行政院及所屬各機關出國報告

（出國類別：實習）

『電子商務協商及各項交易機制技術』實習報告

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實習電子商務協商(Electronic Collaborative Business)及各項交易機制技術

主辦機關:

中華電信數據通信分公司

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關鍵詞:　電子商務協商

內容摘要: 近年來，電子商務的興起對企業營運模式造成的改變已是有目共睹的事實。隨著B2B電子商務的興起，企業界也開始不斷探索在電子商務領域的應用與發展。電子商務演化至今，單一的電子商務營運模式或資訊交換技術已無法有效對企業營運提供助益。因此強調延伸企業流程與整合企業間商務活動的電子商務管理方法 - 協同式電子商務必將成爲下一代電子商務應用之主流趨勢。 IBM WebSphere Application Server整合了企業資料與交易，以及現今的電子商業世界。使用者能透過內容豐富的應用程式部署環境，建立、管理、 及部署動態的電子商業應用程式，處理大量交易，將後端事業資料與應用程式延伸到Web以達到網際網路與企業內部網路團隊的協同合作機制。本次出國實習內容針對使用IBM 的 WebSphere Application Server (WSAS) 組織架構、安裝及備份進行深入之探討，希望透過對IBM WSAS之了解，以供本公司規劃協同式電子商務系統時之參考。

本文電子檔已上傳至出國報告資訊網

『電子商務協商及各項交易機制技術』
實習報告

摘要

本報告針對實習過程與內容作一介紹，內容主要是探討電子商務協同運作(Electronic Collaborative Business) 與 IBM WebSphere Application Server 的架設與相關應用。IBM WebSphere Application Server 是以 J2EE 為平台之 Server。透過 Java-based 所開發之各樣 Application 及靈活的 Application Server 組織架構，提供了電子商務協同運作一個良好的平台。實習報告中除了介紹 Webshpere 家族、WebSphere Application Server 之運作架構及安裝，也對建立 WebSphere Applications 及 IBM Tivoli Storage Manager for Application Servers 進行探討。

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第一章　目的

近年來，電子商務的興起對企業營運模式造成的改變已是有目共睹的事實。隨著 B2B 電子商務的興起，企業界也開始不斷探索在電子商務領域的應用與發展。電子商務演化至今，單一的電子商務營運模式或資訊交換技術已無法有效對企業營運提供助益。因此強調延伸企業流程與整合企業間商務活動的電子商務管理方法 – 協同式電子商務必將成為下一代電子商務應用之主流趨勢。

IBM WebSphere Application Server 整合了企業資料與交易，以及現今的電子商業世界。使用者能透過內容豐富的應用程式部署環境，建立、管理、及部署動態的電子商業應用程式，處理大量交易，將後端事業資料與應用程式延伸到 Web 以達到網際網路與企業內部網路團隊的協同合作機制。

本次出國實習內容針對使用 IBM 的 WebSphere Application Server (WSAS) 組織架構、安裝及備份進行深入之探討，希望透過對 IBM WSAS 之了解，以供本公司規劃協同式電子商務系統時之參考。

第二章　研習行程及課程

研習行程及課程

92 年 11 月 2 日：行程，搭機赴美國

92 年 11 月 3 日~11 月 7 日：實習電子商務協商平台(IBM WebSphere)

92 年 11 月 9 日：行程，洛杉磯->聖荷西

92 年 11 月 10 日~11 月 13 日：實習 IBM Tivoli Storage Manager for WebSphere Application Servers

90 年 11 月 14、15 日：返程，搭機回臺北

第三章 IBM WebSphere Application Server

3.1 IBM WebSphere 家族系列

IBM WebSphere 家族系列可依功能面區分為三大部份(如圖 3.1.1)：

1. 基礎架構及工具 (Foundation & Tools) ：用來建置、部署及管理電子商務平台。包括：WebSphere Studio、WebSphere Application Server
2. 標的及使用者經驗(Reach & User Experience) ：用來擴展及個人化電子商業平台，讓使用者能夠很順利地取得客製化的資料。包括：WebSphere Commerce、WebSphere Everyplace、Websphere Portal Server
3. 企業整合(Business Integration) ：整合單一封閉的個體轉變成統一且強大的系統，以期能夠靈活作業、成本降低及改善作業控管。包括：WebSphere MQ 、WebSphere MQ Integrator、Websphere Business Integration

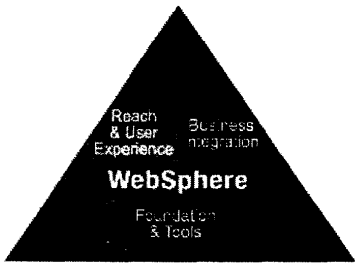


圖 3.1.1

3.2 WebShpere Application Server

WebSphere Application Server(WSAS)是屬於 WebSphere 家族中的基礎架構及工具。也是本次實習的主角。WSAS 是包含了 J2EE 技術及 web 基礎服務設定之 WebSphere 基礎平台。可以利用它來發展、整合及管理動態的電子商務服務。IBM 提供了四種 WSAS 包裝。分別是：

1. IBM WebSphere Application Server Express

   -它是一個內含有開發工具及application server 的產品。

2. IBM WebSphere Application Server base configuration

   -它提供了一個完整的J2EE 基礎環境。

3. IBM WebSphere Application Server Network Deployment

   -它可將多個單一application server組織成群集。

4. IBM WebSphere Application Server Enterprise。

   -它除了可以組織群集之外，也含有完整的開發工具

這四種 WSAS 包裝的詳細功能、原件及支援的 OS 平台，如圖 3.2.1 所示：

圖 3.2.1

	IBM WebSphere Application Server Express	IBM WebSphere Application Server, Base	IBM WebSphere Application Server, Network Deployment	IBM WebSphere Application Server, Enterprise
WebSphere Studio Site Developer	yes	no	no	no
Application Server	Application Server - Express	yes	yes	yes
IBM HTTP Server	Embedded	yes	yes	yes

	IBM WebSphere Application Server Express	IBM WebSphere Application Server, Base	IBM WebSphere Application Server, Network Deployment	IBM WebSphere Application Server, Enterprise
Web server plug-in	supported but not included	yes	yes	yes
Application Client	no	yes	yes	yes
Application Server Toolkit	no	yes	yes	yes
DataDirect Technologies JDBC drivers for WebSphere Application Server	no	yes	yes	yes
Deployment Manager	no	no	yes	yes
DB2® Universal Database™ Edition V7.2	restricted license	restricted license	restricted license	restricted license
Edge Components	no	no	yes	yes
IBM Directory V4.1	no	no	yes	yes
Programming Model Extensions	no	no	no	yes
WebSphere MQ V5.3	no	no	no	yes
Tivoli® Performance Viewer	no	no	yes	
Platform support	Studio: ► Windows ► Linux: Application Server - Express: ► Windows ► Linux ► OS/400	► Windows ► Linux/Intel ► Linux/390 ► OS/400 ► AIX ► Sun Solaris ► HP-UX	► Windows ► Linux/Intel ► Linux/390 ► OS/400 ► AIX ► Sun Solaris ► HP-UX	► Windows ► Linux/Intel ► Linux/390 ► OS/400 ► AIX ► Sun Solaris ► HP-UX

