PUTTING THE PIECES OF .NET TOGETHER

Wade Harvey

8/25/2010

Welcome

What are the obstacles?

1. There are a lot of pieces
2. The pieces are scattered out in many different places on the computer
3. Lots of versions
4. Lots of options for each version

Major Components of .NET

|	
1	• Servers
2	• .NET Framework
3	• Security
4	• Monitoring Tools
5	• Web Servers
6	• SQL Server
7	• Software Develop Tools
8	• Languages

1. Servers

1. Servers

What is a server? **It is like a servant.**

- A Server is a socket "Listener" that waits for commands and then performs operations to serve up information.
- It is the **foundation**.
- There are many types of servers:
  - Server Operating System
  - Web Servers
  - File Servers
  - FTP Servers
  - Network Server
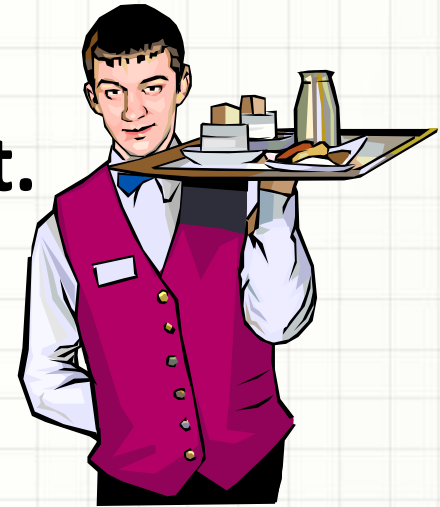
Server Operating Systems

Server Operating Systems reside in the C:\Windows folder

- Windows 2000 & XP – IIS 5.0
- Windows 2003 & Vista – IIS 6.0
- Windows 2008 & Windows 7 – IIS 7.0

2. .NET Framework

.NET Framework

- What is it?
  - It is a virtual machine that includes a large class library.
- Why use it?
  - Reuse code for basic functions
  - Security
  - Memory Management
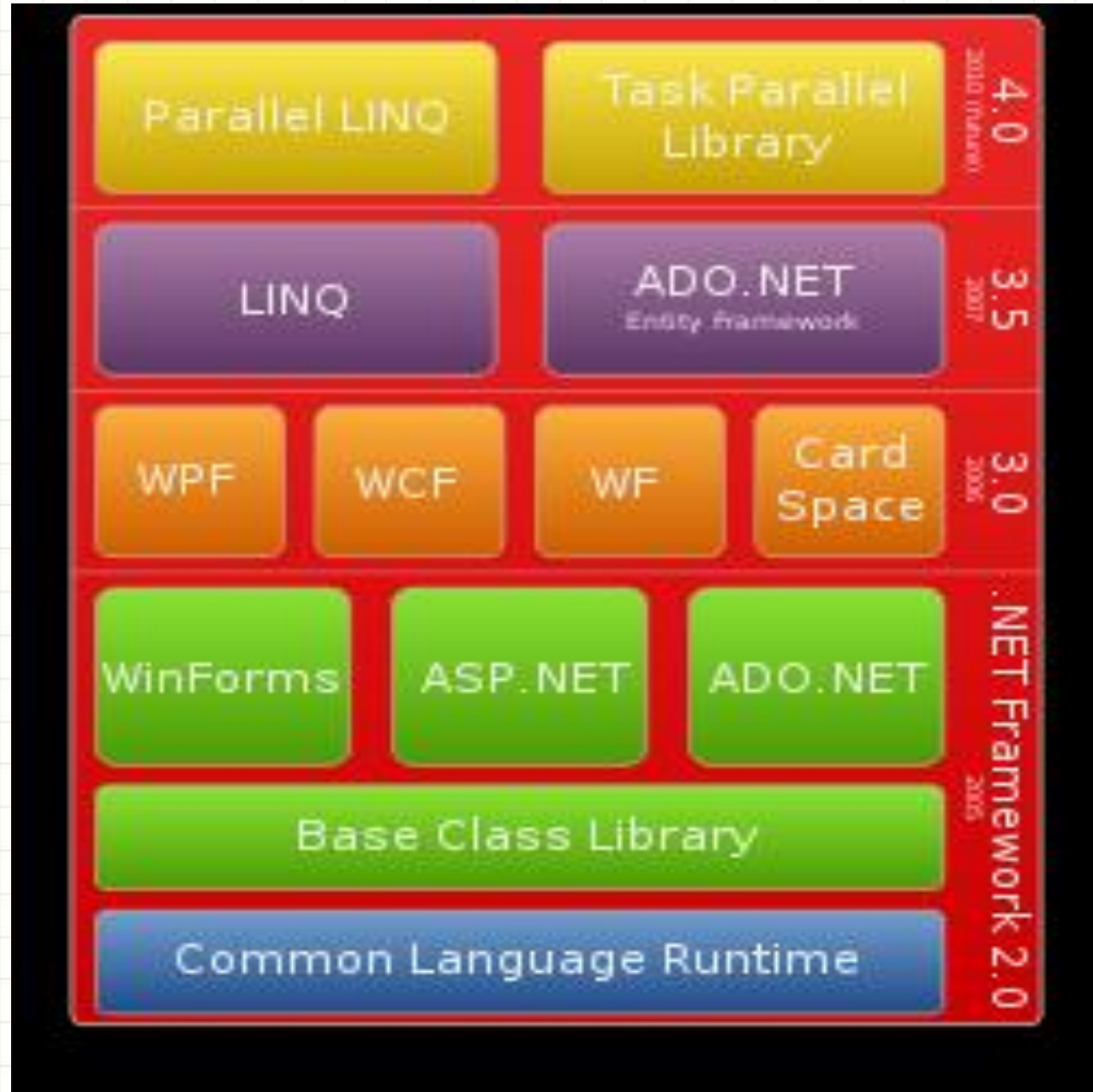 - Safe sandboxes for applications.

