

# M-Business Anywhere

## An Introduction

Architecture

Design Guidelines

Channel QuickStart

Version 5.7



## Company information

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### *An Introduction: M-Business Anywhere*

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Written and designed at iAnywhere Solutions

One Sybase Drive  
Dublin, CA 94568

<http://www.iAnywhere.com>

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# Before you begin

“About this guide” (page 9)



# CHAPTER 1. **About this guide**

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- “Focus of this guide” (page 10)
- “Conventions” (page 11)
- “Related publications” (page 12)
- “Recommended references” (page 13)

## Focus of this guide

This guide is an introduction to M-Business Anywhere. It first gives you a high-level overview of the application architecture, then you are presented with a description of development guidelines that you would need to follow to create mobile client applications. Lastly, you can review code samples for incorporating standard functionality in addition to code samples of more advanced techniques.

The sections in this guide will refer you to the appropriate chapters and sections located in the various books of the M-Business Anywhere documentation set for actual implementation details and in-depth information.

### Audience

This guide is targeted towards people who will be evaluating whether this technology is the solution to mobilizing their company's applications.

## Conventions

### Formatting conventions

The following table lists the formatting conventions used throughout this guide.

**Table 1-1**  
Formatting  
conventions

Item	Treatment	Example
Name of publication	Italic	<i>Administrator Guide for M-Business Server</i>
User interface items: buttons, links, keywords	Bold	Click the <b>Reset</b> button.
Multi-level menu selections	Bold with vertical hash	Select <b>Start Settings  Control Panel</b> .
Text you type	Bold fixed width font	Type <b>Admin</b> in this field.
Text displayed in a file or on the screen	Fixed width font	The screen reads: Backup Complete
Variables	Angle brackets	http://<servername>:<port>
Keyboard key	Angle brackets	<Enter>
File names and paths	Italic	<i>pods.h</i> <i>C:/Program Files</i>

## Related publications

In addition to this document, there are several other iAnywhere Solutions publications available that you may find useful in developing mobile applications in the M-Business Anywhere environment.

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**Note**

Unless otherwise noted, all of these publications are available from:  
[http://www.ianywhere.com/developer/product\\_manuals/mbusiness\\_anywhere/](http://www.ianywhere.com/developer/product_manuals/mbusiness_anywhere/)

- *M-Business Anywhere QuickStart Guide*
- *Release Notes for M-Business Anywhere*
- *Administrator Guide for M-Business Anywhere Server*
- *User Guide for M-Business Anywhere Client*
- *M-Business Anywhere Developer Handbook*
- *M-Business Anywhere Developer Reference*
- *UltraLite for M-Business Anywhere User Guide*, available from [http://www.ianywhere.com/developer/product\\_manuals/sqlanywhere/0902/en/pdf/ulagen9.pdf](http://www.ianywhere.com/developer/product_manuals/sqlanywhere/0902/en/pdf/ulagen9.pdf)
- *UltraLite for M-Business Anywhere Tutorial*, available from [http://www.ianywhere.com/developer/product\\_manuals/sqlanywhere/0902/en/html/ulagen9/00000043.htm](http://www.ianywhere.com/developer/product_manuals/sqlanywhere/0902/en/html/ulagen9/00000043.htm)
- *The CustDB Sample UltraLite Application*  
[http://www.ianywhere.com/developer/product\\_manuals/sqlanywhere/0902/en/html/ulfoen9/00000017.htm](http://www.ianywhere.com/developer/product_manuals/sqlanywhere/0902/en/html/ulfoen9/00000017.htm)
- SQL Anywhere Studio documentation, available from [http://www.ianywhere.com/developer/product\\_manuals/sqlanywhere/0902/en/html/index.html](http://www.ianywhere.com/developer/product_manuals/sqlanywhere/0902/en/html/index.html)
- *Ensuring Mobile Security from the Device to the Datacenter*, available from [http://www.ianywhere.com/whitepapers/ensuring\\_security.html](http://www.ianywhere.com/whitepapers/ensuring_security.html)

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## Recommended references

In addition to the related publications from iAnywhere Solutions, you may want to consult references on the standards and third party software that are incorporated in the M-Business Anywhere architecture.

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### Note

The *Developer Reference for M-Business JavaScript Engine*, *M-Business Client Extension API*, and *M-Business XML API* documents in detail only those features of JavaScript, DOM, and CSS that differ from the published standards.

If you already have a favorite reference on any of these topics, there is no need to seek out another. However, if you need additional reference material and do not already have it at hand, the following list of sources is a good place to start.

### *Cascading Style Sheets (CSS)*

*W3C Cascading Style Sheets home page.*

HTML: <http://www.w3.org/Style/CSS/>

A comprehensive reference on CSS maintained by the W3C.

### *Document Object Model (DOM)*

*W3C Document Object Model (DOM) Level 1 Specification (Second Edition)*

PDF: <http://www.w3.org/TR/2000/WD-DOM-Level-1-20000929/DOM.pdf>

plain text: <http://www.w3.org/TR/2000/WD-DOM-Level-1-20000929/DOM.txt>

A basic reference on the DOM spec.

### *DOM Tutorial*

HTML: <http://www.w3schools.com/dom/default.asp>

A good introduction to DOM maintained by W3Schools.

### *Dynamic HTML (DHTML)*

*Introduction to Dynamic HTML .*

HTML: <http://msdn.microsoft.com/library/default.asp?url=/workshop/author/dhtml/dhtml.asp>

The Microsoft Developer Network's tutorial/reference on DHTML.

### *HTML*

*Dynamic HTML, the Definitive Reference*

Author: Danny Goodman

Publisher: O'Reilly, August 1998

Amazon.com online description: <http://www.amazon.com/exec/obidos/tg/feature/-/6779/103-8587514-0449445>

A good source of examples, with tutorials, organized more for learning than for reference; content is targeted at desktop browsers.

## *Java*

*Designing Enterprise Applications with the J2EE™ Platform, Second Edition*

HTML: [http://java.sun.com/blueprints/guidelines/designing\\_enterprise\\_applications\\_2e/DEA2eTOC.html](http://java.sun.com/blueprints/guidelines/designing_enterprise_applications_2e/DEA2eTOC.html)

Describes designing web applications with J2EE, which is a common platform you can use/adapt to producing M-Business Anywhere applications.

## *JavaScript*

*Netscape Client-Side JavaScript Reference*

HTML: <http://devedge.netscape.com/library/manuals/2000/javascript/1.3/reference/>

A basic reference on JavaScript; free online, but not completely up-to-date.

*JavaScript Bible, 5th Edition*

Authors: Danny Goodman and Michael Morrison

Publisher: Hungry Minds, Inc., March 2004

Publisher's online description: <http://www.wiley.com/WileyCDA/WileyTitle/productCd-0764568620.html>

A more current popular basic reference on JavaScript, containing numerous coding examples.

## *XHTML*

*XHTML™ 1.0: The Extensible HyperText Markup Language*

HTML: <http://www.w3.org/TR/xhtml1/>

A comprehensive reference on XHTML maintained by the W3C.

*XHTML Tutorial*

HTML: <http://www.w3schools.com/xhtml/default.asp>

A good introduction to XHTML maintained by W3Schools.

