http://iringtools.org

Installation Guide

Version 2.00.00

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The total number of pages in this document, including the cover page is 40.

List of Abbreviations

Acronym	Description
iRING	ISO 15926 Realtime Interoperability Network Grid
ISO	International Organization for Standardization
RDSWIP	Reference Data Service Work in Progress
SP	Service Pack
GUI	Graphical User Interface
IIS	Internet Information Services
MIME	Multipurpose Internet Mail Extensions
OLTP	Online Transaction Processing
API	Application Programming Interface
CRUD	Create, Read, Update and Delete
LAN	Local Area Network
FIPS	Federal Information Processing Standard

1 Overview

iRING is a set of information interoperability and integration protocols and reference data that are compliant with the ISO 15926, Parts 7, 8, and 9 standards, which builds and depends on ISO 15926 Parts 1 through 6.

iRINGTools is a set of free, public domain, open source (BSD 3 license) software applications and utilities that implement ***iRING*** protocols. ***iRINGTools*** provide users with production ready deployable solutions. ***iRINGTools*** also provides technology solution providers with usage patterns for the implementation of ***iRING*** protocols in their respective solutions.

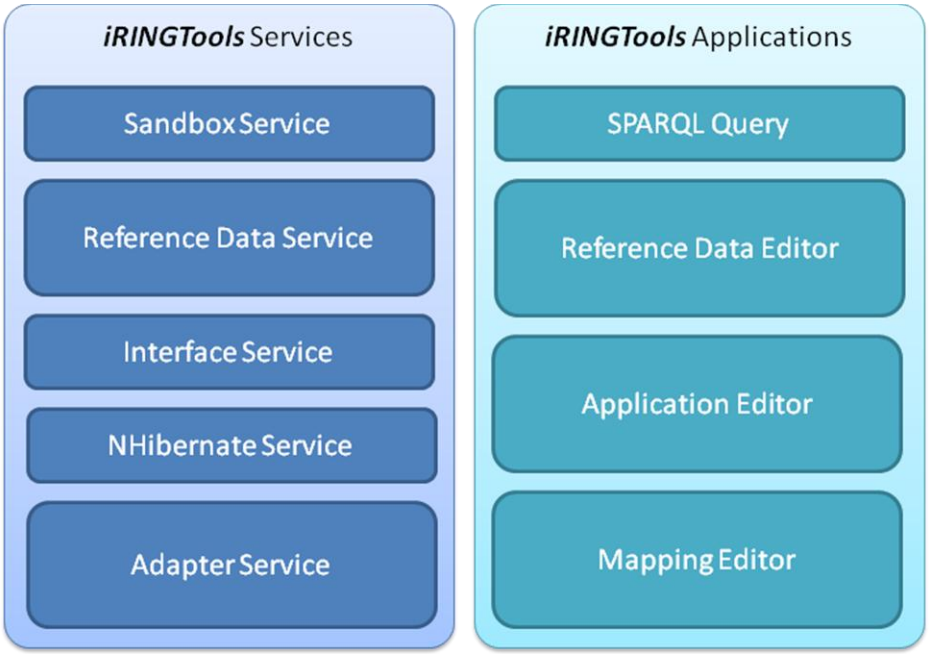
This installation guide provides detailed instructions for the setup of ***iRINGTools***. Once ***iRINGTools*** is setup, it will still need to be configured. Refer to the ***iRINGTools*** Users Guide for configuration.

1.1 Components

iRINGTools is deployed in a single package and includes both ***iRINGTools*** Services and ***iRINGTools*** Applications.

The ***iRINGTools*** Services includes RESTful web services that are hosted in IIS. These services provide the core of the functionality including reference data federation, data access, projection into various XML formats, and semantic repositories.

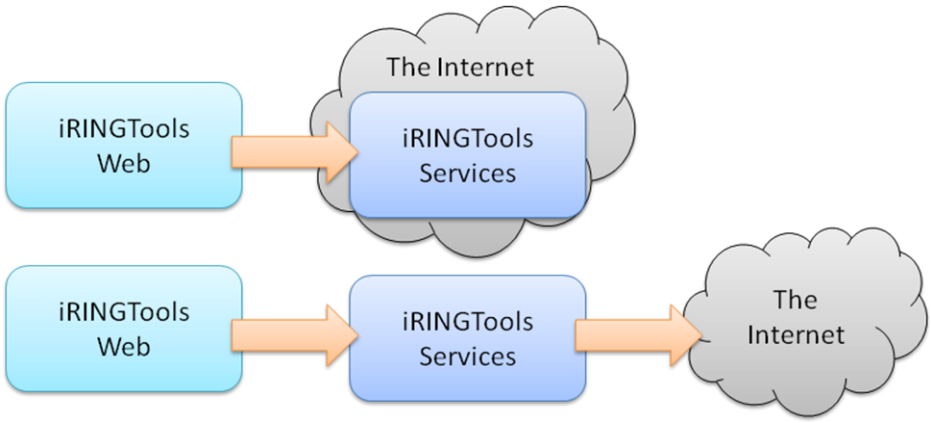
The ***iRINGTools*** Applications includes Silverlight applications that are also hosted in IIS. These applications enable the editing of reference data, scope, application, and mapping configuration and SPARQL query.



These packages work together, but do not need to be installed on the same web server. You need to determine which packages will be configured and where. It is easiest to install both packages on a single machine, but each can be installed on separate machines by deploying ***iRINGTools*** to each server and configuring accordingly. Virtual machines can also be used to host ***iRINGTools***.

1.2 Component Dependencies

Though each component is independent of the other, the ***iRINGTools*** Applications needs access to an ***iRINGTools*** Services.



If only the ***iRINGTools*** Applications will be deployed, then it will require internet access to connect to an existing ***iRINGTools*** Services. The guide assumes that both packages will be deployed, and that the ***iRINGTools*** Applications will use the ***iRINGTools*** Services on the same machine.

1.3 Prerequisites

There are several prerequisites and assumptions that are made in this guide. Some instructions are provided for setting up and configuring the prerequisites, but the instructions may not handle every case. Please see the documentation links provided in the section for each prerequisite for more information.

The base assumptions made are:

- The host server is running Windows Server 2003 SP2.
- You have administrative access to the host server.
- You are able to login to the host server.
- You have basic knowledge of the Windows Operating System and Windows Security.

Older and newer versions of windows are supported, but the installation and configuration may be slightly (and subtly) different for those versions. No instructions will be given on how to properly secure the operating system or the files on the host server. However, instructions will be provided on how to use the specific features of the operating system to properly install ***iRINGTools***.

The following software components are required for this installation:

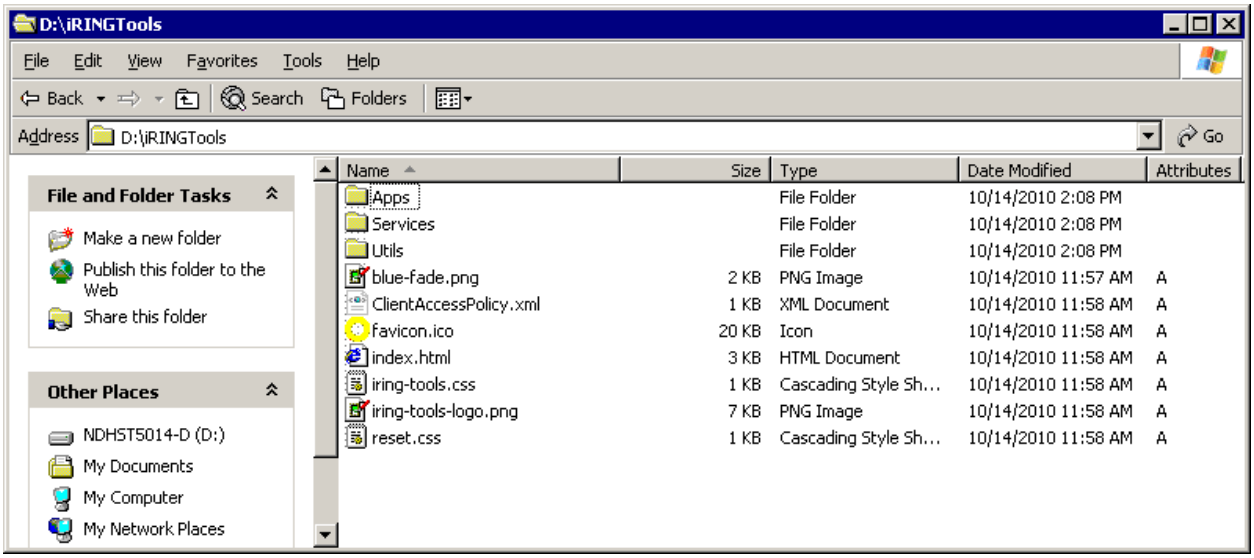
Software Component	Remarks
iRINGTools Components	Use for both services and applications
.NET Framework 4.0	
Internet Information Services	Versions 5.0, 6.0 or 7.0
SQL Server	Adapter uses only for test
Silverlight MIME Extensions	
Silverlight 4.0	

1.4 Preparing for Installation

Download the ***iRINGTools*** components and set the folder permissions.

1.4.1 Downloads

At the ***iRINGTools*** development web site http://code.google.com/p/iring-tools/downloads/list, download iRINGTools-2.0.0.zip. Unzip the downloaded file to a folder on the server called iRINGTools. (The target folder must be iRINGTools to ensure files are properly merged.)

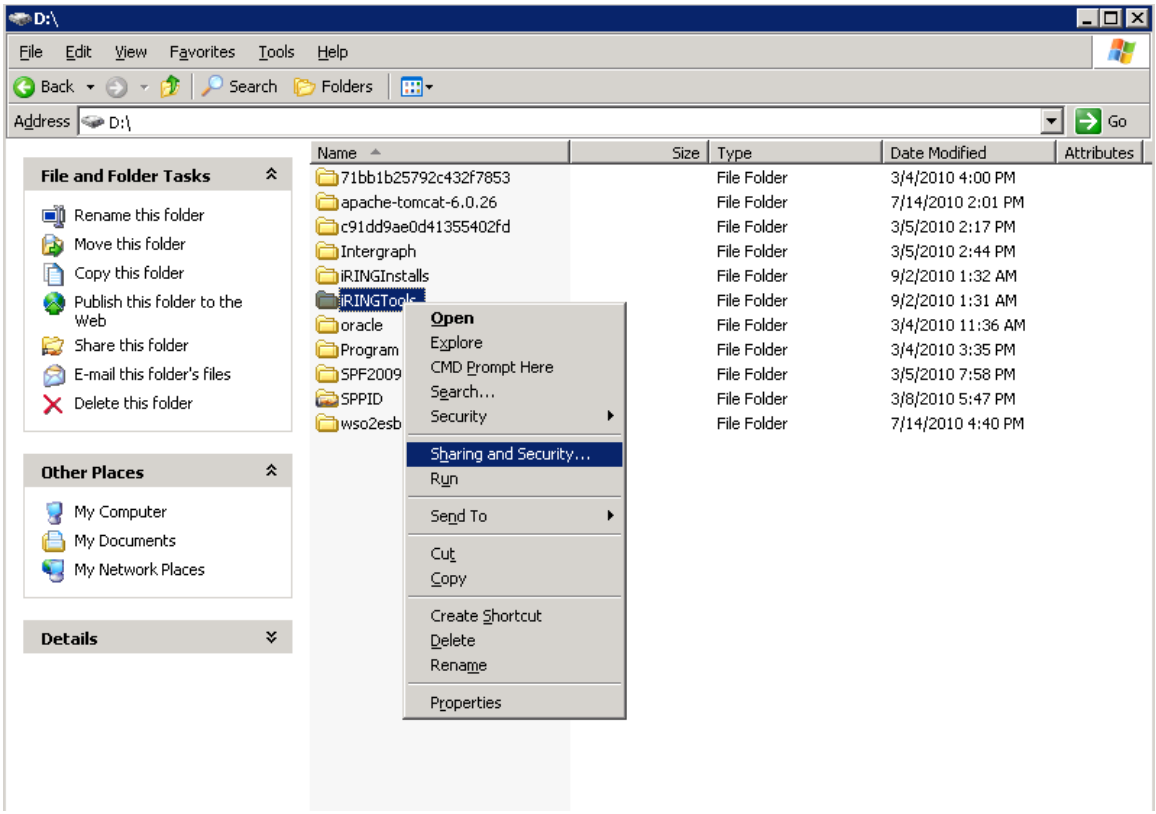


Other software packages may also be required. Installation links and instructions will be provided if and when necessary.

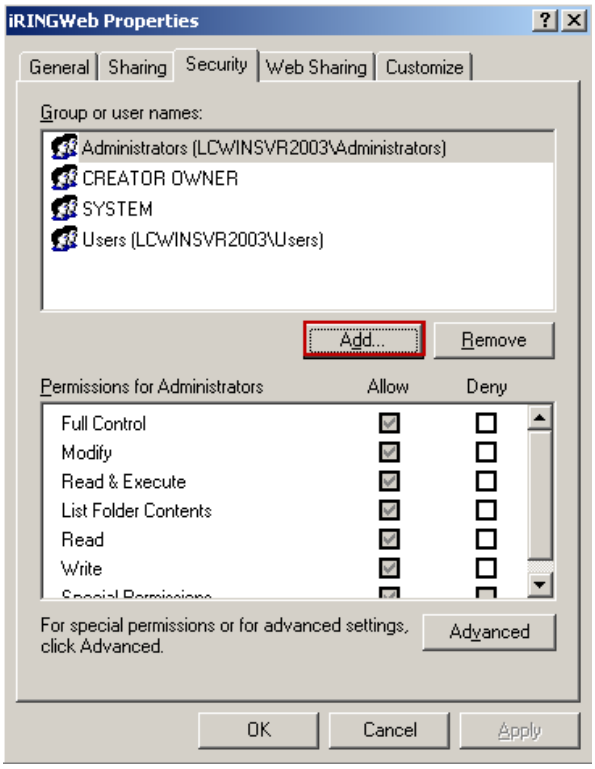
1.4.2 iRINGWeb Folder Permissions

File permissions are needed to by web server to open files and execute commands. Set folder permissions as follows.

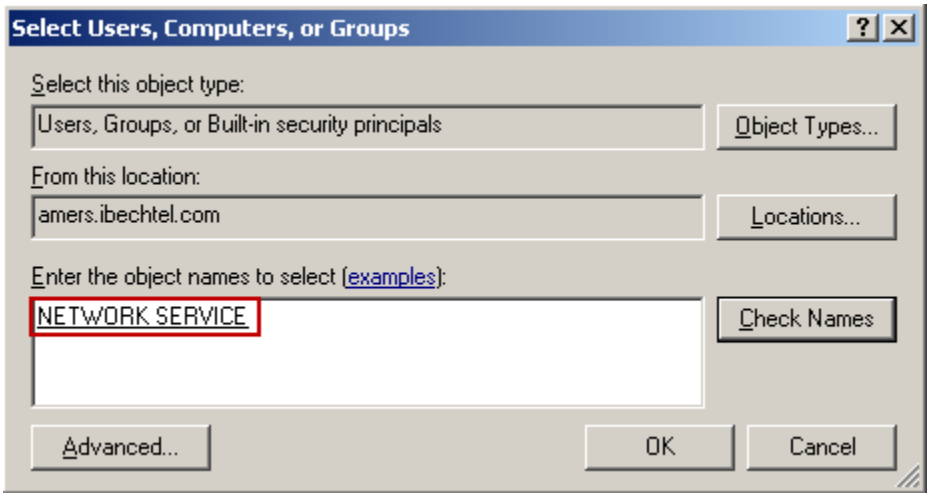
1. In Windows Explorer, locate the iRINGTools folder, right-click and select Sharing and Security.



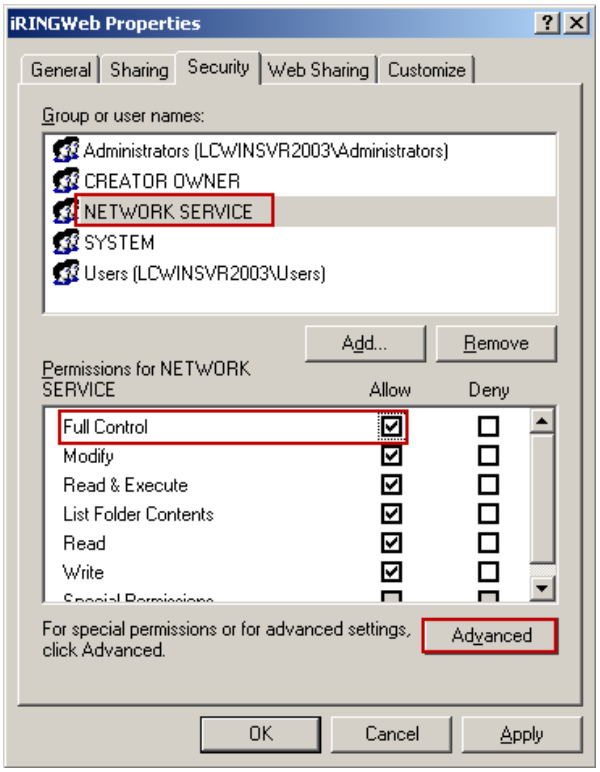
2. Select the Security tab and click Add.



