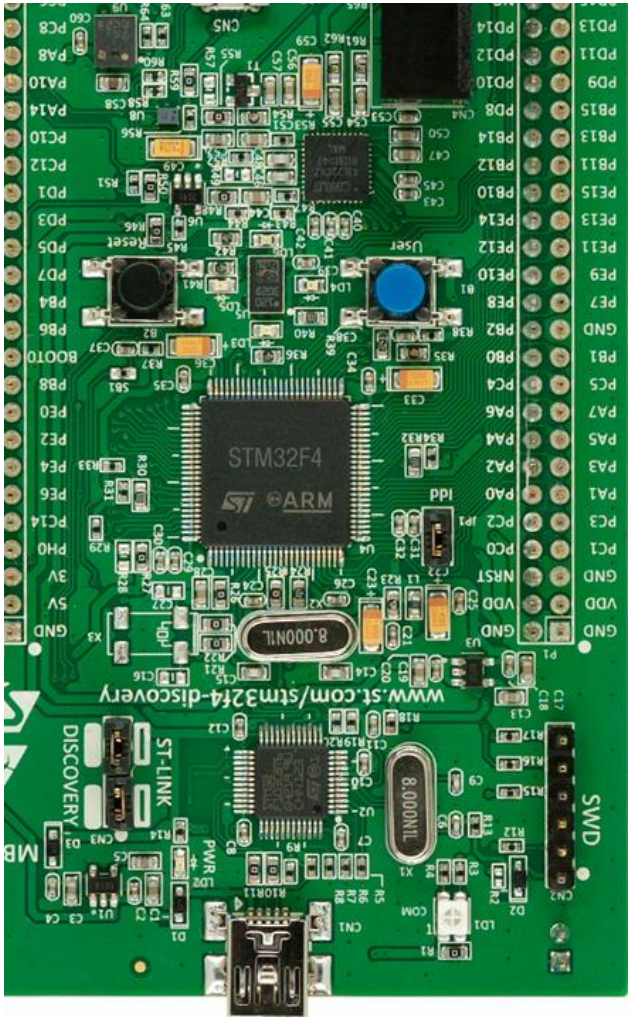
Mikrocontroller STM32F415

Mikrocontroller

- Halbleiterchip

- Ein-Chip-Computersystem



STM32F415

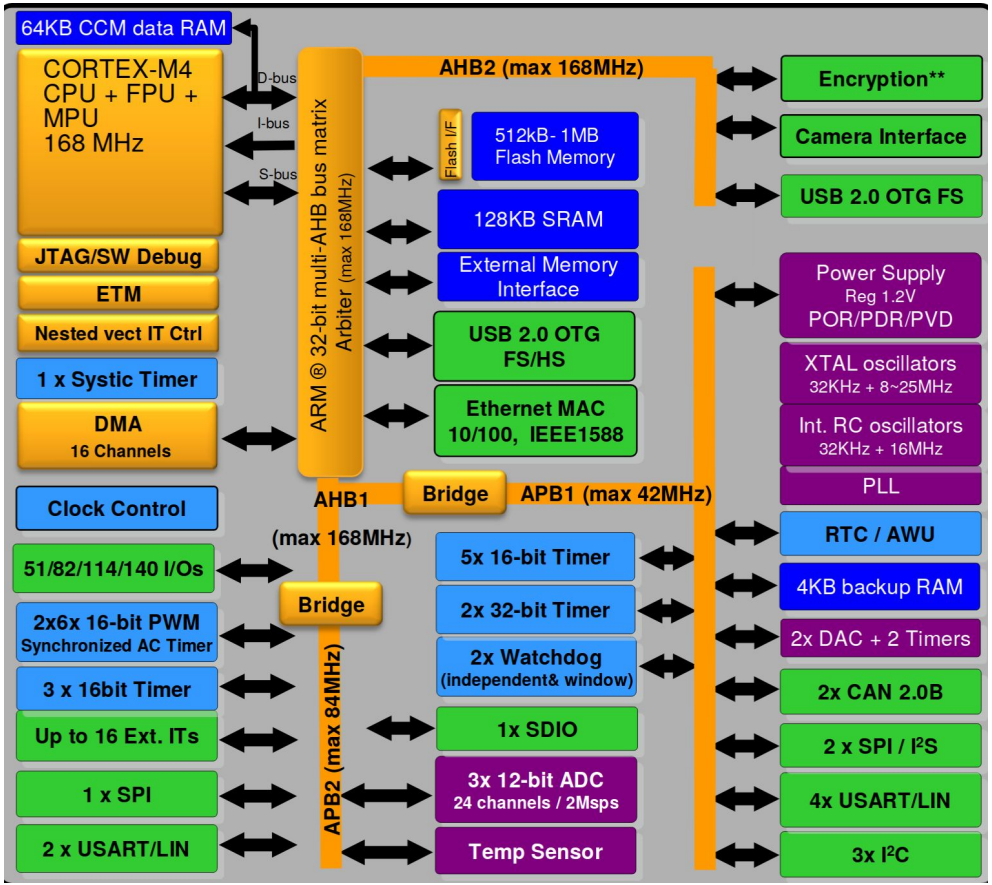
- 32 Bit Mikrocontroller von STMicroelectronics
- ARM Cortex M4
- Fließkommaeinheit
- Kryptographischer und Hash-Prozessor

