DHCP Server for Windows Server 2012

2012.05

엄기성

- I am
  - IT Pro. (Since 2000)
  - IT Admin. at Bluehole Studio.
- Like
  - WDS, AD, GPO, VMware, Vim
- Dislike
  - BSOD, Attended Installation

DHCP, Why ?

DHCP, Important !!

DHCP, Important !!

500+ Devices

300+ Employees

DHCP provides…..

Automatic IP Config.

Automatic IP Config.

Centralized IP Mgmt.

Automatic IP Config.

Centralized IP Mgmt.

PXE-based Infra.

OK. WS2012 comes.

3 Cool changes in DHCP Server

DHCP Server Failover

DHCP Server Failover

Policy-based assign.

DHCP Server Failover

Policy-based assign.

PowerShell support.

Details on
DHCP Server Failover

RFC-Based feature

DHCP Failover Protocol
<draft-ietf-dhc-failover-12.txt>

Status of this Memo

This document is an Internet-Draft and is in full conformance with all provisions of Section 10 of RFC2026.

Internet-Drafts are working documents of the Internet Engineering Task Force (IETF), its areas, and its working groups. Note that other groups may also distribute working documents as Internet-Drafts.

Internet-Drafts are draft documents valid for a maximum of six months and may be updated, replaced, or obsoleted by other documents at any time. It is inappropriate to use Internet- Drafts as reference material or to cite them other than as "work in progress."

The list of current Internet-Drafts can be accessed at http://www.ietf.org/ietf/1id-abstracts.txt

The list of Internet-Draft Shadow Directories can be accessed at http://www.ietf.org/shadow.html.

Already in ISC DHCP

```
#
# /etc/dhcpd.conf for primary DHCP server
#

authoritative;
ddns-update-style none;

failover peer "dhcp-failover" {
  primary; # declare this to be the primary server
  address 192.168.200.2;
  port 647;
  peer address 192.168.200.3;
  peer port 647;
  max-response-delay 30;
  max-unacked-updates 10;
  load balance max seconds 3;
  mclt 1800;
  split 128;
}

subnet 192.168.200.0 netmask 255.255.255.0 {
  option subnet-mask 255.255.255.0;
  option broadcast-address 192.168.200.255;
  option routers 192.168.200.1;
  option domain-name-servers 192.168.200.1;
  pool {
    failover peer "dhcp-failover";
    max-lease-time 1800; # 30 minutes
    range 192.168.200.100 192.168.200.254;
  }
}
```

Failover with ISC DHCP
http://www.madboa.com/geek/dhcp-failover/
Paul Heinlein <heinlein@madboa.com>
Initial publication: November 6, 2005

Now in WS2012 ☺

I love its

I love its Simplicity.

Split Scope Failover cluster

~~Split Scope~~

~~Failover cluster~~

Not simple !!!!

Split Scope

Two DHCP servers back each other up by each hosting part of the IP address range of a scope. **Split scope deployment does not provide IP address continuity and is unusable in scenarios where the scope is already running at high utilization of address space**, which is very common with Internet Protocol version 4 (IPv4).

