

Dave Haseman, Ross Hightower

Mobile Development for SAP®



Bonn • Boston

Contents

Introduction	17
Acknowledgments	19

PART I Getting Started

1 Introduction to Mobile App Development 23

1.1 The Mobile Market and SAP	23
1.1.1 Growth of Smart Devices	23
1.1.2 SAP and Mobility	26
1.2 Mobile Devices and Data Sources	27
1.2.1 Device Platforms	27
1.2.2 Backend Data Sources	30
1.3 Types of Mobile Apps	32
1.3.1 Game Apps	32
1.3.2 Utility Apps	32
1.3.3 Real-Time Apps	33
1.4 Types of Mobile App Development	34
1.4.1 Native App Development	34
1.4.2 Web App Development	35
1.4.3 Hybrid App Development	36
1.5 Introduction to SAP Mobile Platform	36
1.5.1 Architecture	37
1.5.2 Mobile App Development for SAP Mobile Platform	39
1.6 Summary	47

2 Introduction to Sybase Unwired Platform 49

2.1 Sybase Mobile SDK	50
2.1.1 Unwired Workspace	51
2.1.2 Mobile SDK Library: Object API	53
2.1.3 Mobile SDK Library: OData	54
2.2 Unwired Platform Runtime	55
2.2.1 DMZ	56
2.2.2 Unwired Server	58

2.2.3	SAP Afaria Server	61
2.2.4	Sybase Control Center (SCC)	62
2.3	Summary	62
3	Installing the Sybase Unwired Platform Runtime	63
3.1	Choosing the Unwired Platform Landscape	63
3.1.1	Single-Server Installation	63
3.1.2	Simple Load-Balancing Cluster	64
3.1.3	Standard Microsoft Failover Cluster	65
3.1.4	Microsoft Failover Cluster with Shared Hosts	66
3.2	Choosing Licensing Options	66
3.2.1	Types of Environments	67
3.2.2	Product Editions	67
3.2.3	License Types	68
3.2.4	Mapping Environment to Product Editions and License Types	69
3.2.5	Examples: Single-Developer Development and Team Development	70
3.3	Typical Installation Steps	72
3.3.1	Hardware and Software Requirements	72
3.3.2	Generating License Keys	73
3.3.3	Downloading Installation Files	76
3.3.4	Installation of the Unwired Platform Runtime	76
3.4	Sybase Control Center	82
3.4.1	Creating a New Administrative User	84
3.4.2	Creating a New Domain	87
3.5	Summary	89
4	Installing and Connecting the Sybase Mobile SDK	91
4.1	Getting Started	91
4.1.1	Hardware and Software Requirements	92
4.1.2	Backward Compatibility	92
4.2	Steps for Installation and Connection	93
4.2.1	Installing the Unwired Workspace	93
4.2.2	Connecting the Unwired Workspace	95

4.3	Installing and Connecting a Cloud-Based Sybase Unwired Platform	107
4.3.1	Creating the SUP Server Instance	108
4.3.2	Installing the Unwired Workspace	109
4.3.3	Managing the Server	110
4.3.4	Configuring Connections in the Local Unwired Workspace	114
4.4	Summary	116

5 Installing the Hybrid Web Container Application 117

5.1	Android Devices	117
5.1.1	Installing Android Emulators	118
5.1.2	Installing and Configuring the Container Application on the Emulator	127
5.1.3	Installing the Container Application on the Device	133
5.2	iOS Devices	134
5.2.1	Installing the Simulator	134
5.2.2	Installing and Configuring the Container Application on the Simulator	136
5.2.3	Installing the Container Application on the Device	139
5.3	Summary	139

PART II Building Hybrid Apps

6 Working with the Hybrid Web Container 143

6.1	Mobile Architectures	143
6.1.1	Native Apps	143
6.1.2	Mobile Web Apps	147
6.1.3	Hybrid Apps	150
6.2	Hybrid Web Container Architecture	153
6.3	Hybrid App Design for the Hybrid Web Container	156
6.4	Hybrid App Patterns for the Hybrid Web Container	160
6.4.1	Online Lookup	160
6.4.2	Server Notification	162
6.4.3	Cached Data	164
6.5	Summary	165

