2

A Peek into Windows

Since the mid-1990's, Windows Server has been the brand name for the Microsoft family of server operating systems. The majority of businesses who install Windows Server will not have IT as their major focus, but instead Windows Server is typically used to provide tools and services to support those work environments. Whether it is a small mom and pop shop or a Fortune 500 company, Windows Server is used as the foundation to provide services such as email, websites, and data security.

There are other manufacturers of server operating systems, such as Linux. However, Windows Server provides a stable, easy to use platform that is found in the majority of networks. It is because of Microsoft's large user base that you will find a broader support for software applications and hardware devices for Windows Server over competing server products.

In addition, the rapidly changing world of more mobile, more connected and more data driven working environments has transformed how we do business. Windows Server provides the framework to support new flexible services, agile applications, and the proliferation of Bring Your Own Device (BYOD) work environments

The very reason for this book is that Windows Server is the product that most people learn when they are first entering the IT workplace or the operating system that the accidental administrator is likely to find when asked to assist with Windows Server Administration.

Windows Server is a very large topic and there have been many versions and editions over the years. However, this book is meant to be version and edition neutral as much as possible. We want to focus on what you need to get up and going to perform day-to-day Windows Server Administrator in a very short matter of time. In addition, we try to avoid deep dives into the

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theoretical background information. While I believe that information is important, it is not the purpose of this book. We are more concerned in how to get the tasks done that are needed to be a successful Windows Server Administrator.

As previously mentioned, this book is meant to be about getting tasks done and less about concepts and theory. However, we do need to know a little vocabulary before we begin. In this chapter we cover the key terms and concepts needed for this book as well as for your career as a Windows Server Administrator.

The majority of all computer related work activity is performed on a machine located at your desk. This machine could be running a series of programs to assist you in getting your job done in a timely and efficient manner. While there are other products out there, Microsoft products and services are found in an overwhelming majority of companies. This is regardless of the size or type of company. As part of our daily tasks many of us need to share documents, files, and information with other people in our office or vendors or customers. This is done by physically connecting or networking the computers together. However, after we have connected the computers together we need to have other computers to manage, authorize, and control this network communication. This is the role of the Windows Server computers in our network. Now we just need someone who can administer those Windows Servers.
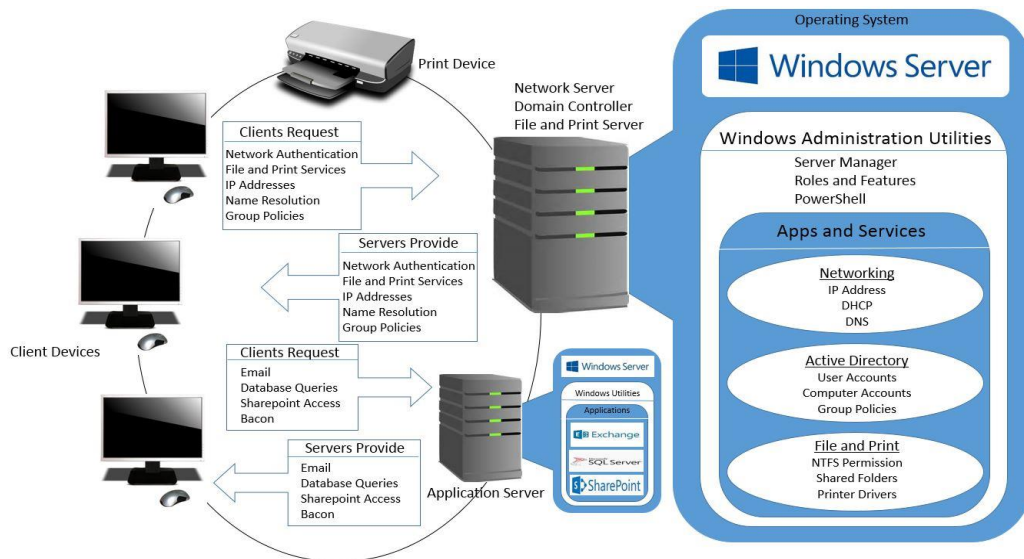
Getting to Know Windows Server

Figure 2.1 Windows Server Network

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As you can see in the Figure 2.1, we connect or network these computers together to be able to collaborate with others within our company. As we will see later in this chapter the computers that are used to perform daily work tasks will be our client devices. However, for our client devices to perform specific tasks they would need to contact or request services from a machine that is managing our network. This would be one of the machines that has Windows Server running on it. These Windows Servers will have services running on them to provide the resources needed that will authenticate users on the network, provide addresses to our client devices, secure access for our files and printers, and many other services as needed.

Over the course of this book you will learn how to manage, administer, and troubleshoot the primary services of a Windows Server such as Networking Services, Active Directory Domain Services, File Services, and Print Services.

Some important terminology
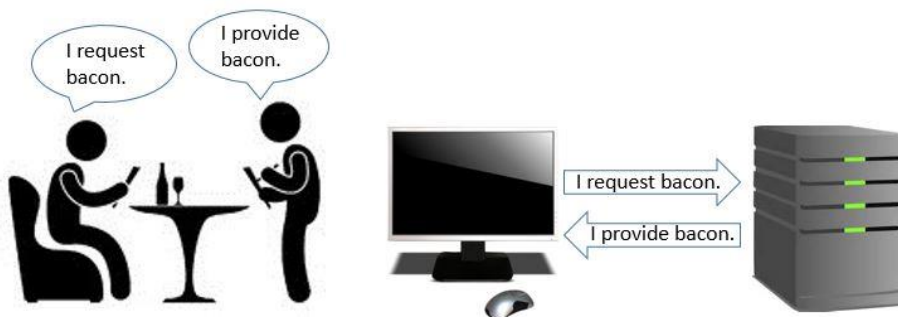
2.1.1 Client vs. Server

Figure 2.2 Client vs. Server

If during your lunch you walk down the street to the little café on the corner and sit down at one of the tables, a very nice person will show up to take your order. You might order a bacon sandwich, salad, and a glass of water. The very nice person then goes to the kitchen of the little café and brings back your order in response to your request.

