MontaVista Carrier Grade Edition 7

Carrier Grade Linux for Next Generation Telecom & Network Infrastructure

MontaVista CGE 7 delivers reliable, secure, and serviceable Linux to interconnected embedded devices and high performance networks.

In recent years, there has been a change in the way Network Equipment Providers (NEPs) and Telecom companies develop their network infrastructure applications. Ever increasing demands on packet performance, the need for higher equipment utilization, and rapid deployment in today's dynamic network architecture has presented a new challenge for the industry; implementing *carrier grade network function virtualization*. With the dramatic increase in the world mobile data traffic, NEP's are challenged with scaling mobile networks more efficiently than the static networks of the past. Many are looking for a solution where their networks can change on demand. A network that is as dynamic as the data running on it.
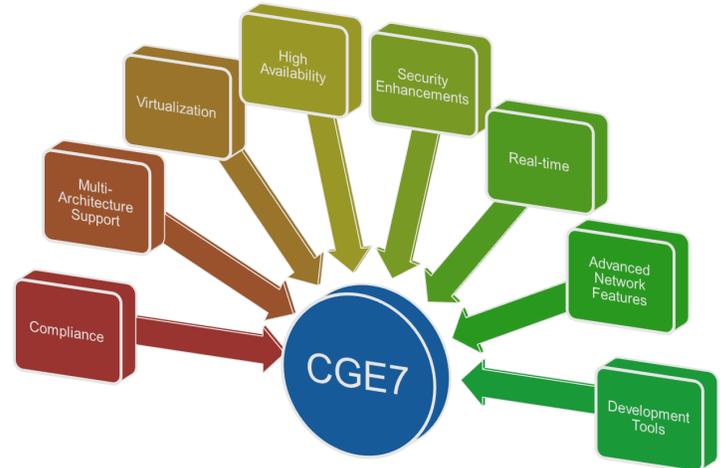
These future networks, will be defined less by the statically deployed hardware/software combinations and more by the dynamic software that is managing these fluid systems. Ideal for optimized and targeted applications, the new capabilities in MontaVista Carrier Grade Edition (CGE7) enable next-generation networks (NGN) to handle the explosive increase in mobile traffic, driven by the growth in video-rich content and applications. CGE7 meets the demands of the Software Defined Networks (SDN) and Network Function Virtualization (NFV), providing application portability, dynamic configuration, virtualized functions, and real-time performance in a single platform.

Reliable

MontaVista® CGE7 offers "Carrier Grade" quality enhancements of "High Availability", "Security", "Rich Networking and IO support", "Real-Time response time with high throughput" and "Multicore & Virtualization support".

Maintainability

Proven Linux development process ensures that all BSPs benefit from CGE7 periodic maintenance cycle with LTS (Long Term Support) options of up-to 10 Yrs+.

Lower Total Cost of Ownership (TCO)

Cut your total cost of ownership with a fully supported, standardized Linux platform. When you deploy CGE7, any concerns about reliability, security, upgrades, or patches, will be handled by MontaVista so you can focus on your core competence.

Commercial

MontaVista ® CGE7 provides rich productivity tools, intensive testing and bug fixes to deliver proven quality for commercial products. Frequent security updates, training, technical support, custom engineering, along with access to GPL legal expertise , and export compliance services, enable NEMs faster time to market.

FEATURES

- Best of breed Linux Environment delivers carrier grade Linux reliability, security and serviceability to interconnected embedded devices and high performance networks.
- Single code (**Unified Kernel**) base across all platform architectures and platforms (MontaVista Only*)
- Advanced Security by leveraging features applicable to the embedded environment from Security Technology Implementation Guideline (STIG) and Common Criteria Operation System Protection Profile (OSPP) standards
- Real-Time / Deterministic Kernel

- Agile development with Secure Build, and Flexible Configuration
- Latest 3.10 Long Term Support (LTS) Linux kernel
- Pre-built cross architecture MSDs based on ARM®v7/v8 , X86 64, Power PC and MIPS multi-core
- Carrier Grade : High Availability, Serviceability, Long Term Support
- Virtualization: Linux Containers (LXC), Docker™, & KVM
- Eclipse-based IDE - MontaVista **DevRocket**®

MontaVista Carrier Grade Edition 7

Comprehensive Development Platform

MontaVista® Linux® Carrier Grade Edition (CGE7), delivers a comprehensive platform meeting developers need of a truly open solution for higher control that is fully tested for reduced time to market. MontaVista also provides risk mitigation by providing its customers with protection from IP and patent infringement and will provide full US export registration coverage for CGE7.

