ASP.NET Deployment in IIS

How to Deploy ASP.NET Web Applications in IIS?

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INTERNET INFORMATION SERVICES (IIS 6.0 / 7.0 / 7.5 / 8.0 / 8.5)

Internet Information Services (IIS)

- Internet Information Services (IIS) is a Web server (HTTP server)
  - Microsoft's Web server, part of Windows Server
  - Serves static and dynamic content (through the ISAPI interface)
  - IIS hosts and runs ASP.NET Web applications
- IIS processes
  - World Wide Web Publishing Service (**`iissvcs`** in **`svchost.exe`**) holds the IIS core runtime
  - IIS Worker Process (**`w3wp.exe`**) hosts the application pools which host the ASP.NET runtime and the ASP.NET apps

IIS: History and Versions

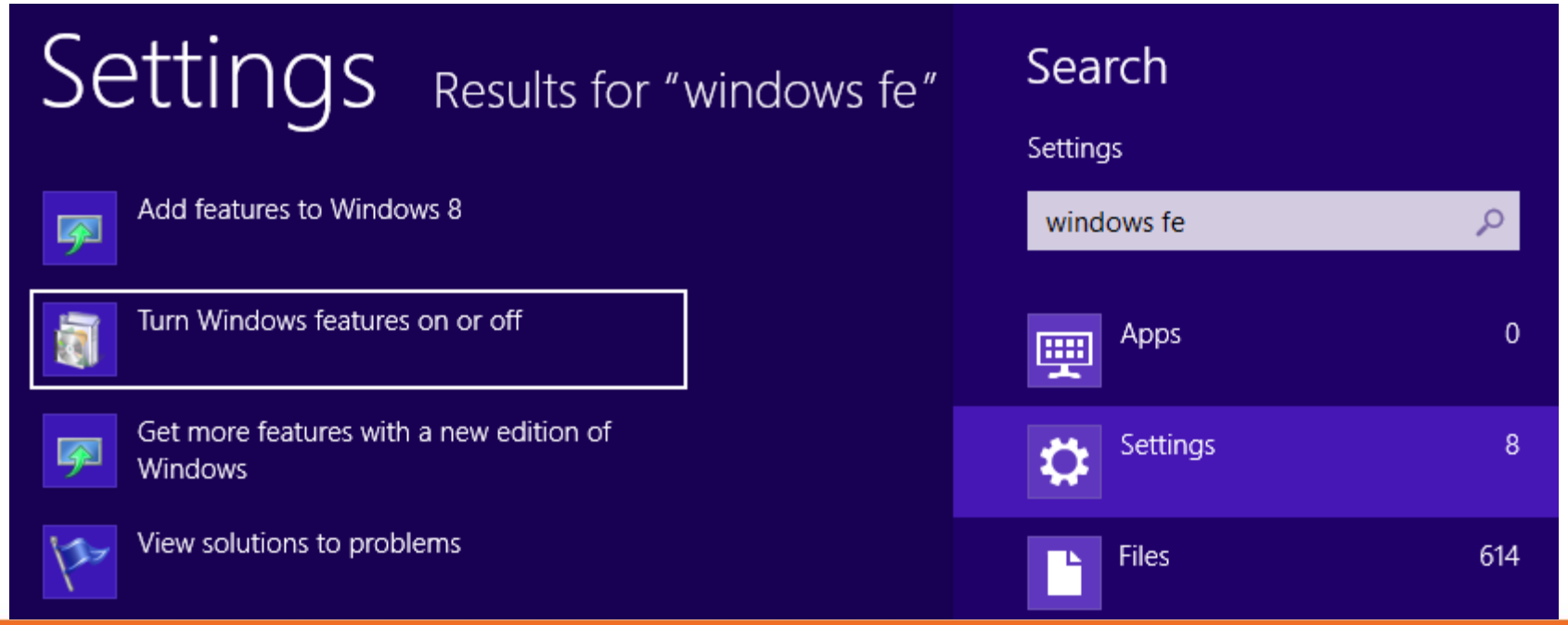
- IIS 5.1 (Windows XP)
  - 10 simultaneous connections, a single Web site
- IIS 6.0 (Windows Server 2003)
  - Faster and more secure, supports application pools
- IIS 7.0 (Windows Vista / Server 2008)
  - Can restrict machine resources per user / app
- IIS 7.5 (Windows 7 / Server 2008 R2)
  - IIS Express – limited developer edition
- IIS 8 (Windows Server 2012)
- IIS 8.5 (Windows Server 2012 R2)

INSTALLING IIS / IIS EXPRESS

Turn On / Off Windows Features,
Web Platform Installer

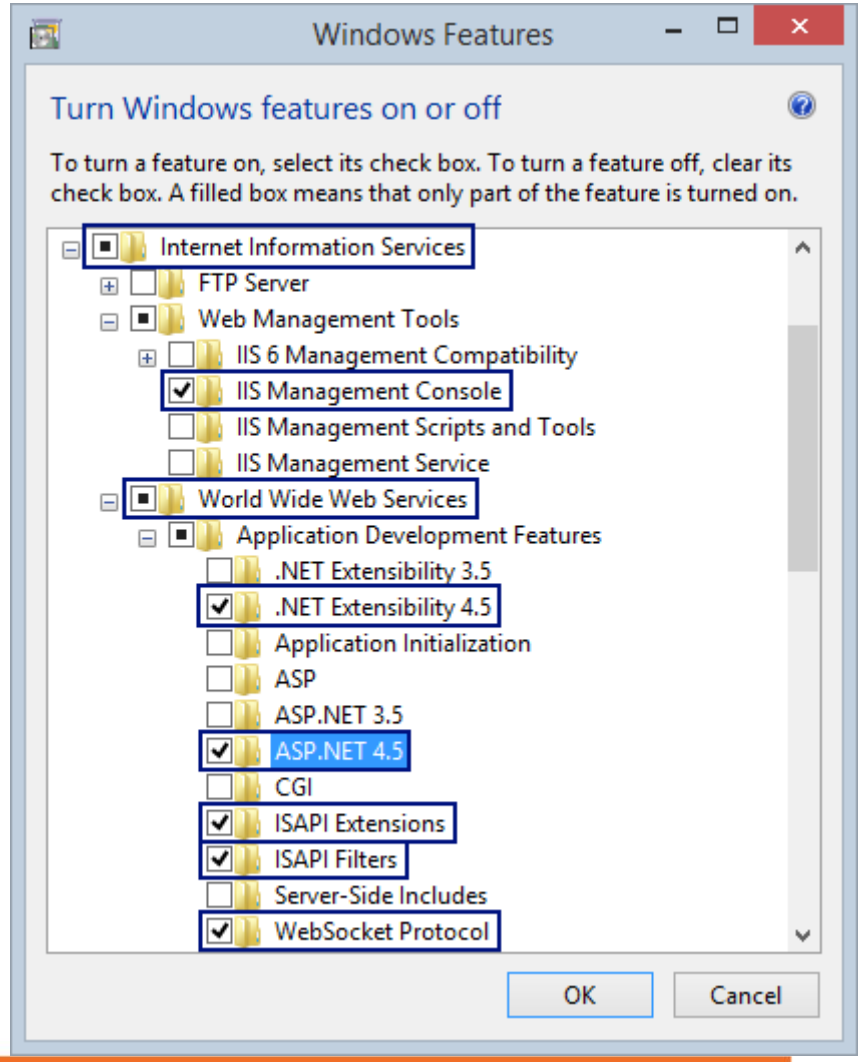
Installing IIS

- IIS is part of Windows (Win7, Win8, Windows Server 2008, Windows Server 2012, …)
  - Installed by "Turn Windows features on or off"



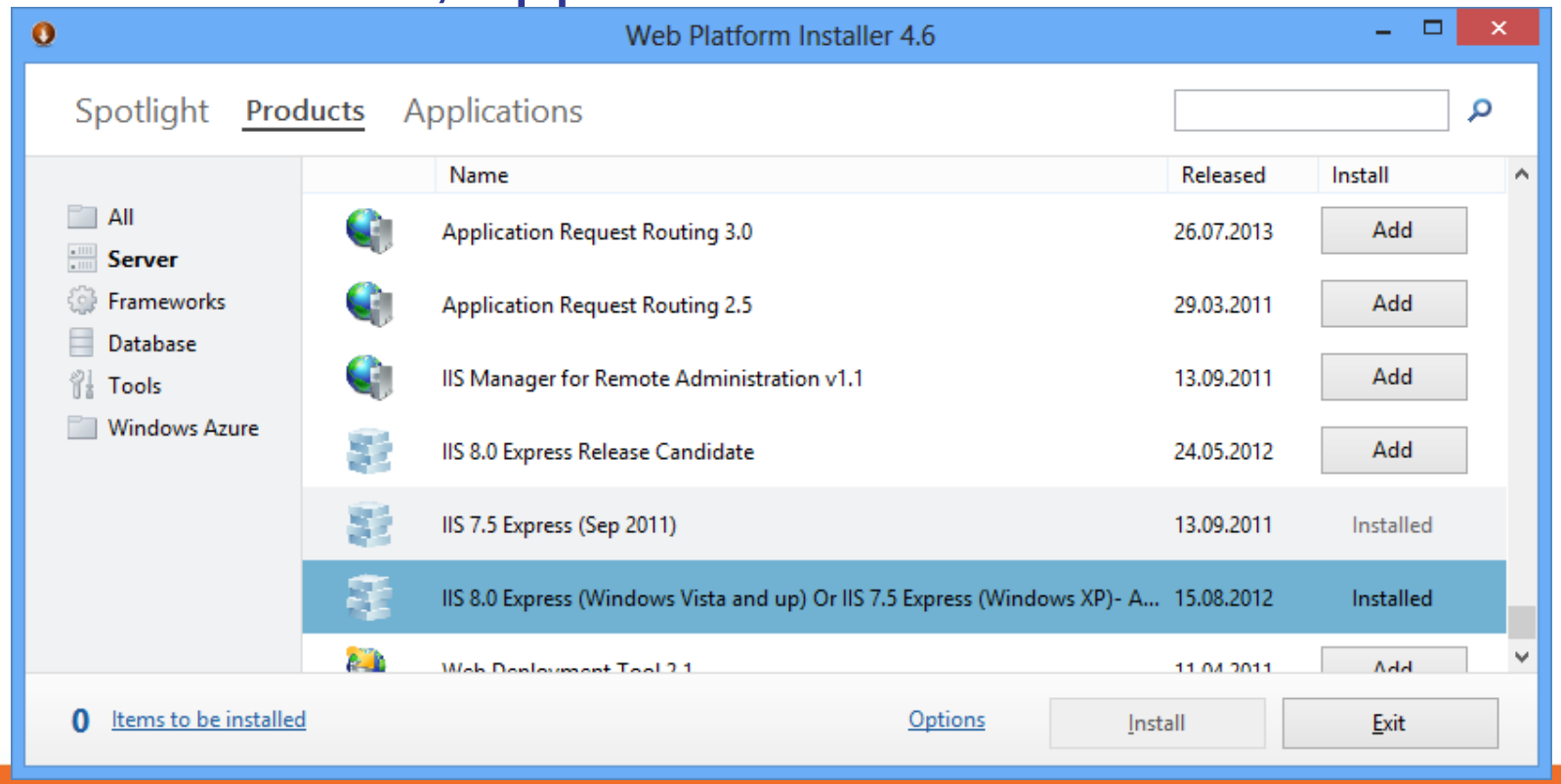
Installing IIS (2)

- IIS features to install:
  - Internet Information Services
  - ASP.NET 4.5 + .NET Extensibility 4.5
  - ISAPI Filters + ISAPI Extensions
  - WebSocket Protocol (for SignalR)
  - IIS Management Console



IIS Express and the Web Platform Installer

- Web Platform Installer (Web PI) can install IIS Express
  - Installs Web servers, applications and tools