This is exactly the concept of a client and server relationship in computer networking. A client is any application or service that requests information and a server is any application or service that provides that information.

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2.1.2   Hardware vs. Software

HARDWARE

Hardware is an overall term used to describe any of the physical components of a computer. Within your computer case you will have a system board commonly referred to as the motherboard. The motherboard is used to connect all the other pieces of your computer together. The four primary components of hardware that are in your computer are called the Central Processing Unit (CPU), hard drive, memory, and network adapter card. We will cover these hardware components in more detail later in this chapter.

SOFTWARE

Software is a set of instructions used by your computer to tell your hardware how to perform specific tasks. The software that is first installed on a machine is referred to as the Operating System (OS) and is used to tell the hardware how to operate the system.

2.1.3   Clients Devices and Server Computers

CLIENT DEVICES

You may be very familiar with working with a desktop, laptop, or tablet. These are typically considered client devices. However, for the hardware to operate correctly they would need software to give the hardware instructions on how to operate the system. For your client devices this would be an operating system (OS) such as Windows 8.1 or Windows 10.

In addition, you could install additional software onto your operating system that allows you to perform specific tasks such as working on a spreadsheet, checking your email, or browsing the Internet. This additional software is what is called your application software.

SERVER COMPUTERS

For a larger networked environment your company will probably have more powerful machines hidden in very cold rooms. These computers would be the hardware that is considered your server machines and would need more CPU processing power, larger hard drives for storage, more memory, and possibly faster network adapter cards. And just like your client devices needed software to give the hardware instructions on how to operate; your server machines will also need an operating system. And in a Microsoft environment this would be the Windows Server operating system which is the main focus of this book.

Once the Windows Server operating system is installed you could add Roles and Features that would provide Authentication and Networking services for your environment. You could also install additional application software that provides specific tasks for your network. For example, you may have Outlook software installed on your client device to read email and on the server computer you would have Exchange Server software installed to store and transport email.

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Remember in our previous example when you were the client sitting in the front-end of the little cafeteria? The person or server taking your order went to the back-end of the café to retrieve your sandwich, salad, and water. When you have application software that has components on both the client machine and the server machine, the software on the client machine is considered the front-end part of the application and the software on the server machine is considered the back-end part of the application.

THREE TYPE OF SERVERS

Once Windows Server has been installed you will find that there are three types of servers available depending on how they are configured in your network. These three server types are Standalone Servers, Member Servers, and Domain Controllers.

- Standalone Server – Window Server installed but is not a member of the domain.
- Member Server – Windows Server installed but is a member of the domain.
- Domain Controller – Active Directory Domain Services installed to control domain.

A standalone server can typically be found in a workgroup or peer-to-peer network. This is for small office or home office (SOHO) networks with 10 or less connected devices and will not have a centralized location for user and computer accounts.

A member server would be part of a domain environment that would provide application services to end users in larger networks, but would not have the directory services installed to authenticate users and computers.

A domain controller would also be part of a domain environment, but would have Active Directory Domain Services installed that would hold user and computer accounts to provide authentication and authorization services to the domain environment. This is also were your Group Policies are stored to control Desktop Settings, Security Configuration of the client devices in your network.

WORKGROUP VS. DOMAIN

Since we just mentioned workgroups and domains, it might be a good time to describe the differences between these two logical network designs.

A workgroup is for smaller networks with a mixture of client operating systems and server operating systems connected together in a peer- to-peer environment where authentication of user accounts is decentralized down to the individual computer. Meaning in a workgroup of 10 computer devices you could possibly have 10 separate user names and passwords.

2.2   Four Core Hardware Components

For each of our computers whether they are a client device or a server computer there will be four core hardware components. These components are the Central Processing Unit (CPU), Hard Drive or storage device, Memory or RAM, and a Network Interface Card (NIC). Let us take a closer look at each of these items one at a time. An easy way of thinking of these computer elements is to re-visit the kitchen of the lunch café.

Figure 2.3 Hardware Components in the Kitchen

CENTRAL PROCESSING UNIT (CPU)

In the kitchen of our little café on the corner you will have a chef who will prepare your meal. This is very similar to our CPU which processes the instructions from the operating system and application software. The faster our chef can put our order together, the faster we get our lunch. Now imagine we have two or even four chefs in the kitchen… That is a lot of bacon sandwiches getting made. This is similar to our server computer if it had two processor chips (Dual Core) or four processor chips (Quad Core). The more CPUs the faster our Server computers can perform.

MEMORY (RAM)

While our chef is making our lunch order she needs an area to temporarily place the cooking utensils, dishes, and ingredients needed for our meal. She would place them on the kitchen counter so that they would be close at hand and thereby speed up the preparation time of our sandwich and salad. This is very similar to the Memory or RAM in your computer. While the CPU is processing operation instructions it will need a temporary storage place for data that needs to be immediately accessible. That temporary storage place is your Random Access Memory (RAM) or just simply referred to as memory.

STORAGE (HARD DRIVES)

The chef of our favorite little café is a trained professional. She knows that when not using her cooking utensils, dishes, and pans they need to be placed or stored in the cabinets of the kitchen for when she needs to use those items in the future. Within or computer we place or store our files and folder on a hard drive for use at a later time. There are other types of

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storage other than the internal hard drive within the computer. We could also store files on USB drives for portable storage or in a Server environment we could use a Storage Area Network (SAN) which is basically just a large cabinet with a bunch of drives available to store our data.

NETWORK INTERFACE CARD (NIC)

One of the reasons we like our little café so much is that the chef likes to drive to the garden market to purchase fresh ingredients. While out shopping she might stop at the Post Office to drop off some packages or stop by the library to check out a new cooking book. When she comes back from her errands she parks outside in her private parking space.

We might be stretching our café analogy here, but you can think of the parking space as the chef's network adapter. She knows how to get to the Post Office (Exchange Server), Library (SQL Server), and Fresh Garden Market (Supermarket Website) because of the addresses of their prospective locations. After she has visited each location, she returns back to the address of the parking space in front of the café.

In computers, each of our Network Interface Cards (NIC) have their own unique Internet Protocol (IP) address to allow each of the computer to communicate with each other. The linking of all these computer with each other is what makes up a network of computers.

