Deploying Microsoft Web Application Server on Oracle Compute Cloud Service

Setup and Configuration

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Introduction

The Oracle Compute Cloud Service is Infrastructure as a Service (IaaS) that can run any workload in the cloud. That includes Microsoft .NET and Internet Information Services (IIS) web applications, as well as Java and open source technologies. These options provide organizations flexibility and choice when moving new and existing applications to the cloud.

Organizations have complete control over the deployment and configuration of their legacy and modern .NET and IIS applications within Oracle Compute Cloud Service. This paper describes how to install and configure IIS and Oracle Data Provider for .NET (ODP.NET) on a Oracle Compute Cloud Service, then connect to an Oracle Database Cloud Service. It will demonstrate the following technologies and steps:

» **Creating an Oracle Compute Windows Instance**. This section describes how to create a Windows Server instance in the Oracle Compute Cloud Service.
» **Remote Desktop and Network Configuration**. This section describes how to configure Oracle Compute Cloud Service for Remote Desktop access and network access to the Windows instance.
» **Oracle Database Cloud Service connection information.** This section describes how to obtain Oracle Database Cloud Service connection information.
» **Microsoft Internet Information Services.** This section describes the steps needed to install and configure IIS on the Oracle Compute Cloud Service. The steps are needed only if IIS will host web applications.
» **Web Deployment.** This section describes how to enable Web Deployment on your Oracle Compute Cloud Service. The steps are needed only if Web Deploy will be used when deploying IIS-based applications to the Oracle Compute Cloud Service.
» **Creating and deploying a Web application.** This section describes how to create and deploy a simple web application to the Oracle Compute Cloud Service from Microsoft Visual Studio. This section is useful for those who are not familiar with Web Deploy and want to use it to deploy to the Oracle Cloud.

Oracle Compute Cloud Service currently supports Windows Server 2012 R2 and Windows Server 2008 R2. This white paper will use Windows Server 2012 R2 in its demonstration steps.

Creating an Oracle Compute Windows Instance

This section guides how to create an Oracle Compute Windows instance. Microsoft Windows Server images are available from the Oracle Cloud Marketplace for use within Oracle Compute.

1. Sign in to Oracle Cloud Marketplace. Search for "Microsoft Windows Server 2012 R2" and select that Windows image.

2. Think of a strong password for the Windows Administrator of your instance and keep the password handy. Ensure that the password meets the Windows password complexity requirements.

3. Click **Get App** button and follow the process to create an instance using the web console.

The remaining steps are the same as creating a generic instance for Oracle Compute from the Oracle Cloud Marketplace. If you're unfamiliar with those steps, this Oracle Compute Cloud (IaaS) documentation page will guide you.

When this Compute service is created, remember the Administrator password. This password will be needed when logging in through Microsoft Remote Desktop. Once you have completed creating the Compute instance, proceed to the next section.

Connecting to the Oracle Cloud: Remote Desktop and Network Configuration

This section describes how to enable Microsoft Remote Desktop Protocol (RDP) access and configure the Windows instance network access. These steps allow you to connect to the Windows cloud instance directly to setup and administer the IIS web server, deploy applications to the instance, and permit your end users to access the application.

Port 3389 should be configured to allow RDP access. Port 80, 443, and 8172 should be configured for HTTP, HTTPS, and msdeploy (Web Deploy) access, respectively. The network ports can be configured in the Oracle Public Cloud management portal.

1. Login to the Oracle Cloud My Services dashboard.

2. Navigate to the Compute section and click on the **Open Service Console** button.

3. Select the **Network** tab in the Service Console for the Oracle Compute Cloud Service.

4. Click on the **Security Applications** menu item to create the following security application:

   a. rdp for tcp protocol and port 3389

   b. http for tcp protocol and port 80

   c. https for tcp protocol and port 443

   d. msdeploy for tcp protocol and port 8172

5. Click on the **Security Lists** menu item to create a security list for the instance. Specify DENY for the inbound policy and PERMIT for the outbound policy.

6. Click on the **Security IP Lists** menu item to create a security IP list if necessary.

7. Click on the **Security Rules** menu item to create security rules from the security IP list (public-internet) to the just created security list for http, https, rdp, and msdeploy.

8. To associate the security list with the newly created Oracle machine instance:

   a. Click on **Instances** in the Oracle Compute menu.

   b. Find the machine instance you plan to configure and click on the hamburger button to its right. Choose **View** from the expanded list.

   c. Under **Security Lists**, click the **Add to Security List** button. Choose the security list you just created and click the **Add** button.

   d. Delete the default security list by clicking on its hamburger menu to its left and choosing **Remove from Security List**.

Oracle Database Cloud Service Connection Information

The Oracle Database Cloud Service connection information can be determined from the Oracle Public Cloud portal. This tutorial assumes you have already created a database cloud service.