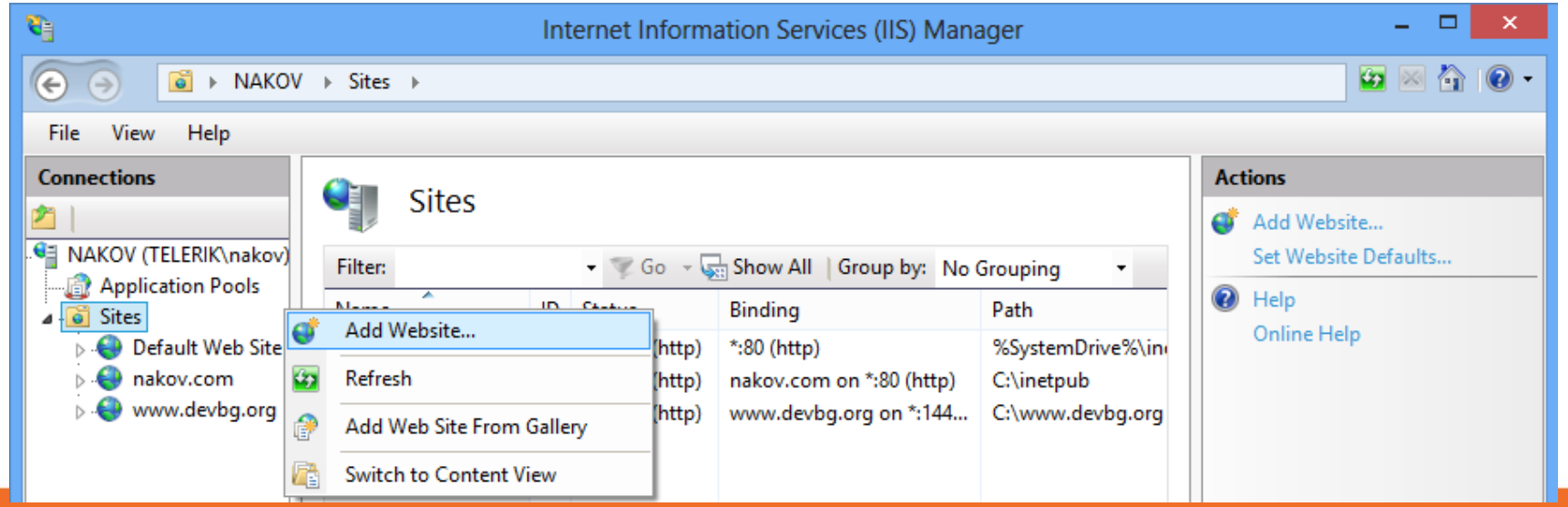


DEPLOYING ASP.NET APPS IN IIS

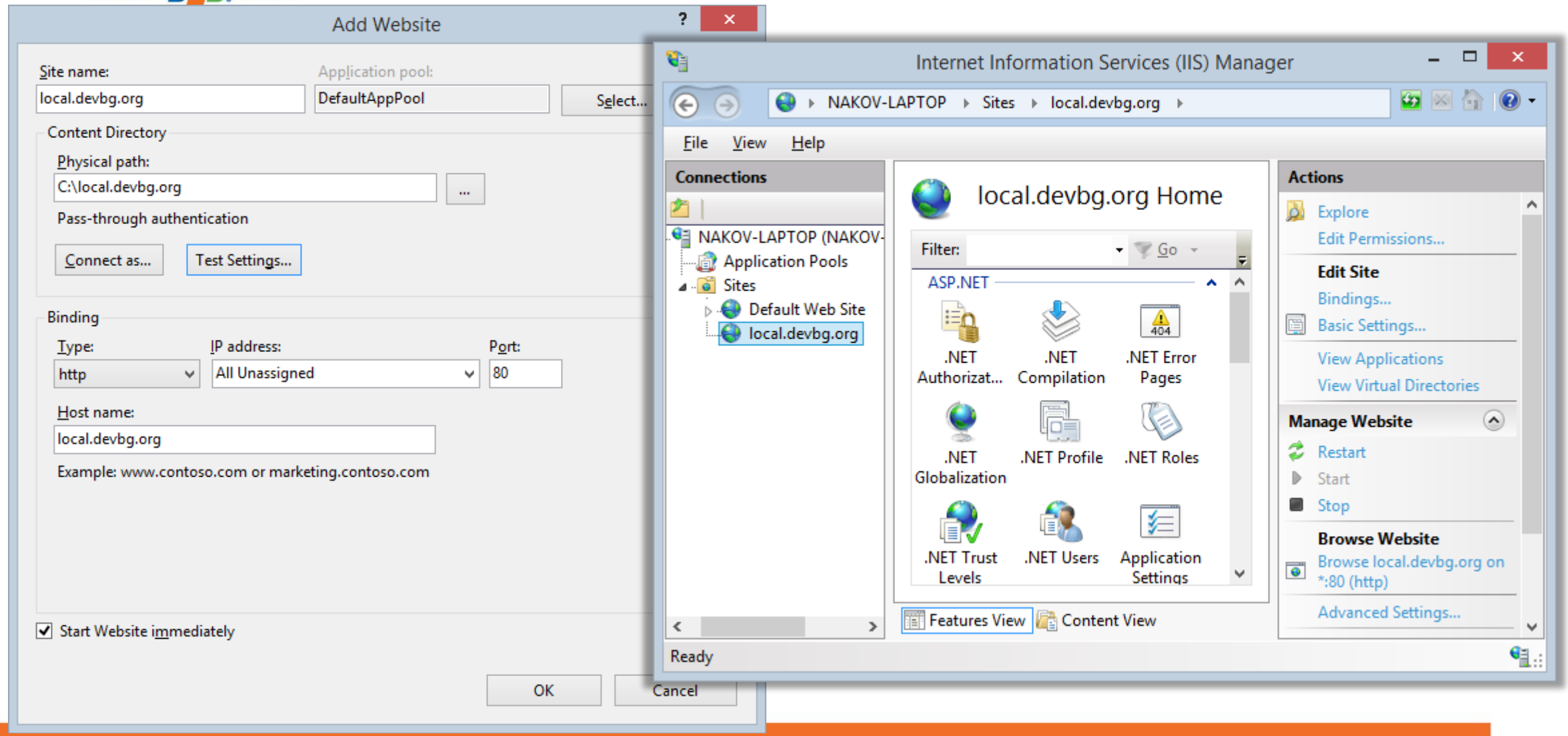
Sites, Applications, Application Pools, DB, …

Web Sites in IIS

- Sites in IIS
  - Instances of the IIS Web server, hosting files and applications
  - Sites are bound to some protocol + host + port
  - E.g. http://mysite.com, https://localhost:8443

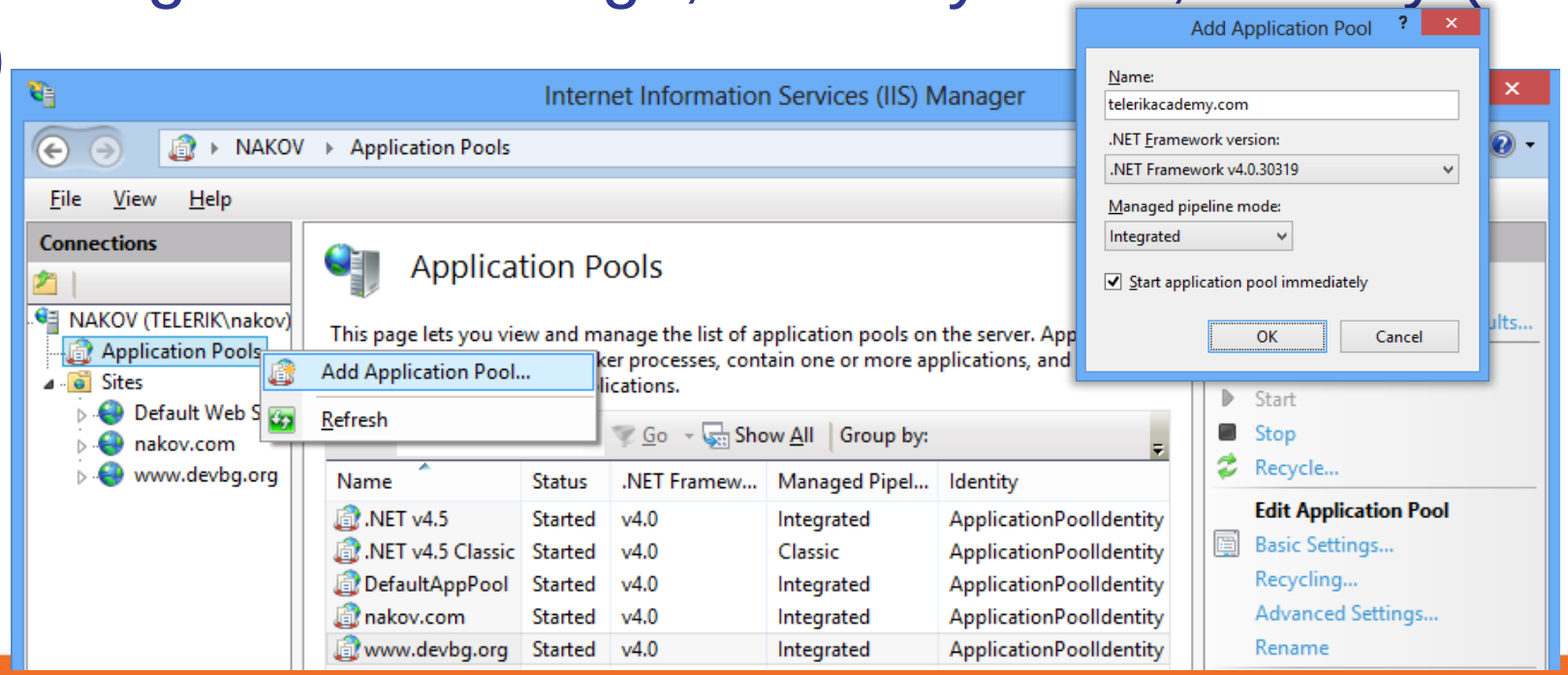


Web Sites in IIS (2)

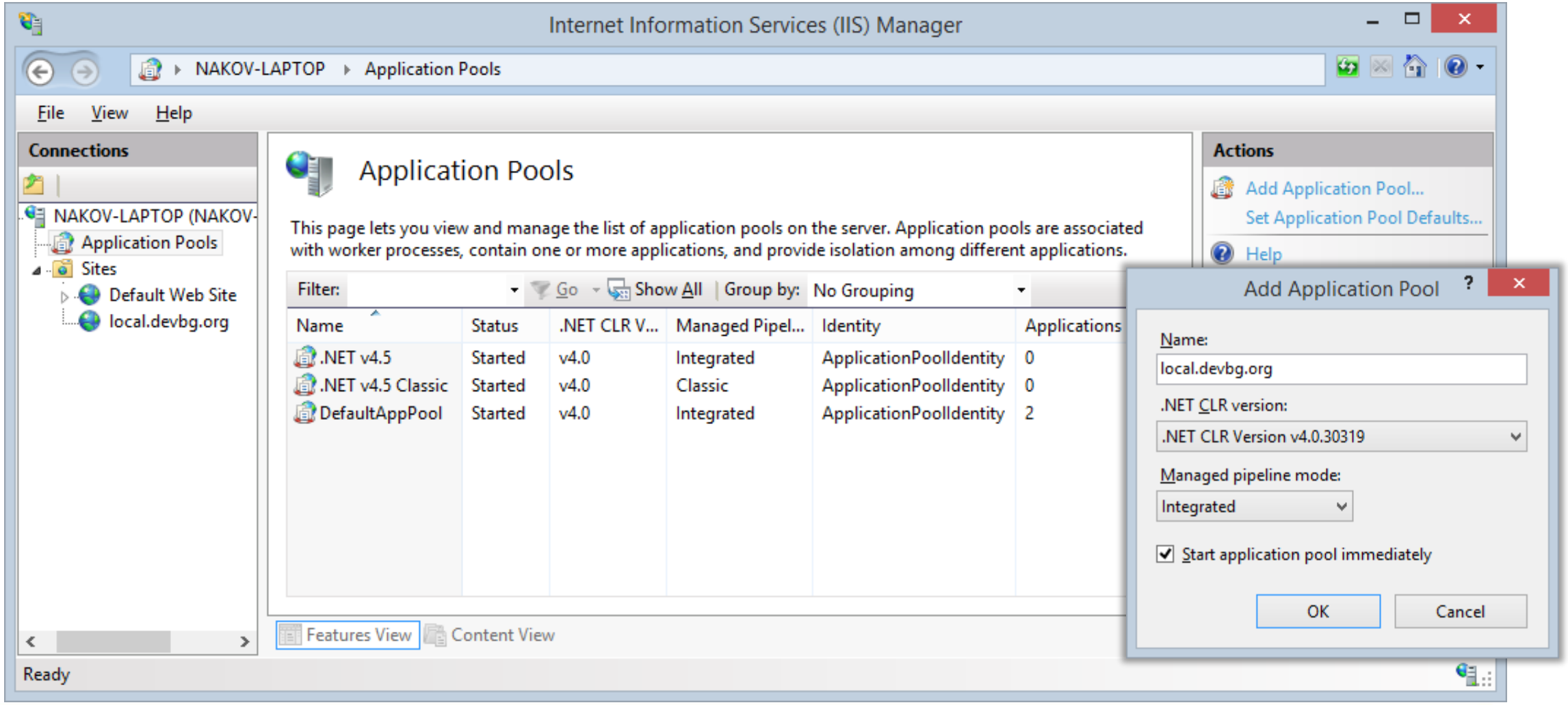


Application Pools in IIS

- Application pools host Web applications in IIS
  - A process group that run the ASP.NET runtime
  - Can configure CPU usage, memory limits, identity (Windows user)