2.3   Finding System Information

Since we have talked about the core hardware components now would be a good time to perform a quick task to see if you can locate the information about your own computer. One way to locate your system information on your client device or server machine is with the System Information screen. Find it like this:

1. Right click on your Windows button and select Control Panel. (Figure 2.4)
2. Click on System and Security. (Figure 2.5)
3. Click on System. (Figure 2.6)
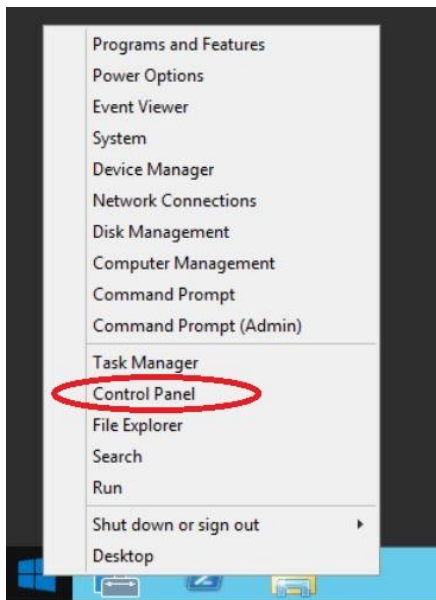4. Review your System Information (Figure 2.7)

Figure 2.4 .Windows Menu Button and Control Panel
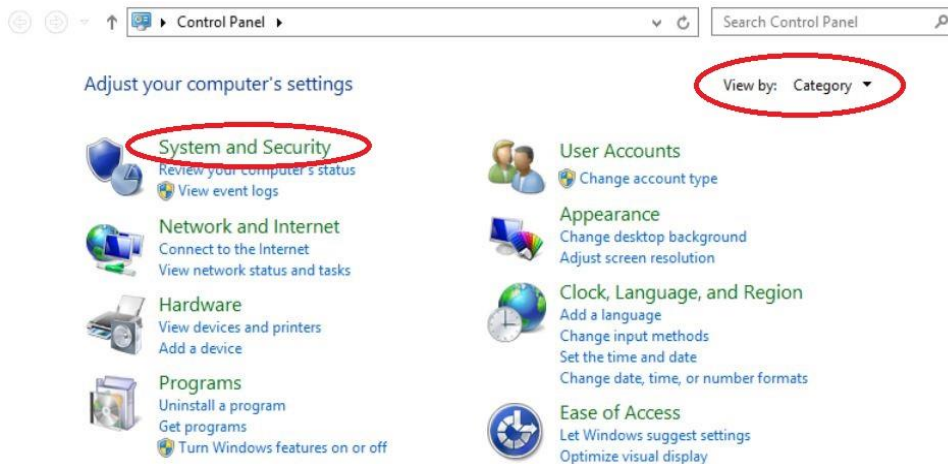

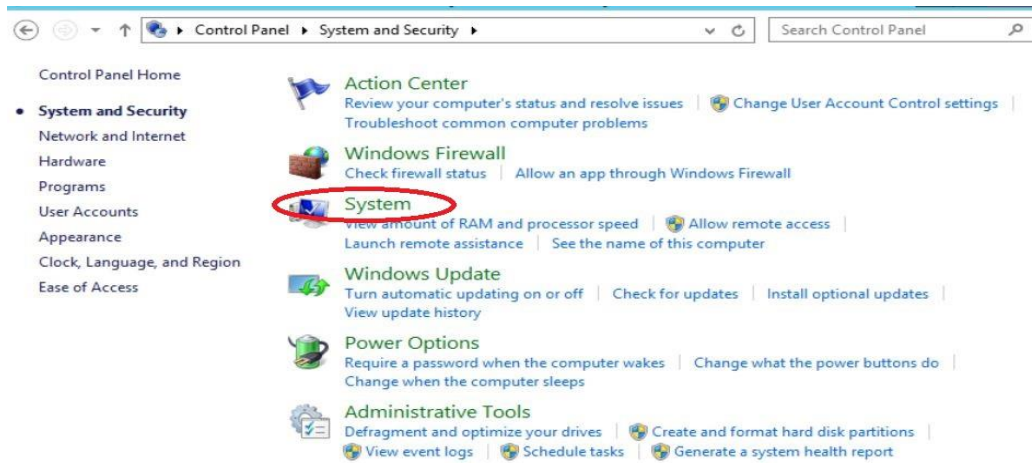Figure 2.5. System and Security in Category view

Figure 2.6 System and Security Options

Figure 2.7 .System Information

2.4 Server Administration Utilities

Once the Windows Server operating system has been installed on our server computers we need tools and utilities to help us manage or administer our server and network environments. These utilities are named Server Manager, Add Roles and Feature Wizard, and PowerShell.
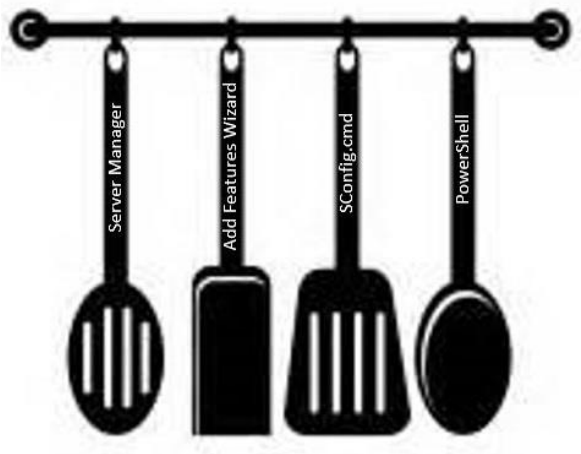
3
Server Manager Tools

Figure 2.1 Windows Server Network

Our chef down at the little café always has a lot of different options available for lunch. Depending on our lunch order she knows that she needs to select the correct cooking utensil to quickly make our tasty meal. As a Windows Server Administrator we also need to select the correct tools and utilities to manage our server environment. We will be discussing these tools over the next two chapters, starting with the Server Manager.

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The Server Manager is the primary tool that we use to maintain our Windows Server environment. In reality is more than just one tool, but a collection of tools. It might be easier to think of it as a large drawer in your kitchen that holds all of your key cooking utensils.