7 Building Mobile Business Objects	167
7.1 Introduction to Mobile Business Objects	168
7.1.1 Defining MBOs	168
7.1.2 MBO Development Concepts	170
7.2 MBO Development Tools	172
7.2.1 Eclipse Menu	172
7.2.2 Workspace Navigator View	174
7.2.3 Enterprise Explorer View	175
7.2.4 Mobile Application Diagram Editor	176
7.2.5 Properties View	176
7.2.6 Palette	177
7.3 Creating MBOs	178
7.3.1 Database MBO	179
7.3.2 Web Service MBO	187
7.3.3 SAP MBO	192
7.4 Controlling Data Flow and Performance	202
7.4.1 Load Arguments	203
7.4.2 Synchronization Parameters	206
7.4.3 Personalization Keys	208
7.4.4 Cache and Cache Groups	210
7.4.5 Join within an MBO	211
7.5 Creating Database Operations	213
7.6 Creating Object Queries	216
7.6.1 FindAll	217
7.6.2 FindByPrimaryKey	218
7.6.3 Designer Developed Queries	218
7.7 Creating Relationships between MBOs	219
7.8 Summary	224
8 Creating Hybrid Apps	225
8.1 Designing a Hybrid App: Process Overview	225
8.1.1 Creating Hybrid Apps	226
8.1.2 Designing Screen Flow	228
8.1.3 Designing Screens	230
8.1.4 Generating Mobile Packages	233
8.1.5 Testing Apps	235

8.2	Designing Screen Flow	236
8.2.1	Flow Design Page Properties	236
8.2.2	Starting Points	239
8.2.3	Drag and Drop	241
8.2.4	Palette Options	246
8.3	Designing Screens	247
8.3.1	Defining General Properties	248
8.3.2	Adding Controls	250
8.3.3	Defining Values for Control Properties	252
8.3.4	Adding Menu Items and Custom Actions	259
8.3.5	Defining Values for Menu Item and Custom Action Properties	260
8.4	Generating a Hybrid App	265
8.5	Summary	268

9 Examples of Hybrid App Development 269

9.1	Employee Database Example	269
9.1.1	MBO	269
9.1.2	Flow Design	270
9.1.3	Screen Design	271
9.1.4	Review App	275
9.2	Customer/Sales Order Database Example	276
9.2.1	MBOs	276
9.2.2	Flow Design	278
9.2.3	Screen Design	280
9.2.4	Review App	285
9.3	General Ledger Account Balances from SAP Example	291
9.3.1	MBO	291
9.3.2	Flow Design	296
9.3.3	Screen Design	296
9.3.4	Review App	300
9.4	Sales Order Notification Database Example	301
9.4.1	MBO	301
9.4.2	Create Hybrid App and Define Server Notification	304
9.4.3	Flow Design	308
9.4.4	Test App	309
9.5	Summary	311

PART III Customizing Hybrid Apps**10 Customizing Hybrid App User Interfaces 315**

10.1 Generating the Project Code	316
10.1.1 Project Files	319
10.1.2 HTML Files	320
10.1.3 JavaScript Files	322
10.1.4 CSS Files	324
10.2 Adding a jQuery Button Group	325
10.2.1 Modifying the Hybrid App	325
10.2.2 Adding the HTML	326
10.2.3 Hiding the Menu Items	328
10.3 Creating a Custom List	329
10.3.1 Modifying the Hybrid App	329
10.3.2 Adding Custom JavaScript	330
10.4 Displaying a Map Using a jQuery Plug-in	335
10.4.1 Copying the jQuery Map Plug-in	335
10.4.2 Modifying the Hybrid App	336
10.4.3 Adding Custom JavaScript	337
10.5 Implementing Conditional Navigation	341
10.5.1 Modifying the Hybrid App	342
10.5.2 Adding Custom JavaScript	343
10.6 Summary	345

11 Customizing Hybrid App Functionality 347

11.1 Working with Data	347
11.1.1 Understanding the WorkflowMessage Structure	350
11.1.2 Accessing Data using the JavaScript API	352
11.2 Using Custom Actions	360
11.2.1 Two Custom Actions	361
11.2.2 One Custom Action	366
11.3 Using the SUPStorage API	369
11.3.1 Saving the Chosen Postage Type as a Default Value	370
11.3.2 Saving the Postage Types on the Device	373
11.3.3 Using Dynamic Credentials	379
11.4 Summary	381

