



Creating Better Mobile Applications Faster:

Using Borland Tools on Intel® Architecture

Mobility changes the landscape of software development. The dramatic growth in the popularity of wireless computing devices creates both significant opportunities and considerable challenges for developers working on mobile application software. Developers designing mobile applications using best-practice guidelines face substantial challenges: periodic disruption to network connections, wireless security issues, finite power supplies, smaller memory and storage capacities of handheld computing devices, and so on. Whether creating an application from the ground up or extending an existing application for mobile deployment, developers must adopt a different mindset and learn the best ways to create efficient, secure applications enabled for the latest generation of wireless devices, from handheld PDAs built with Intel XScale® technology components to mobile notebooks equipped with Intel® Centrino™ mobile technology.

Development tools from Borland and cutting-edge Intel platforms combine to provide an optimal development environment for the next generation of mobile applications. This paper discusses the tools available from Borland and the benefits of designing fast and efficient mobile applications on platforms powered by Intel processors.

Mobilized Software: What Is It?

Applications designed for the mobile computing environment differ significantly from traditional applications (built for the conventional workplace), which are characterized by tethered computers powered by AC wall outlets. An architecture that favors mobile applications integrates portable computing devices and wireless networks, ensuring that users remain productive independent of the network connection status. Applications designed for mobile users must adapt to changing network connections without losing data or compromising security. The increased flexibility and productivity boosts to be gained from this type of application benefit everyone. People can use mobile notebooks or handheld devices to access financial accounts while traveling, get on-the-spot weather or news, and stay in touch with family and friends. Business users—mobile professionals who know how to capitalize on the best of the emerging technologies—can boost productivity by staying in close contact with project team members and staff, synchronizing business data and information while on the road, and adjusting travel plans on the fly. The mobile applications that perform these functions present unique development challenges and require a different approach than applications targeted for static desktop or server uses.

The benefits of mobilized software can be substantial. Business executives gain a means for extending the enterprise and improving communication, strengthening the ties to partners, customers, suppliers and other key parties. IT managers frequently see greater efficiencies for mobile workers and productivity increases in combination with improvements in network reliability. To the software development community, mobile applications present burgeoning opportunities to participate in a rapidly growing market, delivering the well-recognized benefits and advantages of mobile technology to an expanding customer base.

Mobile applications typically run on a diverse variety of devices, requiring flexibility and adaptability during the development process. A particular application might be designed to run on a notebook or laptop computer, a compute-capable smartphone, a handheld PDA or another type of device. A development environment that can effectively support code generation for a wide range of devices simplifies programming tasks and helps bring new products to market more rapidly.

Mobilized software frees workers from the constraints of tethered computers and this new category of software clearly requires fresh thinking and flexible, capable development tools that demonstrate an understanding of the differences inherent in mobilized software products. Borland offers a number of products and tools

targeted to the mobile application developer, which are well aligned with the Intel® Mobilized Software architectural guidelines. Intel also provides Web-based resources to assist developers, as well as a wide range of developer programs and programming tools to streamline and improve mobile application development (refer to the “Mobilized Software Resources” section near the end of this paper).

Enabling Applications for Mobility

Over several decades, Borland’s strengths in the area of cross-platform and cross-architectural development tools have led to the latest generation of products well equipped to support mobile computing. Application development can effectively be scaled from servers to cell phones, helping developers minimize the time and effort required to support multiple architectures. In many cases, an application can be deployed once to a target platform and then extended across a range of other mobile devices. Business users familiar with a particular desktop application gain the advantage of extending this use to the mobile devices they rely on while traveling.

One of the key characteristics of mobile applications is the ability to function reliably and predictably when connected directly to the network as well as when disconnected, either by choice or by disruption. Network transitions must be handled gracefully, whether the link is lost by moving out of range of an access point or because of electro-magnetic interference. The well-designed mobile application compensates for any breaks in network connectivity, maintaining a store of offline data that allows the user to remain productive when off line, and securely synchronizes their data when online.

Mobile applications must also include provisions to contend with the greater risk of security violations. Communications beamed through the air are significantly easier to intercept than data transmitted through a wire, requiring greater vigilance and a software design emphasizing security without burdening the user with frequent re-authentications following interrupted connections.

Other factors present unique development challenges. Because mobile devices are battery powered, applications must be designed to conserve this limited resource and manage extended periods of operation efficiently. Smaller displays require special consideration, as well as the modest storage capabilities-built-in and removable-available in typical handheld mobile computing devices. A volume of database information that can be easily handled on a mobile notebook or desktop machine may overwhelm a handheld PDA unless the mobile application compensates for the differences in storage capacities. Processing power in handheld mobile computing devices is also more modest than a mobile notebook or desktop computer, requiring skillful programming and compact programs to run applications in a responsive and efficient manner.

Intel® architecture and Borland toolsets provide complementary development benefits, helping developers bring mobile applications to market faster, more efficiently and more reliably.

The well-designed mobile application provides secure, efficient and predictable operation, enabling the mobile workforce to remain productive when in the field. Interruptions to network connectivity, reduced operating spans due to battery power, data availability during online and offline operation, and similar challenges need to be addressed during program development. As part of the Intel Mobilized Software Initiative, Intel offers guidelines to developers in the *Intel® Mobile Application Architecture Guide*, which highlight the primary considerations when developing mobile applications.