.NET Framework

- It is only 8 years old:
    - 1.0 = 2002
    - 1.1 = 2003
    - 2.0 = 2005
    - 3.0 = 2006
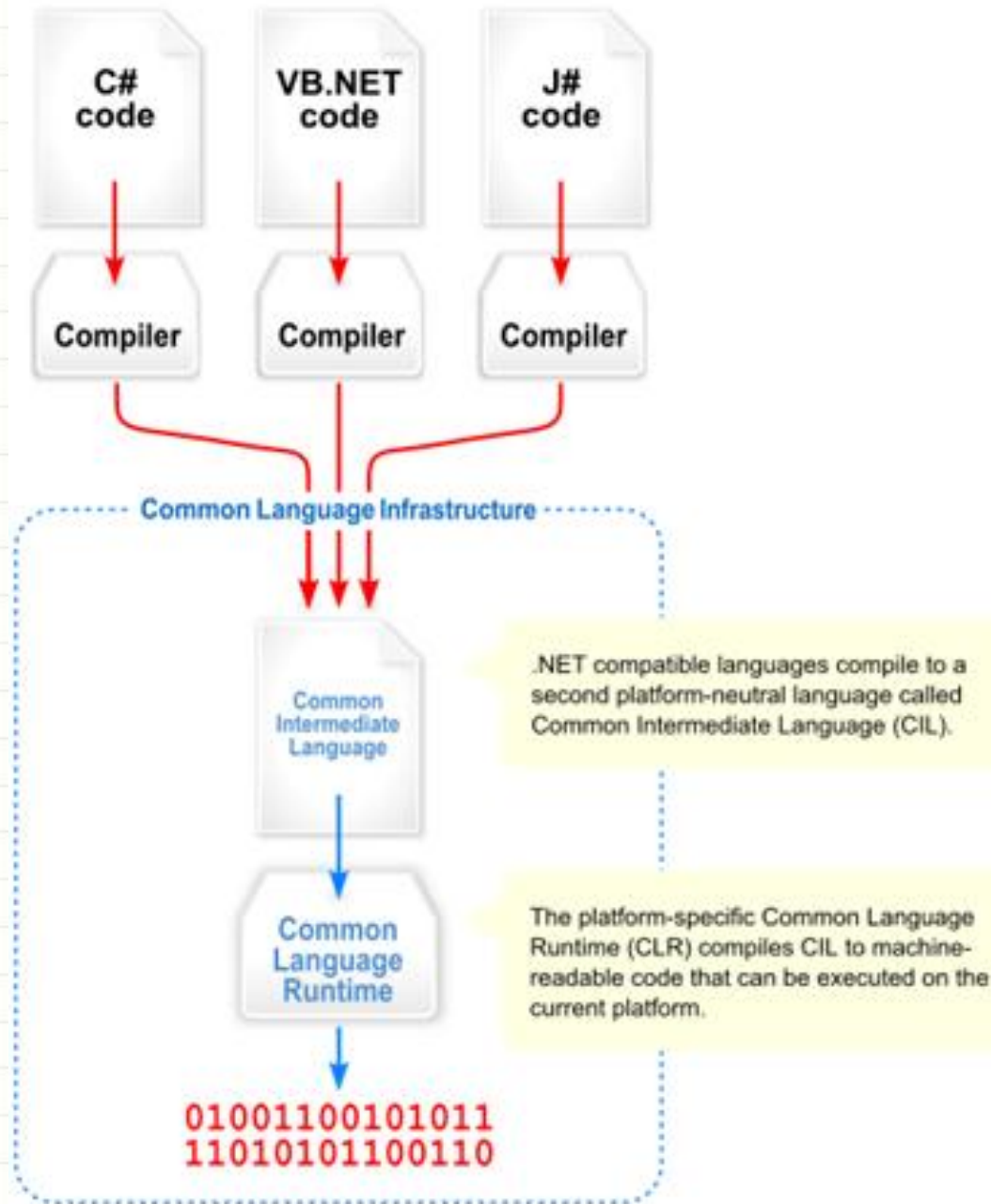   - 3.5 = 2007
    - 4.0 = 2010
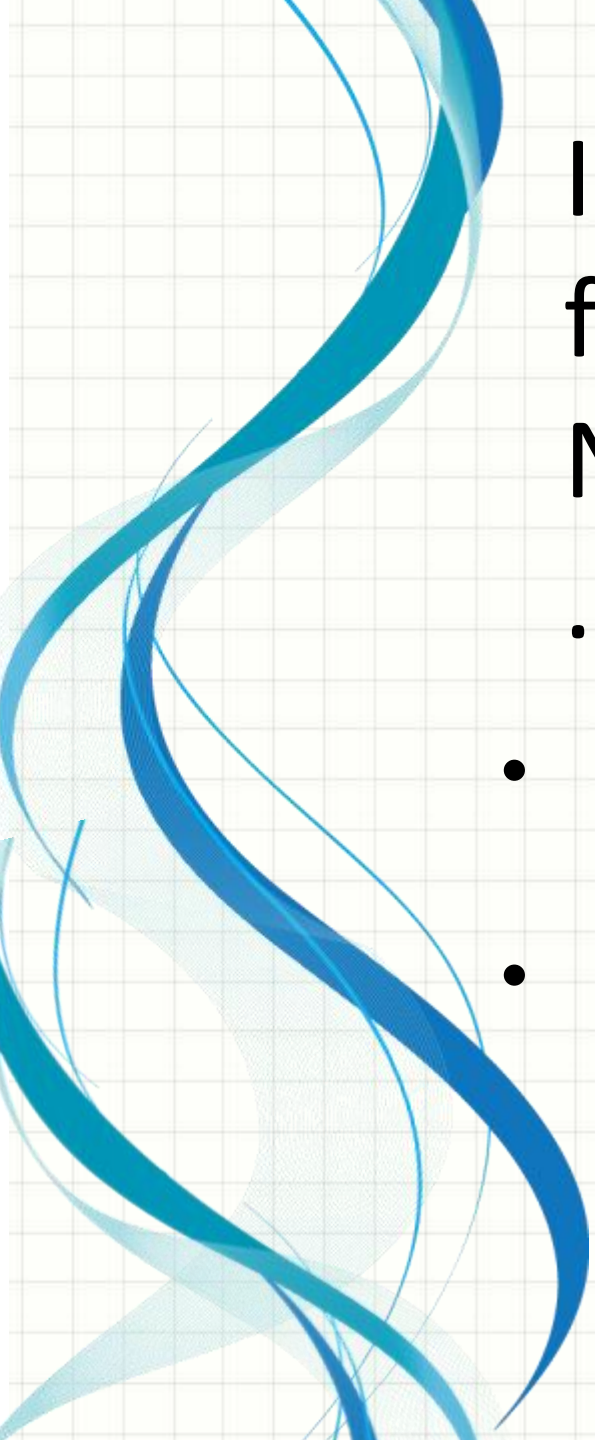
2 . .NET Frameworks