而各包裝間的開發功能及部署功能比較圖，請參閱圖 3.2.2。

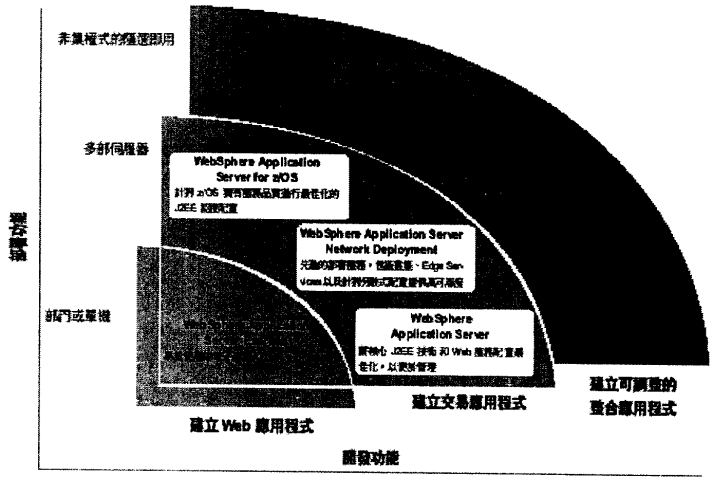


圖 3.2.2

3.3 WebSphere Application Server 之運作模式

WSAS 之基本功能邏輯示意圖如圖 3.3.1 所示。Web browser 送出 request 到 web server。而 web server 藉由 websphere plug-in 將需求送往 WebSphere Application Sevrver 去處理。WebSphere Application Sevrver 處理完成之後將結果送回 Client 端。

圖 3.3.1

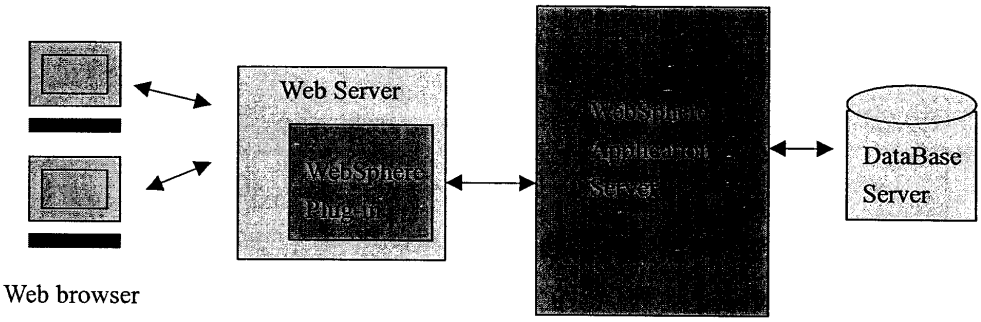


圖3.3.2為單一 Application Server 運作時之詳細示意圖。以下將對系統之重要元件做進一步說明。

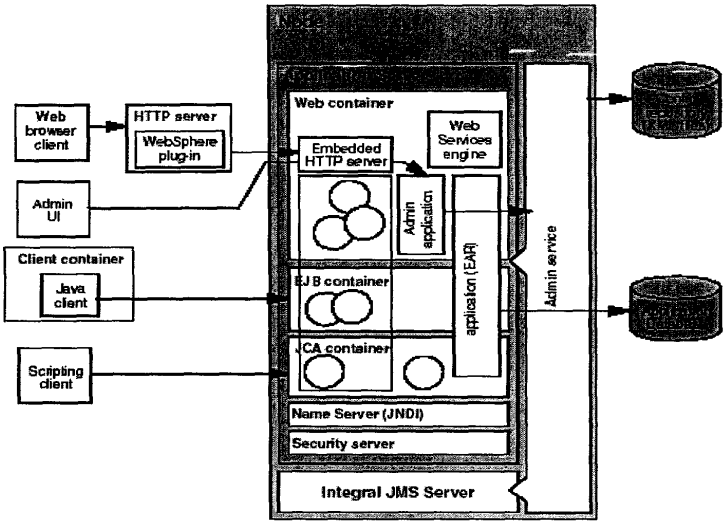


圖3.3.2

Application Server 是 WebSphere 之主要元件。它提供了一個JVM (Java Virtual Machine)的執行環境讓所有的application元件在此環境中執行。其中包含了三個主要的Container。分別是Web Container、EJB Container及J2C Container。

1. Web container :

Web Container 處理server端的程式。如servlets、JSP 等。在Web Container 中還包括了一個嵌入的Http Server。這個嵌入的Http Server用來處理從webshpere plug-in或瀏覽器送過來的需求。而Web Services engine 提供許多API服務以滿足application 特殊的需求。

2. EJB Container :

EJB Container 提供一個 Enterprise Java Bean (EJB)和 Server 間的介面。EJBs 透過在 EJB Container 內執行與 Server 溝通。

3. JCA container:

Java Connector Architecture(JCA) container 讓 EIS 經銷商所提供之 JCA Resource Adapters 可以 plug in，以便讓 JCA application 可以在 Server 上執行。

每一個 Application Server 都有一個 Name Server 用來儲存所有存放在 Application Server 中 EJBs 、JMS 、J2C、JDBC、JavaMail 等等的名稱。

