Real-Time Edge Software

REALTIME-EDGE-SOFTWARE

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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.
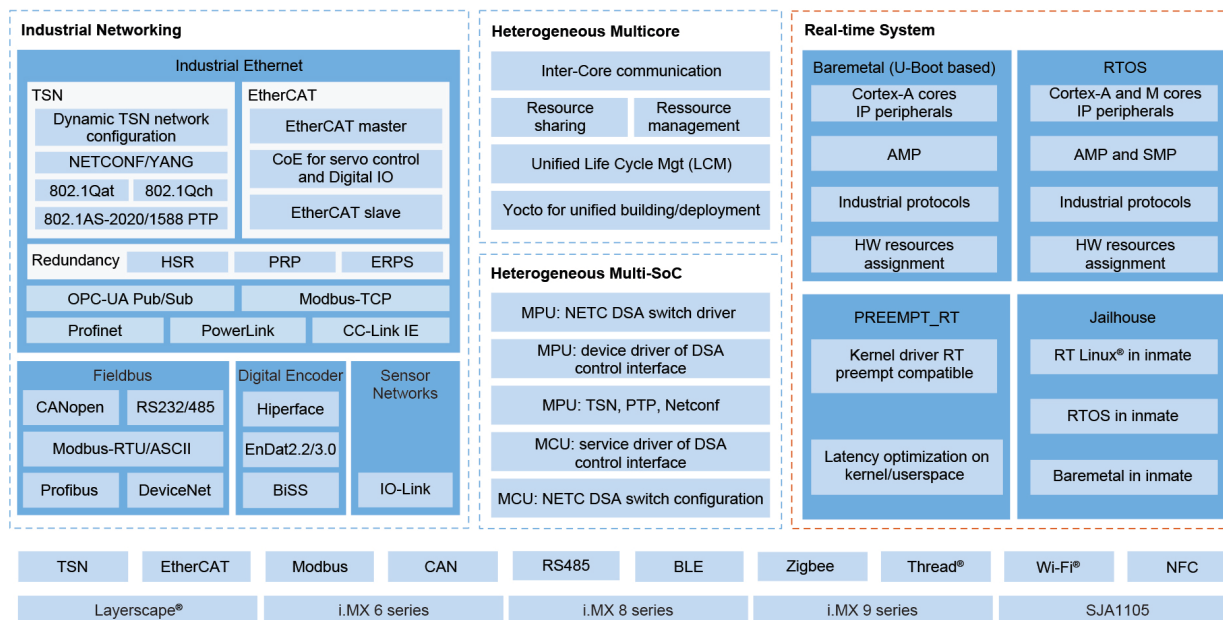
Heterogeneous Multicore Framework enables the flexible boot combination by assigning different systems to different cores with unified lifecycle management, Inter-core communication for message communication and high-performance data transferring, and resource sharing when the hardware IP has been assigned 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		Heterogeneous Multicore	Real-time System	

Industrial Networking

Industrial Ethernet

TSN
- Dynamic TSN network configuration
- NETCONF/YANG
- 802.1Qat | 802.1Qch
- 802.1AS-2020/1588 PTP

EtherCAT
- EtherCAT master
- CoE for servo control and Digital IO
- EtherCAT slave

Redundancy | HSR | PRP | ERPS

OPC-UA Pub/Sub | Modbus-TCP

Profinet | PowerLink | CC-Link IE

Fieldbus
- CANopen | RS232/485
- Modbus-RTU/ASCII
- Profibus | DeviceNet

Digital Encoder
- Hiperface
- EnDat2.2/3.0
- BiSS

Sensor Networks
- 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)
- Cortex-A cores IP peripherals
- AMP
- Industrial protocols
- HW resources assignment

RTOS
- Cortex-A and M cores IP peripherals
- AMP and SMP
- Industrial protocols
- HW resources assignment

PREEMPT_RT
- Kernel driver RT preempt compatible
- Latency optimization on kernel/userspace

Jailhouse
- RT Linux® in inmate
- RTOS in inmate
- 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.

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