

ETH

Ethernet MAC

XMC™ microcontrollers
September 2016



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Overview

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Key feature: automatic CRC and pad generation

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Key feature: flexible address filtering modes

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Key feature: ethernet frame time stamping

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System integration

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Application example

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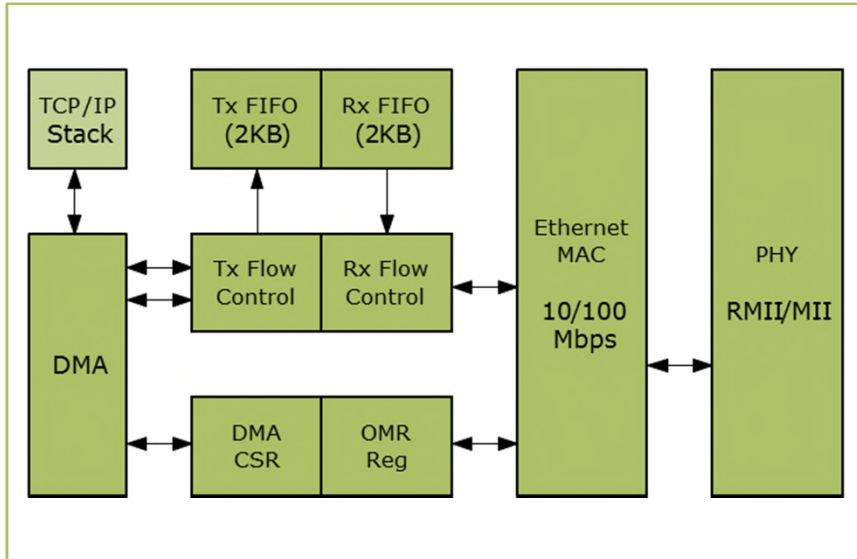
Key feature: ethernet frame time stamping

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Application example



Highlights

The Ethernet core supports 10/100-Mbit/s data transfer rates which is compliant with IEEE 802.3 specification and this allows for an external fast Ethernet PHY interface with RMII/MII.

Key features

- › Automatic CRC and pad generation
- › Flexible address filtering modes
- › Support Ethernet frame time stamping compliant with IEEE 1588-2008

Customer benefits

- › User do not have to take care of CRC calculation and pad insertion
- › Auto checking of the destination and source address of receive frame
- › Better accuracy to synchronize clocks throughout a network

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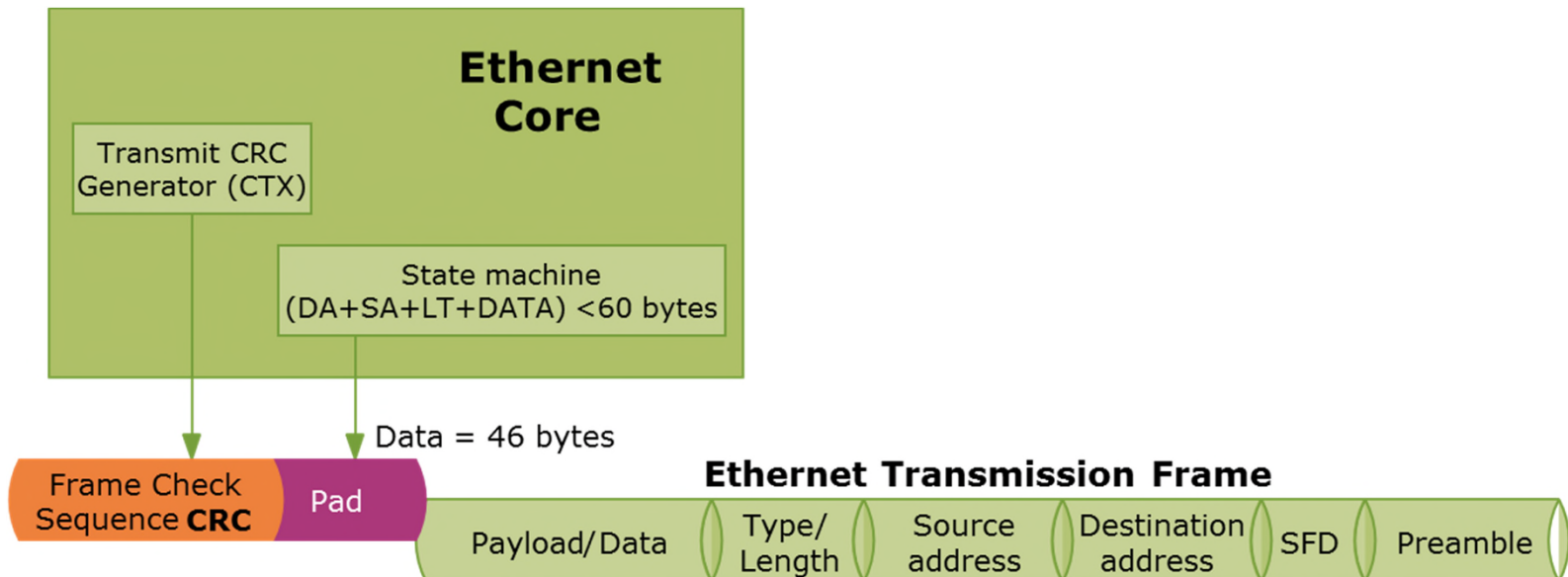
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Application example