# Concepts and development guidelines

“M-Business Anywhere” (page 17)

“Mobile application design guidelines” (page 31)

“Channel creation QuickStart” (page 43)





## CHAPTER 2. M-Business Anywhere

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- “Overview” (page 18)
- “Architecture” (page 19)
- “Understanding channels” (page 22)
- “HTML page development” (page 23)
- “When to use the M-Business client extension API” (page 25)
- “Security options” (page 29)

## Overview

M-Business Anywhere is a comprehensive platform for developing, deploying, and managing mobile applications using web technology on a variety of devices, including handheld PDAs (Personal Digital Assistants) running the PocketPC or Palm operating systems; the Microsoft Smartphone (2000, 2002, 2003, and 2004 Phone Editions); RIM (957 series devices), and Win32 devices.

This is the industry's most reliable, scalable, secure and open mobile applications platform. It uniquely supports an “always available” model of seamless online and offline connectivity modes.

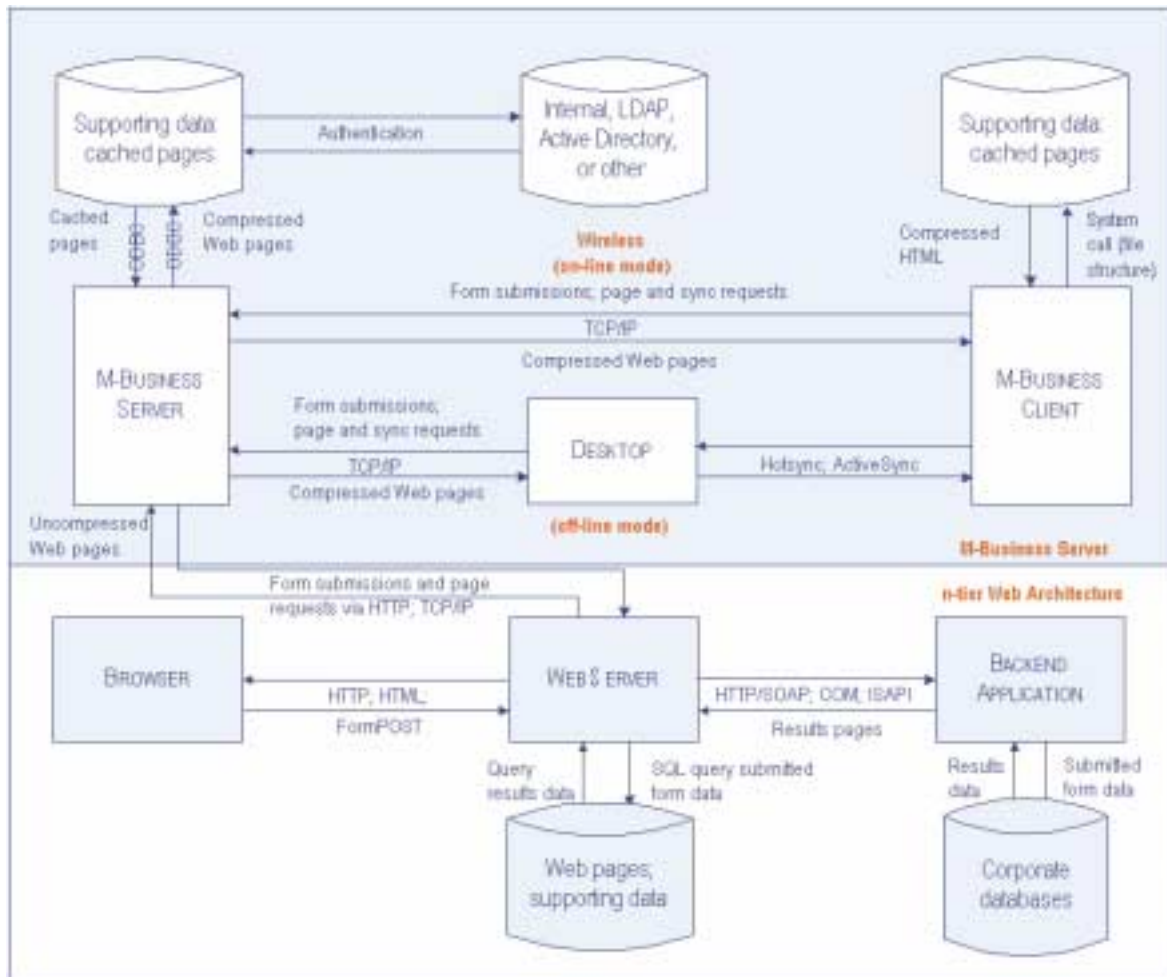
Using this industry-leading platform, you, the application developer, can today create and deliver useful information and applications to mobile users wherever and whenever your users need them.

This chapter discusses this platform’s architecture by first presenting an architectural overview diagram followed by a discussion of each major architectural component. We provide references to the various books in the product documentation set that will enable you to research additional information about specific features you want to implement.

## Architecture

Refer to the following architectural diagram for an illustration of the M-Business Anywhere environment. The following sections in this chapter will discuss each component at a high level and provide you with references on where to find detailed information.

Figure 2-1 M-Business Anywhere architecture



### M-Business Anywhere server components

#### *M-Business Anywhere server*

The M-Business Anywhere server accepts form submissions and page and sync requests from the M-Business Anywhere client. It then returns compressed web pages to the M-Business Anywhere client.

### *Supporting data; cached web pages*

Both the M-Business Anywhere server and the M-Business Anywhere client cache web pages for a administrator-specified amount of time. This allows the system administrator to decide how often a channel needs to be refreshed, based upon the type of content that is being accessed.

### *M-Business Connect*

The desktop component of the M-Business Anywhere client is M-Business Connect, which is the conduit that allows you to sync your device with the M-Business Anywhere server. The settings in M-Business Connect provide the information that the M-Business Anywhere client uses to communicate with the M-Business Anywhere server.

If you use a Palm OS or Pocket PC OS device, M-Business Connect also installs on your mobile device, allowing you to configure settings for the M-Business Anywhere server directly on your device and to sync remotely (if your device is equipped with a modem, network, or wireless connection).

If you use a RIM 957 Series Wireless Handheld, you can configure M-Business Connect from your desktop only. M-Business Connect does not install on your mobile device.

Refer to the *User Guide for M-Business Anywhere Client* CHAPTER 2., “Introduction” for additional information.

### *M-Business Anywhere client*

The M-Business Anywhere client is usually installed on a handheld or mobile device such as a Palm Treo 650, Pocket PC, or Microsoft Smartphone. The mobile device can be used as a Web browser, for forms submission—where forms are filled in on the device and later synchronized with the server via a sync—and for data access to an on-device datastore.

## **General N-tier Web architecture components**

The following items describe general industry-standard N-tier web architecture components with which M-Business Anywhere interacts.

### *Web server*

M-Business Anywhere supports any HTTP web servers that serve HTML including Apache, IIS, IIS.Net, TomCat, WebLogic (BEA), and WebSphere (IBM).

### *SQL query submitted form data*

Web servers query data using ADO, ADO.NET, .NET, ODBC, OLEDB, PBI, and SQL connectivity, among others, to the backend database(s).