- 1.0
- 1.1
- 2.0
- 3.0
- 3.5
- 4.0

2. .NET Frameworks

C# code

VB.NET code

J# code

Compiler

Compiler

Compiler

Common Language Infrastructure

Common Intermediate Language

.NET compatible languages compile to a second platform-neutral language called Common Intermediate Language (CIL).

Common Language Runtime

The platform-specific Common Language Runtime (CLR) compiles CIL to machine-readable code that can be executed on the current platform.

010011001010111
11010101100110

Interoperability: Going from Managed Code to Native (.NET => .COM or .DLL)

- To access COM objects, you use System.Runtime.InteropServices
- To access other native code objects like Windows API, you use P/Invoke feature

.NET Framework Resides:

C:\Windows\Microsoft.NET\Framework
C:\Windows\Microsoft.NET\GAC_32
C:\Windows\Microsoft.NET\GAC_MSIL
C:\Windows\Microsoft.NET\v4.0.30319
\Temporary ASP.NET Files (compiled op)
C:\Windows\Microsoft.NET\v4.0.30319
\Config\Machine.config

3. Security

3. Security – Authentication & Authorization

- Authentication asks: "Who is this?"

- Authorization asks: "Does this person have the rights to do this?"

Different Levels of Security

- File Level
- Sql Server Level
- ASP.NET

Different Levels of Security

- File Level
  - Add Users
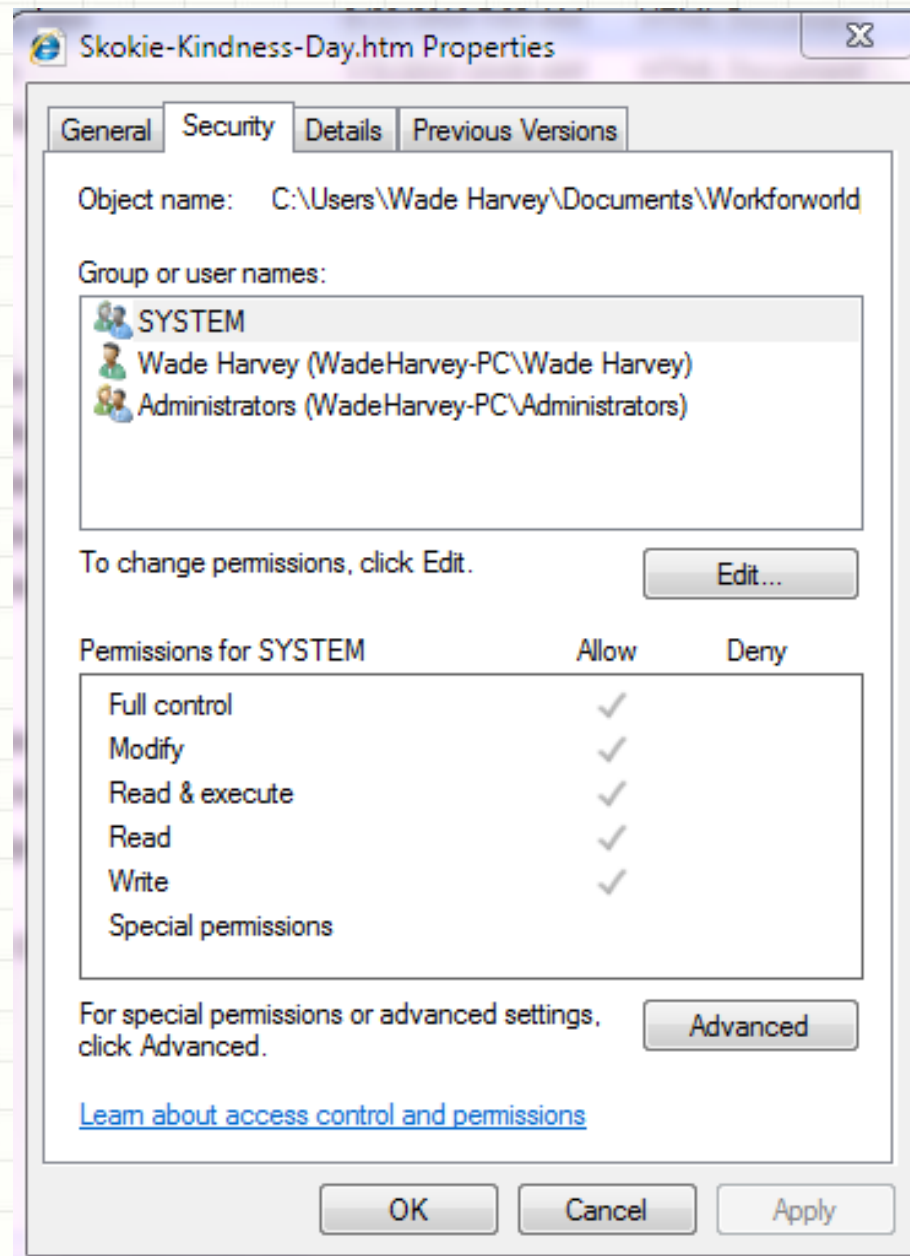   - Control Panel
    - Add User