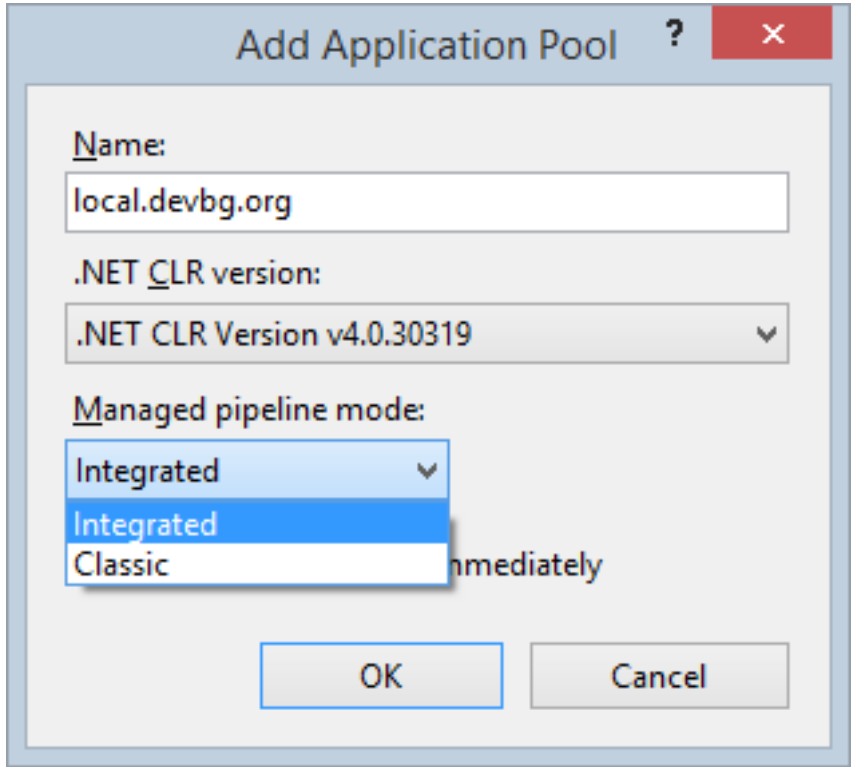


Application Pools in IIS (2)



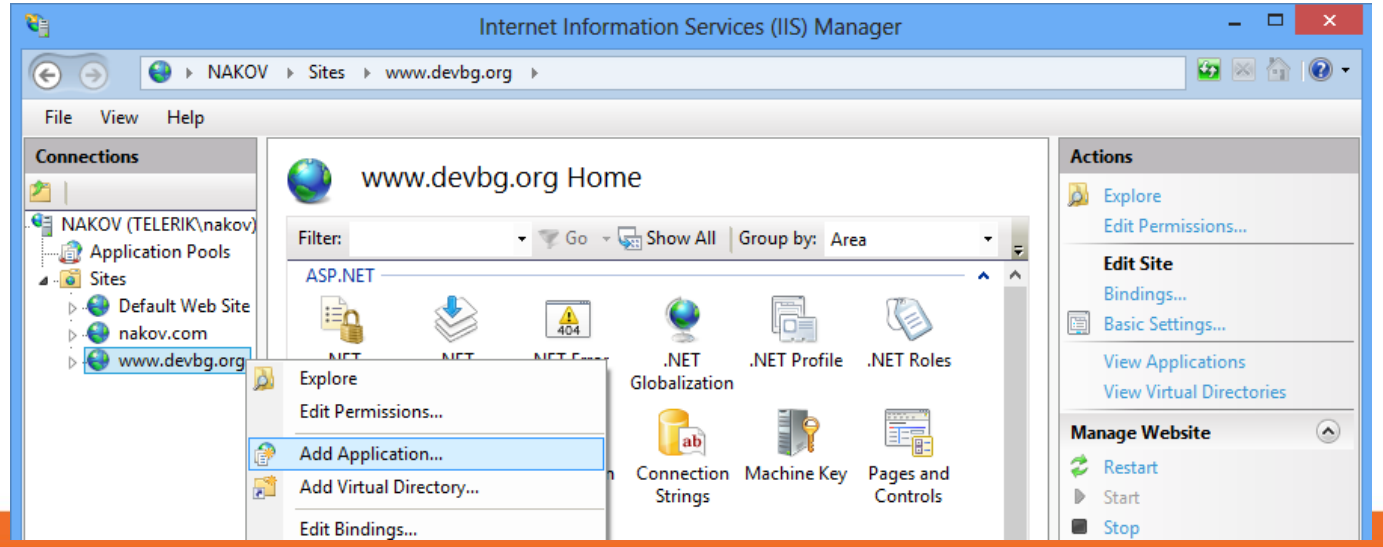
Pipeline Mode for IIS Application Pools

- Managed pipeline mode:
  - Classic
    - Use ASP.NET as external IIS plugin, like the PHP and Perl interpreters
  - Integrated (recommended)
    - ASP.NET is integrated inside IIS
    - ASP.NET can control the request pipeline, e.g. through **`HttpModule`** and **`HttpHandler`**

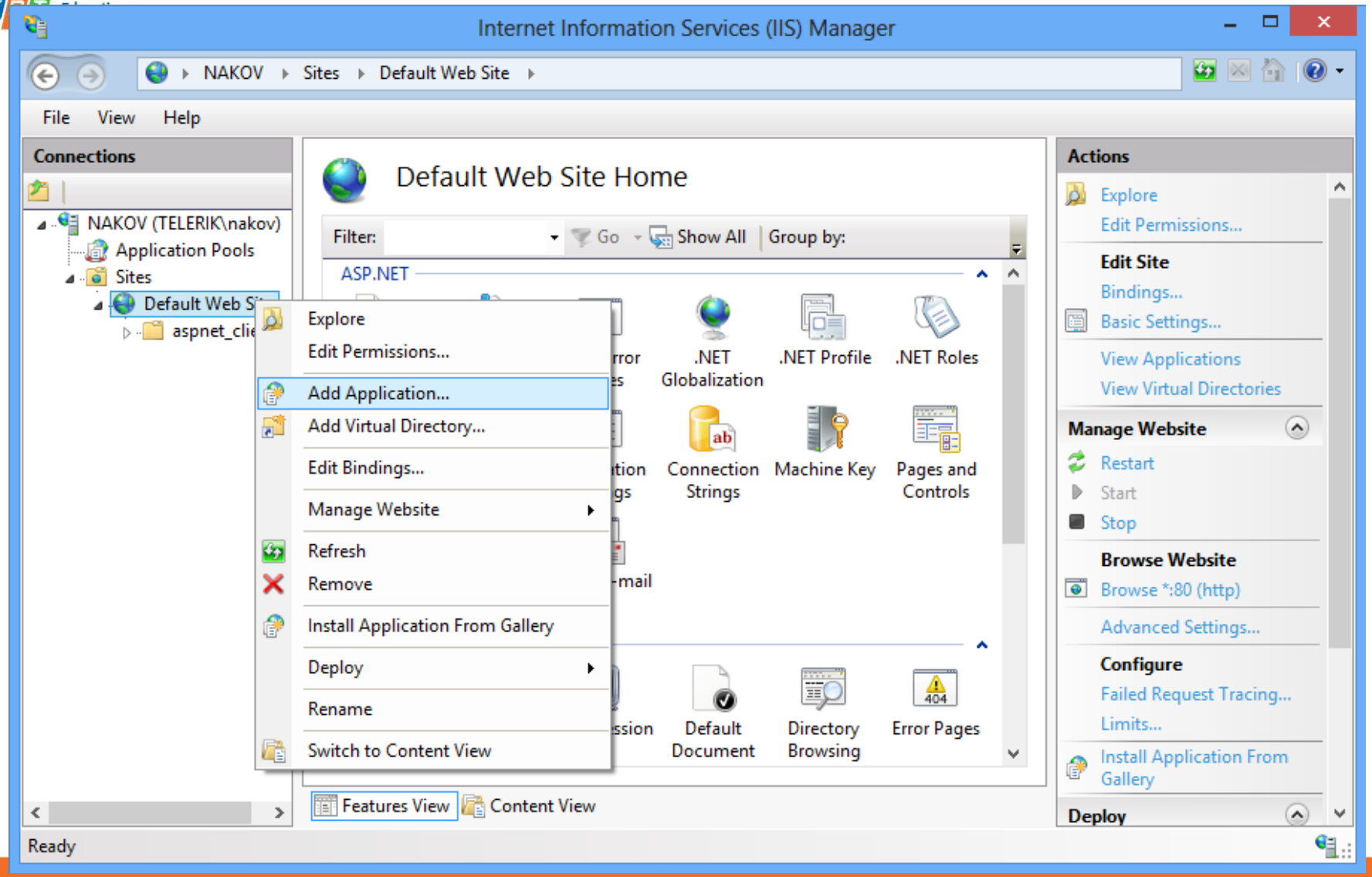


Applications in IIS

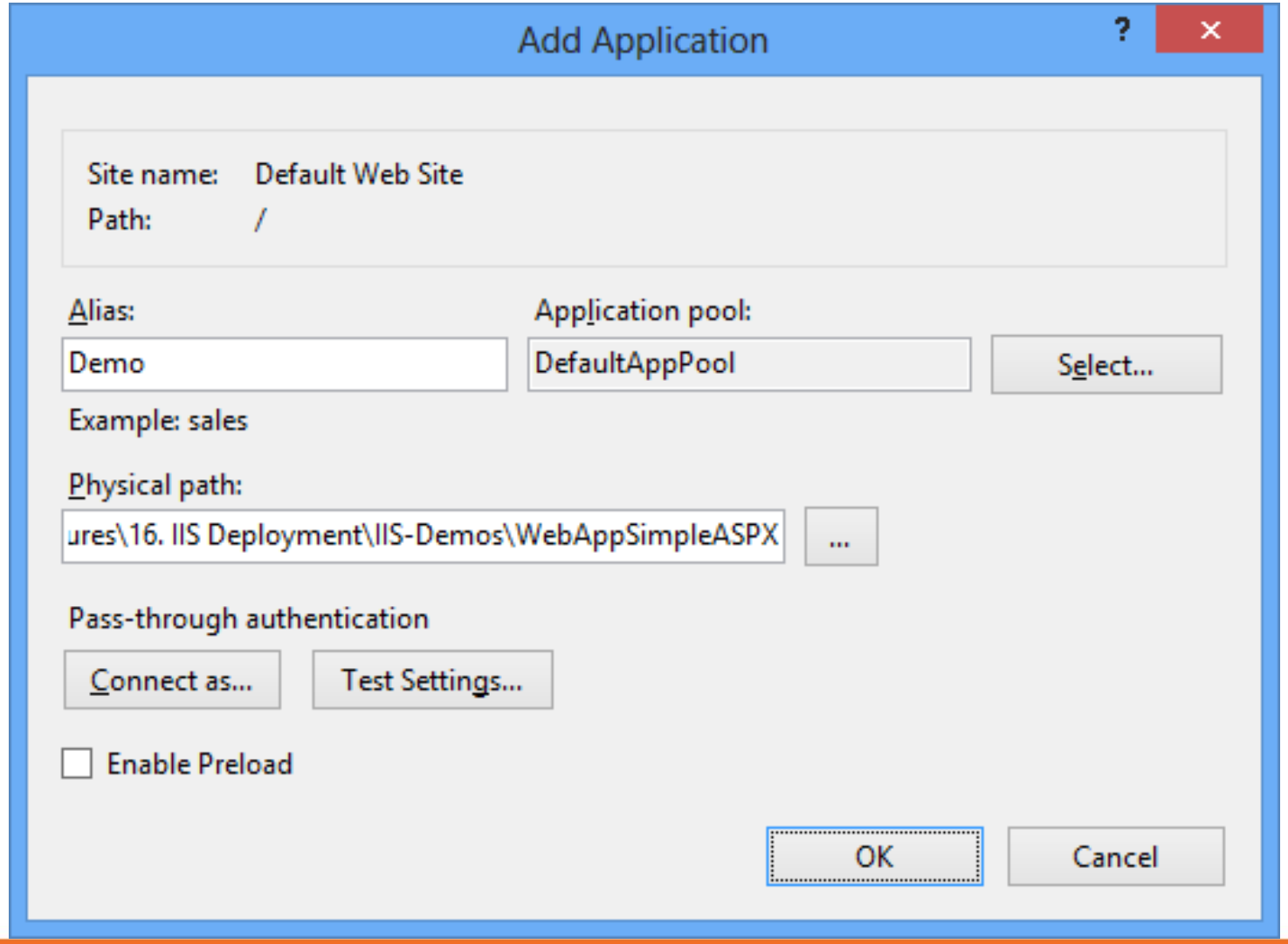
- Applications in IIS are
  - Physical directory with files (application code)
  - Belong to existing Web site and run in existing application pool
  - Have alias (virtual directory), e.g. http://localhost/alias/