Instead of having to search different areas of the operating system to locate consoles to manage different roles and features, Server Manger allows you to have a one-stop management experience. And not for only one server in your network, but you can group, organize and manage multiple servers based on server type or administrative needs.
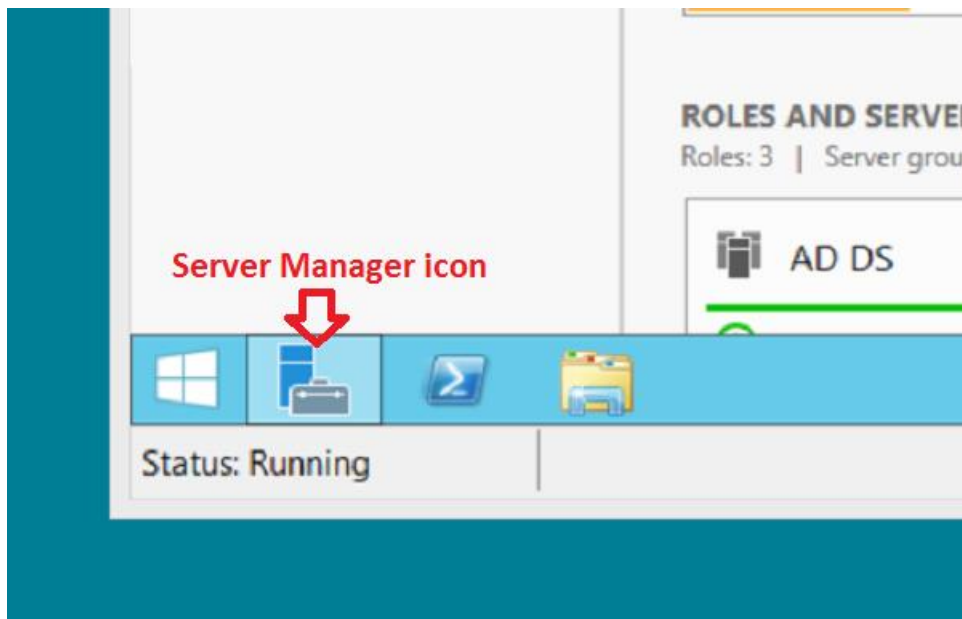
Figure 3.2 Starting Server Manager

3.1   Getting to Know Windows Server

In many cases, Server Manager will start up when you log on to your Windows Server. However, if it does not open, click on the Server Manager icon located on the Taskbar as seen in Figure 3.2. You will notice the Server Manager will open directly to the Dashboard as seen in Figure 3.3.
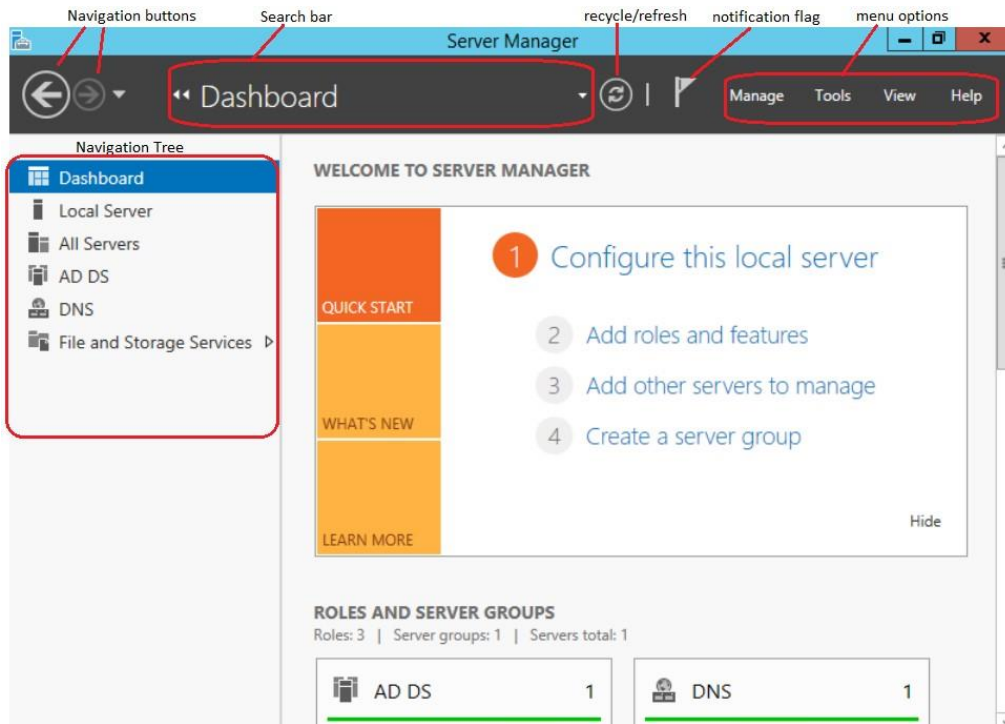
Figure 3.3 .Server Manager Window

Across the top of the Server Manager window you will see a gray menu bar that contains many of the management consoles and notifications that we will be using throughout this book. On the left-hand side of the window you will see the navigation pane that organizes the different server roles that are installed and could be managed on the server. The center dashboard window is broken down into two main parts. The Welcome to Server Manager Tile gives you a Quick Start tool to add server roles and features to your local server. The Roles and Server Groups section will allow you to organize the servers you want to manage in your network.

Let us start our tour of the Server Manager window with the gray menu bar across the top of the Server Manager window. The two encircled arrows on the left side of the menu bar will allow you to navigate up and down the navigation tree. The gray down arrow to the right of the two arrows will allow you to return to a previous navigation tree selection. Then you will see the name of your current location in the navigation tree. In our example in Figure 2.2 we are currently looking at the Dashboard area.

If we click on the word DASHBOARD, this will activate the Search Bar which allows you to quickly navigate between different areas of Server Manager.

As we move further right we see a recycle/refresh button which allows us to surprisingly refresh the window. Next we see our notification flag which gives us information on tasks currently running, task errors, or tasks that still need to be accomplished or finished.