- Understand and Troubleshoot DHCP Failover in Windows Server 8 Beta

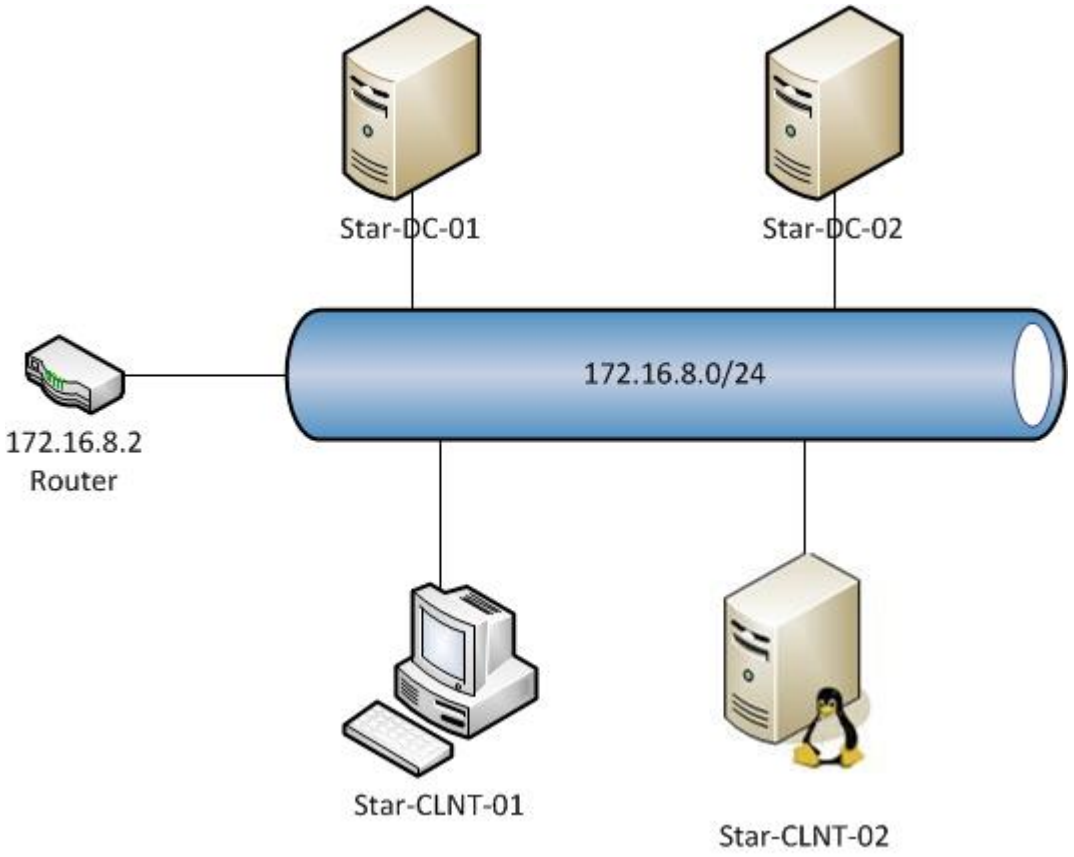
Failover cluster

By using clustering support for DHCP, administrators can implement DHCP server failover for a single site, achieving greater fault tolerance. The clustering deployment uses a single shared storage. This makes the storage a **single point of failure**, and requires additional investment in redundancy for storage. In addition, **clustering involves relatively complex setup and maintenance.**

- Understand and Troubleshoot DHCP Failover in Windows Server 8 Beta

Demo

LAB


Star-DC-01
Star-DC-02
172.16.8.0/24
172.16.8.2
Router
Star-CLNT-01
Star-CLNT-02

Limit

IPv4 Scope only.

Max 2 DHCP Servers.

Details on Policy-based assign.

Already in ISC DHCP

```
class "Etherboot" {
match if substring (option vendor-class-identifier, 0, 13) = "Etherboot-5.0";
filename "/etherboot/nbgrub";
option vendor-encapsulated-options 3c:09:45:74:68:65:72:62:6f:6f:74:ff;
option vendor-class-identifier "Etherboot-5.0";
vendor-option-space PXE;
option PXE.mtftp-ip 0.0.0.0;
next-server 192.168.200.1;
}

class "PXE" {
match if substring(option vendor-class-identifier, 0, 9) = "PXEClient";
#filename "/PXEClient/pxegrub";
filename "/PXEClient/pxelinux.0";
option vendor-class-identifier "PXEClient";
vendor-option-space PXE;
option PXE.mtftp-ip 0.0.0.0;
next-server 192.168.200.1;
}

class "known" {
  match hardware;
  one-lease-per-client on;
  ddns-updates on;
  ddns-domainname = "mandrakesoft.com";
  ddns-hostname = pick-first-value(ddns-hostname, option host-name);
  option fqdn.no-client-update on;
  set vendor_class_identifier = option vendor-class-identifier;
}
```

HOWTO setup a PXE 2.x server under Linux
http://people.mandriva.com/~aginies/doc/pxe/ch04.html#id2522426
First public version: 19 Febuary 2002

5 Info from client

Vendor Class

User Class

MAC Address

Client Identifier

Relay Agent Info.