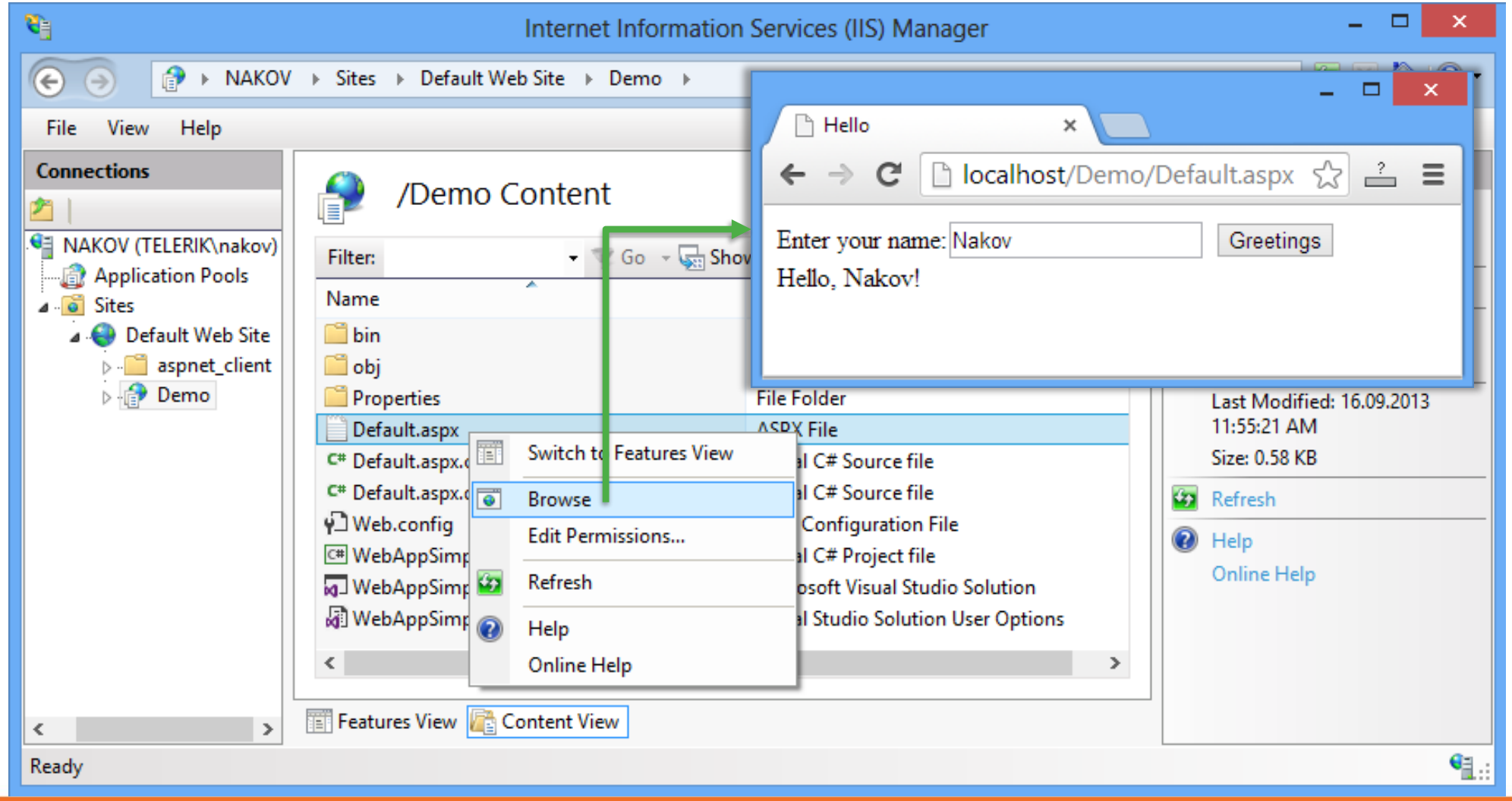
Creating an Application in IIS



Creating an Application in IIS (2)



Creating an Application in IIS (3)



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What Files to Deploy in the Production IIS?

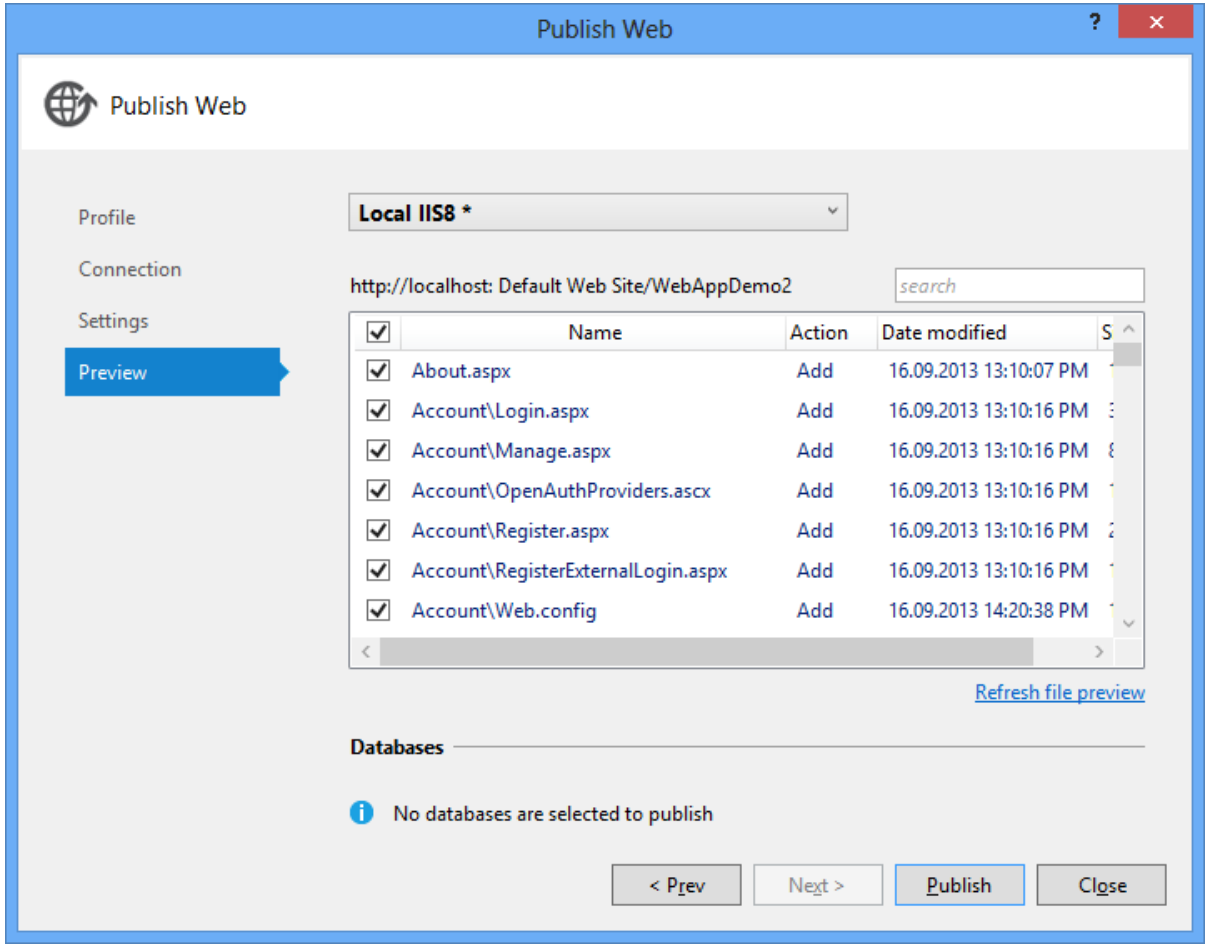
- Files to copy to the IIS application directory:
  - Views, pages, controls: **`*.cshtml`**, **`*.aspx`**, **`*.Master`**, **`*.ascx`**
  - Resources: **`*.jpg`**, **`*.png`**, **`*.gif`**, **`*.css`**, **`*.js`**, fonts, …
  - Compiled C# files: **`bin\*.dll`**
  - Config files: **`Web.config`**, **`Global.asax`**
- Don't deploy these files:
  - Source code: **`*.cs`**, **`*.csproj`**, **`*.sln`**
  - Databases: **`*.mdf`** / **`*.ldf`** (deploy separately in SQL Server)

WEB PUBLISHING FROM VISUAL STUDIO

Publish Web App from VS to IIS

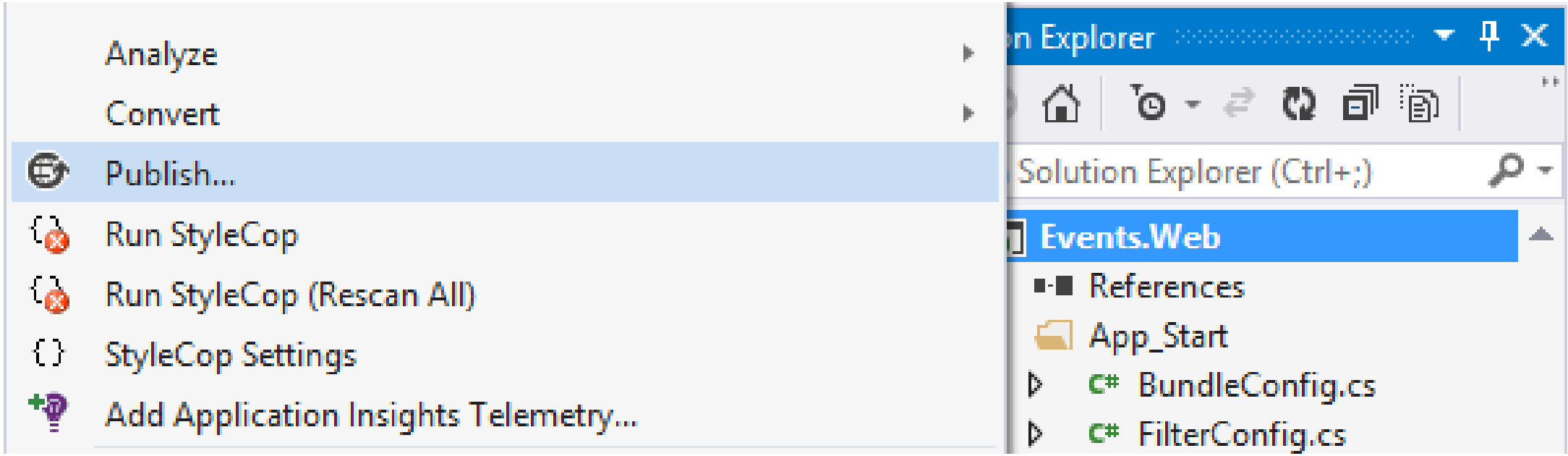
Web Publishing in Visual Studio

- Visual Studio provides a Web Publishing Wizard
  - Used to deploy ASP.NET Web apps to remote IIS
  - Supports local deploy (in the file system), Web deploy, deploy package, FTP
  - Uses pre-configured publish profiles