Finally, we see the words Manage, Tools, View, and Help. There are a variety of options to choose when selecting one of these menus, so let us take a look at these menus one at a time.

First we will start with the Manage menu option as seen in Figure 2.3. This option will allow us to Add and Remove Roles and Features, Add Servers and Server Groups, and work with Server Manager Properties. Working with Role and Features will be discussed in the next chapter while Add Server and Server Groups will be a lesson later in this chapter. For now, let us look at the Server Manager Properties as seen in Figure 2.4.
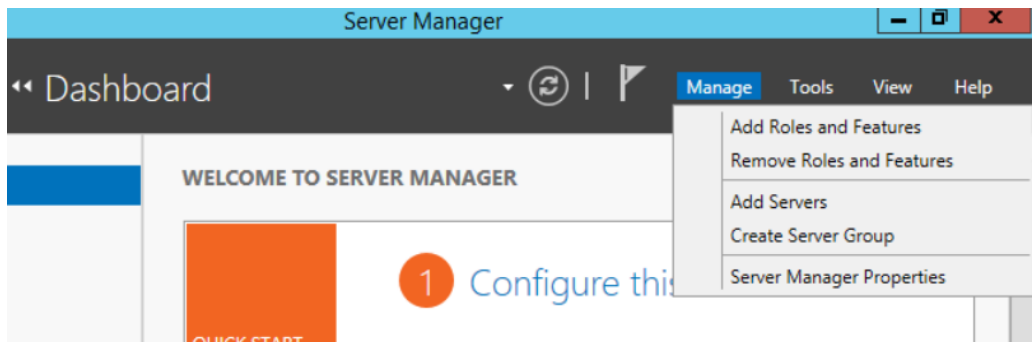

Figure 3.4 – The Manage Menu Option.

The Server Manager Properties dialog box allows you to configure two basic settings on how often you would like the Server Manager data to be refreshed and on whether you would like the Server Manager to automatically start when you log in to the server.
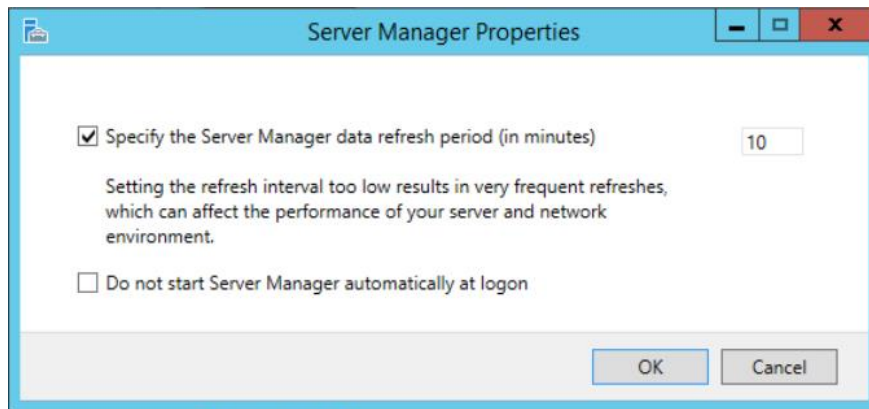
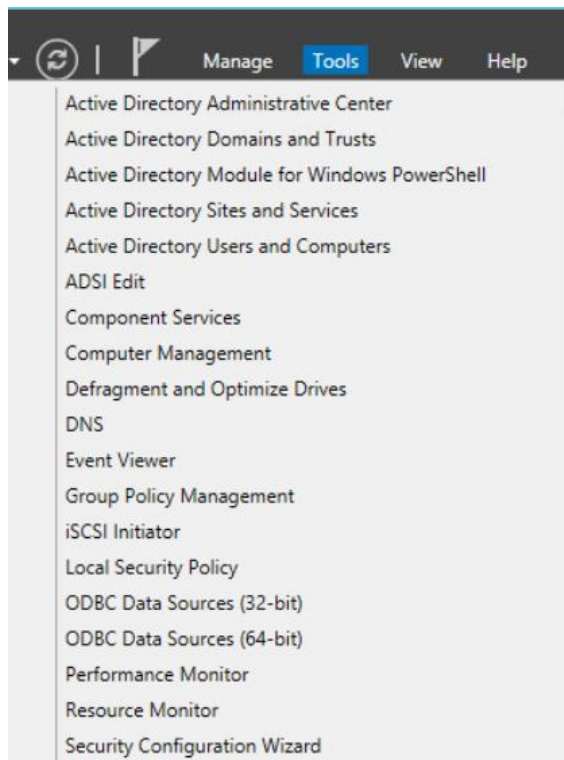Figure 3.5 – Server Manager Properties.

Figure 3.6 – Administration Tools.