2 Operator

AND

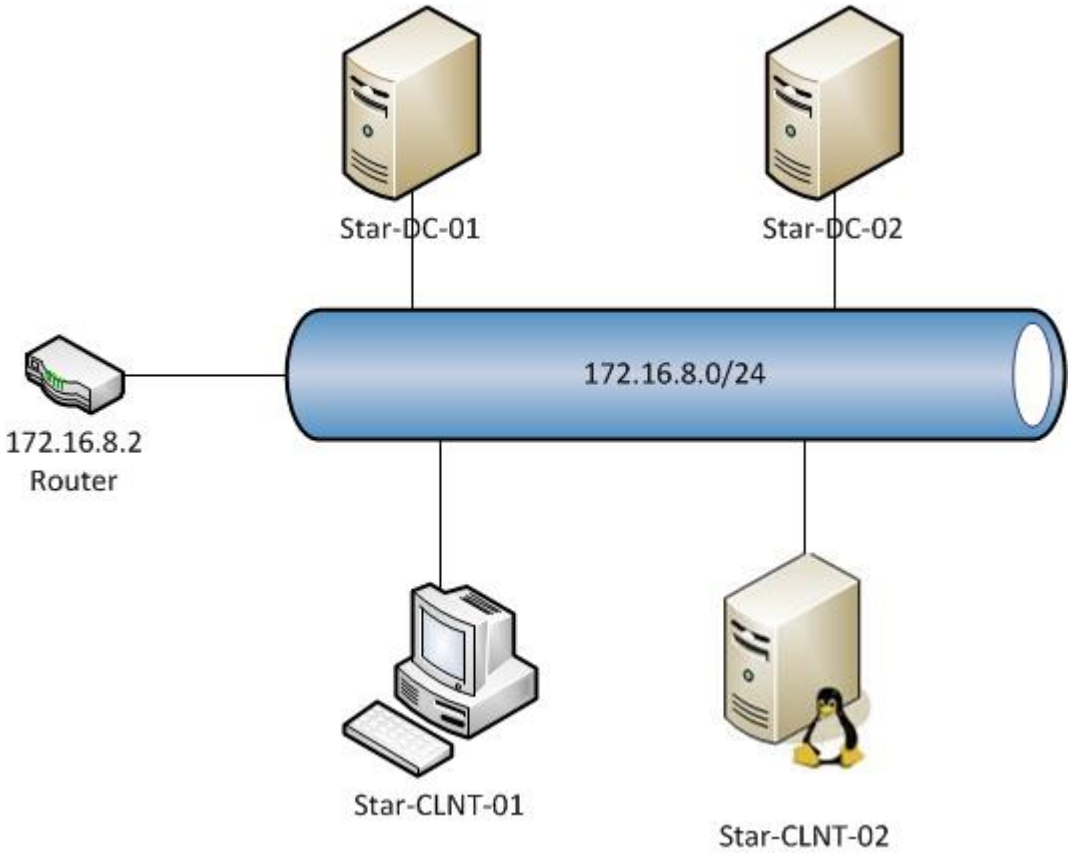
OR

DHCP Request

```
DHCP: Request            (xid=2757554E)
    DHCP: Op Code           (op)     = 1 (0x1)
    DHCP: Hardware Type     (htype)  = 1 (0x1) 10Mb Ethernet
    DHCP: Hardware Address Length (hlen) = 6 (0x6)
    DHCP: Hops              (hops)   = 0 (0x0)
    DHCP: Transaction ID    (xid)    = 660034894 (0x2757554E)
    DHCP: Seconds           (secs)   = 0 (0x0)
    DHCP: Flags             (flags)  = 0 (0x0)
        DHCP: 0............... = No Broadcast
    DHCP: Client IP Address (ciaddr) = 0.0.0.0
    DHCP: Your   IP Address (yiaddr) = 0.0.0.0
    DHCP: Server IP Address (siaddr) = 0.0.0.0
    DHCP: Relay  IP Address (giaddr) = 0.0.0.0
    DHCP: Client Ethernet Address (chaddr) = 08002B2ED85E
    DHCP: Server Host Name  (sname)  = <Blank>
    DHCP: Boot File Name    (file)   = <Blank>
    DHCP: Magic Cookie = [OK]
    DHCP: Option Field      (options)
        DHCP: DHCP Message Type      = DHCP Request
        DHCP: Client-identifier      = (Type: 1) 08 00 2b 2e d8 5e
        DHCP: Requested Address      = 157.54.50.5
        DHCP: Host Name              = JUMBO-WS
        DHCP: Parameter Request List = (Length: 7) 01 0f 03 2c 2e 2f 06
        DHCP: End of this option field
```

Demo

LAB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Router
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Note

Note

Keep It Simple !!!

