12.2 使用 Java 開發 Windows Azure 應用程式

在使用 Java 開發 Windows Azure 應用程式前,我們需要先準備好它的開發工具,除了標準的 Java SDK 以及 Java 執行環境外,還需要一個開發工具,在這裡我們直接使用目前最受歡迎的 Java IDE—Eclipse¹作為 Java 開發 Windows Azure 應用程式的工具,微軟也特別在 Eclipse 上開發了一個 Windows Azure 的工具,稱為 Windows Azure Toolkit for Java,可相容於 Eclipse Juno SR1 與 Helios SR2 版本。

於 2013/5/1,微軟發行了 Windows Azure Tools for Eclipse 2.0,將雲端服務訂 閱帳戶與儲存帳戶等資訊的整合管理做得更齊全了,開發人員只需要像在 Visual Studio內匯入發行設定檔即可輕鬆整合 Windows Azure 上的所有訂閱帳 戶。

安裝這個工具很簡單:

Step 1. 在 Eclipse 的 Help 功能表中選擇 Install New Software:

0				PHP - Ech	ose	L=1	_	
Ele	Edit Naviga	te Segrch <u>P</u> roject <u>B</u> un <u>W</u> indow	He	P				
	🚳 Welcome	8 🗄 🗢 🛪 🛪 🖽 🖻 🖉	٩	<u>W</u> elcome		🚳 Welcome 🕴 🏠 🕀 🕂 🖍 🛅 😁 🗸	Ð	
12			0	Help Contents		5		8
		Tutorials Samples What's New	<i>%</i>	Sgarch		Workbanch		
8				Dynamic Help	_	HUT ADDINA		-
-		Ourselaur		Key Assist Ctrl+Shift+L				
		Overview		Lips and Tricks				
			æ	Chest Sheets				
2				Seliara Madatalara				
	1 ×	Workbench basics		Check for Lindates		Java development		
<u>\$</u> .		Learn about basic Eclipse workbe		Install New Software	-	Get familiar with developing Java programs using Edipse		
				About Eclipse	1			
	88	Team support			<u></u>	Eclipse plug-in development		
	77	Find out how to collaborate with	othe	r developers	-	Learn how to extend Eclipse by building new plug-ins		
	Data	Lools Platform						
	The Da	ta Tools Platform project provides	exte	nsible frameworks and exemplary				
	tools, techno	enabling a diverse set of plug-in off logies and supported by the DTP e	enn	gs specific to particular data-centric stem.				
		DTP project						
	-	Learn more about the Edipse Dat	a To	iols Platform project				
	01	DTP documentation						
	(=0=	Learn how to use the Data Tools	Plat	form features and tools				
	3	College Machatalana						
	mp	Eclipse Marketplace						
	, .	more extensions and sol	ucio	15				
						1		

圖 12.2 安裝新軟體

¹ 可参考 http://faq.programmerworld.net/programming/best-java-ide-review.html

Step 2. 在安裝的對話盒的 Work With 選單中輸入

『http://dl.msopentech.com/eclipse』, 並按下 ENTER, 即可看到 Windows Azure Toolkit for Java 的資訊,請全選:

Ins	itall
Available Software Check the items that you wish to install.	
Work with: Windows Azure - http://dl.msopentech.com/eclipse	✓ <u>A</u> dd
Fin	d more software by working with the <u>"Available Software Sites"</u> preference:
type filter text	
Name	Version
⊿ ✓ 000 Windows Azure Toolkit for Java	
Microsoft JDBC Driver 4.0 for SQL Server	4.0.2206.100
✓ ↓ Package for Apache Qpid Client Libraries for JMS (by MS Op	en Te 0.19.0.201305032202
Package for Windows Azure Libraries for Java (by MS Open 1	Fech) 0.4.2.201305032202
Windows Azure Access Control Services Filter (by MS Open T	ech) 0.2.0.201305032202
Windows Azure Common Plugin (by MS Open Tech)	2.0.0.201305032202
✓ Kpi Windows Azure Plugin for Eclipse with Java (by MS Open Tec	n) 2.0.0.201305032202
Select All Deselect All 6 items selected Details Provides support for developing projects that help build, test and deploy J	lava applications for the Windows Azure cloud in Eclipse and via
Show only the latest versions of available software	More
	What is also do include an
✓ Group items by category	What is <u>already installed</u> ?
Show only software applicable to target environment	
☑ <u>C</u> ontact all update sites during install to find required software	
0	< <u>Back</u> <u>Next ></u> <u>Finish</u> Cancel

