



AWLRS Infrastructure Guide v1.2

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Table of Contents

Disclaimer	1
1 Database Server	2
2 Application Server	3
2.1 Base Server	3
2.2 Staging Folder.....	4
2.2.1 Oracle Client Software.....	4
2.2.2 MapServer.....	4
2.3 Install IIS.....	5
2.4 Install .NET 4.7.2.....	12
2.5 Install Web Deploy	13
2.6 Configure MIME Type	16
2.7 Install the Oracle Client	18
2.8 Patch Oracle Client	21
2.8.1 Update OPatch	23
2.8.2 Install the patch set.....	24
2.9 Configure the database connection	30
2.10 Configure GAC.....	37
2.11 Install MapServer.....	37
2.11.1 Build the MapServer directory.....	37
2.11.2 GIS-Internals Mapserver Build.....	37
2.11.3 Bentley Mapserver Build	39
2.11.4 Encyption Key.....	40
2.11.5 Configure Mapserver in IIS	41
2.12 Upgrade Mapsever	49

DISCLAIMER

Disclaimer

This guide provides instructions for building a basic “out of the box” environment to which the AWLRS application can be deployed. **It is intended only as a guide**; each individual customer site may have their own rules regarding the configuration of components such as IIS in which case the instructions given here may need to be adapted accordingly.

You must **ensure** that you have **adequate licensing** for all 3rd party software required such as **Windows Server** and **Oracle**. If you are unsure, please contact your Bentley Account Manager.

1 Database Server

The AWLRS application is dependent upon a fully patched exor core 4800 installation therefore it is assumed that an appropriate database server with an instance of exor core 4800 installed already exists before any attempt to deploy AWLRS is made.

2 Application Server

2.1 Base Server

The application server build should start with clean installation of Windows Server 2016.

The following additional assumptions are made:

1. The server is fully patched via Windows Update.
2. A single static IP address is used.
3. Minimum specification for the application server is as follows:
 - 2 CPU Cores
 - 8 GB RAM
 - 1 logical disk (C:) with 50GB of space allocated

2.2 Staging Folder

The following software components will need to be downloaded to a staging folder on the application server, for example C:\Stage, from this point on this folder will be referred to as <stage>.

2.2.1 Oracle Client Software

Download the following

- Oracle 12c Release 2 Client (12.2.0.1) for Windows x64

Download the appropriate patch set

- Microsoft Windows 64-bit Bundle Patch 29394003 April 2019

Download latest published OPatch patch (see oracle SR document **274526.1** for further details if needed)

From the appropriate Oracle Download site.

NB. Please note that a “My Oracle Support” account may be required to download this component.

2.2.2 MapServer

Up to and including AWLRS build 1.2.12.1 either the GIS-Internals or the Bentley build of mapserver can be used.

From AWLRS build 1.2.13.1 onwards the Bentley build of Mapserver included in the AWLRS release zip (assetwise_mapserver_7.0.7.33.zip) MUST be used.

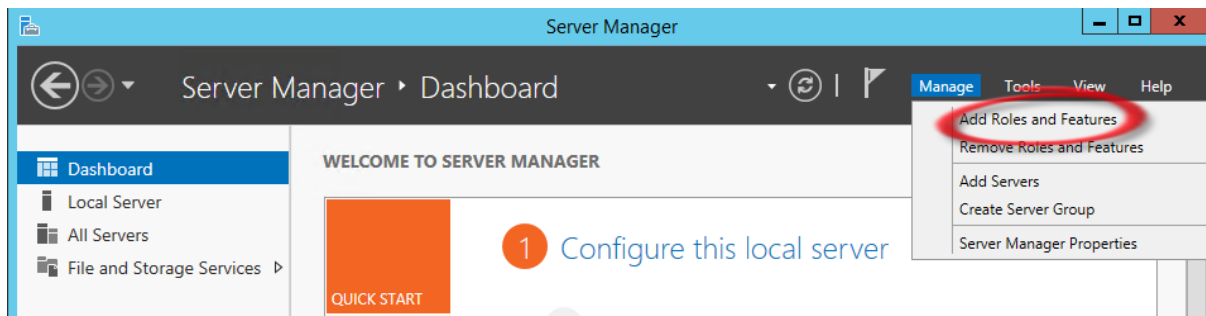
The GIS-Internals build of Mapserver can be downloaded the x64 version of Mapserver (**release-1800-x64-gdal-2-1-3-mapserver-7-0-4.zip**) from the following URL:

<http://download.gisinternals.com/sdk/downloads//release-1800-x64-gdal-2-1-3-mapserver-7-0-4.zip>

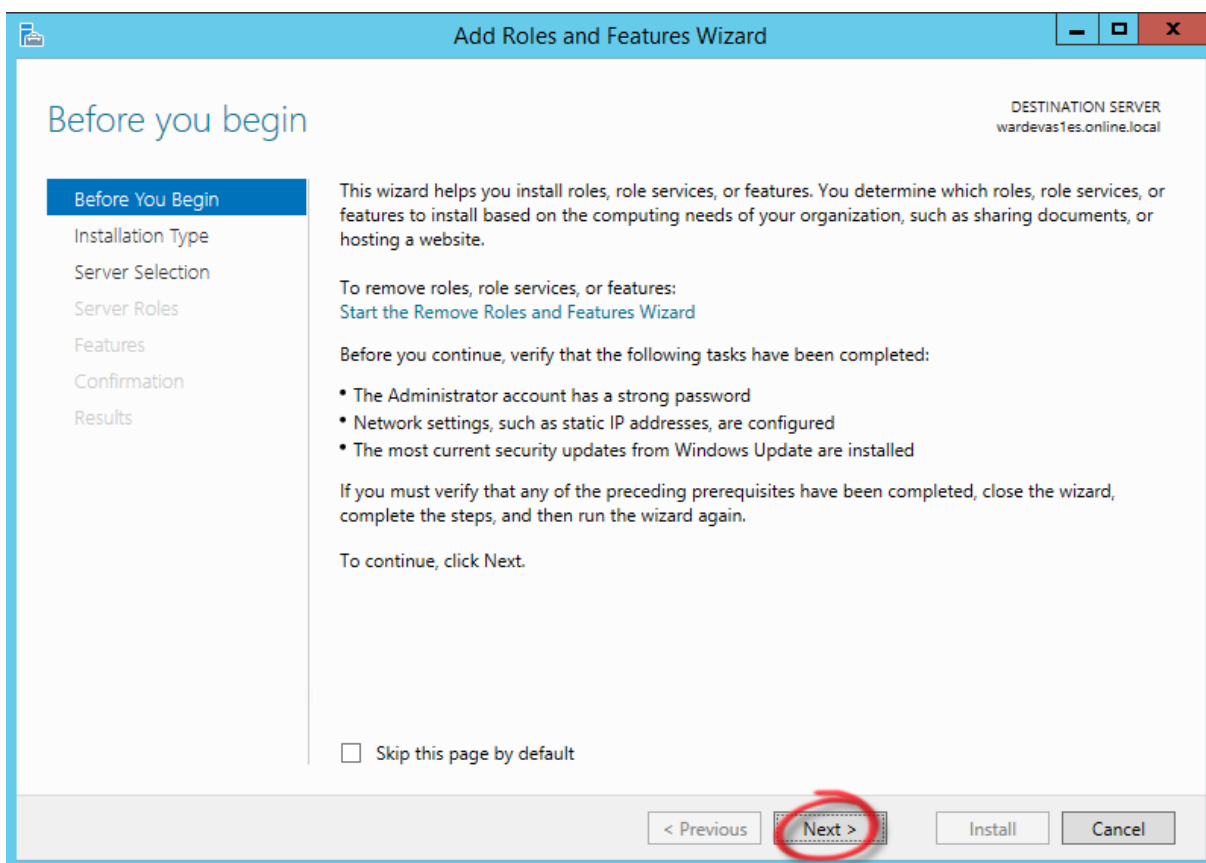
APPLICATION SERVER

2.3 Install IIS

Open Server Manager and select “Add roles and features” from the “Manage” menu:

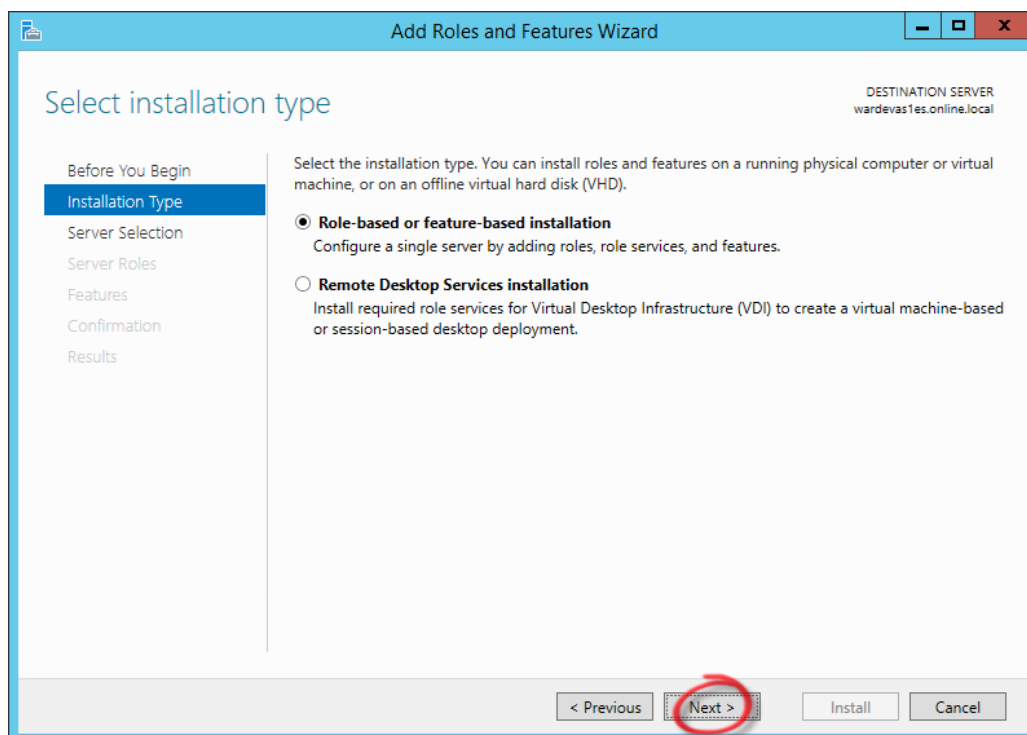


If the “Before You Begin” page is shown click on “Next”:

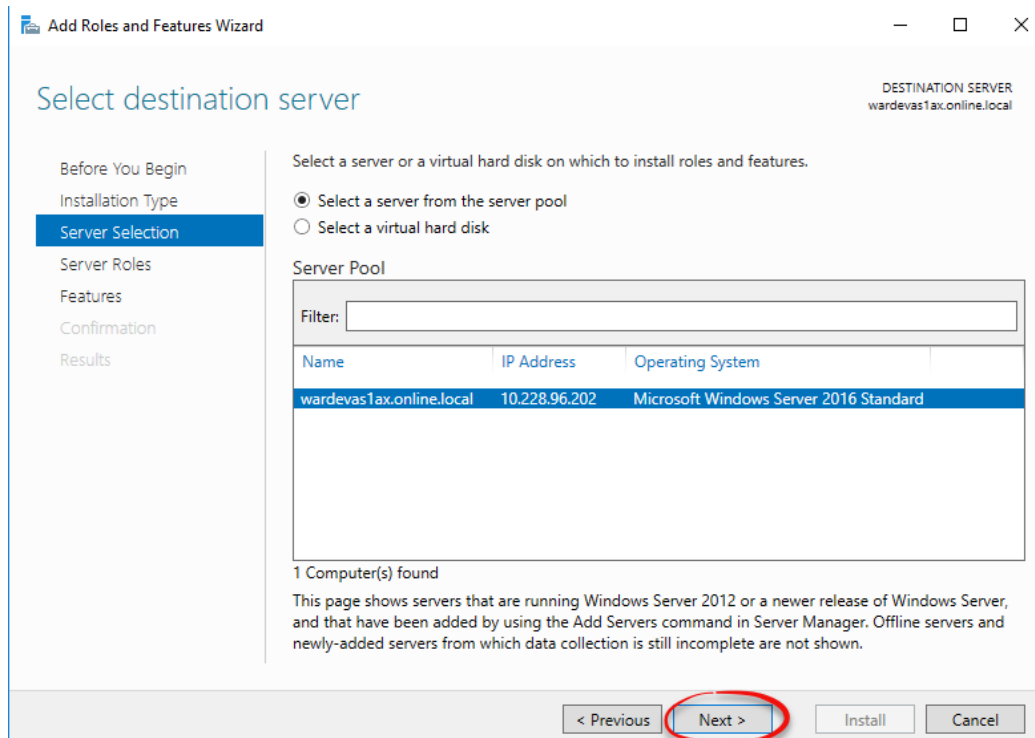


APPLICATION SERVER

Make sure that “Role-based or feature-based installation” is selected and click on “Next”:

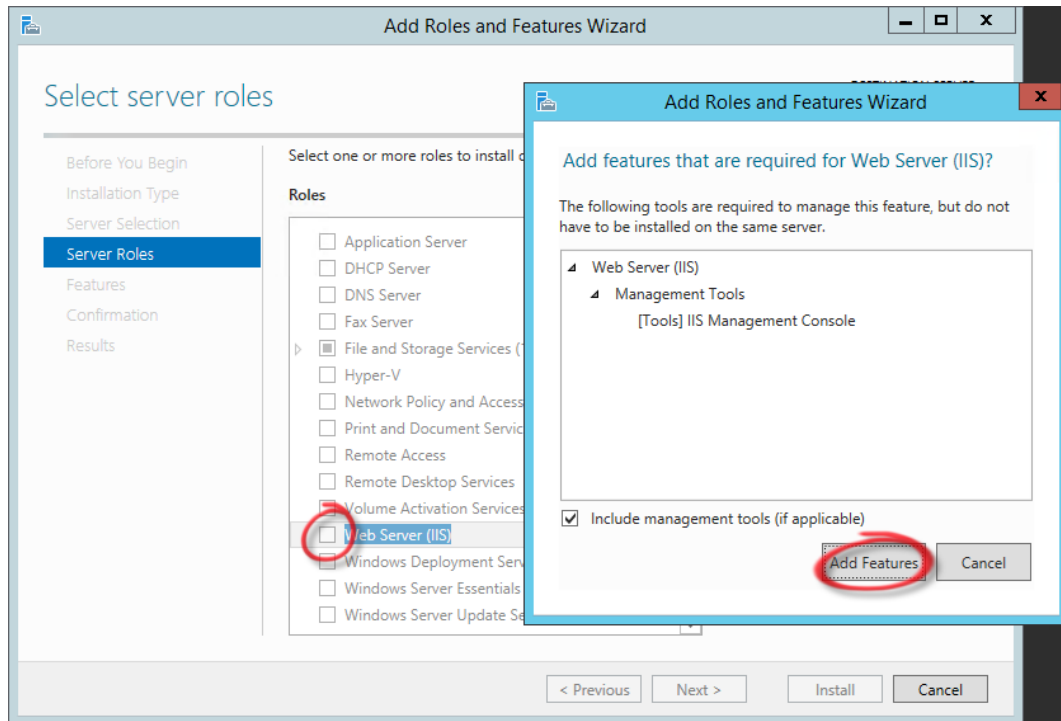


Accept the default “Select a server from the server pool” and the server being configured from the server pool and click on “Next”:

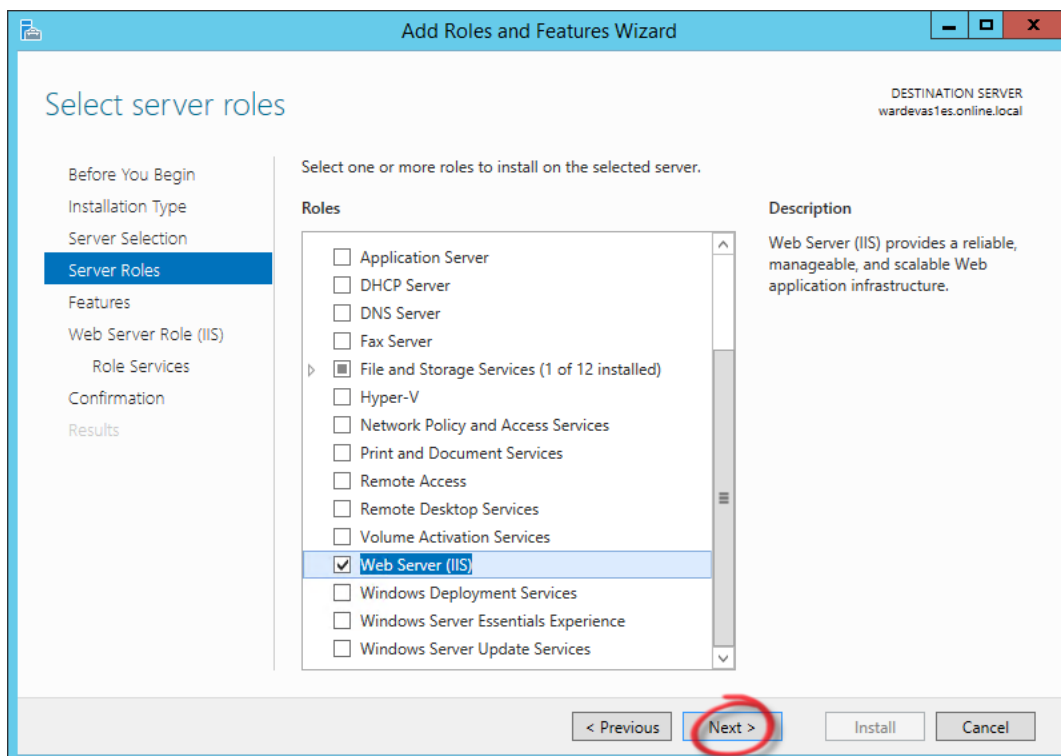


APPLICATION SERVER

Scroll down the list of Server Roles and select “Web Server (IIS)”, click on “Add Features” in the window that pops up to confirm the addition of the IIS Management Console:



Click on “Next”:

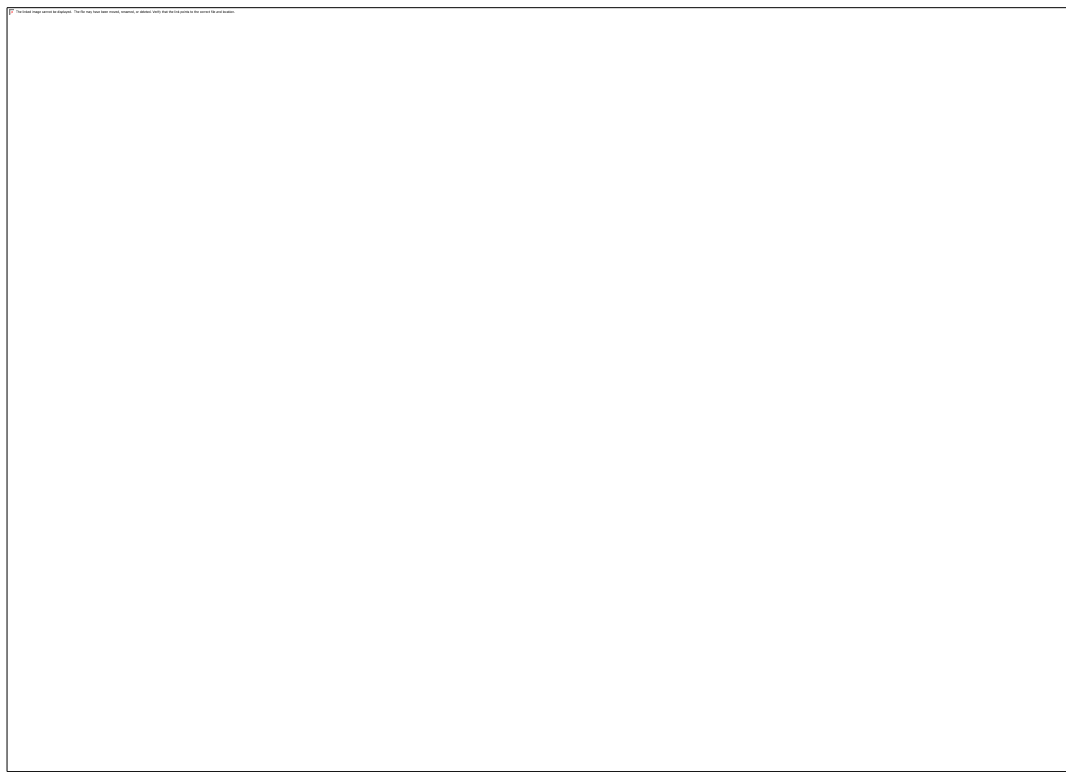


CONFIDENTIALITY STATEMENT

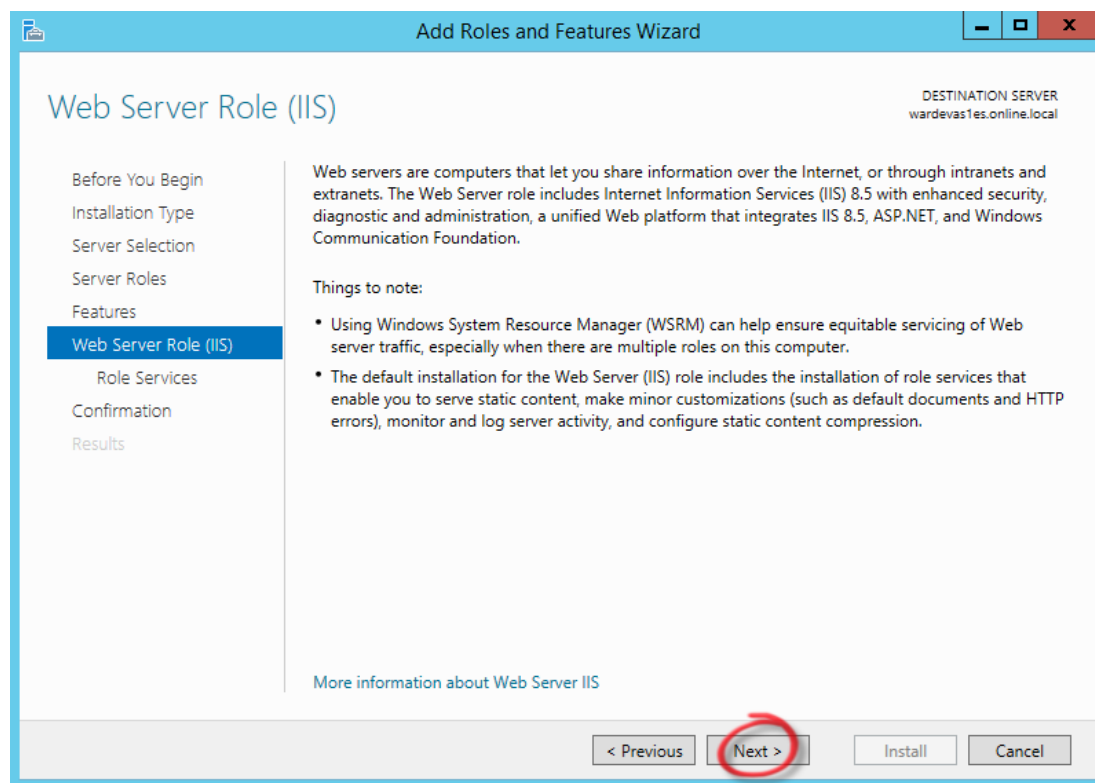
The contents of this document, including system ideas and concepts, are confidential and proprietary in nature and are not to be distributed in any form without the prior written consent of Bentley, Inc.

APPLICATION SERVER

Select “ASP.NET 4.6” from the list of Features and click on “Next”:



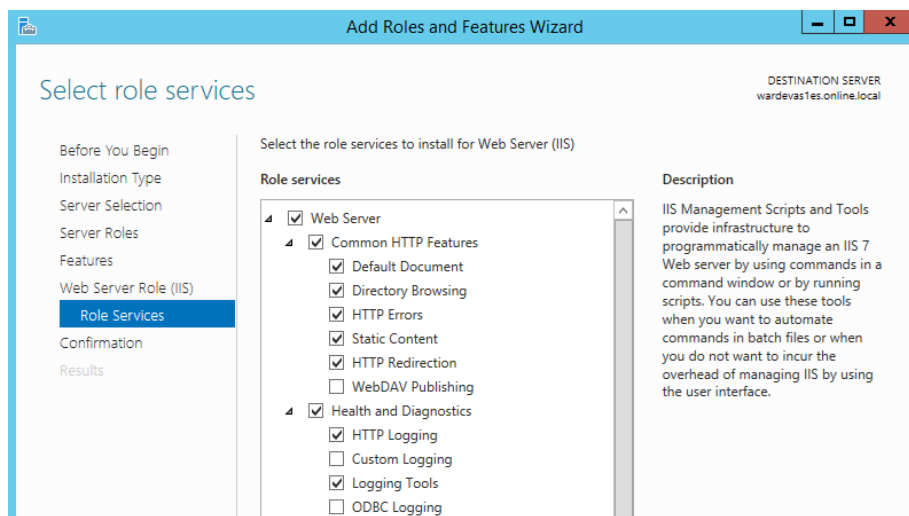
Click on “Next” to continue to “Role Services”:



APPLICATION SERVER

Ensure that the following Role Services are selected in addition to the defaults (Click on “Add Features” if any popups are displayed as you select the Role Services from the list) then click on “Next”:

- HTTP Redirection
- Logging Tools
- Request Monitor
- Dynamic Content Compression
- Basic Authentication
- Client Certificate Mapping Authentication
- Digest Authentication
- IIS Client Certificate Mapping Authentication
- IP and Domain Restrictions
- URL Authorization
- Windows Authentication
- .Net Extensibility 4.6
- ASP
- ASP.NET 4.6
- CGI
- ISAPI Extensions
- ISAPI Filters
- Server Side Includes
- IIS Management Scripts and Tools



APPLICATION SERVER

Add Roles and Features Wizard

Select role services

DESTINATION SERVER
wardevastax.online.local

Before You Begin
Installation Type
Server Selection
Server Roles
Features
Web Server Role (IIS)
Role Services
Confirmation
Results

Select the role services to install for Web Server (IIS)

Role services

- ☒ Logging Tools
- ☐ ODBC Logging
- ☒ Request Monitor
- ☐ Tracing
- ☒ Performance
 - ☒ Static Content Compression
 - ☒ Dynamic Content Compression
- ☒ Security
 - ☒ Request Filtering
 - ☒ Basic Authentication
 - ☐ Centralized SSL Certificate Support
 - ☒ Client Certificate Mapping Authentication
 - ☒ Digest Authentication
 - ☒ IIS Client Certificate Mapping Authentication
 - ☒ IP and Domain Restrictions
 - ☒ URL Authorization
 - ☒ Windows Authentication
- ☒ Application Development
 - ☐ .NET Extensibility 3.5
 - ☒ .NET Extensibility 4.6
 - ☐ Application Initialization
 - ☒ ASP
 - ☐ ASP.NET 3.5
 - ☒ ASP.NET 4.6
 - ☒ CGI
 - ☒ ISAPI Extensions
 - ☒ ISAPI Filters
 - ☒ Server Side Includes
 - ☐ WebSocket Protocol
- ☐ FTP Server
 - ☐ FTP Service
 - ☐ FTP Extensibility
- ☒ Management Tools
 - ☒ IIS Management Console
 - ☐ IIS 6 Management Compatibility
 - ☒ **IIS Management Scripts and Tools**
 - ☐ Management Service

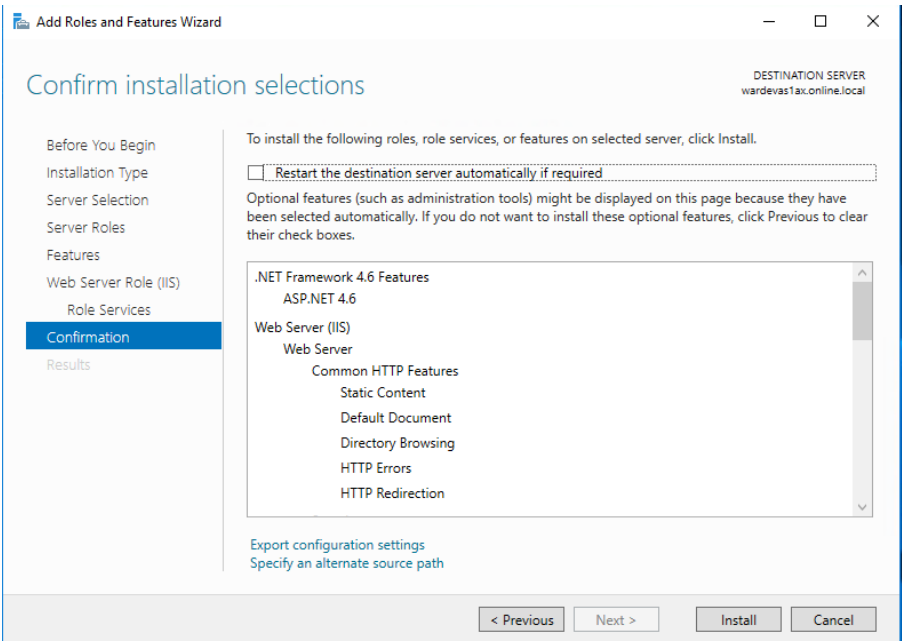
Description

IIS Management Scripts and Tools provide infrastructure to programmatically manage an IIS 10 Web server by using commands in a command window or by running scripts. You can use these tools when you want to automate commands in batch files or when you do not want to incur the overhead of managing IIS by using the user interface.

< Previous Next > Install Cancel

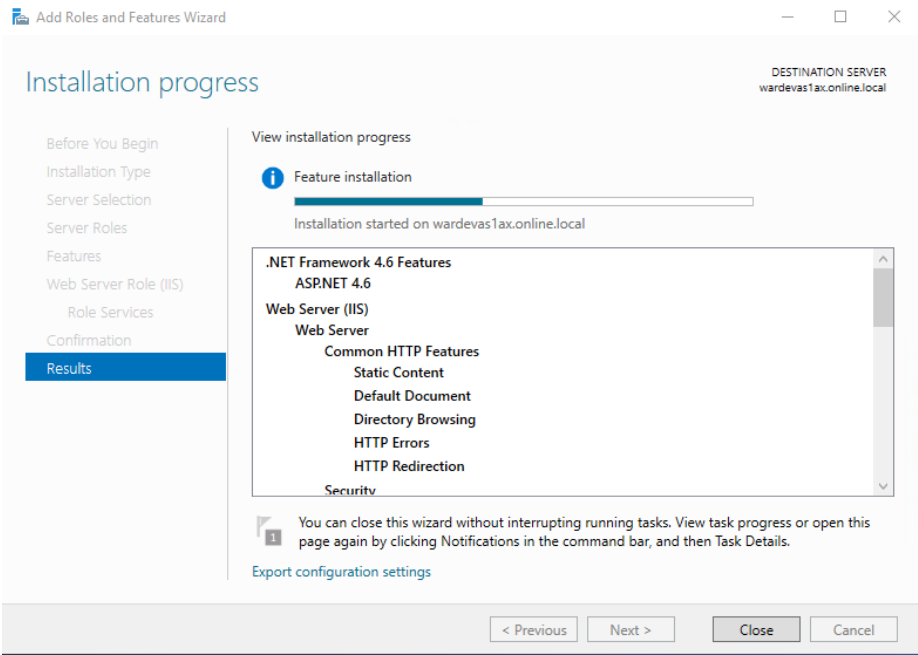
Check the list of Roles and Features to be installed then click on “Install”:

APPLICATION SERVER



The installation will start, it may take a few minutes to complete:

Once the installation is complete click on “Close”



APPLICATION SERVER

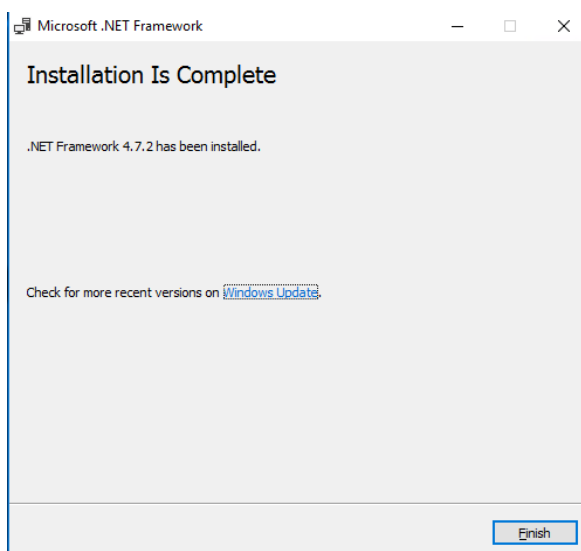
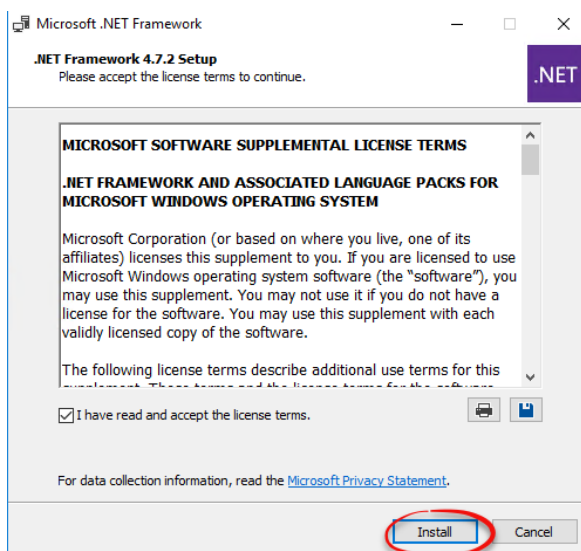
2.4 Install .NET 4.7.2

Using a browser on the **application server**, navigate to the following URL:

<https://dotnet.microsoft.com/download/dotnet-framework/net472>

Download the runtime version, once downloaded, depending on your browser, you may see a pop-up prompt asking for permission to run the file, if not the browser to the download location and double click on the file to execute it.

Select “Install”



Once complete restart the app server.

2.5 Install Web Deploy

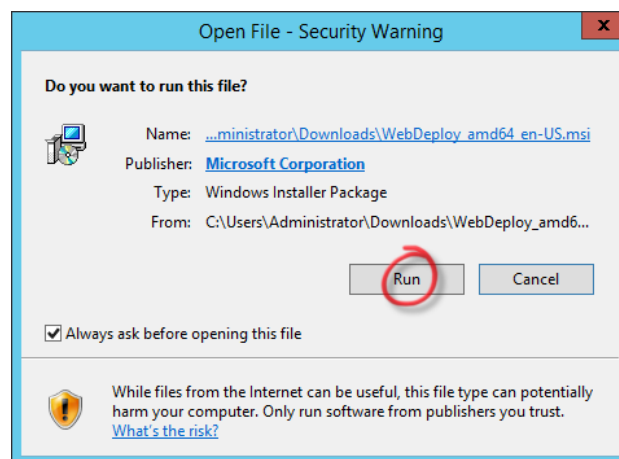
Using a browser on the **application server**, navigate to the following URL:

<https://www.microsoft.com/en-gb/download/confirmation.aspx?id=39277>

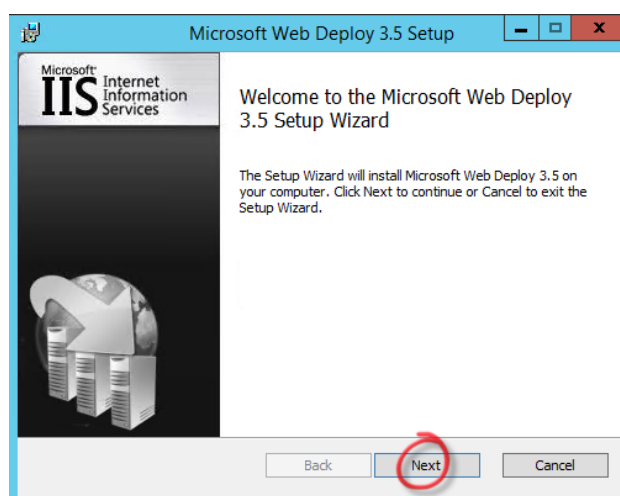
This will initiate the download of the file “WebDeploy_amd64_en-US.msi”

Once downloaded, depending on your browser, you may see a pop-up prompt asking for permission to run the file, if not the browse to the download location and double click on the file to execute it.