Funktionseinheiten

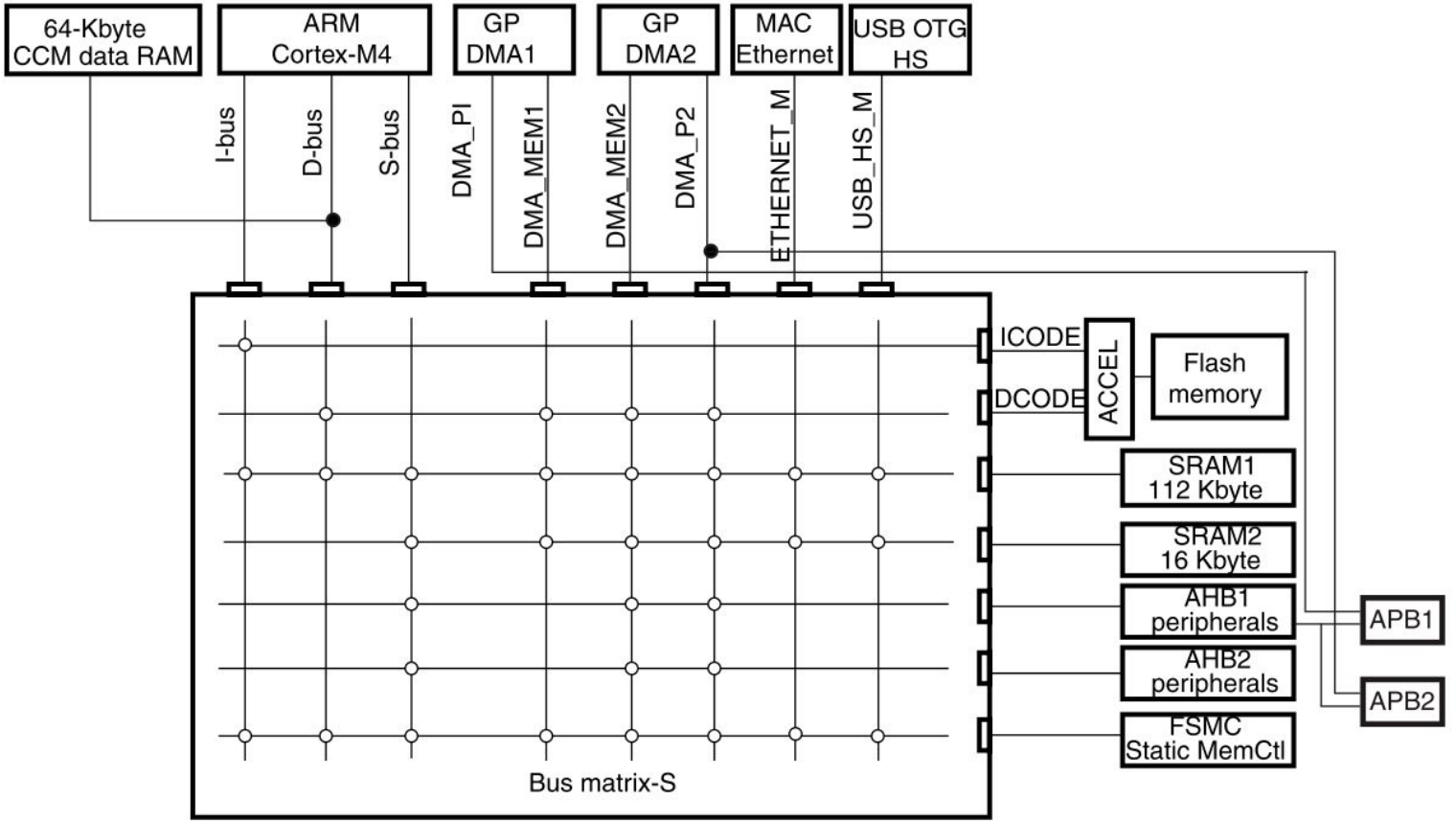
unter anderem:

