

Unicast and Multicast NLB

Previous versions of NLB have relied on unicast traffic. In unicast, traffic sent to a single IP address can be received by a single MAC address. NLB works with this by commanding each member's load-balanced network adapter to respond to a virtual MAC address, ensuring that all members receive all cluster traffic.

However, connecting the members to a switch can defeat NLB because switches are designed to send traffic only to the switch port that contains the destination MAC address. Without special configuration, switches send all cluster traffic to a single cluster member. Because that member is expecting other members to respond to some of that traffic, much of it goes unanswered.

You can work around this by configuring the switch to act as a hub, sending all traffic to all ports connected to cluster members. Or, in Windows Server 2003, you can configure NLB to use multicast mode.

In multicast mode, a single IP address can be used to represent multiple MAC addresses. Most switches and routers are multicast compatible, simply requiring each computer that wants to receive multicast traffic to announce (or *register*) itself. NLB performs this announcement, ensuring that all client members receive all cluster traffic.

In multicast mode, each member's network adapter driver is instructed to use an additional multicast MAC address. This enables members to also be addressed independently, using their private IP addresses and MAC addresses. However, in unicast mode, NLB overwrites the members' private MAC addresses with its own virtual MAC address, making it impossible for members to communicate independently using their load-balanced network adapter. If NLB is enabled in unicast mode on a computer with only one network adapter, that computer will be incapable of communicating with any other computers in a reliable fashion.

In general, you should enable and use multicast NLB whenever possible. Use unicast mode only if your network equipment—switches and routers—don't support multicast or if they experience significant performance issues when multicast is enabled.