- Comprehensive Board Support with latest Linux 3.10 LTS Kernel version with Pre-integrated Open Embedded user-land.

- Software Development Kit that includes Yocto™ 1.4 release with GNU toolchains and DevRocket™ Eclipse IDE.

- MontaVista Zone secure content repository.

MontaVista Image Designer™ GUI simplifies the creation of the smallest and highest performance file-system, making it easy to configure and build your custom Linux platform.
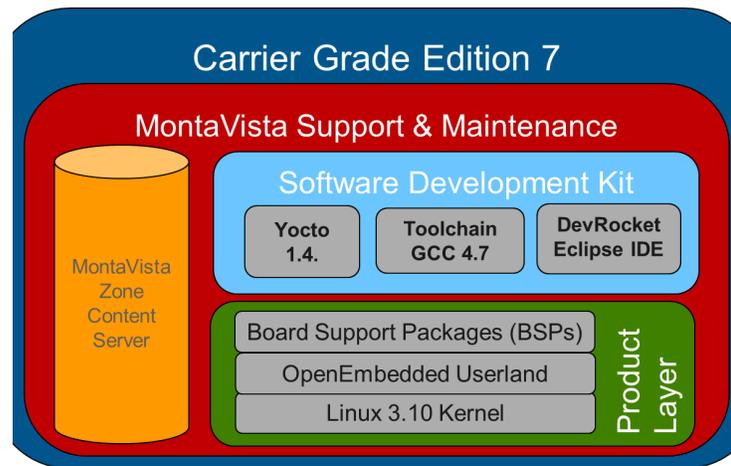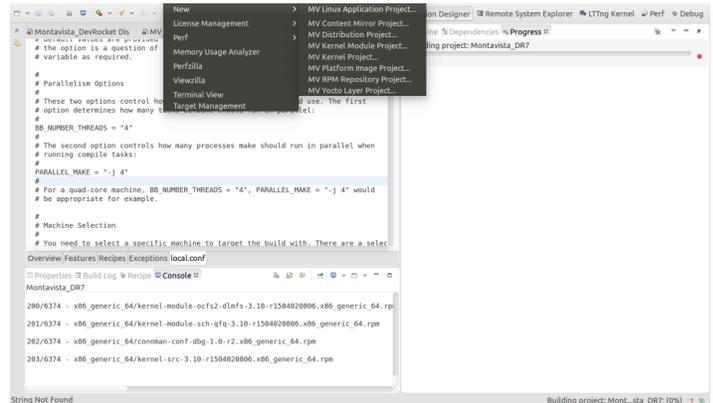

Reduce your total cost of ownership with a fully supported, standardized Linux platform. The "make vs. buy" decision has been resolved: acquiring CGE 7 is the right choice for OEMs to build a device platform , eliminating concerns about reliability, security, upgrades, or patches, and allowing them to focus on core value-added expertise in application development.

DevRocket™ IDE

MontaVista CGE7 includes new runtime components that integrate with MontaVista DevRocket, an Eclipse-based IDE with development tools that enhance productivity for both kernel-level and application-level engineers. Integrated memory leak detection, performance profiling, memory usage analysis, and system tracing combine to accelerate system development and maintenance, and increase system availability.

MontaVista Support & Professional

In addition to the technical values, MontaVista CGE7 users benefit from MontaVista's global support organization that can also provide customized support programs for all your needs. This is complemented by MontaVista's world-class Engineering Services group to assist customers in building solutions to support their specific use cases ranging from portability of legacy applications to scalable KVM implementations with real-time performance. In addition to the initial solution, the Engineering Services group can build out a full test and validation process and a long-term support and maintenance strategy to suit the requirements of any deployment strategy.