Note

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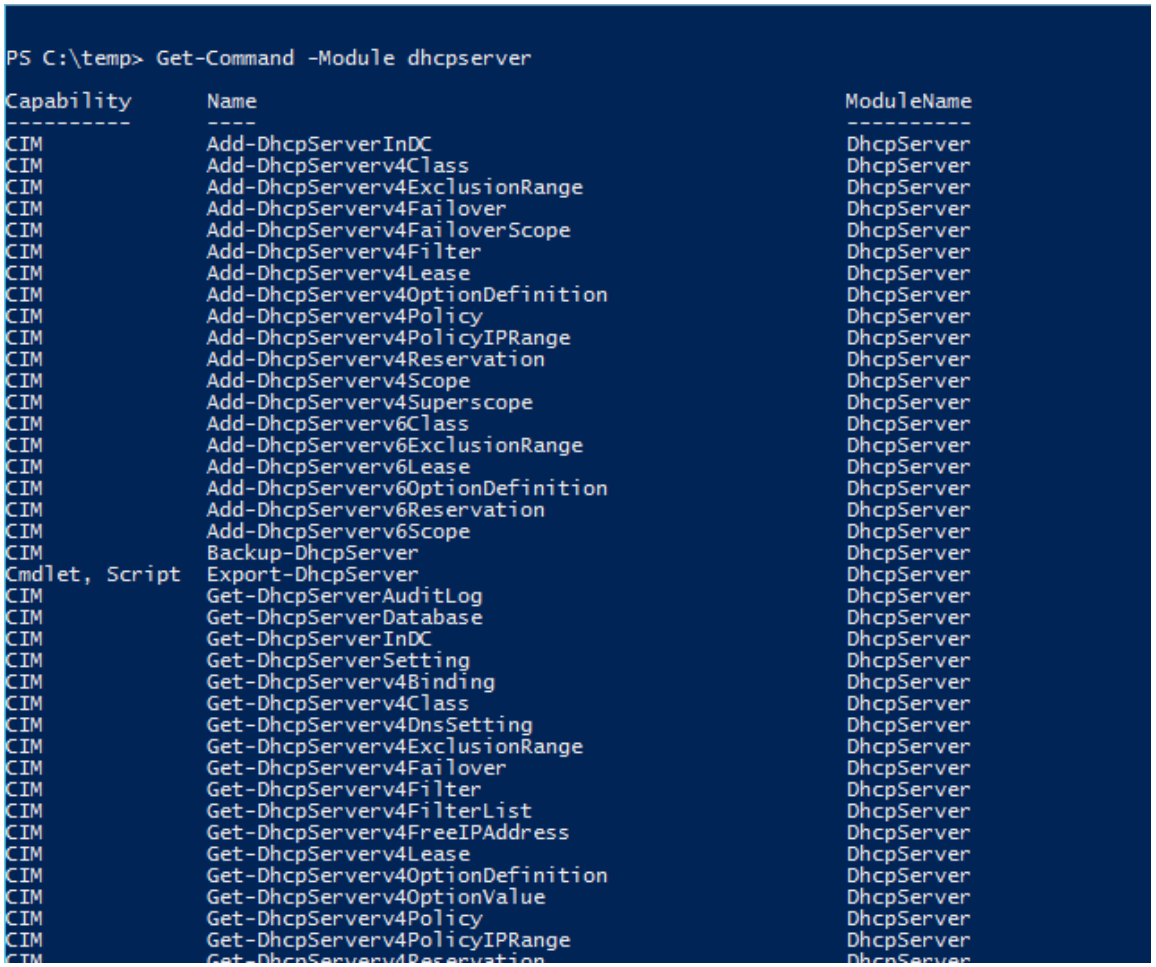
Do not trust Client !!!