圖 12.3 搜尋 Windows Azure Tools for Eclipse

Step 3. 按下 Next, 會進入確認安裝資訊的畫面, 確認這次安裝會有哪些軟體 或套件會被安裝到電腦內:

0	Install		_ 🗆 X
Install Details			
Review the items to be installed.			
Name	Version	Id	
Microsoft JDBC Driver 4.0 for SQL Server	4.0.2206.100	com.microsoft.sqljdbc4.feature.feature.grou	р
Package for Apache Qpid Client Libraries for JMS (by MS)	0.19.0.201305032202	com.microsoftopentechnologies.qpid.featu	re.feature.group
Package for Windows Azure Libraries for Java (by MS Op	0.4.2.201305032202	com.microsoftopentechnologies.windowsaz	ure.tools.sdk.f
Windows Azure Access Control Services Filter (by MS Ope	0.2.0.201305032202	com.microsoftopentechnologies.acsfilter.fea	ature.feature.gr
🖗 Windows Azure Common Plugin (by MS Open Tech)	2.0.0.201305032202	com.microsoftopentechnologies.wacommo	n.feature.featu
R Windows Azure Plugin for Eclipse with Java (by MS Open	2.0.0.201305032202	com.persistent.winazure.eclipseplugin.featur	re.feature.group
Size: 8,439 KB			
Details			
Provides IDBC ADI for SOL Server and Windows Azure SOL Data	hase for Java Platform I	Interprise Edition 6	
Flowdes JDBC AFTIOL SQL Server and Windows Azure SQL Data	base for Java Platform	Interprise Edition o	
\odot		< <u>B</u> ack <u>N</u> ext > <u>F</u> inish	Cancel

圖 12.4 確認 Windows Azure Tools for Eclipse 套件

Step 4. 按 Next, 會進入授權合約的畫面:

Install	
Review Licenses Licenses must be reviewed and accepted before the software can be installed.	
Licenses:	License <u>t</u> ext:
LICENSES MICROSOFT OPEN TECHNOLOGIES, INC. COMMUNITY TECHNOLOGY PREVI MICROSOFT OPEN TECHNOLOGIES, INC. COMMUNITY TECHNOLOGY PREVI MICROSOFT SOFTWARE LICENSE TERMS PACKAGE FOR APACHE QPID CLIENT LIBRARIES FOR JMS (BY MICROSOFT OP)	LICENSES
< III >	\bigcirc I <u>d</u> o not accept the terms of the license agreements
?	< <u>B</u> ack <u>N</u> ext > <u>F</u> inish Cancel

圖 12.5 授權合約檢視

請選擇『I accept the terms of the license agreement』後,按 Finish,即可開始 安裝

۲	Installing Software	_ □ ×
Installing Software		
Fetching com.microsoftope	ntechnologies.wtp://dl.msopentech	.com/eclipse/plugins/
Always run in background		
	Run in <u>B</u> ackground Cancel	Details >>

圖 12.6 安裝 Windows Azure Tools for Eclipse 套件

Step 5. 安裝完成後,重新啟動 Eclipse 即可,打開 New->Project,能在專案的 範本中看到 Windows Azure Deployment Project,我們可以運用這個專案檔來 封裝與發行 Java 的專案。

New Project	
Select a wizard New Windows Azure Deployment Project	
<u>W</u> izards:	
type filter text	
 > > EJB > Java > > Java EE > > JavaScript > > JAXB > > JPA > > Plug-in Development > > Web > > Windows Azure Deployment Project > > Windows Azure Deployment Project > > Examples 	▲ E
(?) < <u>B</u> ack <u>N</u> ext > <u>F</u> inish	Cancel