- Verschiedene Kommunikationsschnittstellen
- Verschiedene interne Speicher
- 2 DACs
- 3 ADCs
- 17 Timer
- FSMC
- True Random Number Generator
- Krypto/Hash Prozessor

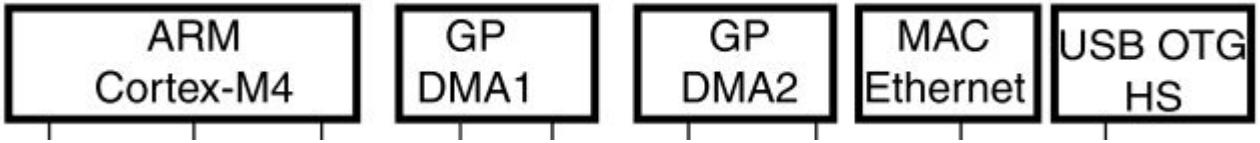
Blockschaltbild



Busmatrix


64-Kbyte
CCM data RAM
ARM
Cortex-M4
GP
DMA1
GP
DMA2
MAC
Ethernet
USB OTG
HS
I-bus
D-bus
S-bus
DMA_PI
DMA_MEM1
DMA_MEM2
DMA_P2
ETHERNET_M
USB_HS_M
ICODE
DCODE
ACCEL
Flash
memory
SRAM1
112 Kbyte
SRAM2
16 Kbyte
AHB1
peripherals
AHB2
peripherals
FSMC
Static MemCtl
APB1
APB2
Bus matrix-S