HIGHLIGHT

PRODUCT LAYER

EMBEDDED LINUX KERNEL 3.10
BOARD SUPPORT PACKAGES (BSPs)
OPEN EMBEDDED USERLAND
CARRIER GARDE FEATURES

*PROFDUCT LAYER ALSO NAMED AS MARKET SPECIFC DISTRIBUTION (MSD).

SOFTWARE DEVELOPMNET KIT

YOCTO 1.4 BUILD ENGINE
KERNEL & APPLICATION DEVELOPMNET TOOLS
SYSTEM MEASUREMENT TOOLS
DEVICE MANAGEMENT TOOLS

MONTAVISTA CONTENT SERVER

ON-DEMAND CODE FETHING
NETWORK BINARY CACHE (PRE-BUILT BINARIES)
LOCAL SOURCE MIRROR
SECURE BUILD & UPDATES

MONTAVISTA DEVROCKET

ECLIPSE-BASED IDE
PERFORMANCE MONITTORING PROFILING
MEMORY LEAK DETECTION
MEMORY USAGE ANALYSIS
SYSTEM & APP TRACING

MontaVista Carrier Grade Edition 7

Multicore Resource Management

MontaVista® CGE7, provides multiple options for maximizing the resource utilization of multi-core processors. With both AMP and SMP support, along with Linux container (LXC), core isolation and KVM virtualization, CGE7 provides the most flexibility and the highest performance for multi-core applications.

Microstate Accounting

CGE7 as a commercial carrier grade Linux product offers engineers ability to accurately measure process and thread utilization on a CPU. CGE7 performs high-resolution process accounting, so applications can be monitored to anticipate and prevent CPU overload situations. This enables engineers to design automated load balancing and graceful protocol degradation using reliable and accurate CPU load numbers. Engineers can accurately monitor and precisely predict CPU loads, increasing the accuracy of worst-case planning, preventing downtime, and reducing the purchase of backup equipment for traffic surges.

Flight Recorder

When a system fails today, field engineers must wait until the next failure to investigate the first one. Engineers have no way of gathering enough data about what happened before and during a crash to conduct an effective post-crash diagnosis and take corrective action. CGE7 includes the new Flight Recorder, which acts like a black box to track and log system history. It keeps a history log containing the scheduled processes and system events which provides much more information than a crash dump snapshot, and is user-extensible for customized tracking.

Live Application Core Dump (LACD)

When field engineers need to perform a core dump to help them debug problems on a running application, LACD dramatically reduces the downtime required to make a core dump. With only a short (generally tens to hundreds of milliseconds) stop of the application, this new feature takes a snapshot of the running application. The application can continue running while engineers debug the snapshot to fix the application.

Carrier standards compliance

MontaVista is the only carrier grade Linux compliant with Carrier Grade Linux Specification 5.0 from the Linux Foundation, LSB 4.1 compliant, and IPv6 certification ready. CGE7 is also compliant with the SCOPE Alliance Linux Profile, and runs on hardware designed to support the PICMG Advanced Telecommunications Computing Architecture (ATCA) and MicroTCA specifi-cations. CGE7 supports Intel's Extensible Firmware Initiative (EFI).

Security

MontaVista has worked closely with the leader in enterprise security to create a platform that meets all relevant requirements for the network enterprise market. Additionally, CGE7 update leveraged the features applicable to the embedded environment from Security Technology Implementation Guideline (STIG) and Common Criteria Operation System Protection Profile (OSPP) standards to build out the security features for the platform. As a trusted Operating System Vendor, MontaVista receives notification of all security fixes and CGE7 security team provides rapid updates of any new security fixes to the CGXE7platform.

Integrated Real-time Response

Carrier Grade Edition 7 is 100% native Linux with real-time performance features, including MontaVista enhancements and integrated high resolution nanosecond timers (hrtimers) Additional real-time features include fast mutexes, threaded soft and hard IRQ handlers, and application-level priority inheritance and queuing, provide deterministic preemption response latency.