Select “Run” when prompted:

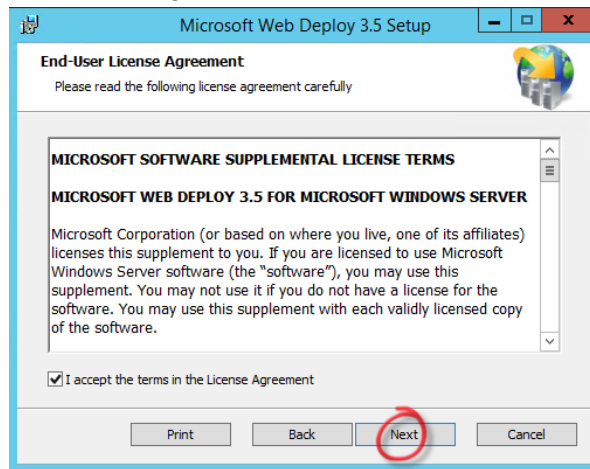


When the Setup window is displayed click on “Next”:

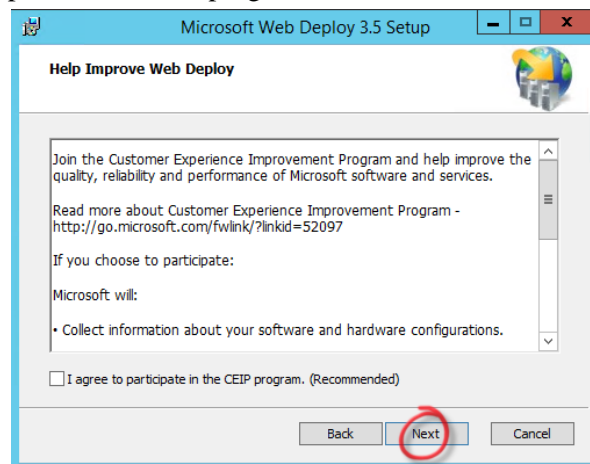


APPLICATION SERVER

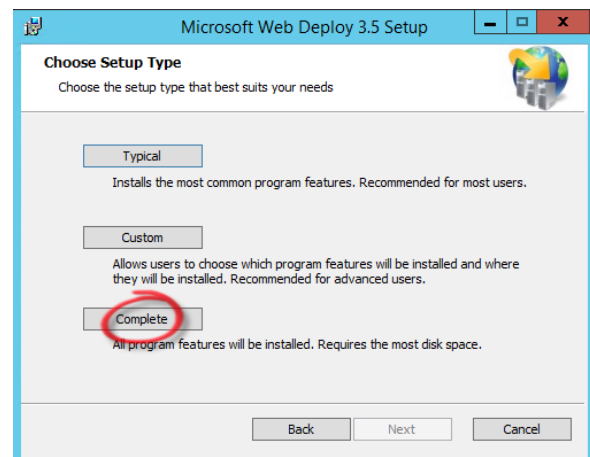
Tick the box to accept the terms of the license agreement and click on “Next”:



Tick the box if you wish to participate in the CEIP program and click on “Next”:

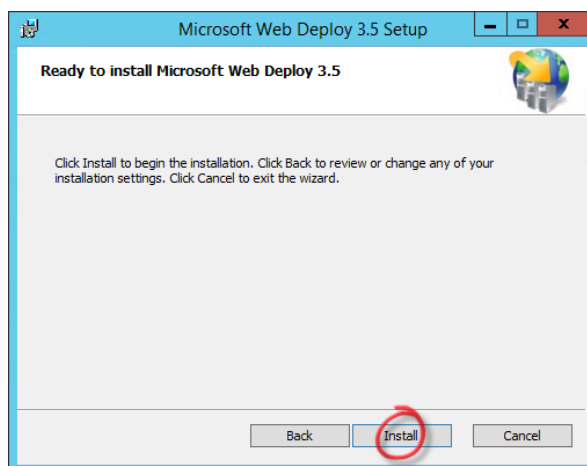


Click on “Complete” to perform a full install:

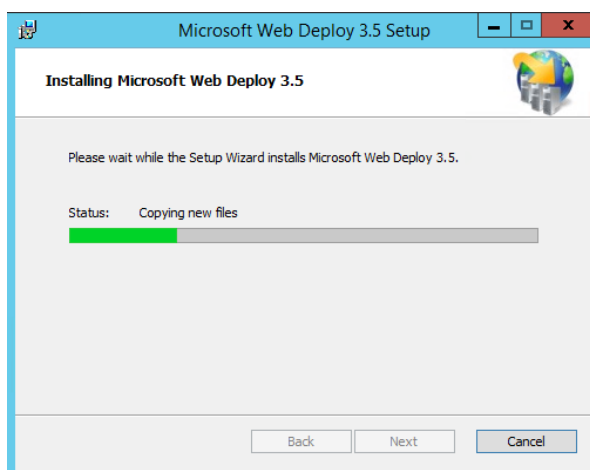


APPLICATION SERVER

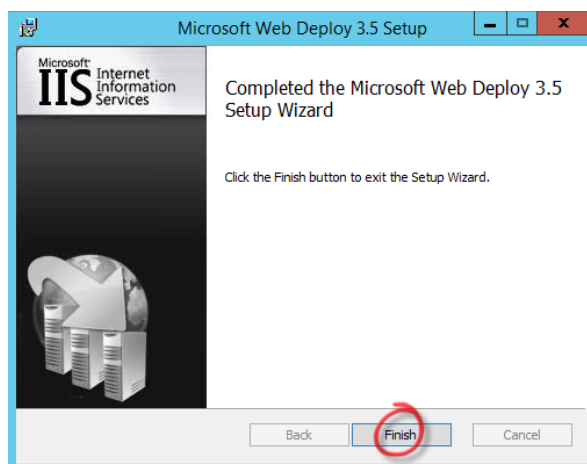
Click on “Install”:



The installation will begin:



Click on “Finish” to complete the installation:



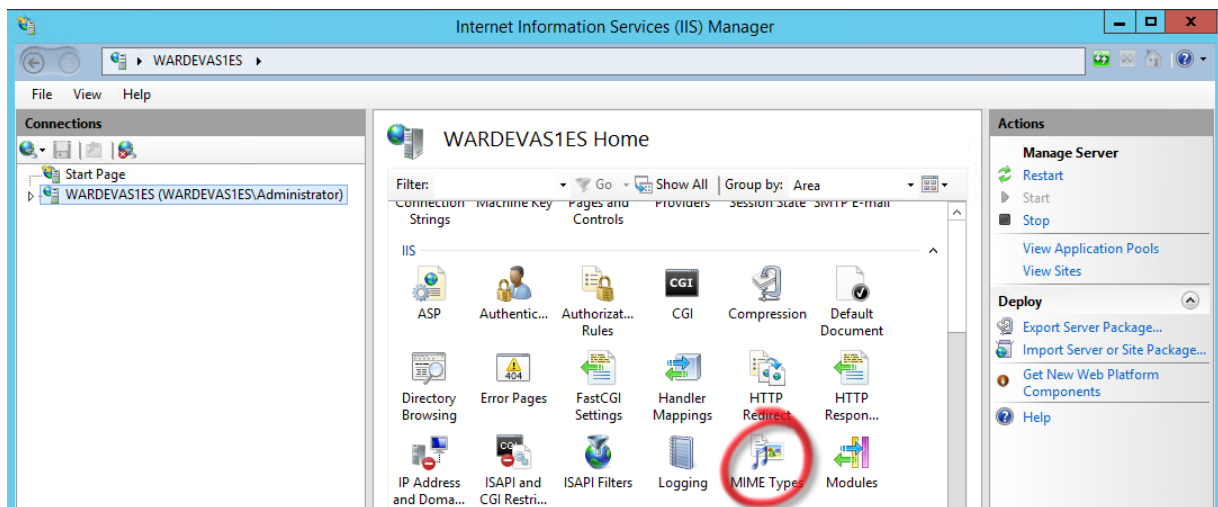
The Web Deploy installation is now complete.

APPLICATION SERVER

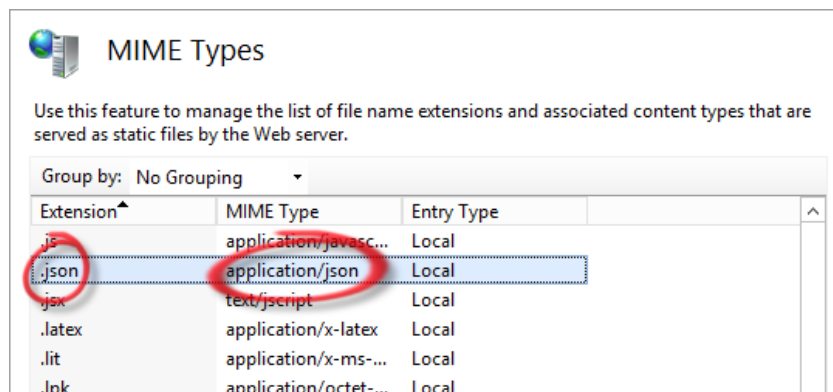
2.6 Configure MIME Type

The AWLRS Web Api returns some content to the AWLRS Application as json files so a MIME Type for the “.json” extension is required.

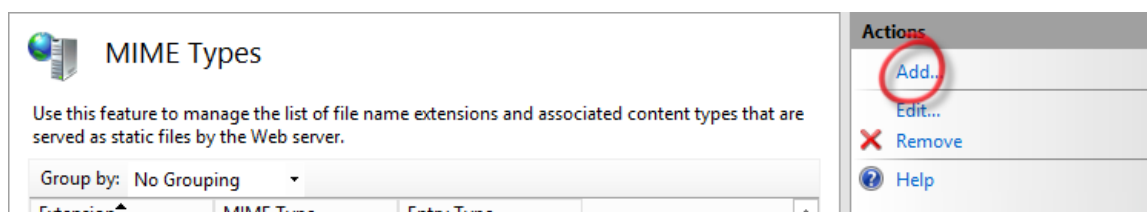
On the **application server** run the Internet Information Services (IIS) Manager application, select the server in the left-hand side and double click the “MIME Types” icon in the central panel:



Check that the list of MIME Types has an entry for the extension “.json” as shown below:



If there is no entry then click “Add” in the “Actions” panel on the right-hand side:

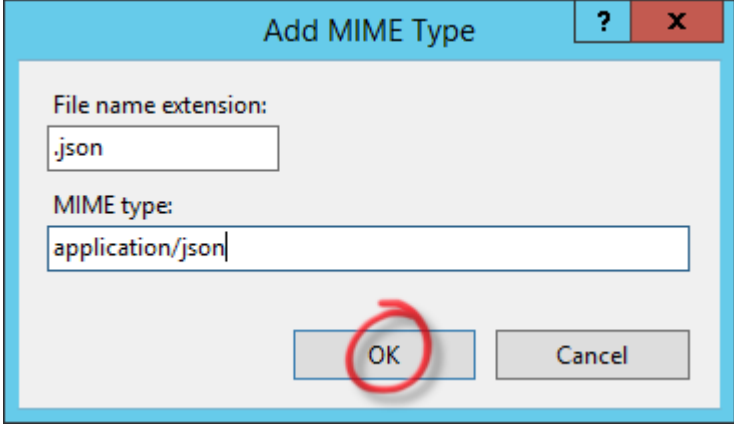


APPLICATION SERVER

Enter the following values and click on “OK”:

File name extension: .json

MIME type: application/json



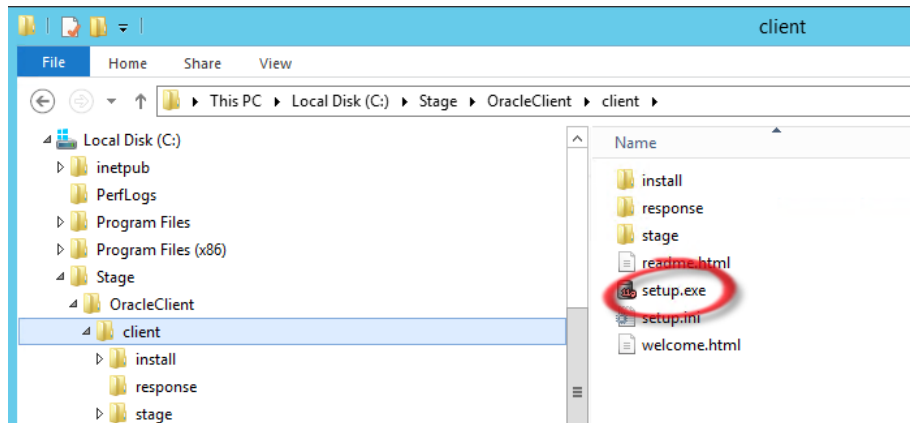
Exit IIS Manager.

APPLICATION SERVER

2.7 Install the Oracle Client

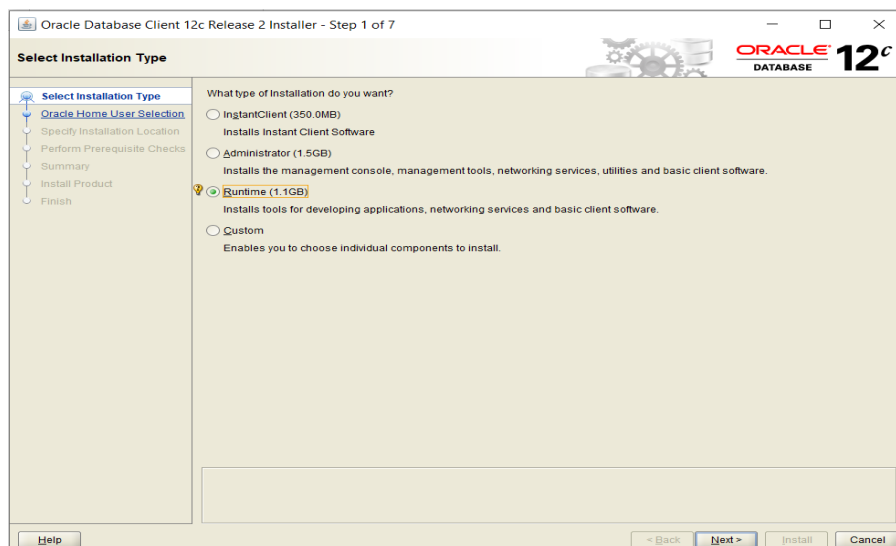
On the **application server** go to the <stage> folder created in section 2.2 and unzip the downloaded Oracle 12c Client (12.2.0.1) for Windows x64 to a folder called OracleClient

You should now have a folder structure that looks something like this:



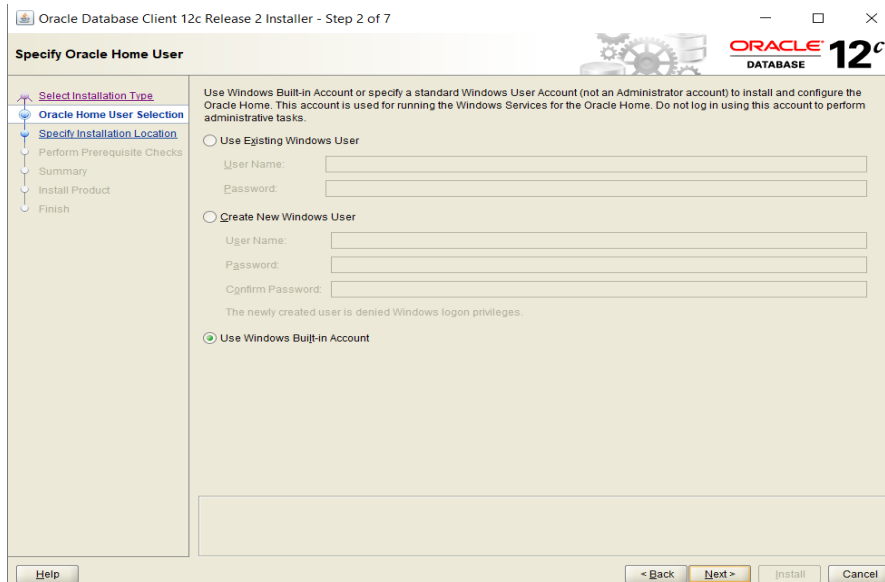
Run <stage>\OracleClient\client\setup.exe as administrator, a command prompt will be briefly displayed followed by the Oracle Client Installer.

Select “Runtime” from the list of installation types and click on “Next”:



APPLICATION SERVER

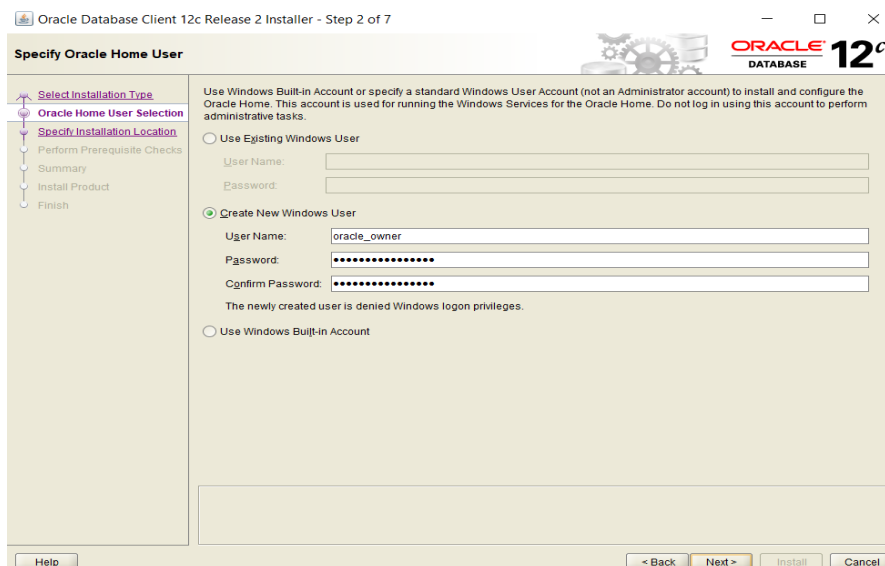
In the next section you have different options. The Oracle recommended approach is to install as a new windows user.



- For Bentley internal or development purposes can stick to the default of “Use Windows Built-in Account”.
- If you are unable to create a windows user, the most likely reason is setup.exe is not being with Administrator Privileges – it would be best to start the install again.

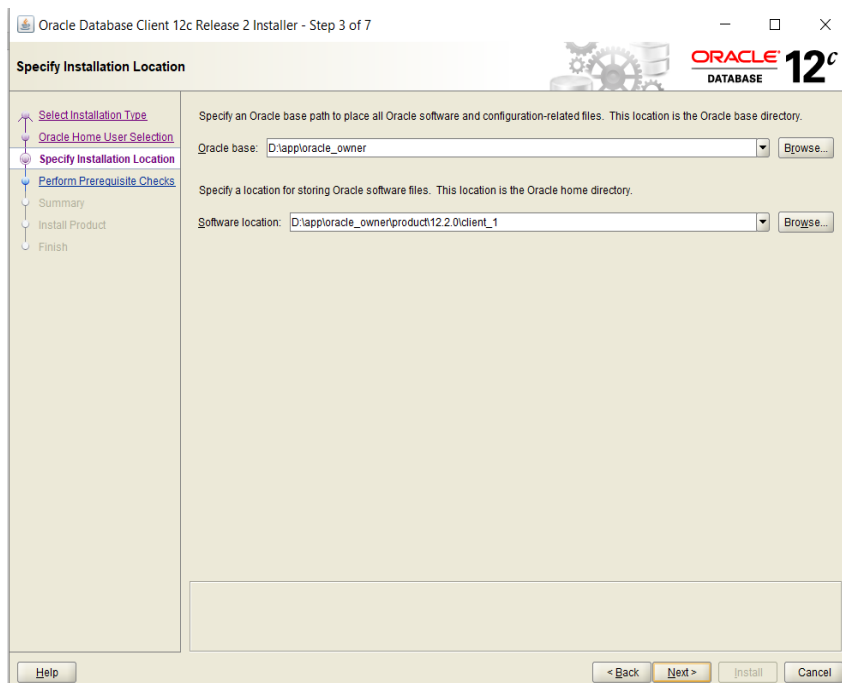
In this example the windows user will be called “oracle_owner”

Regardless of whether you chose a built-in account, or to Create a New Windows user, Click Next .