PART IV Developing Native Apps**12 Introduction to Developing Object API Native Apps 385**

12.1 Synchronization	387
12.2 Object API App Functionalities	389
12.2.1 Registering an App on the Unwired Server	389
12.2.2 Accessing MBO Data	393
12.2.3 Manipulating Data	395
12.3 APIs Included in the Object API	397
12.3.1 Application API	397
12.3.2 Afaria APIs	402
12.3.3 Connection API	402
12.3.4 Authentication API	405
12.3.5 Personalization API	405
12.3.6 Synchronization API	406
12.3.7 Message-Based Synchronization API	407
12.3.8 Log Record APIs	408
12.3.9 Change Log APIs	408
12.3.10 Security APIs	408
12.3.11 Callback and Listener APIs	408
12.3.12 Query APIs	415
12.3.13 Persistence API	416
12.4 Summary	419

13 Developing Android Apps 421

13.1 Getting Started	421
13.1.1 Components of an Android App	422
13.1.2 Preparing the Development Environment	423
13.1.3 Introducing the Example App	425
13.2 Creating the MBOs	427
13.3 Generating the Object API Classes	428
13.4 Creating the Project	431
13.5 Importing Libraries	434
13.6 Implementing the App	435
13.6.1 Defining the App Structure in AndroidManifest.xml	435
13.6.2 Creating the Layout Files	437
13.6.3 MainActivity	448

13.6.4	CustomerListActivity	455
13.6.5	CustomerListAdapter Activity	458
13.6.6	CustomerDetailsActivity	460
13.6.7	CustomerSearchActivity	465
13.7	Running the App	469
13.8	Summary	471

14 Developing iOS Apps 473

14.1	Getting Started	474
14.1.1	iOS App Components	474
14.1.2	Preparing the Development Environment	476
14.1.3	Introducing the Example App	476
14.2	Generating the Object API Classes	478
14.3	Creating the Project	481
14.4	Importing Libraries	483
14.5	Importing Generated Code	485
14.6	Implementing the App	486
14.6.1	CustomerAppAppDelegate	486
14.6.2	ConnectionController	489
14.6.3	CustomerAppViewController	493
14.6.4	ItemListViewController	498
14.6.5	DetailViewController	504
14.7	Running the App	510
14.8	Summary	511

PART V Advanced Topics**15 Using the Mobile Analytics Kit 515**

15.1	Introducing the Example App	516
15.2	Creating the Hybrid App	518
15.3	Copying MAKit Files	521
15.3.1	Copying CSS Files	523
15.3.2	Copying Images Associated with CSS	524
15.3.3	jQuery Style Sheets	524
15.3.4	General Images	525
15.3.5	Copying JavaScript Files	525
15.4	Creating a Simple Column Chart	527

15.4.1	Modifying the Current App	527
15.4.2	Developing Code	529
15.4.3	Testing the App	535
15.5	Creating a Zooming Chart	538
15.5.1	MBOs	539
15.5.2	Flow Design Changes	539
15.5.3	Developing Code	541
15.5.4	Testing the App	548
15.6	Summary	550
16	SAP Support for Open Platforms	553
16.1	Introduction to Third-Party Frameworks	553
16.2	SAP Partnerships	556
16.2.1	Adobe PhoneGap	556
16.2.2	Sencha Touch	557
16.2.3	Appcelerator Titanium	561
16.3	REST Services Apps	562
16.4	Summary	563
17	CRM Lite Case Study	565
17.1	The Scenario	565
17.2	Defining MBOs	566
17.2.1	Queries and Server Queries	567
17.2.2	Customer MBO	570
17.2.3	Products and Categories MBOs	571
17.2.4	Employee MBO	573
17.2.5	Sales Orders and Sales Order Items MBOs	574
17.2.6	Purchase Orders MBO	575
17.3	Developing the Hybrid App	576
17.3.1	Designing the Standard App	576
17.3.2	Customizing the App	584
17.4	Summary	608
The Authors	609	
Index	611	