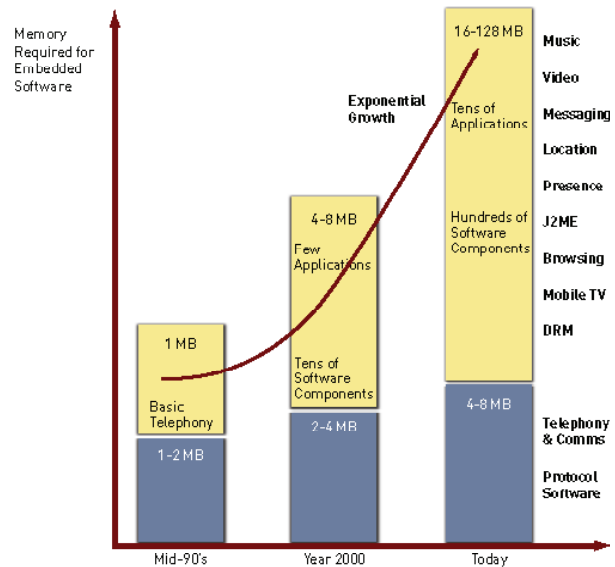




Mobile Software Management

Now you have complete flexibility and control over updating, adding, replacing and removing any software component in a mobile phone at any point during the lifetime of that device. Deliver new features, applications, services and their software enablers to both feature phones and smartphones already in the hands of consumers with Mobile Software Management from Red Bend Software.

Mobile phones are sophisticated devices, offering advanced features such as digital cameras, music players, and Web browsers. Phones can have 128 MB of flash memory to support tens of applications and hundreds of software components. The process to design and develop a new mobile phone requires that all of a mobile phone's core software functions be integrated into the phone's firmware prior to shipping to consumers. Once the phone is in consumers' hands, any changes to the embedded software must be made as part of an upgrade to the entire firmware image. This process, known as Firmware Over-the-Air (FOTA) updating, allows for making improvements to a phone's existing software as one entire firmware image. It has not allowed for individual software components to be updated, added, replaced or removed independently of the other components in the device.



Exponential Growth of Embedded Software

Source: Red Bend Customers

Yet, there is growing demand for everyone in the mobile value chain to have more flexibility and control over a phone's software assets. Operators work with device manufacturers to customize a mobile phone to suit the operator's goals for market segmentation. In this approach, every phone in a market segment has the same software assets when it ships.

However, consumer demand for personalization of mobile phones is taking customization requirements further. Consumers currently personalize their phones with ringtones, games and wallpapers. Tomorrow, consumers will want to personalize their mobile phones by selecting the software features, applications and services that fit their unique lifestyles. Potentially, no two phones will be alike. Customization at this level will require unprecedented access to areas of the device embedded in ROM.

Red Bend Software, the market leader in Firmware Over-the-Air (FOTA) updating for mobile phones, now offers a next-generation Mobile Software Management solution that allows core applications on feature phones and smartphones to be updated, added, replaced and removed at any time during the lifetime of that device – even phones already in the hands of consumers.

Manufacturers and operators benefit from faster time-to-market for mobile devices and new services by delivering new software components easily and securely over-the-air