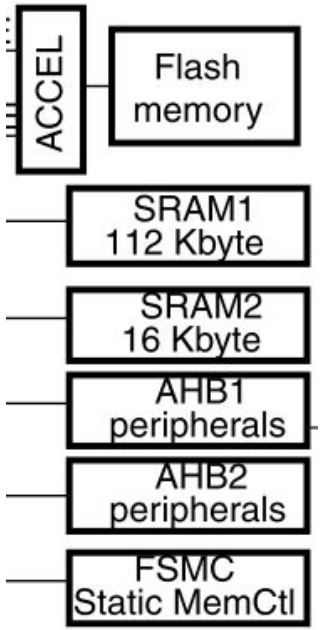
Master



- ARM Cortex M4: Prozessor

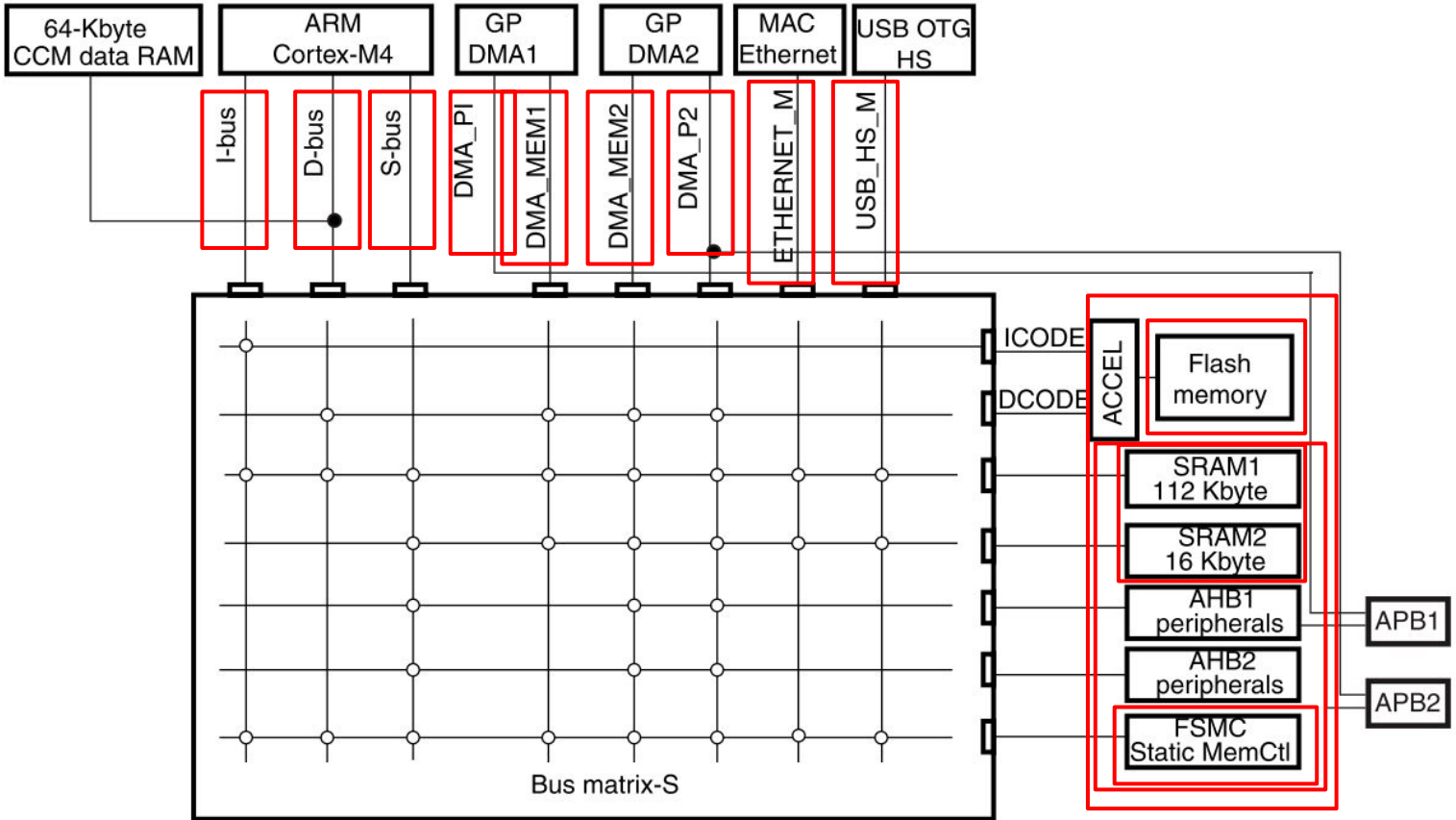
- DMA: direkter Speicherzugriff durch Peripheriegeräte

Slaves



- Flash Speicher: nicht flüchtiger Speicher
- SRAM: flüchtiger Speicher
- AHB: Beschleunigung von Speicherzugriffen, pipelined Operations...
- FSMC: Peripherieanbindung

