



QVM™ Software Architecture

Overview

The market for mobile handsets is increasingly being driven by high performance wireless multimedia applications. To meet the demand for these and other advanced applications, QUALCOMM has developed the Launchpad™ suite of applications. With robust multimedia, connectivity, position location, user interface and removable storage features, the Launchpad suite enables a broad range of new handsets, applications and wireless Internet services.

QUALCOMM's QVM™ solution is one of the key components of the Launchpad suite, integrated in many of the MSM6xxx™ family of Mobile Station Modem™ (MSM™) chipsets. QVM software supports applications developed using the high-level programming language Java®, developed by Sun Microsystems™.

QVM Software Benefits

QUALCOMM's QVM™ solution reduces time-to-market for handset manufacturers by providing a fully integrated Java virtual machine platform, including the ARM® Jazelle™ technology for Java platform acceleration. For operators, it enables access to the dynamic Java application development community — more than four million Java technology developers worldwide delivering innovative products to the market. These mobile Java applications function seamlessly on QVM software, which is fully integrated with QUALCOMM's MSM system software and various Launchpad features.

Java technology developers now have access to high performance MSM features like highly accurate position location technology, MPEG-4 video engines, enhanced 2D and 3D gaming functions and JPEG encoding and

decoding. QUALCOMM's QVM software incorporates QUALCOMM's extensions for the Java API (QJAE) which supports existing Launchpad applications, including:

- gpsOne® position location technology
- PureVoice VR™ (voice recognition)

As a result of the integration QUALCOMM is known for, applications are faster and more robust, while the range of Launchpad multimedia features allows the Java technology developer community to create new and exciting wireless applications not possible before.

The QVM software's increased processing power and memory capacity enable richer multimedia functionality and offer the enhanced graphic technology needed to support Java (MIDlet) applications. Designed for minimal RAM and ROM requirements, the QVM solution is easily configurable and portable across multiple handset platforms. It also offers full application management support integration.

QVM is optimized for the QUALCOMM MSM6xxx family Dual-Mode Subscriber Software™ (DMSS™). QVM uses ARM® Jazelle™ technology; Jazelle further optimizes QVM's performance by integrating software using the Jazelle Technology Enabling Kit (JTEK). With JTEK, QVM Jazelle integration speeds up specific software methods in the QVM virtual machine to increase performance.

QVM Software Summary

- TCK certified standard J2ME™ (MIDP) platform
- Java Technology for the Wireless Industry (JTWI)-compliant
- Modular architecture with leading JSRs supported
- Advanced graphics optimization and JSR 184 (3D)
- Small memory footprint
- QJAE APIs for gpsOne and PureVoice VR
- Support for:
 - QUALCOMM PureVoice® files
 - HyperText Transfer Protocol (HTTP)
 - Secure Sockets Layer (SSL)
- ARM926EJ-S processor with the ARM Jazelle Java platform accelerator, optimized for MSM6xxx family
- ARM JVM accelerator software integration

The Launchpad Suite of Technologies

The Launchpad Suite of applications technologies offers wireless operators and manufacturers a cost-effective, scalable and timely solution for providing advanced wireless data services. This seamlessly integrated solution enables advanced next-generation applications and services that incorporate multimedia, position-location, connectivity, customized user interface and storage capabilities. Launchpad allows manufacturers to select from a menu of enabling technologies to create customizable devices for each market segment. Getting all the

enabling technologies from one supplier ensures compatibility and makes it cheaper and easier to incorporate the features customers are demanding, at a price they are willing to pay.

Launchpad features drive airtime usage and allow operators to offer handsets from different manufacturers that run identical feature sets, increasing efficiency and reliability. Launchpad features are available for each QUALCOMM chipset, closely matching the specific functionality and cost-target objectives agreed upon in joint product planning with manufacturers and wireless service operators worldwide.

QUALCOMM's Complete Solution — Our Commitment to Our Partners

QUALCOMM CDMA Technologies is shaping and creating new ways to communicate. Working with manufacturers and operator partners worldwide, we develop systems that provide the foundation for tomorrow's wireless services while delivering what the market needs today. Our industry-leading CDMA engineers create detailed reference designs to accelerate testing and deployment for our partners. Our chipsets and systems bring advanced features and functionality to legacy and next-generation networks and devices. With QUALCOMM CDMA Technologies, manufacturers and wireless operators can deliver the products and services the world wants now and be the first to market with future developments.



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