Under the Tools Menu (Figure 3.6) we find all of our Administration Tools needed to manage the different Windows Roles and Features that have been installed on the local server. Notice that we have our Active Directory Tools installed. This is because we have already installed Active Directory on this server, which of course makes it a Domain Controller. Throughout our lunches we will cover many of these tools; however some of the more advanced tools are outside the scope of this book. We do encourage at a future date to become aware of all of the tools as you become more comfortable in the Windows Server Environment.
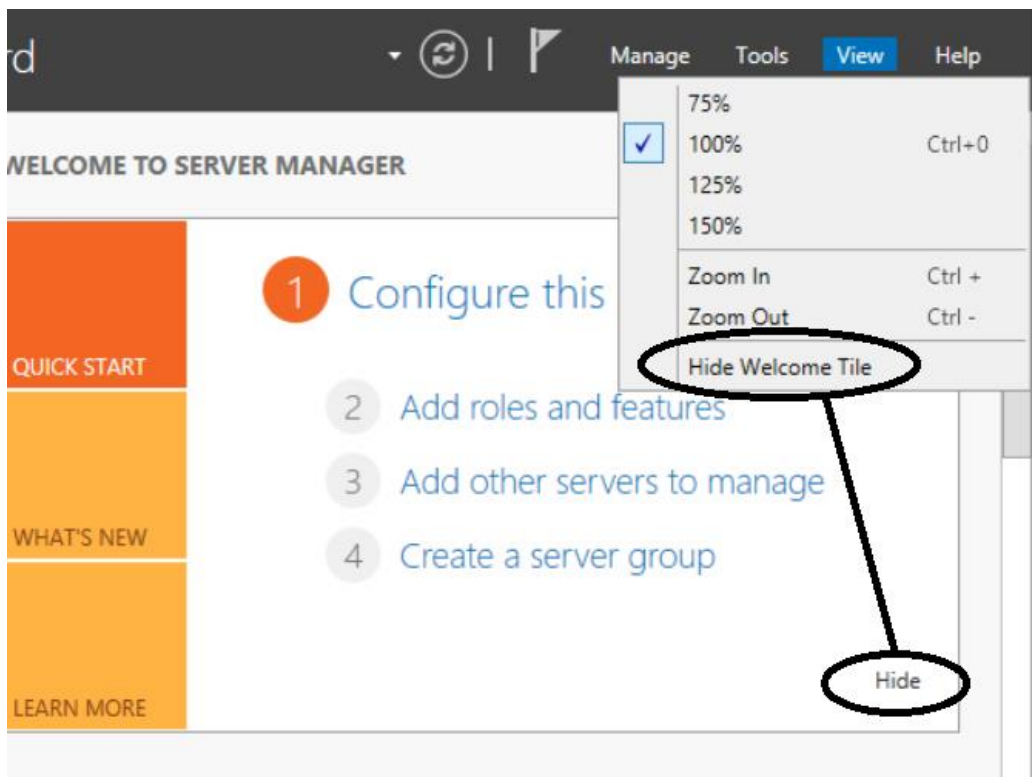

Figure 3.7 – View Menu.

The View Menu (Figure 3.7) is exactly what you would think, a way of Zooming In or Out. But it is also where you can Hide or Unhide the Welcome to Server Manager Tile. The Welcome Tile could also be hidden by clicking the Hide button within the actual Welcome Tile, but you would need the View Menu to bring it back.

Finally, the last part of the Server Manager Menu bar is the Help button that can provide help on Server Manager which could also be accessed be using the F1 button on your keyboard.

The Help menu also will provide links to online resources like the Windows Server Marketplace, Windows Server TechCenter and Server Manager Forums.
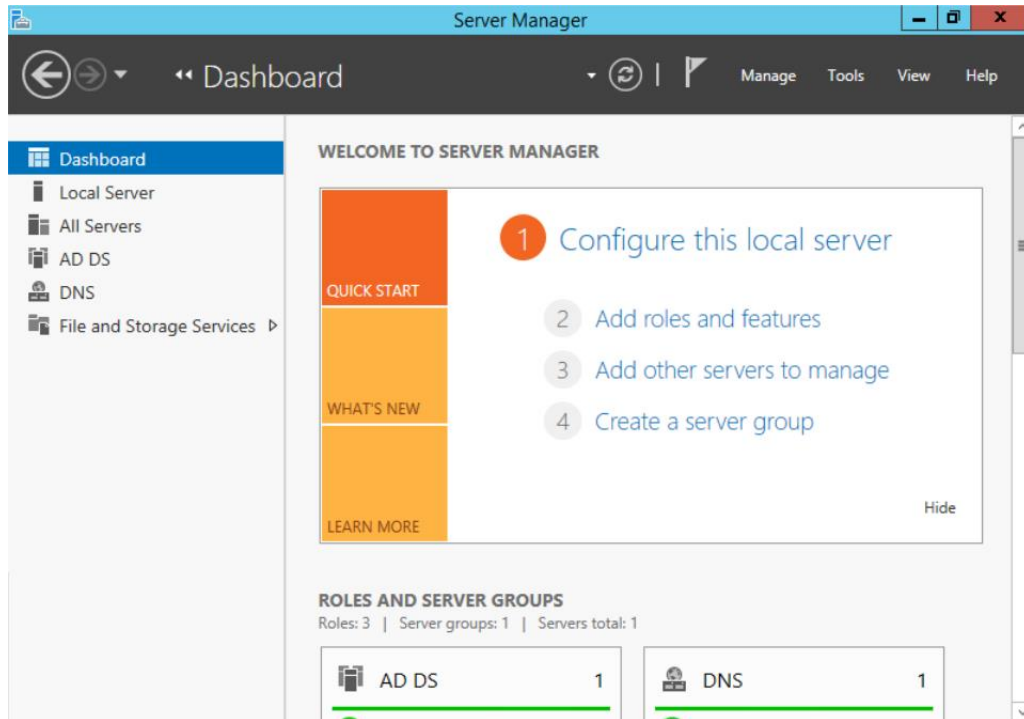
3.2   The Dashboard

Figure 3.8 – The Dashboard.

As mentioned at the beginning of this chapter, The Dashboard window is broken down into two main parts. The first of which is the Welcome to Server Manager Tile which as was mentioned previously can be hidden or unhidden from the View menu. The Welcome Tile gives you three main groupings to get you started.

- Quick Start
- What's New
- Learn More

Quick Start

This will allow you to Add Roles and Features, Add Other Servers to the Server Manager to manage and allow you to create additional Server Groups based on roles or administrative needs.

What's New?

This section explains what is new in your Windows Server product including links and references to the help section that explains the new features in more detail.

Learn More

This section provides links to resources on the Internet to assist you with common problems.