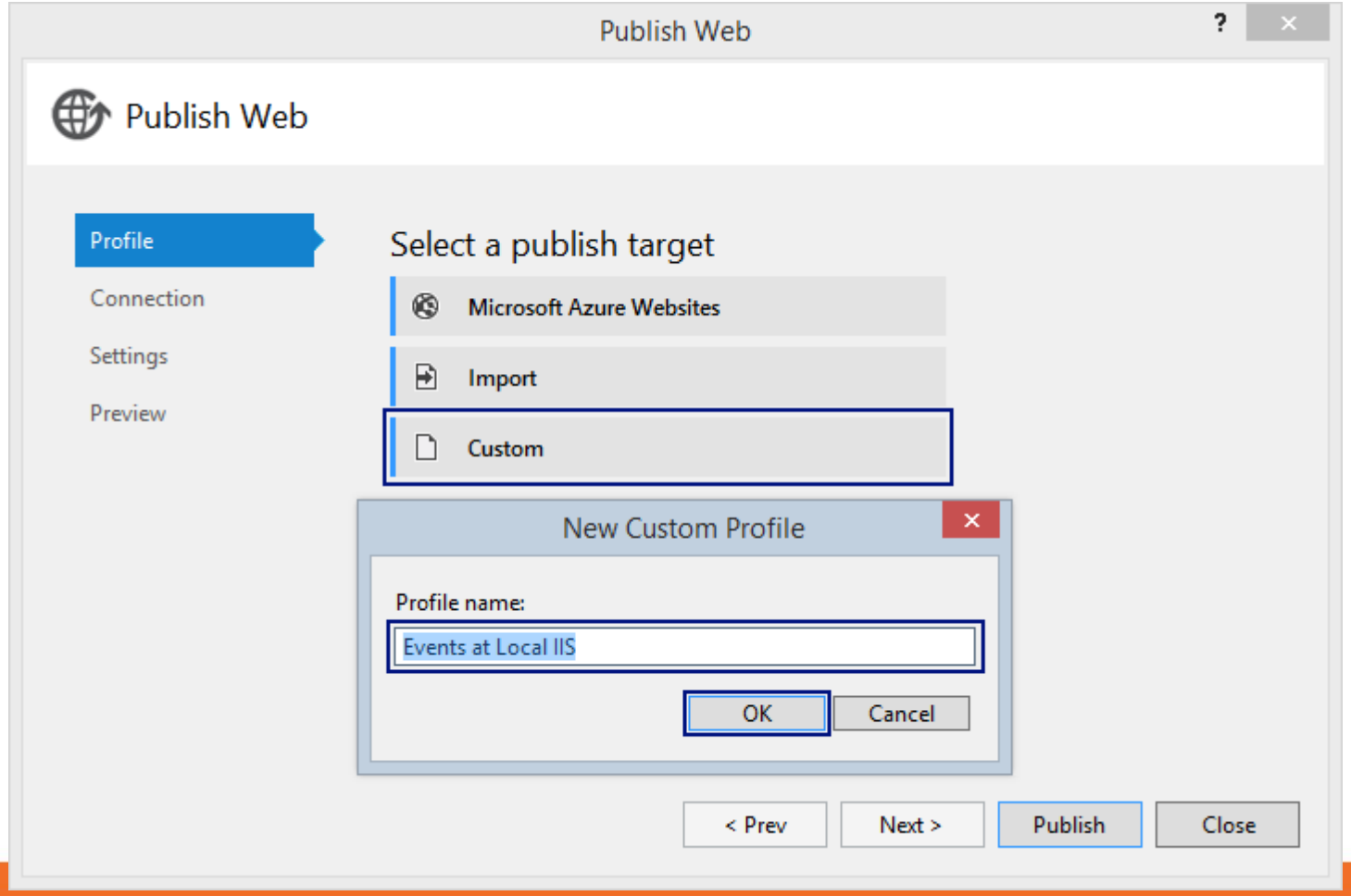
Web Publishing in Visual Studio (2)

- Click on the Web project and choose [Publish…]



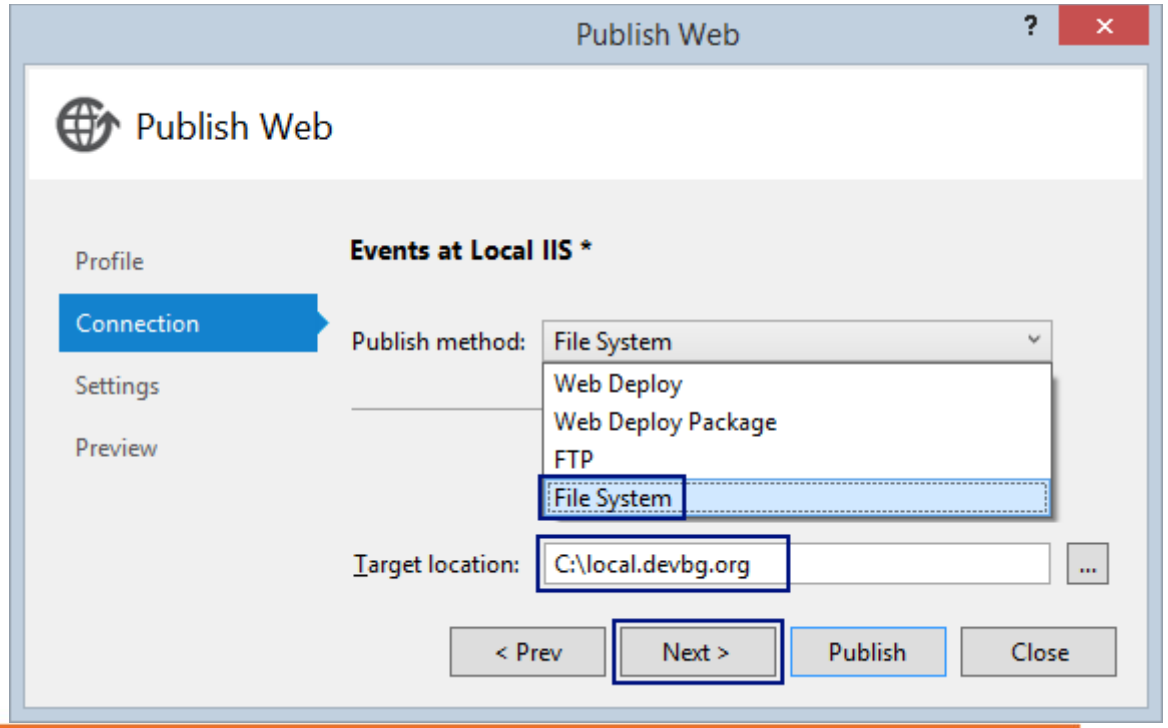
Web Publishing in Visual Studio (3)

- Create a New Custom Profile

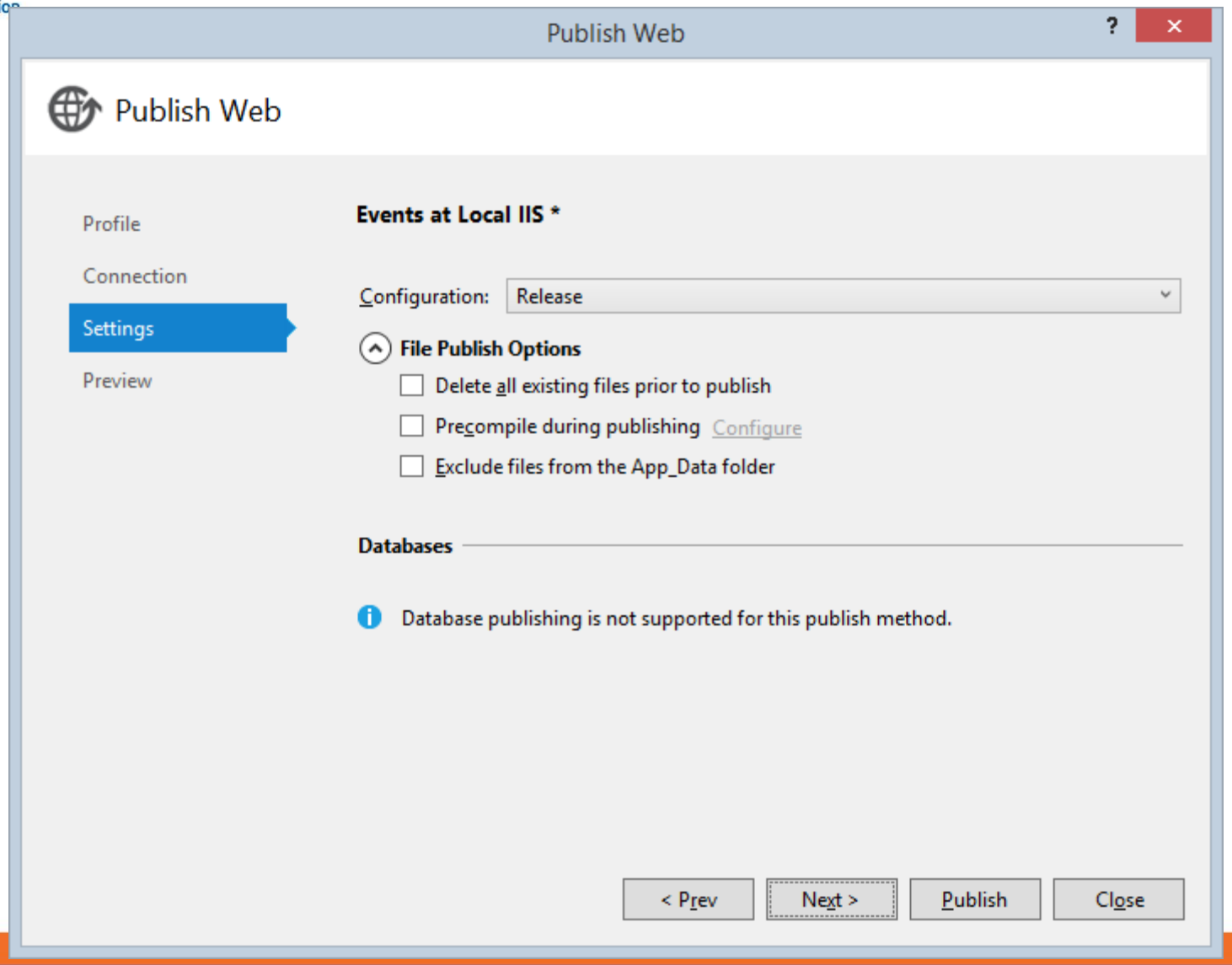


Web Publishing in Visual Studio (4)