User Accounts and Family Safety
Add or remove user accounts
Set up parental controls for any user

 - Windows Active Directory for Network

  - Give file Permissions
    - Right-click file in windows explorer
    - Select properties/security tab
    - Use Edit to add person or rights for existing person

Skokie-Kindness-Day.htm Properties

General | Security | Details | Previous Versions

Object name: C:\Users\Wade Harvey\Documents\Workforworld

Group or user names:

SYSTEM
Wade Harvey (WadeHarvey-PC\Wade Harvey)
Administrators (WadeHarvey-PC\Administrators)

To change permissions, click Edit.   Edit...

Permissions for SYSTEM   Allow   Deny

Full control   ✓
Modify   ✓
Read & execute   ✓
Read   ✓
Write   ✓
Special permissions

For special permissions or advanced settings, click Advanced.   Advanced

Learn about access control and permissions
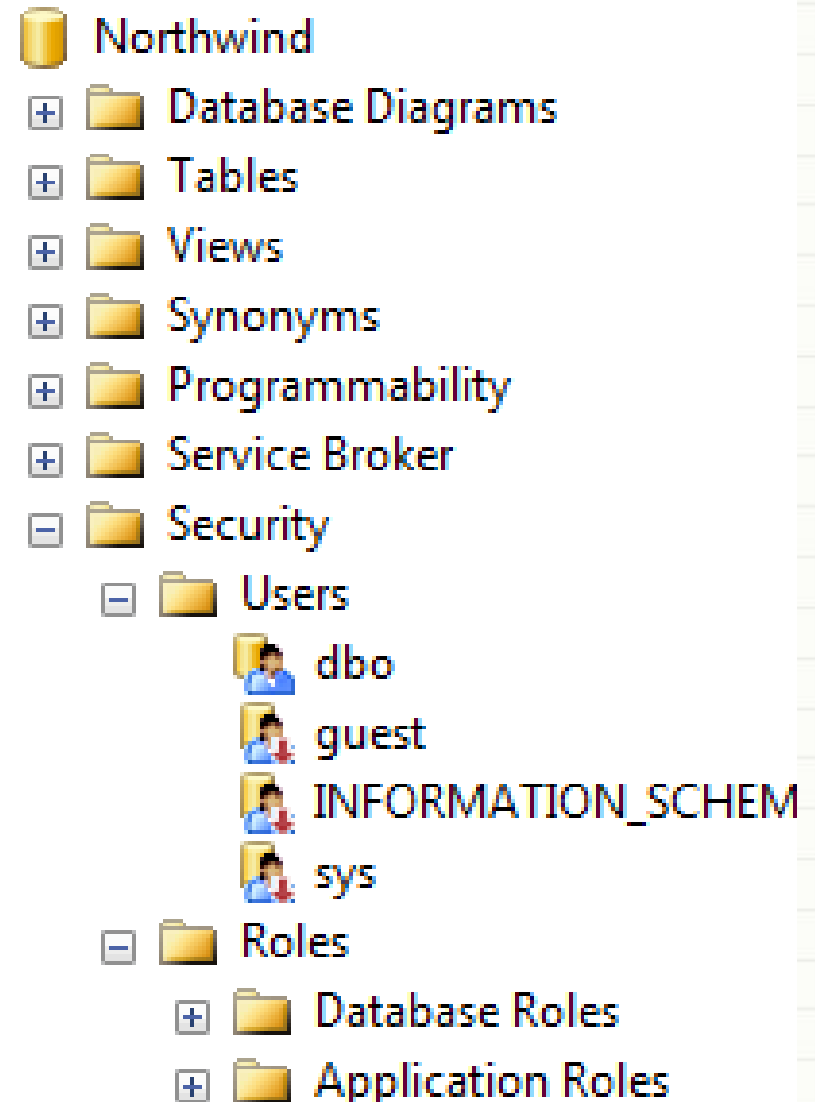
OK   Cancel   Apply

