

# **Windows Embedded for Point of Service and POS for .NET Step-By-Step**

**By Sean D. Liming and John R. Malin**

## **Table of Contents**

<b>FOREWORD .....</b>	<b>I</b>
<b>SJJ EMBEDDED MICRO SOLUTIONS .....</b>	<b>III</b>
<b>1 INTRODUCTION.....</b>	<b>1</b>
1.1    WHAT IS WEPOS? .....	1
1.2    WEPOS VS. XP EMBEDDED .....	2
1.3    WHAT IS POS FOR .NET .....	3
1.4    SOFTWARE / HARDWARE REQUIREMENTS FOR THE EXERCISES.....	4
1.4.1 <i>Development System and Target WEPOS System</i> .....	4
1.4.2 <i>POS Hardware</i> .....	4
1.4.3 <i>Software</i> .....	5
1.5    ABOUT THIS STEP-BY-STEP BOOK.....	5
1.6    SUMMARY – GET GOING WITH POS.....	6
<b>2 WEPOS BASIC SETUP.....</b>	<b>7</b>
2.1    INSTALLATION AND BOOT OPTIONS .....	7
2.2    SETUP WIZARD: ATTENDED INSTALL SCREENS.....	8
2.3    SETUP OPTIONS AND SIZE IMPACT .....	15
2.4    EXERCISE 2.1 CD INSTALL .....	16
2.5    A LITTLE BIT ABOUT FBA .....	17
2.6    WHAT IS GOING ON DURING THE FBA PROCESS?.....	18
2.7    FBALOG.TXT AND THE FBA PHASES.....	20
2.8    UNATTENDED SETUP ANSWER FILES .....	26
2.8.1 <i>Setup.exe Command Line Tool</i> .....	27
2.8.2 <i>Additional Command Line Functionality</i> .....	28
2.8.3 <i>WEPOS Unattended Generator</i> .....	29
2.9    EXERCISE 2.2 CD INSTALL WITH ANSWER FILE .....	30
2.9.1 <i>Part 1: Create the Setup Answer File</i> .....	30
2.9.2 <i>Part 2: Using the Answer file for Unattended Install</i> .....	31
2.10    CLONING .....	31
2.11    SUMMARY: WEPOS – SETUP MADE EASIER .....	34
<b>3 POST OS INSTALLATION IDEAS.....</b>	<b>35</b>
3.1    HARDWARE: SERVICE OBJECTS AND OPOS DRIVERS.....	35
3.2    LOCKDOWN AND CUSTOMIZING THE IMAGE.....	36
3.2.1 <i>Footprint Reduction</i> .....	36