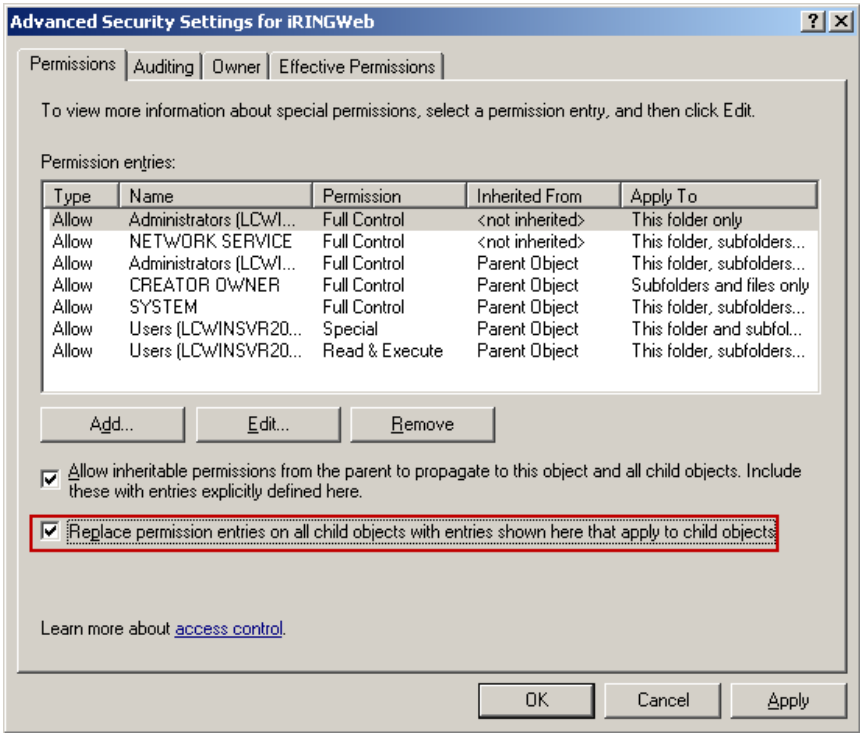
3. Enter the name NETWORK SERVICE and click Okay.



4. Select NETWORK SERVICE and click Full Control. Then click the Advance button.



5. Ensure the “Replace permission entries on all child objects with entries show here that apply to child objects” is checked.



6. Click the OK button to close the dialogs.

1.4.3 Internet Access

iRINGTools is a web-enabled system and therefore requires access to the internet to work properly. If the host server is behind a firewall, the proxy server information and valid proxy credentials will be needed later in the setup.

1.4.4 RDS-WIP Access

Access to the RDSWIP (http://rdswip.ids-adi.org/presentation/overview/index.html) is required for the Reference Data Service to generate new IDs for classes, templates and roles. An identity from ids-adi.org will be needed later in the setup.

1.4.5 Sandbox Access

If there are any existing Sandbox Services or other semantic repositories that will be used by the ***iRINGTools*** Services being deployed, then the URLs for those Sandbox Services will need to be entered into the configuration later.

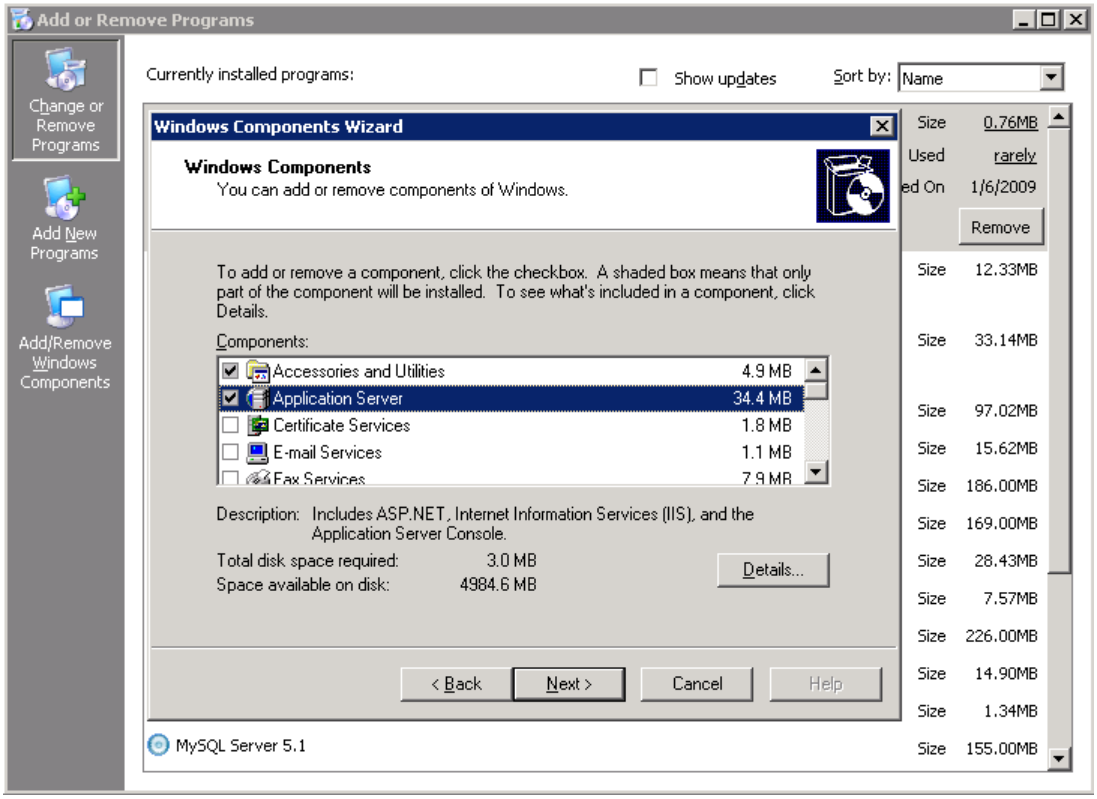
2 Installing Prerequisites

The following sections will provide detailed instructions for the installation and configuration of each prerequisite.

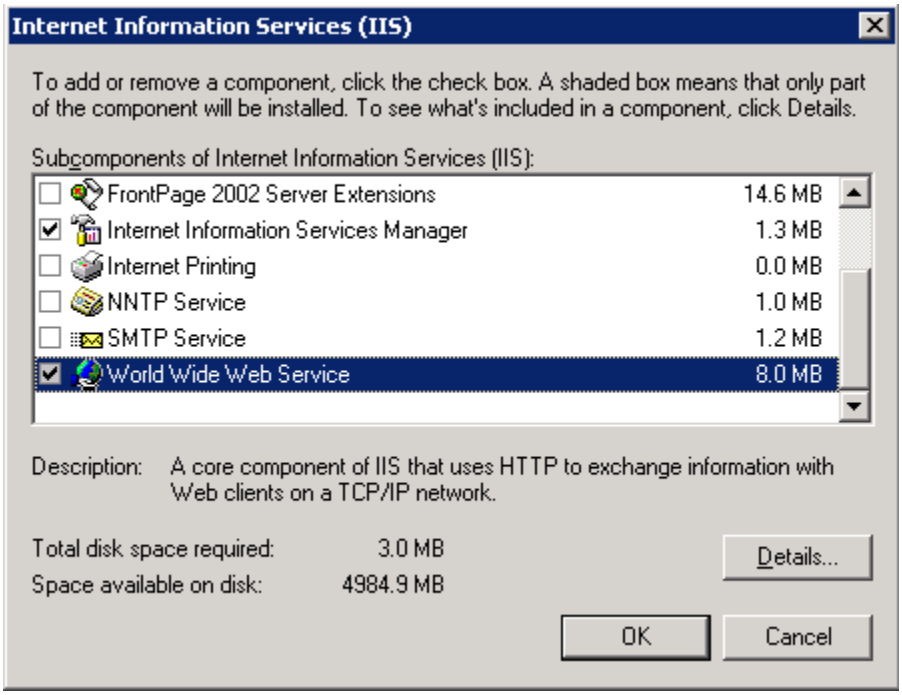
2.1 Internet Information Services

IIS (Internet Information Services) is part of the Windows Server 2003 operating system, but it is an optional component and is typically not installed by default. Perform the following steps to install or verify installation of IIS:

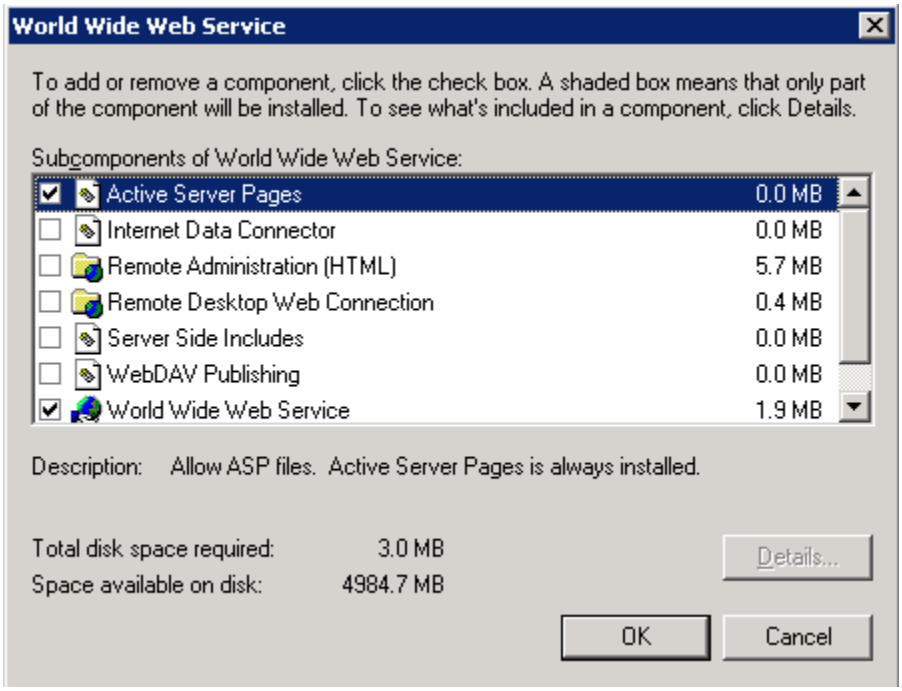
1. From the **Start** menu, click **Control Panel**.
2. Double-click **Add or Remove Programs**.
3. Click **Add/Remove Windows Components**.
4. In the **Components** list box, click **Application Server**.



5. Click **Details**.
6. Click **Internet Information Services (IIS)**.
7. Click **Details** to view the list of IIS Subcomponents.
8. Ensure that the **Common Files** (not shown), **Internet Information Services Manager** and **World Wide Web Service** are checked.



9. Click **World Wide Web Service**.
10. Click **Details**.
11. Ensure that **Active Server Pages** and **World Wide Web Service** are checked.



12. Click **OK** until you are returned to the **Windows Component Wizard**.
13. Click the **Next** button and complete the **Windows Component Wizard**.

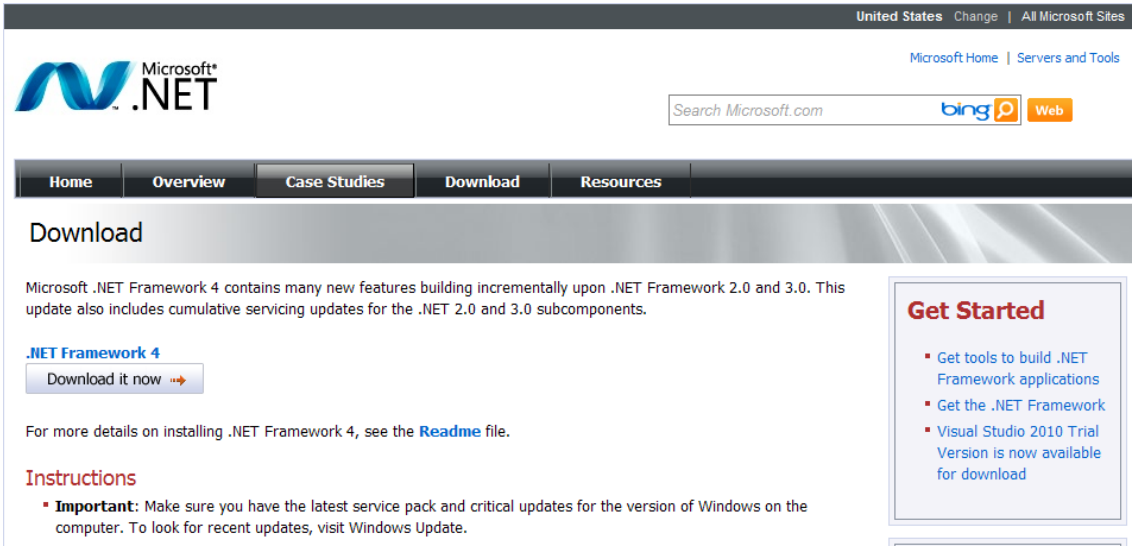
2.2 .NET Framework 4.0

The .NET Framework 4.0 is used by most of the ***iRINGTools*** components.

Note: to determine if .NET Framework 4.0 is already installed, go to the WINDOWS folder and look for the folder Microsoft.NET\Framework\v4.0.30319.

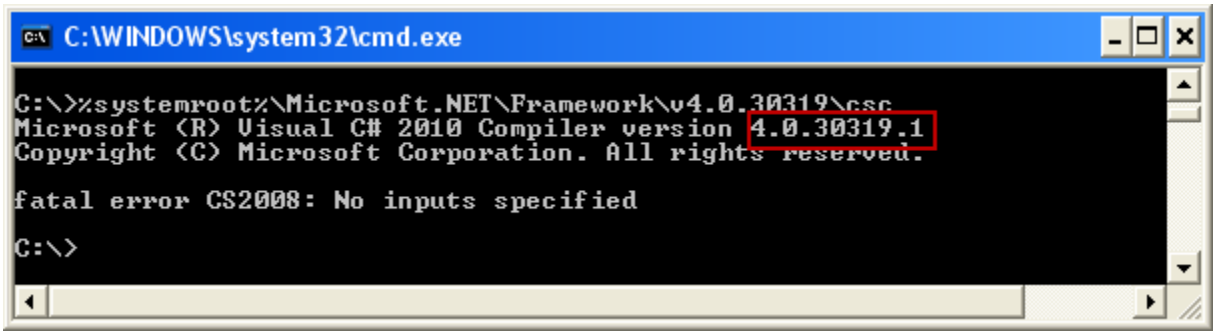
To install the .NET Framework, perform the following:

1. Download and install .NET Framework 4.0 from http://www.microsoft.com/net/Download.aspx.

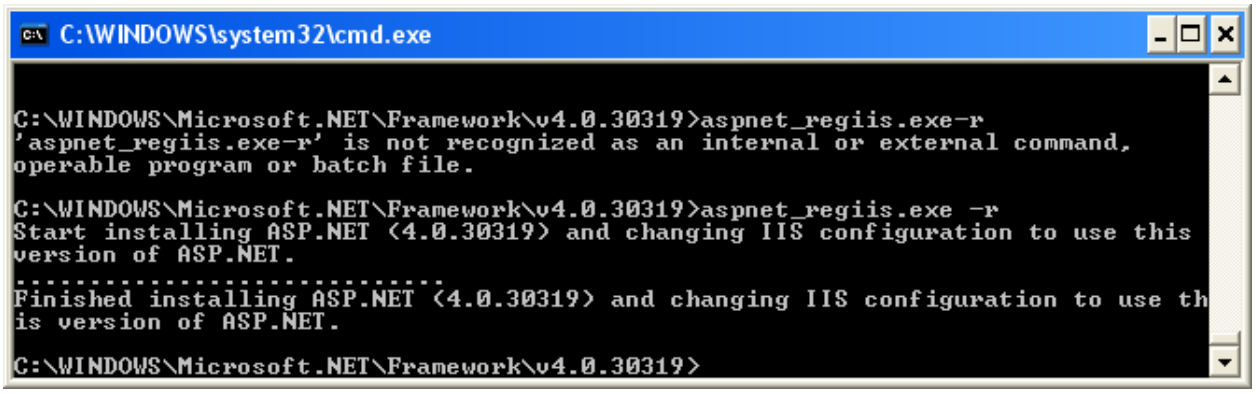


2. You can verify if .NET Framework 4.0 is installed correctly by typing the following in a command prompt:

   %systemroot%\Microsoft.NET\Framework\v4.0.30319\csc



3. Register IIS with .NET Framework 4.0 by executing the command aspnet_regiis.exe –r from the .NET Framework 4.0 folder.