Configuration Repository 用來保存各元件之設定檔。與前面版本不同的是所有的設定資料都是存成 XML 檔。

Application Server 透過 JDBC 與後端的 Application Database 連接以存取相關資料。

圖 3.3.3 為多個 Application Server 運作時之詳細示意圖。

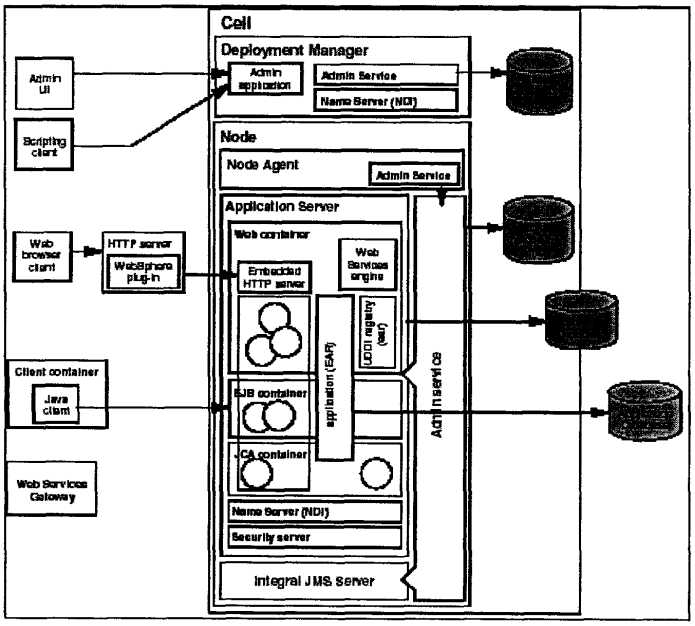
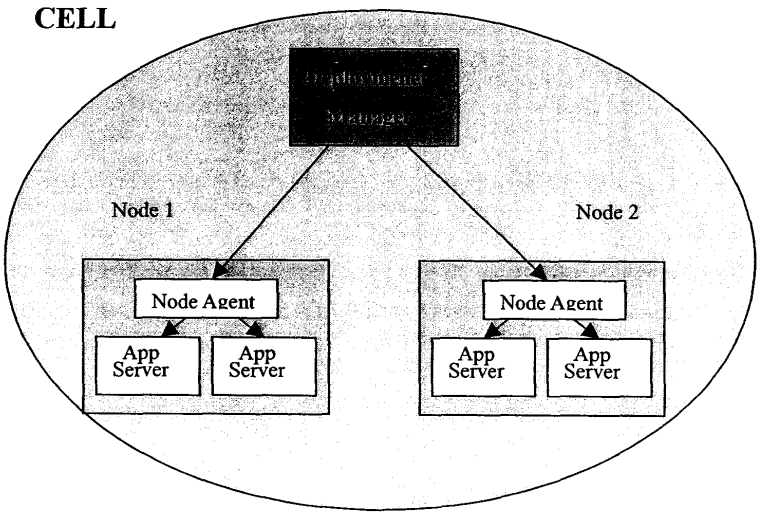


圖 3.3.3

與單一 Application Sever 架構不同的是每個 Node 之 Node Agent 將被啟動，透過與 Deployment Manager 之連接整合入 Cell 中。

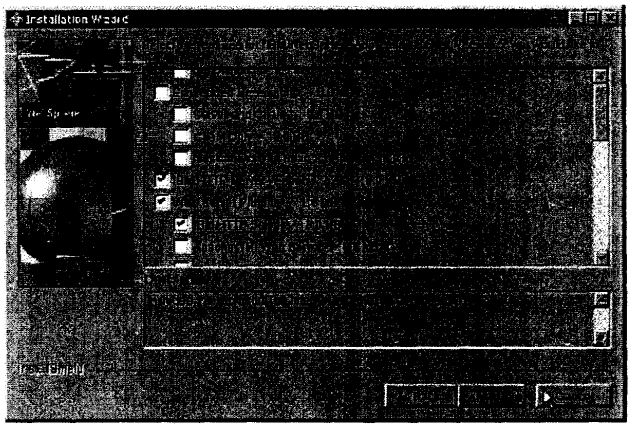


3.4 Application Server 之安裝

3.4.1 本次實習是安裝單一 Application Server 在 Windows 2000 平台上。在安裝 Application Server 之前需先安裝 IBM HTTP Server 及 WebSphere Plug-in。IBM HTTP Server 是 Aparch Web Server 之改良版。

IBM HTTP Server 安裝步驟

1. 以 administrator 身份登入Windows local server 領域。
2. 將WebSphere Application Server V5 CD 放入CD 槽.
3. 在 CD \nt 目錄下找到 **LaunchPad.bat** 檔. Double-Click此檔案開始安裝。
4. 選擇 Launchpad 之語言(English) 然後 click **OK**.
5. Click **"Install the product"**.
6. 在歡迎視窗, click **Next** 繼續.
7. 安裝程式將檢查你的系統.
8. 選擇 **Custom** 安裝模式，然後選擇 **Next** 繼續.
9. 然後會出現下面選擇視窗。



選擇安裝Http Server 及WebServer Plugins。

10. 接下來選擇所要安裝之目錄。Web Server 之 default 目錄是

"c:\Program Files\IBMHttpServer"。

Plugin則為

"c:\Program Files\WebSphere\AppServer\Webserver plug-in"

11.繼續按Next一直到全部完成.

3.4.2 設定HTTP Server

在安裝HTTP Server 完成之後，有兩個設定必須完成。

1.新增 HTTP 管理者帳號.

```
Microsoft Windows 2000 [Version 5.00.2195]
(C) Copyright 1985-2000 Microsoft Corp.
C:\>cd ibmhttpserver
C:\IBMHttpServer>htpasswd -m -c conf\admin.passwd admin
New password: *****
Re-type new password: *****
Adding password for user admin
C:\IBMHttpServer>htpasswd -m conf\admin.passwd wasadmin
```

例：新增一個"admin"管理者帳號

2. 更新 httpd.conf.

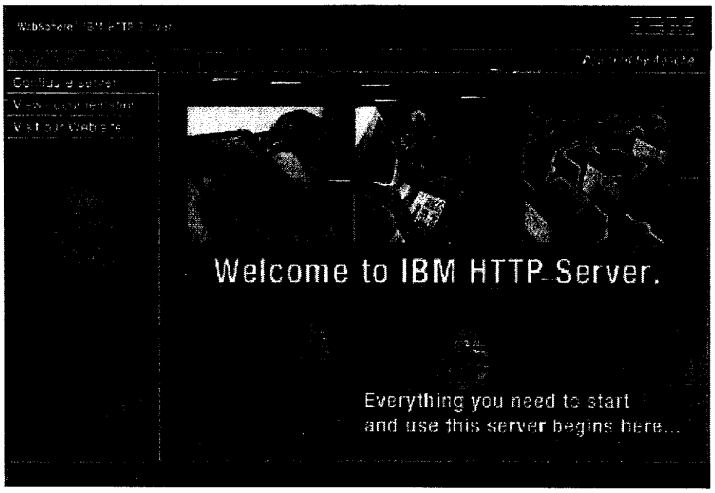
打開 "c:\Program Files\IBMHttpServer\conf\httpd.conf" 檔。確定 ServerName 的值是正確的。

3.4.3 確定HTTP Sever 是否安裝正確

確定HTTP Sever 是否安裝正確，可直接用Browser連到Server 的網址，如:

http://websphere.hinet.net

如果正確安裝會出現下面畫面：



如果有任何問題，可以檢查下列項目：

1. 檢查安裝log=><WAS_HOME>\logs\ihs_log.txt

2. 確定service有執行

Service name	Status	Startup mode
IBM HTTP Administration 1.3.26	Started	Automatic
IBM HTTP Server 1.3.26	Started	Automatic

