

Re: Understanding DHCP server client conversation

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<http://www.tech-archive.net/Archive/Certification/microsoft.public.cert.exam.mcsa/2008-03/msg00003.html>

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 - *Date:* Sat, 1 Mar 2008 17:42:24 -0500
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See comments in line.

"XeDigital" <weamfox@xxxxxxxxxxxx> wrote in message
news:26449890-937B-443F-9A05-8AEFAA966107@xxxxxxxxxxxxxxxxxxxx

Dear Friends,

...snip..

Now, my questions are :-

1) I understand that the Client is sending a broadcast message because it doesn't know any concrete DHCP server in order to request an IP address, but why the DHCP sends also a broadcast message to the client (*) (**)?

Because the client does not yet have a TCP/IP address assigned to it and can only receive broadcast traffic.

2) Let's agree that the DHCP server is broadcasting its offer, what happen if there is more than one client (lets say 50 or more) is getting same IP address that's suppose to be offered to a concrete client at the same time?

Doesn't this make a high traffic in the network making all the clients go back and forth with the DHCPNACK, DHCPDECLINE and the DHCPACK????

NOTE: I understand that the client sends an ARP request with the offered IP address if it gets a reply that means that this IP address is in use and

the client sends DHCPDECLINE, this is from the CLIENT side but what about the server side and the whole network?? :-s

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The DHCP packet contains the hardware (MAC) address of the client. This prevents other requesting clients from assuming someone else's offer.

3) Why don't the DHCP server cut the crap and use the client MAC address to send the DHCPOFFER and the DHCPACK instead of broadcasting to all clients?
PLEASE NOTE : That the MAC address is in the second layer (Data Link layer) in the OSI model while the IP address is in the third layer (Network layer) which make it more reasonable for the DHCP server to use the the MAC address of the client that is requesting the service to send him the IP address instead of BROADCASTING the DHCPOFFER and the DHCPACK and making high traffic.

You have to remember that the client cannot assume the IP address in the offer until it receives the DHCP ACK. Further, the client may have accepted an offer from another DHCP server on the lan. When a server sees a client issue a DHCP Request packet to a different DHCP server, it automatically assumes that the offer it made is not accepted. Since all of this traffic is broadcast based, all DHCP servers (and relay agents) on the lan know what is going on. See RARP for a configuration protocol based on ARP.

Once the client does assume the IP address, maintenance of the lease is the clients responsibility. Typically, after receiving a DHCP offer, the client will issue an ARP request to see if another node responds. If so, the client will assume the address is in use and will issue a DHCP decline, and then another DHCP discover to start all over.

So, in general...

1. Client issues DHCP discover
2. Server responds with DHCP offer
3. Client officially asks for IP from the offer
4. Server responds with DHCP ACK and updates it's lease table

At this point, and this point only, can the client begin to use the IP address. Up to this point, the traffic must be broadcast based so that the client can see it, and other DHCP servers on the LAN (or remotely through DHCP relay agents) can see it. Lease times of as little as 15 minutes can prevent a lan with thousands of clients from becoming overburdened with DHCP traffic.

For a better understanding, google or find a diagram of a DHCP packet. You'll see it includes fields for the client IP, Your IP (which is used separately from client IP, Server IP, router IP, client MAC, server host

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name, boot file name, and in some cases, vendor specific info.

John R

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