2.3 SQL Server

A test database is needed to test and verify the ***iRINGTools*** Services and Applications. ***iRINGTools*** supports the following SQL Server database versions.

- SQL Server 2005
- SQL Server 2008
- SQL Server Express 2008

Install these databases in accordance with the database installation instructions. Later in this document, databases will be created (using SQL Server Express 2008) for the Interface Service (for the adapter triple store and for testing purposes) and the Sandbox Service (for the sandbox triple store).

3 *iRINGTools* Website

The following section will create and configure the ***iRINGTools*** website.

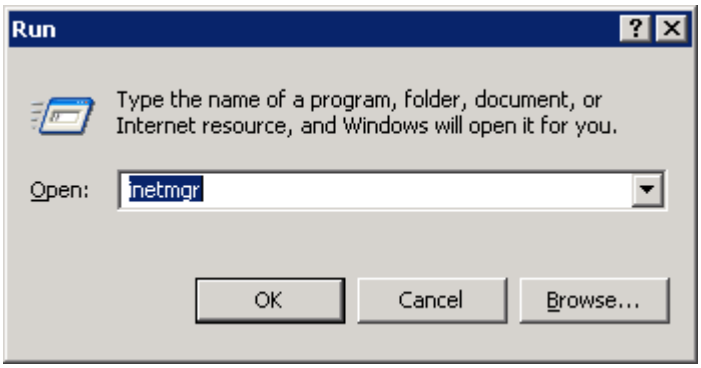
3.1 Localhost versus Server Hostname

The ***iRINGTools*** web.config files use localhost as the initial hostname. It is best to keep localhost as the hostname during installation to making testing easier. Instructions will be provided later in this document on where and how to change the hostname.

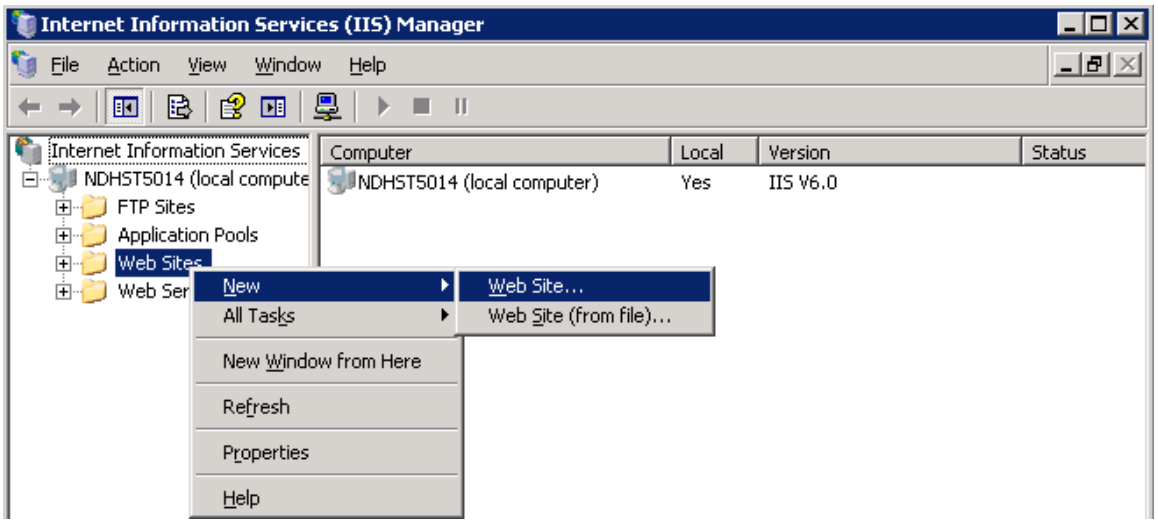
3.2 Installing Website

Create the ***iRINGTools*** website in IIS by performing the following steps.

1. Start IIS Manager. One way to do this is to use Run from the Start menu. Type the command inetmgr.

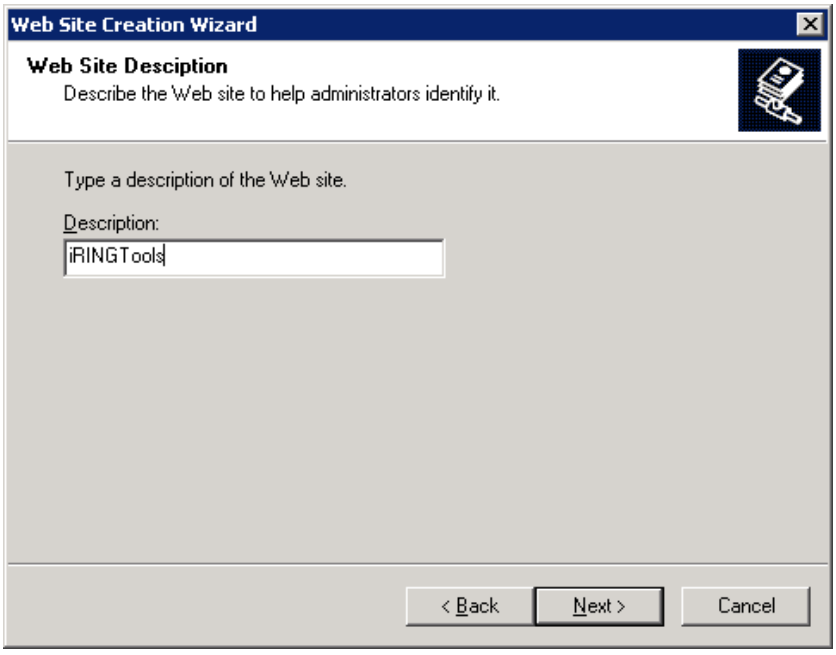


2. In IIS Manager, select the Web Sites folder, right-click and select New > Web Site.

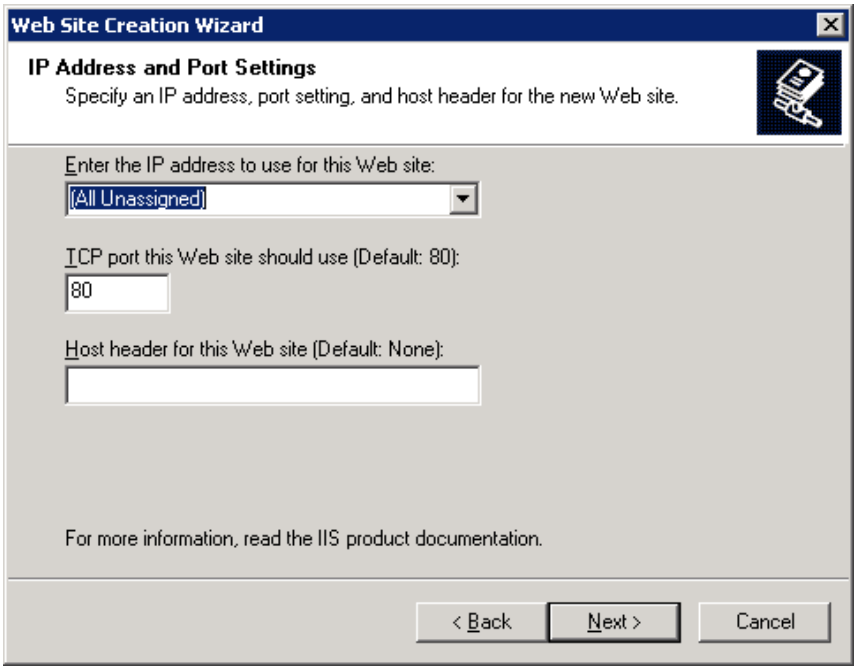


3. This starts the Web Site Creation Wizard. Click the Next button.

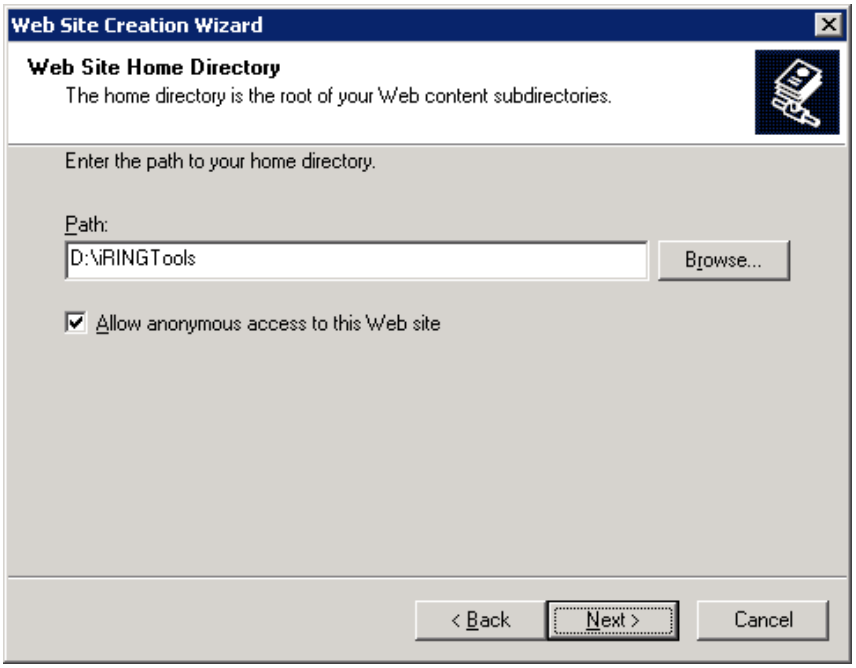
4. Enter iRINGTools for the Description. Click the next button.



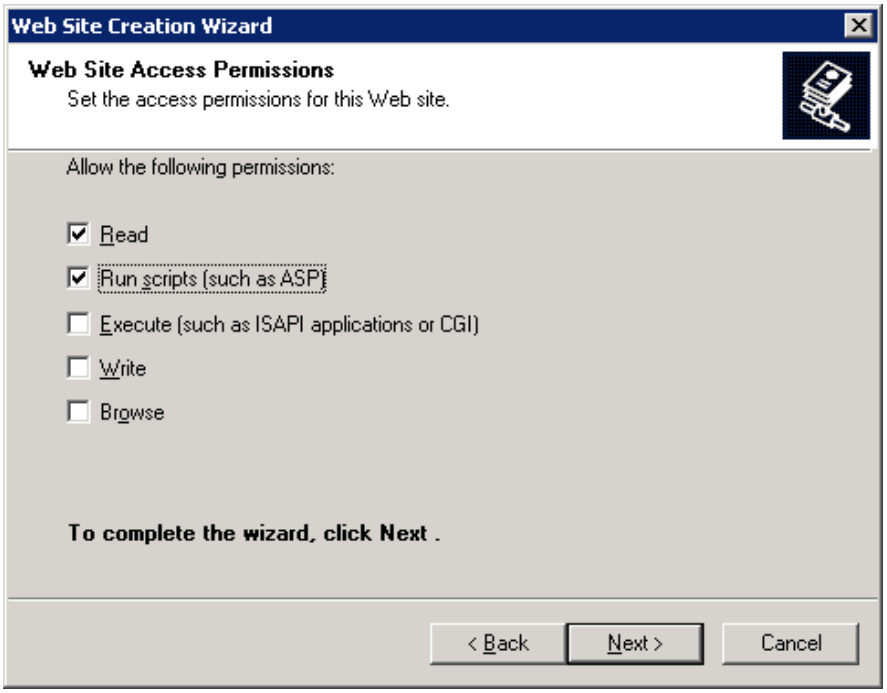
5. Enter the IP address and port settings and then click the Next button.



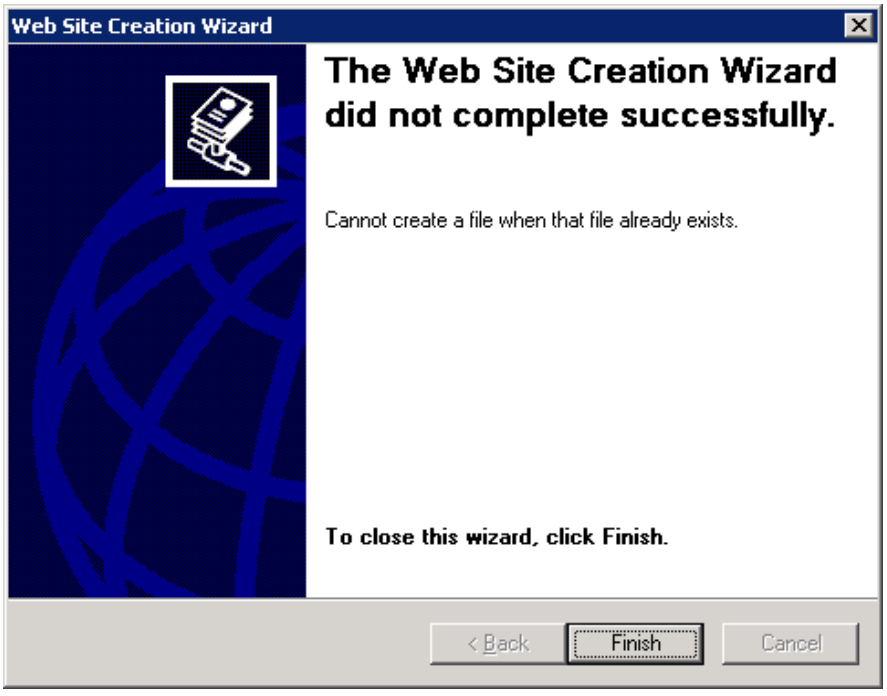
6. Enter the path to the iRINGTools folder (installed earlier). Click the Next button.



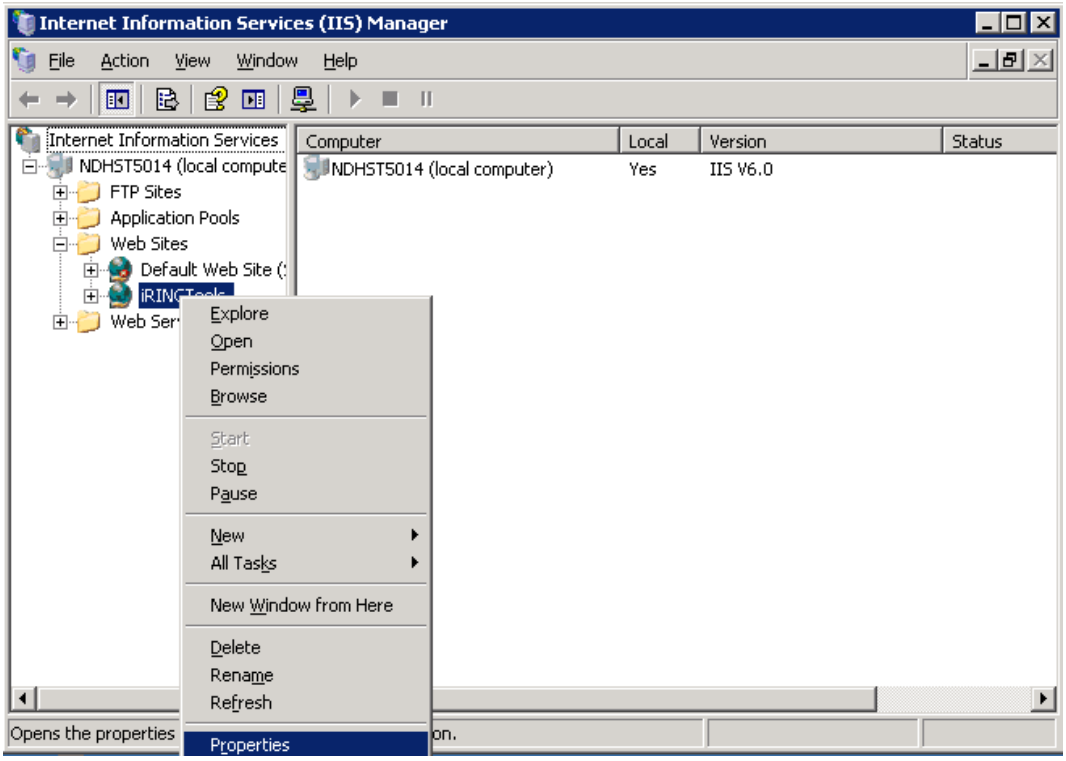
7. Click Read and Run scripts for web site access permissions and then click the Next button.