Different Levels of Security

- SQL Server
  - Server Level – SQL Server Authentication vs. Mixed Mode
    - Logins
    - Server Roles
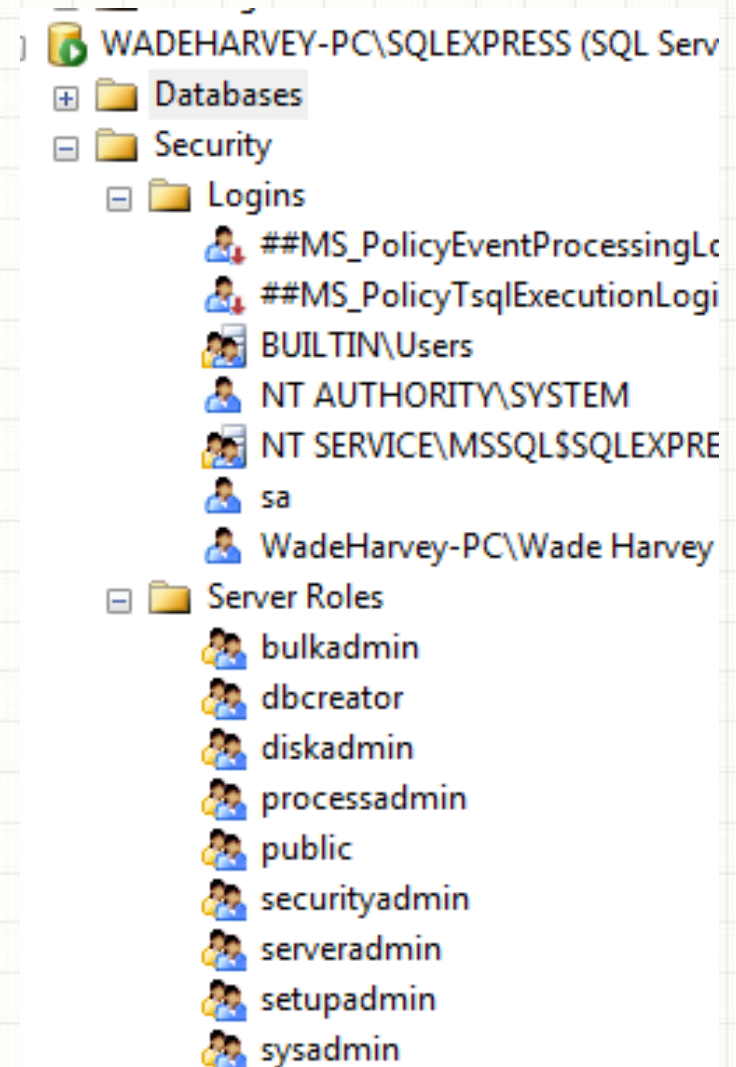
Different Levels of Security

- SQL Server
  - Database Level
    - Users
    - Roles

Different Levels of Security

- ASP.NET
  - Use ASP.NET Configuration Tool or do it programmatically
    - AspNetSqlMembershipProvider
    - ConnectionString in web.config points to DB
      - Add Users
      - Add Roles
      - Give Permissions

- Tables
  - ASPNET_Applications
  - ASPNET_Membership
  - ASPNET_Paths
  - ASPNET_Personalization
  - ASPNET_Profiles
  - ASPNET_Roles
  - ASPNET_Users
  - ASPNET_UsersInRoles
  - ASPNET_WebEvents

Security

- How to find out who is using a process:
  - Type taskmgr in Windows taskbar/Start/Cmd
  - Right-click on Application and select Go to Process
  - The process will show who the user is