如果沒有執行，可依照下列步驟將service 啟動。

_ Start -> Programs -> IBM HTTP Server 1.3.26 -> Start HTTP Server

_ Start -> Programs -> IBM HTTP Server 1.3.26 -> Start Administration Server

IBM HTTP Server 提供 web 管理介面(圖3.4.1)，網址如下：

http://<hostname>:8008/apadminred.html

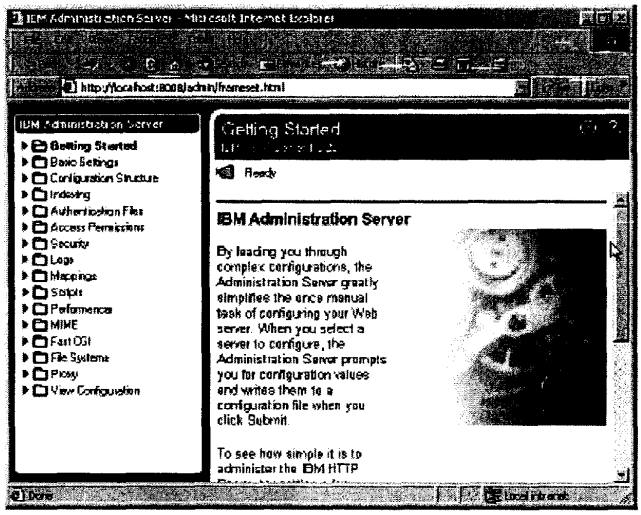


圖3.4.1

3.4.4 確認 Web server plug-in 安裝

打開httpd.conf 設定檔。在檔案的最後部份應看到下列資料:

LoadModule ibm_app_server_http_module

"C:\WebSphere\AppServer/bin/mod_ibm_app_server_http.dll"

WebSpherePluginConfig

"C:\WebSphere\AppServer/config/cells/plugin-cfg.xml"

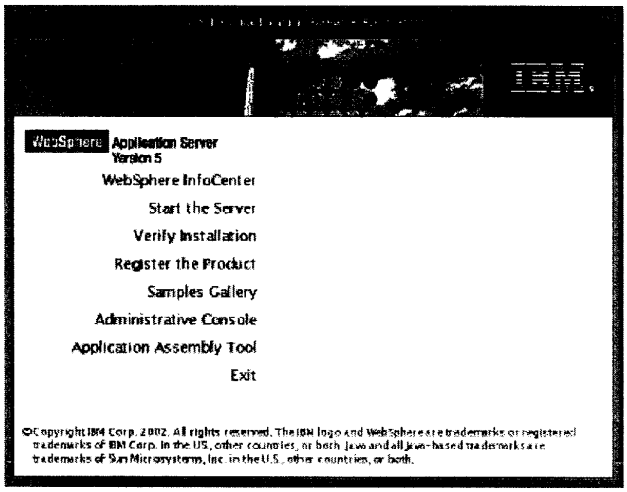
3.4.5 安裝 IBM WebSphere Application Server

1. 以 administrator 身份登入Windows local server 領域。
2. 將WebSphere Application Server V5 CD 放入CD 槽.
3. 在 CD \nt 目錄下找到 **LaunchPad.bat** 檔. Double-Click此檔案開始安裝。
4. 選擇 Launchpad 之語言(English) 然後 click **OK**.
5. Click "**Install the product**".
6. 在歡迎視窗, click **Next** 繼續.
7. 安裝成式將檢查你的系統.
8. 選擇 **Custom** 安裝模式，然後選擇 **Next** 繼續.
9. 然後會出現選擇視窗。選擇 Application Server 及相關項目，然後click 繼續。
10. 選擇安裝目錄 "c:\ProgramFiles\WebSphere\AppServer"。
11. 下個視窗將要選擇這個node的名字。要注意這個名字在cell中必需是惟一的。Click next 繼續。
12. 選擇讓Application Server 自動啟動。
13. Click Next 開始安裝。.
14. 當所有檔案複製完畢，安裝程式將安裝application 樣本。
15. click "finish" 結束。如果有安裝錯誤，可查看

<WAS_HOME>\logs\log.txt。

3.4.6 確認 IBM WebSphere Application Server 安裝

當第一次安裝完成之後，會出現下面視窗。



從這個視窗：

1. 選擇 “Start the server” 項目.如果 server成功被叫起，將會看到下列訊息：

ADMU3000I: Server server1 open for e-business; process id is 2928

2. 選擇 “Verify Installation” 項目. 如果確認Installation成功，將會看到下列訊息：

IVTL0050I: Servlet Engine Verification Status - Passed

IVTL0055I: JSP Verification Status - Passed

IVTL0060I: EJB Verification Status - Passed

IVTL0070I: IVT Verification Succeeded

IVTL0080I: Installation Verification is complete

以下是WebSphere log 檔之匯整

Component	File
WebSphere Application Server	log.txt
IBM HTTP Server	ihs_log.txt
Default Application	installDefaultApplication.log
Sample Application	installSamples.log
Administrative console	installAdminConsole.log
MDB Samples Application	installMessagingSamples.log
Pet Store Application	installPetStore.log

Note: 在第一次安裝之後，如果你要開啟First-Step 的視窗，可以用下列方式：

_ 選擇 Start -> Programs -> IBM WebSphere -> Application Server V5.0 -> First Steps

_ Run <WAS_HOME>\bin\firststeps.bat

3.4.7 如何開啟或停止Application Server

有三種方式可以開啟或停止Application Server

1. 使用Windows 開始工作列:

- Select Start -> Programs -> IBM WebSphere -> Application Server V5.0 -> Start the Server

-Select Start -> Programs -> IBM WebSphere -> Application Server V5.0 -> Stop the Server

2. 直接下指令:

- <WAS_HOME>\bin\startServer server1
- <WAS_HOME>\bin\stopServer server1

3. 在控制台中直接開啟或停止Server V5 - server1 service.