Details on PowerShell support

100+cmdlet

100+

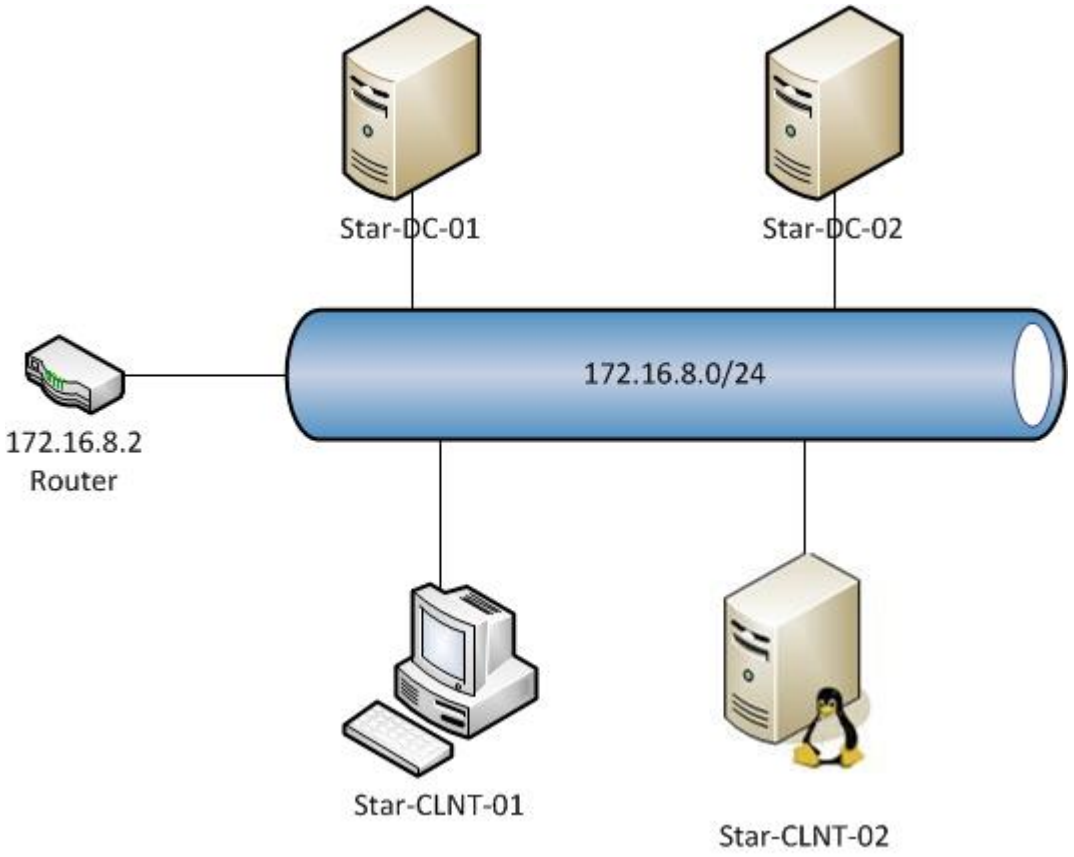


```
PS C:\temp> Get-Command -Module dhcpserver

Capability      Name                                               ModuleName
----------      ----                                               ----------
CIM             Add-DhcpServerInDC                                 DhcpServer
CIM             Add-DhcpServerv4Class                              DhcpServer
CIM             Add-DhcpServerv4ExclusionRange                     DhcpServer
CIM             Add-DhcpServerv4Failover                           DhcpServer
CIM             Add-DhcpServerv4FailoverScope                      DhcpServer
CIM             Add-DhcpServerv4Filter                             DhcpServer
CIM             Add-DhcpServerv4Lease                              DhcpServer
CIM             Add-DhcpServerv4OptionDefinition                   DhcpServer
CIM             Add-DhcpServerv4Policy                             DhcpServer
CIM             Add-DhcpServerv4PolicyIPRange                      DhcpServer
CIM             Add-DhcpServerv4Reservation                        DhcpServer
CIM             Add-DhcpServerv4Scope                              DhcpServer
CIM             Add-DhcpServerv4Superscope                         DhcpServer
CIM             Add-DhcpServerv6Class                              DhcpServer
CIM             Add-DhcpServerv6ExclusionRange                     DhcpServer
CIM             Add-DhcpServerv6Lease                              DhcpServer
CIM             Add-DhcpServerv6OptionDefinition                   DhcpServer
CIM             Add-DhcpServerv6Reservation                        DhcpServer
CIM             Add-DhcpServerv6Scope                              DhcpServer
CIM             Backup-DhcpServer                                  DhcpServer
Cmdlet, Script  Export-DhcpServer                                  DhcpServer
CIM             Get-DhcpServerAuditLog                             DhcpServer
CIM             Get-DhcpServerDatabase                             DhcpServer
CIM             Get-DhcpServerInDC                                 DhcpServer
CIM             Get-DhcpServerSetting                              DhcpServer
CIM             Get-DhcpServerv4Binding                            DhcpServer
CIM             Get-DhcpServerv4Class                              DhcpServer
CIM             Get-DhcpServerv4DnsSetting                         DhcpServer
CIM             Get-DhcpServerv4ExclusionRange                     DhcpServer
CIM             Get-DhcpServerv4Failover                           DhcpServer
CIM             Get-DhcpServerv4Filter                             DhcpServer
CIM             Get-DhcpServerv4FilterList                         DhcpServer
CIM             Get-DhcpServerv4FreeIPAddress                      DhcpServer
CIM             Get-DhcpServerv4Lease                              DhcpServer
CIM             Get-DhcpServerv4OptionDefinition                   DhcpServer
CIM             Get-DhcpServerv4OptionValue                        DhcpServer
CIM             Get-DhcpServerv4Policy                             DhcpServer
CIM             Get-DhcpServerv4PolicyIPRange                      DhcpServer
CIM             Get-DhcpServerv4Reservation                        DhcpServer
```