***Query results data***

A web server may use ADO, ADO.NET, .NET, ODBC, OLEDB, PBI, and SQL connectivity to retrieve data from the backend database(s). This is abstracted from the web server. The results data is incorporated into HTML or saved as XML.

***Web pages: supporting data***

The supported web servers listed above can use a variety of databases, including: ASA, ASE, DB2, Oracle, and SQL Server.

***Backend application***

Application servers can be used to support backend applications, such as: Lotus Notes, Oracle, PeopleSoft, Salesforce.com, Siebel, SQL Server, SQL, SOAP, and Siebel.

**Submitted form data**

A web server or backend application supports ADO, ADO.NET, .NET, ODBC, OLEDB, PBI, and SQL connectivity to the backend corporate database(s).

**Results data**

A web server uses ADO, ADO.NET, .NET, ODBC, OLEDB, PBI, and SQL connectivity to retrieve data from the backend database(s).

***Corporate database(s)***

The supported backend applications listed above can use a variety of databases, including: ASA, ASE, DB2, SQL Server, and Oracle.

## Understanding channels

### What is an M-Business channel?

In its most basic form, an M-Business channel is just another website. There is more to it than that, of course. An M-Business channel page does not contain all the bells and whistles you might see on, say, a web page in Internet Explorer 5.x. But if you know how to create a web page, you can make yourself an M-Business channel.

As a simple introduction, look at what happens when you subscribe to (and subsequently download) an M-Business channel. Some elements have been simplified for the sake of brevity, but you will get a basic understanding of the process. Refer to the *M-Business Anywhere Developer Handbook* “Testing your M-Business channel” (page 57) topic.

The first thing you need to do is open up and configure an account on the M-Business Anywhere server. This account contains certain relevant information: your username and password, what channels you want to subscribe to, and so on.

After that, you install the software necessary to view M-Business channels. This software includes:

- M-Business Anywhere client. This is a web browser (and a mini web server) that is installed on your Palm OS, Pocket PC, or other mobile device. Some information about your account is also stored here.
- M-Business Connect. This is installed on both your desktop computer and device. It is the software that enables you to connect to the M-Business Anywhere server whenever you sync your device.

### What happens when you sync?

When you sync your mobile device, M-Business Connect takes over and connects to the M-Business Anywhere server. The M-Business Anywhere server, after looking up what channels you are subscribed to, downloads those pages from sites on the Internet. In most cases, these sites are distinct areas that contain pages optimized specifically for M-Business channels.

The M-Business Anywhere server downloads all these pages and performs some pre-processing on them. This includes shrinking images too large for the mobile device’s screen, discarding pieces that cannot be used by the M-Business Anywhere client (such as Java applets), and compressing the rest of the HTML. This compressed HTML is compared with what is on the device. If necessary, the pages are transferred to the device. For additional information, see the *Developer Handbook*, “What is an M-Business channel?” (page 29) topic.

## HTML page development

The M-Business Anywhere client supports a rich palette of features that web designers can use to create effective HTML pages. To make more effective use of the limited memory available on mobile devices, some of the least used features found in desktop browsers such as Microsoft's Internet Explorer have been omitted. The majority of features that are used in most websites are fully supported.

Web designers for mobile devices will find that they can continue to use most of the features they are accustomed to using in pages designed for desktop browsers. The greatest challenge is posed by the inherent limitations of mobile devices: small screens, limited color depth, or no color at all.

There is also greater variation in the way a page displays on different mobile devices, as compared with the variations in how the same page may display on PCs running different browsers on different monitors. For guidance on designing HTML pages for the M-Business Anywhere client, see the *Developer Handbook*, "Designing pages for the channel site" (page 78) topic.

### HTML page development tools

You can use any tool with which you are comfortable to develop HTML pages. These tools include any text editor such as emacs, TextPad, Notepad, up to high-end products such as DreamWeaver.

### JavaScript

JavaScript provides you, the web developer, a quick and simple language to use for enhancing web pages and servers. A segment of JavaScript functionality is embedded as a small program within a web page which is in turn interpreted and executed by the web client. JavaScript functions that can be called from within a web document are often executed by mouse functions, buttons, or other user-initiated actions. For additional information about the JavaScript engine versus PODS, refer to the *M-Business Anywhere Developer Reference*, "What is JavaScript engine?" (page 28).

### Screen widths

Mobile devices impose severe constraints on HTML page design due to limitations on device screen widths. Refer to the following table to view a list of sample screen widths for supported devices.

**Table 2-1**  
List of supported  
device screen  
widths

Device type	Older models	Newer models
PPC	240 x 320	480 x 640
Palm	160 x 160 (Treo 600; m500)	320 x 320 (Tungsten C; O/S 5.0)
EPOC	176 x 208	208 x 320
Win32	N/A	Tablet PC - N/A Laptops - N/A
MS Smartphone	N/A	176 x 220

## When to use the M-Business client extension API

Use the M-Business client extension API to support your HTML pages. See the *M-Business Anywhere Developer Reference* for additional information. Refer to CHAPTER 6., “PODS API mechanics,” starting on page 81 for a discussion of the following topics:

- “Roadmap to PODS interfaces” (page 82) in the *M-Business Anywhere Developer Reference*.

This section summarizes the functionality provided by each M-Business client extension API (PODS) interface. From these summaries, you should be able to determine which interface you need to use to implement which types of application tasks in PODS.

- “Interface inheritance” (page 85) in the *M-Business Anywhere Developer Reference*.

A PODS interface can extend another PODS interface, meaning that the interface includes all of the methods of its parent interface(s). This section shows you how to define a sample interface to extend another hypothetical interface.

- “PODS data types” (page 88) in the *M-Business Anywhere Developer Reference*.

The PODS data types, defined in the `podstypes.h` file, are described in Table 6-1, “PODS data types” (page 91).

By using PODS data types, your code will be insulated from any future changes in the way these data types are defined; it also will make your PODS code more portable. Whenever possible, you should use PODS data types instead of any equivalent data type that may be available in C. Refer to this section to view a list of PODS data types and their descriptions.

- “Deriving C macro method syntax directly from IDL source” (page 90) in the *M-Business Anywhere Developer Reference*.

The source files for PODS are Interface Definition Language (IDL) files. The vast majority of header files in M-Business Anywhere are generated from these IDL files. The API reference documents the details of calling each method in each interface, through the method’s associated macro.

- “PODSPodNew() function reference” (page 94) in the *M-Business Anywhere Developer Reference*.

`PODSPodNew()` is the single entry point to the shared library containing a POD. It is comparable to a constructor for a C++ class.

`PODSPodNew()` creates and returns a new `PODSPod` object. It allocates memory for the POD and tells the M-Business Anywhere client about this POD. Your implementation may also perform any other initialization functions that your POD requires.

## Built-in PODS

The following PODS are built into M-Business Anywhere.