1. Navigate to the Oracle Database Cloud Service section of the Oracle Public Cloud portal.
2. Click **Service Console** for the Oracle Database Cloud Service.
3. Select the service instance to which you want to connect. Where it says **Additional Information**, select **Show More**.
4. Look at **Connect String**, which uses the following format: <hostname>:<port>/<service_name>

You may need the fully-qualified hostname. Alternatively, you can use the IP address instead. To determine this information:

1. Select the **Service Console** for the Oracle Compute Cloud Service.
2. Select **View** for the instance for the database service from the hamburger menu.
3. Look at **DNS Name** for the fully-qualified hostname of the database service or **Public IP Address** for its IP address.

Installing Microsoft Internet Information Services

This section describes how to install Microsoft IIS, which is required for hosting web content. IIS installation and eventual setup requires using the just configured RDP connection.

1. Open Microsoft Remote Desktop from the Windows client.
2. Enter the Oracle Compute Cloud Service's public IP into the Computer field.
3. Enter the user name: Administrator
4. Enter the password. The password was provided during the instance creation process.
5. Click **Ok**.
6. The IIS Web Server role, **Web Server (IIS)**, can be enabled by using the graphical Server Manager or command line.
   a. The graphical Server manager installation instructions are available [here](#).
   b. Alternatively, execute the Deployment Image Servicing and Management (DISM.exe) present on the machine from the command line using:

   > **DISM.EXE /enable-feature /online /featureName:IIS-WebServerRole /featureName:IIS-WebServer**

7. Verify the Web Server (IIS) is running once done enabling it.

Web Deployment

This section describes the steps required to deploy a web application to Oracle Compute Windows instance.

Enable Server Roles

Enable following server roles:

» ASP.NET
» Management Service

ASP.NET

ASP.NET is required for running ASP.NET-based managed web applications. It can be installed by selecting this option under **Application Development** on the **Web Server Role (IIS)** → **Role Services** page in Server Manager.

Alternatively, this task can be performed from the command line by executing the following:

> **DISM.EXE /enable-feature /all /online /featureName:IIS-ASPNET45**

In this command, ASP.NET 4.5 is installed.

IIS Management Service

The IIS Management Service is required for remotely managing the web server and remotely deploying and administrating web applications. It can be installed by selecting the option under **Management Tools** on the **Web Server Role (IIS) → Role Services** page in Server Manager.

Alternatively, this task can be performed from the command line by executing:

> **DISM.EXE /enable-feature /all /online /featureName:IIS-ManagementService**

Web Deployment Tool Installation

Web Deploy can be used to migrate, manage and deploy IIS Web Servers, Web applications and Websites.

Installing IIS Deployment Handler feature in the Web Deployment Tool allows integration with Web Management Service and allows users to perform remote operations.

Download the Web Deployment Tool from the Microsoft Web Deploy download page to the Oracle Compute instance. Oracle recommends using the 64-bit version.

You will have to adjust the browser security settings if you download this file from the internet.

1. Go to Internet Explorer.
2. Choose **Internet Options** from Tools in the menu bar.
3. Click on the Security tab.
4. Click on the Internet icon.
5. Click on the **Custom Level** button.
6. Scroll down to the **Downloads → File Download** setting and select **Enable**.
7. Click **Ok** twice to exit.

Web Deploy can be installed from the command line in silent mode using the command:

> **msiexec /i WebDeploy_amd64_en-US.msi ADDLOCAL=ALL LicenseAccepted="0" /qn**

Note: The command will return immediately, but the Windows Installer process may still be running and the installation may take a few minutes to complete.

You may execute the below command instead to display a progress bar to indicate the installation status.
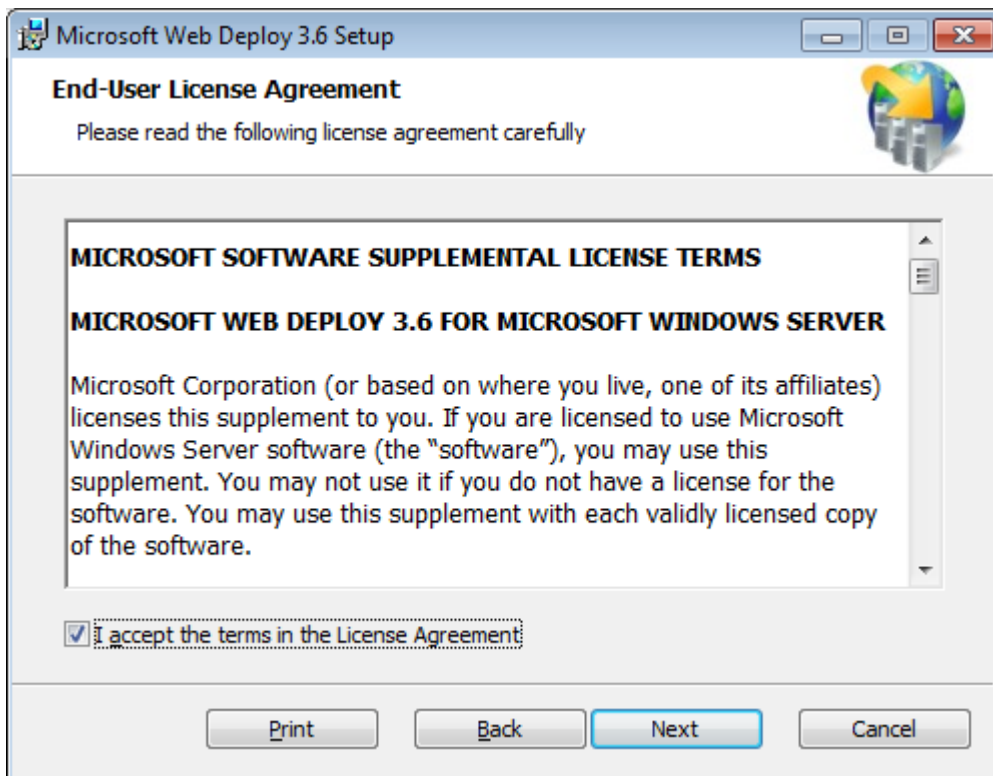
> **msiexec /i WebDeploy_amd64_en-US.msi ADDLOCAL=ALL LicenseAccepted="0" /passive**