Demo

LAB


Star-DC-01
Star-DC-02
172.16.8.0/24
172.16.8.2
Router
Star-CLNT-01
Star-CLNT-02

Good Bye~

"Netsh DHCP Server"

Conclusion

Install WS2012.

Install WS2012.

Install RSAT for DHCP.

Install WS2012.

Install RSAT for DHCP.

Play with PS 3.0 ☺

Install WS2012.

Install RSAT for DHCP.

Play with PS 3.0 ☺

When RTM ready, use DHCP Server Failover !!

Thank you.

Resources

Dynamic Host Configuration Protocol (DHCP) overview
http://technet.microsoft.com/en-us/library/hh831825.aspx

Step-by-Step: Configure DHCP for Failover
http://technet.microsoft.com/en-us/library/hh831385.aspx

Step-by-Step: Configure DHCP Using Policy-based Assignment
http://technet.microsoft.com/en-us/library/hh831538.aspx

PowerShell and DHCP: 1 – servers
http://msmvps.com/blogs/richardsiddaway/archive/2011/09/20/powershell-and-dhcp-1-servers.aspx

PowerShell 3 and DHCP 2: scopes
http://msmvps.com/blogs/richardsiddaway/archive/2011/09/23/powershell-3-and-dhcp-2-scopes.aspx

Configuring DHCP failover in Windows Server 8 beta
http://terrytlslau.tls1.cc/2012/04/configuring-dhcp-failover-in-windows.html

Microsoft DHCP Vendor and User Classes
http://support.microsoft.com/kb/266675

Option Classes
http://technet.microsoft.com/en-us/library/cc958901.aspx

Resources

Failover with ISC DHCP
http://www.madboa.com/geek/dhcp-failover/

iPhone DHCP
http://xeraph.com/5295980

BOOTP / DHCP options
http://www.networksorcery.com/enp/protocol/bootp/options.htm

Dynamic Host Configuration Protocol (DHCP) and Bootstrap Protocol (BOOTP) Parameters
http://www.iana.org/assignments/bootp-dhcp-parameters/bootp-dhcp-parameters.xml#options

Contents of DHCP Vendor Class Identifier
http://en.wikipedia.org/wiki/Boot_Service_Discovery_Protocol#Contents_of_DHCP_Vendor_Class_Identifier
http://opensource.apple.com/source/bootp/bootp-198.1/Documentation/BSDP.doc

DHCP Basics
http://support.microsoft.com/kb/169289/EN-US

All about DHCP vendor classes and user classes
http://blogs.msdn.com/b/anto_rocks/archive/2005/02/25/380231.aspx