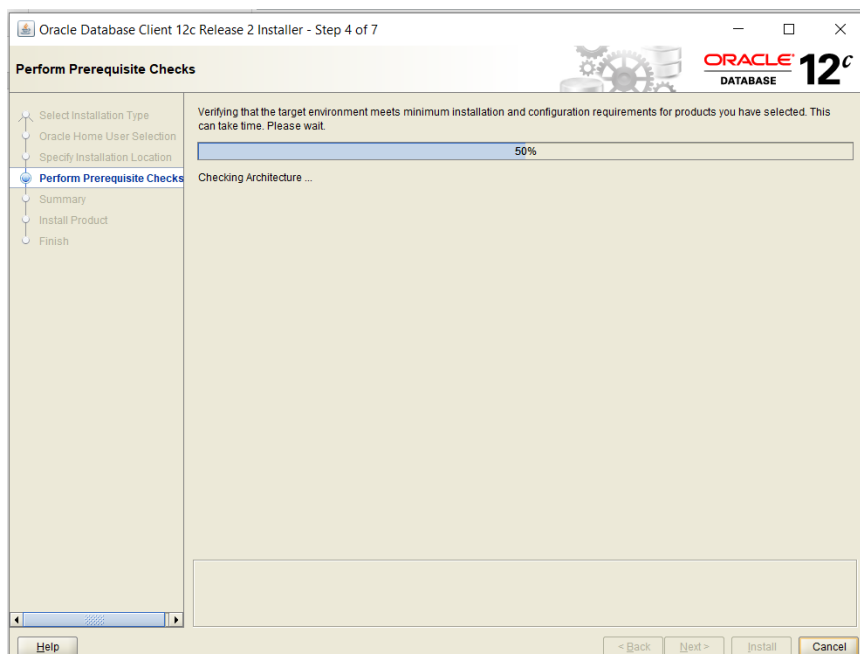


APPLICATION SERVER

Optionally amend the locations of the install and click next:

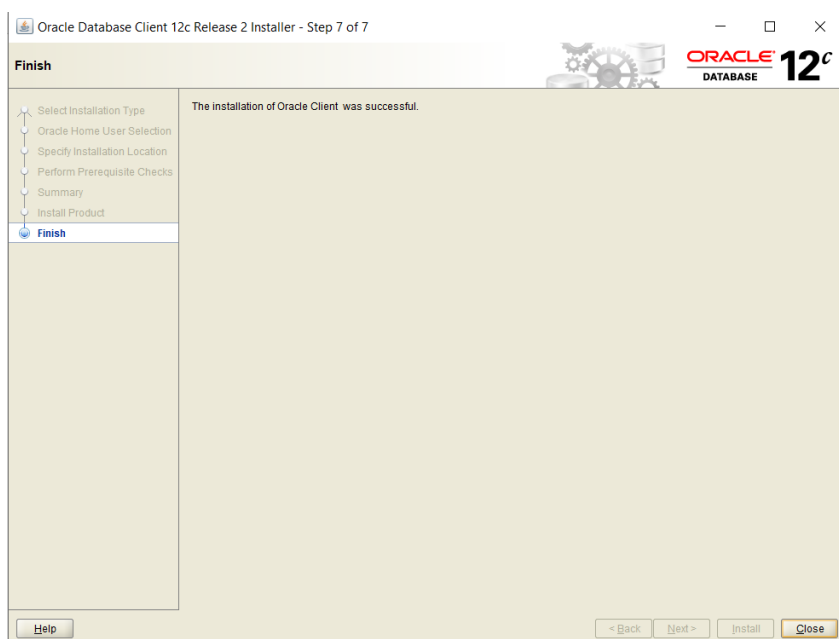
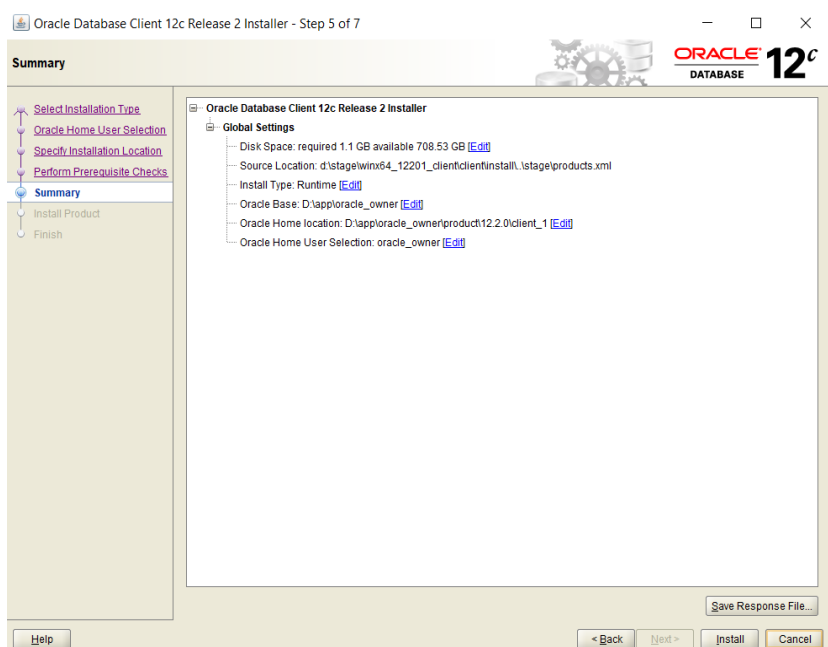


Click Next, Install will verify Pre-requisite checks



APPLICATION SERVER

Click install when it has completed pre-requisite checks ok



At this point the Oracle 12c client is installed, if patching is required please follow oracle guidelines.

2.8 Patch Oracle Client

This section contains two tasks

APPLICATION SERVER

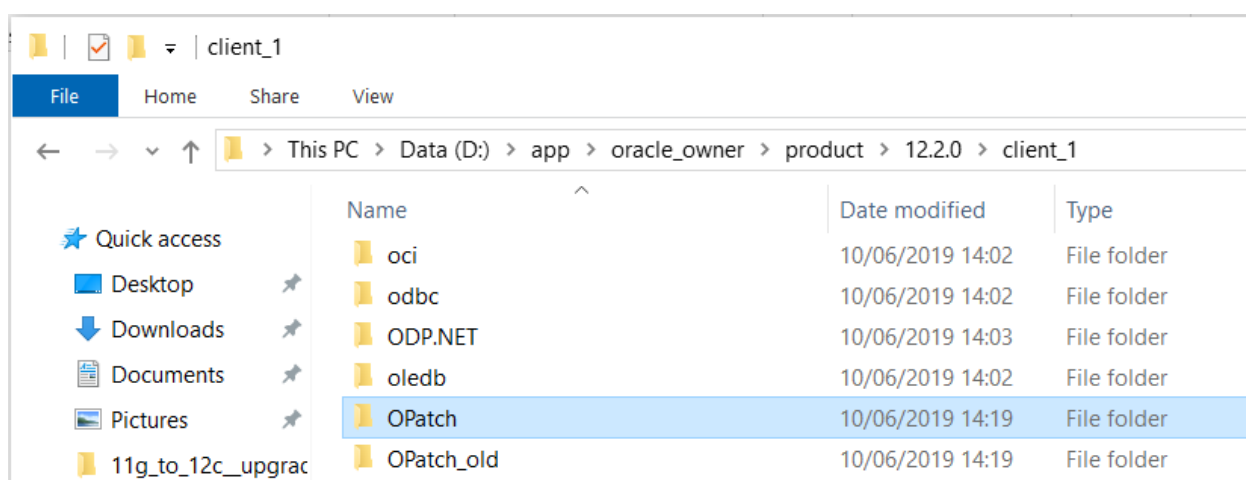
- Extract the latest copy of Opatch, and put it in the Client Oracle_Home
(Opatch is Oracle's Patching Utility.)
- Install the patchset

APPLICATION SERVER

2.8.1 Update OPatch

Navigate to the Oracle client install directory and rename the existing Opatch directory as Opatch_old
(Which in this example is D:\app\oracle_owner\product\12.2.0\client_1\OPatch)
e.g.

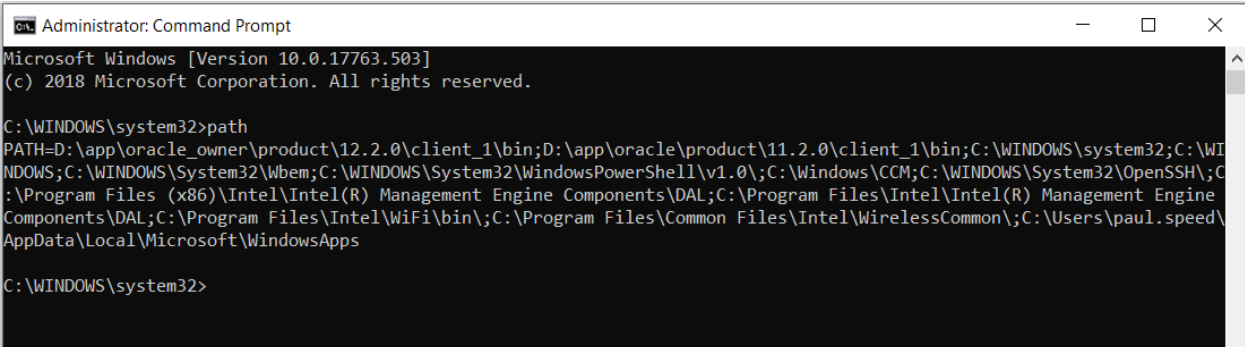
Extract opatch download into a Staging area and copy the Opatch folder from it, and then paste it into your client installation



APPLICATION SERVER

2.8.2 Install the patch set

Open a **NEW** command prompt as administrator, this is to make sure your PATH has been updated with the new ORACLE_HOME for the client.



```

Administrator: Command Prompt
Microsoft Windows [Version 10.0.17763.503]
(c) 2018 Microsoft Corporation. All rights reserved.

C:\WINDOWS\system32>path
PATH=D:\app\oracle_owner\product\12.2.0\client_1\bin;D:\app\oracle\product\11.2.0\client_1\bin;C:\WINDOWS\system32;C:\WI
NDOWS;C:\WINDOWS\System32\Wbem;C:\WINDOWS\System32\WindowsPowerShell\v1.0\;C:\Windows\CCM;C:\WINDOWS\System32\OpenSSH\;C
:\Program Files (x86)\Intel\Intel(R) Management Engine Components\DAL;C:\Program Files\Intel\Intel(R) Management Engine
Components\DAL;C:\Program Files\Intel\WiFi\bin\;C:\Program Files\Common Files\Intel\WirelessCommon\;C:\Users\paul.speed\
AppData\Local\Microsoft\WindowsApps
C:\WINDOWS\system32>

```

(Above). Run the PATH command.

You should now see an Oracle client on the front of the path.

If you don't see an oracle client on it, you need to close the window, and open a new one.

Set the following variables – please note this is for a client installed in

D:\asqlpluspp\oracle_owner\product\12.2.0\client_1

Your home may be different, depending on what you chose.

```

SET ORACLE_HOME=D:\app\oracle_owner\product\12.2.0\client_1
PATH=%ORACLE_HOME%\OPatch;%PATH%
PATH=%ORACLE_HOME%\perl\bin;%PATH%

```

This adds opatch and perl into the path, we can verify that's ok as follows using these two commands

Perl -v

Opatch lsinventory

APPLICATION SERVER

```

Administrator: Command Prompt
(c) 2018 Microsoft Corporation. All rights reserved.

C:\WINDOWS\system32>path
PATH=D:\app\oracle_owner\product\12.2.0\client_1\bin;D:\app\oracle\product\11.2.0\client_1\bin;C:\WINDOWS\system32;C:\WI
NDOWS\system32\Wbem;C:\WINDOWS\system32\WindowsPowerShell\v1.0\;C:\Windows\CCM;C:\WINDOWS\system32\OpenSSH;C
:\Program Files (x86)\Intel\Intel(R) Management Engine Components\DAL;C:\Program Files\Intel\Intel(R) Management Engine
Components\DAL;C:\Program Files\Intel\WiFi\bin\;C:\Program Files\Common Files\Intel\WirelessCommon\;C:\Users\paul.speed\
AppData\Local\Microsoft\WindowsApps

C:\WINDOWS\system32>SET ORACLE_HOME= D:\app\oracle_owner\product\12.2.0\client_1

C:\WINDOWS\system32>PATH=%ORACLE_HOME%\OPatch;%PATH%

C:\WINDOWS\system32> PATH=%ORACLE_HOME%\perl\bin;%PATH%

C:\WINDOWS\system32>perl -v

This is perl 5, version 22, subversion 0 (v5.22.0) built for MSWin32-x64-multi-thread

Copyright 1987-2015, Larry Wall

Perl may be copied only under the terms of either the Artistic License or the
GNU General Public License, which may be found in the Perl 5 source kit.

Complete documentation for Perl, including FAQ lists, should be found on
this system using "man perl" or "perldoc perl". If you have access to the
Internet, point your browser at http://www.perl.org/, the Perl Home Page.

C:\WINDOWS\system32>

```

This should show some output from Perl.

```

Administrator: Command Prompt
C:\WINDOWS\system32> PATH=%ORACLE_HOME%\perl\bin;%PATH%

C:\WINDOWS\system32>opatch lsinventory
Oracle Interim Patch Installer version 12.2.0.1.14
Copyright (c) 2019, Oracle Corporation. All rights reserved.

Oracle Home      : D:\app\oracle_owner\product\12.2.0\client_1
Central Inventory : C:\Program Files\Oracle\Inventory
   from           :
OPatch version    : 12.2.0.1.14
OUI version       : 12.2.0.1.4
Log file location : D:\app\oracle_owner\product\12.2.0\client_1\cfgtoollogs\opatch\opatch2019-06-10_14-33-28PM_1.log

Lsinventory Output file location : D:\app\oracle_owner\product\12.2.0\client_1\cfgtoollogs\opatch\lsinv\lsinventory2019-06-
10_14-33-28PM.txt

-----
Local Machine Information::
Hostname: emea29888.bentley.com
ARU platform id: 233
ARU platform description: Microsoft Windows (64-bit AMD)

Installed Top-level Products (1):

Oracle Client 12c                      12.2.0.1.0
There are 1 products installed in this Oracle Home.

There are no Interim patches installed in this Oracle Home.

-----

OPatch succeeded.

C:\WINDOWS\system32>

```

The last line should say “OPatch Succeeded”

Stop the service for the Distributed Transaction Coordinator service (which is not an Oracle service) if it is running. It may not be running, so ignore the error (as below) if it isn’t running.

APPLICATION SERVER

net stop msdtc

```
C:\WINDOWS\system32>net stop msdtc
The Distributed Transaction Coordinator service is not started.

More help is available by typing NET HELPMSG 3521.

C:\WINDOWS\system32>
```

Here is an example if it is running

```
E:\app\client\oracle\product\12.2.0\client_1\odp.net\bin\4>net stop msdtc
The Distributed Transaction Coordinator service is stopping.
The Distributed Transaction Coordinator service was stopped successfully.

E:\app\client\oracle\product\12.2.0\client_1\odp.net\bin\4>
```

Now we are finally ready to install the patch.

Navigate to the staging area, and unzip the patch p29394003_122010_MSWIN-x86-64,

Using the command prompt we have open navigate into the folder and type opatch apply answering Y to the questions.

APPLICATION SERVER

```

C:\stage\29394003>opatch apply
Oracle Interim Patch Installer version 12.2.0.1.16
Copyright (c) 2019, Oracle Corporation. All rights reserved.

Oracle Home      : E:\app\client\oracle\product\12.2.0\client_1
Central Inventory : C:\Program Files\Oracle\Inventory
   from           :
OPatch version    : 12.2.0.1.16
OUI version       : 12.2.0.1.4
Log file location : E:\app\client\oracle\product\12.2.0\client_1\cfgtoollogs\opatch\opatch2019-07-09_12-02-33PM_1.log

Verifying environment and performing prerequisite checks...

-----

Start OOP by Prereq process.
Launch OOP...

Oracle Interim Patch Installer version 12.2.0.1.16
Copyright (c) 2019, Oracle Corporation. All rights reserved.

Oracle Home      : E:\app\client\oracle\product\12.2.0\client_1
Central Inventory : C:\Program Files\Oracle\Inventory
   from           :
OPatch version    : 12.2.0.1.16
OUI version       : 12.2.0.1.4
Log file location : E:\app\client\oracle\product\12.2.0\client_1\cfgtoollogs\opatch\opatch2019-07-09_12-02-56PM_1.log

Verifying environment and performing prerequisite checks...
OPatch continues with these patches: 29394003

Do you want to proceed? [y|n]
Y (auto-answered by -silent)
User Responded with: Y
All checks passed.

Please shutdown Oracle instances running out of this ORACLE_HOME on the local system.
(Oracle Home = 'E:\app\client\oracle\product\12.2.0\client_1')

Is the local system ready for patching? [y|n]
Y (auto-answered by -silent)
User Responded with: Y

```

...continues...

APPLICATION SERVER

```

Backing up files...
Applying interim patch '29394003' to OH 'E:\app\client\oracle\product\12.2.0\client_1'
ApplySession: Optional component(s) [ oracle.tfa, 12.2.0.1.0 ], [ oracle.assistants.server, 12.2.0.1.0 ], [ oracle.ntrdbs.admin, 12.2.0.1.0 ], [ oracle.ntrdbs.oraconfig, 12.2.0.1.0 ], [ oracle.precomp.common, 12.2.0.1.0 ], [ oracle.xdk, 12.2.0.1.0 ], [ oracle.network.aso, 12.2.0.1.0 ], [ oracle.precomp.lang, 12.2.0.1.0 ], [ oracle.clrintg.ode_net_2, 12.2.0.1.0 ], [ oracle.usm, 12.2.0.1.0 ], [ oracle.rdbms.ic, 12.2.0.1.0 ], [ oracle.has.cfs, 12.2.0.1.0 ], [ oracle.has.crs, 12.2.0.1.0 ], [ oracle.sdo, 12.2.0.1.0 ], [ oracle.sdo.locator, 12.2.0.1.0 ], [ oracle.rdbms.dbscripts, 12.2.0.1.0 ], [ oracle.rdbms.dv, 12.2.0.1.0 ], [ oracle.oraolap, 12.2.0.1.0 ], [ oracle.ntonldb, 12.2.0.1.0 ], [ oracle.rdbms.lbac, 12.2.0.1.0 ], [ oracle.wlm.dbwlm, 12.2.0.1.0 ], [ oracle.has.cvu, 12.2.0.1.0 ], [ oracle.rdbms.util, 12.2.0.1.0 ], [ oracle.tomcat.crs, 12.2.0.1.0 ], [ oracle.has.db, 12.2.0.1.0 ], [ oracle.aspnet_2, 12.2.0.1.0 ], [ oracle.sqlplus.ic, 12.2.0.1.0 ], [ oracle.ctx, 12.2.0.1.0 ], [ oracle.ldap.client, 12.2.0.1.0 ], [ oracle.rdbms.rman, 12.2.0.1.0 ], [ oracle.rdbms.tg4db2, 12.2.0.1.0 ], [ oracle.ntonants, 12.2.0.1.0 ], [ oracle.rdbms.olap, 12.2.0.1.0 ], [ oracle.rdbms.scheduler, 12.2.0.1.0 ], [ oracle.odbc.ic, 12.2.0.1.0 ], [ oracle.rdbms, 12.2.0.1.0 ] not present in the Oracle Home or a higher version is found.

Patching component oracle.precomp.rsfc, 12.2.0.1.0...
Patching component oracle.xdk.parser.java, 12.2.0.1.0...
Patching component oracle.ldap.rsfc, 12.2.0.1.0...
Patching component oracle.network.client, 12.2.0.1.0...
Patching component oracle.rdbms.install.plugins, 12.2.0.1.0...
Patching component oracle.has.common.cvu, 12.2.0.1.0...
Patching component oracle.rdbms.rsfc, 12.2.0.1.0...
Patching component oracle.has.common, 12.2.0.1.0...
Patching component oracle.oracore.rsfc, 12.2.0.1.0...
Patching component oracle.assistants.deconfig, 12.2.0.1.0...
Patching component oracle.xdk.rsfc, 12.2.0.1.0...
Patching component oracle.rdbms.rsfc, 12.2.0.1.0...
Patching component oracle.has.deconfig, 12.2.0.1.0...
Patching component oracle.has.rsfc, 12.2.0.1.0...
Patching component oracle.rdbms.deconfig, 12.2.0.1.0...
Patching component oracle.assistants.acf, 12.2.0.1.0...

```

...continues...

```

Patching component oracle.network.rsfc, 12.2.0.1.0...
Patching component oracle.usm.deconfig, 12.2.0.1.0...
Patching component oracle.ntonldb.odp_net_2, 12.2.0.1.0...
Patching component oracle.ldap.rsfc, 12.2.0.1.0...
Patch 29394003 successfully applied.
Log file location: E:\app\client\oracle\product\12.2.0\client_1\cfgtoollogs\opatch\opatch2019-07-09_12-02-56PM_1.log
OPatch succeeded.
C:\stage\29394003>

```

Command should finish with “Opatch Succeeded”,
you are finished.

If you stopped the MTSDC, restart it.

net start msdtc

APPLICATION SERVER

```
C:\stage\29394003>net start msdtc
The Distributed Transaction Coordinator service is starting.
The Distributed Transaction Coordinator service was started successfully.

C:\stage\29394003>_
```

To ensure this was successfully run then type

Opatch lsinventory|findstr Patch

This should show the patch – see below “Patch Description” line.