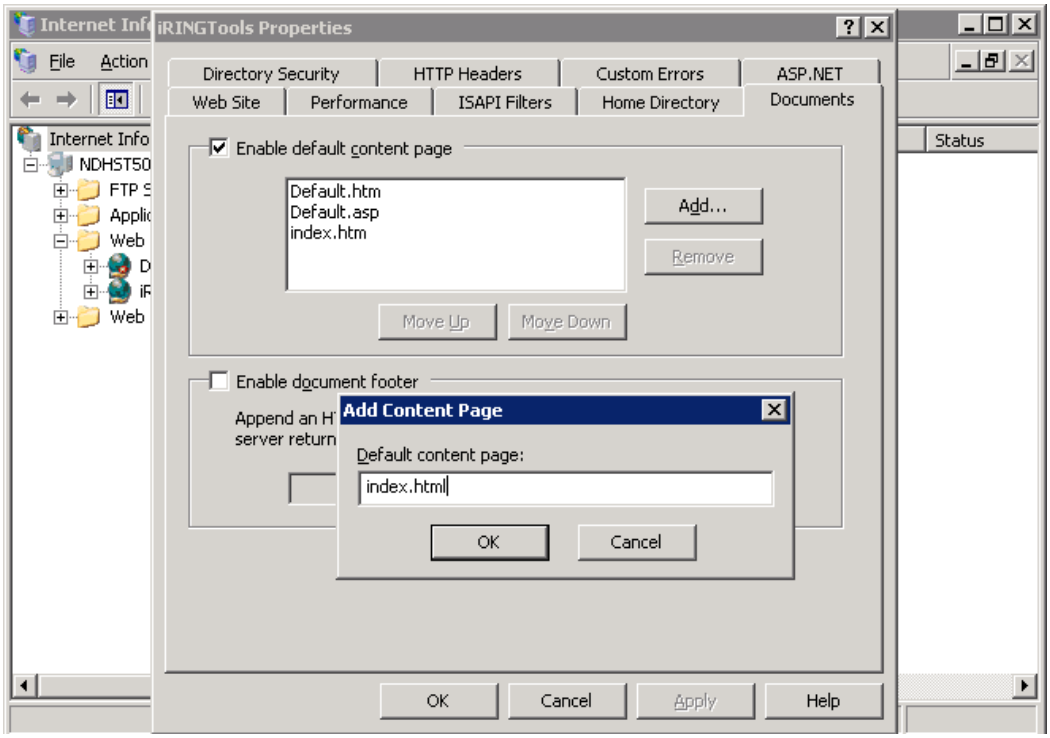
8. Click the Finish button to close the wizard.



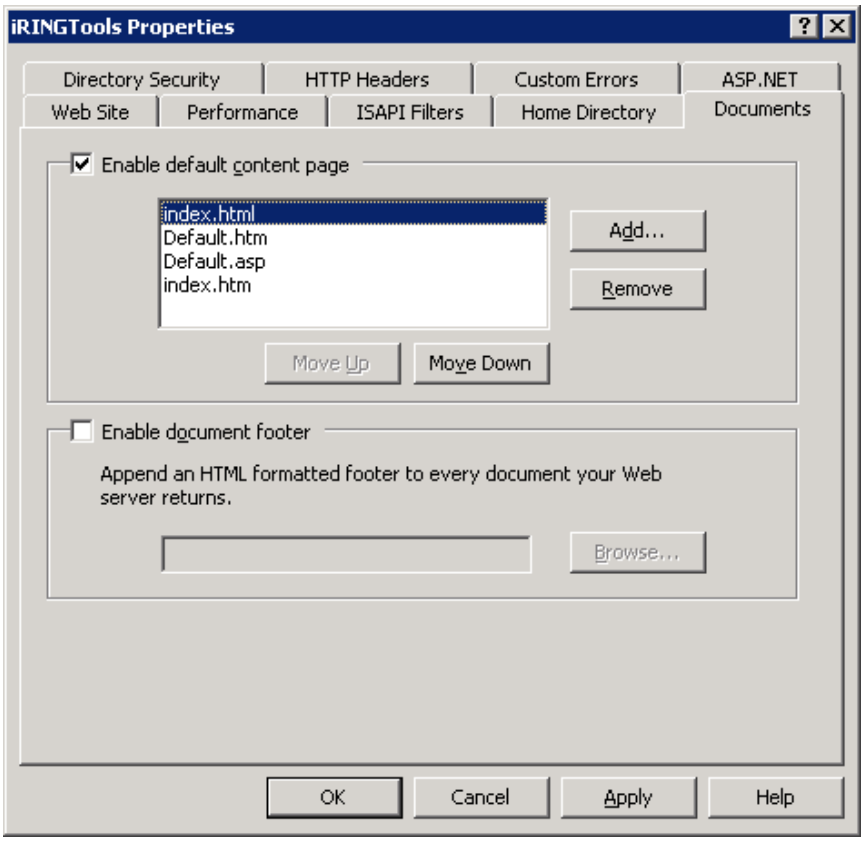
9. Right-click the new website and select Properties button.



10. Select the Documents tab and add index.html to the content page.



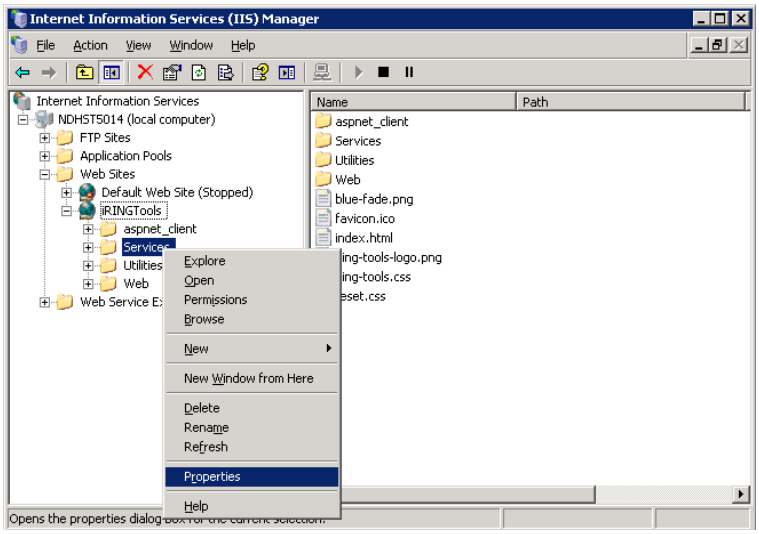
11. Move index.html to the top of the list.



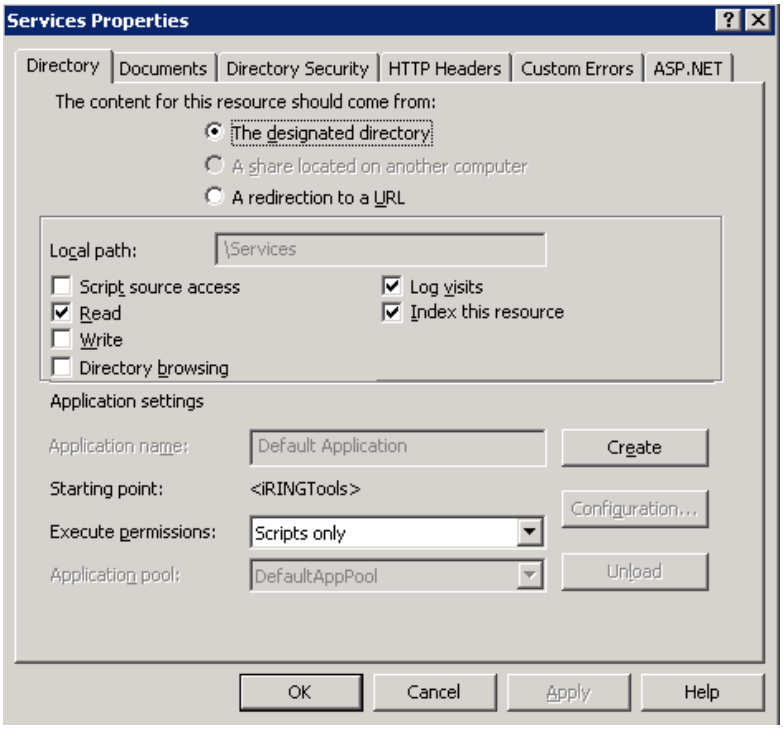
3.3 Create Virtual Directories

Create the virtual directories in IIS by performing the following steps.

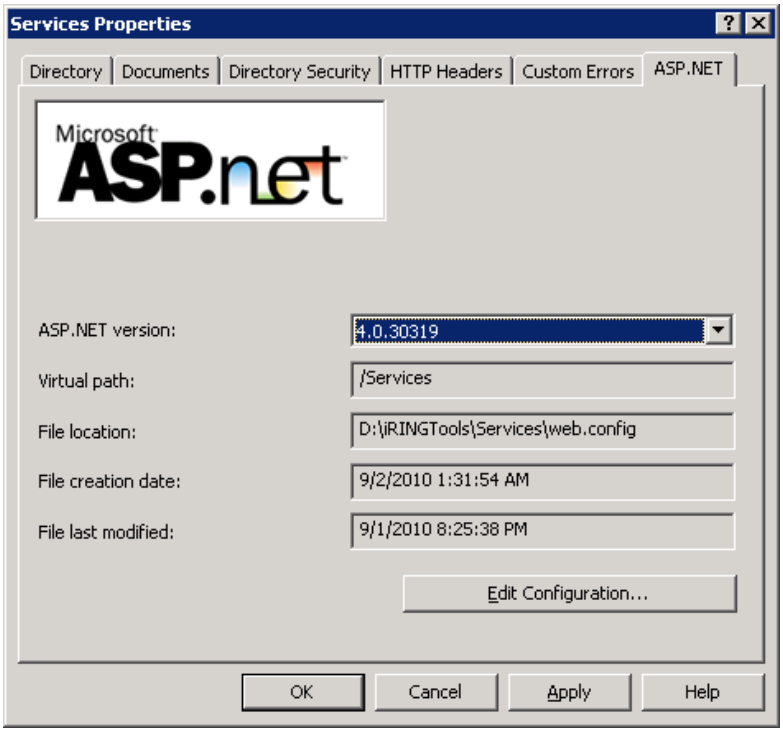
1. In IIS Manager, select the iRINGTools > Services folder, right-click and select Properties.



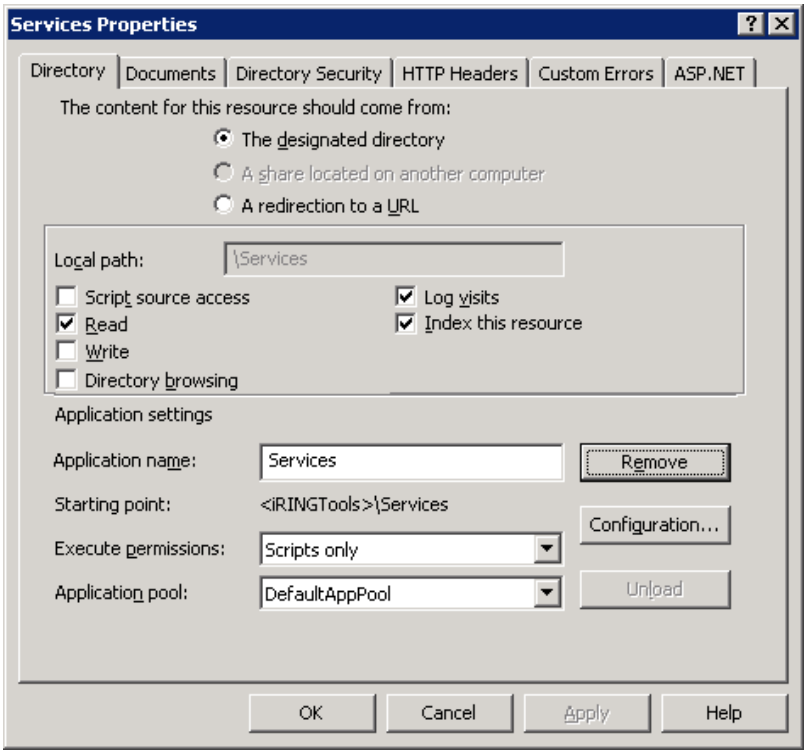
2. Click the Create button.



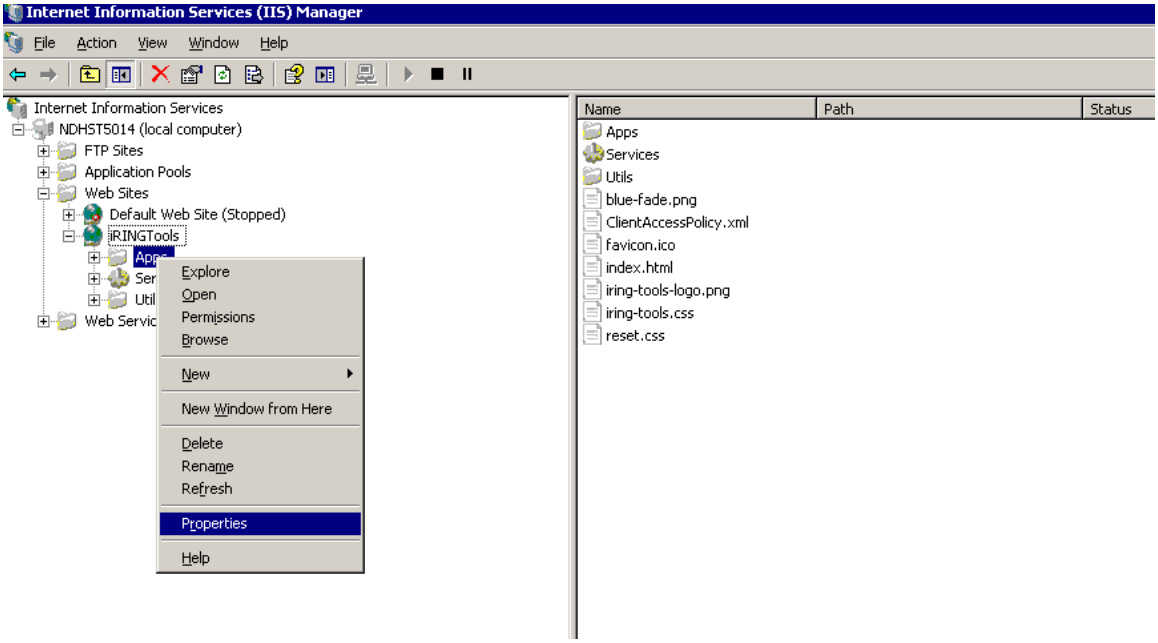
3. Select the ASP.NET tab and set the ASP.NET version to 4.0.30319. Click the OK button.



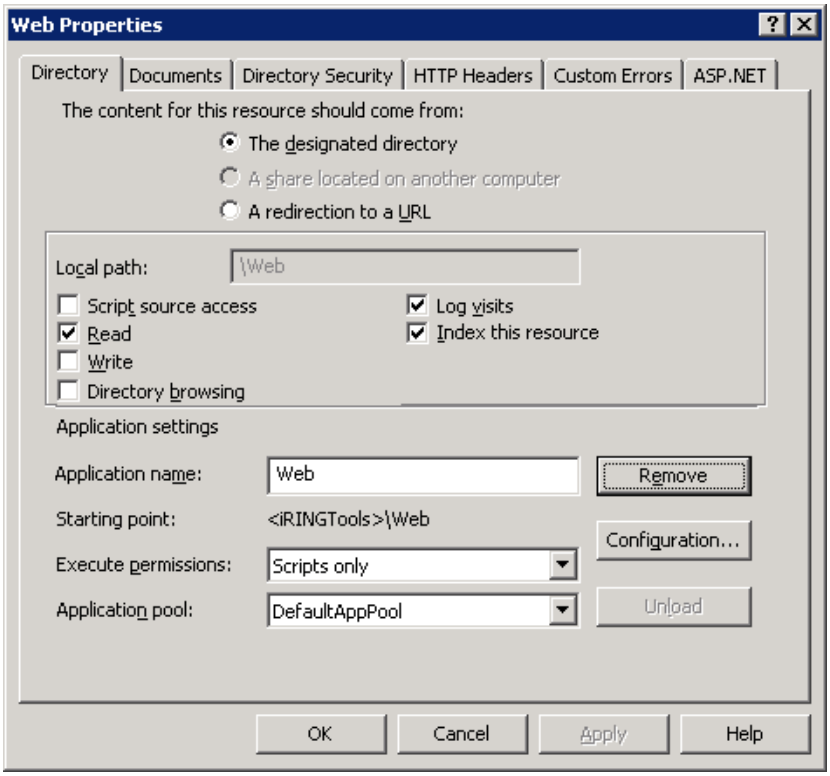
4. Click the OK button to complete Services setup.