### *JavaScript*

Refer to the *M-Business Anywhere Developer Handbook* “JavaScript” (page 340) topic to view a list of supported ECMA and DOM features from standard JavaScript. ECMA is core JavaScript specified in ECMA-262, 3rd Edition. DOM 0 is client-side JavaScript specified in the standard called DOM Level 0 API. W3C DOM consists of the document object model features specified in the W3C DOM 1.0+ standards. Refer to the *Developer Handbook* “Using DHTML” (page 120) topic. Use the Executive Dashboard sample to execute the example and view the described functionality.

Figure2-2  
Executive  
Dashboard



### *Scanner (Palm only)*

M-Business Anywhere provides you with a `PODSSymbolScanner` interface that implements a Symbol Technologies API for the Palm OS platform. See the *M-Business Anywhere Developer Handbook*, “Using a Symbol scanner” (page 270) topic.

### *Signature capture*

M-Business Anywhere provides you with an in-line scribble widget that allows signature capture on the device at the scribble label level. There is no large dialog box that pops up, so the signer of the document is clearly signing the agreed-upon document. See the *M-Business Anywhere Developer Handbook*, “Creating an in-line scribble widget for signature capture” (page 271) topic.

## Plug-in PODS

This section provides application details, including object tag parameters and APIs for using the M-Business PODS listed below.

See the *M-Business Anywhere Developer Handbook*, CHAPTER 12., “Tools to add special features to a channel” topic for application details including examples of how the plug-ins appear on both a PocketPC device and a PalmOS emulator.

### Date/Time picker

The M-Business Date/Time Picker is a MIME player that allows the user to select a date and/or a time. A Date/Time Picker instance is initially displayed as a read-only text field. The user taps on the text field to expand the date/time picker inline; the user taps on the text field again to return the Date/Time Picker to its original state. Refer to the *M-Business Anywhere Developer Handbook*, “Using the Date/Time Picker” (page 237) topic.

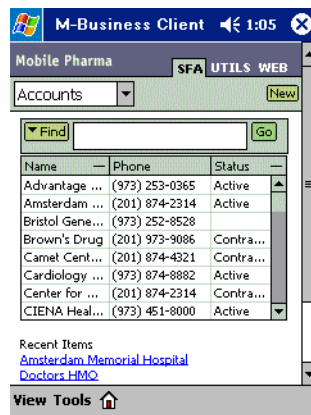
Figure2-3  
Date/Time Picker



### List Viewer

The List Viewer displays the contents of an `agdbset` or of an `ExtendedDBSet`. Refer to the *M-Business Anywhere Developer Handbook*, “Using the List Viewer” (page 251) topic.

Figure2-4  
List Viewer



### Scanner (PPC only)

M-Business Anywhere provides you with a `PODSSymbolScanner` interface that implements a Symbol Technologies API for the Pocket PC platform. Refer to the *M-Business Anywhere Developer Handbook*, “Using a Symbol scanner” (page 270) topic.

### *UltraLite for M-Business Anywhere*

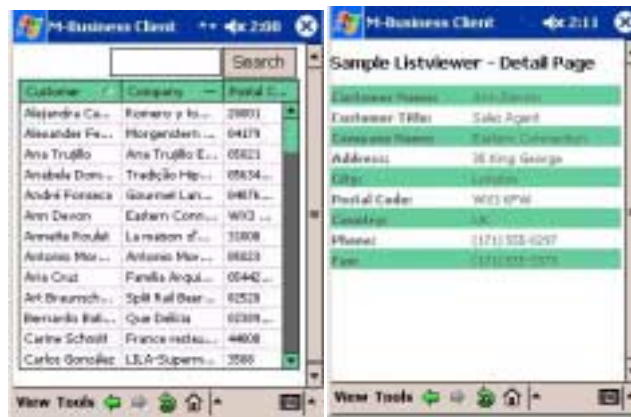
UltraLite technology provides the industry's first application-optimized, ultra-small XML datastore that resides locally on mobile devices and can synchronize data with most central consolidated database management systems. This deployment option is aimed at mobile and embedded devices. Refer to the tutorial for an overview of UltraLite for M-Business Anywhere at the following URL:

[http://www.ianywhere.com/developer/technotes/overview\\_ultralite.html](http://www.ianywhere.com/developer/technotes/overview_ultralite.html)

### *M-Business XML datastore*

M-Business Anywhere supports access to data stored in database systems and enterprise applications. The M-Business XML datastore is used to store relational data on-device.

Figure 2-5  
Master-Detail page



Refer to the following URL to view the detailed code sample:

[http://www.ianywhere.com/developer/code\\_samples/master\\_detail\\_mbus.html](http://www.ianywhere.com/developer/code_samples/master_detail_mbus.html)

## Security options

### Securing M-Business Anywhere client to M-Business Anywhere server sessions

You can secure M-Business Anywhere client/M-Business Anywhere server sessions by implementing industry-standard 128-bit SSL (Secure Sockets Layer) protocol (version 3.0). SSL is implemented through the M-Business Anywhere client's default proxy settings, unless you implement SSL through Microsoft Internet Explorer proxy settings.

### Securing M-Business Anywhere client/M-Business Anywhere server to on-device sessions

Elliptic curve cryptography is used to secure server to device connections. This helps with the on-device performance of your handheld. Elliptic curves are used in this cryptosystem to take a set of elements and perform arithmetic operations on them.

### Securing the M-Business Anywhere server

The M-Business Anywhere server automatically provides some significant security features. For example, the M-Business Anywhere server stores user cookies encrypted using a 128-bit key. When SSL is enabled, the M-Business Anywhere server automatically performs transmission checks, monitoring all transmissions received to ensure that the SSL protocol is not being bypassed.

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**Caution**

To make the M-Business Anywhere server and its communications with web servers and the M-Business Anywhere client as secure as possible, take all the standard precautions that security experts recommend for any server software that connects to the Internet.

### Securing the M-Business Anywhere server to web server connection

In addition to enabling SSL for the connection between the M-Business Anywhere client and the M-Business Anywhere server, you also can enable SSL for the M-Business Anywhere server–web server connection. SSL between the M-Business Anywhere server and web servers is used to authenticate secure pages. M-Business Anywhere supports all industry standard certificates, including Thawte and RSA.

Other security-related product features include on-device password hashing, minimum password length option in the Admin UI, secure only connections, and available integration for NT domain, LDAP, and Active Directory.

## Implementing security options

Refer to the *Administrator Guide for M-Business Anywhere Server* for instructions on enabling the Secure Sockets Layer (SSL) security option for use with the M-Business Anywhere server. CHAPTER 6., “Security on Windows,” starting on page 67 discusses setting up security. For a general overview of this security option, refer to “Securing M-Business Anywhere server: an overview” (page 37).

Depending on whether you install an ECC or an RSA certificate, M-Business Connect will use either the Default or the Microsoft Internet Explorer proxy settings to provide users with a secure connection during syncs to the M-Business Anywhere server.

## Securing the mobile device

M-Business Anywhere offers several ways to secure your data on the M-Business Anywhere client mobile device. These include on-device encryption when you store data in an Ultralite datastore, and user authentication when accessing the on-device application.