Alternatively, the GUI installer can be used by running the MSI file that was downloaded.
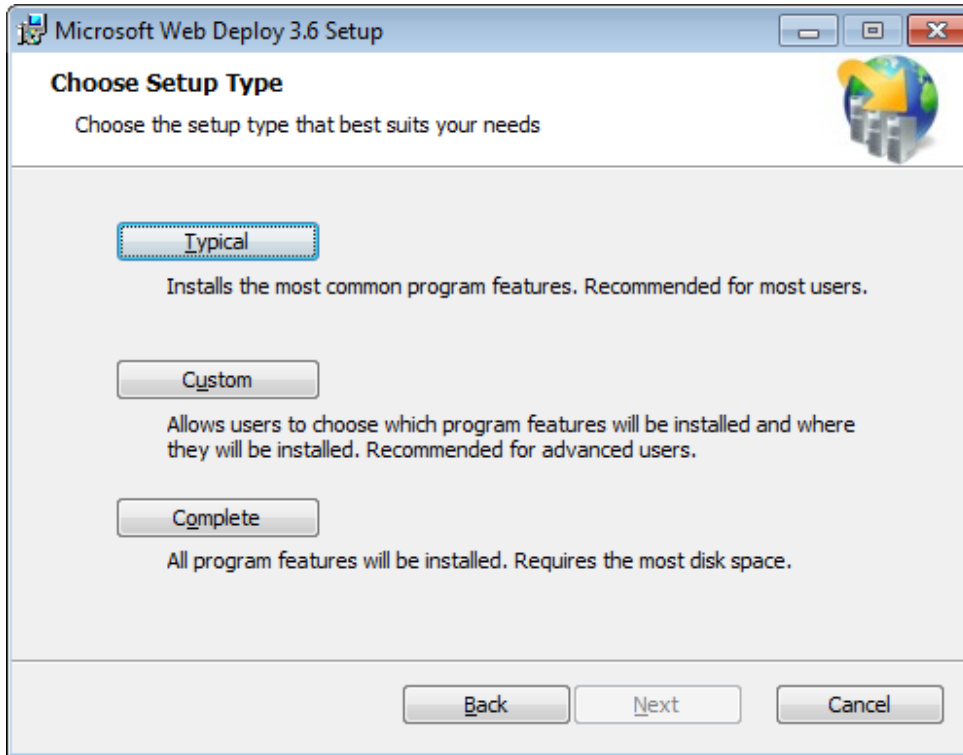
1. Double click the MSI file to begin installation.
2. Click the **Next** button.
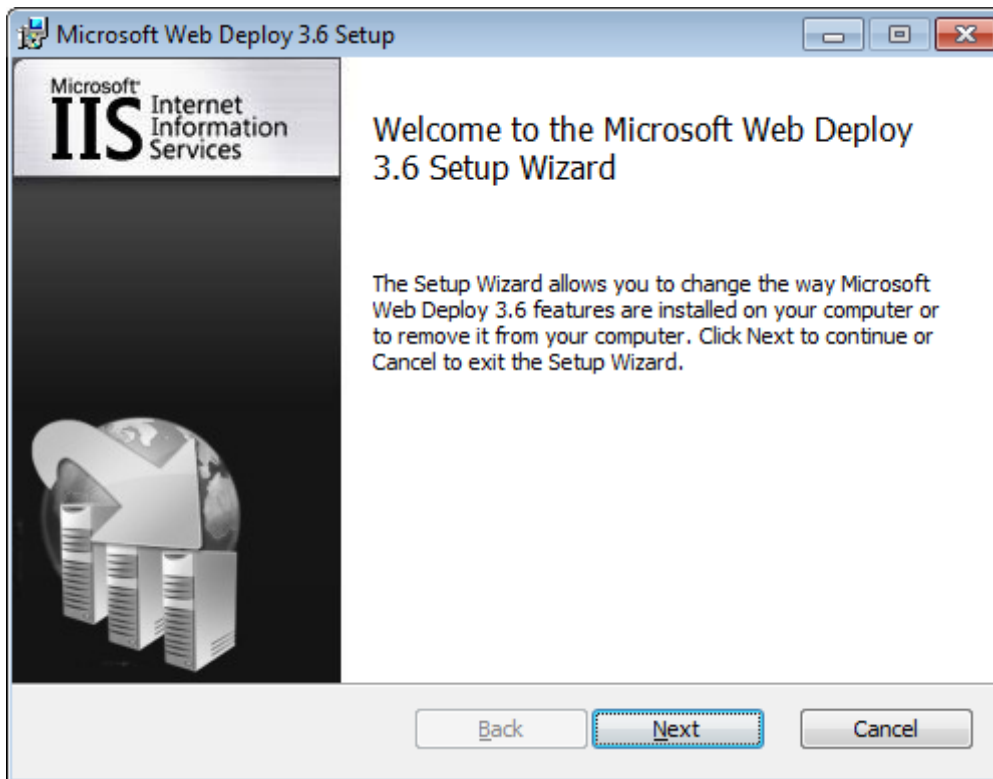
3. Accept the license agreement and click on the **Next** button.