Kernel Virtual Machine (KVM)

KVM provides a full virtualized environment for hosting multiple guest OS's. KVM allows users to partition the system into multiple OS's with maximum isolation and security. Currently available for all architectures that support KVM.

Linux Containers (LXC)

Linux containers provide an isolated application space without the need for a complete virtualization solution. They are an operating system-level partitioning method for running multiple isolated processes. Containers do not provide a virtual machine, but rather provides a virtual environment that has its own process and network space allocated which allows CPU time and memory constraints to be set.

Virtual Appliance

3rd Party App — JVM · C++ App · Legacy App & OS · App/OS

LXC · SMP · KVM · Core Isolation

CGE 7 – Platform for Networking
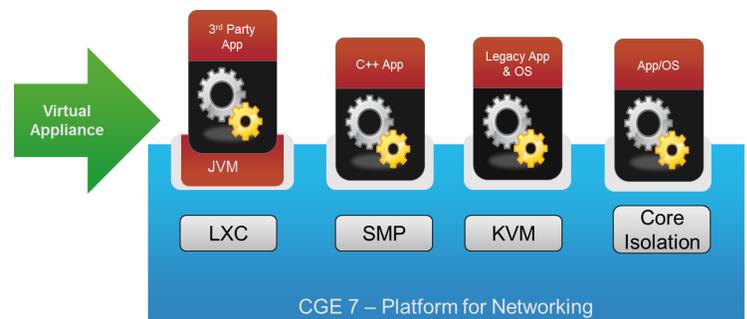
HIGHLIGHT

VIRTUALIZATION

MULTICORE RESOURCE MGMT
KERNEL VIRTUAL MACHINE (KVM)
LXC CONTAINERS
CORE ISOLATION

CARRIER GRADE LINUX

HIGH AVAILABILITY
FIELD SERVICEABILITY FEATURES
ADDITIONAL I/O(IPMI, RAID etc.
CGL 5.0 COMPATIBILITY
LONG TERM SUPPPORT

SECURITY

SECURE BUILD & UPDATES
STIG and Common Criteria
Operation System Protection
Profile (OSPP) standards
Address Space Layout
Randomization (ASLR)

LINUX BSP & TOOLCHAINS

ARCHITECTURE CROSS TOOLS
GCC 4.7 COMPILER & DEBUGGER
UCLIBC AND GLIBC SUPPORT

DEVELOPMENT HOSTS

LINUX (RHEL 6/7, UBUNTU 12/14)

MontaVista CGE 7 Key Benefits

- **Release Products Faster** - CGE7 has readily available BSP support of the most popular embedded SoC architectures to get your development started today. In addition, CGE7's toolchain and DevRocket offer a world class development environment enabling rapid application and platform creation. And MontaVista's world-class professional services and support teams can offer valuable assistance to help you commercialize a new product idea.

- **Lower TCO** - Cut your total cost of ownership with a fully supported, standardized Linux platform from MontaVista. Adopting CGE7 in your project, eliminates concerns about reliability, security, upgrades, or patches, at a fraction of the cost it would take for you to manage. The focus then is on your value-added expertise in application development.

- **Be First to Market**- Migrate your application to new, faster, cheaper silicon in record time for maximum competitive advantage. CGE7's multi-architecture virtualization capability provides forward porting from your legacy OS, enabling you to update existing products more quickly. You can seamlessly move complex applications to the fastest and most efficient silicon – reducing price/packet/watt performance – gaining competitive advantage.

Meets Telecom Standards	• Carrier Grade Linux Specification 5.0 • Linux Standards Base 4.1
Multi-Architecture	• Supports ARM x86 MIPS TECHNOLOGIES PowerPC • Unified Kernel and Toolchain
Enables 99.9999% uptime	• Realtime with PREEMPT_RT • High Availability and Serviceability features

LinuX.Connected.Everything.

About MontaVista Software

MontaVista Software, LLC, a wholly owned subsidiary of Cavium Networks (NASDAQ:CAVM) is a leader in embedded Linux commercialization. For over 15 years, MontaVista has been helping embedded developers get the most out of open source by adding commercial quality, integration, hardware en-ablement, expert support, and the resources of the MontaVista development community.

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