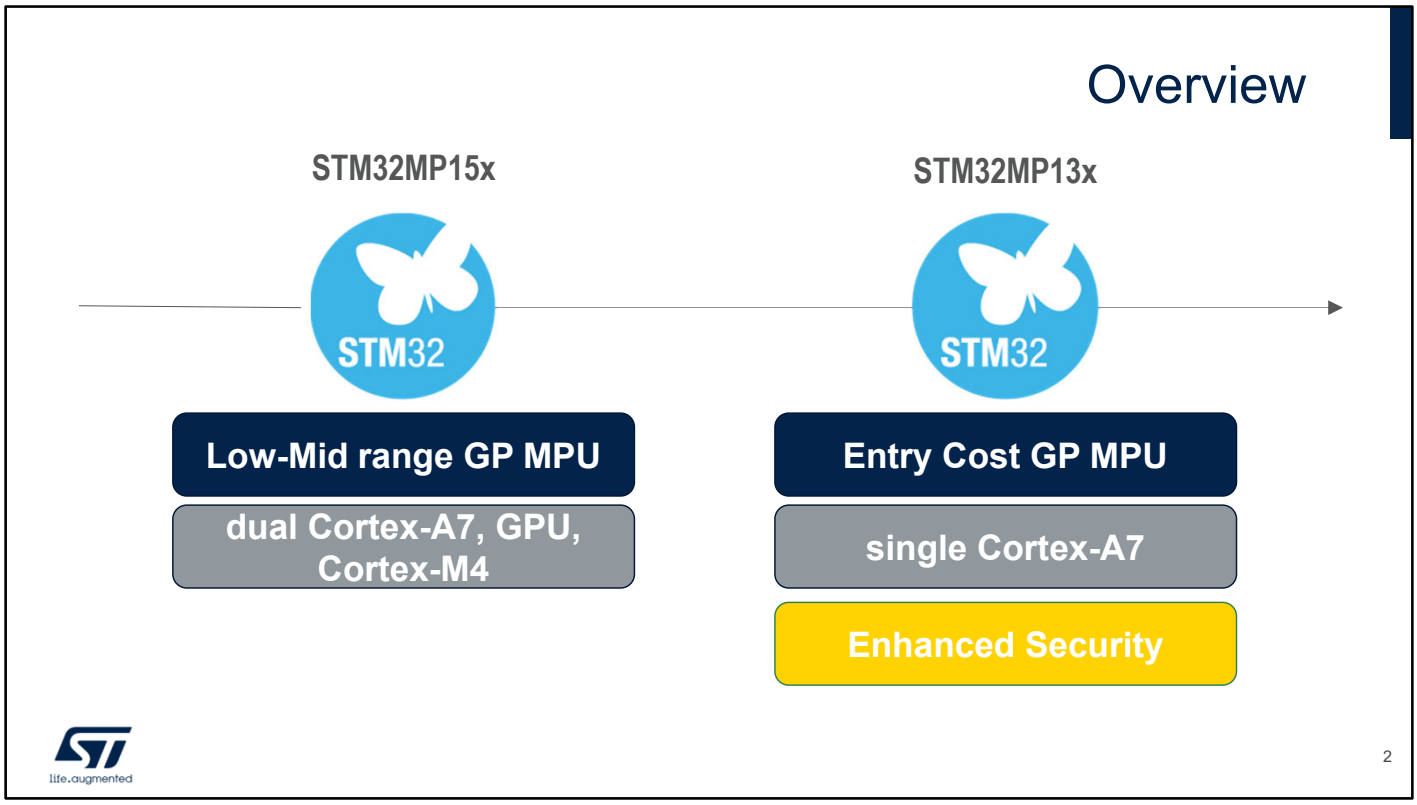
Hello, and welcome to this presentation of the STM32MP13x introducing the main differences between STM32MP13x and STM32MP15x.