## CHAPTER 3. **Mobile application design guidelines**

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- “Using dynamic HTML” (page 34)
- “Using M-Business client extension API” (page 36)
- “Using offline form submissions” (page 37)
- “Using M-Business Anywhere client HTTP request headers to customize content” (page 38)
- “Designing applications to work both online and offline” (page 40)
- “Testing and deploying your mobile application” (page 41)

## Using dynamic HTML

Refer to the *Developer Handbook* for detailed implementation information that M-Business channel developers need to smoothly implement efficient channels to serve target audiences. It provides guidance on creation of handheld-friendly channel content with basic HTML. It does not cover details of programming in C/PODS. You should read this guide if you are creating, administering, or troubleshooting an M-Business channel.

Refer to APPENDIX A. “HTML 4 support in M-Business Anywhere client” in the *Developer Handbook* for detailed information.

### General page design considerations

Refer to the *M-Business Anywhere Developer Handbook*, APPENDIX A., “HTML 4 support in M-Business Anywhere client,” starting on page 313, for a list of references to information about how to use supported M-Business Anywhere client HTML 4 features.

References include:

- WorldWide Web Consortium, at:  
<http://www.w3.org/>
- W3 Schools, at:  
<http://www.w3schools.com/>
- Web Monkey, at:  
<http://hotwired.lycos.com/webmonkey/>

### Brief description of JavaScript Engine

JavaScript is a compact, cross-platform, object-based scripting language that extends the capabilities of HTML. JavaScript is integrated with HTML to allow developers to create interactive web pages. For example, you can create a JavaScript program to pre-validate a form before sending it back to the server, set options based on user preferences, update text displayed in a form’s text box, etc. Because JavaScript is downloaded with the HTML page, its execution requires no further interaction with the server.

JavaScript is easy to learn, yet powerful enough for sophisticated scripting tasks. It uses syntax similar to C and C++ and has object-oriented features that use prototype-based inheritance.

M-Business JavaScript Engine is the iAnywhere Solutions, Inc. implementation of client-side JavaScript. Many JavaScript features that are not considered high priority for handheld devices are not supported in order to conserve mobile device resources. At the same time, most of the features of PODS are directly available to JavaScript Engine as if they were provided by JavaScript native objects. For details

on what JavaScript Engine omits from JavaScript and what it adds from PODS, see the *M-Business Anywhere Developer Handbook*.

## Specific features of JavaScript Engine

JavaScript Engine enables developers to:

- Dynamically generate HTML pages
- Dynamically change the contents of HTML pages via DHTML
- Dynamically change the contents of forms on HTML pages
- Call a browser to perform various tasks, such as manipulating form fields or form submissions
- Support user interaction with HTML pages when disconnected, if the page is cached on the device

## Using M-Business client extension API

Refer to the *M-Business Anywhere Developer Reference* for client extension API information including information on how JavaScript Engine can call M-Business Anywhere client extension API. Also review its “Reference” (page 79) section for information describing the various PODS objects in addition to CHAPTER 14., “M-Business XML API reference,” starting on page 341.

That chapter will present you with a roadmap to M-Business XML datastore API interfaces, a database inheritance diagram, and details of the available API interfaces.

### JavaScript versus PODS

JavaScript provides you, the web developer, a quick and simple language to use for enhancing web pages and servers. A segment of JavaScript functionality is embedded as a small program within a web page which is in turn interpreted and executed by the web client.

PODS, on the other hand, provides you with better performance, the capability to perform file operations, interaction with native programs, and increased programming flexibility.

## Using offline form submissions

Refer to the *M-Business Anywhere Developer Handbook*, “Submitting forms” (page 119) topic for a list of supported extensions to the JavaScript methods of the `Form` object for form submission.

Refer to the *Administrator Guide for M-Business Anywhere Server* for general form submission information. In addition, refer to the “Creating a personal channel for a user” (page 185) topic.

The *M-Business Anywhere Developer Handbook* contains the following information:

- CHAPTER 7. “Customizing content for users and devices” – the “Using M-Business Anywhere client HTTP request headers to customize content” (page 147) topic contains information and examples concerning setting cookies.
- CHAPTER 8. “Managing channel form submissions”, contains information about submitting forms offline and using the Forms Manager.

## Using M-Business Anywhere client HTTP request headers to customize content

There will be times when you want finer control of the display on the client. The best example of this would be with logos. Sure, a color logo looks great on a high-end color Palm or a Pocket PC device, but it looks dithered on a black-and-white Palm. And while a posterized 4-color grayscale logo looks nice on a black-and-white Palm, when you look at it on a color device, it looks like a 4-color grayscale logo. What you would really like is the ability to serve up different images based on the device that is viewing your channel.

That is where the M-Business Anywhere client headers come in. As you already know, when a browser accesses your web server, it sends across several headers in the HTTP page request. These are informational headers telling your server a little about the browser; what type of browser it is, what host it thinks it is connecting to, the language the client prefers, and other parameters as follows: all of which can be used to customize content.

**Table 3-1**  
List of M-Business -  
specific headers

Header	Description
User-Agent	Mozilla/4.0 (compatible; AvantGo 5.5; Windows NT)
X-AvantGo-Version	base64 encoded
X-AvantGo-ColorDepth	base64 encoded
X-AvantGo-ClientLanguage	en_US
X-AvantGo-ScreenSize	base64 encoded
X-AvantGo-DeviceOS	base64 encoded
X-AvantGo-DeviceOSVersion	base64 encoded
X-AvantGo-UserId	base64 encoded
X-AvantGo-DeviceId	base64 encoded
X-AvantGo-ChannelId	en_US

Refer to the *M-Business Anywhere Developer Handbook*, “Using server URL macros to customize content” (page 153) topic for additional information.

### *AG\_USER example*

Below are some simplified examples of mapping the AG\_USER URL macro to web server directories and files. In these examples, it is assumed that the web server's domain is `http://myserver.com`, that this domain maps to the file system path `D:\webserver\contentroot`, and that you have three user IDs: `aasmith`, `bjwong`, and `ccgomez`.

### *Code samples*

Refer to the following code samples for an illustration of the concepts described above.

- Different files for different users, in same directory:

Channel URL - `http://myserver.com/myapp/AG_USER.asp`

Files for different users -

`D:\webserver\contentroot\myapp\aasmith.htm`

`D:\webserver\contentroot\myapp\bjwong.htm`

`D:\webserver\contentroot\myapp\ccgomez.htm`

- Different directories for different users, with same file name:

Channel URL - `http://myserver.com/AG_USER/myapp.htm`

Files for different users -

`D:\webserver\contentroot\aasmith\myapp.htm`

`D:\webserver\contentroot\bjwong\myapp.htm`

`D:\webserver\contentroot\ccgomez\myapp.htm`

- User ID passed as parameter to web application:

Channel URL - `http://myserver.com/myapp.asp?id=AG_USER`

Files for different users -

`D:\webserver\contentroot\myapp.asp`

(The same file, *myapp.asp*, generates different content when each user ID replaces AG\_USER in the channel URL.)

## Using URL macros to distribute content to multiple device types

URL macros on the M-Business Anywhere server allow you to set up a single channel that delivers different content to different users. The content differences can be based on the username, the user's device, or even the processor on the user's device. Again, refer to the *M-Business Anywhere Developer Handbook*, "Using server URL macros to customize content" (page 153) topic for a discussion on how to insert URL macros into your channel URL and a list of available URL macros.

