Communication products

USB:

The CONNECT USB Host component enables developers to integrate USB host functionality easily into embedded products.
It takes responsibility for detecting insertion and removal of USB devices, providing power, assigning a unique address to the attached devices, and managing the control and data flow.
http://www.highintegritysystems.com/middleware/usb-connect/

SEGGER emUSB **Device** is a high speed USB device stack specifically designed for embedded systems. The software is written in ANSI "C" and can run on any platform.
https://www.segger.com/emusb.html

TCP/IP Networking:

InterNiche has been providing embedded operating systems and networking software for embedded internet devices since 1989.
http://www.iniche.com/

SEGGER emboss/IP CPU independent TCP/IP stack: 'a high performance library optimized for speed, versatility and a small memory footprint that can be use on virtually any CPU'.
https://www.segger.com/embos-ip.html

File systems:

The CONNECT File System is compact and highly reliable embedded FAT16/FAT32 file system that has been specifically designed for embedded applications requiring data storage to media such as SD/MMC, USB and Flash drives.
http://www.highintegritysystems.com/middleware/fat-and-flash-file-systems/

SEGGER emFile is a file system for embedded applications which can be used on any media, for which you can provide basic hardware access functions. emFile is a high performance library that has been optimized for minimum memory consumption in RAM and ROM, high speed and versatility.
https://www.segger.com/emfile.html

Performance measures

Dhrystone and MIPs performance of ARM processors:

The MIPS figures which ARM quotes are "Dhrystone VAX MIPs". The idea behind this measure is to compare the performance of an ARM system) against the performance of a reference machine.

http://infocenter.arm.com/help/index.jsp?topic=/com.arm.doc.faqs/ka3885.html

---

Dhrystone benchmark:

Dhrystone: *A synthetic system programming benchmark*, Reinhold P. Weicker, Computing Practices, Vol.27, No.10, pp 1013-1030, Oct.1984.

http://en.wikipedia.org/wiki/Dhrystone

Whetstone benchmark:

A Synthetic Benchmark, H.J.Curnow and B.A.Wichmann, Computer Journal, Vol.19, No.1, pp 43-49, Jan.1976.

http://en.wikipedia.org/wiki/Whetstone_%28benchmark%29

Hartstone benchmark
Is a series of timing requirements for testing a system's ability to handle hard real-time applications.

Hartstone: *Synthetic Benchmark Requirements for Hard Real-Time Applications*, N.Weiderman, Technical Report, Software Engineering Institute, Carnegie Mellon University CMU/SEI-89-TR-23, June 1989.

http://www.sei.cmu.edu/reports/90tr007.pdf

Rhealstone benchmark:
The Rhealstone figure is a sum obtained from six categories of activity most crucial to the performance of real-time systems, irrespective of the actual application. The Rhealstone metric chiefly helps developers select real-time computer systems appropriate for their applications.

http://collaboration.cmc.ec.gc.ca/science/rpn/biblio/ddj/Website/articles/DDJ/1989/8902/8902a/8902a.htm

Implementing the Rhealstone Real-Time Benchmark, R.P.Kar, Dr. Dobbs Journal, pp 46-102, April.1990.

SPEC benchmarks:

These are designed to provide performance measurements that can be used to compare compute-intensive workloads on different computer systems

http://www.spec.org/benchmarks.html

SPEC *as a Performance Evaluation Measure*, R.Giladi and N.Ahituv, IEEE Computer, Vol.28, No.8, pp 33-42, August 1995.

EEMBC benchmark software:

These help to predict the performance of embedded processors and memory subsystems in a range of applications.
http://www.eembc.org/products/index.php

CoreMark:
Is a benchmark that aims to measure the performance of central processing units (CPU) used in embedded systems. It was developed in 2009 by Shay Gal-On at EEMBC and is intended to become an industry standard, replacing the antiquated Dhrystone benchmark.

http://en.wikipedia.org/wiki/Coremark

RTOS

Deos™ is a proven, full featured DO-178 Level A certifiable real-time operating system (RTOS) which addresses the issues of high robustness and formal certifiability for avionics and safety critical applications.

http://www.ddci.com/products_deos.php

---

embOS
embOS, from Segger, is designed to be used as a foundation for the development of embedded real-time applications.

http://www.segger.com/embos.html

---

eSOL is a leading provider of software development solutions for multi-core and many-core processors,

http://www.esol.com/embedded/multicore_manycore.html

---

eTaskSync
eTaskSync is a MISRA-compliant, verifiable scheduler used for running tasks in an embedded system. It provides the essential functions of an embedded kernel: tasks, events, and mutexes using a priority-based, pre-emptive scheduling mechanism. It can be used for cooperative task scheduling in an embedded system.
eTaskSync has a small footprint <2kB code; 100bytes RAM and is fully compliant with MISRA-C:2004.