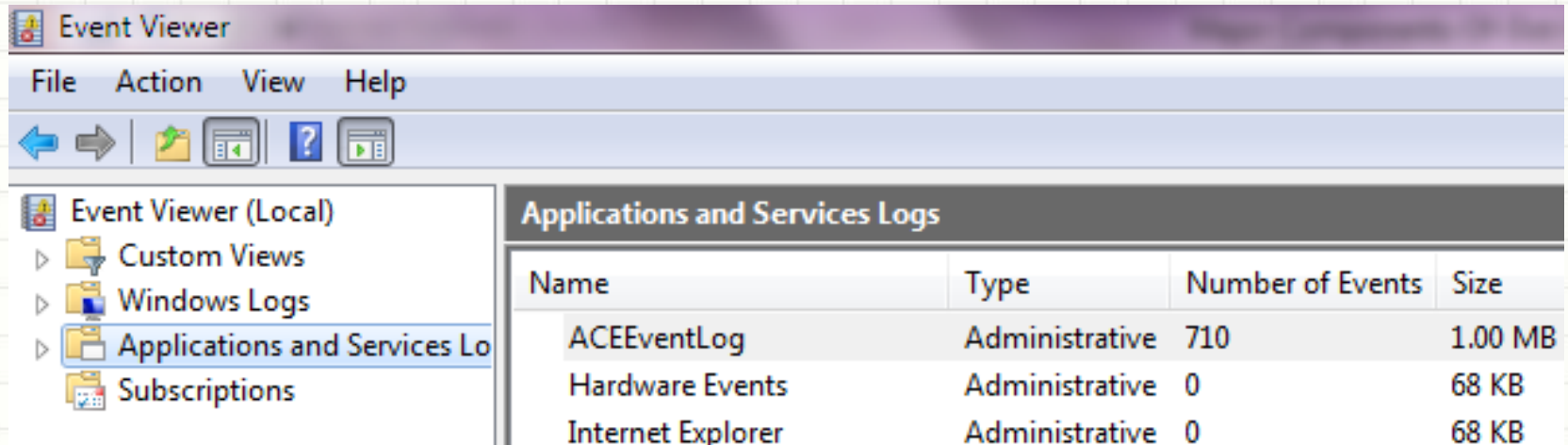# 4. Monitoring Tools

4. Monitoring Tools

- Event Viewer

- Task Manager

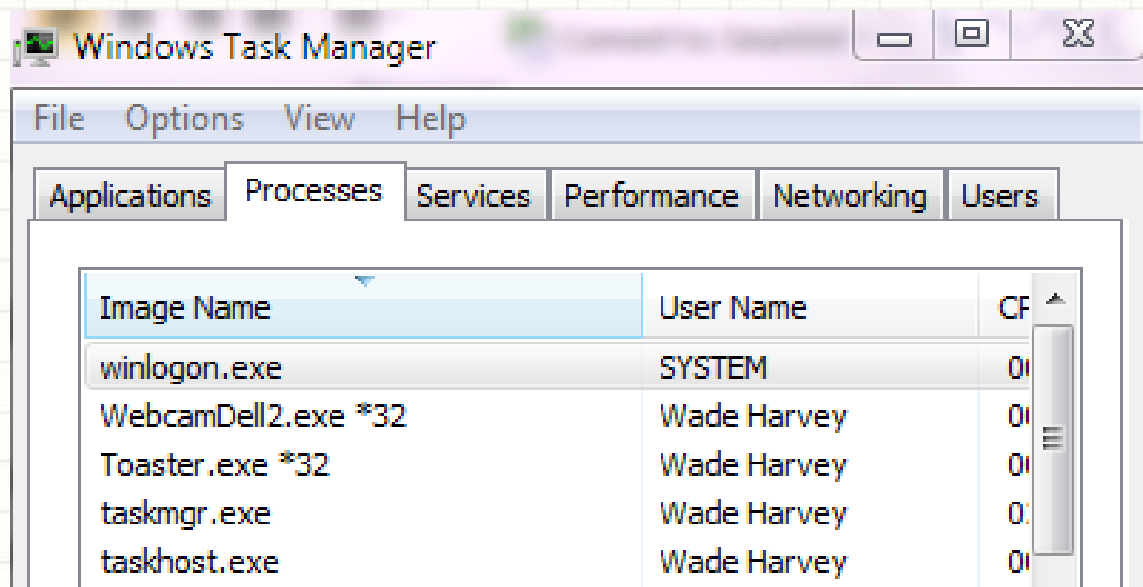- Process Explorer

- Sql Profiler

- ILDASM

4. Event Viewer

- What is EventViewer?
  - It is a low-level way of looking at system events
- How do you get to EventViewer?
 - Start/Control Panel/Admin Tools/EventViewer

4. Task Manager

- What is Task Manger?
  - It shows applications, processes, and who is using them
- How do you get to Task Manager?
  - Ctrl+Alt+Delete or Start/Cmd and type taskmgr

4. Process Explorer

- What is Process Explorer?
  - It is like Task Manager, but allows you to use find to search who is using resource
- How do you get to Process Explorer?
  - You download from www.sysinternals.com
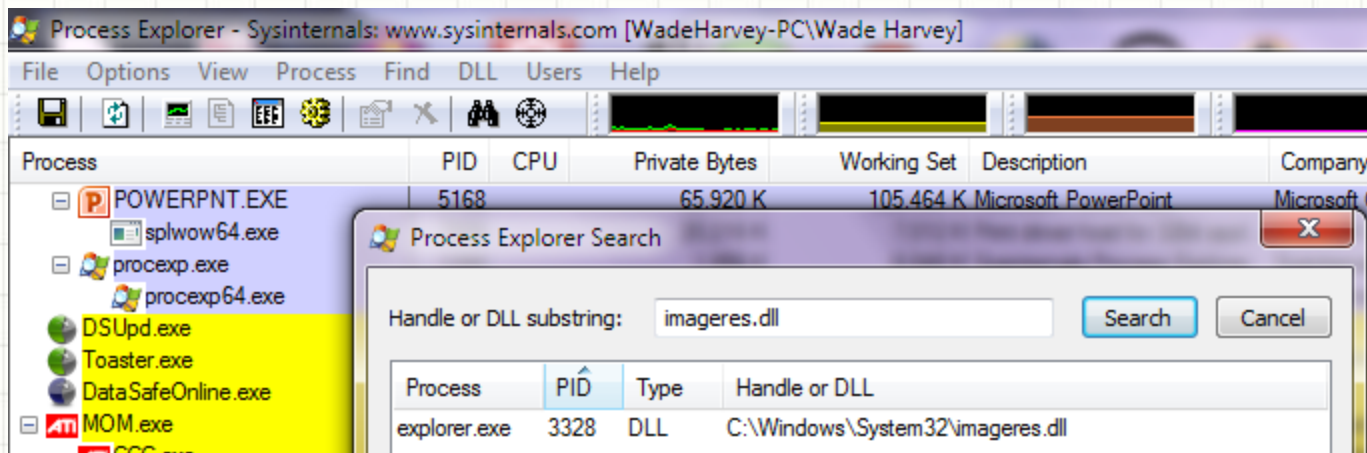
4. SQL Server Profiler

- What is SQL Server Profiler?
  - It allows you to monitor the execution of SQL commands
- How do you get to SQL Server Profiler?
  - It is under Program Files/Microsoft SQL Server/Performance Tools if you have SQL Server 2008
  - If you have the SQL Server Express edition, it is not included, but you can download AnjLab Express Profiler for free from: http://sites.google.com/site/sqlprofiler/

4. ILDASM

- ## What is ILDASM?

  - ILDASM (Intermediate Language Dis-Assembler allows you to decompile assemblies that are in MSIL

- ## Where is ILDASM?