## Designing applications to work both online and offline

Refer to the *M-Business Anywhere Developer Handbook*, CHAPTER 8. “Managing channel form submissions”, for information on designing and managing channels that contain forms which users can submit.

Follow the few simple guidelines presented in that chapter to give your users a much more elegant experience. You will also have complete control over the messages displayed and how the response pages are accessed after a user’s next sync. The chapter contains the topics listed below.

### Forms in the online world

You should already have a sense of how forms work in the normal online world of desktop web browsers. You create a form and associate it with an action — often a cgi-bin script of some sort. A user enters data into the form through text fields, check boxes, and so on. Using the M-Business Anywhere client capabilities, you also can create a form with fields pre-populated with a user’s email address and zip code, and, if you feel like being clever, you can enter data for the user through hidden fields. Regardless of what elements are in the form, the data is passed on as parameters to the action associated with that form. The action will perform some sort of processing on the data received, and then outputs its results in the form of an HTML document.

### Forms in the offline world

The majority of mobile devices do not come with modems, so dealing with forms and user input is a little more tricky. Your users are viewing your forms offline. They can enter all their data into the forms using text fields, checkboxes, radio buttons, and all the usual form objects.

### What the Forms Manager does

When users submit a form in offline mode, the form is stored on the device in a repository called the Forms Manager. This is where your form is kept until your mobile device is synced again. At that point, the data is sent to the cgi-bin script (or other action) associated with the form. It is processed, then the resulting HTML page is sent back to the mobile device.

### Submitting forms the right way

If you want your channel form submissions to work nicely, whether the user is online or offline, all you have to do is be sure that the form submissions work well in offline mode.

## **Avoiding collisions in multiple offline submissions**

When the same form is submitted more than once while the user is offline, cookies in the successive submissions can interfere with each other when the M-Business Sync Server processes them. There are several ways to avoid this problem.

## **Serializing forms: breaking one form into several pages**

Sometimes it is desirable to break a single form into several logical pages, which compose a single form submission. There are two basic approaches to doing this in M-Business Anywhere: Serialize from a single page, and Serialize using Submission Manager.

## **Using cookies to support personal channels**

Cookies through the M-Business Anywhere client and the M-Business Sync Server work similarly to cookies in other applications. The only difference is that cookies are not stored on the mobile device. They are stored on the M-Business Sync Server and are associated with the user's M-Business Anywhere account.

## Testing and deploying your mobile application

Most of the guidelines for testing and deploying any web-based application apply equally to mobile applications using the M-Business Anywhere architecture.

### *Testing*

Initial application testing can be done in a desktop browser if M-Business Anywhere client extensions are not involved (M-Business client extension API, certain JavaScript engine features). Even if your application will use M-Business Anywhere client extensions, you may find it more convenient to do initial testing of the HTML and most of the JavaScript pieces in a desktop browser.

If you are developing an application for the Palm OS, initial testing can be done on the desktop in the Palm emulator software. If you are developing an application that will be used on RIM OS, in addition to other platforms, we recommend that you do initial development and testing on the RIM platform.

When you begin testing application components on a mobile device, you may be able to save time by copying files directly to the device, then opening HTML pages through the Open Page dialog box. This may be quicker than syncing the entire channel, especially for large applications.

### *Setting up users and groups*

Unless your application is intended for everyone in the company to use, you probably have in mind particular individuals or groups as the application's target audience. All the users for your application must be defined on your M-Business Anywhere server individually. For convenience, individual users can be assigned to groups so that the M-Business Anywhere server system administrator can provide the whole group access to the same content.

Groups may already be defined on your M-Business Anywhere server for functional workgroups, such as sales, human resources, and top management. There may even be a group for everyone in the company who uses a mobile device. You may be able to use some combination of existing groups to give users access to your application, or you may need to define a new group.

For instructions on setting up users and groups, see the *Administrator Guide for M-Business Anywhere Server*, CHAPTER 12., "Managing users," starting on page 177 and CHAPTER 13., "Managing groups," starting on page 197.

### *Setting up a channel and subscribing users*

Your application will be delivered to the mobile devices of the groups of users that you specify through a channel. For an overview of how channels work, see *Administrator Guide for M-Business Anywhere Server*, CHAPTER 14., "Managing channels," starting on page 215.

When you set up a channel on the M-Business Anywhere server, you specify a single URL for the top level page of the channel content, and the Link Depth — the number of links away from that page for which pages should also be downloaded. For a graphic explanation of Link Depth, refer to the *M-Business Anywhere Developer Handbook*, “The Link Depth setting” (page 52) topic.

When you set up a channel, you may also specify the channel audience. Channels can be categorized according to the audience targeted, as follows:

- **Group channels:** A group is a collection of users to which you can assign web channels. When you assign web channels to a group, all members of that group will have access to those channels. You can also specify the type of channel you are creating: Managed, Optional, or Required.
- **Personal channels:** You specify a single user, and that user only is automatically subscribed to the channel.
- **Public channels:** By defining a channel as public, you allow any user to subscribe to it, but no one will be subscribed to it automatically. The channel will be listed in the M-Business Anywhere server’s list of public channels and individual users may subscribe to them through the M-Business Anywhere server desktop user interface or directly from the mobile device.

For instructions on setting up these different categories of channels, see the *Administrator Guide for M-Business Anywhere Server*, “Creating channels for a group” (page 203), “Creating a personal channel for a user” (page 185), and “Using public channel publishing and administration” (page 227) topics. For user instructions on self-subscribing to channels, see the *User Guide for M-Business Anywhere Client*.



# CHAPTER 4. Channel creation QuickStart

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- “Creating real channel content” (page 44)
- “Refining channel design” (page 45)
- “Improving channel performance with caching” (page 47)
- “Subscribing real users” (page 49)

## Creating real channel content

This chapter provides the information you will need to create, test, debug, and modify an M-Business channel. The rest of this guide deals with creating the content for your channel, making your channel available to the public, and subscribing readers.

### Overview

When you are designing a website for an M-Business channel, you have to make design decisions at two levels: site and page.

#### *Site-level considerations*

How many links away from the home page within your site will be downloaded in the channel; whether or not links to pages outside your site will be included in the channel; what is the maximum size within which your channel must fit? These issues are covered in the *M-Business Anywhere Developer Handbook*, “Designing the channel site” (page 71) topic.

#### *Page-level considerations*

The nitty-gritty details of each page; the specific HTML used; details of included graphics; which mobile devices for which you want to optimize your pages and which pages you want to optimize. These issues are covered in the *M-Business Anywhere Developer Handbook*, “Designing pages for the channel site” (page 78) topic.

At the page level, the design decisions you need to make about graphics for your channel warrant their own section in the same chapter — *M-Business Anywhere Developer Handbook*, “Designing graphics for channel pages” (page 84) topic.

Even if you are really in a hurry to get your channel up and running, you should spend some time going over the *M-Business Anywhere Developer Handbook*, “Designing the channel site” (page 71) topic before you start designing your channel pages.

## Refining channel design

Before you deal with individual pages, it's a good idea to work out the site design within which the individual pages need to fit. Remember that, compared with desktop web development, channel development forces you to work within fairly tight constraints. This section describes the design considerations that you will have to deal with, and the trade-offs that you might choose to make.