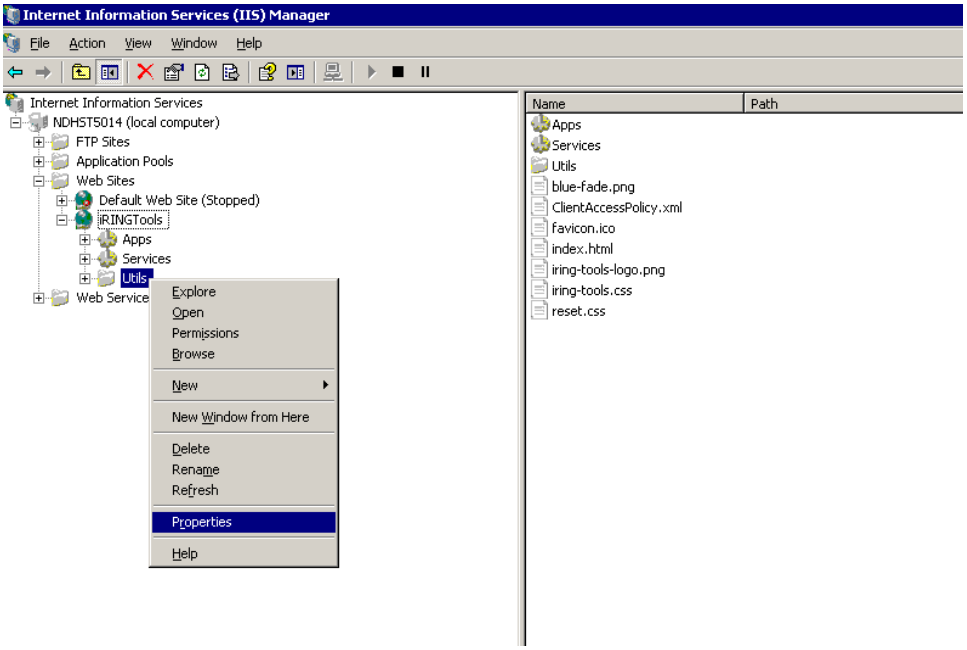
5. In IIS Manager, select the iRINGTools > Apps folder, right-click and select Properties.



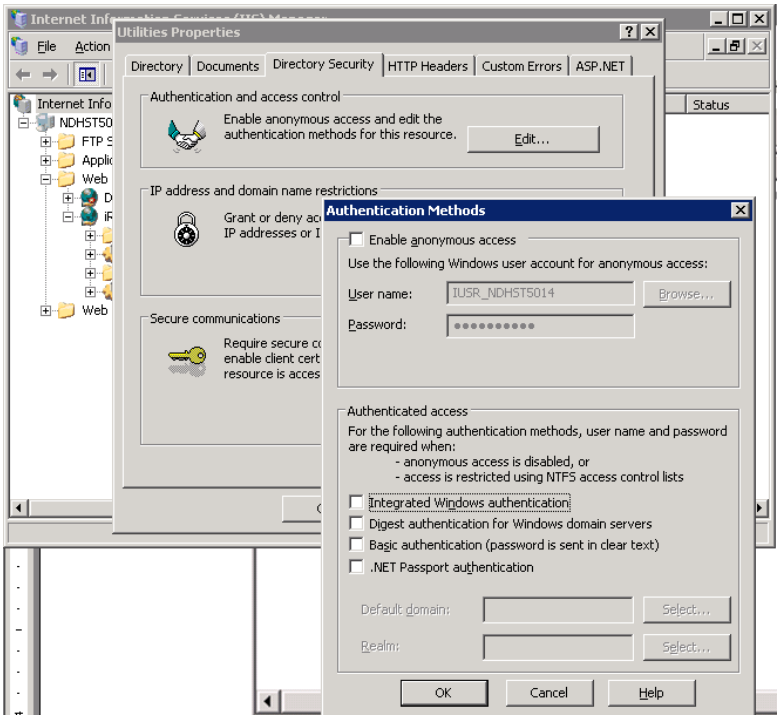
6. Click the Create button.



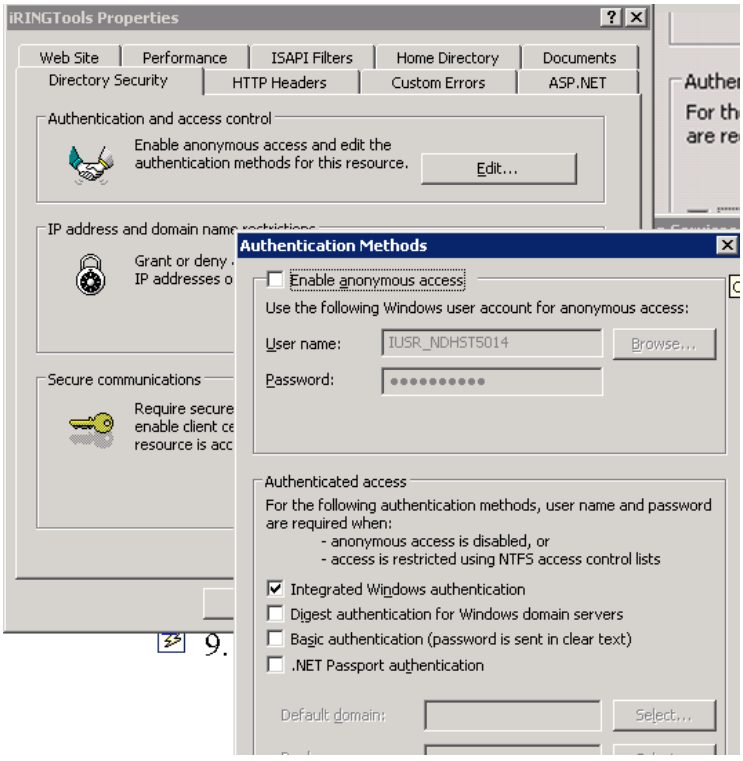
7. Select the ASP.NET tab and set the ASP.NET version to 4.0.30319. Click the OK button.
8. Click the OK button to complete Apps setup.
9. In IIS Manager, select the iRINGTools > Utils folder, right-click and select Properties.



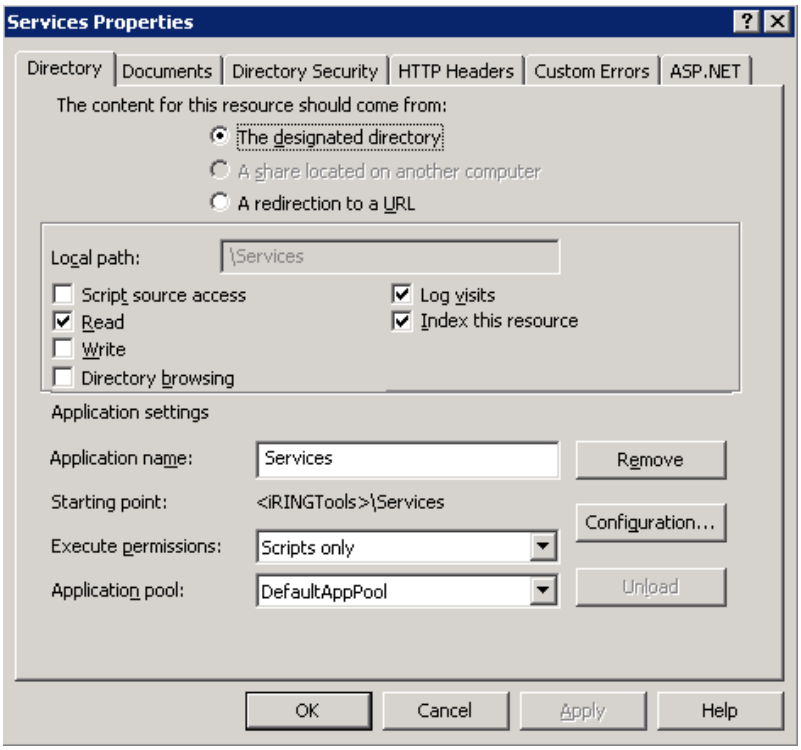
10. Uncheck anonymous access & integrated windows authentication.

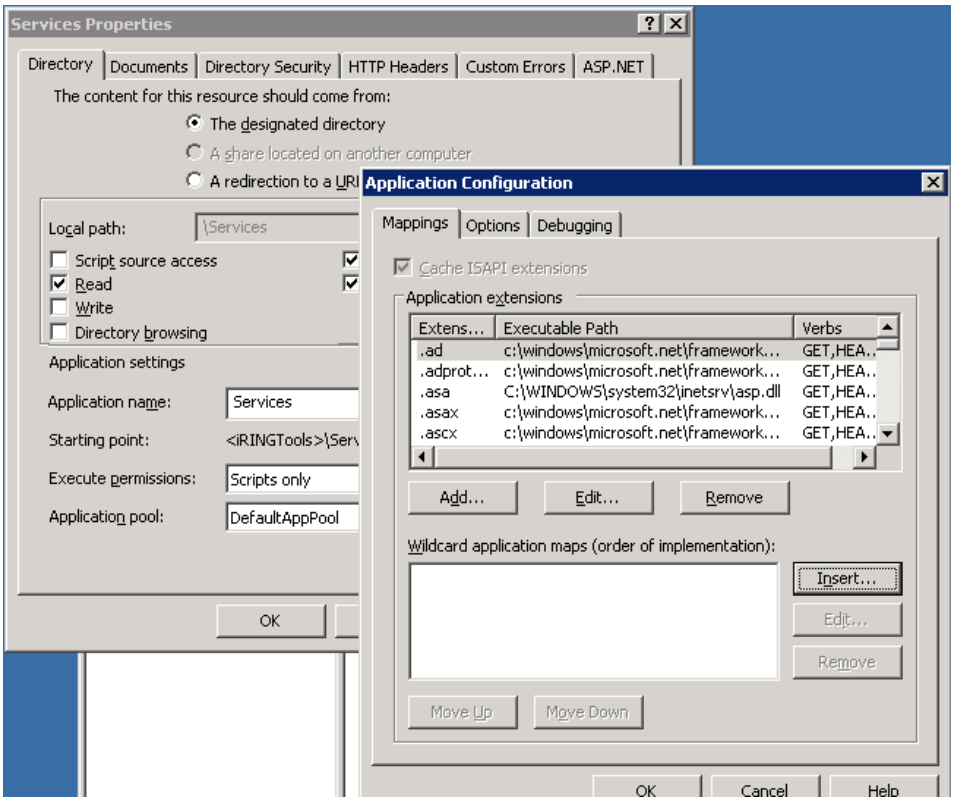


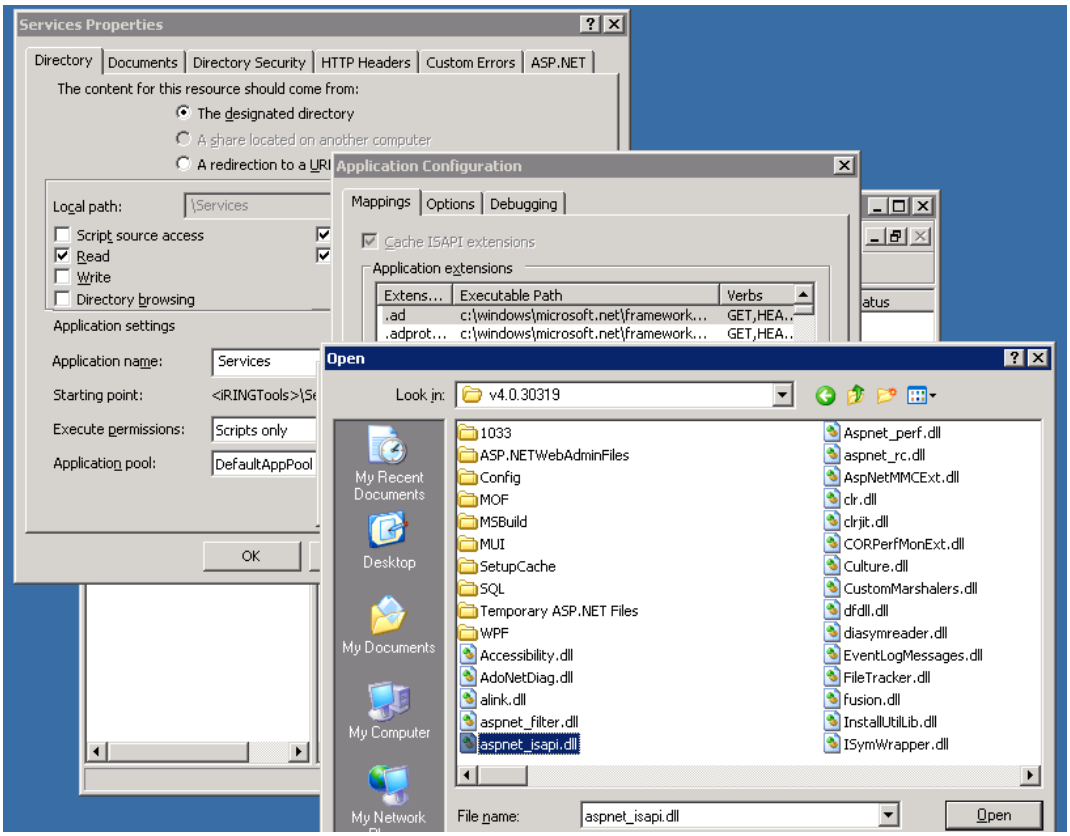
11. Remove anonymous access from iRINGTools website.



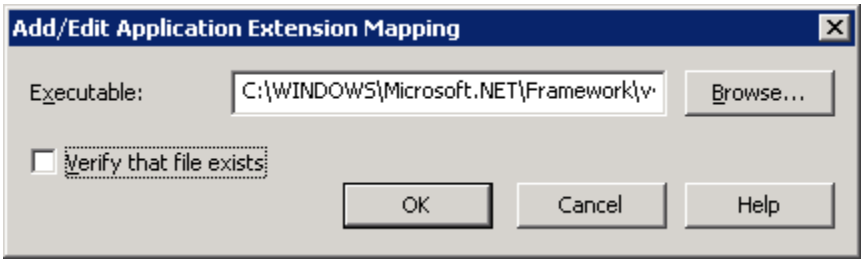
12. Open the Services Properties and add aspnet_Isapi.dll to app configuration for virtual directory Services.

