



## Mobile Development – Discovery Document

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## Table of Contents

1. Introduction .....	4
2. Zigron Inc .....	4
3. Overview .....	4
4. Development Platforms/Technologies .....	5
4.1 Java ME (formerly, J2ME) .....	5
4.2 BREW .....	7
4.3 Windows Mobile .....	8
5. Contact Us.....	9

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## 1. Introduction

Mobile space is the next paradigm of computing and more and more mobile devices are getting the computational power to host native applications. This is a technical discovery document to explore different mobile application development environments and how can one go about it.

## 2. Zigron Inc

Zigron, Inc. is a product development and user experience firm. We are specialized in technologies like J2EE, PHP and Flash in frameworks like Strut, Tiles, Spring and Symfony. Zigron Inc also has considerable skill set in mobile web and native applications.

Zigron Inc is a design driven firm where our philosophy is to develop stunning and beautiful applications.

## 3. Overview

Mobile application depends heavily on the exact requirements. Our basic assumptions are stated in the section 3. Based on the basic requirement to create a very generic mobile application following are the three approaches in the order of our preference:

- Considering the basic and generic requirements Java ME is the ideal development platform. We can adopt different approaches within Java ME to reduce the development effort to make the application ready for all possible platforms and devices. Biggest drawback for this approach will be the application performance and security as this app will run on top of JVM.
- Second approach is to create a custom Mobile Execution Environment. We will need to develop this environment for each platform with minimum interfaces/APIs as per our requirements. This will result in more effort to create such MEEs for each platform/handset but application development will be rapid. Users will require downloading our own MEE just like they need to download JVMs.
- Finally the most stable and secure approach will be to create each application in platform's native language. This will be requiring substantial effort but application's performance will be at its best.

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## 4. Development Platforms/Technologies

In this section we have briefly explained how each development platform will be used across different handsets and OS for basic features.

### 4.1 Java ME (formerly, J2ME)

#### Introduction / Development Approach

- Java ME Platform represents the only true open solution for building mobile applications for the industry. The technology allows portability of applications between platforms and investments are kept to a minimum through the possibility of reuse.
- The Java ME technology is based on three elements:
  - A configuration provides the most basic set of libraries and virtual machine capabilities for a broad range of devices.
  - A profile is a set of APIs that support a narrower range of devices.
  - An optional package is a set of technology-specific APIs.

#### Deployment Approach

To be MIDP 2.0-compliant, devices must support OTA provisioning. The easiest way to package MIDlets for wireless installation is to use the J2ME Wireless Toolkit, which incorporates a small provisioning server that emulates a production OTA environment. Available in version 2.0 Beta 2 and later versions of the toolkit, this nice feature enables you to get an idea of whether a server will provision a device with your application successfully without the hassle of setting up and configuring a local web server to act as an OTA server. Some MIDP 2.0 features - like the push registry - are available only to applications downloaded via OTA. If your application uses those features, the built-in OTA server is a critical tool of the development process.

#### Features

- PUSH

The MIDP includes a feature called "PUSH Registry" to push data from server to mobile devices, without the interaction of user. The MIDlet registers a port along with the protocol name in the mobile device. From the server, a message is sent to the specific mobile device using the particular protocol and port where the MIDlet application is registered to listen. After the message is delivered to the mobile device, the AMS calls the MIDlet application. Once the message is delivered to the MIDlet, it is the application's responsibility to process the message accordingly.
- SMS Integration
  - The Wireless Messaging API (WMA) is an optional package for J2ME that provides platform-independent access to wireless communication resources like Short Message Service (SMS). WMA can be used on top of CLDC and MIDP.
  - There are many third party APIs available for SMS integration in Java ME applications. Some examples are Java SMS library from new-phone.com, SMS JDK from NCL Technologies Ltd, jSMS from objectXP, etc.

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- Data Synchronization
  - Recently released, Sun's Mobile Enterprise Platform (MEP), provides two-way data synchronization with security, device management and off-line access features for enterprises. It can integrate data from a wide range of back end applications.
  - A third party API, Sync4j is an open source initiative to deliver a complete mobile application platform implementing the SyncML protocol. SyncML defines a standard way to synchronize data and remotely manage devices. Sync4j provides SyncML client APIs (J2SE, J2ME and C++) that you can use to build an application.

## Devices and Platforms

### Motorola:

- MOTOMAGX, Motorola's next-generation Mobile Linux®, supports three different application environment– Java ME, Web UI and native Linux
- MOTODEV Studio for Java ME, Motorola's robust toolset for developer innovation currently supports the Java ME application environment on many Motorola handsets and wireless modules

### Nokia:

- Nokia phones have an extensive Java ME API set
- Nokia provides support for the industry's leading open-source Java™ IDEs: NetBeans and Eclipse. Both IDEs offer robust tools that make it easy to create high-quality Java applications efficiently

### Blackberry:

- Many new Blackberry devices support the Java 2 Platform, Micro Edition (J2ME), primarily because Java technology makes developing applications so much easier. Its platform-independence eliminates many porting woes and its automatic garbage collection lets developers concentrate on application logic rather than memory management
- In addition to Java-based handhelds, RIM offers a BlackBerry Development Environment for J2ME

### Samsung:

- Some Samsung handsets give errors for J2ME (user experience). Some users have reported errors like Samsung not suitable for J2ME game developers, slow emulator, Java apps can only be loaded via OTA, giving "Unsupported content error" on Samsung F490 phone

### LiMO:

- LiMO application developers will be able to use SDKs to write managed code running in a Java virtual machine, browser apps for WebKit, and native code.

