

Limitation Note

ARP problem in the NLB environment

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Introduction

In the specific environment that use virtual mac address, WIZnet IC cannot respond to the ARP request packet. This document describes the causes and solutions.

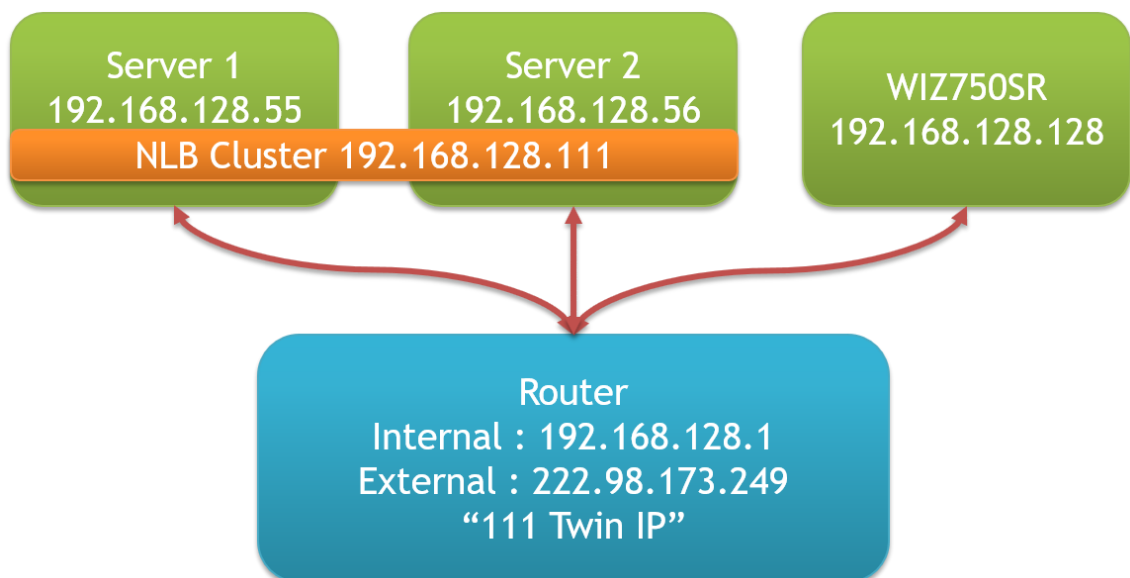
Symptom

1. Windows Server 2008 R2 environment that clustered in NLB(network load balance) unicast mode.
2. If NLB server application operates in TCP client mode, it cannot establish connection with WIZnet IC(WIZ750SR in the figure below) operating in TCP server mode.

Test environment

1. Preparations
 - A. 2 Windows 2008 servers (NLB unicast cluster mode)
 - B. WIZ750SR (and W5500 board)
 - C. Router (IP time)
 - D. Monitoring PC