4. Choose Setup Type **Complete** so that IIS Deployment Handler will also be installed. Or choose **Custom** Setup Type and select the IIS Deployment Handler feature.

5. Click on **Install** button to begin installation

Configure Web Deploy for a Non-Administrator

When a web application is published from Visual Studio using Web Deploy, a username and password need to be specified. The user will be authenticated by Web Deploy on IIS, and that user must have the privileges to deploy the web application. First, a Windows user needs to be created on the IIS. Then, IIS Manager can be used to authorize that Windows user. This step can be configured from either command line or IIS Manager:

Command Line Web Deploy Configuration

Execute **SetupSiteForPublish.ps1** as documented by Microsoft for automating Web Deploy setup.

For example, let's publish for a Windows user named **Oracle** on the existing website, **Default Web Site**, and save the publish settings file **Oracle_Default Web Site.PublishSettings** onto the Windows Administrator Desktop. From the PowerShell command window, execute **SetupSiteForPublish.ps1** from '%programfiles%\IIS\Microsoft Web Deploy v3\Scripts'" directory as below:

> **.\SetupSiteForPublish.ps1 -siteName "Default Web Site" -deploymentUserName Oracle -publishSettingSavePath C:\Users\Administrator\Desktop -publishSettingFileName "Oracle_Default Web Site.PublishSettings"**
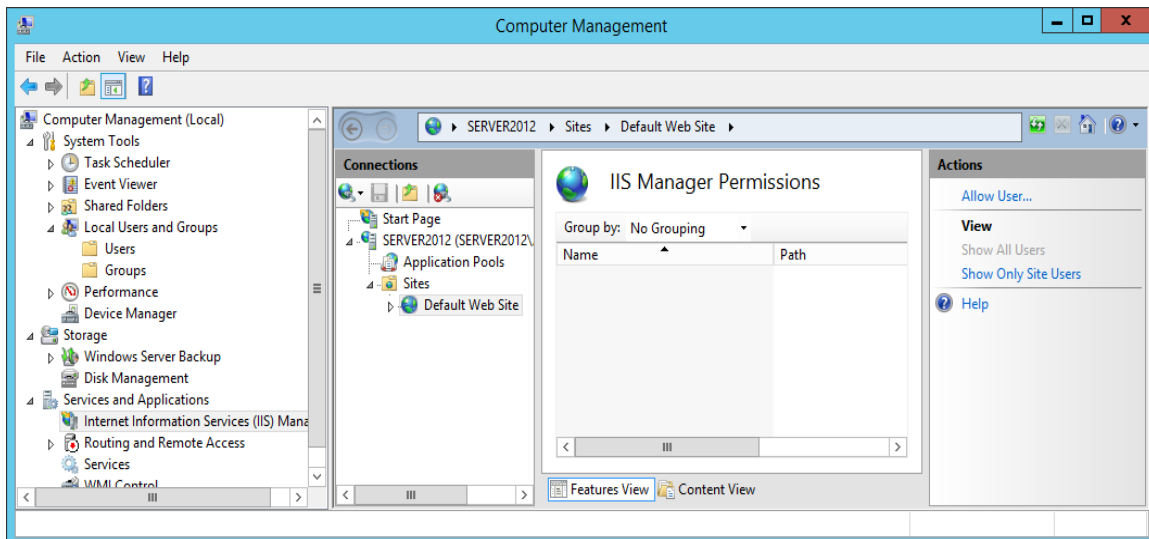
Note: The **Oracle_Default Web Site.PublishSettings** file will contain the deployment user name's password.