3.3 Roles and Server Groups

The Roles and Server Groups section of the Dashboard will allow you to organize the servers you want to manage in your network as seen in Figure 3.9.
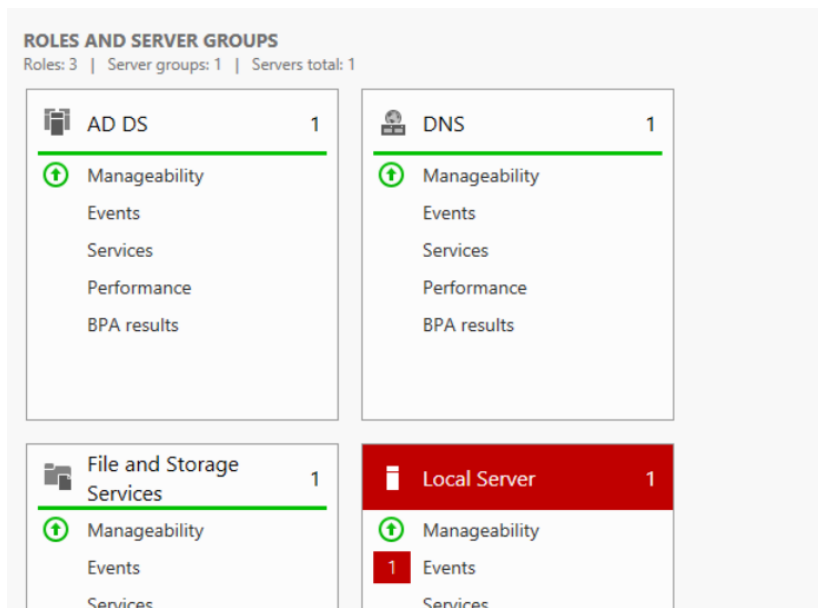

Figure 3.9– Roles and Server Groups.

On my demonstration server I currently have three roles installed. Active Directory Domain Services (AD DS), Domain Name Services (DNS), and File and Storage Services. If I had other servers in my network with these same roles I could add them all into their respective Server Groups and manage them from the Server Manager.
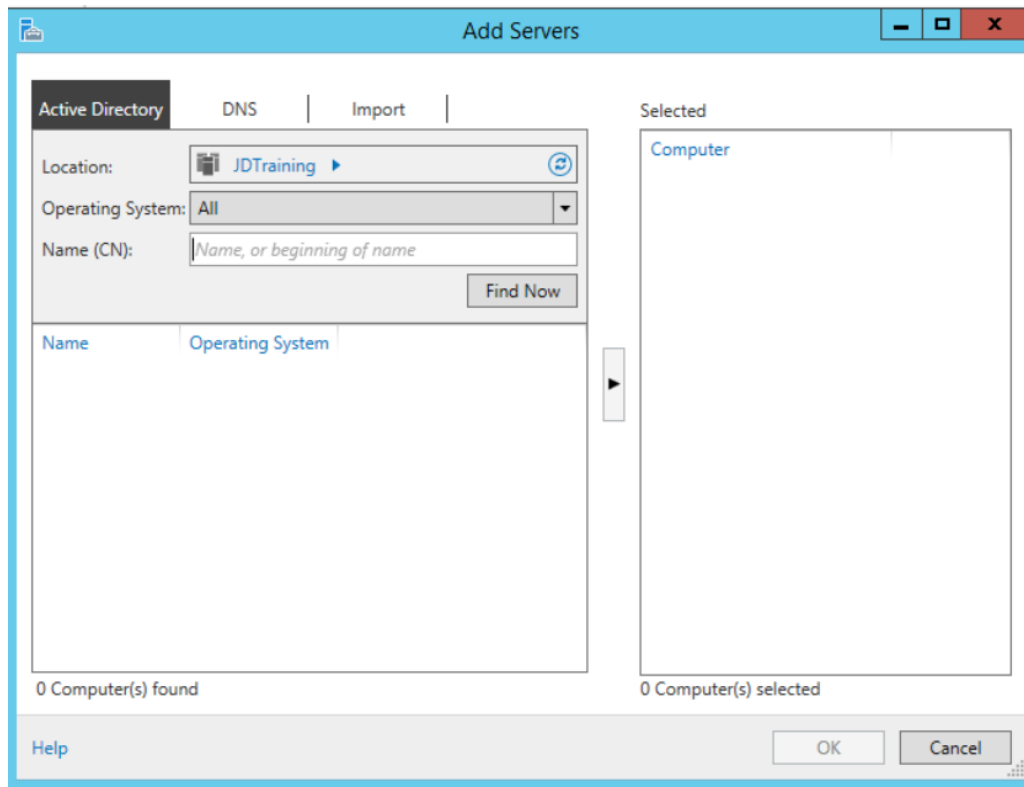

Figure 3.10 – Add Servers.

As you can see in Add Servers Wizard show in Figure 2.9 we would be able to add servers based on Active Directory or DNS roles. We also have an Import tab that would browse a text file as an input and would read any IP address or DNS information for a list of servers.

At this point we would be adding servers to their appropriate groups based on a specific role, however, we could also group these servers based on AD Sites, Departments, Administrative Groups, Operating System, IP Address, or any other way we might decide to organize the servers.
We create the Custom Server Group either by selecting Manage – Create Server Group from the Server Manger menu bar or Create Server Group from the Welcome Tile.

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Returning back to the Server Groups in Figure 2.6 you may notice that we also have a tile for our Local Server, which is currently showing an error or an Event that will need to be fixed. We will take a look at the event later in this book.

Within each Server Group tile you should notice five main categories to assist you in quickly identifying any issues with those services or servers. All these categories with the exception of Manageability can also be found by selecting a role from the Navigation Tree on the left-hand side of Server Manager. These five categories are

Manageability
This will allow the option to view the various status messages of the servers.

Events
This provides a centralized view of events or errors that may have happened on the servers.

Services
This provides that status of services running or not running on the servers.

Performance
This allows the option to monitor for issues with CPU or memory performance on the servers.

BPA Results
The Best Practices Analyzer provides suggestions based on best practices for your servers.