Busmatrix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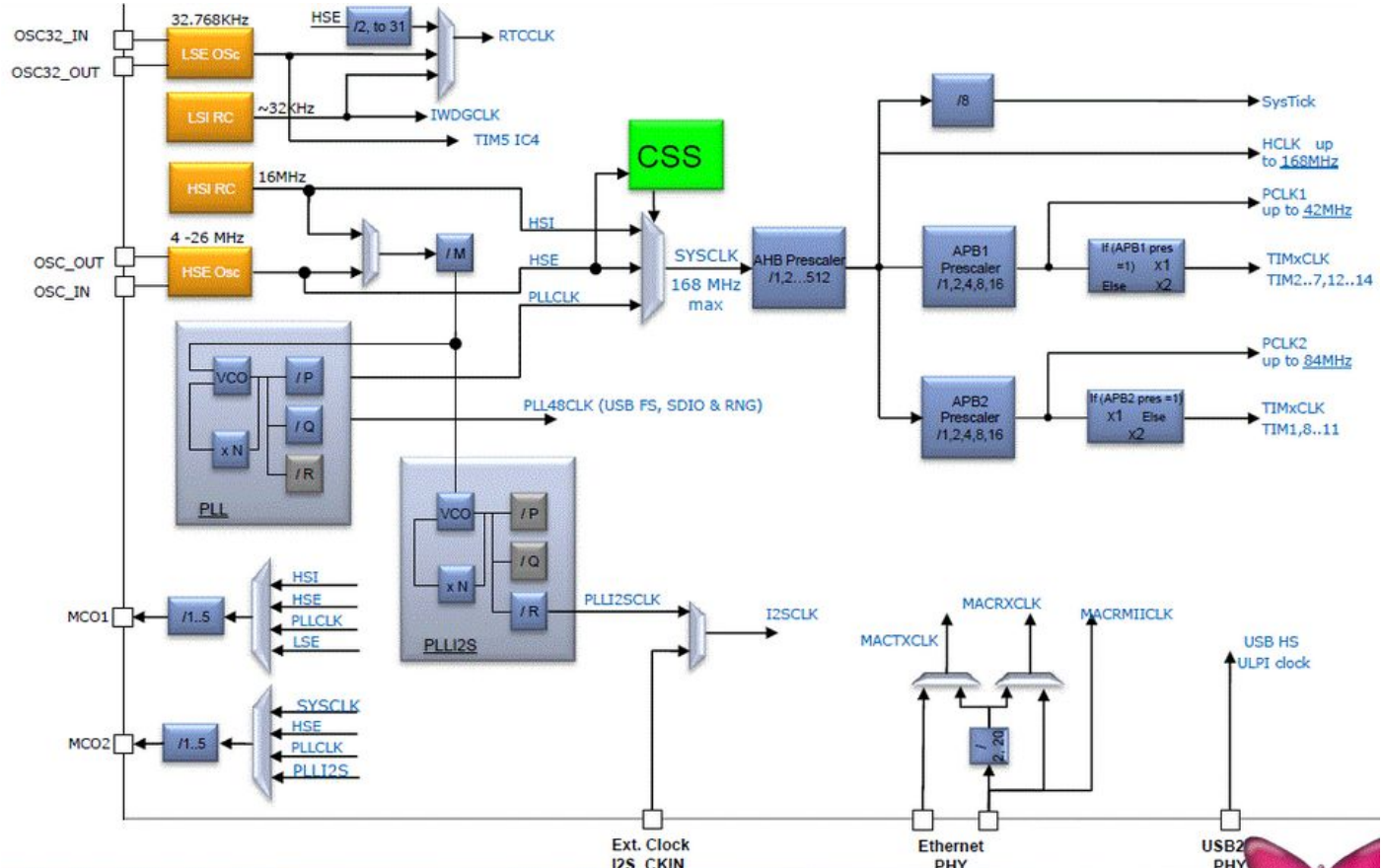
APB2
Bus matrix-S