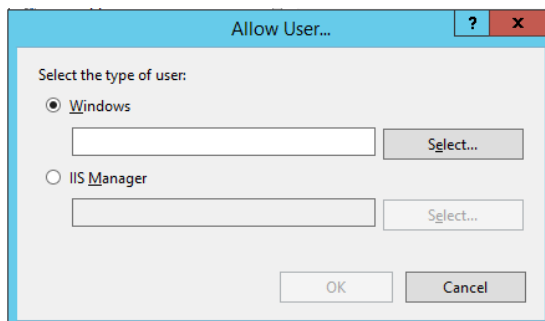**IIS Manager Web Deploy Configuration**

1. In IIS Manager, select **Default Web Site**, and double-click on **IIS Manager Permissions**.
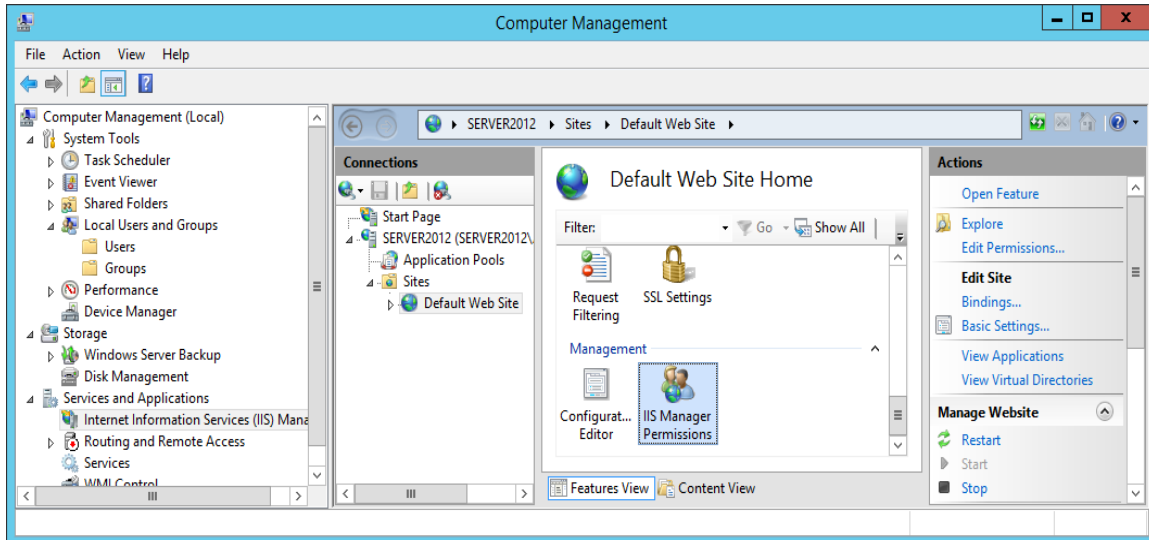

2. In the Actions pane, click **Allow User**.

In the Allow User dialog box, with **Windows** selected, click **Select**, and select a Windows user. Then, click on **OK**.

3. In IIS Manager, right-click **Default Web Site**, and from the Deploy sub-menu, select **Configure Web Deploy Publishing**. If you don't see the Deploy sub-menu, exit out of IIS Manager and reopen it.

Click the down arrow for **Select a user to give publishing permissions**, and select the Windows user to authorize, such as **Oracle**. Then, click **Setup**.
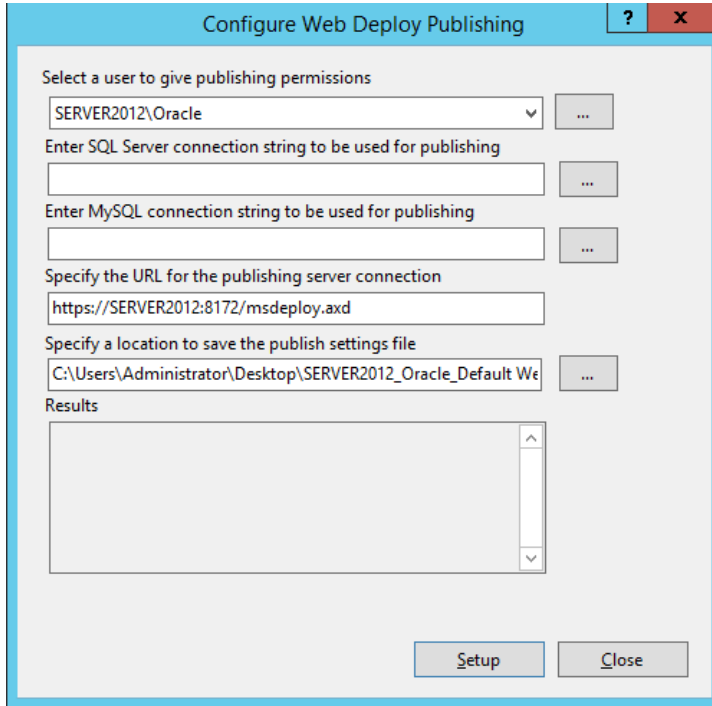
4. The Windows user will be authorized to deploy a web application using Web Deploy.