3.4.8 管理介面

有三種方式可以開啟管理介面：

1. 使用browser到下列網址:

   http://<hostname>:9090/admin

2. 選擇 Start -> Programs -> IBM WebSphere -> Application Server V5.0 ->

   Administrative Console

3. 選擇 Start -> Programs -> IBM WebSphere -> Application Server V5.0 First Steps

圖3.4.8.1為管理介面之GUI

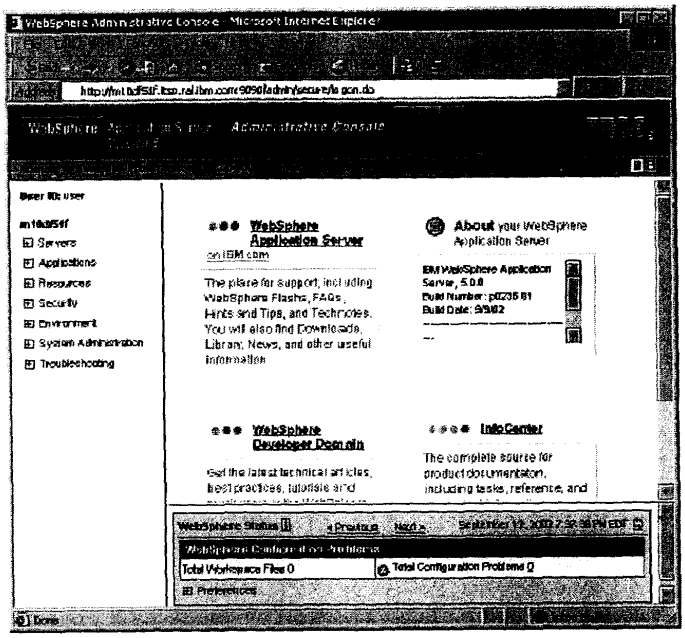


圖3.4.8.1

當 WebSphere Application Server 安裝完成之後，至少會有一個Default Application 被安裝。我們可以利用下列之URL來存取這些Servlets:

http://<WAS_hostname>:9080/snoop

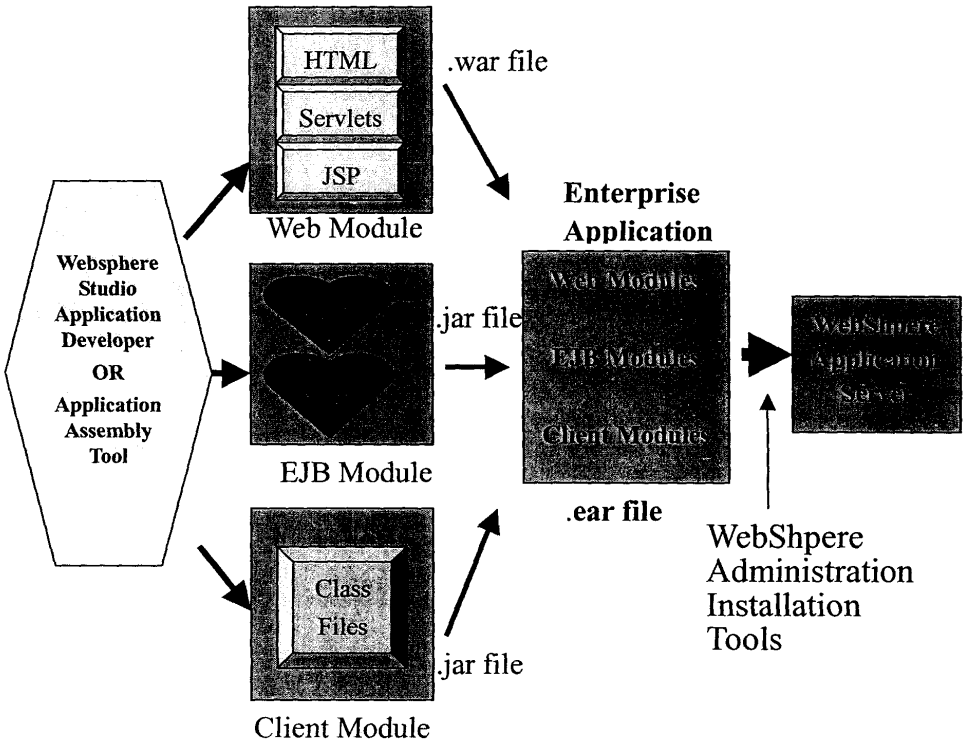
http://<WAS_hostname>:9080/Hello

http://<WAS_hostname>:9080/HitCount

3.5 WebShpere Application

3.5.1 WebSphere Application 組合元件

WebSphere Application 是由 Web Module、EJB Module 及 Client Module 三個 componnt 所組成。這三個 Module 可由 Application Assemble Tool(AAT) 或 WebSphere Studio Application Developer 組成一個 WebSphere Application (.ear file)。並且藉由 Administration Installation Tools 將此 application 安裝到 WebSphere Server 上。這個元件因此就可以被呼叫執行。

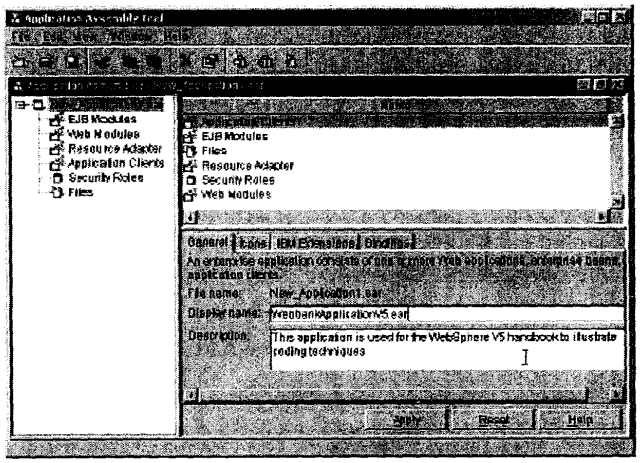


3.5.2 application 產生操作

本次實習是以產生一個 Webbank 企業 application 為例。

1. New一個新的application

Step1. 開啟AAT, 然後double-click選擇**Application.**

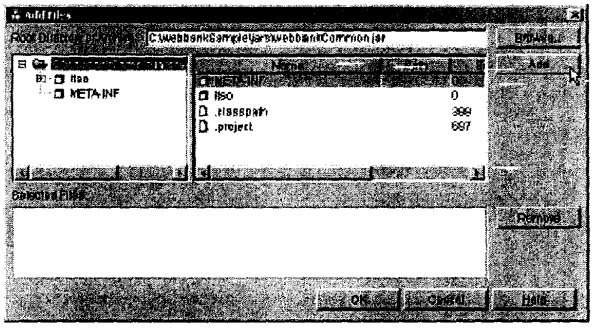


Step2. 輸入application各個propertie值。然後Apply。

Step3. 加入webbankCommon. jar file at the root of the EAR file。

Step4. Click "Browse" 按鈕, 選擇 "E:\WebbankSample\jars directory."

Step5. 選擇 webbankCommon. jar 檔, click Add.



