

Multiport Link Aggregation

<https://campus.barracuda.com/doc/19333734/>

Multiport link aggregation, or link bonding, allows you to aggregate multiple physical network links into a single logical link. You can use link aggregation to achieve multi-gigabit capacity to services and servers.

Multiport link aggregation is an advanced feature; before completing this deployment, confirm that this configuration is necessary to meet the needs of your organization.

Use multiport link aggregation to:

- Load balance multiple NICs;
- Combine multiple network connections;
- Incorporate redundancy in case one of the links fails;
- Increase bandwidth beyond what is available through one port.

Link Aggregation Requirements

- Physical links must be at least 1 Gbps operating in full duplex mode.
- If you intend to use Dynamic Link Aggregation Control Protocol (IEEE 802.3ad), the corresponding switch must support it.
- Configure the same speed for all ports of a bonded interface or you should set the speed to **Automatic**. Navigate to the **NETWORK > Ports** page, click **Edit** next to a port, and configure the **Speed** using the drop down menu (**10**, **100**, **1000**, or **Automatic**).

Configuring Link Aggregation

To create a link bond, go to the **NETWORK > Ports** page. Enter a bond name, assign the bond mode, and then select the ports. It is recommended that you select an even number of ports to bond.

Bond Modes

Three bond modes are supported:

- **Round Robin**

The round robin mode transmits packets in sequential order from the first available network port through the last. This mode provides load balancing and fault tolerance.

Outgoing traffic is spread across all of the ports in the bond. While round-robin distribution is the only mode that allows a single TCP/IP stream to use more than one network port worth of throughput, this mode also introduces the potential for out-of-order packets and retransmitted segments.

Example: Consider a bond configured with 4 ports [ge-1-1, ge-1-2, ge-1-3 and ge-1-4], and mode as Round Robin. In this case all packets for outgoing traffic during a connection will be routed through all the ports configured in the bond. If there are four TCP segments to be sent via the example bond, then each port will carry one segment.

- **Active-Backup**

Only one port in the bond is active; a different port becomes active if, and only if, the active port fails. This mode provides fault tolerance only. All the packets are routed through the active port.

Example: Consider a bond configured with 2 ports [ge-1-1 and ge-1-2], and mode as Active-Backup. All outgoing traffic will be routed through the active port ge-1-1 on the bond. The backup port ge-1-2 becomes active if, and only if, the active port fails.

- **Dynamic Link Aggregation Control Protocol (LACP) / IEEE 802.3ad Dynamic Link Aggregation**

This mode creates aggregation groups that share the same speed and duplex settings, and utilizes all ports in the group according to the IEEE 802.3ad specification. This does not increase the bandwidth for a single conversation; it achieves high utilization only when carrying multiple simultaneous conversations.

Verify that IEEE 802.3ad/LACP is enabled on the switch.

Existing IP Addresses

When adding a port to a link, at most one of them may have an IP address configured. If an IP address/Custom Virtual Interfaces/Static Routes/SNAT IP address exists on one of the ports, it is automatically moved to the newly created bond. However, if you attempt to add multiple ports with IP

addresses configured, you cannot create the bond until you delete these extra IP addresses.

Using a Bonded Interface

Once you create a bonded interface, it appears in the user interface and can be used in the same way as any physical interface. For example, you will find it in the Interfaces list when you add a service on the **BASIC > Services** page.

Example - Creating Two Bonded Links

To create two bonded links, one for the service, one for the servers:

1. On the **NETWORK > Ports** page:
 1. Create *WANbond0* with ports 1-4
 2. Create *LANbond1* with ports 5-8.
 3. If you selected *Dynamic Link Aggregation* as the mode, verify that IEEE 802.3ad is enabled on the switches.
2. On the **NETWORK > Interfaces** page:
 1. Add a custom virtual interface that associates the network address of the services subnet with *WANbond0*.
 2. Add a custom virtual interface that associates the network address of the real server subnet with *LANbond1*.
3. Create a service on the *WANbond0* interface on the **BASIC > Services** page.

High Availability

If you are clustering two Barracuda Load Balancer ADC systems, make sure that each system has similar cabling. If failover occurs, any link bonds are created on the newly-active system using the corresponding ports. For example, if port ge-1-2 and port ge-1-3 form a bond on the active system, on failover, the newly-active system will attempt to use these same ports for the bond.

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