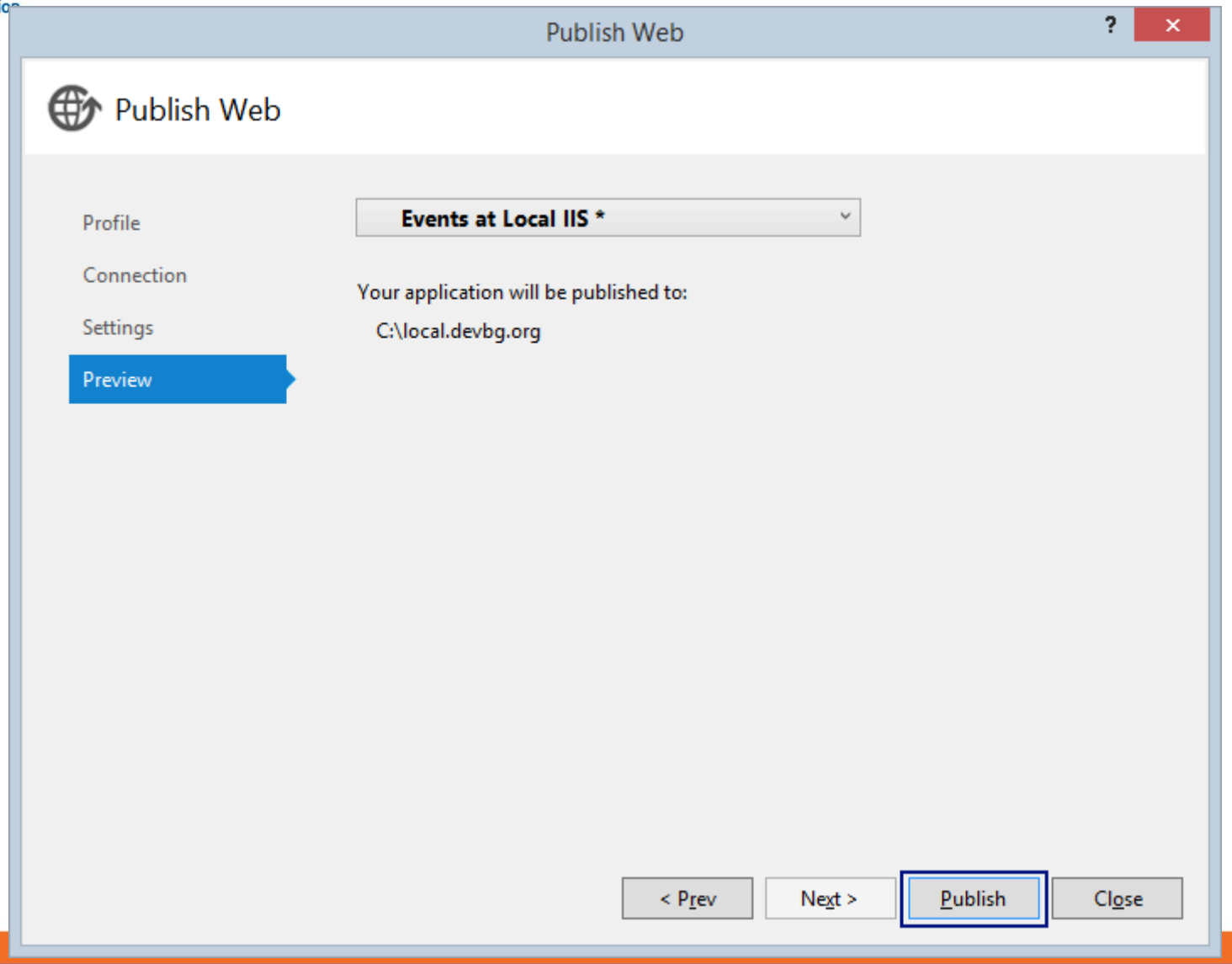
- Web Deploy: deploy to IIS
  - Remote deploy requires IIS Web Management Service (WMSvc)
- Web Deploy Package:
  - Create a ZIP package for later deployment to IIS
- FTP: deploy with FTP upload
- File System: deploy to a local folder



Web Publishing in Visual Studio (5)

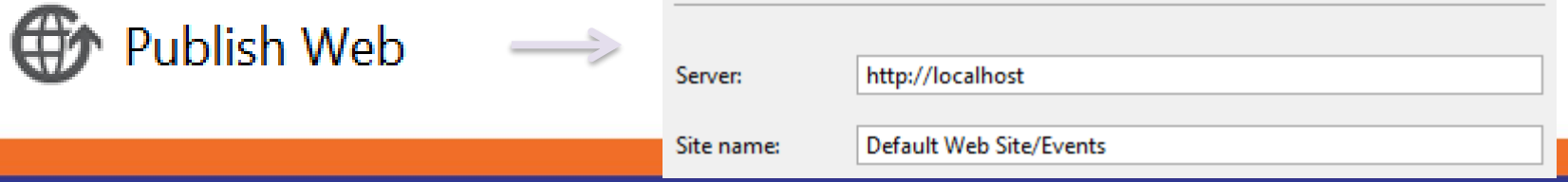


Web Publishing in Visual Studio (6)



Web Deploy from IIS to Visual Studio

- Visual Studio can directly deploy a Web application to IIS
  - Use the Web Publish Wizard → Web Deploy
  - Remote IIS deploy requires
    - IIS Web Management Service (WMSvc) running at the remote host
    - Proper firewall configuration: open TCP port 8172
  - Local IIS deploy requires Visual Studio running as Administrator



DEPLOYING DATA-DRIVEN APPLICATIONS IN IIS

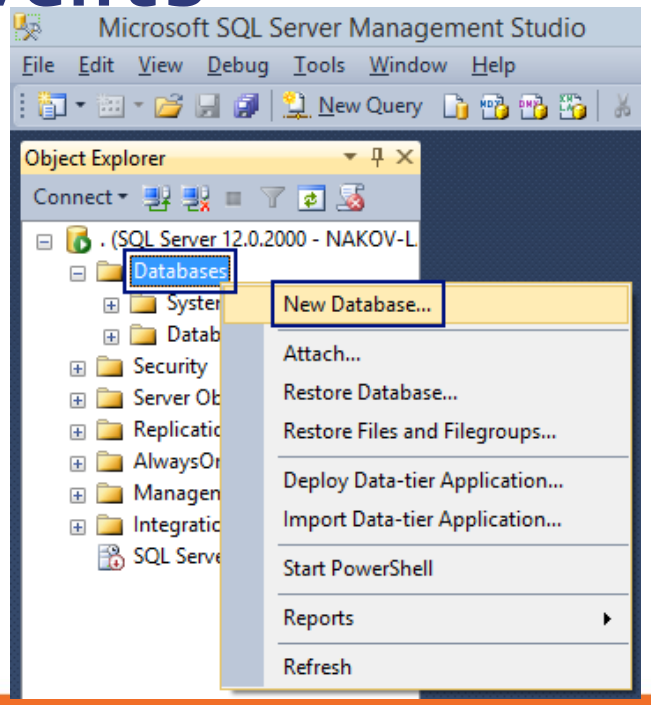
Configuring IIS to Access SQL Server

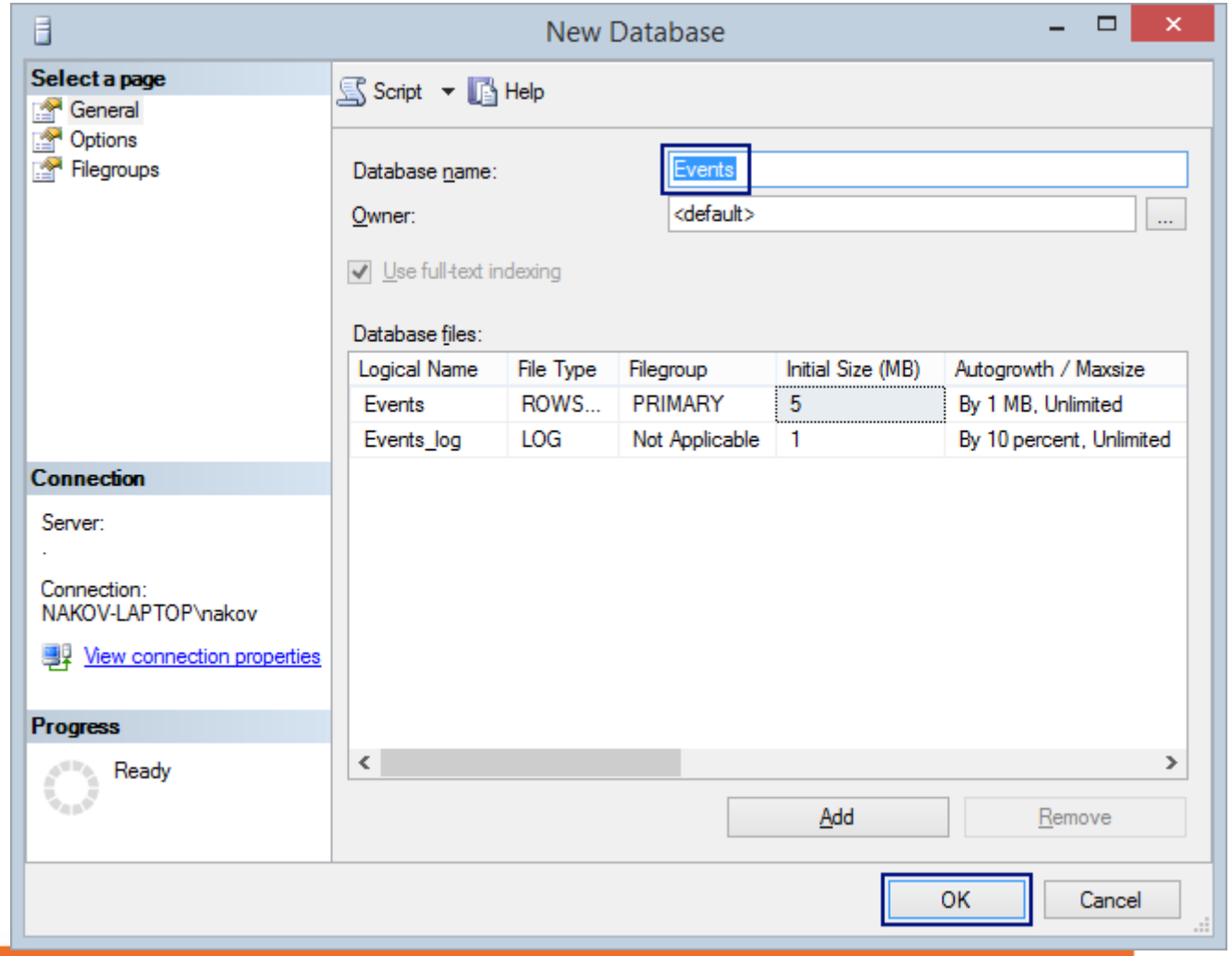
Configuring IIS to Access SQL Server

- Typically in IIS your application runs under the user "**IIS APPPOOL\DefaultAppPool**" (or you app pool's user)
  - This user cannot login in SQL Server (can't establish connection)
  - This user has no permissions for your database in SQL Server
- To access the SQL Server DB from IIS:
  1. Configure the database connection string in **Web.config**
  2. Create a SQL Server login "**IIS APPPOOL\DefaultAppPool**"
  3. Assign "**db_owner**" database role for this login for your DB

Step 1: Create a Database

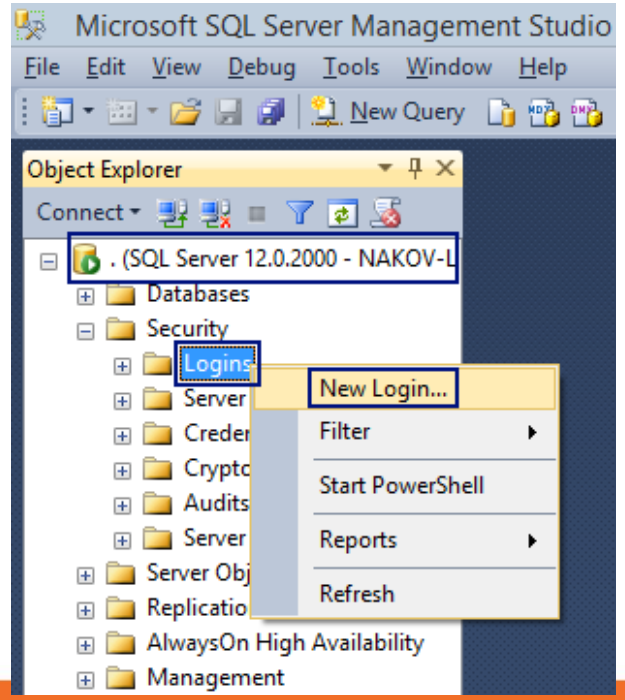
- Create a new database for your Web application in SQL Server, e.g. "**Events**"