http://www.hcc-embedded.com

FreeRTOS™ is a market leading real time operating system (or RTOS) from Real Time Engineers Ltd. that supports 34 architectures

http://www.freertos.org/

HeartOS from DDC-I is a POSIX-based hard real-time operating system that is fast, light and well featured for most for small to medium embedded applications, including safety-critical applications.

http://www.ddci.com/products_heartos.php

INTEGRITY
INTEGRITY, from Green Hills Software, is a leading RTOS for use in critical embedded systems.

http://www.ghs.com/products/rtos/integrity.html

ITRON is a Japanese open standard for an RTOS meant for hard real-time embedded applications. ITRON and μITRON are the name of RTOS specifications coming out of ITRON projects. 'μ' means that the particular specification is meant for the smaller 8-bit or 16-bit CPU targets. Examples of open source RTOS that incorporates API based on μITRON specification are eCos (http://ecos.sourceware.org/) and RTEMs (http://www.rtems.com/).
http://en.wikipedia.org/wiki/ITRON_project

QNX
QNX produces a range of RTOSs for embedded systems: general purpose, automotive, medical, etc.

http://www.qnx.co.uk/products/neutrino-rtos/index.html

RTX Real-Time Operating System
The Keil RTX is a royalty-free, deterministic Real-Time Operating System designed for ARM and Cortex-M devices.

http://www.keil.com/rl-arm/kernel.asp

SAFERTOS
SAFERTOS is a safety certified real time operating system (RTOS) for embedded microcontrollers.   SafeRTOS and its Industrial Design Assurance Pack are available pre-certified by TÜV SÜD to IEC 61508 SIL 3.

http://www.highintegritysystems.com/safertos/

Also see their interesting white papers at
https://www.highintegritysystems.com/white-papers/

SMX
SMX, from Micro Digital, is a real time operating system specifically designed for embedded systems.

http://www.smxrtos.com/about.html

ThreadX

ThreadX, from expresslogic, has been designed specifically for deeply embedded applications. It has also been certified for safety-critical applications.

http://rtos.com/products/threadx/

VxWorks
VxWorks, from Wind River, is possibly *the* major RTOS for embedded systems. It comes in a number of variants, being tailored to specific industries.

http://www.windriver.com/vxworks/reinvented/

µC/OS-III
µC/OS-III, from Micrium, is 'a highly portable, ROMable, scalable, preemptive, real-time, deterministic, multitasking kernel for microprocessors, microcontrollers and DSPs'.

http://micrium.com/rtos/ucosiii/overview/

TOOLS

'The **QNX® Momentics**® Tool Suite is 'a comprehensive, Eclipse-based integrated development environment with innovative profiling tools for maximum insight into system behavior. It gives developers at-a-glance views of realtime interactions, memory profiles. Multi-core specific tools help developers migrate code cleanly from single-core to multi-core systems, and safely optimize performance'.

http://www.qnx.org.uk/products/tools/qnx-momentics.html

Atollic® TrueSTUDIO® is a C/C++ compiler and debugger development suite for ARM® microcontrollers.
Atollic® TrueINSPECTOR® is a professional tool for static source code analysis.
Atollic® TrueANALYZER® measures the test coverage during system testing.
Atollic TrueVERIFIER analyze your source code, auto-generate a test suite with unit tests for each function, and execute it automatically in your target board.

http://www.atollic.com/index.php/product-overview

Tracealyzer 'is a powerful and intuitive visualization allows you to troubleshoot faster and to improve software quality, performance and robustness'.

http://percepio.com/

RAPID RMA: The Art of Modeling Real-Time Systems
'The multiple analysis tools contained in RAPID RMA allow designers to test software models against various design scenarios and evaluate how different implementations might optimize the performance of their systems (by isolating and identifying potential scheduling bottlenecks in both soft and hard real-time systems)'.

http://www.tripac.com/rapid-rma

STATEVIEWER is 'a plug-in kernel-aware debugger for use by engineers working in either an IAR Embedded Workbench, Keil or Eclipse environment'.
http://www.highintegritysystems.com/tools/

SEGGER Embedded Studio is 'a streamlined and powerful C/C++ IDE (Integrated Development Environment) for ARM microcontrollers'.

https://www.segger.com/embedded-studio.html

Keil µVision IDE
'The µVision IDE from Keil combines project management, make facilities, source code editing, program debugging, and complete simulation in one powerful environment'.

http://www.keil.com/uvision/

Green Hills Probe is 'an advanced hardware debug device that connects to the onboard debug ports present on most modern microprocessors, such as IEEE 1149.1 JTAG and BDM. With support for more than one thousand devices from over thirty manufacturers, a flexible electrical interface, and out-of-the-box support for the largest multicore systems, the Green Hills Probe provides fast, reliable debugging, programming, and system visibility to projects present and future'.

http://www.ghs.com/products/probe.html#overview