Clocksystem



CSS - clock security system

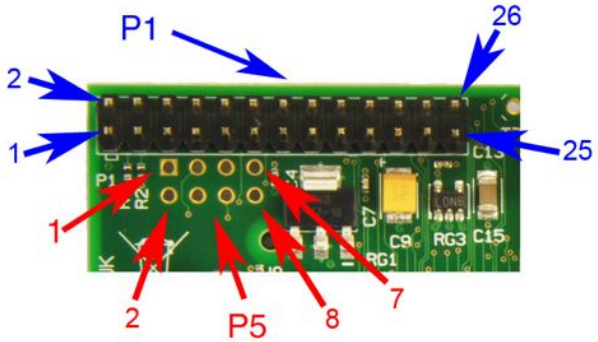
Functions

void	**RCC_DeInit** (void) Resets the RCC clock configuration to the default reset state.
void	**RCC_HSEConfig** (uint8_t RCC_HSE) Configures the External High Speed oscillator (HSE).
ErrorStatus	**RCC_WaitForHSEStartUp** (void) Waits for HSE start-up.
void	**RCC_AdjustHSICalibrationValue** (uint8_t HSICalibrationValue) Adjusts the Internal High Speed oscillator (HSI) calibration value.
void	**RCC_HSICmd** (FunctionalState NewState) Enables or disables the Internal High Speed oscillator (HSI).
void	**RCC_LSEConfig** (uint32_t RCC_LSE) Configures the External Low Speed oscillator (LSE).
void	**RCC_LSEDriveConfig** (uint32_t RCC_LSEDrive) Configures the External Low Speed oscillator (LSE) drive capability.
void	**RCC_LSICmd** (FunctionalState NewState) Enables or disables the Internal Low Speed oscillator (LSI).
void	**RCC_PLLConfig** (uint32_t RCC_PLLSource, uint32_t RCC_PLLMul) Configures the PLL clock source and multiplication factor.
void	**RCC_PLLCmd** (FunctionalState NewState) Enables or disables the PLL.
void	**RCC_PREDIV1Config** (uint32_t RCC_PREDIV1_Div) Configures the PREDIV1 division factor.
void	**RCC_ClockSecuritySystemCmd** (FunctionalState NewState) Enables or disables the Clock Security System.
void	**RCC_MCOConfig** (uint8_t RCC_MCOSource) Selects the clock source to output on MCO pin (PA8).

GPIO

= Pin, dessen Verhalten vom Nutzer zur Laufzeit bestimmt wird

- Bis zu 16 I/Os
- Separate Geschwindigkeiten
- Frei programmierbar
- Hier blau (!) Bsp

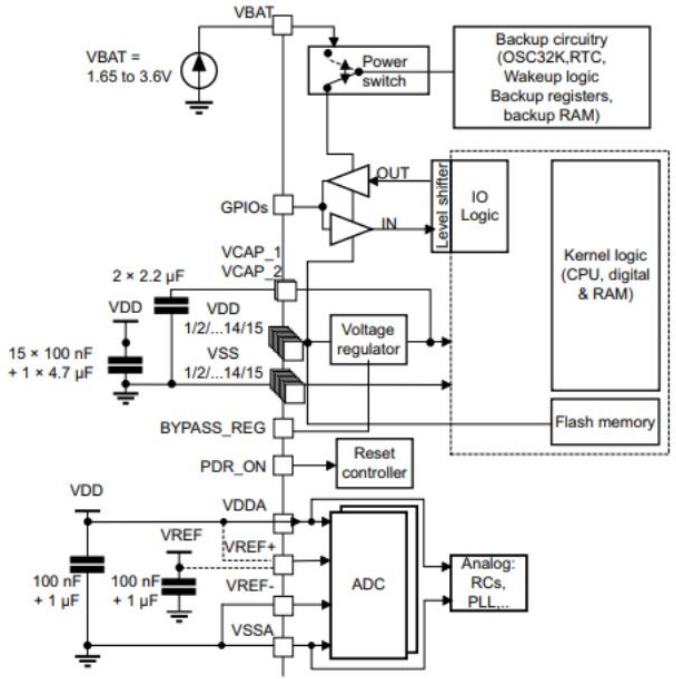


- U.a. Konfigurations-, Daten- und Set/Reset Register
- Verschiedene Input- und Output States
- Locking-Mechanismus

Beschaltung der Spannungsversorgung

- Betriebsspannung von 1,8 bis 3,6 V (VDD)

- Run-Modus
- Stop-Modus (1.2V)
- Standby-Modus



Mikrocontroller STM32F415

Ende

Quellen

https://www.st.com/en/microcontrollers/stm32f405-415.html

https://www.itwissen.info/Master-Slave-Betrieb-master-slave-operation.html

http://infocenter.arm.com/help/index.jsp?topic=/com.arm.doc.ddi0479b/Babedjhb.html

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