A PublishSettings file will also be generated. This file can be copied to the client where Visual Studio is, then imported by the Publish Web wizard. It then needs to be configured.

   a. The web application name will need to be appended to the site name and the destination URL.

   b. The machine name will need to be replaced with the IP address or DNS name of the Oracle Compute instance.

   c. The password needs to be entered in the Publish Web wizard.
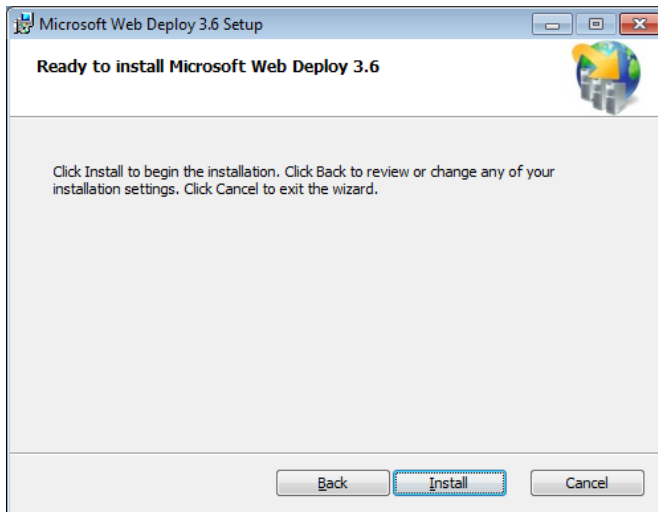
Creating and Deploying a Web Application

This section describes the steps to create and deploy an ASP.NET application that uses ODP.NET from on-premises to Oracle Compute Windows instance.

Creating a Website Application

Create an ASP.NET website application using the following steps:

1. Open Visual Studio 2015.
2. Click **File → New → Project**.
3. In the left pane under **Templates → Visual C#**, select **Web**. In the center pane select **ASP.NET Web Application**. Provide a name and location for the project. Select an appropriate target .NET Framework version from the dropdown at the top of the dialog. .NET Framework 4.0, 4.5, 4.5.1 is included in Windows 2012 R2. .NET Framework 4.5.2 and higher are not included by default, but can be downloaded from the Microsoft website. Click on **OK**.
4. In the **New ASP.NET Project** screen, select **Empty** as a template. Click on **OK**.
5. In the Solution Explorer, right click the project and select **Add → New Item**
6. In the **Add New Item** dialog, select **Visual C# → Web** in the left pane. Select **Web Form** in the middle pane. Select an appropriate name, for example, **default.aspx**. Click on **Add**.

   Note: If you choose an unconventional name for the default page, such as **WebForm1.aspx**, then add this name to the Default Document list in IIS Manager on the web server.
7. Right click on **default.aspx** under the project and select **Set as Start Page**.

Add ODP.NET to the Website Application

Add ODP.NET, Managed Driver to the ASP.NET application so that data access can occur between the middle tier and database server. These steps will outline installation using NuGet package management.

1. Un-GAC and un-configure any existing managed ODP.NET assembly (i.e. **Oracle.ManagedDataAccess.dll**) and policy DLL (i.e. **Policy.4.121.Oracle.ManagedDataAccess.dll**) with the same main major version numbers that exist in the GAC. For example, if you plan to use managed ODP.NET version 12.1.0.2 in your Oracle Compute application, remove all managed ODP.NET 12.1.0.2 references from the GAC.
2. Remove all **Oracle.ManagedDataAccess** references from the **machine.config** file, if any exist.
3. Right click the existing Website project and select **Manage NuGet Packages**.
4. Select **nuget.org** as the package source.
5. In the Search box, search for the package with id, **Oracle.ManagedDataAccess**. Verify that the package uses this unique ID to ensure it is the official Oracle Data Provider for .NET, Managed Driver.
6. Select the package and click on the **Install** button.
7. Accept the license agreement and Visual Studio will continue the setup.

Configuring DataSource Entry in web.config

The web application's **web.config** file needs to be configured properly with a **<dataSource>** entry to connect to the Oracle Database Cloud Service.

The connection information for Oracle Database Cloud Service can be determined from the Oracle Public Cloud portal. The instructions to determine this information was included earlier in the **Oracle Database Cloud Service Connection Information** section of this white paper.

The NuGet package installation creates a **<dataSource>** entry for the **SampleDataSource** alias in the **web.config**, such as what you see below.

```
<dataSources>

        <dataSource alias="SampleDataSource"
descriptor="(DESCRIPTION=(ADDRESS=(PROTOCOL=tcp)(HOST=<host_name>)(PORT=<port>))(CONNECT_DATA=(SERVIC
E_NAME=<service_name>))) "/>

</dataSources>
```

Modify the **<host_name>**, **<port>**, and **<service_name>** placeholders for the **SampleDataSource** alias with the values of the connection string that was obtained from the Oracle Public Cloud portal. You can also change the SampleDataSource name to something more relevant for your application.