3.4 Configuring Local Server Settings

One of the other tools we have within Server Manager is the Local Server settings which provide us a centralized location of configuring, managing, and gathering information about our local server. We select Local Server from the Navigation Tree located on the left-hand side of the Server Manager as seen in Figure 3.10.
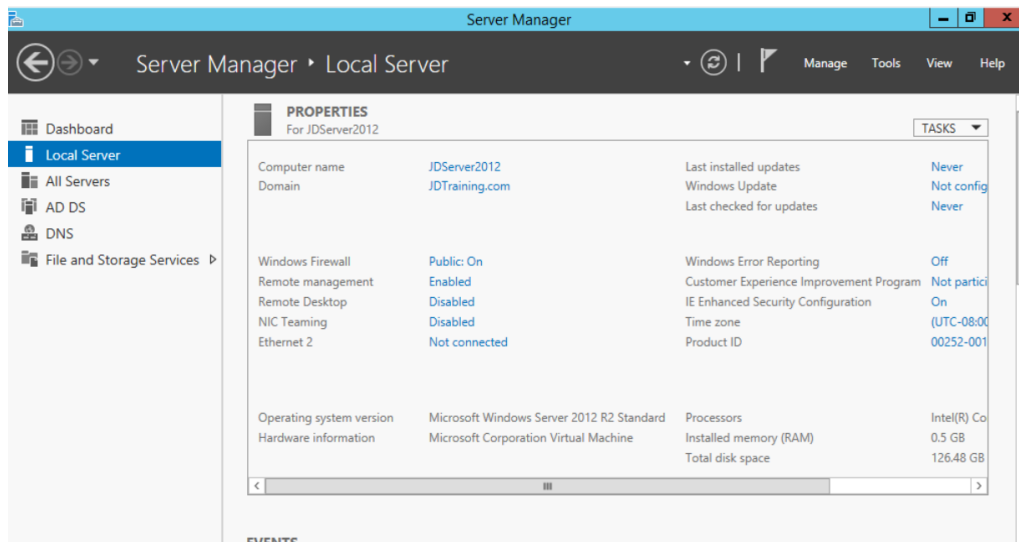
Figure 3.11 – Local Server Settings

The first area we look at for our server properties is changing the computer name and configuring the workgroup or domain settings. As you can see in Figure 3.10, the current name of our server is JDServer2012 and the name of our domain is JDTraining.com. To change either of these settings we would need to open up our Systems Properties dialog box which is shown in Figure 3.11. This dialog box can be accessed by either clicking on my computer name or domain name.

Once this dialog box is open, most people make the mistake of thinking the text box on the Computer Name tab is where you would put in the computer name. However, this is just for the computer description. To rename the computer or change its domain or workgroup we click on the Change button.

Before we click on the Change button, let us take time to notice the Full computer name of my server which is JDServer2012.JDTraining.com. The computer or host name is combined with the name of my domain to display the Fully Qualified Domain Name (FQDN) of our server.

When we click on the Change button the System Properties dialog box (Figure 3.11) will appear that will let us change our computer name as well as being able to change our domain or workgroup. Since our example server is a domain controller, we would be unable to change the domain or workgroup until we demote the server to a member server by removing Active Directory. However, we are still able to rename the server.

Renaming a domain controller is typically not recommended as this might cause authentication and network communication issues. In addition, renaming any server will require a reboot of the server for the name to take effect.
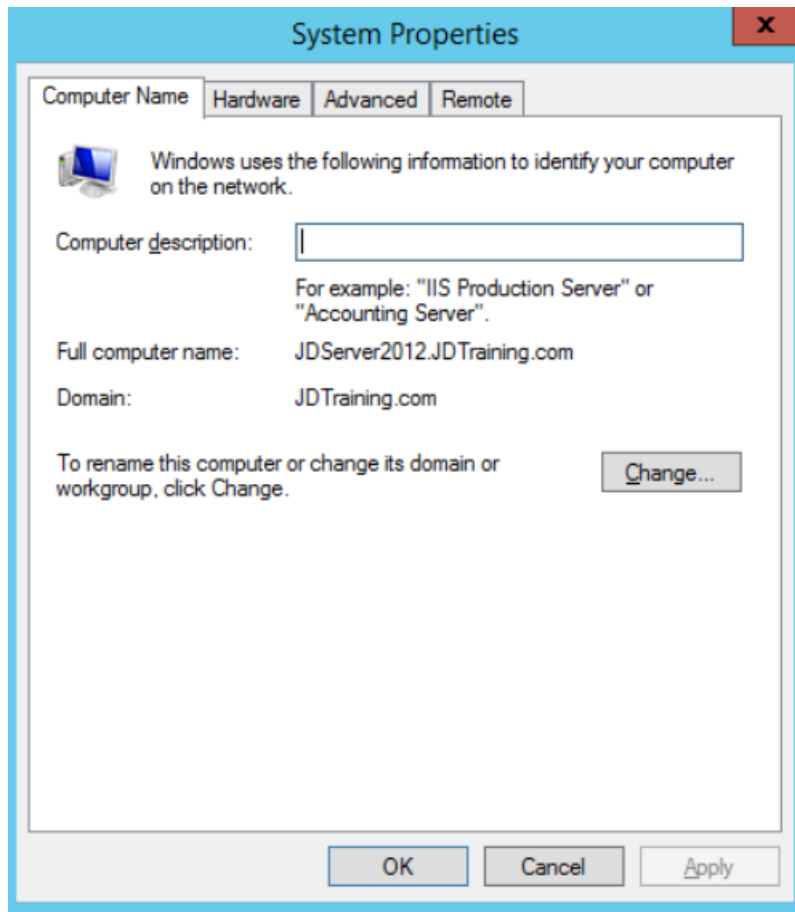

Figure 3.12 – Server System Properties

Figure 3.13 – Computer Name / Domain Change dialog box

The remaining Local Server settings in Server Manager we will discuss later in this book. But let us look at a quick overview of these settings.

Windows Firewall
Helps to prevent hackers or malicious software from gaining access to your server through the Internet or your network.

Remote Management
Enables applications or commands that require Windows PowerShell remote access to manage your server.

Remote Desktop
Allows access to the server desktop through a Remote Desktop Protocol (RDP) connection.

NIC Teaming

Allows multiple network adapters on a server to be grouped together to combine bandwidth or allow for traffic failover to prevent connectivity loss.

Ethernet

Allows you to configure your networking settings such as IP address, Subnet Mask, and Default Gateway for your server.

Last installed updates

Displays the last time the Windows Update service has updated your server.

Windows Update

Provides the settings to configure Windows Update for your server.

Last checked for Updates

Displays the last time the Windows Update service checked for new updates.

Windows Error Reporting

This will capture software crash and server failures of your server to be used for debugging.

Customer Experience Improvement Program

Allows Microsoft to gather information and feedback about your server environment.

IE Enhanced Security Configuration

Assigns security zones for the Internet Explorer on your server.

Time Zone

Allows you to change the time and time zone of the server.

Product ID

Displays the Product ID for your installation of your server.