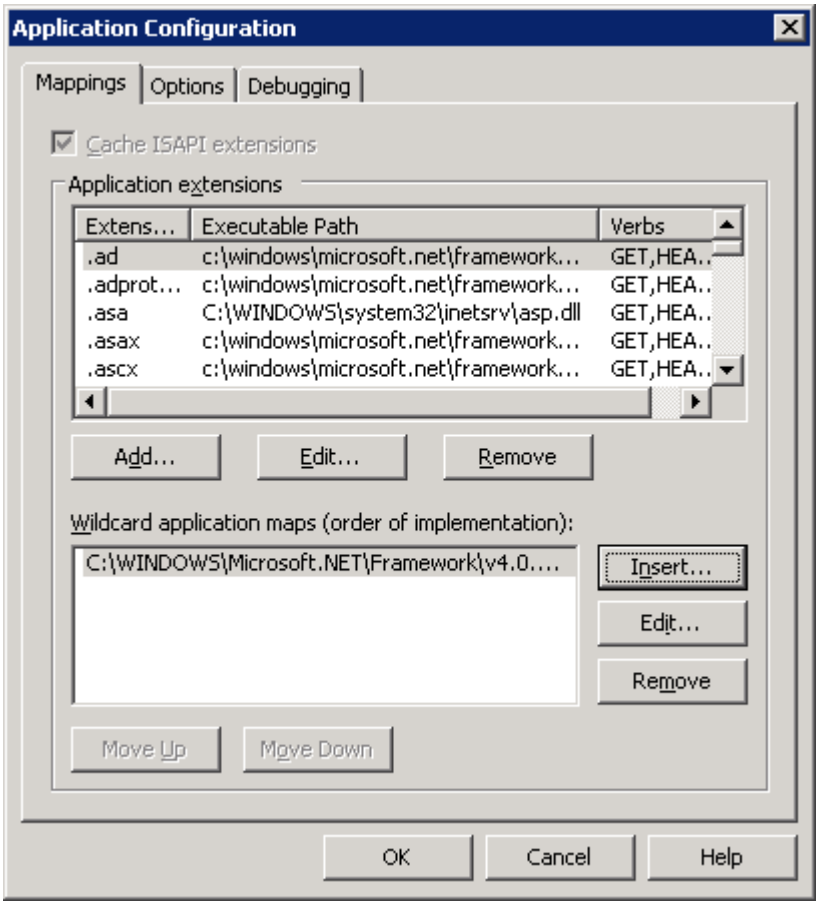




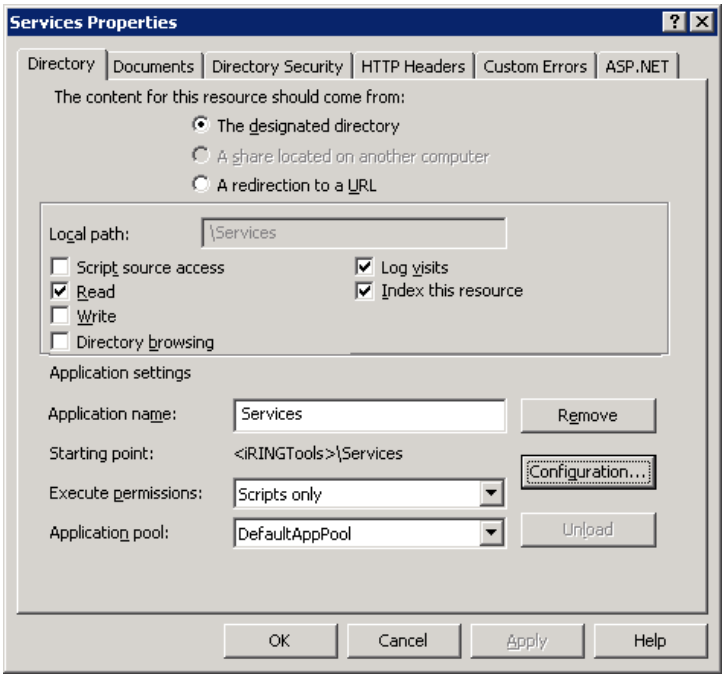


13. Uncheck Verify that file exists and click the OK button.




Application Configuration
Mappings
Options
Debugging
Cache ISAPI extensions
Application extensions
Extens...
Executable Path
Verbs
.ad
c:\windows\microsoft.net\framework...
GET,HEA...
.adprot...
c:\windows\microsoft.net\framework...
GET,HEA...
.asa
C:\WINDOWS\system32\inetsrv\asp.dll
GET,HEA...
.asax
c:\windows\microsoft.net\framework...
GET,HEA...
.ascx
c:\windows\microsoft.net\framework...
GET,HEA...
Add...
Edit...
Remove
Wildcard application maps (order of implementation):
C:\WINDOWS\Microsoft.NET\Framework\v4.0....
Insert...
Edit...
Remove
Move Up
Move Down
OK
Cancel
Help

14. Click OK.


Services Properties
Directory
Documents
Directory Security
HTTP Headers
Custom Errors
ASP.NET
The content for this resource should come from:
The designated directory
A share located on another computer
A redirection to a URL
Local path:
\Services
Script source access
Read
Write
Directory browsing
Log visits
Index this resource
Application settings
Application name:
Services
Remove
Starting point:
<iRINGTools>\Services
Configuration...
Execute permissions:
Scripts only
Application pool:
DefaultAppPool
Unload
OK
Cancel
Apply
Help

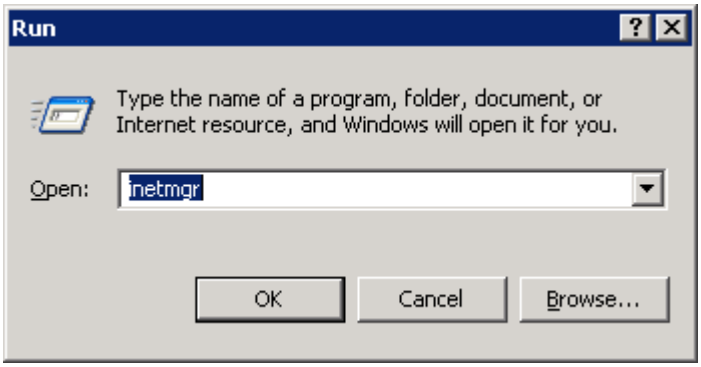
3.4 Silverlight MIME Extensions

iRINGTools use Silverlight for the Applications. To host Silverlight on a web server that is not IIS version 7 (e.g., IIS version 6), you will need to add the MIME types to support the correct content type interpretation by the browser. In the case of Silverlight this is the XAML content type. IIS version 7 has these MIME types already added but if they're not there this will result in errors. There are three MIME types required:

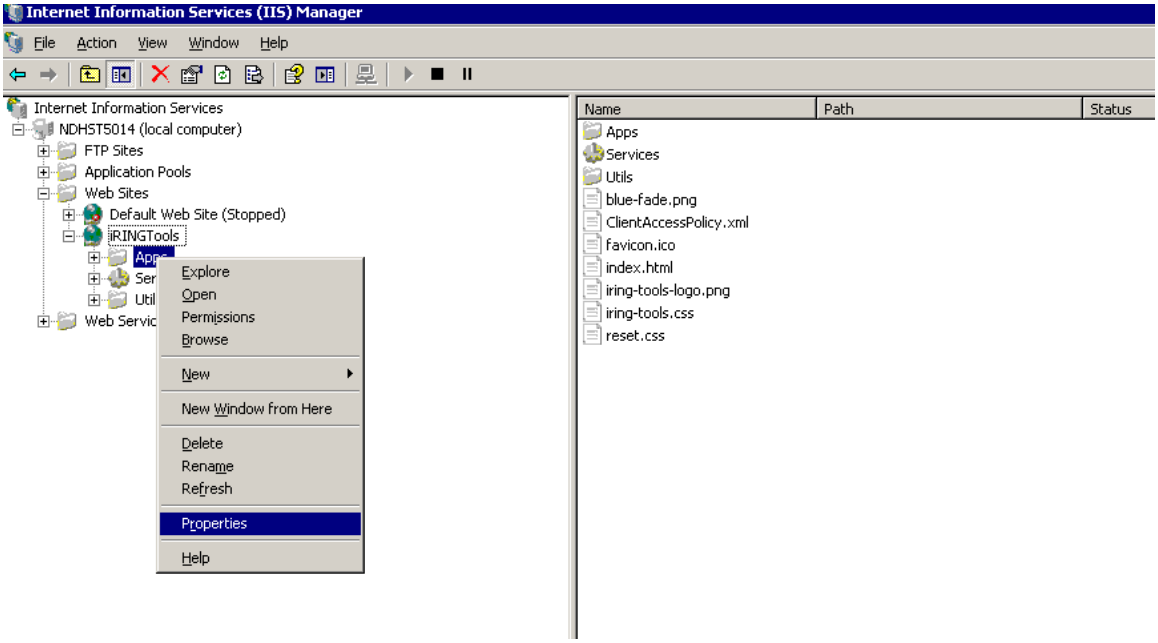
1. .xaml application/xaml+xml
2. .xap application/x-silverlight-app
3. .xbap application/x-ms-xbap

To add (or verify) the three MIME types, perform the following steps:

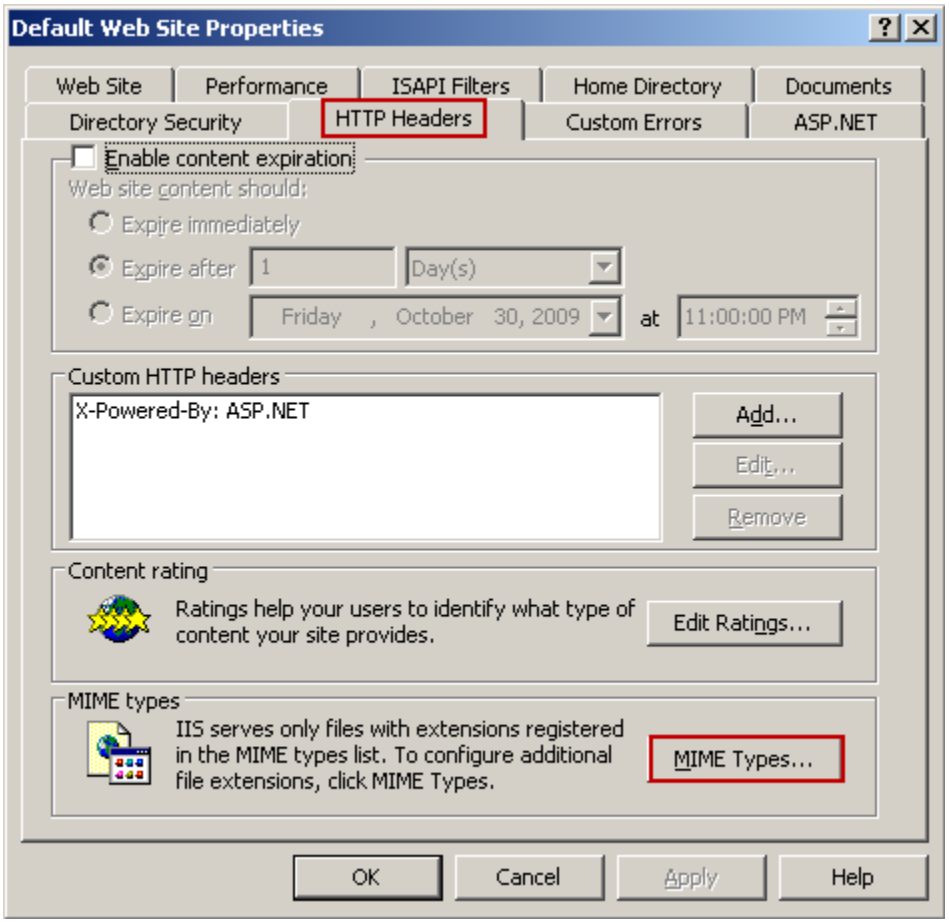
1. Start IIS Manager. One way to do this is to use Run from the Start menu. Type the command inetmgr.



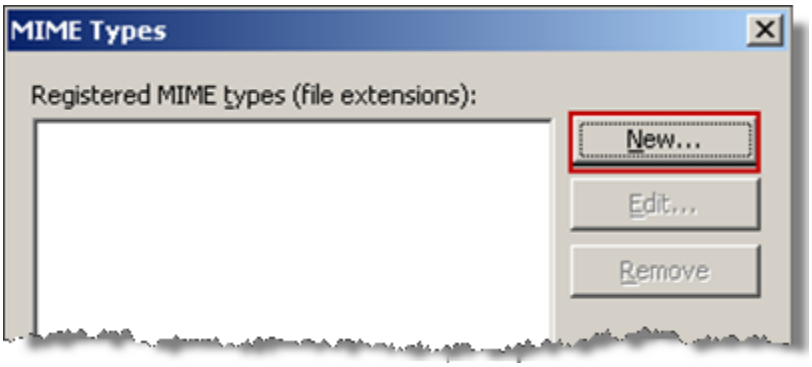
2. From the Web Sites folder, select the iRINGTools > Apps folder, right-click and select Properties.



3. Select the HTTP Headers tab in the Properties window and then click on the MIME Types button.



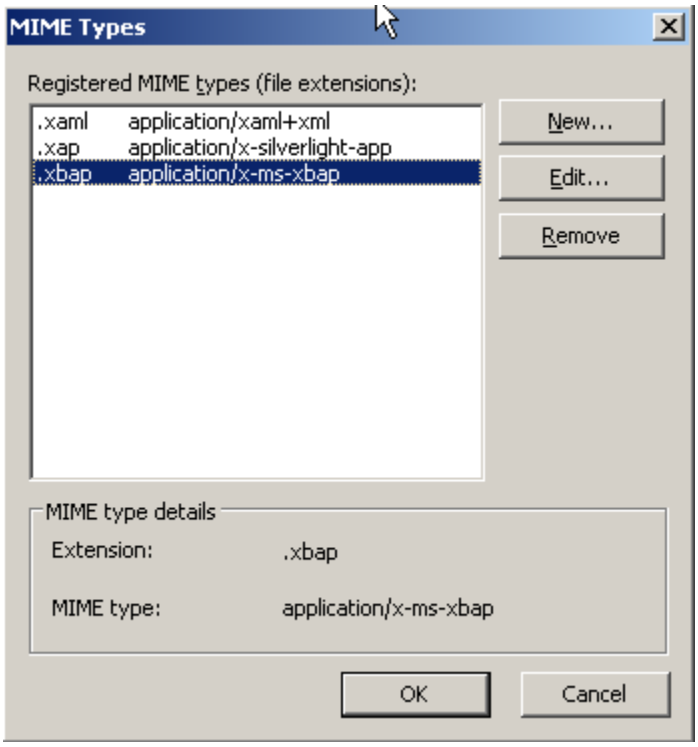
4. If one or more of the three required MIME types are not listed, then click on the New button.



5. If necessary, enter the extension and MIME type for the three types.

Extension	MIM type
.xaml	application/xaml+xml
.xap	application/x-silverlight-app
.xbap	application/x-ms-xbap

6. When finished, verify the MIME types are added and then click the OK button.



7. Close the Properties window.

3.5 Web.Config Setup

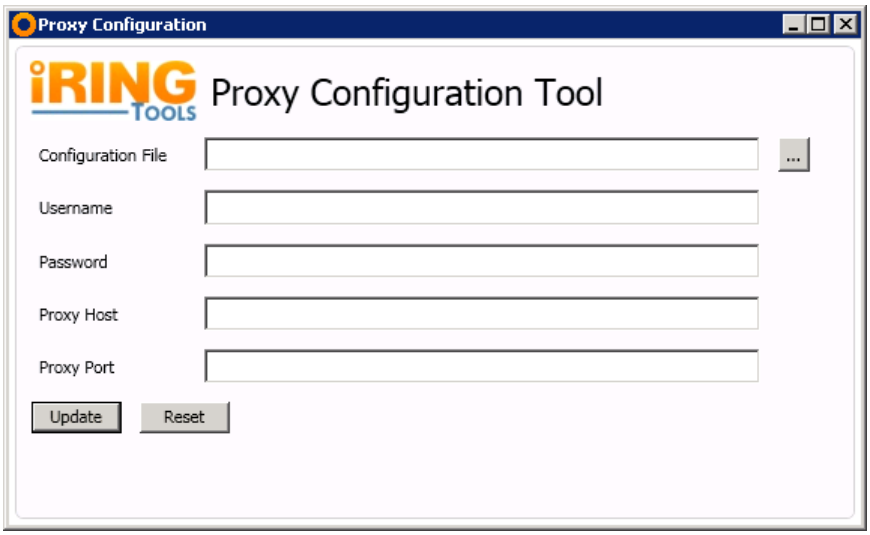
You may need to configure the web.config file in the Services folder if:

1. Your server is behind firewall (proxy credentials are needed)
2. You will be generating class ids (IDS-ADI credentials are needed)

To configure, open the web.config file with an XML or text editor, and copy the necessary keys from Service Settings Defaults and Reference Data Setting Defaults to appSettings and set as necessary.

```
<!--Service Setting Defaults
  <add key="BaseDirectoryPath" value="AppDomain.CurrentDomain.BaseDirectory"/>
  <add key="XmlPath" value=".\XML\"/>
  <add key="ProxyCredentialToken" value=""/>
  <add key="ProxyHost" value=""/>
  <add key="ProxyPort" value=""/>
  <add key="IgnoreSslErrors" value="True"/>
-->

<!--Reference Data Setting Defaults
  <add key="SparqlPath" value=".\SPARQL\"/>
  <add key="PageSize" value="100"/>
  <add key="ClassRegistryBase" value="http://rdl.rdlfacade.org/data#"/>
  <add key="TemplateRegistryBase" value="http://tpl.rdlfacade.org/data#"/>
  <add key="ExampleRegistryBase" value="http://example.org/data#"/>
  <add key="UseExampleRegistryBase" value="False"/>
  <add key="RegistryCredentialToken" value=""/>-->

<!--NHibernate Setting Defaults
  <add key="ExecutingAssemblyName" value="App_Code"/>
  <add key="BinaryPath" value=".\Bin\"/>
  <add key="CodePath" value=".\App_Code\"/>-->

<!--Adapter Setting Defaults
  <add key="InterfaceService" value="http://localhost/Services/InterfaceService/query"/>
  <add key="ReferenceDataServiceUri value="http://localhost/Services/RefDataService"/>
  <add key="DefaultProjectionFormat" value="xml"/>
  <add key="EndpointTimeout value="30000"/>
  <add key="dotNetRDFServer" value=".\SQLEXPRESS"/>
  <add key="dotNetRDFCatalog" value="InterfaceDb"/>
  <add key="dotNetRDFUser" value="dotNetRDF"/>
  <add key="dotNetRDFPassword" value="dotNetRDF"/>
  <add key="TrimData" value="False"/>
  <add key="ExecutingAssemblyName" value="App_Code"/>-->

<appSettings>
  <add key="dotNetRDFConfig" value="~/App_Data/config.ttl" />
</appSettings>
```

This version of iRINGTools adds a new utility for configuring the Proxy Credentials. The Proxy Configuration Tool (proxyConfig.exe), shown below, can be found in the Utils folder.



