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Managing Networking

In this chapter, we cover the following recipes:

* Configure IP Addressing
* Installing DHCP
* Using DHCP
* Configure DHCP Scopes and Options
* Implementing DHCP Fail Over/Load Balancing
* Deploying DNS in the Enterprise
* Configuring DNS Forwarding
* Managing DNS Zones and Resource Records

# Introduction

At the heart of every organization is the network—the infrastructure that enables your client and server systems to interoperate. Windows has included networking features since the early days of Windows for Workgroups 3.1 (and earlier with Microsoft LAN Manager).

Every server or workstation in your environment needs to have a correct IP configuration. While IPv6 is gaining in popularity, most organizations rely on IPV4. In the Configuring IP addressing recipe, we look at how to set a network interface's IPv4 configuration, including DNS settings.

Many organizations assign a static IPv4 addresses to most server systems. The servers used throughout this book, for example, make use of static IP addresses. For client hosts, and for some servers, an alternative to assigning a server a static IP addresses is to use Dynamic Host Control Protocol (DHCP). DHCP is a network management protocol that enables a workstation to lease an IP address (and re-lease it when the lease expires). You set up a DHCP server to issue IP address configuration to clients by using the *Installing and authorizing a DHCP* server recipe.

Once your DHCP server is set up, you can use the *Configuring DHCP scopes* recipe to set up the details that your DHCP server is to hand out to clients. In the *Configuring IP address from static to DHCP* recipe, we set a network interface to get IP configuration from DHCP.

In the *Configuring DHCP failover and load balancing* recipe, we deploy a second DHCP server and configure it to act as a failover/load balancing DHCP service.

In the final recipe of this chapter, *Configuring DNS zones and resource records*, you configure the DNS server on DC1 with zones and additional resource records. Before you can begin to administer your Windows Server 2019 infrastructure, you need to create an environment in which you can use PowerShell to carry out the administration.

# Configure IP Addressing

By default, Windows uses DHCP to configure all NICs that are the Windows installation process discovers when you install Windows. Once you complete the installation of Windows, you can use the control panel applet (ncpa.cpl). the network shell console application (netsh.exe), or, of course, PowerShell to set IP configuration manually. In this recipe, you set the IP address details for SRV2 and ensure the host is registered in ther Reskit.Org DNS domain (on the DNS service running on DC1).

Setting up any host requires setting an IP address, a subnet mask and a default gateway which you do in the first part of this recipe. Then you configure SRV2 (which is a a workgroup host), to register with the DNS Server on DC1.Reskit.Org. This raises some challenges. By default, when you created DC1.Reskit.Org as a DC, the DNS Zone for the domain is set to only allow secure updates. So, again, by default, a workgroup host can not register. You can overcome this by setting the zone to allow all updates. But this could be dangerous as it allows ANY host to, potentially, register their address. A second challenge is that since SRV2 is not a domain member, remoting to DC1 fails. A solution to that issue is to set the WinRM service to trust all hosts. This to has security implications you should consider before using this approach in production.

## Getting Ready

This recipe uses SRV2, a recently added workgroup host, which is, initially, configured as a DHCP client.

## How to do it...

1. Discovering the network adapter, adapter interface and adapter interface index

$IPType    = 'IPv4'

$Adapter   = Get-NetAdapter |  Where-Object Status -eq 'Up'

$Interface = $Adapter | Get-NetIPInterface -AddressFamily $IPType

$Index     = $Interface.IfIndex

Get-NetIPAddress -InterfaceIndex $Index -AddressFamily $IPType |

  Format-Table -Property Interface\*, IPAddress, PrefixLength

1. Setting a new IP address for the NIC

$IPHT = @{

  InterfaceIndex = $Index

  PrefixLength   = 24

  IPAddress      = '10.10.10.51'

  DefaultGateway = '10.10.10.254'

  AddressFamily  = $IPType

}

New-NetIPAddress @IPHT

1. Verifying the new IP address

Get-NetIPAddress -InterfaceIndex $Index -AddressFamily $IPType |

  Format-Table IPAddress, InterfaceIndex, PrefixLength

1. Setting DNS Server IP address

$CAHT = @{

  InterfaceIndex  = $Index

  ServerAddresses = '10.10.10.10'

}

Set-DnsClientServerAddress @CAHT

1. Verifying the new IP configuration

Get-NetIPAddress -InterfaceIndex $Index -AddressFamily $IPType |

  Format-Table

1. Testing that SRV2 can see the domain controller

Test-NetConnection -ComputerName DC1.Reskit.Org |

  Format-Table

1. Creating credential for DC1

$U    = 'Reskit\Administrator'

