Bonding Methods

The SPACE Box supports 7 different bonding modes, they are
1. Balance-rr
2. active-backup
3. balance-xor
4. Broadcast
5. 802.3ad (LACP)
6. Balance-TLB
7. Balance-ALB

The most widely used modes are balance-rr and 802.3ad. Both of these modes support load balancing across the bonded interfaces.

1. Balance-RR

This mode literally sends each individual packet through a different network interface one at a time. The SPACE will queue the packets to be sent and then send a packet through port 1, the next through port 2, the next through port 3, the next through port 4, the next through port 1 and so on. This gives you more throughput. To support this, a switch must have an etherchannel or switchport trunk that has no load balancing options. The edgecore switches support this, but the allied telesis switches don't.

2. Active-Backup

In this mode only one port in the bond is active, if it fails another will become active and pick up the load by taking the failed ports mac address. This gives you redundancy but no additional throughput. Requires no special switch.

3. Balance-XOR

Data is sent from an ethernet port based on (source mac XOR desination mac mod bonded ports) This attempts to put one stream of data between the source and clients through a different interface. If there are mac addresses of clients that are close to each other this can cause problems. Requires support on the switch, the allied telesis switches support this mode.

4. Broadcast

This sends <u>all</u> packets down <u>all</u> ports. Gives redundancy but restricts throughput to that of a single interface. Requires no special switch support.

5. 802.3ad (LACP)

Based on the IEEE 802.3ad Dynamic Link Aggregation standard. Requires all links to be the same speed and have the same cable types. Provides both fault tolerance and added throughput, some throughput lost to added overhead of link connection negotiation and checking. This mode will send a few packets every so often (LACPDU's) as management overhead to check that all ports are still up. It will also separate traffic based on streams, so a receive stream may go through port 1 and a send stream through port 2 for a specific tcp connection. May also use one port as failover until the bandwidth is required. Supported on most modern switches. Allied switches don't seem to

like having more than 1 LACP bond on a bank of ports.

6. Balance-TLB

Adaptive transmit load balancing. Outgoing traffic is distributed based on the current load (computed relative to speed) of each port in the bond. Incoming traffic is received by the port that initially sent it. If a port fails, another port takes it's mac address to compensate. Requires no special switch configuration.

7. Balance-ALB

Does the same as above but will balance receive as well as transmit data. Requires no special switch configuration.