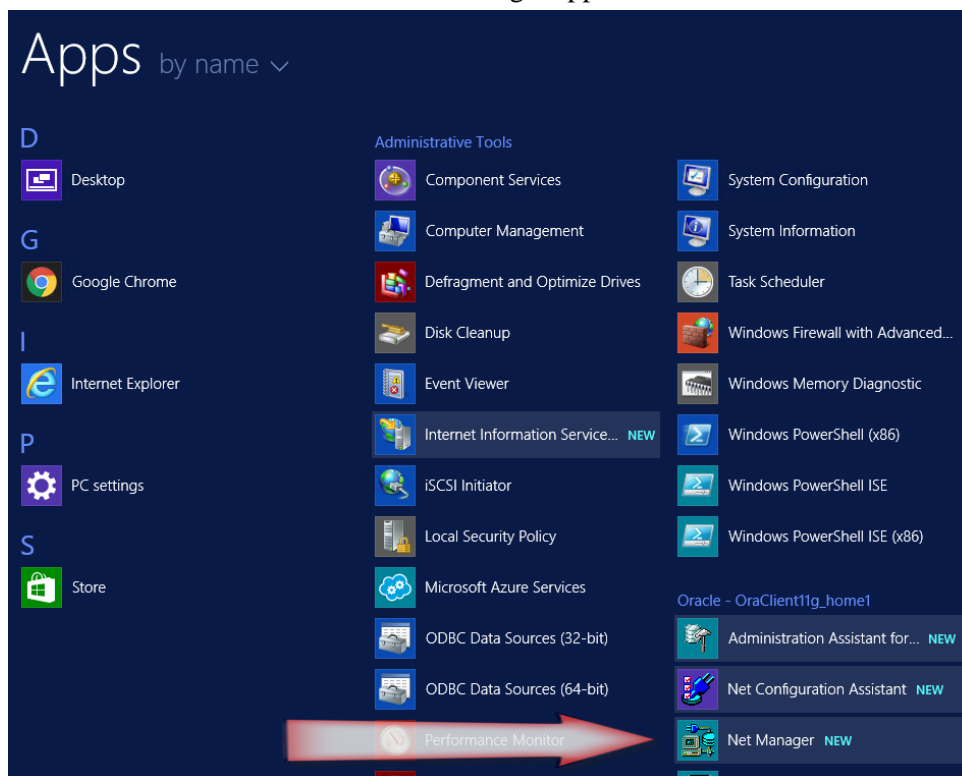
```
C:\stage\29394003>Opatch lsinventory|findstr Patch
Oracle Interim Patch Installer version 12.2.0.1.16
OPatch version      : 12.2.0.1.16
Patch 29394003      : applied on Tue Jul 09 12:03:32 BST 2019
Unique Patch ID:    22838886
Patch description:   "WINDOWS DB BUNDLE PATCH 12.2.0.1.190416(64bit):29394003"
OPatch succeeded.

C:\stage\29394003>_
```

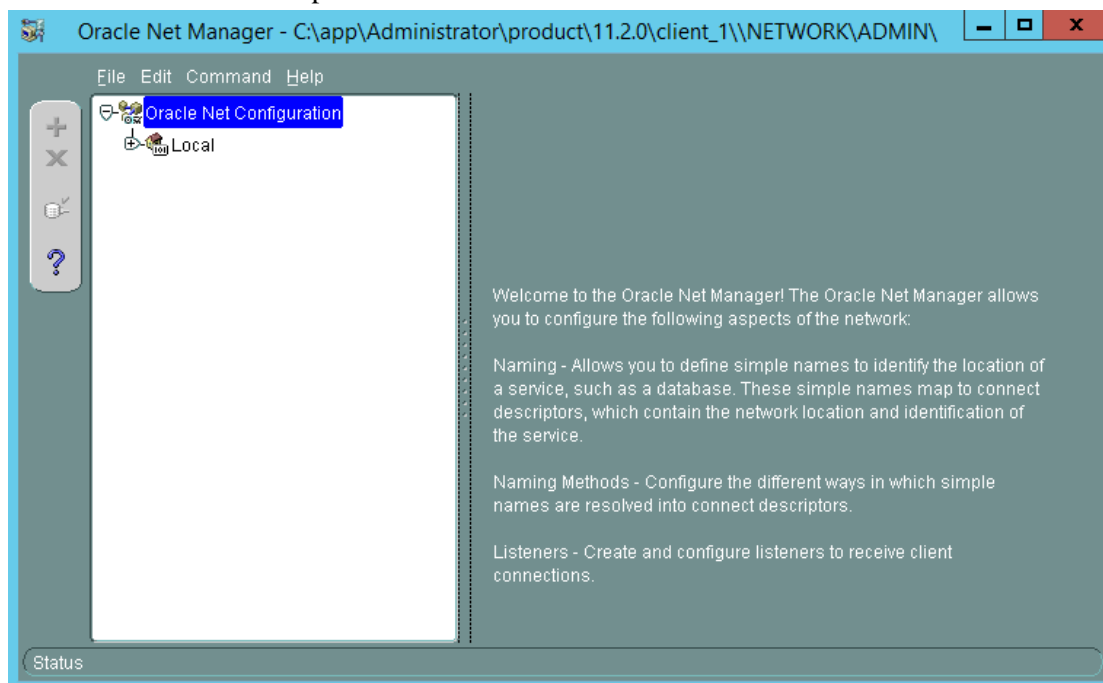
You can now delete the files you copied in your staging area.

2.9 Configure the database connection

To configure a database connection run the Oracle Net Manager application:

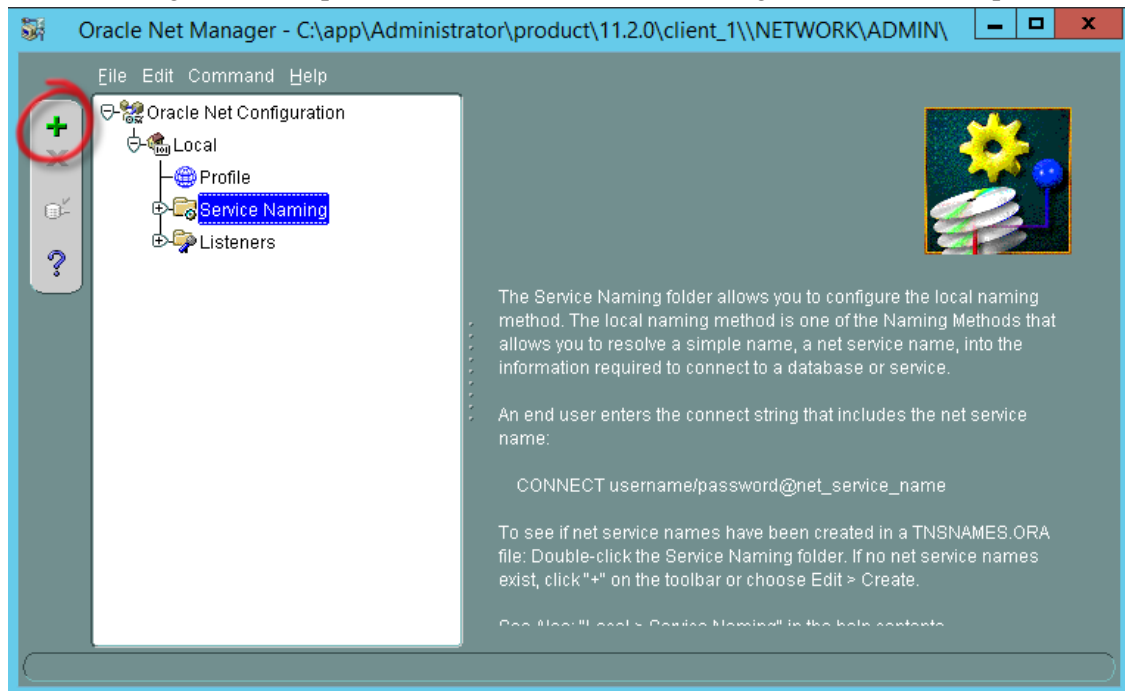


The application will run on the desktop:

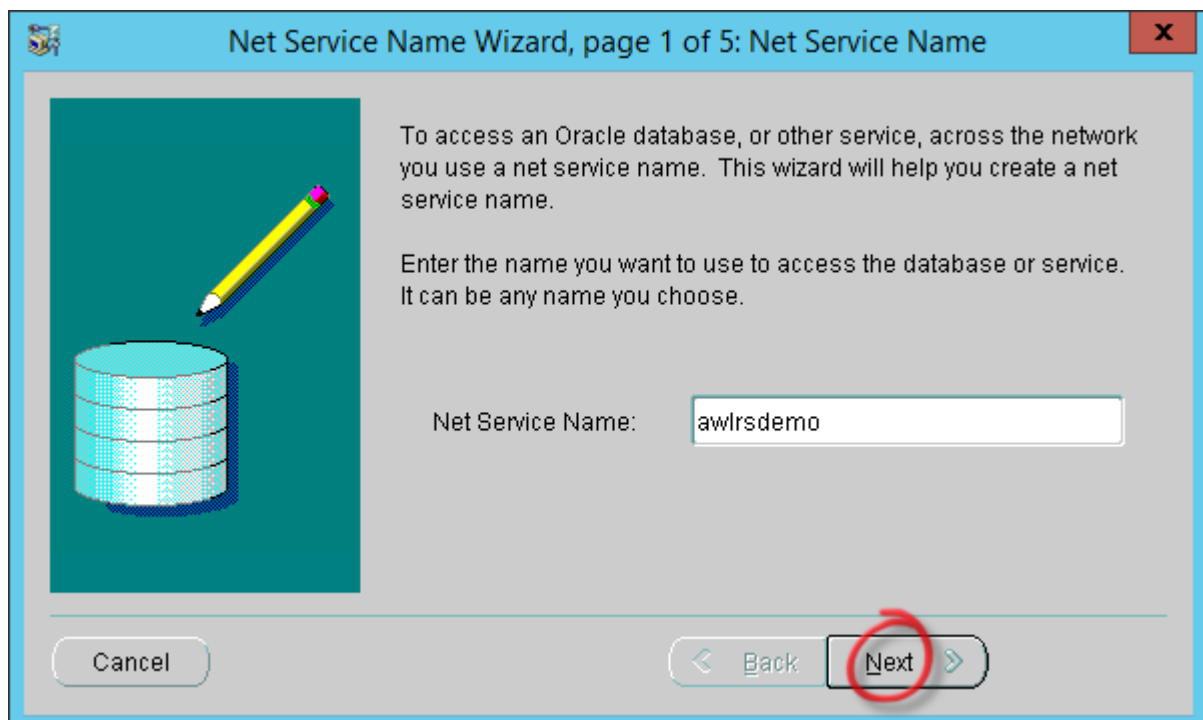


APPLICATION SERVER

Under “Oracle Net Configuration”, expand “Local”, select “Service Naming” then click on the plus [+] icon.

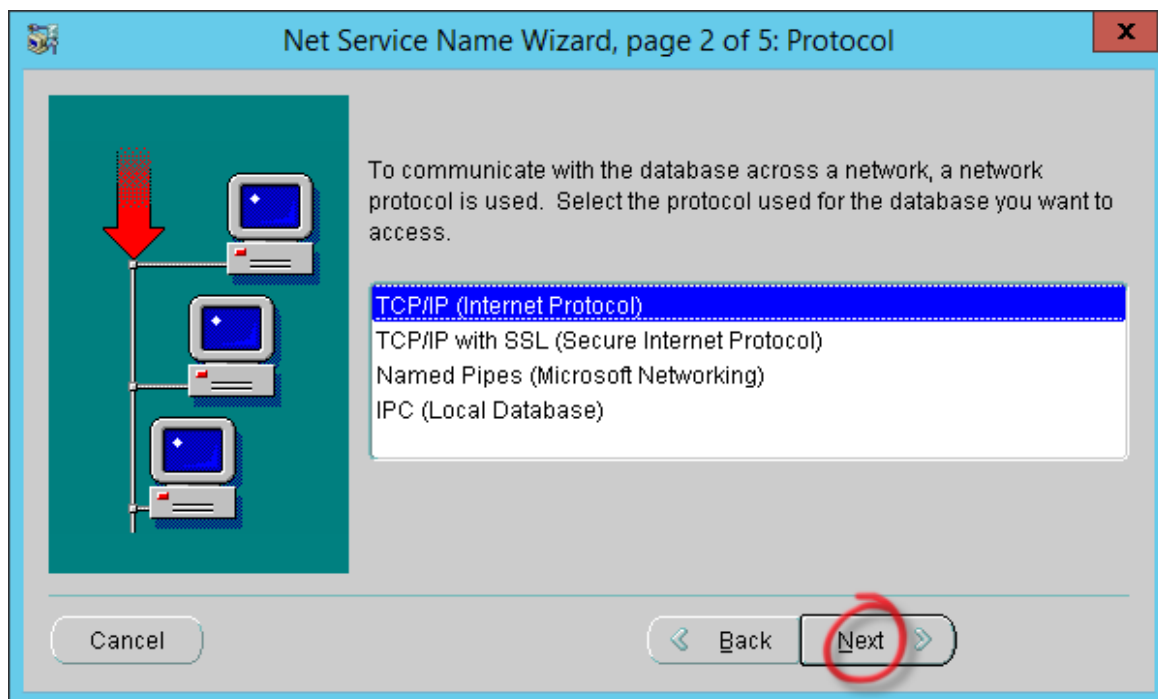


The Net Service Name Wizard will be displayed, enter the name of the database in which AWLRS will be installed and click on “Next”:

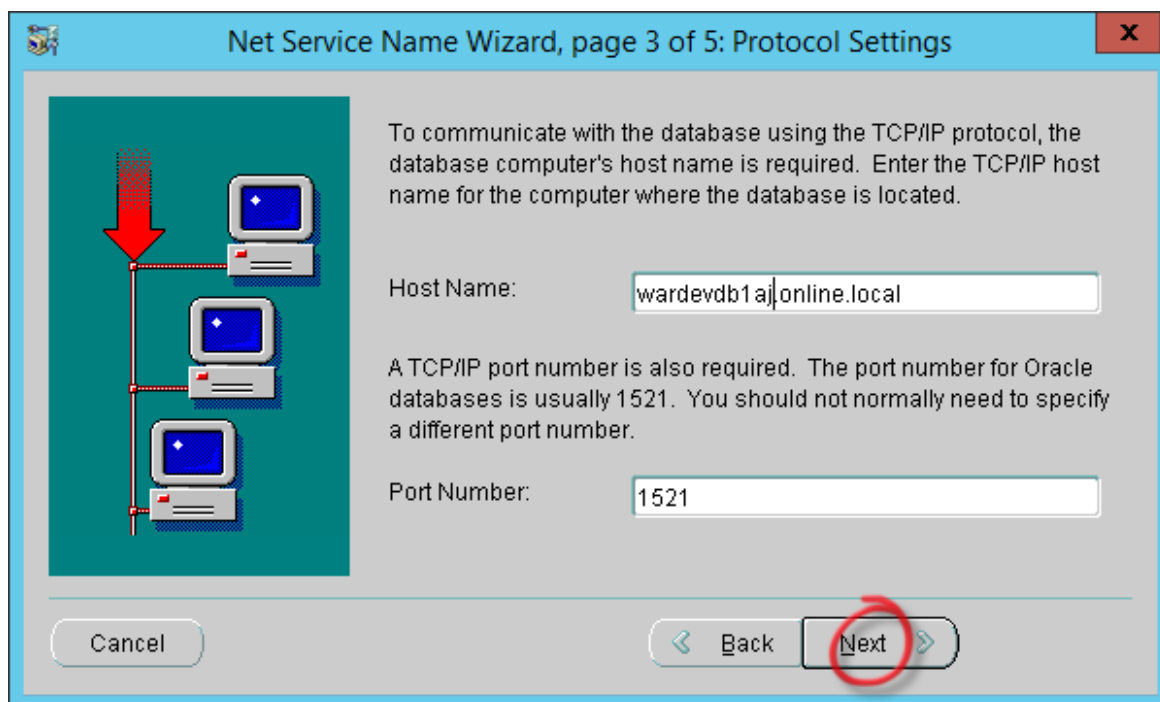


APPLICATION SERVER

Ensure that “TCP/IP (Internet Protocol)” is selected and click on “Next”:

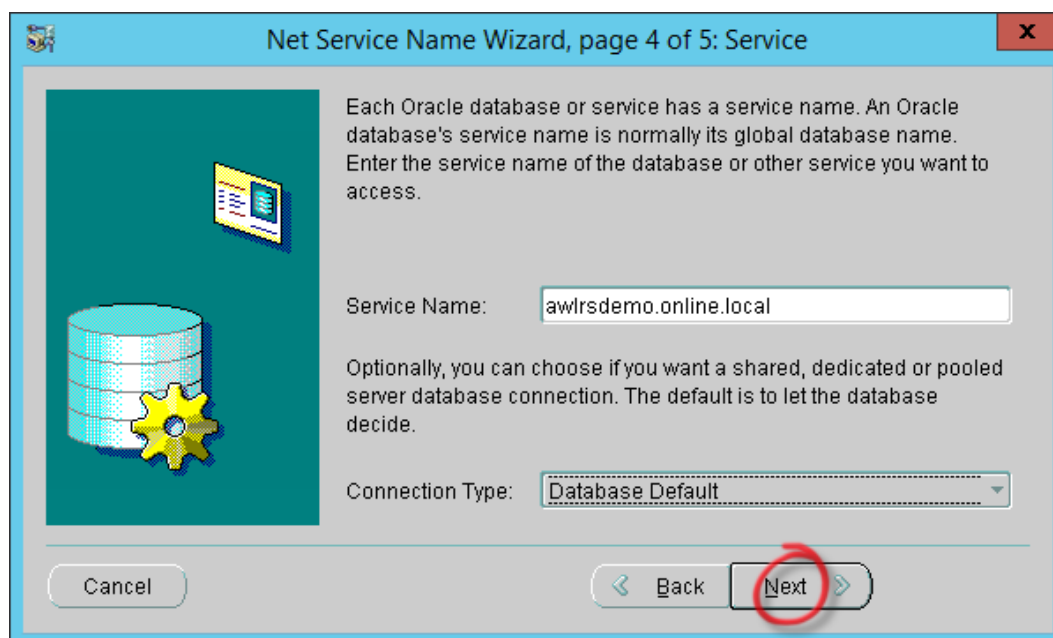


Enter the Host Name (either the fully qualified name of the database server or its IP Address) and the port number and click on “Next”:

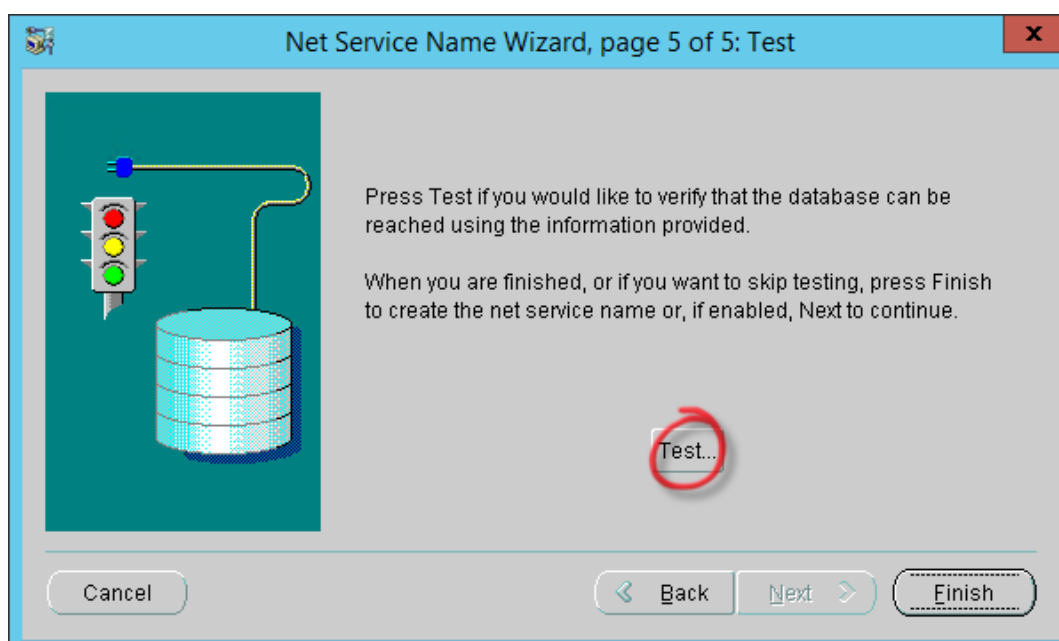


APPLICATION SERVER

Enter the full database name, including the domain, ensure the Connection Type is “Database Default” and click on “Next”:

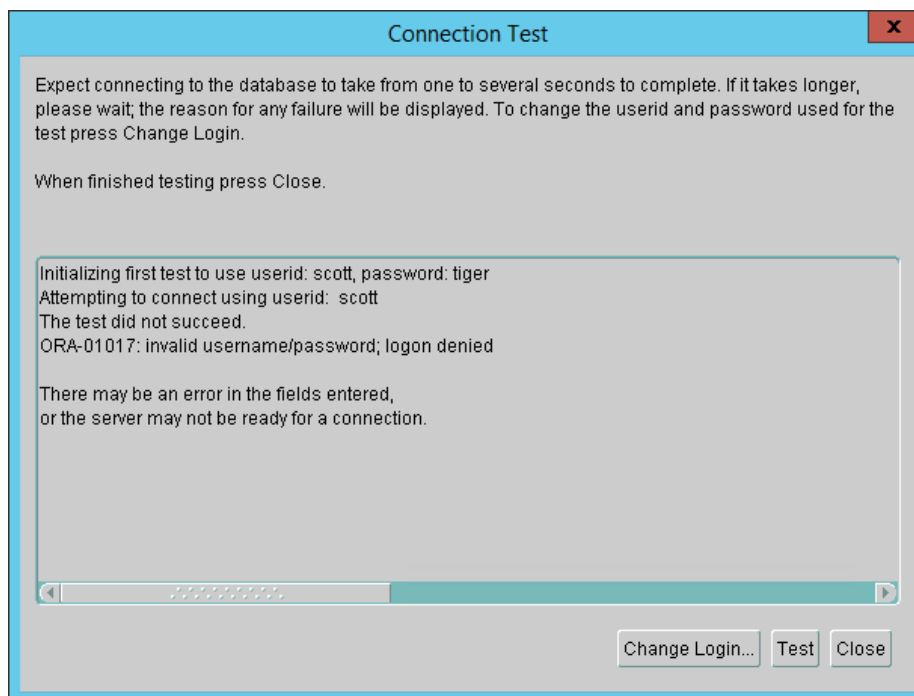


To test the connection details, click on “Test”:

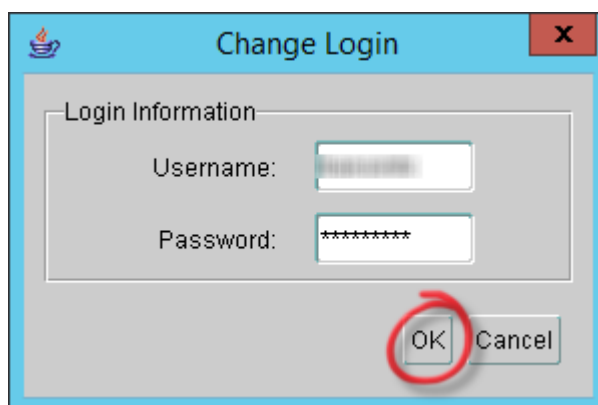


APPLICATION SERVER

The test will probably fail (with either ORA-01017: Invalid usernames/password, logon denied or ORA-28043: invalid bind credentials for DB-OID connection) as the default “scott/tiger” user will not exist in the database. Click on “Change Login”:

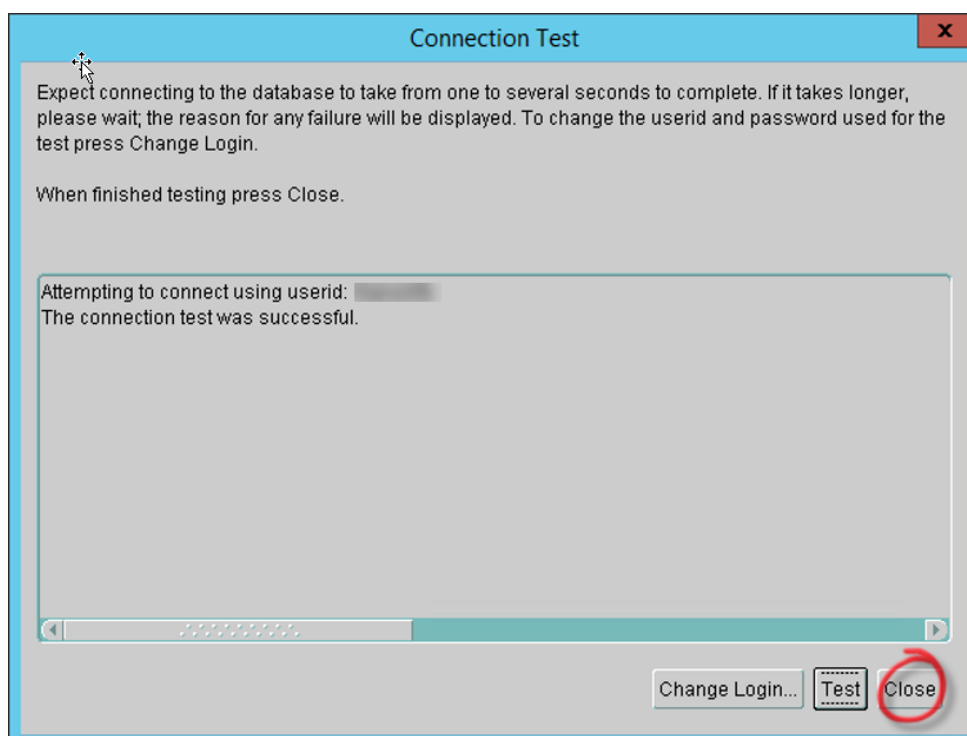
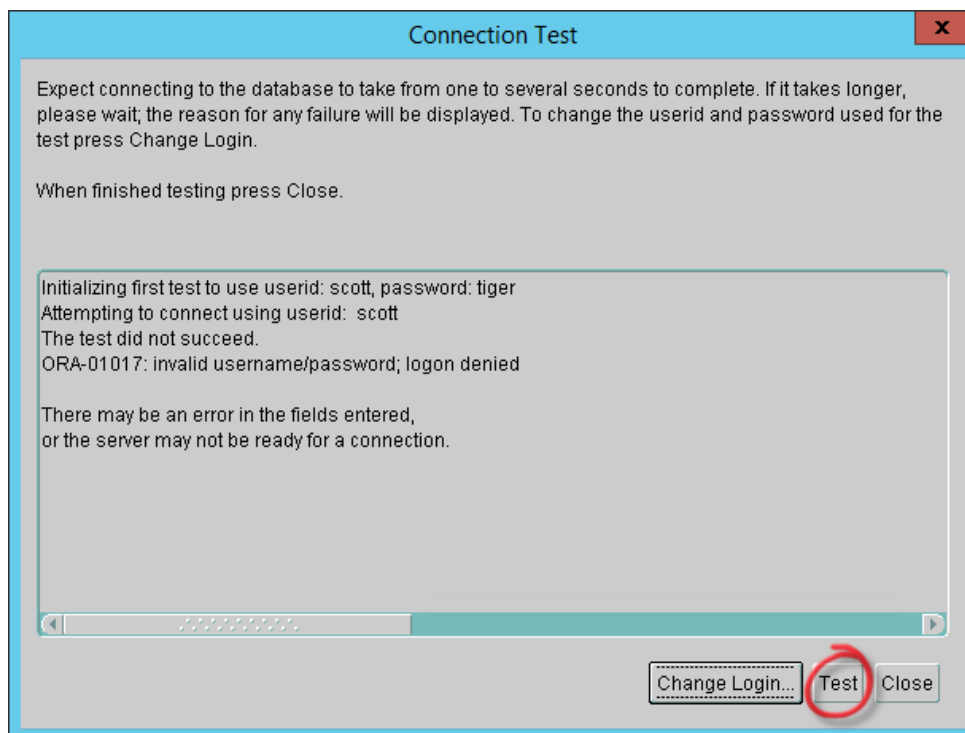


Enter the username and password for a user that does exists on the database, for example the exor Highways Owner, and click on “OK”:



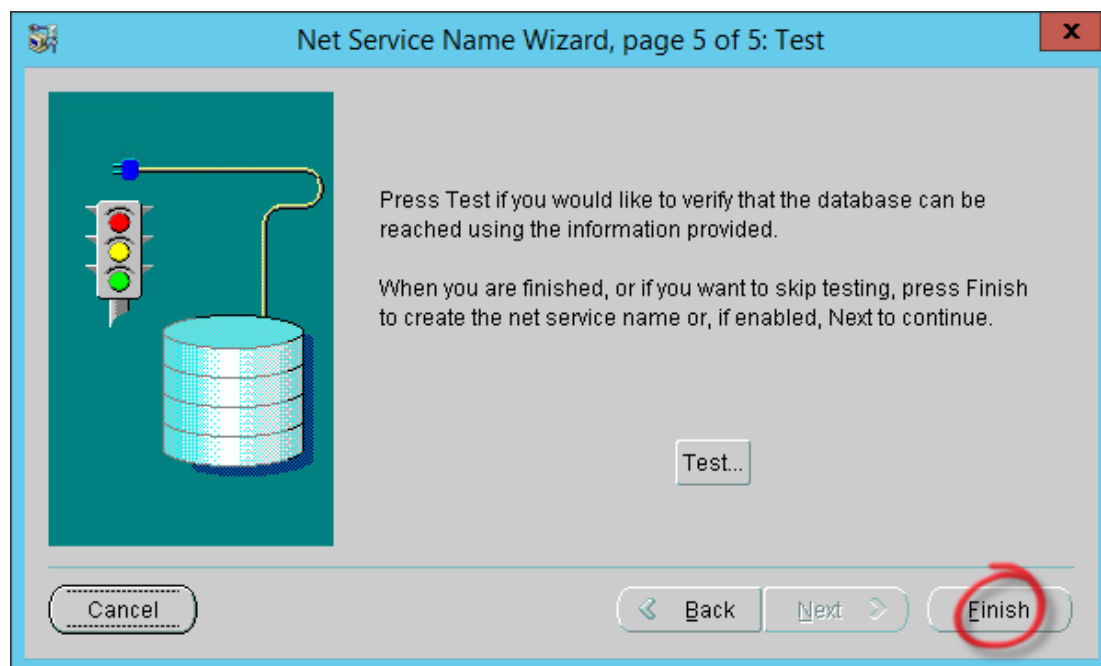
APPLICATION SERVER

Click on “Test” again, this time the connection test should be successful, click on “Close” to continue:

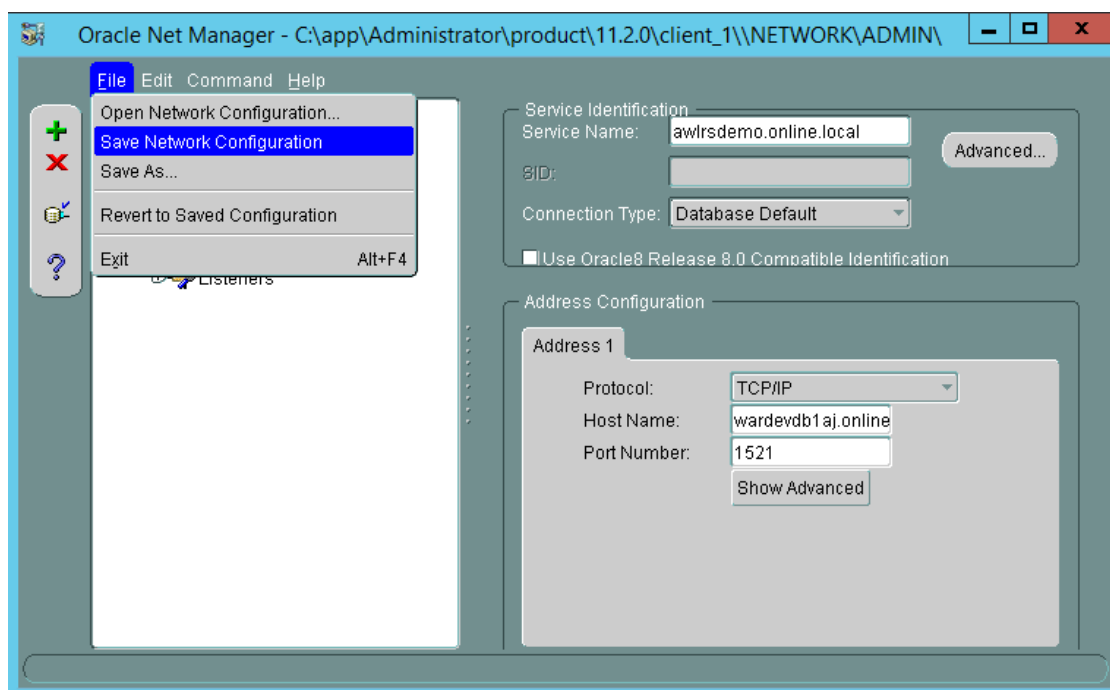


APPLICATION SERVER

Click on “Finish”:



Review the information displayed for the connection that has just been added then click on File → Save Network Configuration to save the changes. Close the Oracle Net Manager application.



2.10 Configure GAC

In order to make the oracle data access DLLs available to the web services they need to be added to the Windows GAC. The Oracle installation provides a tool to assist with this process, the tool, OraProvCfg.exe, is used to add the DLLs to the GAC as follows. NOTE: This should be done after installing the Oracle client and subsequently after any Oracle client patch as the patch may alter the DLLs, so the GAC would need updating with the patched versions. For example:

```
[ORACLE_HOME]\ODP.NET\bin\4\OraProvCfg /action:gac  
/providerpath:[ORACLE_HOME]\odp.net\bin\4\Oracle.DataAccess.dll
```

```
[ORACLE_HOME]\ODP.NET\bin\4\OraProvCfg.exe /action:gac  
/providerpath:[ORACLE_HOME]\odp.net\PublisherPolicy\4\Policy.4.112.Oracle.DataAccess.dll
```

```
[ORACLE_HOME]\ODP.NET\bin\4\OraProvCfg.exe /action:gac  
/providerpath:[ORACLE_HOME]\odp.net\PublisherPolicy\4\Policy.4.121.Oracle.DataAccess.dll
```

```
[ORACLE_HOME]\ODP.NET\bin\4\OraProvCfg.exe /action:gac  
/providerpath:[ORACLE_HOME]\odp.net\PublisherPolicy\4\Policy.4.122.Oracle.DataAccess.dll
```

2.11 Install MapServer

2.11.1 Build the MapServer directory

On the **application server** go to the <stage> folder created in section 2.2 and unzip the downloaded MapServer zip file to a folder on the application server, for example C:\mapserver. This folder will be referred to as the <mapserver> folder from here on.

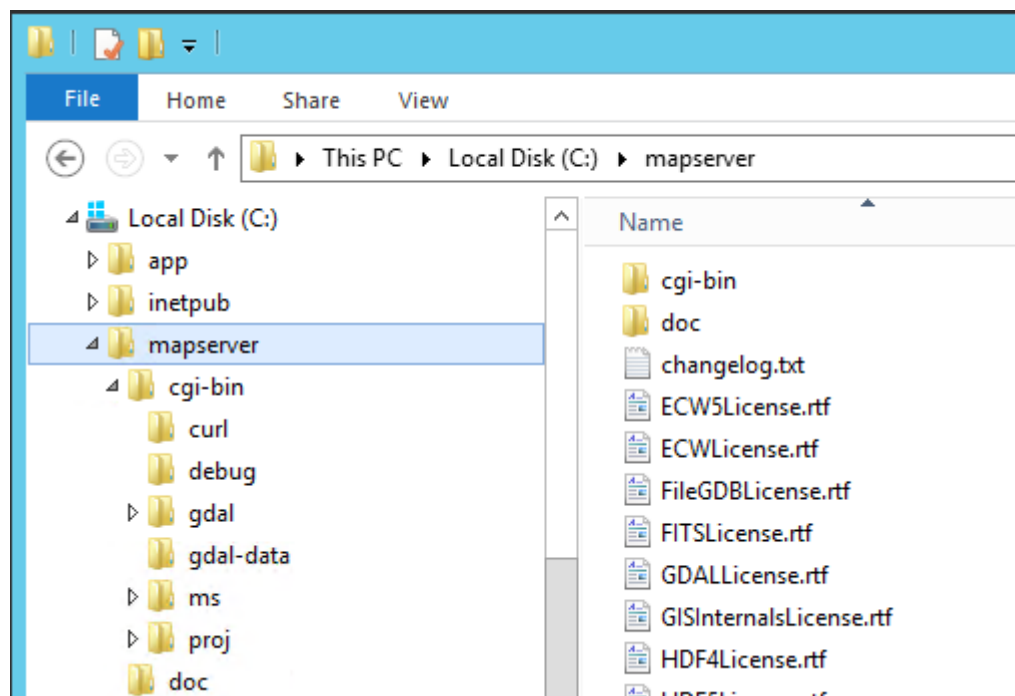
2.11.2 GIS-Internals Mapserver Build

If using the GIS-Internals build of Mapserver (supported up to AWLRS build 1.2.12.1 only) then:

APPLICATION SERVER

- Navigate to the <mapserver> folder and rename the bin folder to “cgi-bin”.
i.e. <mapserver>\bin should now be <mapserver>\cgi-bin

You should now have a folder structure as shown below:



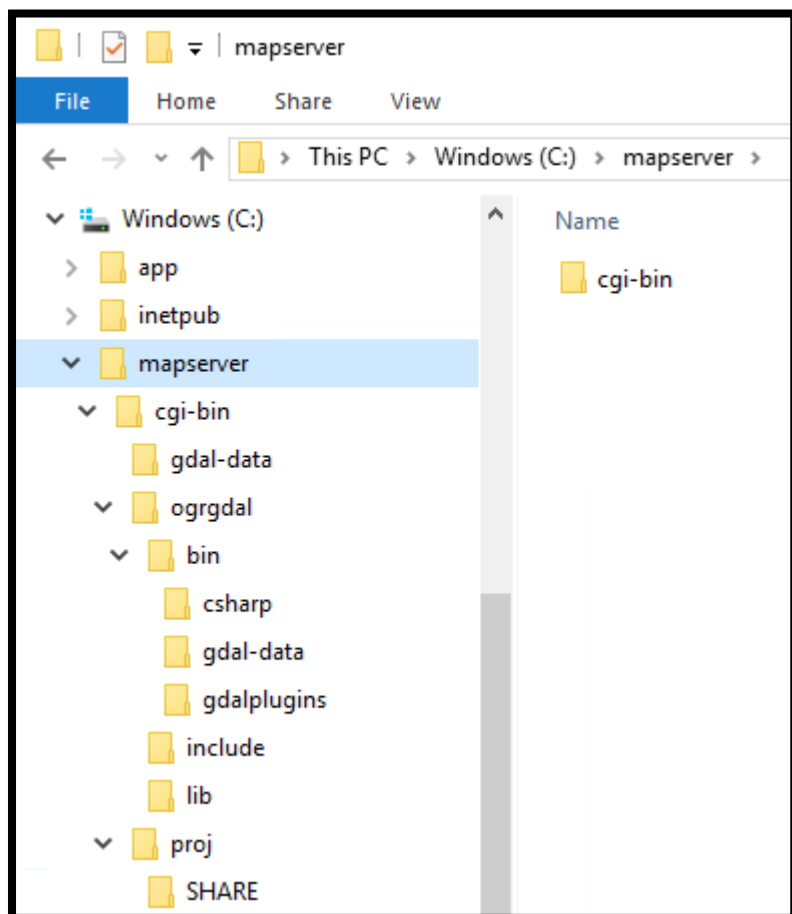
Several files need to be copied from their original locations to <mapserver>\cgi-bin folder:

- <mapserver>**cgi-bin\ms\plugins\oci\msplugin_oracle.dll**
- <mapserver> **cgi-bin\ms\apps\mapserv.exe**
- <mapserver> **cgi-bin\ms\apps\msencrypt.exe**

APPLICATION SERVER

2.11.3 Bentley Mapserver Build

If using the Bentley Build of Mapserver (mandatory from AWLRS build 1.2.13.1 onwards) then you should now have the following folder structure:

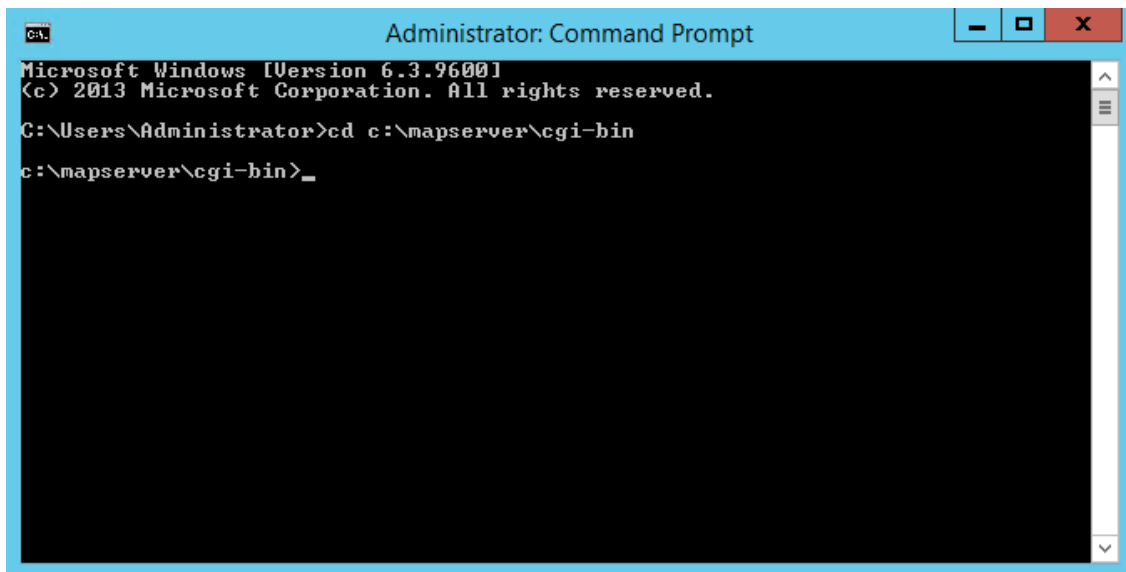


APPLICATION SERVER

2.11.4 Encryption Key

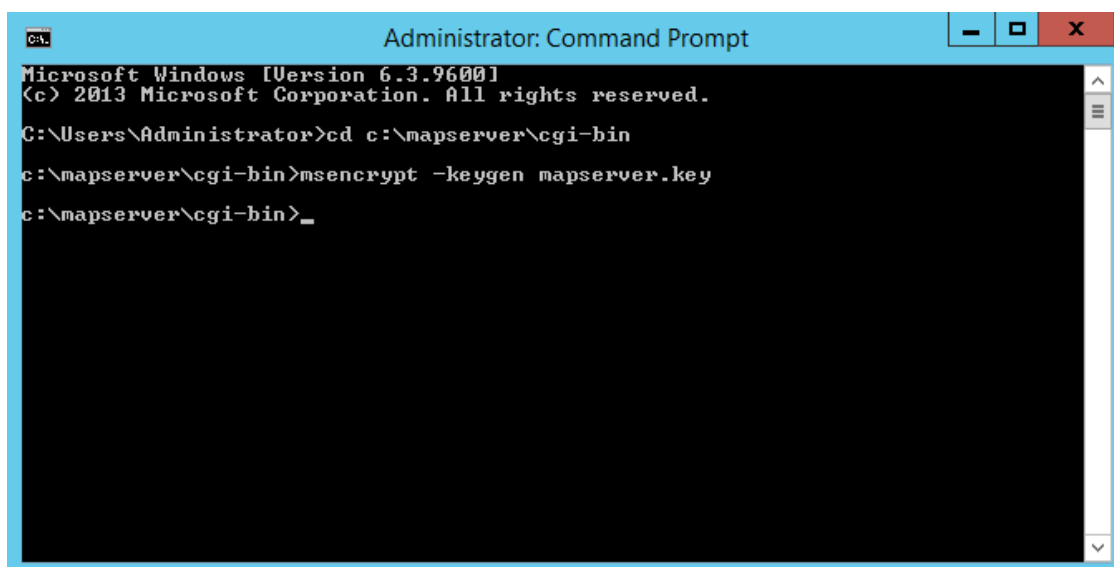
Start a new command prompt using the “Run as Administrator” option, and navigate to the <mapserver>\cgi-bin folder:

```
cd C:\mapserver\cgi-bin
```



Enter the following command to generate an encryption key:

```
msencrypt -keygen mapserver.key
```



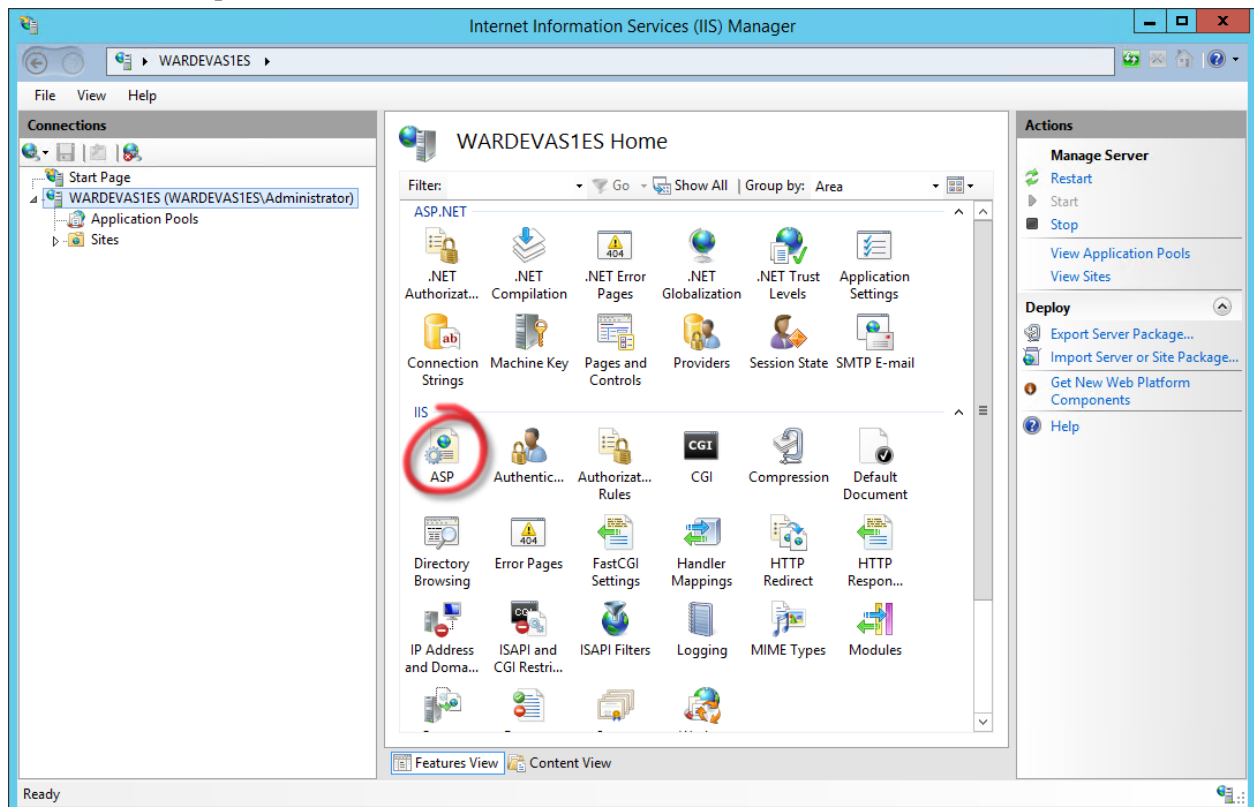
APPLICATION SERVER

There should now be a file called mapserver.key in the <mapserver>\cgi-bin folder. Type exit to close the command prompt.

2.11.5 Configure Mapserver in IIS

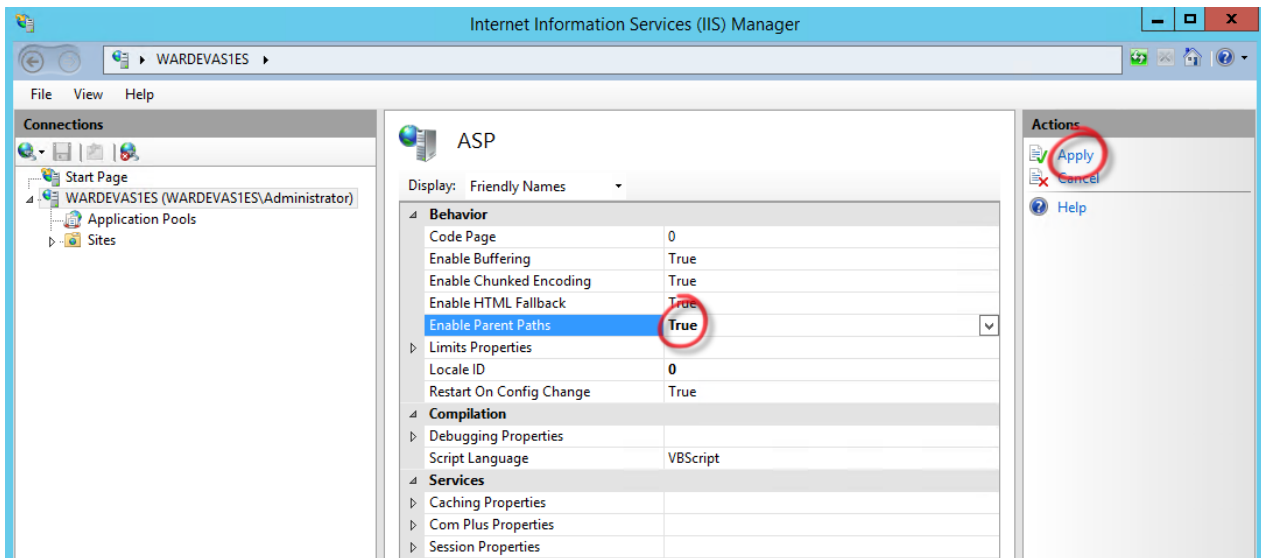
On the **application server** run the Internet Information Services (IIS) Manager application.

Click on the server branch (WARDEVAS1ES in the example below) in the left-hand panel then double click on the ASP icon in the central panel:

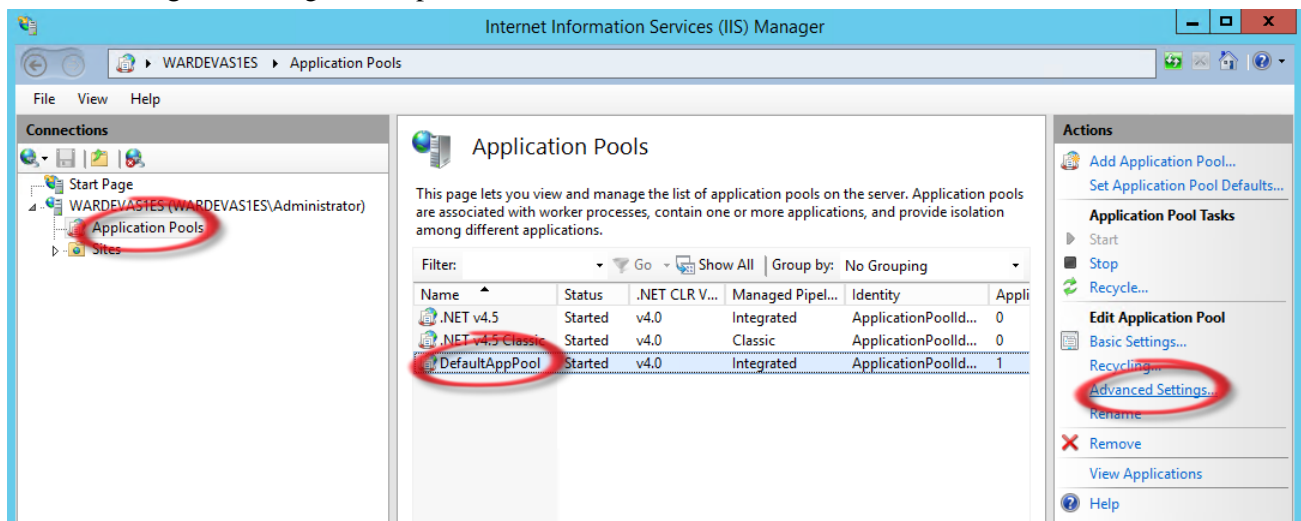


Ensure that “Enable Parent Paths” is set to “True”, if you changed the value click on “Apply” on the right-hand side to save the change:

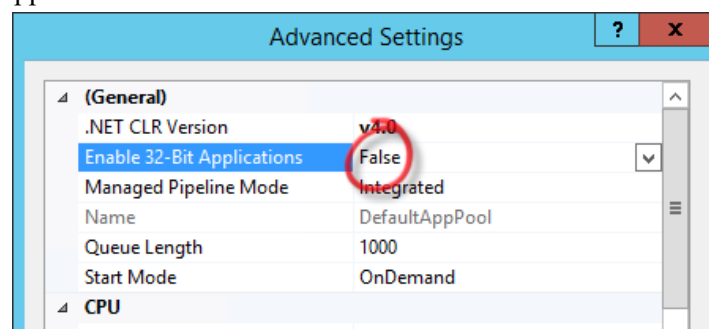
APPLICATION SERVER



Click on “Application Pools” in the left-hand panel, select “DefaultAppPool” in the central panel then click on “Advanced Settings” in the right-hand panel:

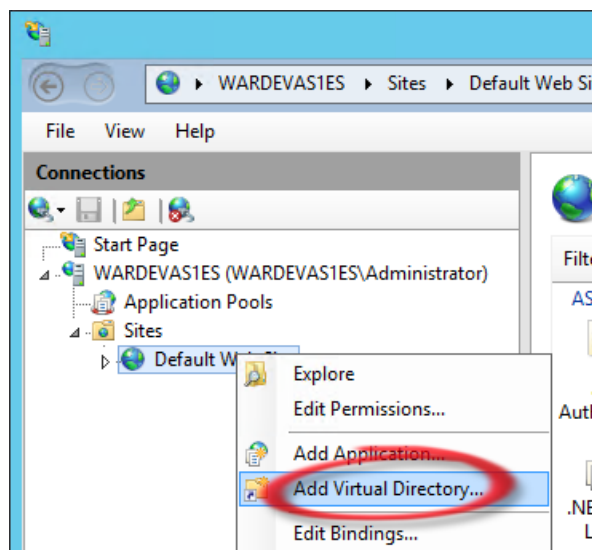


Ensure that “Enable 32-Bit Applications” is set to “False”:



Expand the “Sites” branch in the left-hand panel, right click on “Default Web Site” then select “Add Virtual Directory...” from the context menu:

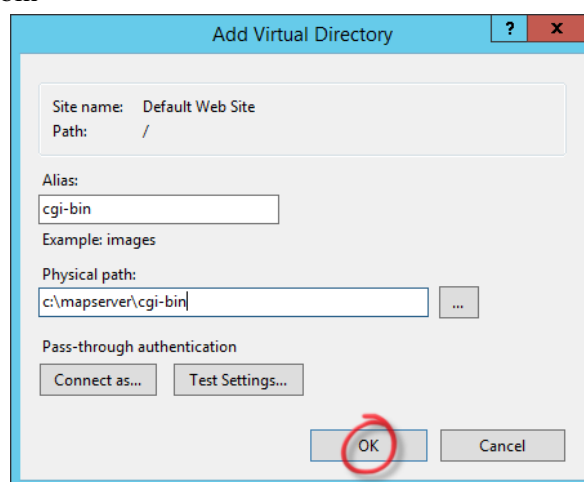
APPLICATION SERVER



Enter the following values and click “OK”:

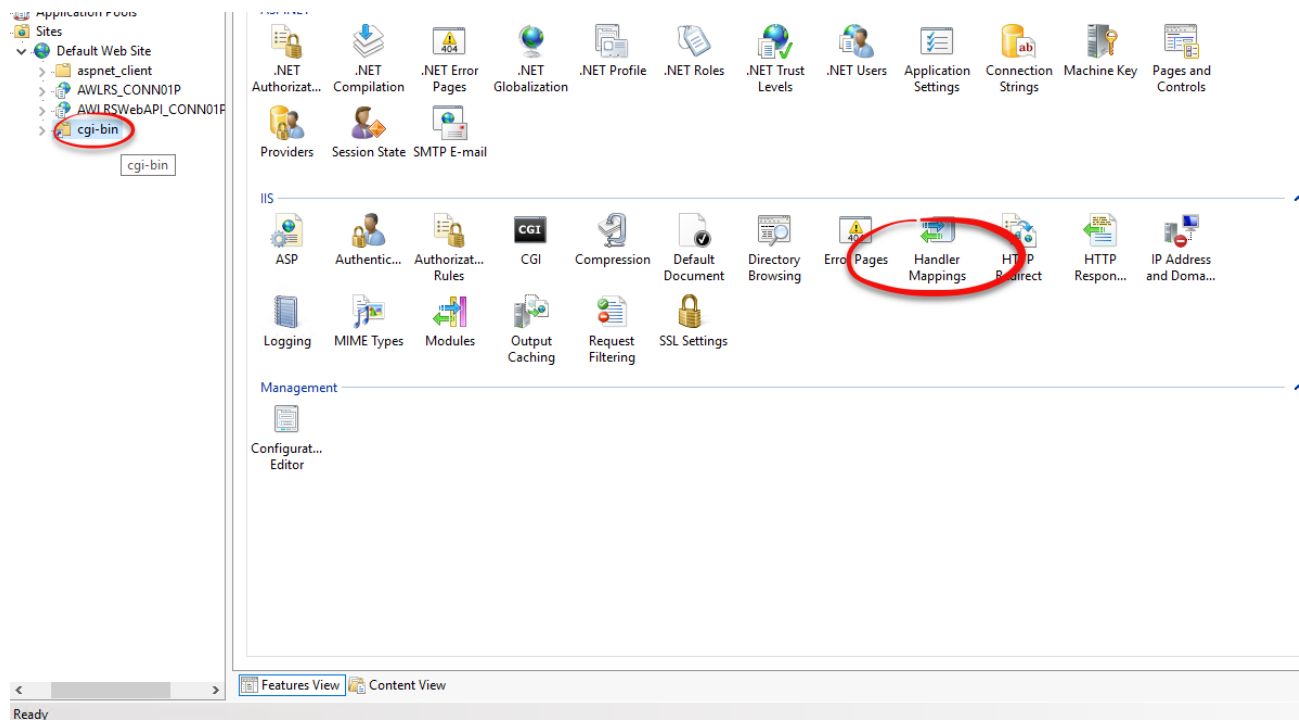
Alias: cgi-bin

Physical path: <mapserver>\cgi-bin



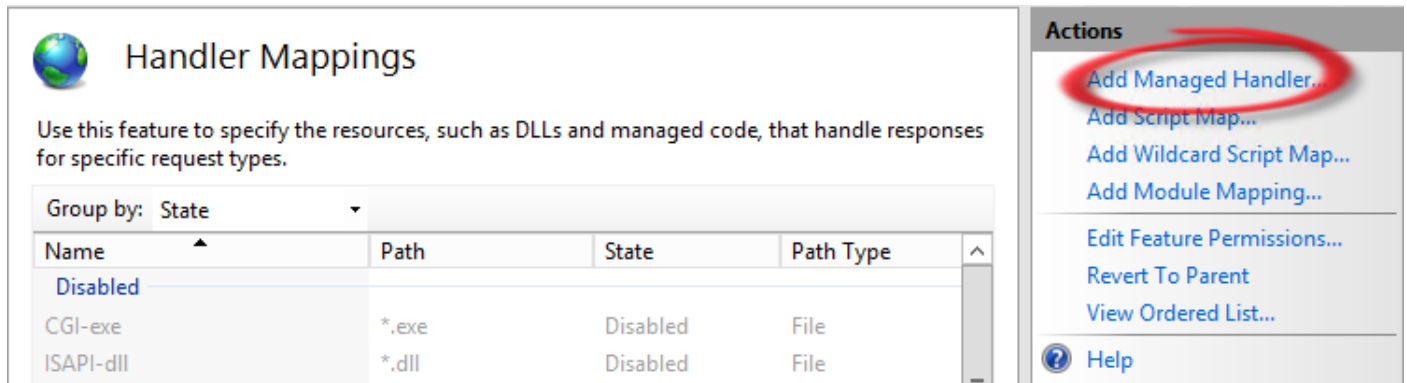
Select “cgi-bin” in the left-hand panel then double click on the “Handler Mappings” icon in the central panel:

APPLICATION SERVER



APPLICATION SERVER

Click on “Add Managed Handler...” in the right-hand panel:



Handler Mappings

Use this feature to specify the resources, such as DLLs and managed code, that handle responses for specific request types.