The STM32MP13x devices are derivatives from the STM32MP15x devices within the STM32MP1 Series.
The STM32MP13x devices are lower cost, single CortexA7 products including enhanced security features versus the STM32MP15x.

features **removed** versus STM32MP15x

- **MPU sub-system**
  - 1 x Cortex-A7 core (remains x1)
  - 3D GPU
  - DSI (controller, PHY, PLL)
  - USB-FS (remains HS)
  - System Trace Macrocell (STM)
- **MCU sub-system**
  - Cortex-M4 (remains x0)
  - HDMI-CEC
  - HSEM, IPCC
  - MDIOS
  - WWDG
  - GPIO J, K, Z ports (remains 135 GPIO)
  - 1 x SDMMC (remains x2)
  - 2 x SAI (remains x2)
  - 1 x SPI (remains x5)
  - 1 x I2C (remains x5)
  - 2 x DAC (remains x0)

life.augmented

3

The following features or IP's have been removed on STM32MP13x versus STM32MP15x:

- 1 Cortex-A7 core
- the 3D Graphical processor unit
- The Display serial interface
- The USB FS interface (only High speed remains)
- The debug System Trace macrocell
- 1 Cortex M4 and associated IP's like Hardware semaphore (HSEM), Inter processor communication controller (IPCC) and Window watchdog (WWDG)
- MDIOS
- Some GPIOs
- 1 SDMMC interface
- 2 SAI interfaces
- 1 SPI interface
- 1 I2C interface
- 2 DAC interface

features **added** or **modified** versus STM32MP15x

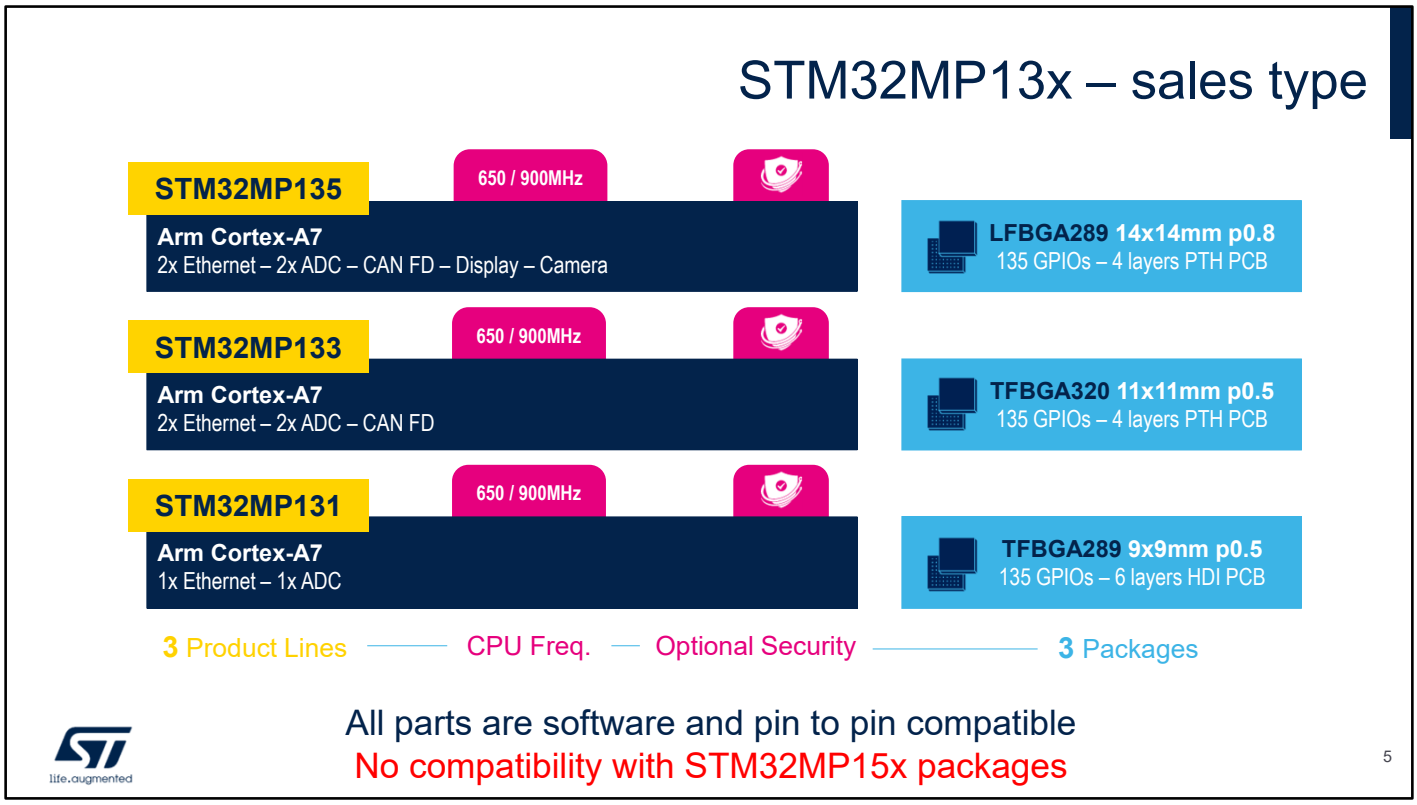
- **Security**
  - DDRMCE: On-The-Fly encryption / decryption on DDR
  - CRC, CRYP, HASH, RNG (enhanced versions)
  - 64-bit PKA & secure AES both w/ DPA
  - HASH (added SHA2-384, SHA2-512, SHA3)
  - RTC (256-bit secret key in backup reg., HW Keybus)
  - All GPIO ports securable (vs only Z port)
  - 12 tamper pads (5 outputs in VSW domain) (vs. 3)
  - 8kB backup RAM (vs. 4kB)
  - Additional DMA/DMAMux instance for secure accesses
- **Camera / Display**
  - DCMIPP 16-bit with 3Mpix 30fps (vs 14-bit DCMI)
  - LTDC CDC300 with 1 secure layer and YUV
- **Interface**
  - 16-bit DDR interface (vs 32-bit)
  - x2 gigabit Ethernet MAC (vs x1) , no GMII
- **Miscellaneous**
  - 160 kB SRAM (vs 704 kB)
  - 2 x 12-bit 5MSPS ADC (vs 2x 16-bit)
  - DFSDM (2 filters, 4 channels) (vs 6/8)
  - SDMMC UHS-I without external level shifters
- **Low Power**
  - LPLV-Stop2 mode (CPU shutdown)
  - CPU DVFS (CPU dedicated supply)
  - Additional wake-up sources from LPLVx_Stop modes (I2C, SPI, USART)

