

vRapid Mobile® FOTA (Firmware Over-the-Air) Updates for Automotive Devices



Perform software maintenance, reduce warranty costs and decrease recall rates using Red Bend's vRapid Mobile FOTA (firmware over-the-air) update solution for automotive devices. vRapid Mobile provides a more cost-effective method for updating new software versions, enabling field software maintenance and introducing new features for consumers.

■ The Rising Role of Software in Automobiles

Today's automobiles contain an ever increasing number of electronic systems and processors. According to AMR Research, the amount of embedded software in vehicles is expected to increase 50-100 times by 2010. As the role of software in automobiles increases, so will increase the need to perform software maintenance and improvements after the car is purchased by the consumer.

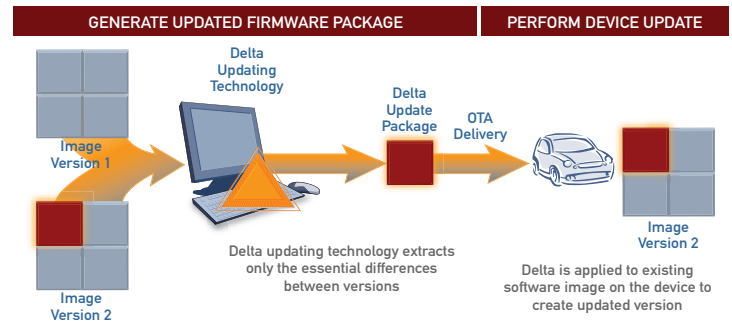
Current re-flashing methods are too slow and inconvenient to support this increase in software. Sophisticated systems such as the driver information systems, telematics and navigation systems, audio system, brake system, and safety are dramatically increasing the number of processors. The embedded software package already is reaching 64MB, while future software images will grow substantially as multimedia infotainment systems begin playing a larger role.

The growing amount of software in automobiles is also affecting warranty costs and recall rates. According to the June 2006 Warranty Week, OEM warranty claims range from \$265 to \$1,000 per vehicle, with many recalls due to software re-programming. With automotive devices having a lifetime of 5-10 years, FOTA creates a significant opportunity to introduce new features in the field.

■ Achieve Faster, More Cost-Effective Downloads

Red Bend's vRapid Mobile FOTA enables firmware updates to be installed in automotive devices securely, rapidly and cost-effectively over the air with complete reliability. Based on Red Bend's patented technology, vRapid Mobile FOTA is composed of two primary components: an Update Generator and an Update Installer.

vRapid Mobile's Update Generator identifies the essential changes from an existing firmware version to a new, updated version and automatically creates an extremely compact package of these changes.



vRapid Mobile's Update Installer resides in the automotive device itself and performs the update installation. The Update Installer is optimized for the limited memory available within automotive devices.

vRapid Mobile FOTA also provides benefits when updating a device via the CAN bus or a cable connection.

■ vRapid Mobile FOTA Advantages for Automotive Devices

Convenient consumer experience. Automobile software re-flashing is performed mainly in two locations: at the dealer and in the warehouse following car assembly. The process is expensive and does not guarantee a high level of update penetration. In addition, visiting a dealership for software maintenance is inconvenient for the consumer. Red Bend's FOTA solution greatly improves the consumer experience while making software updates more cost-effective for the auto manufacturer.

Significant performance improvement. Red Bend's vRapid Mobile FOTA achieves a faster download and end-to-end re-flashing process. The delta file is significantly smaller than the new image and thus allows a fast download time, particularly important when the download is performed over the cellular channel or the CAN bus. It also provides

significant advantages for large applications, such as multimedia applications, telematics and navigation.

Fail-Safe and easy rollback. Red Bend’s fail-safe feature ensures 100% completion even in the event of a power disruption. The company’s patented delta technology allows rollback in the event of issues with the new software release. The availability of rollback provides assurance of an escape from a severe issue.

De-couple the download process from flashing process. Red Bend’s FOTA software does not require a linkage between the downloading phase and the update one. This allows for background downloading, which reduces the system downtime. Once the delta file is available on the device, the update process can be scheduled and triggered in the right moment, and the update duration is significantly smaller than an update which includes downloading. This is important for a consumer-oriented software update, when minimum system downtime is required.

Enhanced security and validation. Red Bend performs many security and verification actions prior to the update commencing to guarantee a successful update. This includes verifying that the source image on the device is the intended image and has not been tampered with; that the Delta file has not been tampered with; and that the target version that will be created is bit-for-bit identical to the intended target version. The Update Installer also verifies that there are enough device resources available to perform the update.

With these advanced features, Red Bend’s FOTA solution for automotive devices provides a more cost-effective method for keeping embedded systems and processors up-to-date with the latest software improvements and features.

Partners

Red Bend is partnering with market-leading solution providers to ease the integration effort and accelerate the solution time to market.



Features of vRapid Mobile FOTA

- Secure software updates
- Small delta size
- Background downloads
- Fast end-to-end update process
- Easy rollback
- Broad platform support, including:
 - RTOS – QNX, Linux, Symbian, proprietary
 - Processors – PowerPC, ARM, Infineon, TI, Marvell
 - Compression – zImage, Gzip, Deflate, Byte-Pair, Zlib

About Red Bend Software

Red Bend Software, the leader in Mobile Software Management (MSM), provides software solutions for managing firmware, applications and devices over the air. The company’s award-winning MSM products enable device manufacturers, mobile operators and software developers to increase revenues, reduce support costs and achieve faster time to market by remotely managing their software assets on mobile devices. Red Bend’s software has been deployed in more than 620 million mobile devices and adopted by eight of the top 10 handset manufacturers, including Kyocera, LG Electronics, Motorola, Sharp, Sony Ericsson and ZTE, as well as dozens of other leading companies in the mobile, M2M and WiMAX markets. Unlike device management vendors with proprietary end-to-end systems and manufacturers’ internally developed solutions that are platform specific, Red Bend is the only company offering independent client software that is interoperable with any standards-based server and that works with any platform on any type of mobile device. Founded in 1999, Red Bend is a privately held, venture capital-financed company with offices in China, Israel, Japan, Korea, the U.K. and the U.S. Visit www.redbend.com.