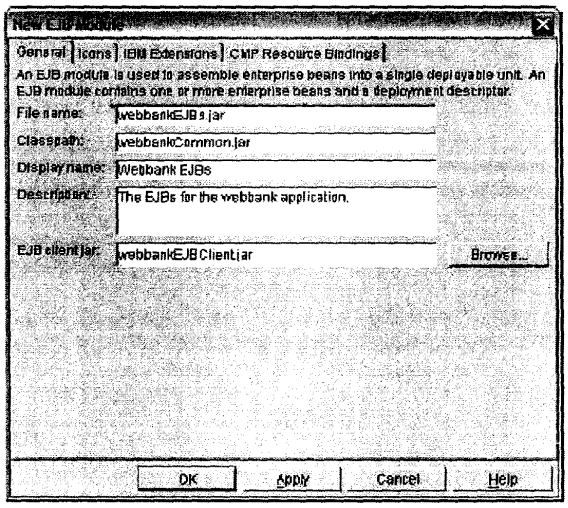
Step6 : Click OK.

現在已準備好加入各種module

2. New 一個EJB module

Step1:在左邊的pane選擇new一個 EJB Module entry 。

Step2. 輸入EJB Module各個propertie值。



Step3. Click OK when you are done.

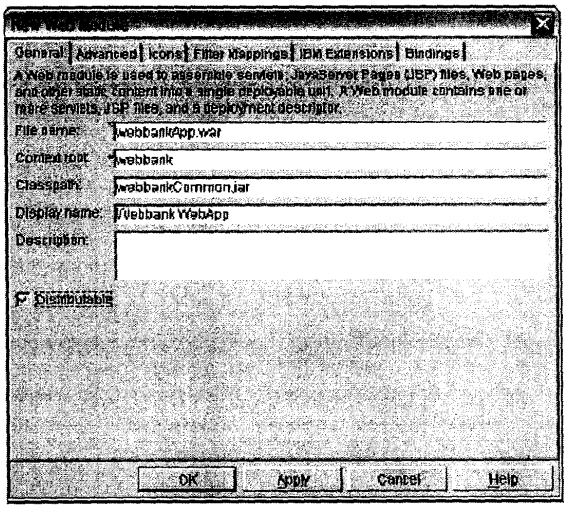
完成之後，我們便可將各種相關檔案，或Java Bean加入這個

module。

3 New一個 Web module

Step1:在左邊的pane選擇new一個 Web Module entry 。

Step2.輸入Web Module各個propertie值。



Step3. Click OK when you are done.

完成之後，我們便可將各種相關檔案，或Servlet加入這個 Web module。

第四章 IBM Tivoli Storage Manager for Application Servers

4.1 IBM Tivoli Storage Manager for Application Servers Overview

IBM Tivoli Storage Manager for Application Servers (Data Protection for WAS)是IBM Tivoli Storage Manager Client端產品。它可以經由 Tivoli Storage Manager backup-archive client 指令行介面或web client 來備份、還原及查詢 WAS 5.0之元件。不過，Data Protection 並不會備份application 資料。

4.1.1 WAS backup

Data Protection for WAS 允許備份單一的 Application Server 或Network Deployment configurations of WebSphere Application Servers. 它提供下列的backup 模式:

Full – 完全備份下列資料

* Configuration information from the WAS Configuration depository
* All files in the properties directory
* WAS Version 5.0 installed Web applications

Differential – 備份上次full 備份到目前友有變更的檔案

4.1.2 WAS Query

Data Protection for WAS 允許查詢Tivoli Storage Manager Server 有關 WAS backups and WAS instances的相關資料. 查詢可經由 **query was** 指令。

4.1.3 WAS Restore

Data Protection for WAS 允許 restore full or differential WAS 備份。我們也可以經由Tivoli Storage Manager backup-archive client **pittime** and **pitdate** 選項還原特定日期或時間的檔案資料。

4.2 安裝 Data Protection for WAS

4.2.1 安裝 Data Protection for WAS 在 AIX

假設機器的CD-ROM 是在 /dev/cd0的目錄下。

1. 插入包含client package 的 CD-ROM。
2. 以 root 身份登入。
3. 打 **smitty install 指令.**
4. 選擇 Install and Update Software. Press Enter.
5. 選擇 Install and Update from LATEST Available Software. Press Enter
6. 敲入 **/dev/cd0** in the Entry Field for INPUT device / directory for software.Press Enter.
7. 選擇 SOFTWARE to install option. 按 F4。
8. 選擇 the Data Protection for WAS package (tivoli.tsm.client.was.32bit) 然後按 F7 、 Enter.
9. 當 Install and Update from LATEST Available Software window 出現， 指定 Yes 在 " ACCEPT new license agreements? ". 按 Enter.
10. window 出現提示訊息:

    ARE YOU SURE?

Press Enter 。

11. 成功安裝 Data Protection for WAS之後, 按F10 to 退出。

4.2.2 安裝 Data Protection for WAS **Windows**

假設 CD-ROM 是在d:\。

1. 將Data Protection for WAS CD-ROM 插入d 槽.
2. Windows 將自動執行安裝精靈程式。
3. 接受合約說明，一直按"下一步"，直到安裝結束。
4. 在DOS模式下，鍵入

```
c:\dsmc show plugins
```

5. 如果出現下列訊息，則表示安裝正常。

```
Tivoli Storage Manager
Command Line Backup/Archive Client Interface - Version 5, Release 2, Level 0.0
(c) Copyright by IBM Corporation and other(s) 1990, 2003. All Rights Reserved.

<<< Installed plug-ins: >>>
*****************************************************
Tivoli Storage Manager WAS Utility
*****************************************************
plug-in name : PIWAS
library name : piwas.dll
library path : .\plugins\piwas.dll
function map : 0xB0000001
plug-in type : WAS
plug-in ver. : 5.2.0
```

4.3 Backup WAS 指令

4.3.1 Before Back up

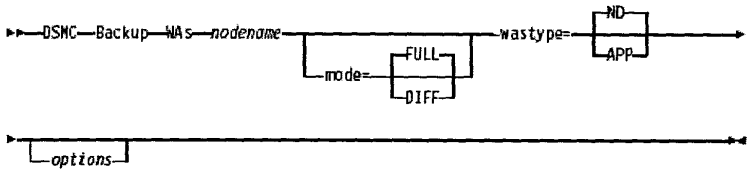
在back up WAS之前，必須確認兩件事情：

1. 確認Application Server 正常運作中

2. 確認WAS configuration repository 沒有被鎖住，且正常運作中

4.3.2 Backup WAS 指令

Backup was 指令備份Network Deployment Manager 或 Application Server 到 Tivoli Storage Manager Server. 只有 *root* user 可以執行 **backup was**指令。以下是backup was 指令之語法：



參數之說明如下：

nodename

指定要備份之 node 名稱.