Automatic CRC and pad generation

- › CRC and pad generation for transmission frame
 - When the number of bytes received falls **below 60 bytes**, the **state machine** automatically appends zeros to the Tx frame to make the **data length exactly 46 bytes**
 - The **Transmit CRC Generator** module calculates the CRC for the Frame Check Sequence (FCS) field before transmission to the TPE module



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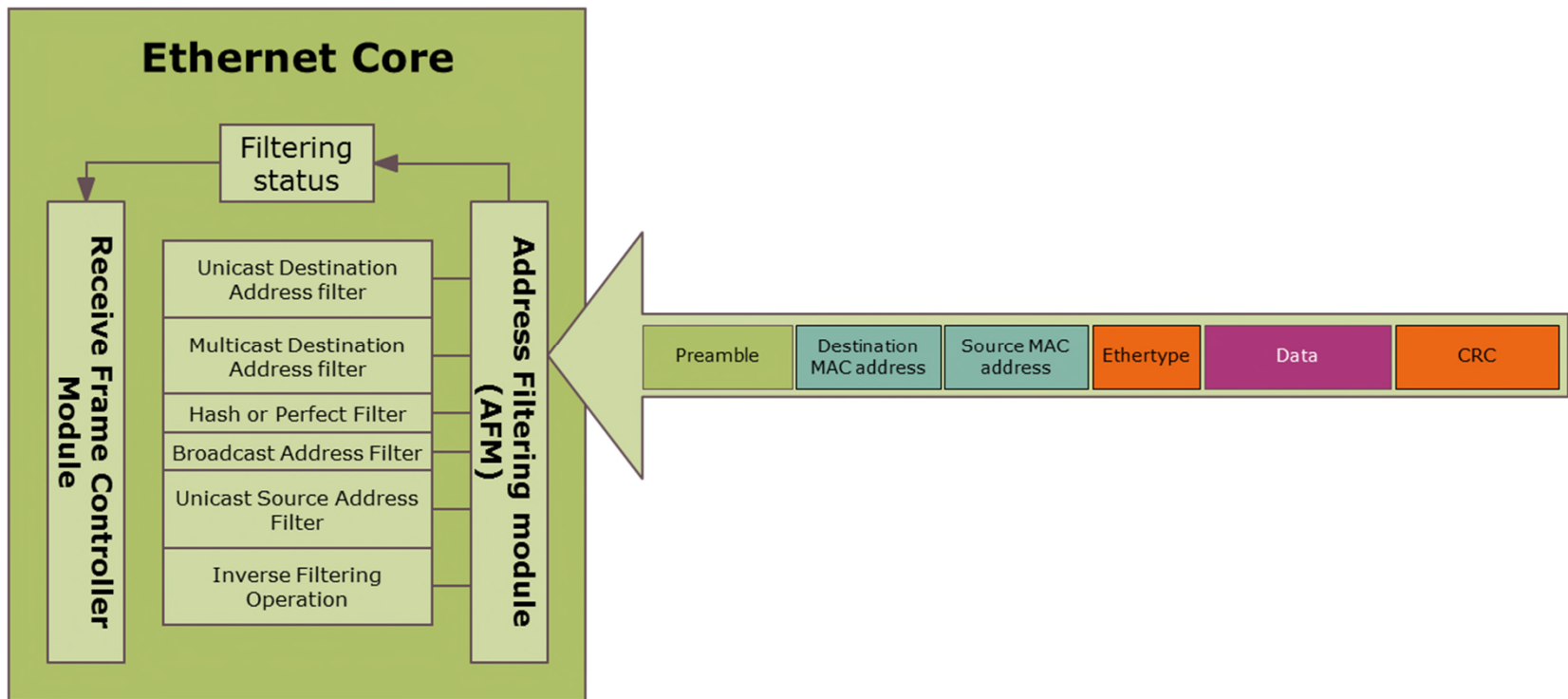
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Application example