Group by: State

Name	Path	State	Path Type
Disabled			
CGI-exe	*.exe	Disabled	File
ISAPI-dll	*.dll	Disabled	File

Actions

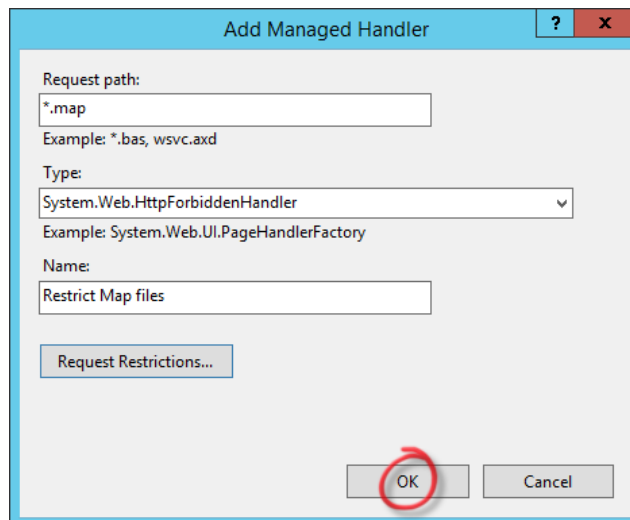
- Add Managed Handler...
- Add Script Map...
- Add Wildcard Script Map...
- Add Module Mapping...
- Edit Feature Permissions...
- Revert To Parent
- View Ordered List...
- Help

Enter the following values and click on “OK”:

Request path: *.map

Type: System.Web.HttpForbiddenHandler

Name: Restrict Map files



Add Managed Handler

Request path:
*.map
Example: *.bas, wsvc.axd

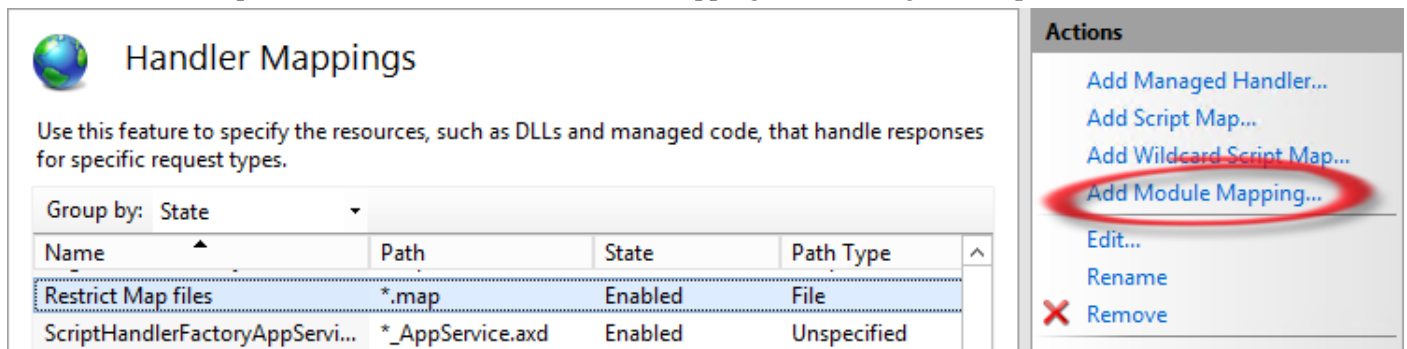
Type:
System.Web.HttpForbiddenHandler
Example: System.Web.UI.PageHandlerFactory

Name:
Restrict Map files

Request Restrictions...

OK Cancel

Select “Restrict Map Files” and click on “Add Module Mapping...” in the right-hand panel:



Handler Mappings

Use this feature to specify the resources, such as DLLs and managed code, that handle responses for specific request types.

Group by: State

Name	Path	State	Path Type
Restrict Map files	*.map	Enabled	File
ScriptHandlerFactoryAppServi...	*_AppService.axd	Enabled	Unspecified

Actions

- Add Managed Handler...
- Add Script Map...
- Add Wildcard Script Map...
- Add Module Mapping...
- Edit...
- Rename
- Remove

APPLICATION SERVER

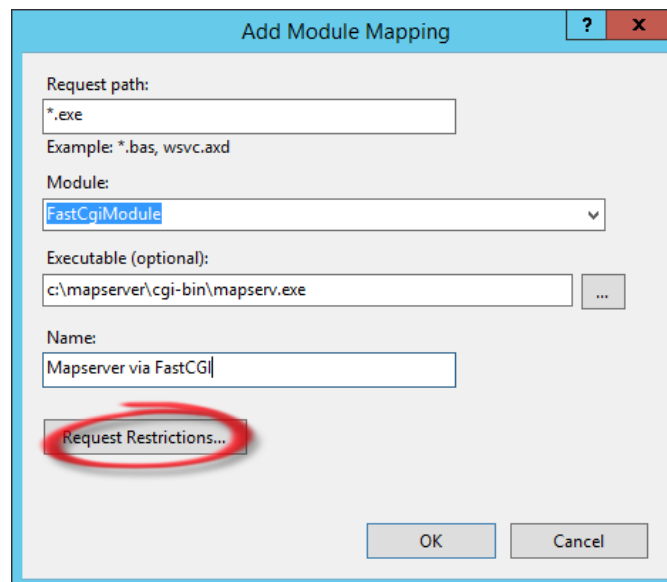
Enter the following values then click on “Request Restrictions...”:

Request path: *.exe

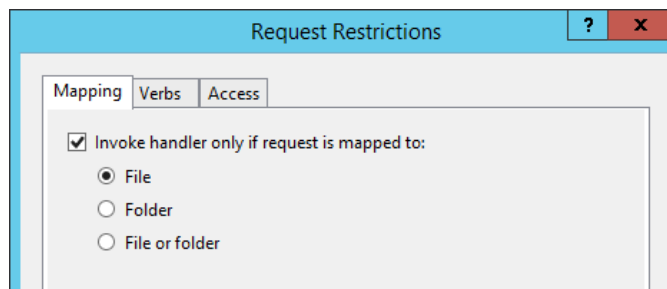
Module: FastCgiModule

Executable: <mapserver>\cgi-bin\mapserv.exe

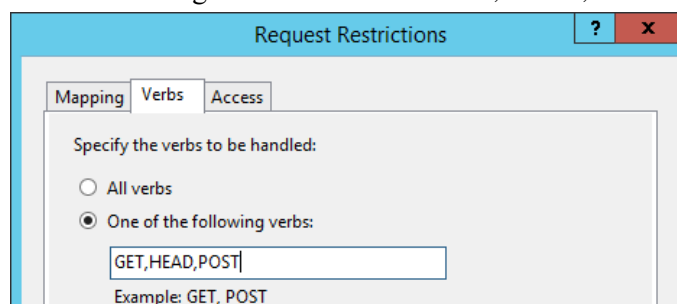
Name: Mapserver via FastCGI



In the “Mapping” tab make sure that “Invoke handler only if request is mapped to:” is ticked and that “File” is selected.

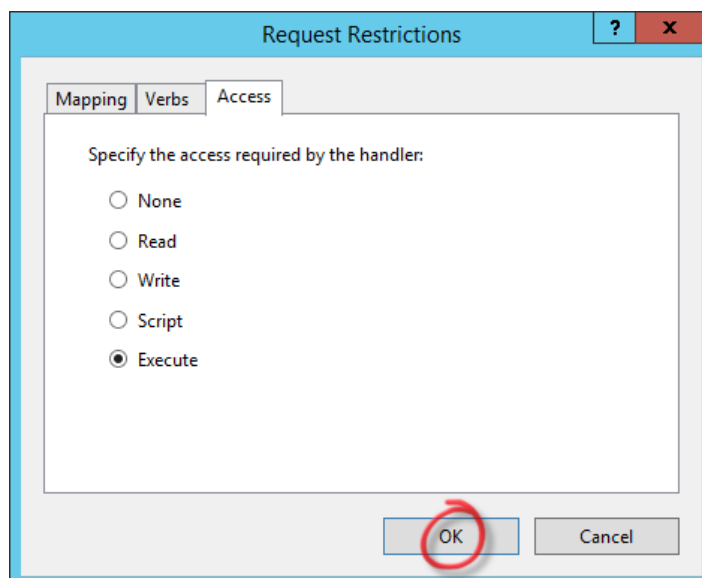


In the “Verbs” tab select “One of the following verbs:” and enter “GET,HEAD,POST”

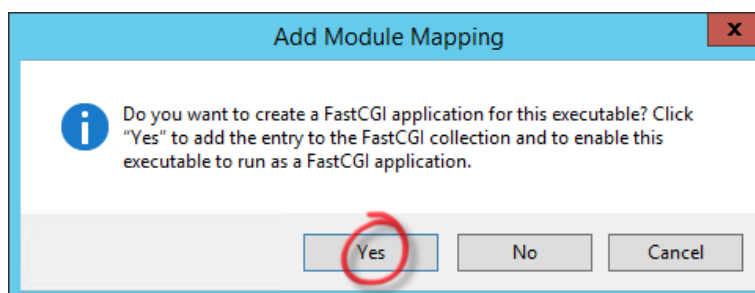
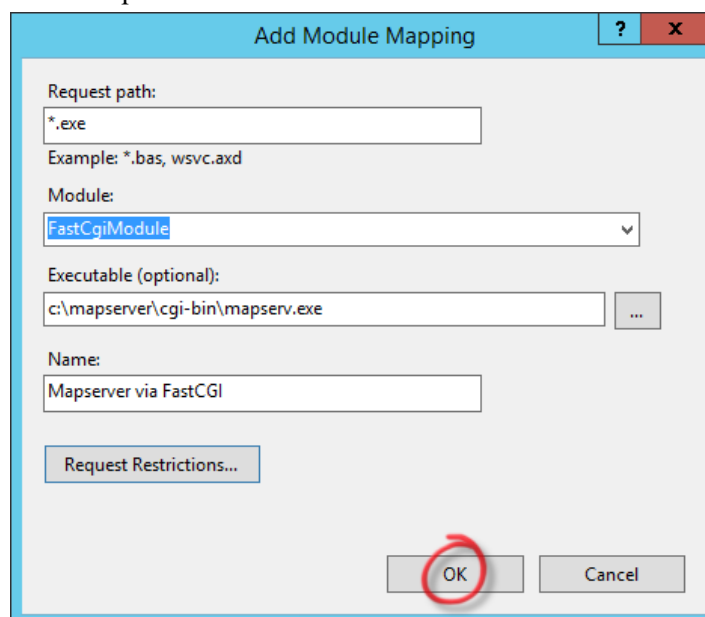


APPLICATION SERVER

In the “Access” tab select “Execute” and click on “OK”

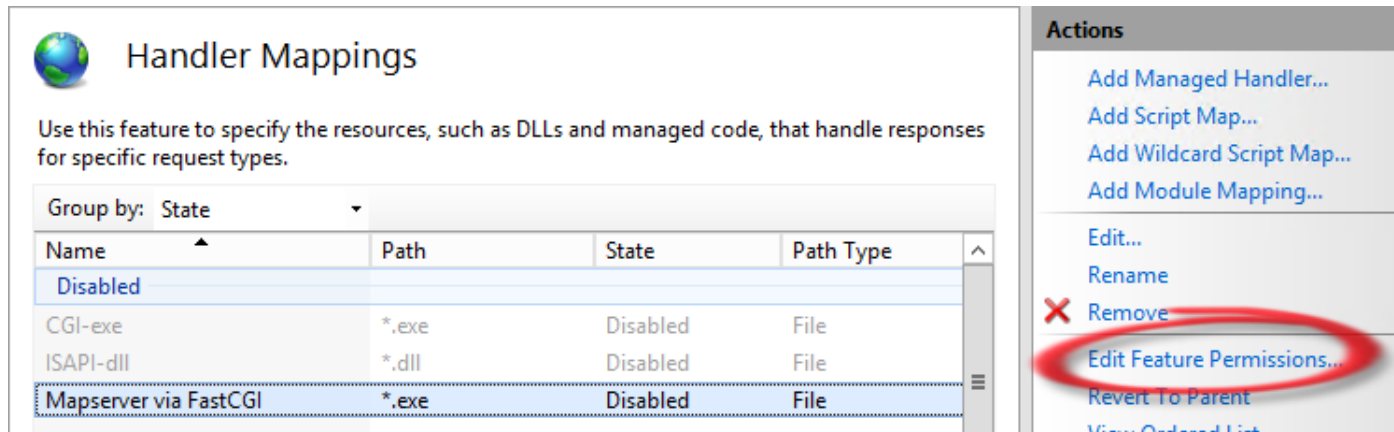


Click on “OK” then “Yes” when Prompted:



APPLICATION SERVER

Select the “Mapserver via FastCGI” handler mapping and click on “Edit Feature Permissions...” in the right-hand panel.




Handler Mappings

Use this feature to specify the resources, such as DLLs and managed code, that handle responses for specific request types.

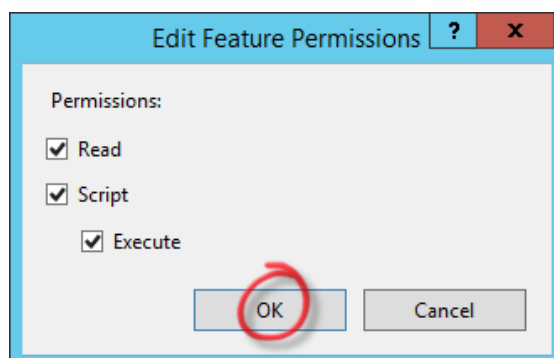
Group by: State

Name	Path	State	Path Type
Disabled			
CGI-exe	*.exe	Disabled	File
ISAPI-dll	*.dll	Disabled	File
Mapserver via FastCGI	*.exe	Disabled	File

Actions

- Add Managed Handler...
- Add Script Map...
- Add Wildcard Script Map...
- Add Module Mapping...
- Edit...
- Rename
-  Remove
- Edit Feature Permissions...**
- Revert To Parent
- View Ordered List...

Ensure that “Read”, “Script” and “Execute” are all ticked then click on “OK”



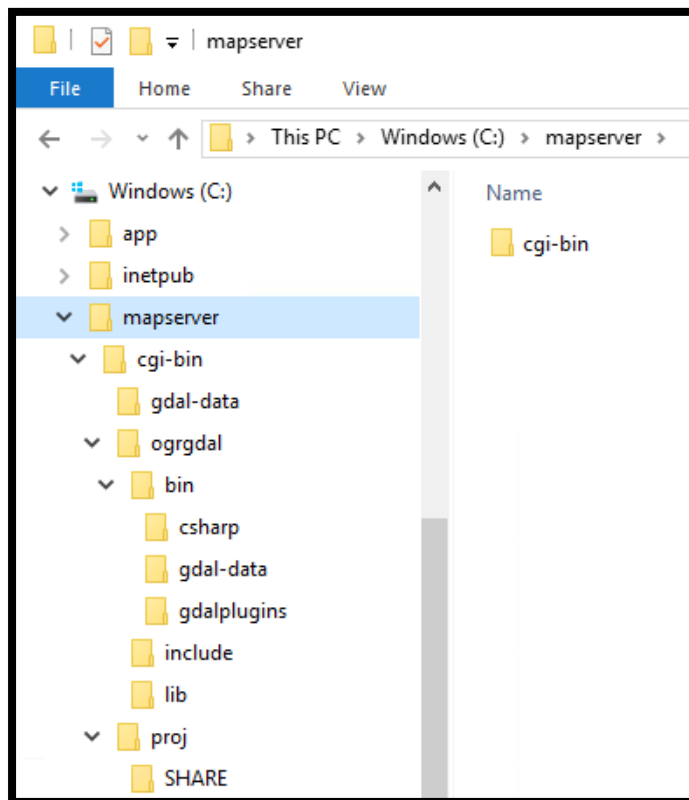
The Mapserver IIS configuration is complete, close IIS Manager.

2.12 Upgrade Mapserver

As previously stated from AWLRS build 1.2.13.1 onwards the use of the Bentley build of Mapserver is mandated, if a different version of Mapserver has previously been deployed to the server for an older build of AWLRS then Mapserver must be updated to the version shipped in the AWLRS release zip (assetwise_mapserver_7.0.7.33.zip).

To upgrade an existing Mapserver deployment please log into the IIS server and follow these steps:

1. Stop IIS (At the command prompt type “iisreset /stop”)
2. Rename the existing mapserver folder to mapserver_old (e.g. c:\mapserver becomes c:\mapserver_old)
3. Unzip the shipped mapserver zip file (assetwise_mapserver_7.0.7.33.zip) to the path of the old mapserver folder (e.g. c:\mapserver) this should give you the folder structure below:



4. Copy the following files from mapserver_old\cgi-bin to mapserver\cgi-bin
 - web.config
 - mapserver.key
 - fonts.list
5. Start IIS (At the command prompt type “iisreset /start”)