圖 12.7 新增 Windows Azure 專案

NOTE

若是現有 V7.8 工具的使用者,請使用 Check for Updates 的功能來取得新的 Windows Azure Tools 工具。

準備完成後,我們就可以新增一個 JavaHelloAzure 的專案,來簡單的說明怎麼 開發可掛上 Windows Azure Cloud Service 環境的 JSP 應用程式。

Step 1. 請在 New->Project 開啟新專案精靈,並選擇 Web 內的 Dynamic Web Project (即 JSP 應用程式):

New Project	
Select a wizard Create a Dynamic Web project	
<u>W</u> izards:	
type filter text	
 EJB Java Java EE JavaScript JAXB JPA Plug-in Development Web Dynamic Web Project Static Web Project Web Fragment Project 	E V
(?) < Back Next > Einish	Cancel

圖 12.8 新增 Dynamic Web Project (JSP) 專案

Step 2. 按 Next,出現 Dynamic Web Project 的設定,只要在 Project name 欄 位中填入 JavaHelloAzure 即可,然後按 Finish:

Jynamic Web Project		_
Create a standalone Dynamic Web project or add it to a n	ew or exist	ing
Enterprise Application.		
Project name: JavaHelloAzure		
Project location		
Use default location		
Location: D:\workspace\JavaHelloAzure		Browse
Target r <u>u</u> ntime		
<none></none>	•	New <u>R</u> untime
Dimensionals and demonstration		
Dynamic web module version		
3.0		•
Configuration		
Default Configuration	•	Mod <u>i</u> fy
The defendence for the second se		
i ne detault configuration provides a good starting point	. Addition	al facets can
Ine default configuration provides a good starting point later be installed to add new functionality to the project.	. Addition	al facets can
Ine default configuration provides a good starting point later be installed to add new functionality to the project. EAR membership	. Addition	al facets can
Ine detauit configuration provides a good starting point later be installed to add new functionality to the project. EAR membership Add project to an EAR	. Addition	al facets can
In a cerauit configuration provides a good starting point later be installed to add new functionality to the project. EAR membership Add project to an EAR EAR project name: EAR	. Addition	Al facets can
Ine derauit configuration provides a good starting point later be installed to add new functionality to the project. EAR membership ☐ <u>A</u> dd project to an EAR EAR project name: EAR	: Addition	I facets can
Ine derauit configuration provides a good starting point later be installed to add new functionality to the project. EAR membership Add project to an EAR EAR project name: EAR	. Addition	New <u>P</u> roject
In e deraur configuration provides a good starting point later be installed to add new functionality to the project. EAR membership Add project to an EAR EAR project name: EAR Working sets Add project to working sets	. Addition	New <u>Project</u>
In elerauri contiguration provides a good starting point later be installed to add new functionality to the project. EAR membership Add project to an EAR EAR project name: EAR Working sets Add project to working sets Working sets:	. Addition	New <u>Project</u>
In elerauri contiguration provides a good starting point later be installed to add new functionality to the project. EAR membership Add project to an EAR EAR project neme: EAR Working sets Add project to working sets Working sets:	. Addition	New <u>Project</u>
In e defauit configuration provides à good starting point later be installed to add new functionality to the project. EAR membership <u>Add project to an EAR</u> <u>EAR project name:</u> EAR Working sets <u>Add project to working sets</u> Working sets:	x Addition	New <u>Project</u>
In e deraur contiguration provides à good starting point later be installed to add new functionality to the project. EAR membership Add project to an EAR EAR project name: EAR Working sets Add project to working sets Working sets:	x Addition	New <u>P</u> roject S <u>e</u> lect
In e deraur configuration provides a good starting point later be installed to add new functionality to the project. EAR membership Add project to an EAR EAR project name: EAR Working sets Add project to working sets Working sets:	x Addition	New <u>P</u> roject S <u>e</u> lect