To back up multiple WAS instances, use a separate session for each WAS instance you want to back up.

-mode=**DIFF|FULL**

指定要備份之型態-Full 或 Diff.

You can specify:

Full Data Protection for WAS performs a full back up of the specified WAS node. This is the default.

DIFF Data Protection for WAS performs a differential backup of the specified WAS node. If an active full backup does not exist, Data Protection for WAS performs a full backup instead of a differential backup.

-wastype=**ND|APP**

指定要備份之 Node 型態--ND or APP.

You can specify:

ND Specifies that the WAS instance is a Network Deployment Manager configuration. This is the default.

APP Specifies that the WAS instance is a stand-alone Application Server configuration.

-options

INActive 同時指出active and inactive backups。

By default, Data Protection for WAS displays only the latest active Network Deployment Manager and Application Server backups. Use the ***inactive*** option to display both active and inactive backups. You can specify the ***pick*** option with this option (during restore processing) to display the backup versions that match the WAS specification you enter. Available with the **query was** and **restore was** commands.

Example

```
dsmc query was -wastype=app -inactive
```

Pick 產生backup版本之表列

Creates a list of backup versions that match the WAS specification you enter. You can select the backup version to restore from the list that displays. Available with the **restore was** command.

Example

dsmc restore was thunderMgr -wastype=nd -pick -inactive

PITDate 指定所要restore或display之最近備份之日期

Specifies the date at which you want to display or restore the latest version of your backups. WAS files backed up on or before the specified date are processed.

Backup versions you create after this date are ignored. You can specify the ***pittime*** option with this option to establish a time (as well as a date) at which you want to display or restore the latest version of your backups.

Available with the **query was** and **restore was** commands.

Example

dsmc query was thunderMgr -wastype=app -pitdate=01/16/03

PITTime 指定所要restore或display之最近備份之時間

Specifies the time at which you want to display or restore the latest version of your backups. WAS files backed up on or before the specified time are processed.

Backup versions you create after this time are ignored. Specify this option with the *pitdate* option to establish a time (along with a date) at which you want to display or restore the latest version of your backups.

Available with the **query was** and **restore was** commands.

Example

```
dsmc restore was lightning -wastype=nd
-pittime=08:56:15
```

4.4 Backup WAS 範例

以下是實做的範例說明：

範例 1

這個指令執行Network Deployment Manager node differential 備份。node name=*pint* on an AIX client:

dsmc backup was pintoMgr -mode=diff -wastype=nd

```
Tivoli Storage Manager
Command Line Backup/Archive Client Interface - Version 5, Release 2, Level 0.0
(c) Copyright by IBM Corporation and other(s) 1990, 2003. All Rights Reserved.

Node Name: WAS5_PINTO
Session established with server NEXTO: AIX-RS/6000
  Server Version 5, Release 2, Level 0.0
  Server date/time: 01/22/03   14:12:31  Last access: 01/22/03   14:10:39

Backup WAS function invoked mode- DIFFERENTIAL.

ANS1960I Contacting the WebSphere DeploymentManager. This step could take a few
minutes...
Normal File-->            2,312 /usr/WebSphere/DeploymentManager/properties/sch
emas/examples/XMLSchemaValidatorConfig.class [Sent]
Normal File-->            4,359 /usr/WebSphere/DeploymentManager/properties/sch
emas/examples/XMItoXSIType.class [Sent]
Normal File-->           88,208 /usr/WebSphere/DeploymentManager/config/temp/wa
sFileList.txt [Sent]
Backup processing of '/usr/WebSphere/DeploymentManager/config/temp/wasFileList.t
xt' finished without failure.

Total number of objects inspected:      997
Total number of objects backed up:      997
Total number of objects updated:          0
Total number of objects rebound:          0
Total number of objects deleted:          0
Total number of objects expired:          0
Total number of objects failed:           0
Total number of bytes transferred:    34.46 MB
Data transfer time:                    2.33 sec
Network data transfer rate:       15,137.08 KB/sec
Aggregate data transfer rate:      1,165.33 KB/sec
Objects compressed by:                    0%
Elapsed processing time:           00:00:30
ANS1960I Contacting the WebSphere DeploymentManager. This step could take a few
minutes...
ANS5545I WAS Processing has successfully completed.
```

範例 2

這個指令執行Network Deployment Manager node Full 備份。node name=*pinto* on an AIX client:

dsmc backup was pintoMgr -mode=full -wastype=nd

```
Tivoli Storage Manager
Command Line Backup/Archive Client Interface - Version 5, Release 2, Level 0.0
(c) Copyright by IBM Corporation and other(s) 1990, 2003. All Rights Reserved.

Node Name: WAS5_PINTO
Session established with server NEXTO: AIX-RS/6000
  Server Version 5, Release 2, Level 0.0
  Server date/time: 01/22/03   14:17:43  Last access: 01/22/03   14:15:01

Backup WAS function invoked mode= FULL.

AMS1960I Contacting the WebSphere DeploymentManager. This step could take a few
minutes...
Normal File-->             2,312 /usr/WebSphere/DeploymentManager/properties/sch
emas/examples/XMLSchemaValidatorConfig.class [Sent]
Normal File-->             4,359 /usr/WebSphere/DeploymentManager/properties/sch
emas/examples/XMItoXSIType.class [Sent]
Normal File-->            88,208 /usr/WebSphere/DeploymentManager/config/temp/wa
sFileList.txt [Sent]
Backup processing of '/usr/WebSphere/DeploymentManager/config/temp/wasFileList.t
xt' finished without failure.

Total number of objects inspected:      997
Total number of objects backed up:      997
Total number of objects updated:          0
Total number of objects rebound:          0
Total number of objects deleted:          0
Total number of objects expired:          0
Total number of objects failed:           0
Total number of bytes transferred:    34.46 MB
Data transfer time:                    2.85 sec
Network data transfer rate:        12,355.21 KB/sec
Aggregate data transfer rate:       1,128.81 KB/sec
Objects compressed by:                    0%
Elapsed processing time:             00:00:31
AMS1960I Contacting the WebSphere DeploymentManager. This step could take a few
minutes...
AMS5545I WAS Processing has successfully completed.
```