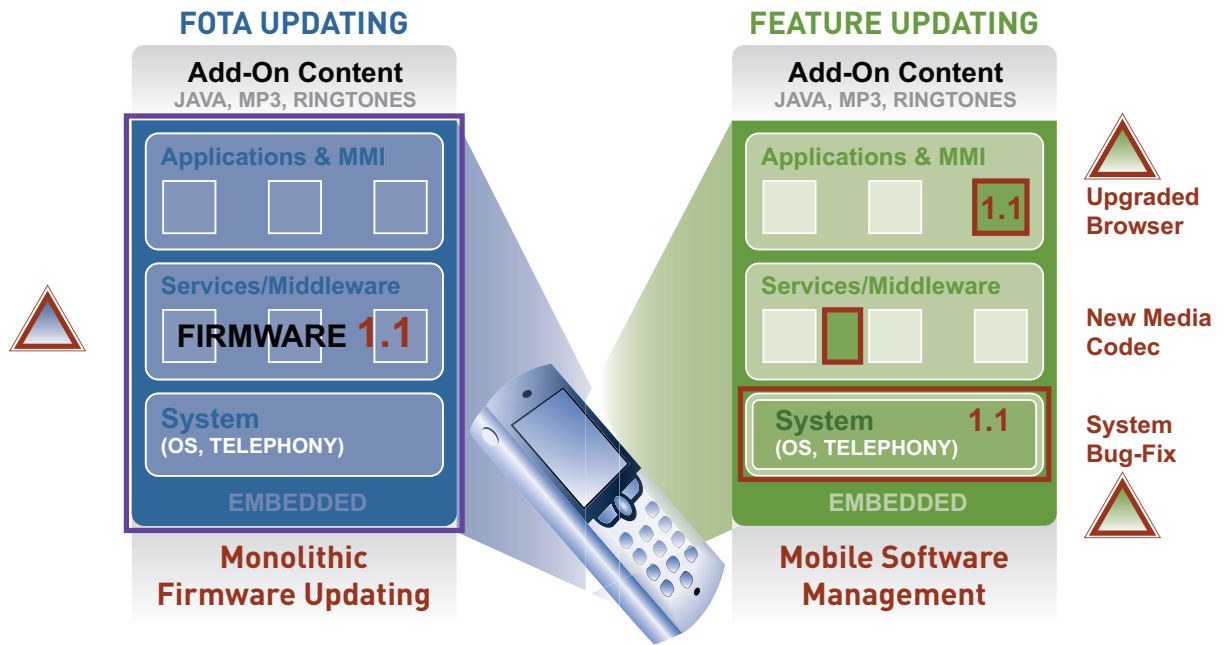
Source: VisionMobile

to mobile phones post-sale. This allows manufacturers and platform providers to bring to market “slimmed down” mobile phones that are lower in BOM costs and later, at point of sale or post-sale, allow consumers to select the software, applications and features that best meet their individual needs. Real-life use-cases include:

- Adding push-mail capabilities via a messaging client update
- Upgrading the phone’s media player to support a new streaming video service
- Adding a new audio codec to the consumer’s phone to support richer music downloads
- Adding a killer service still to be created

Over-the-air technology for firmware updates (FOTA) has been available in the wireless industry for five years. Mobile phone manufacturers and mobile operators use FOTA to deliver software improvements and fix bugs to the firmware of deployed phones. One quarter of all mobile devices shipping worldwide are FOTA-enabled, growing to 50% by 2008, according to U.K.-based analyst firm ARCchart. A typical FOTA update can take 3-15 minutes, depending on the size of the update file, during which time the phone is generally inoperable. For consumers, however, there is no comparison—a few minutes for an update is a major improvement to losing a couple of hours in an inconvenient trip to a retail store or service center.

Unlike FOTA, which updates the entire firmware images as one monolith, Red Bend’s new solution for Mobile Software Management can install, update, and remove individual embedded mobile phone software components. The solution uses standards-based device management infrastructures to deliver the software changes to the device, and a Red Bend client on the mobile phone for actual software manipulation. The new process takes 1-2 minutes (eventually will be tens of seconds) and could be made transparent to the consumer.



From FOTA Updates to Feature Delivery using Mobile Software Management

The full mobile value chain will benefit from this next-generation Mobile Software Management solution:

Consumers – Can enjoy constant feature enhancements to their mobile phone, adding new capabilities and services as they are offered, at the press of a key. Consumers may personalize their phone by selecting applications or services to be added and removing unneeded applications, including ROM-embedded software, affording a more unique mobile user experience.

Operators – Can sell new services, features and applications post-sale, increasing ARPU and, ultimately, improving brand loyalty. Operators no longer need to wait to introduce a new service because the mobile phones in their network cannot support it. Rather, operators can add the missing technology or feature to all the capable devices in their network, and have an instant market for their new service.

OEMs – Can achieve faster time-to-market by adding or changing software after the mobile phone has shipped, versus holding back a product release because a specific software component is not ready. In addition, OEMs can have greater flexibility to offer more software choices to consumers, increasing the value of their phones by being able to meet the latest consumer trends and requirements at any time during the customer lifecycle.

Platform Providers – Can gain greater ability to componentize their software assets and therefore deliver more flexible and efficient platform solutions to operators, increasing their market penetration at greater profitability.

ISVs – Can deploy new features and enhanced software versions without being tied to mobile phone release schedules, greatly enhancing their time-to-market and competitiveness.

Red Bend developed its patented algorithms for over-the-air Mobile Software Management based on its work and experience with incremental compilers. Through its detailed understanding of the nature of compilers and linkers and how they work within the software creation tool-chain, Red Bend has led the industry by providing a truly unique computational approach to embedded mobile software management.

In developing its new product, Red Bend has applied its understanding of memory and build processes with the underlying device software architecture. In the device and platform manufacturing community today, there are many different approaches to architecting software, from statically linked, monolithic structures to more open, dynamically linked modular frameworks. Red Bend's new solution for Mobile Software Management is capable and portable enough to work with any software platform by virtually or actually modularizing the software structure.

With broad support from major industry players, Mobile Software Management from Red Bend Software is improving the way that manufacturers and platform providers bring new mobile phones to market, the way operators launch and deliver new mobile services, and the way consumers personalize the features and applications on their mobile phones.

About Red Bend Software

Red Bend Software helps mobile phone manufacturers and network operators to accelerate the adoption of new services and features, respond rapidly to customer needs, and reduce support costs through mobile software management solutions. LG Electronics, Motorola, NEC, Sharp, Sony Ericsson and other large handset manufacturers use Red Bend's firmware over-the-air (FOTA) mobile client software to quickly and reliably deliver compact firmware updates to more than 150 million mobile phones in the hands of consumers. Founded in 1999, Red Bend Software is a privately held, venture capital-financed company with offices in China, Israel, Japan, Korea, the U.K and the U.S. More information is available at www.redbend.com.



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