圖 12.9 設定新專案屬性

Step 3. 專案建立完成後,進入 Eclipse 的專案瀏覽器,並在 WebContent 中新 增一個 index.jsp 檔案,於 body 中填入下列程式碼:

<body> <% out.println("Hello Azure!"); %> </body>

Step 4. 在 Project Explorer 內的 JavaHelloAzure 專案上按右鍵,選擇 Windows Azure 項目,並選擇 Packaging for Windows Azure 項目:



圖 12.10 新增 Windows Azure 發行專案

此時會出現新增 Windows Azure 專案的視窗,在專案名稱欄位輸入 JavaHelloAzureDeploy:

New Windows Azure Deployment Project	_ D X
Windows Azure Deployment Project	
Enter project name.	
Project name: JavaHelloAzureDeploy	
✓ Use <u>d</u> efault location	
Location: D:/workspace	B <u>r</u> owse
Working sets	
Add project to working sets	
Working sets:	S <u>e</u> lect
(<u>Back</u> <u>Next</u> > <u>Finish</u>	Cancel

圖 12.11 設定 Windows Azure 發行專案

Step 5. 按 Next,接著會出現套件的設定,開發人員需要設定 JDK/Tomcat 以 及應用程式的部署資訊。

在 Windows Azure Tools for Eclipse v1.8²時,JDK/Tomcat/Application 的設定 是放在一起的,但在 v2.0 時,微軟將這三個設定項目分成分頁的方式,除了包 含新增的功能外,也讓設定的畫面更加的清楚。

² 也就是書付梓時所用的版本。

۲	New Windows Azure Deployment Project	_ □	x		
Windows Azure Deployment Project					
Select the type of server to include					
JDK Server Ap	plications				
Use a JDK from t	nis location:				
Locally: C:\Program	n Files\Java\jdk1.7.0_21	Browse			
Cloud deploymen Include the loca	t I JDK in the deployment package				
O Automatically u	pload the local JDK to cloud storage and deploy from there				
O Deploy a JDK fr	om the selected download location				
URL:					
	(must be a ZIP file)				
Storage account:	✓	Accounts	-		
JAVA_HOME:					
?	< <u>Back</u> <u>N</u> ext > <u>F</u> inish	Cancel			

圖 12.12a 設定要包含在 Windows Azure 發行專案內的 JDK 來源位置

JDK 頁籤所包含的是 JDK 的選項,包含本地路徑的來源以及部署時的選項, 而在 Server 頁籤則是 Tomcat 的選項:

۲	New Windows Azure Deployment Project 🛛 🗕 🗖 🗙
Windows Azure D	eployment Project
Specify the applicati	on server to use for this deployment
JDK Server Ap	plications
Use a server from	this location:
Locally: G:\apache	-tomcat-7.0.33 Browse
Type: Apache To	mcat 7 v <u>Customize</u>
Cloud deploymen Include the loca Automatically u Deploy the serv URL:	t I server installation in the deployment package pload the local server to cloud storage and deploy from there er from the selected download location (must be a ZIP file)
Storage account: Home dir:	Accounts
?	< <u>B</u> ack <u>N</u> ext > <u>F</u> inish Cancel

圖 12.12b 設定要包含在 Windows Azure 發行專案內的 Tomcat 來源位置

Server 頁籤允許開發人員在封裝中包含 Tomcat 的服務檔案,筆者在實驗的時候,使用的是 Tomcat 網站下載的 Windows 64 位元 zip 壓縮檔,裡面已包含了 必要的執行檔與資源,我們只要將 Directory 指向我們將 zip 壓縮檔解壓縮的路 徑即可。另外,如果 Tomcat 版本不是預設的 7 的話,要記得在 Select 下拉選 單中選擇正確的版本,否則在啟動 Compute Emulator 的測試以及發行到雲端 環境時會造成伺服器啟動失敗的錯誤。

另外自 2.0 版工具開始,不論是 JDK 或是 Tomcat,都允許開發人員以分開部 署的方式進行,在 JDK/Server 頁籤中,都包含了一個 Cloud Deployment 的設 定:

Cloud deployment O Include the local server installation in the deployment package				
\bigcirc Automatically upload the local server to cloud storage and deploy from there				
 Deploy the server from the selected download location 				
URL: http://firstcloudservicestorage.blob.core.windows.net/				
	(must be a ZIP file with the installation directory inside, e.g. "apache-tomcat-7.0.33")			
Storage account:	firstcloudservicestorage			
Home dir: \%ROLENAME%\apache-tomcat-7.0.33				

圖 12.12c 利用雲端儲存部署 JDK/Tomcat 的選項

這三項設定的說明如下:

- Include the local server installation in the deployment package 表示將 JDK/Tomcat 的來源檔案一起封裝在部署套件中上傳,這個方法是相 容於 v1.8 或更早期版本的項目,因為發行的檔案會變大且無法重覆使 用,所以較不適合會進行持續發行的專案。
- Automatically upload the local server to cloud storage and deploy from there 表示會將本地端的 JDK/Tomcat 封裝成不同的套件上傳到 storage 內,然後由 storage 內的 JDK/Tomcat 進行部署,優點為不必 上傳包含 JDK/Tomcat 的來源檔,時間會少一些,它的預設路徑為 storage 帳戶下的/eclipsedeploy 容器。
- Deploy the server from the selected download location 表示當發行時會 自動檢查 storage 的指定路徑內是否含有必要的 JDK/Tomcat 來源, 若沒有的話會自動由給定的 URL 來下載,這會運用在由不同的 storage 帳戶提供 JDK/Tomcat 的來源,而應用程式封裝放在不同的 storage 帳戶的情境時,而且它允許自訂路徑。

開發人員可以選擇適合的作法來發行應用程式與 JDK/Tomcat 來源檔。

Application 頁籤則是要包含的應用程式封裝的來源位置,若需要部署其他套件 或是檔案時,可利用這個功能來加入:

🙆 Ne	w Windows Azure Deployment Project	_ D X					
Windows Azure Deplo Specify the applications to	yment Project o use for this deployment						
JDK Server Applications							
Name JavaHelloAzure.war		Add Remove					
<u> </u>							
?	< <u>B</u> ack <u>N</u> ext > <u>F</u> inish	Cancel					

圖 12.12d 設定要包含在 Windows Azure 發行專案內的 Application 來源位置

Step 6. 按 Next,可以選擇進一步的功能設定,包含 Session、Caching 與 Remote Debugging 等功能:

💿 New Windows Azure Deployment Project 📃 🗖 🗙						
Windows Azure Deployment Project						
Select any additional optional features to enable for the default role in your project.						
Session Affinity ("Sticky Sessions")						
This enables incoming HTTP requests to always be redirected to the same role instance that initiated the session, allowing your server to maintain session state, by installing routing software in your deployment.						
Caching Learn more						
This enables an in-memory, memcached-compatible, high-availability cache distributed across your role instances and co-located with your application. This cache can be programmatically accessed from your code for fast storage and retrieval of data using a memcached client.						
Remote Debugging						
This enables a remote Java debugger such as Eclipse to debug your application while it is running in the emulator or in the cloud, by configuring an appropriate endpoint and starting the JVM in debug mode.(This might not work with all server types)						
NOTE: You can further configure these and other features using the role properties dialog, after creating the project.						
< Back Mext > Einish Cancel						

圖 12.13 設定 Windows Azure 的延伸功能

Step 7. 按下 Finish,即可產生這個發行專案。在這個專案內包含了 Worker Role 所需要的 Tomcat 伺服器檔案以及 Java JRE 執行環境等,並且也包含了啟 動必要的指令碼,當然 Windows Azure 必要的服務定義檔與服務組態檔都少不