life.augmented

4

The following features or IP’s have been added or modified on STM32MP13x versus STM32MP15x:
On security side new IP’s have been implemented like On the fly DDR encryption (DDRMCE), Secure AES, Public Key accelerator (PKA).
Some features have been improved like hardware keybus on between some secure IPs (SAES, PKA, RNG, CRYP, RTC) preventing software to access data transferred from one IP to the other.
Differential power analysis protection on SAES and PKA.
All GPIO’s are now securable.
Increased number of tamper pins from 3 to 12.
Increased backup SRAM from 4 to 8 Kbyte
A new instance of DMA/DMAMux has been added to manage secure accesses
On the camera and display side, the digital camera interface has been enhanced with 16-bit DCMIPP.
The LTDC display controller includes a secure layer and

YUV format.
The external DDR interface has been reduced to 16-bit.
One additional Ethernet interface has been added, but the GMII interface has been removed (only RGMII, MII, RMII) as well as AVB support.
The internal SRAM memory has been reduced to 160 Kbyte
The 2 internal ADC have changed from 16-bit to 12-bit resolution
The digital filter for sigma delta modulators (DFSDM) have been reduced to 2 filters and 4 channels.
The 2 SDMMC interfaces have independent power supplies that allow to use SDMMC UHS-I mode without the need for external level shifters.
Finally, a dedicated power supply for the arm Cortex-A7 core allow to shutdown the CPU (LPLV-Stop2 mode) hence reducing the power consumption in Stop mode.
It also allow to increase the Cortex-A7 voltage to run at frequency above 650Mhz while keeping the rest of the chip at nominal voltage.
The number of wakeup sources from LPLV-Stop and LPLV-Stop2 modes have been increased (I2C, SPI, USART)



STM32MP13x have 3 different lines offering various feature set.
3 packages are available for each line with same number of GPIO's.
There is no compatibility with STM32MP15x packages ballout and alternate function multiplexing is different.

References

- For more details, please refer to:
  - STM32MP1 Series Reference manuals
  - STM32MP1 Series Datasheets

life.augmented

In addition to this training, you can refer to the STM32MP1 series reference manuals and datasheets.

Thank you

life.augmented