Copyright © 2006 SJJ Embedded Micro Solutions, LLC. All Rights Reserved

3.2.2	<i>Look and Feel on Boot</i> .....	36
3.2.3	<i>Custom Shells</i> .....	38
3.2.4	<i>Security</i> .....	45
3.3	EXERCISE 3.1 – CUSTOM SPLASH SCREEN .....	47
3.4	SUMMARY: ARCHITECTING THE IMAGE .....	48
<b>4</b>	<b>REMOTE INSTALLATION .....</b>	<b>49</b>
4.1	EXERCISE 4.1 – DEPLOYMENT WITH RIS .....	50
4.1.1	<i>Part 1: Server Setup</i> .....	50
4.1.2	<i>Part 2: Creating the Deployable Image</i> .....	53
4.1.3	<i>Part 3: Test the Remote Install</i> .....	58
4.2	SUMMARY: RIS .....	58
<b>5</b>	<b>WEPOS REMOTE BOOT .....</b>	<b>59</b>
5.1	SDI – STORAGE DEVICE IMAGE.....	59
5.1.1	<i>SDI File Structure</i> .....	60
5.1.2	<i>SDI Driver / SDI Loader</i> .....	61
5.1.3	<i>SDIMgr</i> .....	62
5.2	REMOTE BOOT SERVICE INTRODUCTION .....	64
5.2.1	<i>Remote Boot Manager Overview</i> .....	65
5.2.2	<i>Rbsprov.ini File</i> .....	68
5.2.3	<i>Controlling Remote Boot Service and TFTP</i> .....	68
5.3	EXERCISE 5.1 REMOTE BOOT WEPOS.....	69
5.3.1	<i>Part 1: The Development Machine and the Extras Folder</i> .....	69
5.3.2	<i>Part 2: Setting Up Windows Server 2003</i> .....	69
5.3.3	<i>Part 3: Create the SDI Files</i> .....	71
5.3.4	<i>Part 4: Set Up WEPOS Image</i> .....	75
5.3.5	<i>Part 5: Set Up Remote Boot Manager and Download to the Target</i> .....	76
5.4	SUMMARY: WEPOS BOOTING OVER A NETWORK.....	77
<b>6</b>	<b>POS FOR .NET ARCHITECTURE .....</b>	<b>79</b>
6.1	THE PAST AND THE FUTURE .....	79
6.2	POS FOR .NET ARCHITECTURE.....	80
6.3	EXERCISE 6.1 INSTALL AND REVIEW THE POS FOR .NET SDK .....	85
6.4	EXERCISE 6.2 SDK: EXAMPLE SERVICE OBJECT SETUP .....	87
6.4.1	<i>Part 1: Create an XML Configuration File for a USB HID Scanner</i> .....	88
6.4.2	<i>Part 2: Set Up Pole Display OPOS Driver</i> .....	91
6.5	EXERCISE 6.3 - THE FIRST POS FOR .NET APPLICATION.....	94
6.5.1	<i>Part 1: Create the Application and Form</i> .....	95
6.5.2	<i>Part 2: Adding the POS for .NET Libraries and Code</i> .....	96
6.5.3	<i>Part 3: Build and Test</i> .....	100
6.6	NOTES ON APPLICATIONS AND SERVICE OBJECTS.....	102
6.7	EXERCISE 6.4 MSR APPLICATION .....	102
6.7.1	<i>Part 1: Get the Hardware IDs for the XML File</i> .....	103
6.7.2	<i>Part 2: Create and Locate the XML file</i> .....	105
6.7.3	<i>Part 3: Create an MSR Application</i> .....	106
6.7.4	<i>Part 4: Adding the POS for .NET Libraries and Code</i> .....	107