圖 12.14 完成時的 Windows Azure 專案內容

接下來,我們就可以按下工具列上的啟動模擬環境按鈕³,啟動 Compute Emulator 來瀏覽 JSP 網頁。



圖 12.15 Eclipse 中的 Windows Azure 工具列

經過一連串的啟動後, Compute Emulator 視窗會自動開啟,並顯示 Worker Role 已經啟動。



圖 12.16 啟動模擬器

³ 這個工具列只有在 Windows Azure Tools for Eclipse 已安裝時才會出現。

此時再開啟瀏覽器並輸入 http://127.0.0.1:8080/JavaHelloAzure,即可看到 index.jsp 的執行結果:

			x
🗲 💮 🛃 http://127.0.0.1: 🔎 🗕 🖒 🗙 🔣 Hello Windows Azur >	<	6 ደ	7 🔅
Hello Azure!			

圖 12.17 測試結果

當看到執行結果時,表示 JSP 已成功執行。

除了工具的使用外,微軟也為 Java 提供了 SQL Server JDBC Driver 以及 Windows Azure Storage Library for Java⁴等開發環境支援,讓 Java 開發人員也 能善用 Windows Azure 的環境來開發雲端應用程式。

若要發行到 Windows Azure 時,只要在工具列上按『Publish To Windows Azure Cloud』或是在部署專案上按右鍵,選擇 Windows Azure→Deploy to Windows Azure Cloud:

۲		PHP - JavaHelloAzure/WebContent/index.jsp - Eclipse	
File	Edit Refactor Source Na	ate Search Project Run Window Help	
1.3	• 🖩 🎕 📥 🖬 🗭 🖝 🛍	🕼 🗇 🖈 📉 🕸 🕶 🗛 🕶 🕼 🖉 🕫 🗇 🖉 🖉 👘 🖓 🖬 🕼 🖉 🖉 👘 🖓 🖬 🖉 🖉 👘 🖓 \hat{N}	E 🐻 PHP
0 0 22	III PHP Explorer IX IV AvaileEloAzure IV AvaileEloAzure IV AvaileEloAzureDeplo IV AvaileEloAzureDeplo	Image: State of the s	
	deploy WorkerRole1	Go Into * content="text/html; charset=BIGS"> Open in New Window e	
	package.smi ServiceConfigurat ServiceDefinition PhpHelloAzure	Copy Ctri+C Pate C(ri+C Delete Delete	
0 0	b tubueiorarenebio	Ferrover from Context Chi + Aht + Shift + Down Build Path • Pefector Aht + Shift + Down Include Path • Include Path • Import • Import • Close Uncleadered Projects • Validate • Show in Remote Systems view • Run As • Prolife As •	
		Compare With Reators Fron Local Hotoy Windows Azure Cloud Windows Azure Cloud Team Feam Configure Configure Feam Source Feam Feam Feam	
		Properties Act+Enter	~
JavaH	lelloAzureDeploy		

圖 12.18a 發行到 Windows Azure

⁴ https://github.com/WindowsAzure/azure-sdk-for-java

即會出現發行精靈,請設定好要發行的訂閱,儲存帳戶以及發行的組態等資訊後,按下 Publish 按鈕即可發行。

۲	Publish Wizard			x
Publish to Windo	ws Azure		4	3
Import from PUBL	ISH-SETTINGS file			
Subscription:	studyazure.com 🗸	<u>Subs</u>	cripti	<u>ons.</u>
Storage account:	firstcloudservicestorage v	N	ew	
Service name:	gwabcloudservice v	N	ew	
Target environment	Production V			
Remote Access				
User name:				
Password:		<u>Advan</u>	<u>ced</u>	
Confirm:				
Connect to dep	oloyment when ready			
?	Publish	Ca	ncel	

NOTE

若還沒有設定訂閱資訊時,可按下 Import from PUBLISH-SETTINGS files…按 鈕,可連到 Windows Azure 管理介面並下載發行設定檔,其流程和使用 Visual Studio 下載發行設定檔相似。

REFERENCES

更多的 Java 相關 Windows Azure 平合開發的支援與資源,可參考 Windows

Azure 官方網站的 Java Developer Center

(https://www.windowsazure.com/en-us/develop/java/) •