範例 3

這個指令執行Network Deployment Manager instance-inst1 Full 備份。Node name=*pinto* on an AIX client:

dsmc backup was pinto_ndinst1 -mode=full -wastype=nd

```
Tivoli Storage Manager
Command Line Backup/Archive Client Interface - Version 5, Release 2, Level 0.0
(c) Copyright by IBM Corporation and other(s) 1990, 2003. All Rights Reserved.

Node Name: WA55_PINTO
Session established with server NEXTO: AIX-RS/6000
  Server Version 5, Release 2, Level 0.0
  Server date/time: 01/22/03   14:27:22  Last access: 01/22/03   14:24:46

Backup WAS function invoked mode= FULL.

ANS1960I Contacting the WebSphere DeploymentManager. This step could take a few
minutes...

Normal File-->5,881 /wasfs/ndinst1/properties/ffdcRun.properties [Sent]
Normal File-->8,669 /wasfs/ndinst1/properties/sas.stdclient.properties [Sent]
Normal File-->5,482 /wasfs/ndinst1/properties/wsadmin.000 [Sent]
Normal File-->2,657 /wasfs/ndinst1/properties/j2c.properties [Sent]
Normal File-->3,199 /wasfs/ndinst1/properties/servletcache.dtd [Sent]
Normal File-->2,561 /wasfs/ndinst1/properties/soap.client.000 [Sent]
Directory-->512 /wasfs/ndinst1/config/temp [Sent]
Normal File-->9,177 /wasfs/ndinst1/config/temp/wasFileList.txt [Sent]
Backup processing of '/wasfs/ndinst1/config/temp/wasFileList.txt' finished without failure.

Total number of objects inspected:      155
Total number of objects backed up:      155
Total number of objects updated:          0
Total number of objects rebound:          0
Total number of objects deleted:          0
Total number of objects expired:          0
Total number of objects failed:           0
Total number of bytes transferred:    12.13 MB
Data transfer time:                    1.61 sec
Network data transfer rate:        7,714.72 KB/sec
Aggregate data transfer rate:      1,121.95 KB/sec
Objects compressed by:                    0%
Elapsed processing time:           00:00:11
ANS1960I Contacting the WebSphere DeploymentManager. This step could take a few
minutes...
ANS5545I WAS Processing has successfully completed.
```

範例 4

這個指令執行Application Server Full 備份。Node name=*ARJ123* on a windows client:

dsmc backup was ARJ123 -mode=full -wastype=app

```
Tivoli Storage Manager
Command Line Backup/Archive Client Interface - Version 5, Release 2, Level 0.0
(c) Copyright by IBM Corporation and other(s) 1990, 2003. All Rights Reserved.

Node Name: KHEST
Session established with server NEWEST: AIX-RS/6000
  Server Version 5, Release 2, Level 0.0
  Server date/time: 01/15/2003 16:42:42  Last access: 01/15/2003 16:36:48

Backup WAS function invoked mode= FULL.

ANS1960I Contacting the WebSphere Application Server. This step could take a few
 minutes...

Normal File-->198 \\arj123\c$\Program Files\WebSphere\AppServer\propties\version\
deployutils.component [Sent]
Normal File-->196 \\arj123\c$\Program Files\WebSphere\AppServer\properties\version\
distexcep.component [Sent]
Normal File-->190 \\arj123\c$\Program Files\WebSphere\AppServer\properties\version\
drs.component [Sent]
Normal File-->196 \\arj123\c$\Program Files\WebSphere\AppServer\properties\version\
dynacache.component [Sent]
Normal File-->194 \\arj123\c$\Program Files\WebSphere\AppServer\properties\version\
ecutils.component [Sent]
Normal File-->199 \\arj123\c$\Program Files\WebSphere\AppServer\properties\version\
ejbcoiner.component [Sent]
Normal File-->198 \\arj123\c$\Program Files\WebSphere\AppServer\properties\version\
ejbrtable.component [Sent]
Normal File-->293,094 \\arj123\c$\Program Files\WebSphere\AppServer\config\temp\
wasFileList.txt [Sent]
Backup processing of 'C:\PROGRAM FILES\WEBSPHERE\APPSERVER\CONFIG\TEMP\
WASFILELIST.TXT'
finished without failure.

Total number of objects inspected:    1,509
Total number of objects backed up:    1,509
Total number of objects updated:          0
Total number of objects rebound:          0
Total number of objects deleted:          0
Total number of objects expired:          0
Total number of objects failed:           0
Total number of bytes transferred: 39.53 MB
Data transfer time:                949.77 sec
Network data transfer rate:         42.62 KB/sec
Aggregate data transfer rate:       34.20 KB/sec
Objects compressed by:                 0%
Elapsed processing time:           00:19:43
ANS1960I Contacting the WebSphere Application Server. This step could take a few
minutes...
ANS5545I WAS Processing has successfully completed.
```

範例 5

這個指令執行Application Server difference 備份。Node name=*ARJ123* on a windows client:

```
dsmc backup was ARJ123 -mode=diff -wastype=app
```

```
Tivoli Storage Manager
Command Line Backup/Archive Client Interface - Version 5, Release 2, Level 0.0
(c) Copyright by IBM Corporation and other(s) 1990, 2003. All Rights Reserved.

Node Name: KHEST
Session established with server MEMEST: AIX-RS/6000
  Server Version 5, Release 2, Level 0.0
  Server date/time: 01/15/2003 15:23:20  Last access: 01/15/2003 14:42:39

Backup WAS function invoked mode= DIFFERENTIAL.

ANS1960I Contacting the WebSphere Application Server. This step could take a few
 minutes...

Normal File-->669 \\arj123\c$\Program Files\WebSphere\AppServer\properties\version\dtd\
websphere.xsd [Sent]
Normal File-->293,094 \\arj123\c$\Program Files\WebSphere\AppServer\config\temp\
wasFileList.txt [Sent]
Backup processing of 'C:\PROGRAM FILES\WEBSPHERE\APPSERVER\CONFIG\TEMP\
WASFILELIST.TXT' finished
without failure.

Total number of objects inspected:    1,508
Total number of objects assigned:     1,231
Total number of objects backed up:    277
Total number of objects updated:          0
Total number of objects rebound:          0
Total number of objects deleted:          0
Total number of objects expired:          0
Total number of objects failed:           0
Total number of bytes transferred: 39.43 MB
Data transfer time:                 947.73 sec
Network data transfer rate:          42.61 KB/sec
Aggregate data transfer rate:        38.18 KB/sec
Objects compressed by:                   0%
Elapsed processing time:           00:17:37
ANS1960I Contacting the WebSphere Application Server. This step could take a few
 minutes...
ANS5545I WAS Processing has successfully completed.
```

第六章 研習心得與建議

IBM WebSphere Application Server 在電子商務協同運作(Electronic Collaborative Business)環境下，提供一個穩定且可信賴的軟體基礎架構。它讓企業策略和資訊技術之間關係更為密切，讓企業能夠很簡單的創造及經營一個動態的電子商務。藉由此次實習經驗，對於如何建構及備份 IBM Application Server 有更深入之瞭解，相信可以運用此經驗提供建制電子商務協同運作平台相當的技術支援，更有助於資訊系統之整合及運作。