This tool will create a Token from the credentials added, and set the proxy settings in Web.confg file. The result will look similar to:

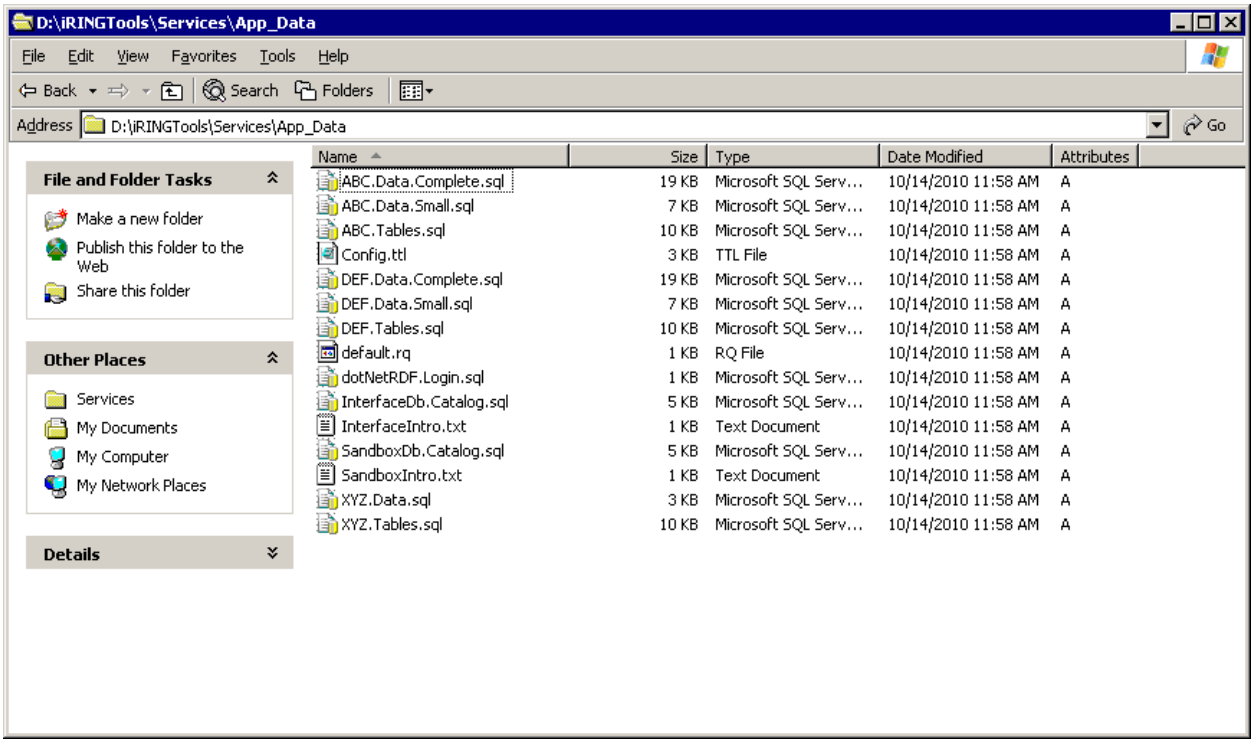
```
<appSettings>
  <add key="ProxyCredentialToken" value="KoU
  <add key="ProxyHost" value="
  <add key="ProxyPort" value="8080"/>
  <add key="dotNetRDFConfig" value="~/App_Data/config.ttl" />
  <add key="RegistryCredentialToken" value="A
</appSettings>
```

The RegistryCredentialToken is not required unless you will be adding new classes or templates in the RefDataEditor. If you need to generate this token, the EncryptCredentials utility can still be used. For additional support on how to configure these and other settings in the web.config file, contact the ***iRINGTools*** development team.

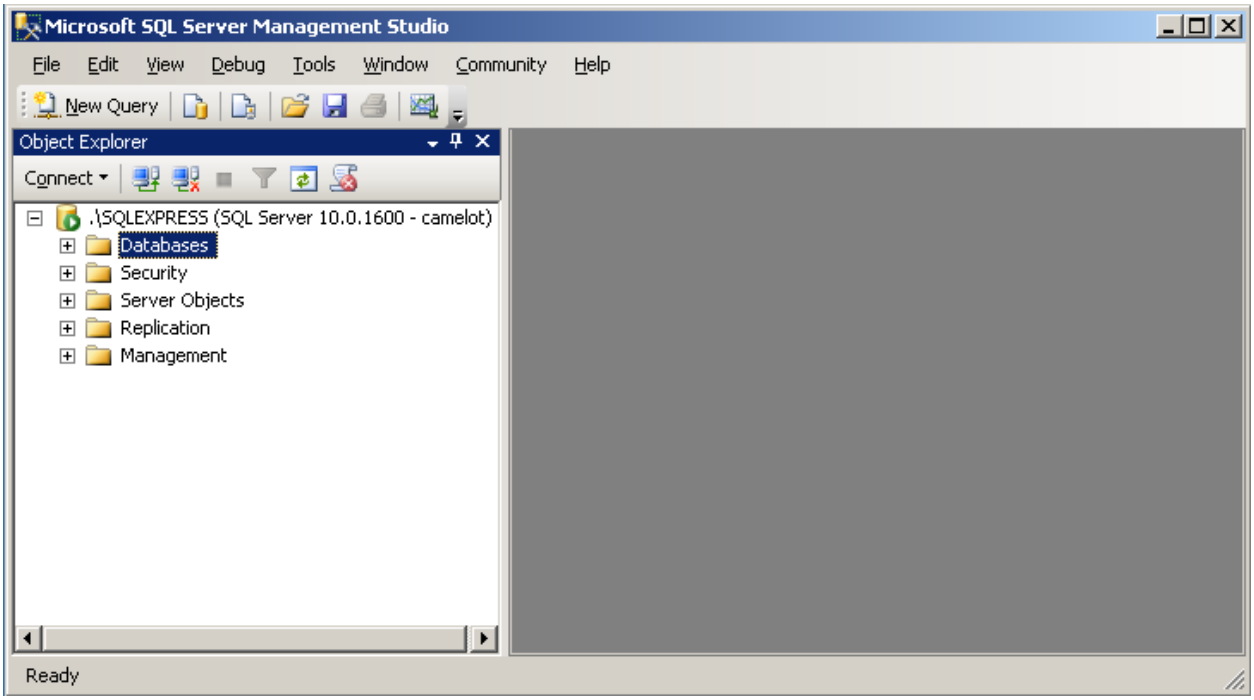
3.6 Creating the Test Database

Create a test database in SQL Server by performing the following steps.

1. Open the folder iRINGTools\Services\App_Data.


D:\iRINGTools\Services\App_Data
File Edit View Favorites Tools Help
Back Search Folders
Address D:\iRINGTools\Services\App_Data
Go
File and Folder Tasks
Make a new folder
Publish this folder to the Web
Share this folder
Other Places
Services
My Documents
My Computer
My Network Places
Details
Name Size Type Date Modified Attributes
ABC.Data.Complete.sql 19 KB Microsoft SQL Serv... 10/14/2010 11:58 AM A
ABC.Data.Small.sql 7 KB Microsoft SQL Serv... 10/14/2010 11:58 AM A
ABC.Tables.sql 10 KB Microsoft SQL Serv... 10/14/2010 11:58 AM A
Config.ttl 3 KB TTL File 10/14/2010 11:58 AM A
DEF.Data.Complete.sql 19 KB Microsoft SQL Serv... 10/14/2010 11:58 AM A
DEF.Data.Small.sql 7 KB Microsoft SQL Serv... 10/14/2010 11:58 AM A
DEF.Tables.sql 10 KB Microsoft SQL Serv... 10/14/2010 11:58 AM A
default.rq 1 KB RQ File 10/14/2010 11:58 AM A
dotNetRDF.Login.sql 1 KB Microsoft SQL Serv... 10/14/2010 11:58 AM A
InterfaceDb.Catalog.sql 5 KB Microsoft SQL Serv... 10/14/2010 11:58 AM A
InterfaceIntro.txt 1 KB Text Document 10/14/2010 11:58 AM A
SandboxDb.Catalog.sql 5 KB Microsoft SQL Serv... 10/14/2010 11:58 AM A
SandboxIntro.txt 1 KB Text Document 10/14/2010 11:58 AM A
XYZ.Data.sql 3 KB Microsoft SQL Serv... 10/14/2010 11:58 AM A
XYZ.Tables.sql 10 KB Microsoft SQL Serv... 10/14/2010 11:58 AM A

2. Open Microsoft SQL Server Management Studio.

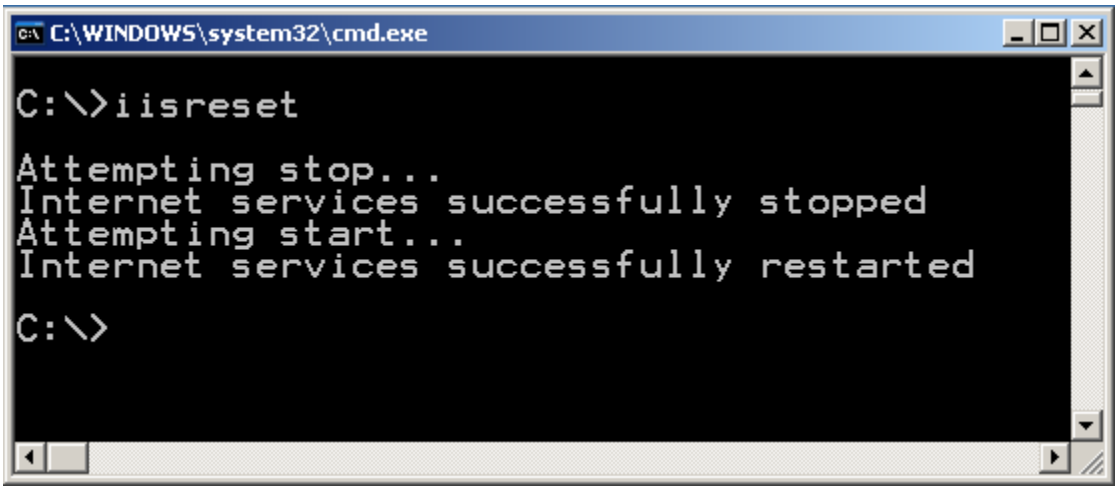


3. Run the following scripts.

   - dotNetRDF.Login.sql
   - InterfaceDb.Catalog.sql
   - SandboxDb.Catalog.sql
   - ABC.Tables.sql
   - ABC.Data.Complete.sql

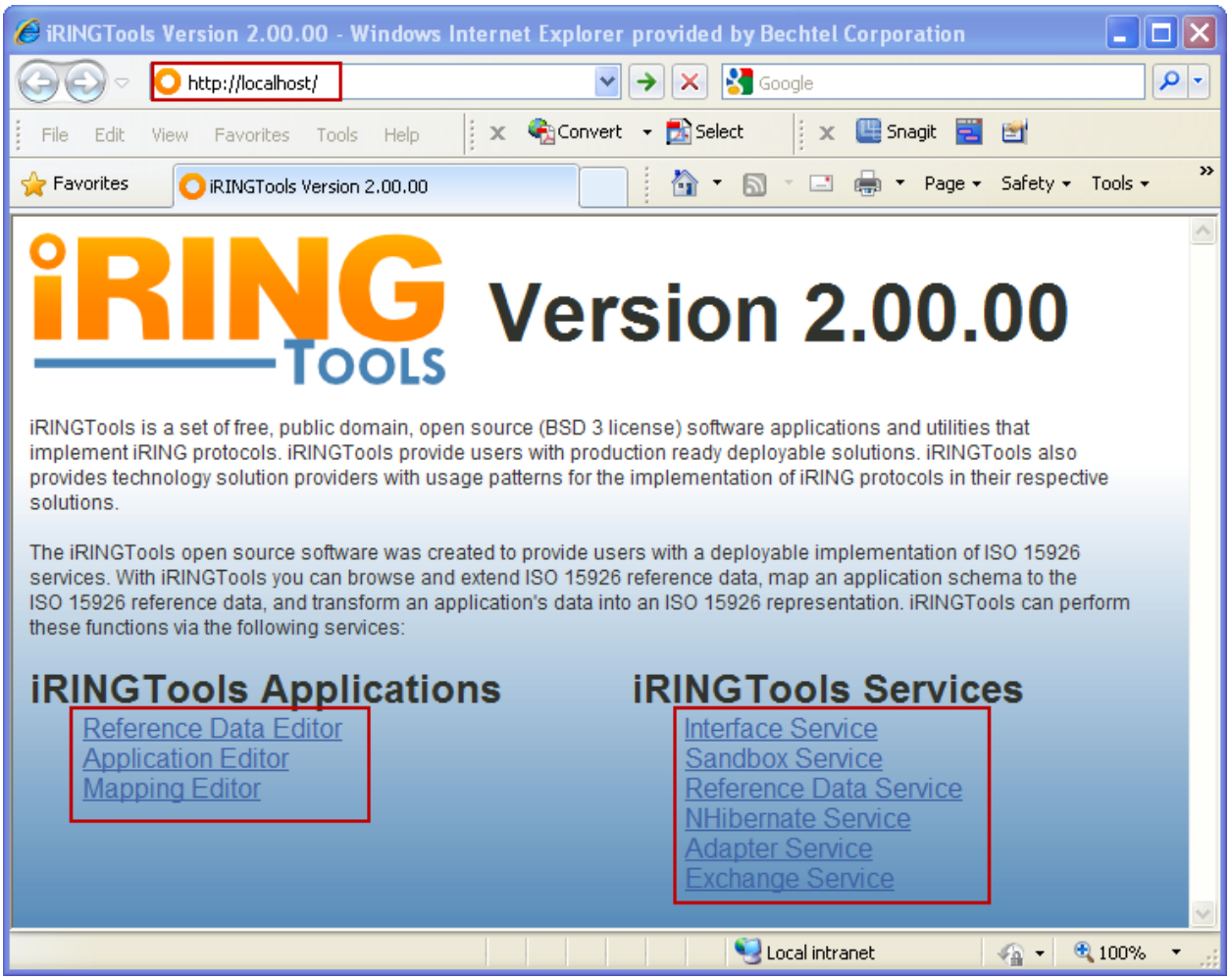
3.7 Reset IIS

IIS needs reset. Execute iisreset in a command window.



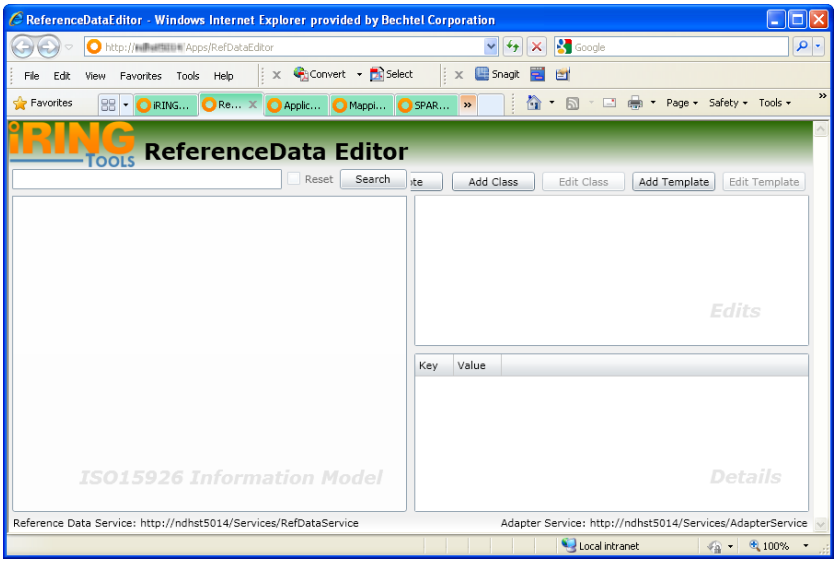
3.8 Final Tests

Browse to http://localhost/ and test the links in ***IRINGTools*** Applications and ***iRINGTools*** Services.