ODP.NET Database Connection

The following steps allow the website application to use ODP.NET to connect to the database service:

1. Add a button control to the **default.aspx** web form in the project. Set the button text in its property page to **Open Connection**.
2. Add a Label control to **default.aspx** and set its text to **Connection State**.
3. Add a text box to **default.aspx**.
4. In **default.aspx.cs**, in the section of using directives at the top of the file, add **using Oracle.ManagedDataAccess.Client** to use managed ODP.NET namespace.
5. Double click on the button and add the below code.

```csharp
// C# -- Specify appropriate user id, password, and data source below

string constr = "user id=<user id>;password=<password>;data source=<SampleDataSource>";

try

{

        OracleConnection con = new OracleConnection(constr);

        con.Open();

        TextBox1.Text = con.State.ToString();

}

catch (Exception ex)

{

        TextBox1.Text = ex.Message;

}
```

Deploy Website Application

1. In the website project in Visual Studio 2015, click on **Build → Publish <Project Name>**.
2. In the **Publish Web** dialog, for **Profile**, select **Import** for the publish target.
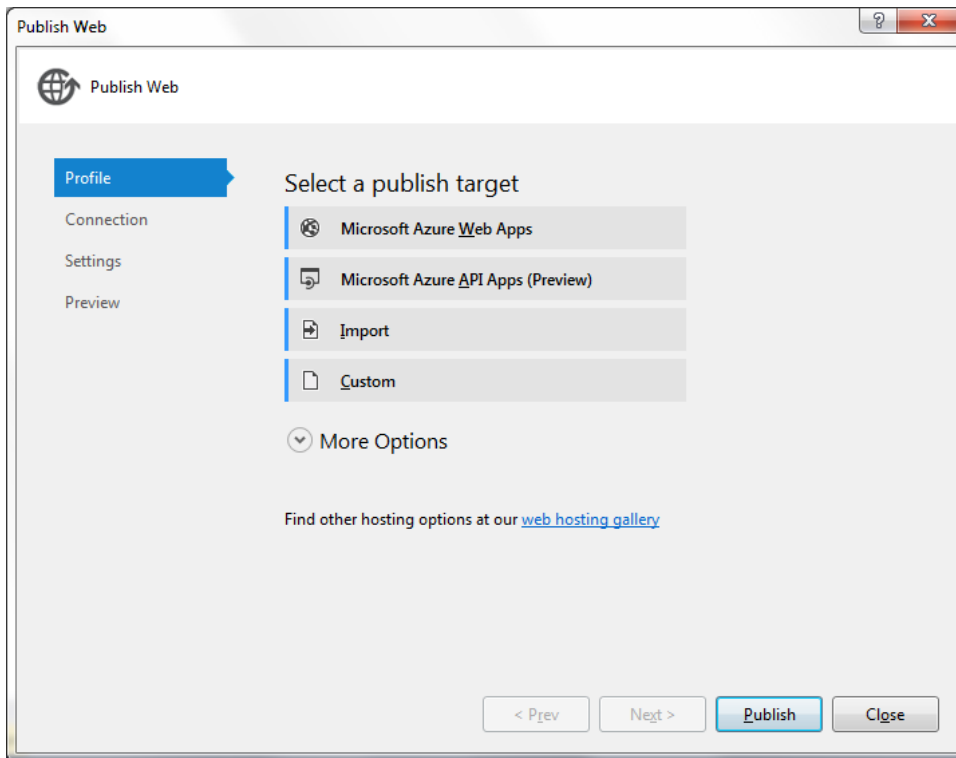
3. In the **Import Publish Settings** dialog, specify the PublishSettings file that was created in the **Configure Web Deploy for a Non-Administrator** section of this white paper. You may have already copied this file from the Oracle Compute instance to your local development machine. Click **OK**.
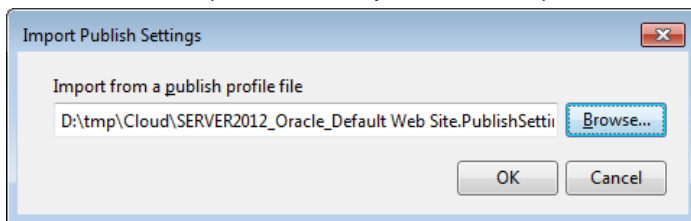
4. In the **Publish Web** dialog, for **Connection**, specify the below values and click the **Publish** button:

   a. **Publish Method**: Web Deploy

   b. **Server**: The virtual machine instance IP address or DNS name needs to be specified, replacing the value from the PublishSettings file. This is the same IP address as you used to connect to the machine via Microsoft Remote Desktop. Use the full URL to the server, including the format for Web Deploy, such as https://<IPaddress>:8172/msdeploy.axd

   c. **Site Name**: The web application needs to be appended to the web site name, replacing the value from the PublishSettings file.