$PPT  = 'Pa$$w0rd'

$PSC  = ConvertTo-SecureString -String $ppt -AsPlainText -Force

$Cred = [pscredential]::new($U,$PSC)

1. Setting WinRM on SRV1 to trust all hosts

$TPPATH = 'WSMan:\localhost\Client\TrustedHosts'

Set-Item -Path $TPPATH -Value 'dc1' -Force

Restart-Service -Name WinRM -Force

1. Enabling non-secure updates to Reskit.Org DNS domain

$DNSSSB = {

  $SBHT = @{

    Name          = 'Reskit.Org'

    DynamicUpdate = 'NonsecureAndSecure'

}

  Set-DnsServerPrimaryZone @SBHT

}

Invoke-Command -ComputerName DC1 -ScriptBlock $DNSSSB -Credential $Cred

1. Ensuring host registers within the Reskit.Org DNS domain

$DNSCHT = @{

  InterfaceIndex                 = $Index

  ConnectionSpecificSuffix       = 'Reskit.Org'

  RegisterThisConnectionsAddress = $true

  UseSuffixWhenRegistering       = $true

}

Set-DnsClient  @DNSCHT

1. Registering host IP address at DC1

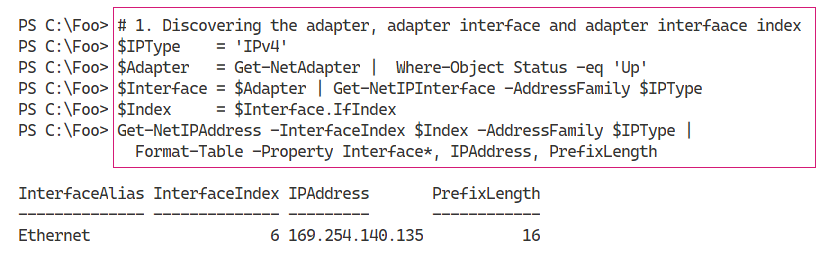
Register-DnsClient

1. Testing the DNS server on DC1.Reskit.Org correctly resolves SRV2

Resolve-DnsName -Name SRV2.Reskit.Org -Type 'A' -Server DC1.Reskit.Org

## How it works...

In step 1, you use Get-NetAdapter and Get-NetIPAddress to determine the IP address of this server. Then you display the resultant address, which looks like this:



1. Insert image B1672\_01\_01.png

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Screen shots for each step that generates one

## There's more...

Some things of interest in this recipe

# Installing DHCP

This recipe, blah blah

## Getting Ready

Specific stuff you need to do this recipe

## How to do it...

1. Step by step

## How it works...

Screen shots for each step that generates one

## There's more...

Some things of interest in this recipe

Repeat the recipe structure

# Using DHCP

This recipe, blah blah

## Getting Ready

Specific stuff you need to do this recipe

## How to do it...

1. Step by step

## How it works...

Screen shots for each step that generates one

## There's more...

Some things of interest in this recipe

Repeat the recipe structure

# Configure DHCP Scopes and Options

This recipe, blah blah

## Getting Ready

Specific stuff you need to do this recipe

## How to do it...

1. Step by step

## How it works...

Screen shots for each step that generates one

## There's more...

Some things of interest in this recipe

Repeat the recipe structure

# Implementing DHCP Fail Over/Load Balancing

This recipe, blah blah

## Getting Ready

Specific stuff you need to do this recipe

## How to do it...

1. Step by step

## How it works...

Screen shots for each step that generates one

## There's more...

Some things of interest in this recipe

Repeat the recipe structure

# Deploying DNS in the Enterprise

This recipe, blah blah

## Getting Ready

Specific stuff you need to do this recipe

## How to do it...

1. Step by step

## How it works...

Screen shots for each step that generates one

## There's more...

Some things of interest in this recipe

Repeat the recipe structure

# Configuring DNS Forwarding

This recipe, blah blah

## Getting Ready

Specific stuff you need to do this recipe

## How to do it...

1. Step by step

## How it works...

Screen shots for each step that generates one

## There's more...

Some things of interest in this recipe

Repeat the recipe structure

# Managing DNS Zones and Resource Records

This recipe, blah blah

## Getting Ready

Specific stuff you need to do this recipe

## How to do it...

1. Step by step

## How it works...

Screen shots for each step that generates one

## There's more...

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Repeat the recipe structure