Flexible address filtering modes

- › The address filtering (AFM) module performs the destination and source address checking function on all received frames and reports the address filtering status to the receive frame controller module
- › The Receive Frame Controller (RFC) module performs frame filtering based on the destination/source address



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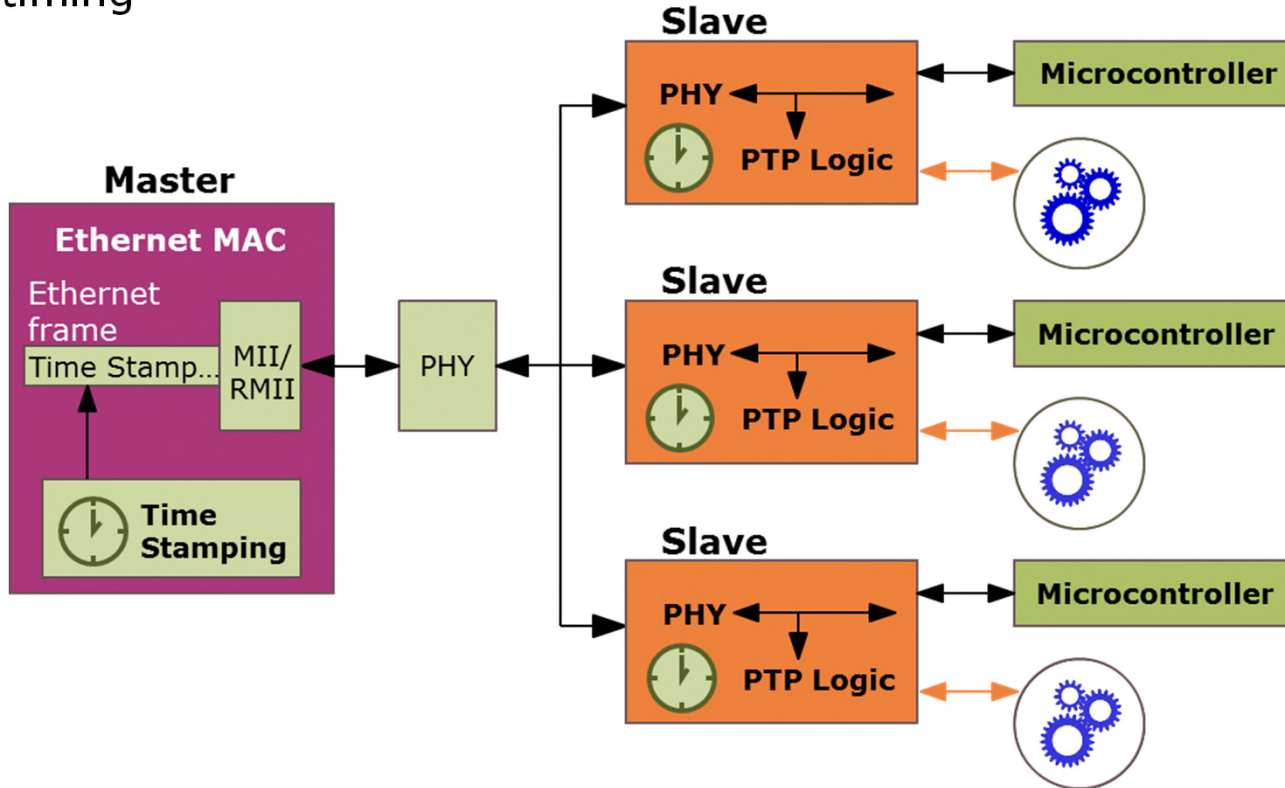
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Application example