2. Diagram

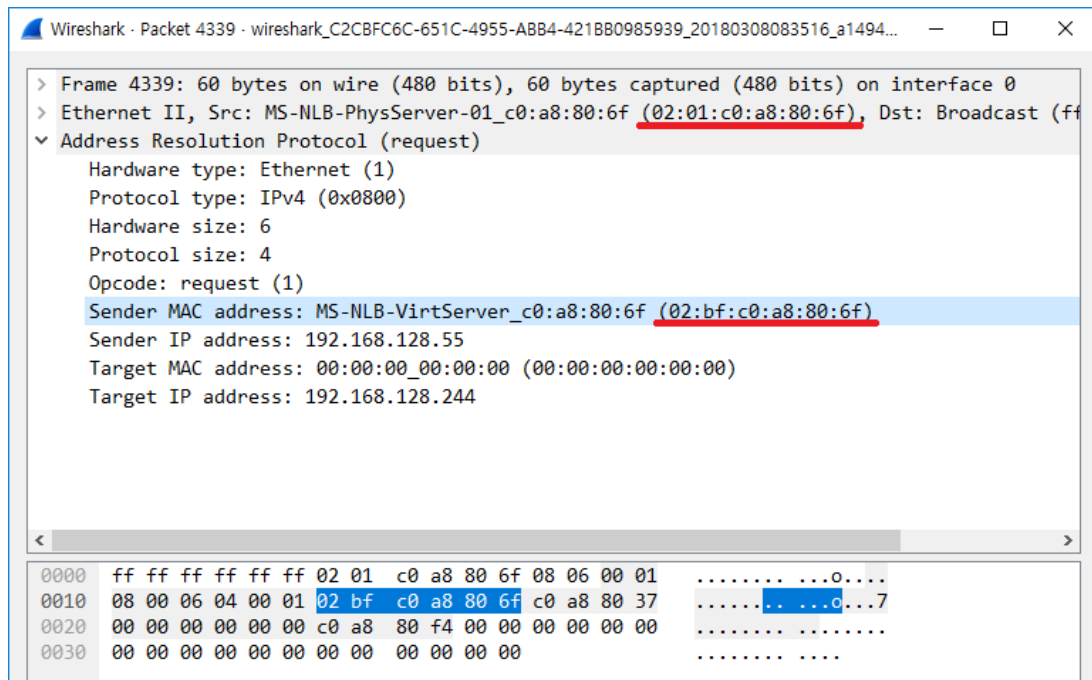


< figure 1 >

3. Server configuration methods are omitted.

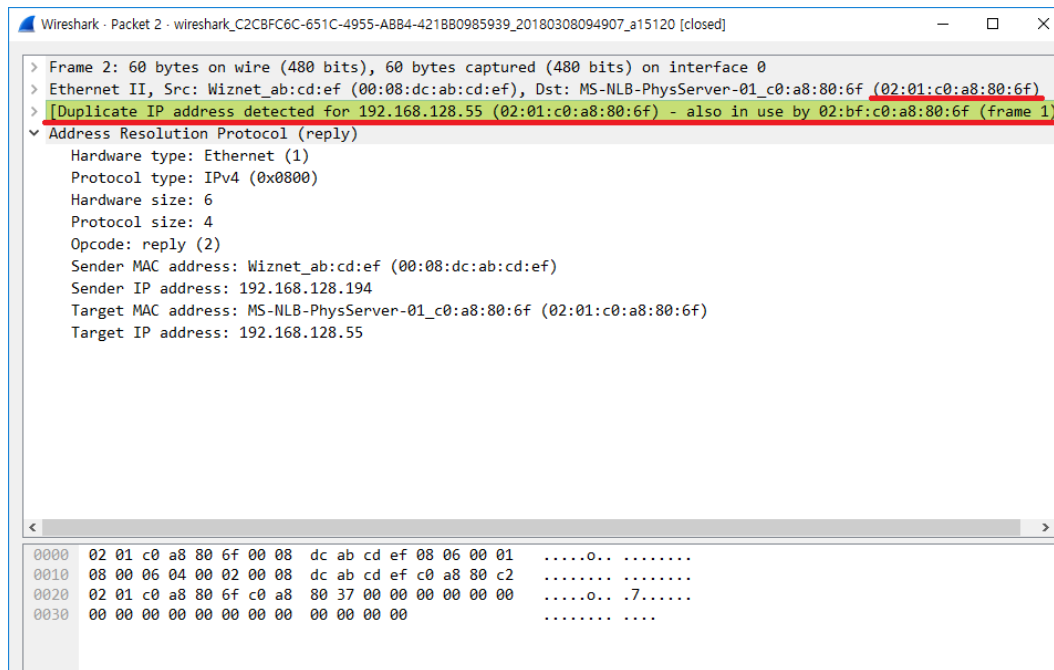
CAUSE

1. As shown in the following capture, NLB server sends an ARP request packet to connect to the WIZ750SR. In that ARP packet, Sender MAC address (02:bf:c0:a8:80:6f) is differ from the Source MAC address(02:01:c0:a8:80:6f) in the ethernet frame. Typically, the sender MAC address is the same as the source MAC address.