### Channel design considerations

Take the following issues into account when you begin to work out the site design:

- **Choosing content:** deciding what information to store on the mobile device.
- **Organizing pages:** striking a balance between the depth of the page hierarchy and the length of the individual pages.
- **Considering mode (online or offline):** When considering whether to break up long pages, you should also consider whether your users will operate primarily in wireless mode or offline sync mode and set the channel link depth accordingly.
- **Size limit issues:** The most important issues you are likely to face in designing your channel site involve size limitations. There are basically three types of size limitations for an M-Business channel:
  - **M-Business Anywhere sync server limits** — restrictions on the maximum size of any one graphic. See *M-Business Anywhere sync server limits* below.
  - **Your channel's Maximum Channel Size limit** — the upper limit you set for the M-Business Anywhere sync server to download from your channel in a sync. See the *M-Business Anywhere Developer Handbook*, "Your channel's Channel Size Limit" (page 74) topic.
  - **User limitations** — users' resistance to subscribing to a channel that is "too large" for limited mobile device memory and 2MB account limit. See the *M-Business Anywhere Developer Handbook*, "User limitations" (page 74) topic.
- **M-Business Anywhere sync server limits:** File sizes of images and HTML pages are compressed when they are sent to the mobile device. The compressed size will be approximately equal to its original size, minus any unsupported HTML.
- **Your channel's Maximum Channel Size limit:** Your channel's compressed size cannot go over the Maximum Channel Size in your channel settings. You may occasionally receive "This page is not available on the device" messages when you exceed this limit.
- **User limitations:** Set your channel's Maximum Channel Size setting to the minimum possible.

- **Avoiding grabbing pages multiple times:** The M-Business Sync Server tracks the URL of each page it retrieves during the current sync. If you request a page that has already been downloaded, the M-Business Sync Server will simply point to the downloaded page, rather than retrieving the page all over again.
- **You can use JavaScript to load the page programmatically without a literal Anchor link by using the following:**

```
window.location = "user.htm";  
<a href="http://localhost:8091/install/WINCE_OS/  
ARM/dbpod_quad.dll"></a>
```

Frequently, blank anchors are used to fetch PODS like the XML datastore POD for ARM Processor Pocket PC devices.

- **Channel caching:** If you expect to have any significant volume of users subscribing to your channel, you will definitely want to implement caching. Refer to the CHAPTER 14., “Caching to improve channel performance” in the *M-Business Anywhere Developer Handbook*.

## Improving channel performance with caching

Implement caching when you expect that a large volume of users will subscribe to your channel. Caching is the process of storing a local copy of remote information, such as a web page, to save time accessing that information the next time it is needed.

The M-Business Sync Server uses caching to store local copies of remote information, such as web pages, to save time accessing that information the next time it is needed. The M-Business Anywhere architecture supports caching of web pages on both the M-Business Anywhere server and the M-Business Anywhere client: called server-side caching and client-side caching, respectively.

Following are descriptions of the three types of caching that can occur in M-Business Anywhere.

### Server-side caching

If you anticipate heavy volumes of traffic on your channel pages, the M-Business Anywhere server supports caching that can reduce the number of channel-related accesses to the supporting web server by up to 98%, in comparison with the same access volume handled without caching.

Even if a web server is operated by a third party, a shared cache, as the server-side cache is called, still provides benefits by reducing the wait time that your end users experience when loading cached pages. Refer to the *M-Business Anywhere Developer Handbook*, CHAPTER 2., “Introduction to channel development” for a discussion on server-side caching.

### Client-side caching

The M-Business Anywhere client also has the ability to cache pages on the mobile device, which can further reduce the load on the web server(s) for your channels, reduce the load on your M-Business Anywhere server, and greatly reduce average load times for cached pages on the device. In addition, if the mobile device is operating in offline mode, client caching also makes the cached pages available while the user is offline.

On the server side, you can dedicate a huge amount of disk space to the shared cache. On the client side, local storage is at a premium. The effectiveness of the client cache is limited by the amount of memory that can be dedicated to caching. Refer to the *Developer Handbook*, CHAPTER 14., “Caching to improve channel performance” for a discussion on client-side caching.

## Controlling caching on the server and client

In order to improve the user experience for online versus synchronization-based environments, the M-Business Anywhere server provides configuration directives that allow you to modify the cache settings for both the client and the server.

### *Setting cache preferences*

Refer to the *Administrator Guide for M-Business Anywhere Server*, CHAPTER 7., “Configuring M-Business Anywhere server on Windows,” starting on page 83 or CHAPTER 10., “Configuring on Unix,” starting on page 137, for information on the following topics.

### Setting on-device cache directives

If you create your own channels, you can control caching with the use of cache-control HTTP headers — see the *M-Business Anywhere Developer Handbook*, CHAPTER 14., “Caching to improve channel performance”. However, many pages marked “handheld friendly” do not include headers to control caching.

### Setting server-side cache directives

The M-Business Anywhere server provides server-side cache settings, which you can modify to improve the way pages are cached on the server. Refer to the *Administrator Guide for M-Business Anywhere Server* and read either the “Setting cache preferences on Windows” (page 96) or “Setting cache preferences on Unix” (page 148) topics.

### *Managing online cache*

Refer to the *User Guide for M-Business Anywhere Client*, CHAPTER 9., “Using M-Business Client on all devices,” starting on page 109, for a discussion on managing the cache on a device.

### *Additional information*

Refer to the *M-Business Anywhere Developer Handbook* for additional caching information. Specifically, CHAPTER 14., “Caching to improve channel performance”, CHAPTER 7., “Customizing content for users and devices”, and CHAPTER 8., “Managing channel form submissions”, address caching issues.

## Subscribing real users

Once you have created your channels, you will need to subscribe users. Refer to CHAPTER 13., “Deploying channels to users”, in the *M-Business Anywhere Developer Handbook*, for detailed information discussing the following topics:

- “Adding users and providing them with the M-Business Anywhere client software’
- “Subscribing users via the M-Business Anywhere server admin UI’
- “Letting users do it themselves’

### Adding users and providing them with the M-Business Anywhere client software

Although it is not absolutely necessary for a user to have a profile defined on the M-Business Anywhere server in order to be subscribed to your channel, this is the most common approach. There are several different ways to create user profiles on the M-Business Anywhere server. Refer to the *M-Business Anywhere Developer Handbook*, “Adding users and providing them with the M-Business Anywhere client software” (page 277) topic for details.

Users must have the M-Business Anywhere client software installed before they can receive your channel content. There are also different ways to provide users with the client software. See the *M-Business Anywhere Developer Handbook*, “Adding users and providing them with the M-Business Anywhere client software” (page 277) topic.

### Subscribing users via the M-Business Anywhere server admin UI

If your channel is to be delivered to all members of certain groups within your organization, the best way to do this is to manage the whole process through the M-Business Anywhere server administrative interface. See the *M-Business Anywhere Developer Handbook*, “Subscribing users via the M-Business Anywhere server admin UI” (page 278) topic.