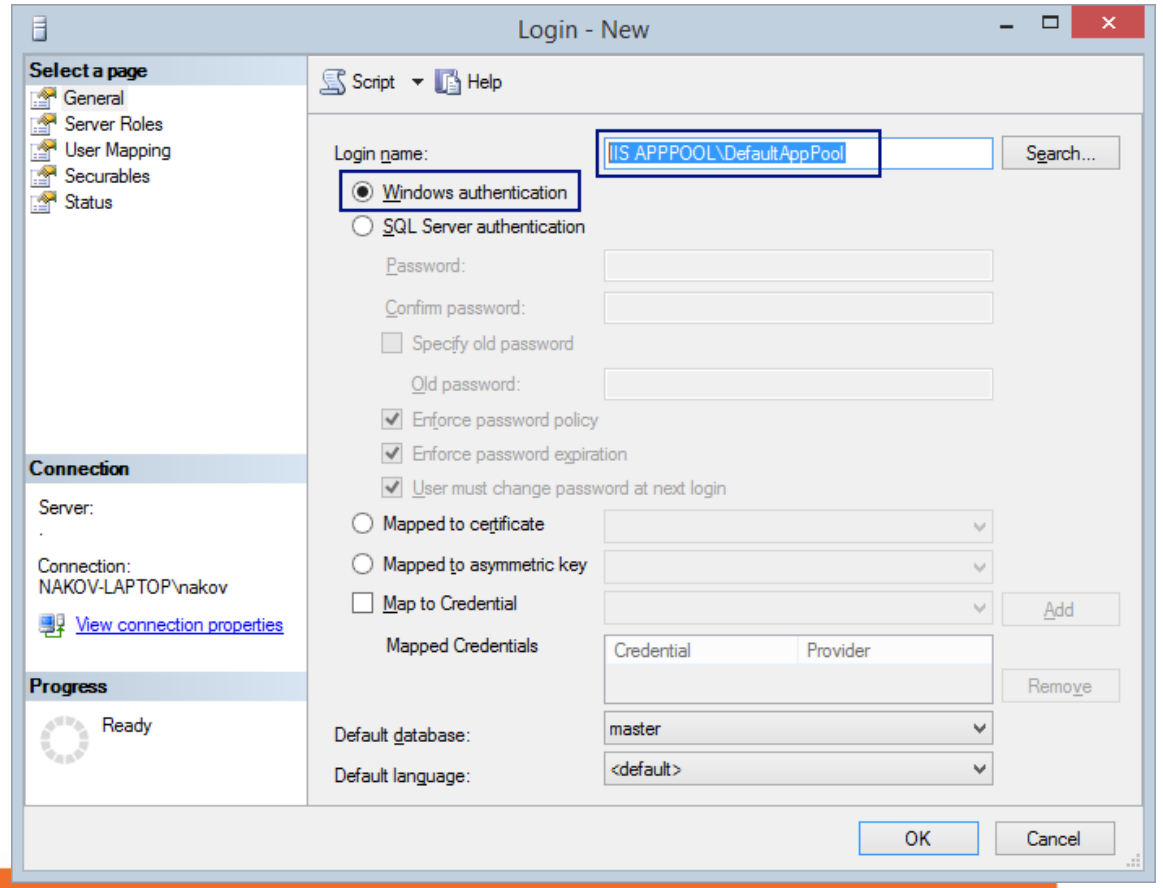




Step 2: Create IIS Login in SQL Server

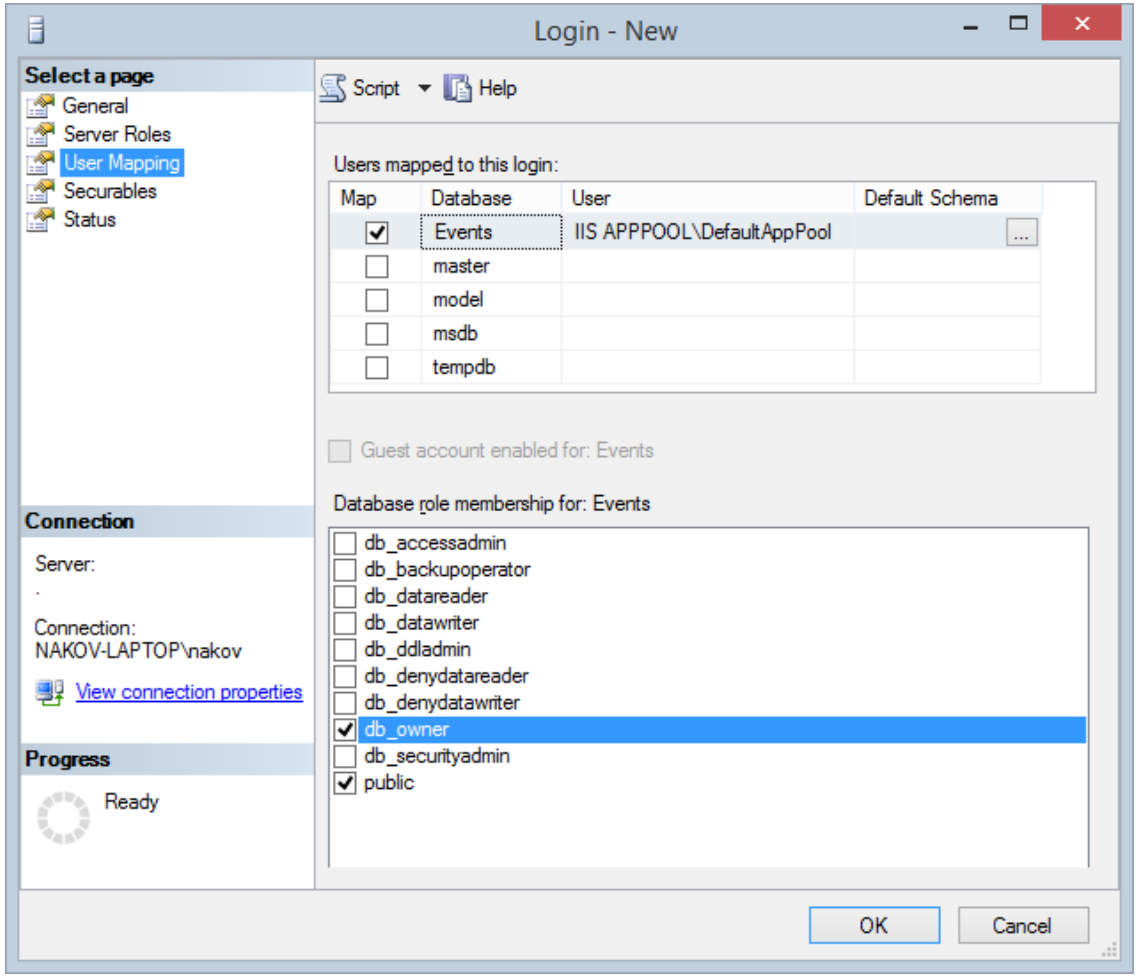
- Create a new login for the "**IIS APPPOOL\DefaultAppPool**" Windows user in SQL Server





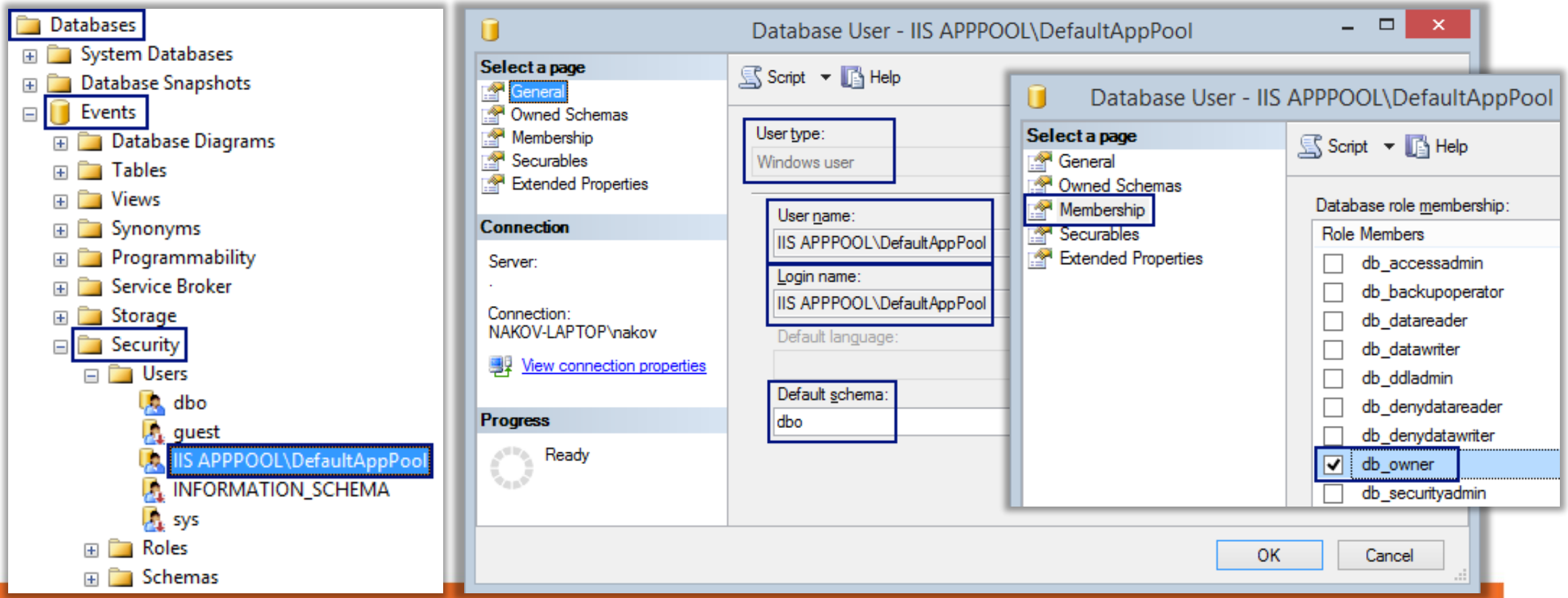
Step 3: Assign Permissions to Access the DB

- Assign permissions for the new SQL Server login "**IIS APPPOOL\DefaultAppPool**" to access your Web app DB
  - Select your Web application's database, e.g. "**Events**"
  - Assign role "**db_owner**" (full access)
- That's all, enjoy!



What Happened in the SQL Server?

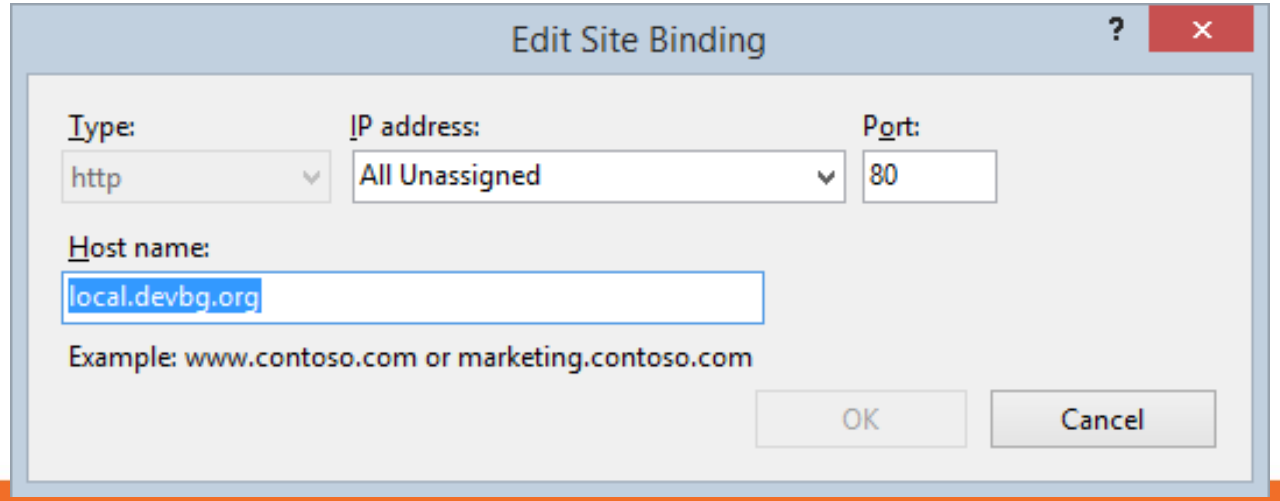
- A Windows user "**IIS APPPOOL\DefaultAppPool**" was created in the "**Events**" database with "**db_owner**" role:



CONFIGURING DOMAINS + SSL IN IIS

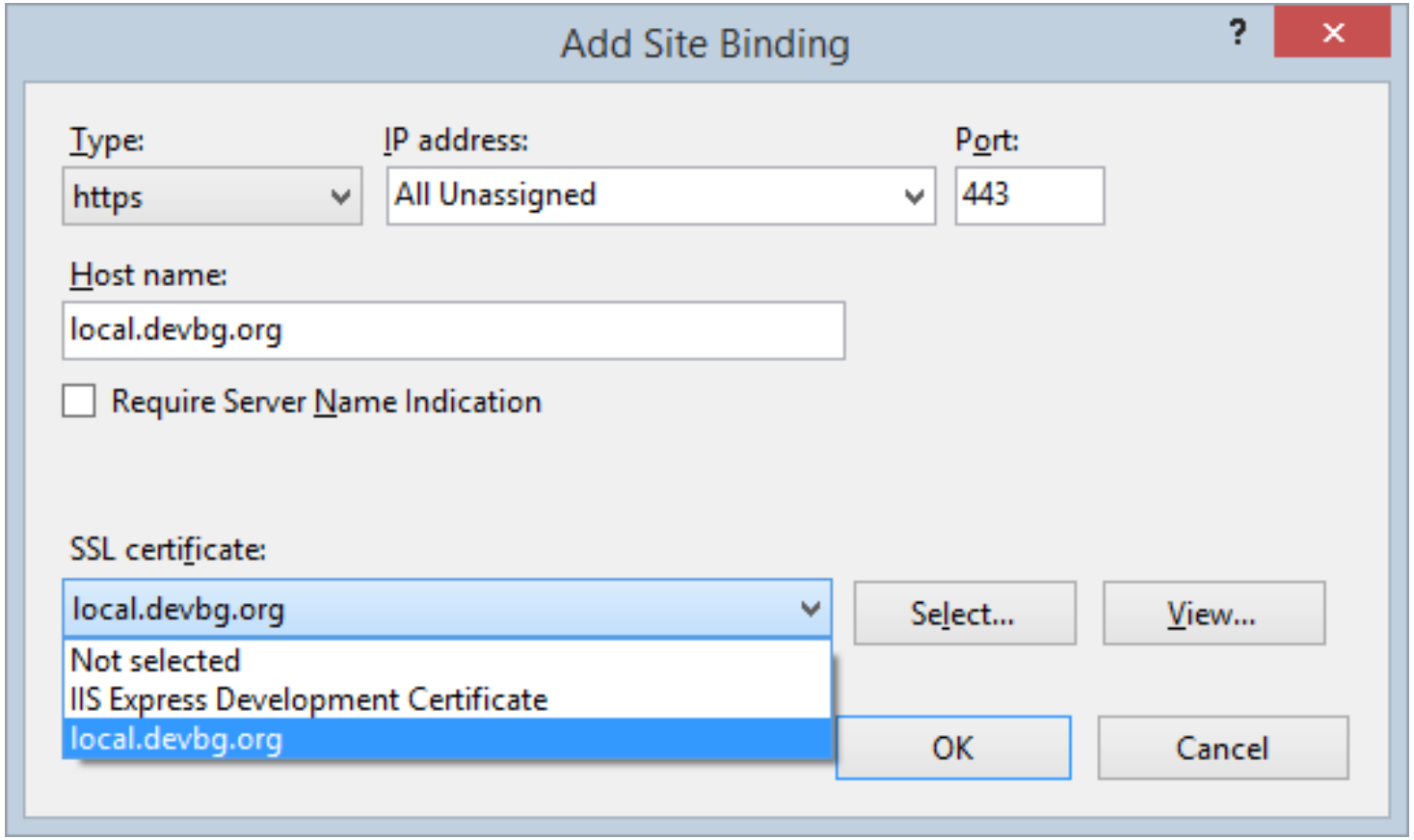
Configuring a Domain in IIS

- Assign the server IP address for your domain name in the DNS
  - From the admin panel of your domain hosting provider
  - E.g. assign **`greenwich.vn`** == **`217.174.159.195`**
- Assign the host name in the Web site binding in IIS:

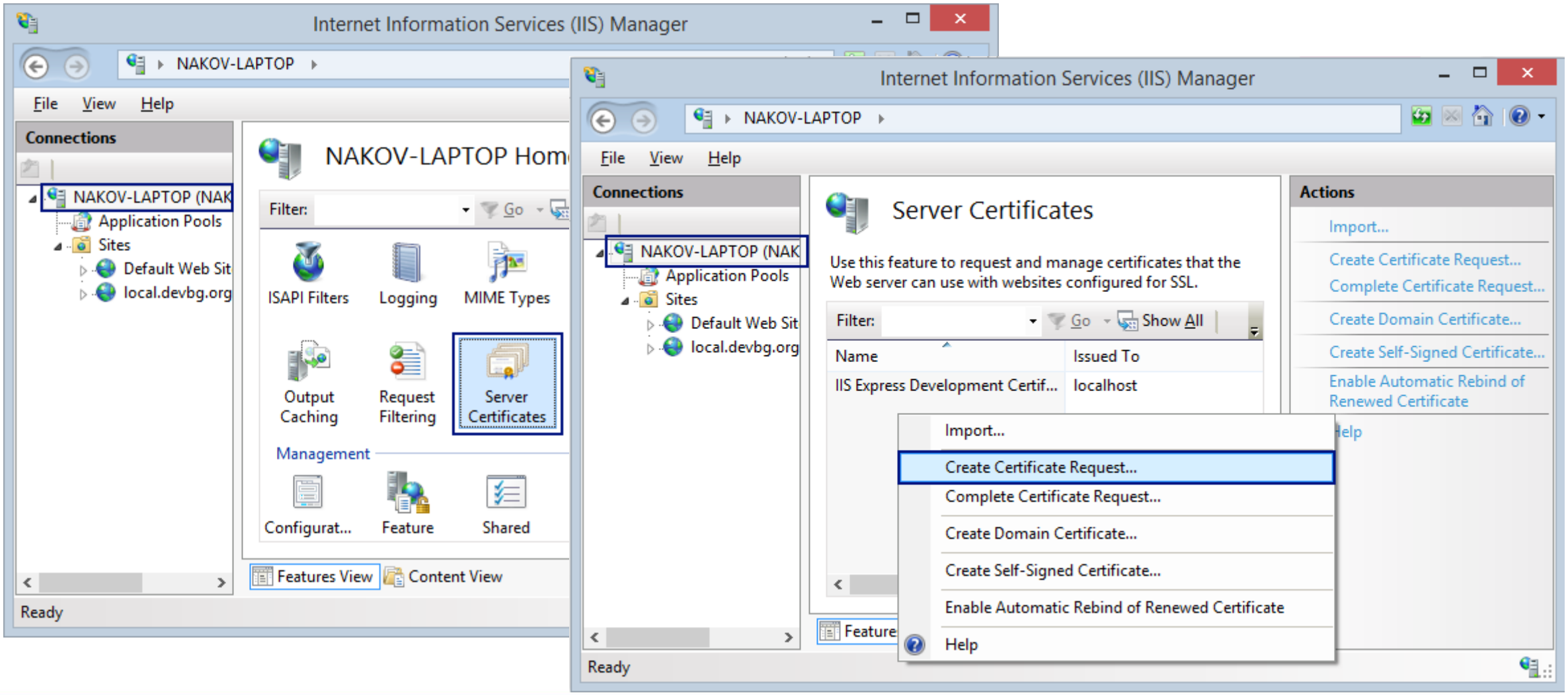


Configuring SSL in IIS

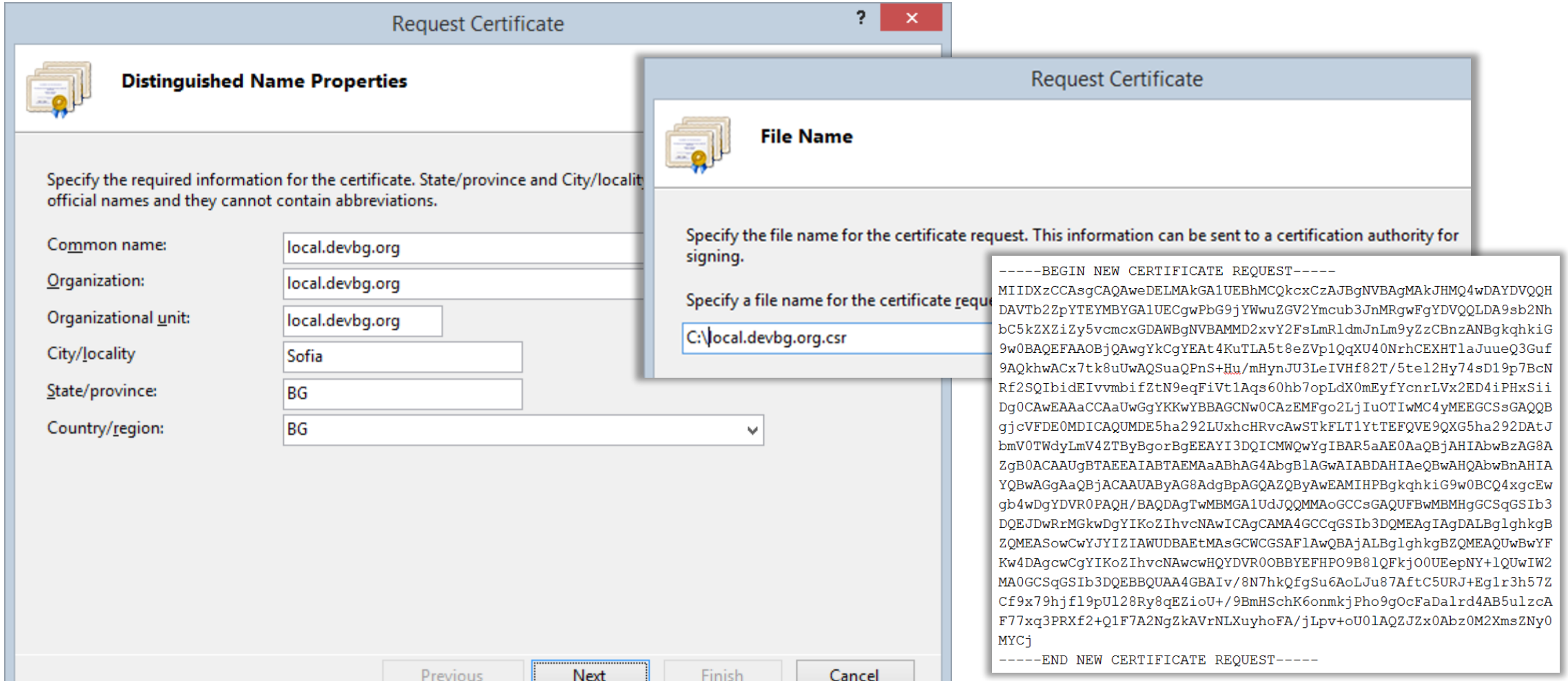
- To configure SSL in IIS, you need to have a server SSL certificate



Requesting New SSL Certificate



Requesting New SSL Certificate (2)



Requesting New SSL Certificate (2)

- Sign the CSR to issue the certificate
  - Different SSL providers have different domain validation process
  - Comodo Instant SSL provide 90-days free SSL certificates: https://www.instantssl.com/free-ssl-certificate.html
  - Once the domain ownership is verified, provider will issue the certificate (typically X.509 **`.crt`** file)
- You can self-sign the CSR (e.g. by OpenSSL)
  - The certificate will be invalid, but can be used for testing purposes

Self-Signing a CSR with OpenSSL

- Your CSR can be signed by yourself, using OpenSSL:

```
# Generate a private key for the signing process
openssl genrsa -passout pass:foobar -out server.key 1024

# Sign the CSR with the private key to obtain the .CER file
openssl x509 -req -days 3650 -in local.devbg.org.csr -signkey
server.key -passin pass:foobar -out local.devbg.org.crt

# Export the certificate with private key as PKCS#12 (pfx file)
openssl pkcs12 -export -in local.devbg.org.crt -inkey server.key
-passin pass:foobar -out local.devbg.org.pfx -passout
pass:foobar -name "local.devbg.org"
```

Summary

- IIS is the Microsoft's Web server
  - Hosts static Web sites and ASP.NET Web applications
- Visual Studio has very powerful Web Publishing Wizard
  - Deploy to directory, local or remote IIS
- To access SQL Server from IIS, create a new login and give permissions to your database
- To use SSL, you need to request, issue and install a certificate