Through the Mobilized Software Initiative, Intel and other leading technology companies are working with independent software vendors (ISVs) and industry leaders to provide a comprehensive set of software

tools, services, architecture specifications and training programs to help design software for mobility. Visit www.MobilizedSoftware.com to learn about the benefits of the Mobilized Software Initiative and obtain technology and business information that can help successfully implement mobilized solutions.

When creating mobile applications, consider these points:

- **Does your application work offline?** Adding functionality that enables an application to work both online and offline allows users to work anywhere, any time, and without disruption.
- **Does your application gracefully handle network transitions?** Providing intelligent roaming capabilities means that users will not waste time reconnecting or lose critical data due to dropped connections when moving from hotspot to hotspot.
- **Does your application manage the use of limited power resources?** Tuning applications to conserve power and maximize performance enhances application execution speed and lets users worry less about running out of battery power.
- **Does your application support multiple platforms?** Having the ability to choose different computing platforms for different tasks positively affects productivity.
- **Does your application meet the security challenges of the mobilized environment?** Robust security architecture allows devices to work anywhere and anytime within a trusted environment.

Effective toolsets for producing mobilized software should address these types of operations and provide easy-to-use mechanisms for implementing them.

Using Borland Tools to Create Mobilized Software

With enterprises increasingly relying on a mobile workforce to boost their competitiveness and agility, core business applications need to be extended to mobile devices to meet the needs of both staff members and customers. Borland Mobile Solutions give developers the freedom to select the device, the operating system and the programming language to accelerate the creation of mobile applications. The

development environment supports a cross-architectural model that spans device types and operating systems. For example, commercial releases of JBuilder* and C++BuilderX* provide tools that let developers rapidly create mobile applications that operate across the enterprise—from the corporate server to handheld wireless devices. The Borland Application Lifecycle Management (ALM) strategy outlines a measured, quantifiable approach to development that includes these distinct stages: Define, Design, Develop, Test and Deploy. The tools produced by Borland reflect the ALM strategy and support development processes that fit this model.

As a leading producer of applications for Web Services development, Borland puts considerable emphasis on mobility software, since many of the most innovative Web Services approaches feature a mobile component. Current Borland products that are targeted directly to the needs of the mobilized software developer include:

- **Borland Enterprise Studio for Mobile:** Provides an end-to-end solution for your Java* and C++ mobile device and server applications, with full support for Application Lifecycle Management, all within a single integrated environment.
- **Mobile Studio:** Combines features from Borland* JBuilder X and C++BuilderX Mobile Editions to give developers a comprehensive toolset for creating innovative mobile applications for the expanding mobile device market.
- **JBuilder X Mobile Edition:** Speeds productivity within the leading Java development environment through integrated support for market leading devices.
- **C++BuilderX Mobile Edition:** Speeds productivity with a robust C++ Rapid Application Development environment and integrated support for market leading devices.

These products deliver productivity benefits to mobile application developers, helping them go to market with mobile applications more rapidly and simplifying the creation of Web Services applications. To reduce training requirements for mobile developers transitioning between Java and C++ development environments, Enterprise Studio for Mobile and Mobile Studio provide a single unified interface.

Mobilized Software Resources

Intel and Borland are both strongly committed to supporting the mobile application development community. Available mobility resources include:

| Resource | Benefit |
|-----------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Intel® Developer Services (IDS) | Provides content, resources and opportunities to accelerate the development and deployment of solutions, applications and tools. IDS offers online training, content (through the Developer Centers) and support. Visit www.intel.com/ids/mobile to obtain the latest technical resources to help you mobilize your notebook and handheld applications. |
| The Intel® Early Access Program | Targets software companies who want to establish a formal relationship with Intel. Program membership includes early access to technology, as well as account relationship and business development opportunities to help maximize software performance on the latest Intel microprocessors. Sign up for Early Access for Mobility at the Early Access Program site: www.intel.com/ids/eap . You can obtain the Intel® Mobile Computing Technology Kit as part of your membership. This suite of tools helps you integrate power management and network communication features into your software applications to create a great mobile experience for the end user. |
| The Intel Mobile Application Architecture Guide | Can help you understand the issues and learn about strategies for implementing portals, document sharing and databases in mobile applications. Visit www.intel.com/ids/mobile/guide . |
| Intel software development products, such as Intel® Integrated Performance Primitives (Intel® IPP) | Can streamline development of mobilized software and help optimize programs that run on Intel® architecture platforms. For details, visit www.intel.com/software/products . |
| The Borland Training Services Group | Assists developers, software architects and corporate IT managers in gaining expertise with Borland products. Formal certification can be obtained in a number of classes. For information, visit www.borland.com/services/training . |
| Borland's Consulting Services | Accelerates the creation of mobilized software and other enterprise applications. These services can give companies a competitive edge in architecture and design, deployment, integration, pilot project design, and other areas related to Borland products. For more information visit www.borland.com/services/packaged/index.html . |

Summary

To satisfy the increasing demand for mobile and wireless solutions, developers gravitate towards those tools that effectively reduce development time and take full advantage of the technology benefits, as well as addressing the specific technology challenges. Intel architecture and Borland toolsets provide complementary development benefits, helping developers bring mobile applications to market faster, more efficiently and more reliably. As consumers and business professionals increasingly recognize the convenience and flexibility that well-designed mobile applications offer, savvy developers will rely on a development environment that lets them deliver fully tested applications to the growing market ahead of the competition. The promise and potential of mobility software can be tapped through tools from Borland running on industry-leading hardware platforms designed by Intel.

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