Copyright © 2006 SJJ Embedded Micro Solutions, LLC. All Rights Reserved

6.7.5	<i>Part 5: Build and Test</i> .....	109
6.8	KEEP CLAIMED OR RELEASE A DEVICE?.....	110
6.9	SUMMARY: FROM ARCHITECTURE TO APPLICATION.....	110
<b>7</b>	<b>POS DEVICE MANAGEMENT.....</b>	<b>113</b>
7.1	POSDM .....	113
7.2	EXERCISE 7.1 SET UP LOGICAL NAME.....	116
7.2.1	<i>Set Up the Scanner / Update Exercise 6.3</i> .....	116
7.3	VBSKRIPT AND WMI CALLS .....	119
7.3.1	<i>The ServiceObject Class</i> .....	119
7.3.2	<i>The PosDevice Class</i> .....	120
7.3.3	<i>LogicalDevice Class</i> .....	122
7.3.4	<i>DeviceProperty Class</i> .....	123
7.4	EXERCISE 7.2 USING WMI.....	123
7.4.1	<i>Part 1: VBScript Equivalent to POSDM LISTDEVICES</i> .....	123
7.4.2	<i>Part 2: VBScript Equivalent to POSDM LISTNAMES</i> .....	124
7.4.3	<i>Part 3: Custom Information Using the ServiceObject Class</i> .....	125
7.4.4	<i>Part 4: Removing a Logical Name</i> .....	126
7.5	CREATING YOUR OWN CUSTOM MANAGEMENT SOLUTION .....	126
7.6	EXERCISE 7.3: CUSTOM MANAGEMENT SOLUTION .....	127
7.6.1	<i>Part 1: Extension Setup</i> .....	127
7.6.2	<i>Part 2: Create the Project</i> .....	128
7.6.3	<i>Part 3: Add the Code Behind the Button</i> .....	130
7.6.4	<i>Part 4: Build and Test</i> .....	132
7.7	SUMMARY: YOU ARE IN CONTROL .....	133
<b>8</b>	<b>SERVICE OBJECTS – THE FOUNDATION FOR POS FOR .NET.....</b>	<b>135</b>
8.1	SIMPLIFYING SERVICE OBJECTS DEVELOPMENT WITH BASE AND BASIC CLASSES .....	135
8.2	THE SERVICE OBJECT CHALLENGE .....	137
8.3	FOUNDATION FOR THE SERVICE OBJECT: RS232 SERIAL CLASS FOR .NET .....	138
8.4	EXERCISE 8.1: CREATING A SERVICE OBJECT.....	140
8.4.1	<i>Part 1: Create the New Service Object Project</i> .....	140
8.4.2	<i>Part 2: Filling in the CashDrawer Service Object</i> .....	142
8.4.3	<i>Part 3: Set Up the Service Object</i> .....	147
8.4.4	<i>Part 4: Debug the Service Object</i> .....	149
8.5	EXERCISE 8.2: TWO SERVICE OBJECTS ACCESS THE SAME RESOURCE .....	153
8.5.1	<i>Part 1: Create the PrinterCDTest Project</i> .....	153
8.5.2	<i>Part 2: Implementing the Code</i> .....	154
8.6	EXERCISE 8.3 MODIFY THE EXAMPLE MSR SO FOR HARDCODE ID .....	157
8.6.1	<i>Part 1: Get the Hardware IDs</i> .....	157
8.6.2	<i>Part 2: Adding the HardwareIDAttribute</i> .....	159
8.7	SUMMARY: SERVICE OBJECTS – THE KEY TO WRITE ONCE, SUPPORT MANY .....	161
<b>9</b>	<b>CREATING POS FOR .NET APPLICATIONS .....</b>	<b>163</b>
9.1	EXERCISE 9.1: SECURITY KIOSK – MSR .....	163
9.1.1	<i>Part 1: Getting Card Numbers / Database Setup</i> .....	164
9.1.2	<i>Part 2: Set Up MSR Logical Name</i> .....	165
9.1.3	<i>Part 3: Create Application</i> .....	166
9.2	EXERCISE 9.2: INVENTORY SCANNER – UMPC CONCEPT .....	172

9.2.1	<i>Part 1: Scanner SO and Database Setup</i> .....	173
9.2.2	<i>Part 2: Review the Code</i> .....	174
9.2.3	<i>Part 3: Testing the Application</i> .....	177
9.3	EXERCISE 9.3: CASH REGISTER APPLICATION .....	178
9.3.1	<i>Part 1: SO Setup and Database Setup</i> .....	179
9.3.2	<i>Part 2: Code Review</i> .....	180
9.3.3	<i>Running the Application and Testing for Traps</i> .....	189
9.4	POS PERFORMANCE MONITORING .....	190
9.5	SUMMARY: BUILDING ON TECHNOLOGY .....	191
<b>A</b>	<b>UNATTENDED ANSWER FILE DETAILS .....</b>	<b>193</b>
A.1	REQUIRED ELEMENTS .....	193
A.1.1	<i>The &lt;UserData&gt; Element</i> .....	194
A.1.2	<i>The &lt;DiskConfig&gt; Element</i> .....	196
A.1.3	<i>The &lt;SystemData&gt; Element</i> .....	200
A.2	OPTIONAL ELEMENTS.....	211
A.2.1	<i>The &lt;LoggingData&gt; Element</i> .....	211
A.2.2	<i>The &lt;SetupData&gt; Element</i> .....	213
A.2.3	<i>The &lt;RunOnce&gt; Element</i> .....	213
A.3	MORE RUNONCE EXAMPLES:.....	215
<b>B</b>	<b>BIBLIOGRAPHY .....</b>	<b>221</b>
B.1	BOOKS.....	221
B.2	MICROSOFT RESOURCES .....	222
B.3	ARTICLES .....	222
B.4	NEWSGROUP .....	222
B.5	WEBSITE .....	222
<b>INDEX.....</b>	<b>223</b>	