  - It is under Program Files/Microsoft Windows SDK v7.1/Tools

5. WEB SERVERS

5. Web Servers

- What does a Web Server do?
  - Receives HTTP requests
  - Authenticates Users
  - Executes Server code
  - Builds HTML Pages
- What are the two main Web Servers?
  - ASPNET Development Server
  - IIS (Internet Information Services)

5. Web Servers

- ASPNET Development Server

  - Executes under logon id of how you logged into Windows

  - Process name is WebDev.WebServer4.0.exe

  - Executes assemblies from Windows/Microsoft.NET/Framework/v4.0.30319/Temporary ASP.NET Files

5. Web Servers

- IIS (Internet Information Services)
  - Executes under logon id of IUSR_MachineName
  - Process name is inetinfo.exe in IIS 5.x, http.sys in 6.0, and w3wp.exe in IIS 7.0
  - Resides in C:\Windows\System32\inetsrv
  - You can get to it by going to windows start button and selecting the run icon – then type inetmgr in the cmd line
  - Executes assemblies from inetpub/wwwroot

5. Web Servers

- IIS (Internet Information Services)
  - Windows 2000 & XP – IIS 5.0 – inetinfo.exe listens port 80
  - Windows 2003 & Vista – IIS 6.0 – http.sys listens from kerneel
  - Windows 2008 & Windows 7 – IIS 7.0 – w3wp.exe
- ASP.NET Runtime
  - IIS 5.x = aspnet_wp.exe
  - IIS 6.0 w3wp.exe
- ISAPI (Internet Server Application Programming Interface) – decides what should go to ASP.NET runtime based on extension (.aspx)

6. SQL Server

6. SQL Server

- What is SQL Server?
  - SQL Server is a database server that listens for SQL commands and returns information from SQL databases
- Where is SQL Server?
  - Programs - Program Files/Microsoft SQL Server/100/MSSQL10.MSSQLServer/MSSQL/Binn
  - Databases - Program Files/Microsoft SQL Server/100/MSSQL10.MSSQLServer/MSSQL/Data
- What File Level Security is needed to access a database?
  - You have to give access rights for SQL Server database to either yourself (if you connect in mixed mode) or to username (if you use SQL Server Authentication)
- How do you create an instance of SQL Server?
  - This happens in the setup process for SQL Server – the default instance for SQL Express is machinename/SQLEXPRESS

6. SQL Server

- How do you start and stop an instance of SQL Server?

  – You can use SQL Configuration Manager which is in Program Files/

- What is SSMS?

  – SSMS is SQL SERVER Management Studio – it allows you to connect to a server , run commands, and edit tables.

7. SOFTWARE DEVELOPMENT TOOLS

7. Software Development Tools

- What tools do I need?

  - Sql Server, SQL Server Management Studio (SSMS), and Visual Web Developer

- Where can I get express (free) versions?

  - www.microsoft.com/express

- Where do the tools reside?

  - Program Files/Microsoft Visual Studio 10.0

  - Program Files/Microsoft SDKs/Windows/v7.0/bin/gacutil

 - Program Files/Microsoft SQL Server/100/MSSQL10.MSSQLServer/MSSQL/Binn & Data

7. Software Development Tools

- What happens when I compile a page?
    - Source starts in Program Files/Microsoft Visual Studio 10.0/Projects or Websites
    - Project Property Pages/Build Options in VS can specify VS2008/Projects/Project name/ for precompiled files and solution files .sln and .suo
    - Precompiled version consists of aspx pages and dll's for code-behind. Dlls are in MSIL that gets converted to native language at runtime
    - Compiling involves bringing in the pieces needed from .NET Framework and from GAC (Global Assembly Cache)
    - Compiled Version goes in C:/Windows/Microsoft.NET/Framework/v4.0.30319/Temporary ASP.NET Files

7. Software Development Tools

What happens when a page executes?
http://msdn.microsoft.com/en-us/library/ms178473.aspx
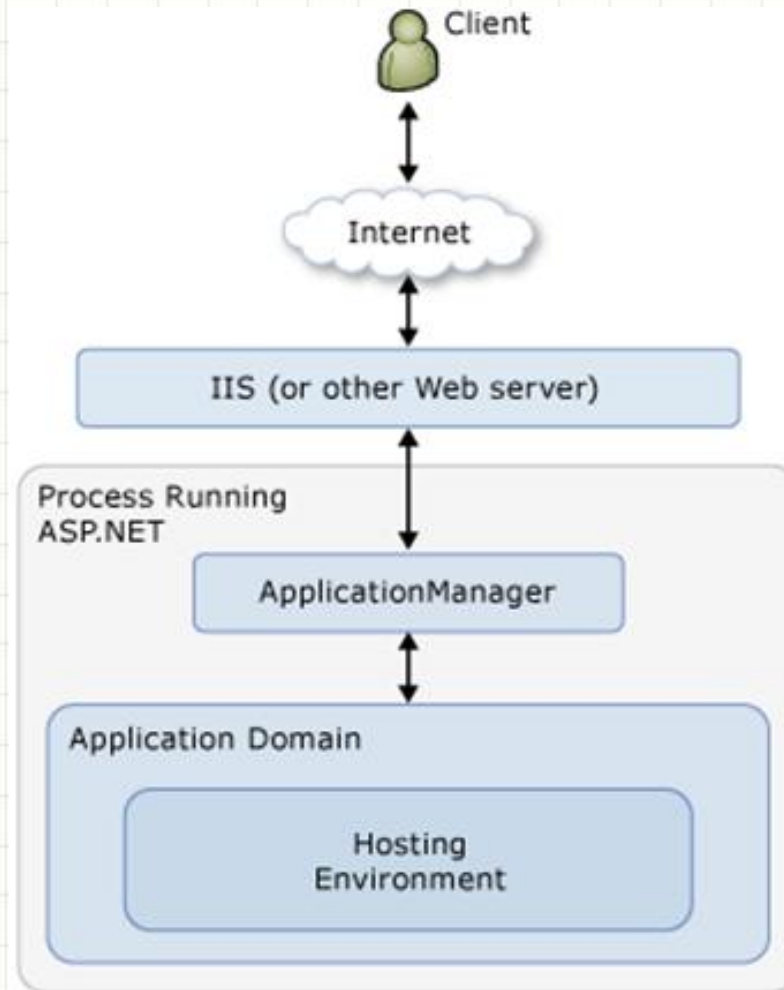
7. Software Development Tools