   d. **User Name**: Use the user name from the PublishSettings file. This is the user that was authorized when configuring Web Deploy for a non-administrator.

   e. **Password**: Specify the password for the user name.

   f. **Destination URL**: The virtual machine instance IP address or DNS name needs to be specified, replacing the value from the PublishSettings file using the format **http://<IP address>/<Site Name>**.
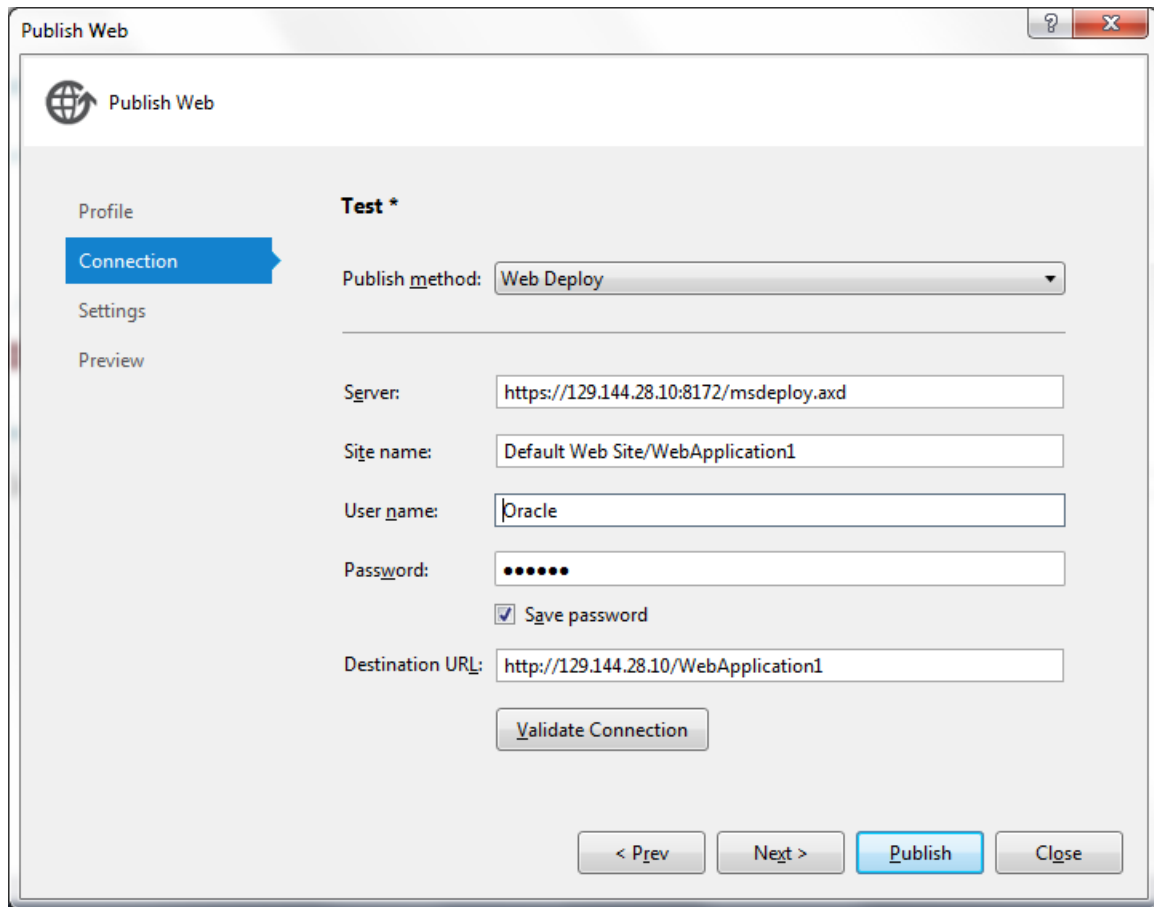
Connect to the Website Hosted on Oracle Compute

With the website published to Oracle Compute instance, you can now connect to it by opening a browser and specifying:

http://<IP or machine name>/<Site Name>

For example,

http://123.123.123.123/WebApplication1

This will load **default.aspx**, which is the startup page. Click the **Open Connection** button and check the connection status in the text box. You should be able to successfully connect from your browser to your Oracle Compute Windows instance running IIS to your Oracle Database Cloud Service.

Conclusion

This white paper demonstrated how to setup Microsoft Windows, .NET, and IIS in the Oracle Public Cloud (IaaS). Through the Oracle Cloud Marketplace, you created an Oracle Compute Windows instance, then installed and set up IIS and .NET on the machine. You then created an ASP.NET application and deployed it to Oracle Compute. The ASP.NET application connected to an Oracle Database Cloud Service. Finally, you were able to use the web application by connecting to the website hosted on Oracle Compute.

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Integrated Cloud Applications & Platform Services

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