Real-Time Edge Software

REALTIME-EDGE-SOFTWARE

Last Updated: Jan 22, 2026

The real-time edge software enables real-time applications for the i.MX and Layerscape products and can be easily integrated with the Yocto Project® SDKs for these products. Real-time edge software enables real-time capabilities via support for Preempt-RT Linux® for low latency applications, baremetal framework and support for real-time operating system (RTOS) on the Arm® Cortex®-A or Cortex®-M cores.
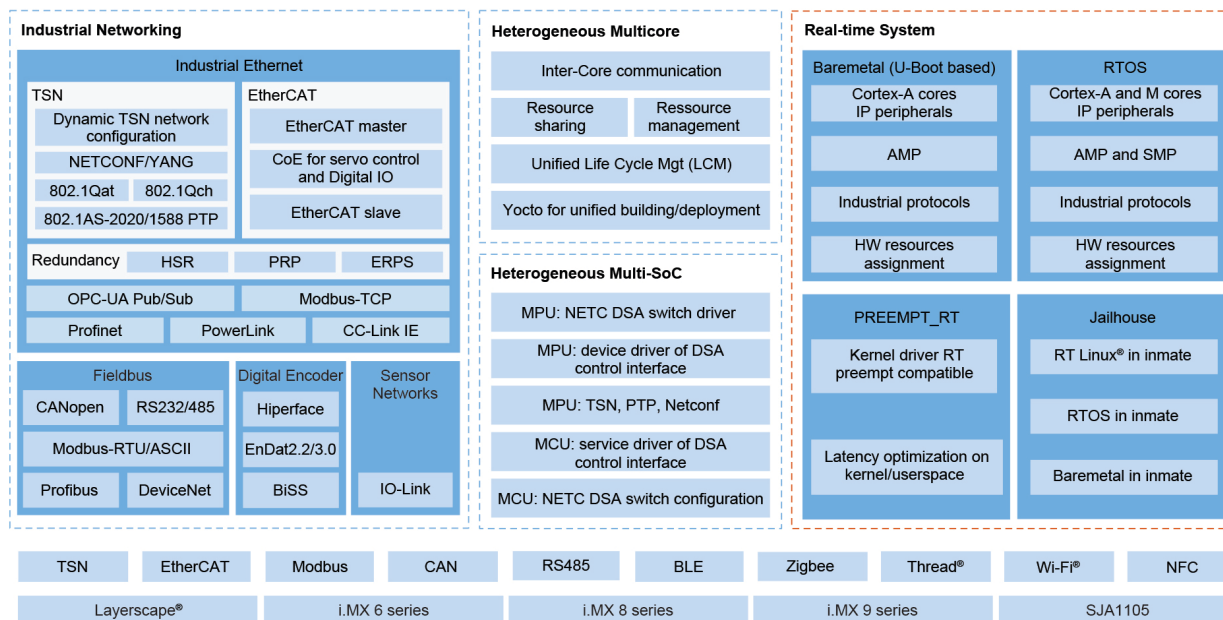
Heterogeneous Multicore Framework enables the flexible boot combination by assigning different systems to different cores with unified lifecycle management, Inter-core communication for message communication and high-performance data transferring, and resource sharing when the hardware IP has been assigned to one of the cores.

Heterogeneous Multi-SoC framework enhances the capabilities of the selected MPU by connecting it to an industry MCU (i.MX RT1180) to support the Real-time domain running on MCU with Industrial protocols and switching capability and computing domain running on MPU with computing-heavy tasks.

Real-time edge software also supports Industrial Networking with Industrial Ethernet, Fieldbus, Digital Encoder and Sensor network. Industrial Ethernet includes rich EtherCAT® master stack with native driver optimization, time-sensitive networking for deterministic transfer, OPC UA Pub/Sub, Modbus®-TCP and Modbus-Simulator. Filedbus supports the CANopen® and Modbus-RTU/ASCII etc.

Complete with reference software and system-validated board support package (BSP), NXP provides you with the tools to test and maximize the performance of the applications you develop.

Real-Time Edge Software Block Diagram Block Diagram

Industrial Networking

Industrial Ethernet

TSN	EtherCAT
Dynamic TSN network configuration	EtherCAT master
NETCONF/YANG	CoE for servo control and Digital IO
802.1Qat 802.1Qch	EtherCAT slave
802.1AS-2020/1588 PTP	

Redundancy	HSR	PRP	ERPS

OPC-UA Pub/Sub	Modbus-TCP
Profinet	PowerLink	CC-Link IE

Fieldbus		Digital Encoder	Sensor Networks
CANopen	RS232/485	Hiperface	
Modbus-RTU/ASCII		EnDat2.2/3.0	
Profibus	DeviceNet	BiSS	IO-Link

Heterogeneous Multicore

Inter-Core communication

Resource sharing	Ressource management

Unified Life Cycle Mgt (LCM)

Yocto for unified building/deployment

Heterogeneous Multi-SoC

MPU: NETC DSA switch driver

MPU: device driver of DSA control interface

MPU: TSN, PTP, Netconf

MCU: service driver of DSA control interface

MCU: NETC DSA switch configuration

Real-time System

Baremetal (U-Boot based)	RTOS
Cortex-A cores IP peripherals	Cortex-A and M cores IP peripherals
AMP	AMP and SMP
Industrial protocols	Industrial protocols
HW resources assignment	HW resources assignment

PREEMPT_RT	Jailhouse
Kernel driver RT preempt compatible	RT Linux® in inmate
	RTOS in inmate
Latency optimization on kernel/userspace	Baremetal in inmate

TSN	EtherCAT	Modbus	CAN	RS485	BLE	Zigbee	Thread®	Wi-Fi®	NFC

Layerscape®	i.MX 6 series	i.MX 8 series	i.MX 9 series	SJA1105

View additional information for Real-Time Edge Software.

Note: The information on this document is subject to change without notice.