### Letting users do it themselves

If user interaction with M-Business is optional — users can decide if they want to participate at all, and if so, which channels they will subscribe to, you can set it up so that the users register and subscribe themselves. Users can even skip the registration step and just subscribe to your channel, if it is not a group channel. See the *M-Business Anywhere Developer Handbook*, “Letting users do it themselves” (page 281) topic.



## CHAPTER 5. Code samples

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- “Overview” (page 52)
- “Samples” (page 53)
- “Online tutorial: Building an UltraLite application for M-Business Anywhere” (page 55)
- “Advanced techniques” (page 56)

## Overview

Refer to the code samples in this Appendix to learn how to develop a data-driven web application using the M-Business Anywhere platform. This information is geared towards the web application developer who wants to develop mobile web applications that are deployable onto mobile devices.

### Downloading sample code

Sample files are contained in downloadable zip files. For example, `pods.zip` is one downloadable zip file containing sample code. To download this file, navigate to the download page URL provided to you via email, or use the URL below to request a developer edition.

[http://www.ianywhere.com/developer/code\\_samples/index.html#mbus](http://www.ianywhere.com/developer/code_samples/index.html#mbus)

Each sample file is named as indicated by its heading as listed under `Samples` (page 53) below.

## Samples

For information on how to download and work with the PODS sample files, refer to APPENDIX A., “PODS code samples”, in the *Developer Reference*.

### Master Detail example

This example demonstrates how to develop a data-driven master-detail web application using the M-Business Anywhere platform. The sample code provided there demonstrates the use of the following iAnywhere technology:

- XMLDB on-device datastore to store relational data.
- MIMEList player to display data from XMLDB in tabular format.
- AvantGo Preferences object to store session information.

Refer to the following URL to view the detailed code sample:

[http://www.ianywhere.com/developer/code\\_samples/master\\_detail\\_mbus.html](http://www.ianywhere.com/developer/code_samples/master_detail_mbus.html)

### Forms sample: Serializing forms

This pair of code samples illustrate two approaches to breaking a single form into multiple logical pages: DHTML to selectively hide and display sections of a single form; and DOM to build sections of a form in the Forms Manger. Available online at:

[http://www.ianywhere.com/developer/code\\_samples/mbus\\_serializing\\_forms.html](http://www.ianywhere.com/developer/code_samples/mbus_serializing_forms.html)

### One button sync

This sample application illustrates use of UltraLite for M-Business Anywhere for on-device data. It uses the MobiLink Redirector and one-button synchronization features of M-Business Anywhere client, version 5.5 and higher, along with MobiLink in Adaptive Server Anywhere, version 9.02. Available online at:

[http://www.ianywhere.com/developer/code\\_samples/master\\_detail\\_mbus.html](http://www.ianywhere.com/developer/code_samples/master_detail_mbus.html)

### Executive dashboard

This sample application illustrates some of the features that you can implement with DHTML, including expanding/collapsing menus and

text hierarchies, an interactive calendars and charts, form submissions, and dynamically sorting a table. Available online at:

[http://www.ianywhere.com/developer/code\\_samples/mbus\\_dhtml.html](http://www.ianywhere.com/developer/code_samples/mbus_dhtml.html)

### Date Time Picker sample

Use this sample to see a demonstration of how to use the `datetimepicker` element to easily add date and time selection to your M-Business Anywhere client application. Refer to APPENDIX A., “PODS code samples”, in the *Developer Reference* for detailed information.

### Pod sample: submitting forms

Use this sample source code to help you create PODS modules for iAnywhere Solutions software. Refer to the *M-Business Anywhere Developer Reference* APPENDIX A., “PODS code samples” topic for detailed information.

### DocumentSrc sample: vending documents

This function is invoked when the document manager searches for a document. If the URL matches your `SAMPLE_URL`, a document is generated and returned to the document manager. Refer to the *M-Business Anywhere Developer Reference* “DocumentSrc sample: vending documents” (page 440) topic for detailed information.

### ObjectSrc sample: vending objects to JavaScript

This function is invoked when the object manager is searching for an object. If the name matches the `SAMPLE_NAME`, it returns the object (creating it if necessary) and returns it to the object manager. Refer to the *M-Business Anywhere Developer Reference* APPENDIX A., “PODS code samples” topic for detailed information.

## Online tutorial: Building an UltraLite application for M-Business Anywhere

To learn how to build a cross-platform UltraLite application for M-Business Anywhere, refer to the online tutorial, *A Sample Application for M-Business Anywhere*, referenced in “Related publications” (page 12). At the end of the tutorial you will have an application and small XML datastore that synchronizes with a central consolidated database.

This tutorial guides you through the process of building an UltraLite application for M-Business Anywhere. It includes the following sections:

- Introduction – provides you with a description of the tutorial, the amount of time it should take you to complete the tutorial, and a list of prerequisites you must have in place to be able to start the tutorial.
- Lesson 1: Create a project architecture – describes how to create an UltraLite database schema. The database schema is a description of the database. It describes the tables, indexes, keys, and publications within the database, and all the relationships between them.
- Lesson 2: Create the application files – shows you how to use a form to create a user interface.
- Lesson 3: Set up the M-Business Anywhere server and client – lists the steps you should take to create an M-Business Anywhere user, group, and channel for your application.
- Lesson 4: Add startup code to your application – instructs you on how to add startup code to your application that connects to an UltraLite on-device database. This will require adding HTML to the main page and adding JavaScript logic to control the application.
- Lesson 5: Add inserts to your application – shows you how to add data manipulation and navigation logic to your application.
- Lesson 6: Add navigation to your application – provides sample code for scrolling forwards and backwards through the rows of a result set.
- Lesson 7: Add updates and deletes to your application – provides sample code for updating and deleting rows.
- Lesson 8: Add synchronization to your application – provides a procedure to implement synchronization.

## Advanced techniques

M-Business Anywhere provides a clean superset of web standards for dealing with the particular requirements of mobile applications development. For signature capture, an input field of type `scribble`, borrowed from the draft HTML 4.1 specification, is provided. For barcode scanning, a JavaScript interface to Symbol<sup>®</sup> scan-enabled devices is provided. The included Forms Manager (with a JavaScript API) provides the ability to manage offline form submissions. Refer to CHAPTER 16., “Utilities” in the *M-Business Anywhere Developer Reference* for additional information.

### Signature capture

Use M-Business Anywhere to capture signatures on Pocket PC or Palm devices. The `scribble` input field has been implemented as specified in the draft HTML 4 standard. It allows the capture of signature data as well as (potentially) the timing information associated with each stroke. Refer to CHAPTER 16., “Utilities” in the *M-Business Anywhere Developer Reference* for additional information.

### Scanner

Web-based applications can take advantage of device features such as barcode scanners and cameras. M-Business Anywhere offers a symbol scanning API encapsulated in a JavaScript object. Refer to CHAPTER 16., “Utilities” in the *M-Business Anywhere Developer Reference* for additional information.

### Other hardware

Cameras usually just place the photos in the file system. PODS allows customers to build plug-ins to the M-Business Anywhere client that can interface with any device hardware. Refer to CHAPTER 16., “Utilities” in the *M-Business Anywhere Developer Reference* for additional information.

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