### S60:

- It supports Java (J2ME MIDP 2.0 commonly, but varies from phone to phone) applications and Symbian C++ applications.

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## Wireless Providers

### Verizon

- Verizon Wireless doesn't offer J2ME support on their phones. Instead, it uses BREW but one can run J2ME applications via BREW-Authored KVM but still it is not that simple

### T-Mobile

- Users are able to download J2ME apps (JAD+JAR) if they have an offline app, like a standalone mobile game but if the app requires an internet connection the users will be able to access internet if and only if:
  - The application was signed with a T-Mobile certificate, or
  - The user has a \$20 "total internet" plan instead of the regular \$6 T-Zones one, or
  - The handset was not bought through T-Mobile
- In short, if you are aiming for a mass-market consumer application and not just one targeted at business users or tech-savvy users, your hands are pretty much tied. The only way to achieve that goal is to go on-deck with T-Mobile

### AT&T

- AT&T appears to be a little less strict than T-Mobile. You can download J2ME applications from anywhere, other applications that want to use socket communication, access to the file system, address book and messaging (SMS/MMS) will probably be blocked

## 4.2 BREW

### Introduction/ Development Approach

- BREW is a software platform that can download and run small programs for playing games, sending messages, sharing photos, etc.
- Using BREW, you can easily port your applications between all Qualcomm devices.
- BREW applications can be written using Java™, C, or C++.
- Unlike the Java ME platform where any developer can upload and execute software on any supported handset, BREW applications must be digitally signed
- The BREW developer community is fairly small and limited to Qualcomm's boards and web sites.
- BREW code can only be compressed if you devise your own method or buy a commercial solution.

### Deployment Approach

- Compile for the specific BREW version available on the handset.
- Installer Packaging Options: OTA

### Features

- PUSH:  
Brew compatible mobile phones can get push based sms/email on the Alltel's network
- SMS Integration:  
Interfaces like ISMS, ISMSMsg, ISMSNotifier, and ISMSStorage are there to handle SMS integration for BREW applications.
- Data Synchronization:  
Open Mobile Alliance for Data Synchronization and Device Management.

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## Devices and Platforms

The BREW platform is pre-integrated into the MSM™ chip software and includes reference implementations for many other device-specific issues (drivers and UI). All the mobile vendors doesn't provide with MSM™ chip. So, we have very limited number of mobiles by default for running BREW application.

## Wireless Providers

Every mobile vendor is supposed to provide handset with the support of BREW for different wireless providers.

## 4.3 Windows Mobile

### Introduction/ Development Approach

- Windows Mobile is an operating system for mobile devices, based on Microsoft Win32 API.
- Devices that run Windows Mobile include Pocket PCs, Smartphones, Portable Media Centers, etc.
- For application development there are different options available, including:
  - Writing native code with Visual C++
  - Writing Managed code that works with the .NET Compact Framework
  - Developing an application using Java Me. There is a limitation if you develop an application in Java ME for Windows Mobile platform. Sun doesn't officially support windows mobile devices and Sun hasn't released an official JVM for pocket PC's so you must go to a third party solution if you intend to use Java ME on Windows Mobile platform.

### Deployment Approach

Windows Mobile-based Smartphones and Windows Mobile-based Pocket PCs (Phone Edition) can be bootstrapped by means of over-the-air (OTA) Wireless Application Protocol (WAP) push. This method is useful if the mobile operator prefers to bootstrap the device over the air at the point of sale or after purchase. In this method, a provisioning document that uses the format defined in the WAP Provisioning specifications can be pushed to the device over the air through the WAP connectionless non-secure push mechanism over the Mobile Terminated Short Message Service (SMS) bearer.

### Features

- PUSH  
The "Direct Push Technology" from Microsoft uses Exchange ActiveSync to keep data on a Windows Mobile based device synchronized with data on a Microsoft Exchange server. The ActiveSync technology on the device manages the direct push communication with Exchange Server. It establishes an HTTP connection with the server for a specified time, and then goes to sleep while waiting for the server to respond. The server responds with either a status indicating that new items were received or that no new items arrived. The device then sends either a synchronization request or another direct push request. Exchange Server 2003 Service Pack 2 includes a direct push component that augments the Exchange ActiveSync infrastructure that supports synchronization.

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- **SMS Integration**  
.Net Compact Framework provides different DLLs for SMS integrations (Microsoft.WindowsMobile.dll, Microsoft.WindowsMobile.PocketOutlook.dll). Using these DLLs you can integrate SMS Send and Receive functionality as well as SMS filtering support in your mobile application.
- **Data Synchronization**  
Exchange Server 2003 is used to synchronize data using ActiveSync. It uses OTA for Installer Packaging.

## **Devices and Platforms**

Nokia & Sony Ericsson

Net60 is an implementation from Red Filve Labs to bring .Net Compact Framework applications unchanged, to Symbian platform (the OS running the Nokia and Sony Ericsson Smartphones).

## **Wireless Providers**

Most of the carriers have handsets with Windows Mobile.

## **5. Contact Us**

If you have any questions or will like to learn more then please feel free to contact us:

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