- What happens when a page executes?
  - User on client machine creates HttpRequest
  - url => dns => IP address => telephone number of machine
  - If dns has not populated on internet, you can associate url to ip address on your machine temporarily by manually editing c:\windows\System32\drivers\etc\host
  - IIS or ASPNET Development Server

- ISAPI

- ASP.NET

- App Domain

- HTTP Runtime

7. Software Development Tools

- What happens when a page executes?
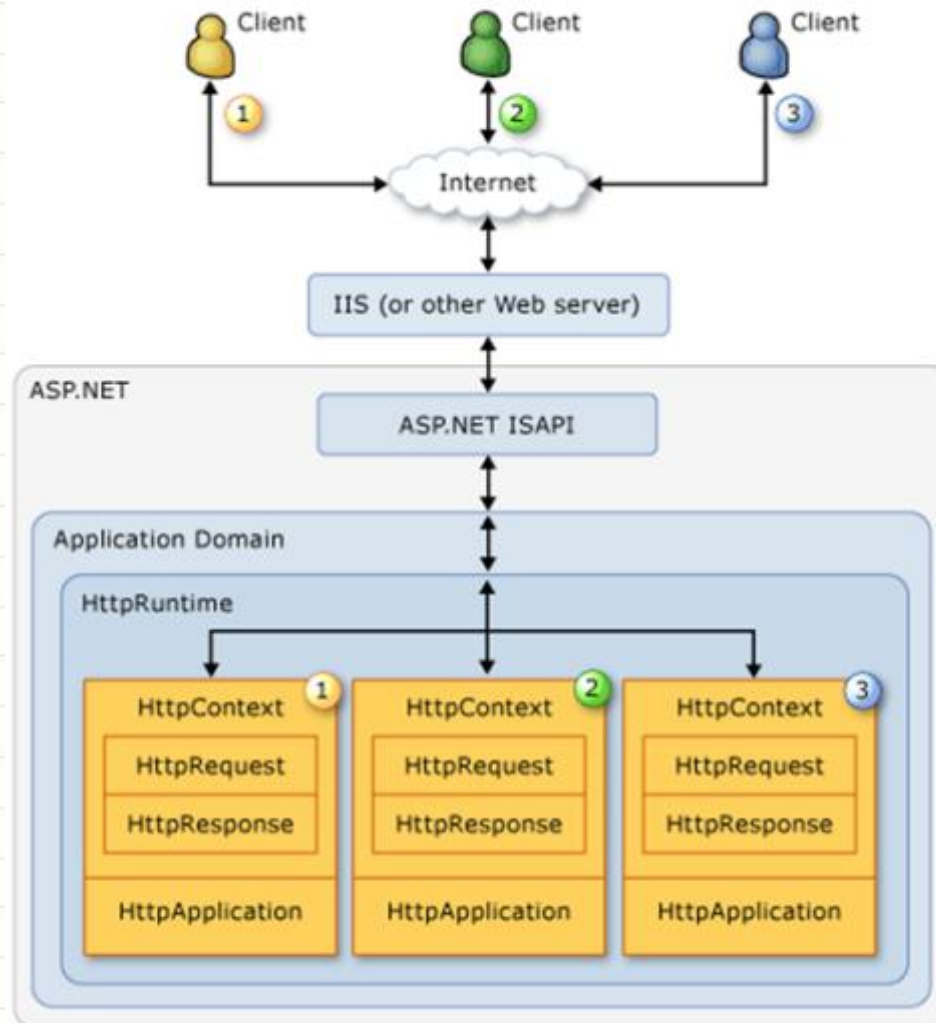
7. Software Development Tools

- What happens when a page executes? (Continued)
  - IIS or ASPNET Development Server
    - .ISAPI looks at extension and turns .aspx extension over to asp.net
    - ASP.NET creates Application Domain the first time and then starts an ApplicationRequest
    - HTTP Runtime can handle multiple HTTPContexts and inside each one is an HTTP Request and an HTTP Response (Page and cookies are involved in request and response)

7. Software Development Tools

- What happens when a page executes? (Continued)

  - .HTTP Runtime does the following:

    - .validateRequest for malicious markup

    - remaps urls

    - uses .NET Framework to convert MSIL in Temporary ASP.NET Files and GAC to native code

    - Checks Authentication and authorization

    - invokes IHTTPHandler to process request - .aspx => System.Web.UI.PageHandler

8. LANGUAGES

8. Languages

.NET	.NET Programming (C# or VB) (Web or Desktop)			
Key Supporting Languages	HTML	CSS	JavaScript	SQL Server

QUESTIONS?