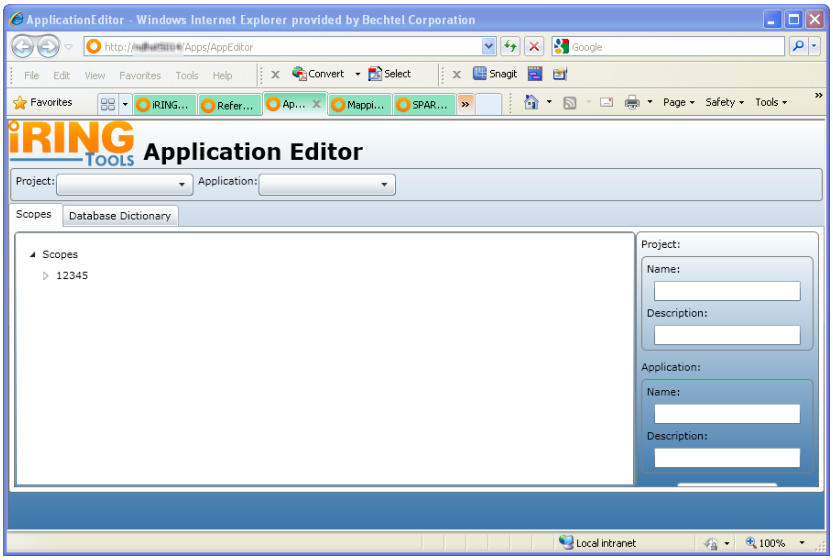


Below are sample screenshots of the applications and services.

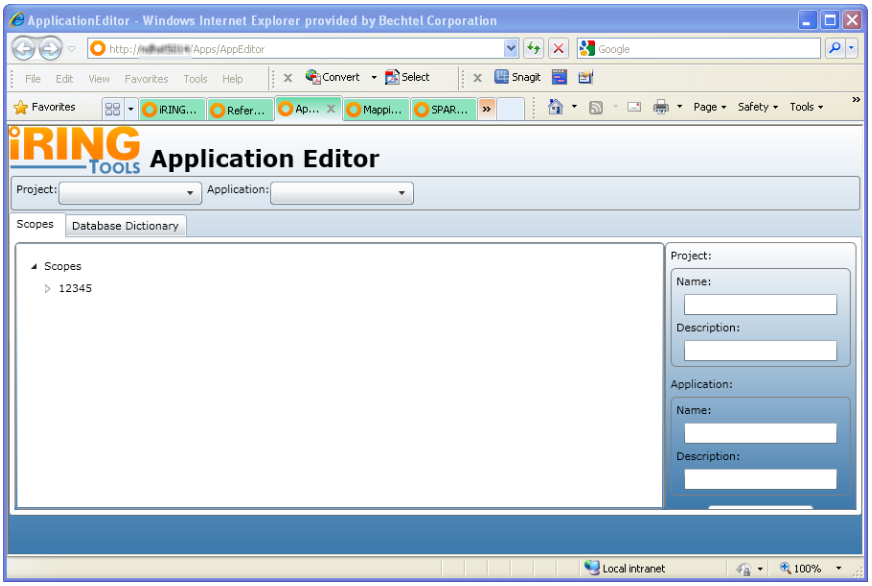
- Reference Data Editor



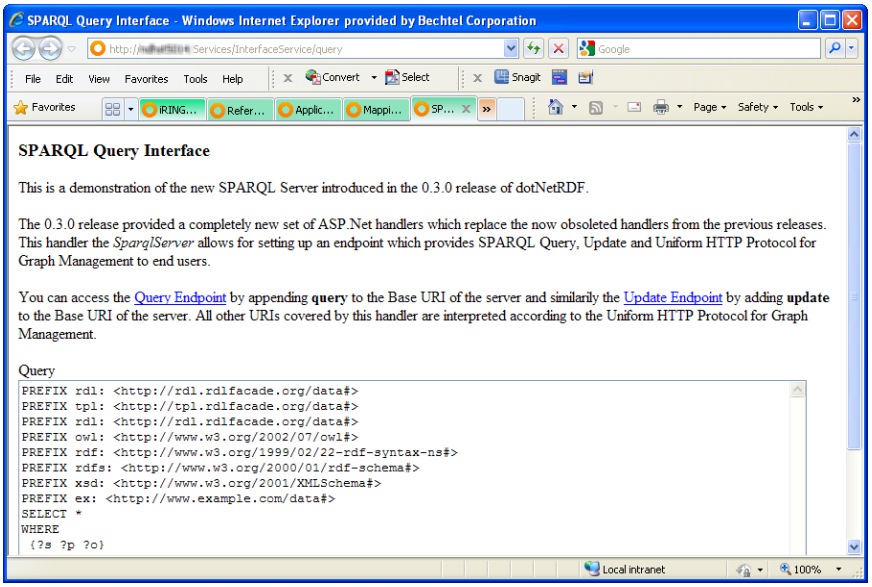
- Application Editor



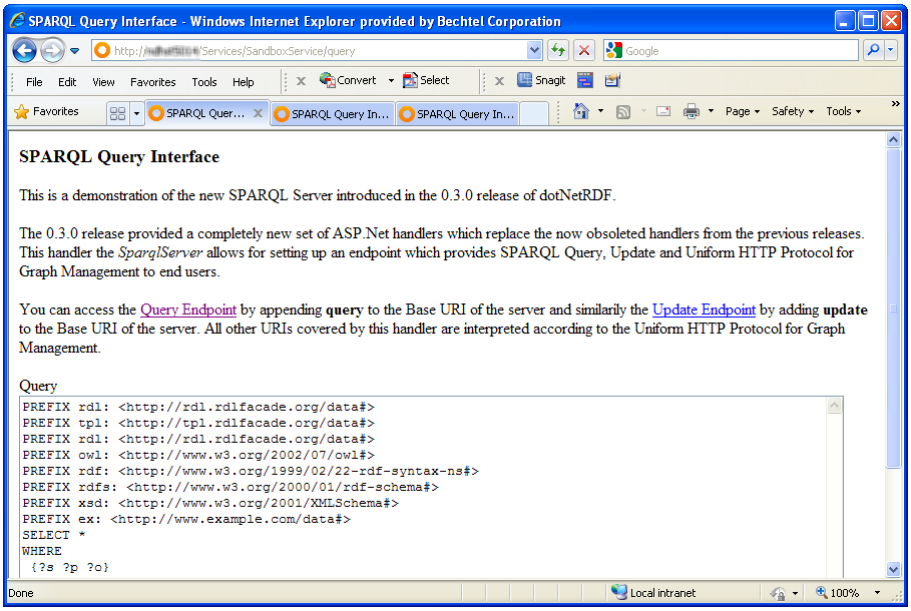
- Mapping Editor



- Interface Service

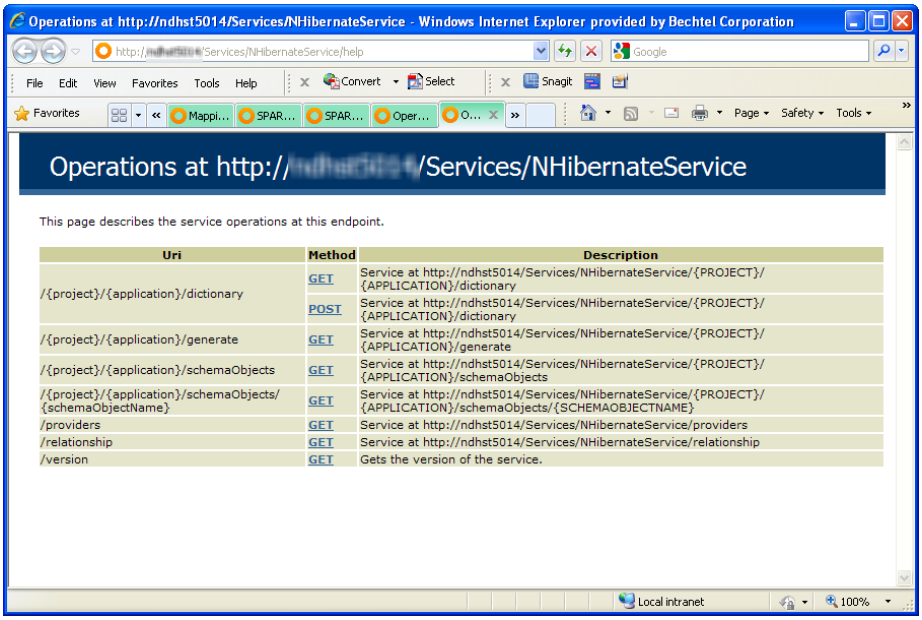


- Sandbox Service



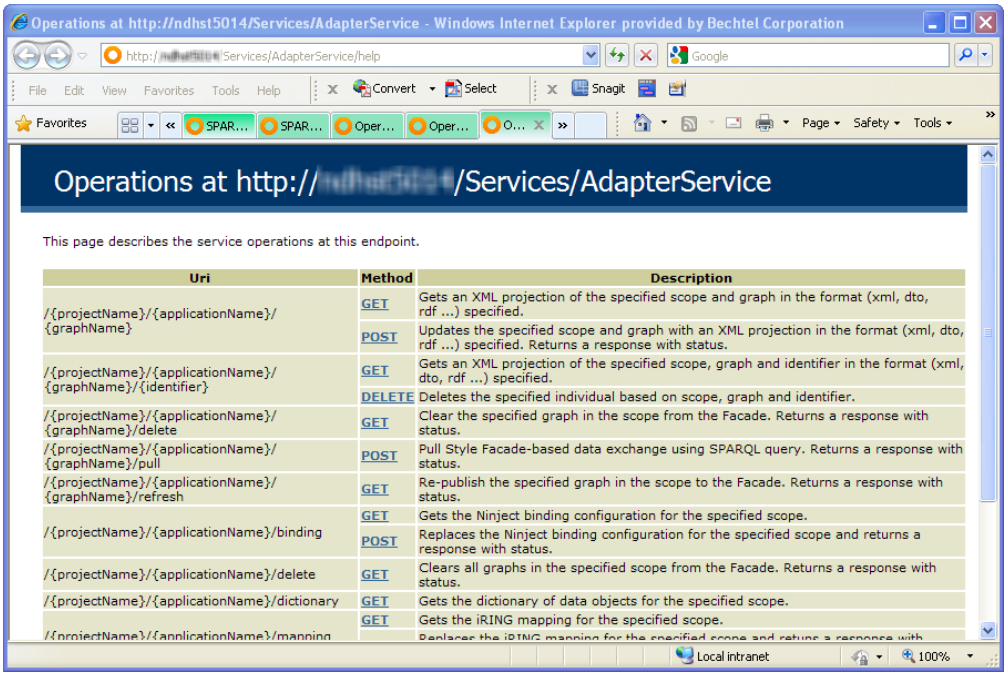
- Reference Data Service

- NHibernate Service



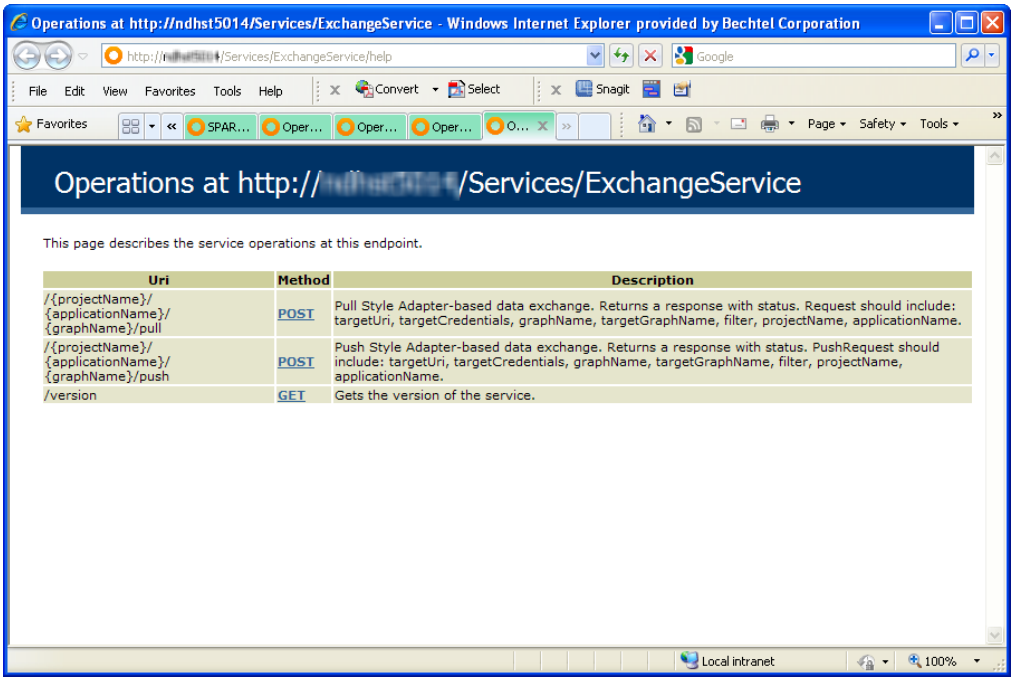
Uri	Method	Description
/{project}/{application}/dictionary	GET	Service at http://ndhst5014/Services/NHibernateService/{PROJECT}/{APPLICATION}/dictionary
	POST	Service at http://ndhst5014/Services/NHibernateService/{PROJECT}/{APPLICATION}/dictionary
/{project}/{application}/generate	GET	Service at http://ndhst5014/Services/NHibernateService/{PROJECT}/{APPLICATION}/generate
/{project}/{application}/schemaObjects	GET	Service at http://ndhst5014/Services/NHibernateService/{PROJECT}/{APPLICATION}/schemaObjects
/{project}/{application}/schemaObjects/{schemaObjectName}	GET	Service at http://ndhst5014/Services/NHibernateService/{PROJECT}/{APPLICATION}/schemaObjects/{SCHEMAOBJECTNAME}
/providers	GET	Service at http://ndhst5014/Services/NHibernateService/providers
/relationship	GET	Service at http://ndhst5014/Services/NHibernateService/relationship
/version	GET	Gets the version of the service.

- Adapter Service



Uri	Method	Description
/{projectName}/{applicationName}/{graphName}	GET	Gets an XML projection of the specified scope and graph in the format (xml, dto, rdf ...) specified.
	POST	Updates the specified scope and graph with an XML projection in the format (xml, dto, rdf ...) specified. Returns a response with status.
/{projectName}/{applicationName}/{graphName}/{identifier}	GET	Gets an XML projection of the specified scope, graph and identifier in the format (xml, dto, rdf ...) specified.
	DELETE	Deletes the specified individual based on scope, graph and identifier.
/{projectName}/{applicationName}/{graphName}/delete	GET	Clear the specified graph in the scope from the Facade. Returns a response with status.
/{projectName}/{applicationName}/{graphName}/pull	POST	Pull Style Facade-based data exchange using SPARQL query. Returns a response with status.
/{projectName}/{applicationName}/{graphName}/refresh	GET	Re-publish the specified graph in the scope to the Facade. Returns a response with status.
/{projectName}/{applicationName}/binding	GET	Gets the Ninject binding configuration for the specified scope.
	POST	Replaces the Ninject binding configuration for the specified scope and returns a response with status.
/{projectName}/{applicationName}/delete	GET	Clears all graphs in the specified scope from the Facade. Returns a response with status.
/{projectName}/{applicationName}/dictionary	GET	Gets the dictionary of data objects for the specified scope.
/{projectName}/{applicationName}/mapping	GET	Gets the iRING mapping for the specified scope.

- Exchange Service



3.9 Hostname Setup

The final step in the installation is updating hostname in certain ***iRINGTools*** services for use with client browsers on the network.

1. Open the file web.config file in Apps and Services folders in a text editor.

2. Change localhost to server name.

Installation of ***iRINGTools*** is complete.