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Ethernet frame time stamping

- › If IEEE 1588 time stamping is enabled for the transmit frame, this block takes a snapshot of the system time when the SFD is put onto the transmit MII bus
- › The time stamping feature can be used in precision time protocol to synchronize clock throughout a network of rotary encoder and control stepping motor at required timing



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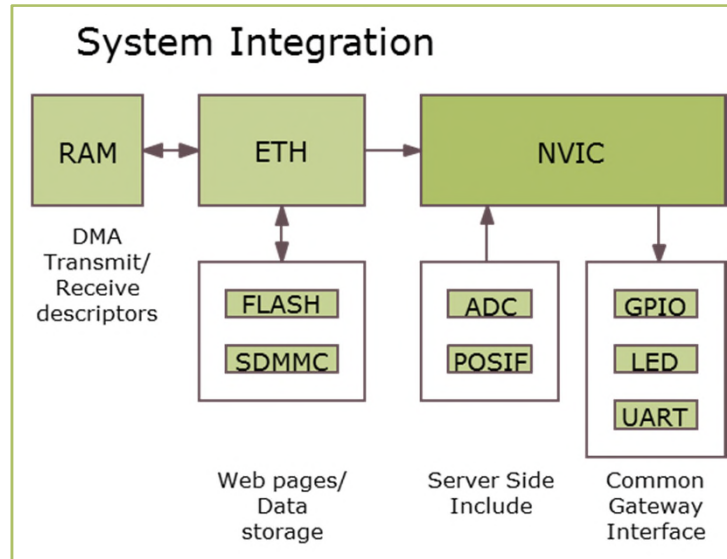
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System integration



XMC™4100	XMC™4200	XMC™4400	XMC™4500
		●	●

The Ethernet MAC can make use of the internal flash or external SDMMC as a resource access from the host.

Additional peripherals such as ADC, GPIO etc, are used to support server side include or common gateway interface application.

RAM – For DMA transmit / receive descriptors.

Flash/SDMMC – For html/JPEG files storage.

NVIC – For Ethernet receive interrupt.

ADC/POSIF – For server side include.

GPIO/LED/UART – For common gate way interface.

› Target applications

- Web server
- FTP server
- MOD bus

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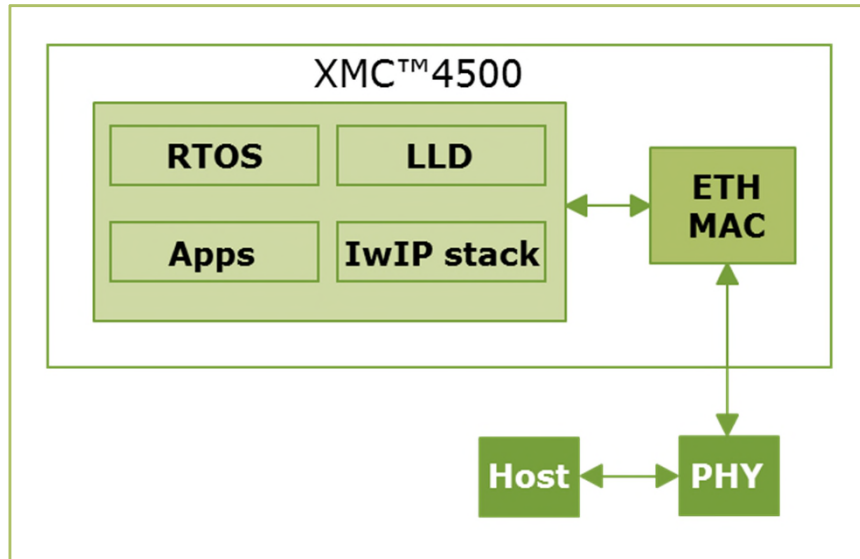
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In brief

The Ethernet MAC in combination with the software RTOS and LwIP stack is able to create a web server application.

Overview

The primary function of a web server is to store, process and deliver web pages to clients. The communication between client and server takes place using the Hypertext Transfer Protocol (HTTP).

Pages delivered are most frequently HTML document, which may include images, style sheet and scripts in addition to text content.

A web browser, initiates communication by making a request for a specific resource using HTTP and the server responds with the content of that resource or an error message if unable to do so.

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Collaterals and Brochures



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