



RTS Hypervisor

System communication

Operate your systems securely and efficiently

Thanks to hardware-assisted segmentation, the RTS Hypervisor rigorously separates all operating systems from one another. In a complex system, however, it is often vital for applications of a specific operating system (OS) to coordinate activities with programs running on a different OS. To assure correct and efficient operation of the overall system, reliable communication methods must be established. The RTS Hypervisor provides three different ways for operating systems to communicate with each other: a virtual network, shared memory, and an event system. Not only do these methods ease inter-system communication; they allow for reliable synchronization between the operating systems in no time as well.

Virtual network

A virtual network provides for seamless socket-based communication. Similar to a traditional Ethernet data communication network, the virtual network conveys data between network nodes via standard network protocols. Each core can be assigned its own IP and MAC address. Thanks to the support of several established protocols like TCP/IP, OPC, or CORBA, there is no need for developers to spend time on learning proprietary inter-system communication methods.

Information is exchanged via a dedicated area in the main memory. This allows fast data transfers between the different operating systems.

Shared memory

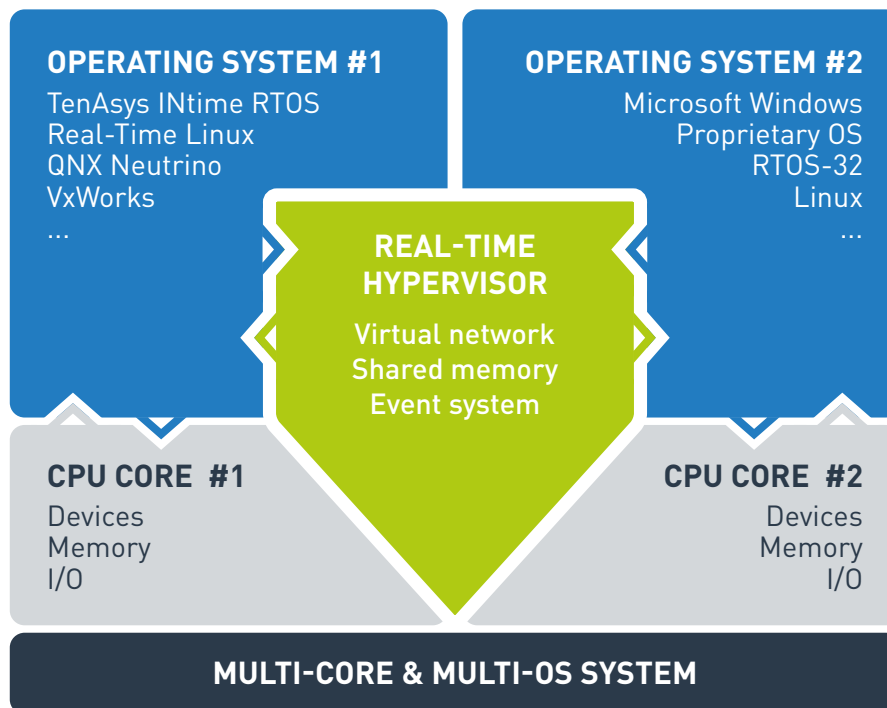
With shared memory areas, applications running on different operating systems can rapidly and easily exchange data via the main memory. In the configuration file, one or more memory partitions can be configured as shared memory sections.

The RTS Hypervisor helps to maintain data integrity. It provides lock mechanisms and prevents shared memory partitions from overlapping with memory sections reserved for specific operating systems.

Cache coherency is maintained by the processor automatically.

»For our robotics system it is vital for QNX and Windows to virtually communicate with each other, just as assuring operation with hard real time.«

Ivailo Kassamakov, CASCINATION AG, Switzerland



The Real-Time Hypervisor allows fast communication between different operating systems, and at the same time reliably partitions the hardware between the involved OS's.

Event system

The event system permits programs executed on different operating systems to communicate with one another via user-created, named events. Applications can send signals to certain events and wait for specific signals to arrive.

Thanks to the use of Inter Processor Interrupts, no hypervisor interaction is necessary.

External communication example

Access to external networks safely takes place via a physical network adapter which is exclusively assigned to a dedicated ›edge OS‹. This eliminates the need for expensive external gateways. Data integrity is assured: For external devices, shared memory can be defined read-only.

Your benefits

- **Rapid inter-system communication:** usage of fast shared memory and Inter Processor Interrupts
- **Safe operation:** fast and reliable synchronization between different operating systems
- **Secured data:** hardware-assisted segmentation without backdoors or open sockets for external gateways
- **Easy integration:** no learning phase needed thanks to API with standard communication protocols
- **Flexible configuration:** specification of network addresses, memory partitions, permissions, etc. in plain text



Real-Time Systems GmbH is a leading provider of real-time virtualization, hypervisor and operating system technology for embedded and real-time systems. With an extensive knowledge of quality software design, Real-Time Systems GmbH provides a competitive advantage to their customers. The Intel® co-development partner was founded in 2006 and is headquartered in Ravensburg, Germany. Since 2018, Real-Time Systems GmbH is a company of congatec GmbH with partners in Europe, USA, and Asia.

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