< figure 2>

2. In case of WIZnet IC including WIZ750SR, it responds by using the source MAC address(02:01:c0:a8:80:6f) as the destination MAC address, but NLB server expects an ARP response packet using the sender MAC address(02:bf:c0:a8:80:6f) as the destination MAC address. So NLB server don't accept the packet from the WIZnet IC and the connection cannot be established.



< figure 3>

3. It can occur not only in the APR process but also in the TCP connection process. WIZnet IC responds using the source MAC address as the destination MAC address, but NLB server only accepts packets using the NLB cluster MAC address.

- Ref: Source MAC address of the ARP packet from the first NLB cluster server is 02:01:c0:a8:80:6f. And the second is 02:02:c0:a8:80:6f. 02:bf:c0:a8:80:6f is the representative MAC address of the NLB cluster. And all servers in the cluster only accepts packets using this representative MAC address as the destination MAC address.

Solutions

1. Set the mode of the NLB cluster to the multicast. Then the NLB server uses the physical MAC address (in the example fc:aa:14:e7:77:8e) of the NIC in the APR request packet. And it will work properly.

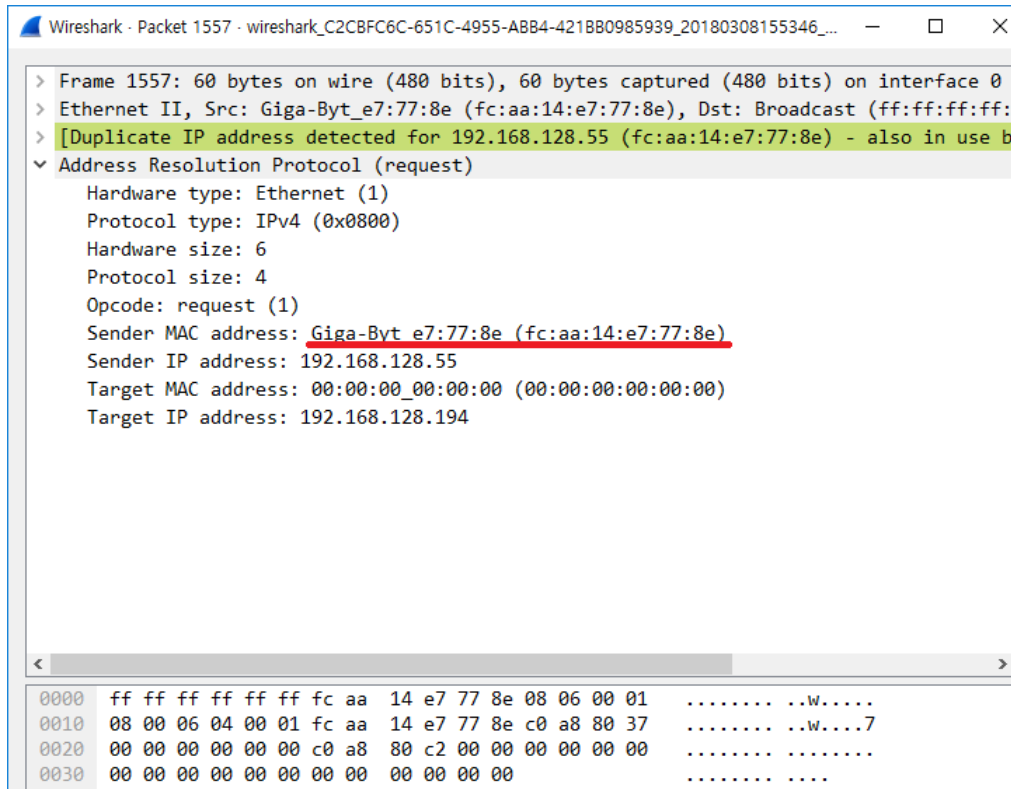


figure 4