IntervalZero

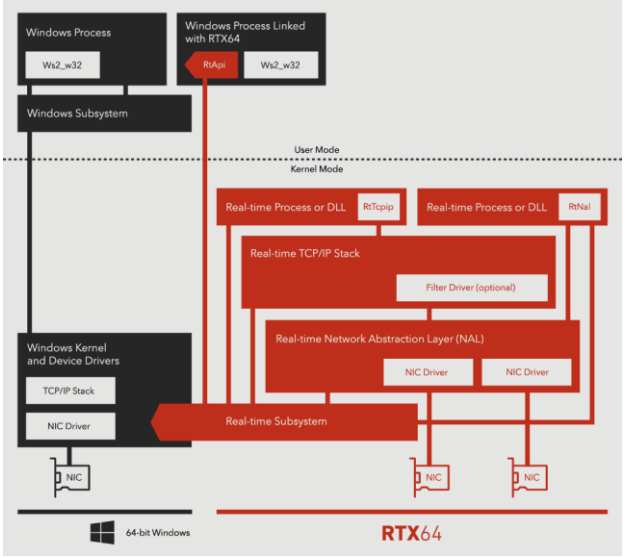
ProductBrief

May 2023

RTX64 RT-TCP/IP Stack

Overview

The Real-time TCP/IP stack (RT-TCP/IP) is a separate purchasable feature of RTX64. RT-TCP/IP allows real-time processes to use standard socket API calls for communication. RT-TCP/IP is a deterministic stack based on the Treck Inc., Treck TCP/IP stack, a high performance TCP/IP protocol suite that is RFC compliant.



Determinism

- Guaranteed Precision – set timer periods down to 1 microsecond, and Interrupt Service Thread (IST) latencies of less the 10 microseconds
- Separation from Windows – Windows processes cannot interfere with RT-TCP/IP stack

Control

- Flexibility to configure the amount of processing capability used for the RT-TCP/IP stack
- Full control of the RT-TCP/IP stack; load balance threads as needed. RT-TCP/IP stack provides the ability to set thread and interrupt affinities for the stack
- Peace of mind if Windows issues a STOP message or shutdown. RT-TCP/IP stack has the ability to continue running until communication is completed

Simplify

- Use a single RT-TCP/IP stack for all real-time applications. The RT-TCP/IP stack is a dual stack that supports IPv4 and IPv6
- RT-TCP/IP is Symmetric Multiprocessing (SMP) aware and can handle multiple applications running across multiple processors
- Use standard socket and basic Winsock API calls for networking communication. The same code can be run in Windows or real-time processes
- Standard interface is provided for writing MAC layer filters

Key Features

Real-time Stack Runtime

- Dual stack support IPv4 and IPv6
- Supports Ethernet, and null link-layers
- Backward compatible IPv4 socket API extensions, compliant with RFC-2553
- IPv6 Address Resolution independent of link
- IPv6 Host functionality
- Built-in support for IPv6 address
- IPv6 functionality

    - Duplicate address detection
    - Prefix discovery with stateless address auto-configuration
    - Multicast listener discovery
    - Neighbor unreachability detection
- Basic Winsock support
- MAC layer filter driver support per interface
- Virtual Network – point to point connection between Windows and RTSS
- Included protocols
    - ICMPv6
    - IPv6
    - TCP
    - UDP
    - ICMPv4
    - IPv4
    - ARP
    - Ethernet
    - Raw Sockets
    - Multicast
- Utilities
    - RtssArp
    - RtssIpConfig
    - RtssPing
    - RtssRoute
- Documentation consisting of installation and user guides, API references, and details on real-time programming concepts

Architecture