

Overview

HP's Auto Port Aggregation (APA) provides the ability to logically group two or more physical network ports into a single "Fat Pipe", often called a "trunk". Network traffic is load balanced across all of the links in the aggregation, which allows you to build large bandwidth logical links into the server that are highly available and completely transparent to the client and server applications.

In addition to increased performance, enterprise users require protection against business interruptions and loss of productivity. HP APA features automatic link failure detection and the ability to transfer traffic to one of the specified redundant links. This is done transparently to the applications to ensure a highly available environment.

For link aggregation, HP APA can be configured in three ways:

Auto with LACP- This mode should be used when configuring Link Aggregates on HP UNIX® servers when connected to IEEE 802.3ad (LACP) supported switches. This is the most widely used and recommended mode of configuration for link aggregation.

Auto with Pagp- This mode should be used when configuring Link Aggregates on HP UNIX® servers when connected to a switch which supports Cisco's Fast EtherChannel protocol (PagP). This protocol is not supported with current generation Cisco Nexus and HP Procurve switches. Please refer to the documentation of the switches to get the support status.

Benefits:

- Allows scaling of networks to improve aggregate throughput with flexibility to scale up or down based on the bandwidth requirements
 - Provides redundancy or link aggregation of network ports.
 - Gain investment protection by adding next-generation networking throughput to the existing infrastructure
 - Supports load balancing and distribute traffic evenly across the aggregated links, based on TCP Port (preferred method) or IP address or MAC address.
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Features:

High throughput

The link aggregation feature allows customers to achieve higher throughput without addition of new hardware. For example, if a customer wants to have network bandwidth of 4GigE to service increasing needs of an application but has no free server slot or does not want to immediately purchase new 10GigE cards, it can have a link aggregate of 4 links each of 1 gigE capacity to service its needs. Other scenarios of higher throughput include cases where the high-end servers require more capacity than is provided by current available network ports e.g. customers requiring 40GigE of bandwidth (which is not supported yet on HP servers) for their mission critical applications with very high I/O needs. In such a scenario, customers can aggregate 4 links of 10GigE capacity each to service his requirements.

NOTE: Mixing of different 10GigE cards i.e. different drivers in an aggregation group is not yet supported. Mixing of 1GigE cards i.e. different drivers but with same connectors (either copper or optics) is supported in an aggregation group e.g. mixing of 2-port 1000 Base-T and 4-port 1000 Base-T

NOTE: Link aggregation with Virtual Connects is not supported as LACP is not supported on the downlink between Blade and Virtual Connect although uplink from Virtual Connect to customer network is supported. Link aggregation with managed switches such as 6120 or pass-through switches are supported.

Load Balancing

The server traffic load is distributed over each member of the link aggregate so that each individual link is used. No links are wasted-as they would be under a "hot standby" mode (which is now deprecated) of operation. HP Auto-Port Aggregation's load balancing also

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attempts to maximize throughput over the links. This load balancing is applicable only to outbound traffic. Inbound load balancing and data flow distribution are strictly determined by the link partner and have no effect on the outbound algorithm. The following load balancing algorithms are supported:

LB_PORT: This algorithm uses the TCP/UDP source and destination port numbers to distribute traffic across the ports in a link aggregate.

NOTE: This is the recommended load balancing algorithm.

LB_MAC: This algorithm uses the least significant byte of the link level destination MAC address of the data flow as an index into a table of 256 possible entries. The physical port selected will be used to send packets for the duration of the specific data flow.

LB_IP: This algorithm uses the least significant bytes of the source and destination IP addresses of the data flow as an index into a table of 256 possible entries.

NOTE: Load Balancing applies only to link aggregation mode and not to LAN Monitor mode or Split Trunking mode.

High availability via multiple links

If any link in a trunk consisting of two, three, or four individual links fails, traffic continues to be carried on the remaining links—so the application will continue to be available to end users. In a four-link HP Auto-Port Aggregation, operation will continue if one, two, or even three links go down.

LAN Monitor

A link or a link aggregate can be backed up by a redundant link as in failover groups. In the case of failure of the primary link, the backup link carries the traffic. In normal conditions, the backup link does not carry traffic. Therefore, LAN Monitor or failover groups are an Active-Standby configuration.

NOTE: LAN Monitor is supported only between links of similar speed.

NOTE: A link aggregation group can be backed up by another such group with similar bandwidth capacity in LAN Monitor mode.

Cisco's protocol for automatic trunk discovery and automatic link aggregate configuration

HP Auto-Port Aggregation software supports Cisco's auto-discovery and configuration capability (PagP). This feature automatically searches for links that qualify for HP Auto-Port Aggregation trunking and, when they are identified, automatically configures them into a trunk. This powerful feature can also determine which links go to the same or different Fast and Gigabit Ethernet switches and can assign compatible links to the appropriate trunks.

NOTE: This feature is not supported on new HP Procurve or Cisco Nexus switches. Please read your switch documentation to know the support status.

Multi Chassis Link Aggregation Group

HP Auto-Port Aggregation supports Multi Chassis Link Aggregation Group (MC LAG) i.e. having link aggregates connect to more than one switch (i.e. remove the switch as a single point of failure). In this configuration, all the links of the link aggregate can carry traffic i.e. an Active-Active configuration. This feature is ideal for customers who want to have higher availability by eliminating switch as a single point of failure but at the same time do not want to have an idle link (as in the case of failover groups) for backup.

NOTE: This feature is currently supported on both 1GB and 10GB Ethernet infrastructure.

Supported Drivers:

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iocxgbe

The 10GigEthr-03 bundle contains the iocxgbe driver for HP-UX 11i v3, which supports the following products:

PCIe 10Gb Standup Card	PCIe 10Gb Mezzanine Card	PCIe 10GbE/FCoE CNA standup card	PCIe 10GbE/FC combo standup cards	PCIe 10Gb/FCoE CNA Mezzanine cards	Integrated Flex fabric Adapters
AT118A	NC552m	AT111A	AT094A	NC551m NC553m	NC553i

iexgbe

The 10GigEthr-02 bundle contains the iexgbe driver for HP-UX 11i v3, which supports the following 10 Gigabit Ethernet adapters and LAN On Motherboard (LOM) hardware:

PCIe 10 Gigabit Ethernet Cards	PCIe 10 Gigabit Ethernet Mezzanine Cards	HP Integrity Server LOM
AM225A 10GbE-SR adapter AM232A 10GbE-LR adapter AM233A 10GbE-CR adapter	NC532m	BL860c i2 BL870c i2 BL890c i2 Integrity Superdome 2

icxgbe

The 10GigEthr-01 bundle contains the icxgbe driver, which supports the HP AD386A PCIe 10 Gigabit Ethernet Card on servers running HP-UX 11i v2 and 11i v3

ixgbe

The 10GigEthr-00 bundle contains the ixgbe driver, which supports the HP AD385A and AB287A PCI-X 10 Gigabit Ethernet Cards on servers running HP-UX 11i v1, 11i v2 and 11i v3.

igelan

GigEther-01 (igelan) is the HP-UX driver for the following cards:

Card	Interface
System board	Core IO 4 ports Base-T
System board	Core IO 1 port Base-T
A6825A	Core IO 1 port Base-T
A6825A	Add on Base-T
A6847A	Add on Base-SX
AB465A	Add on Combo 2 ports Base-T & 2 FC
A9782A	Add on Combo Base-SX (LC connector)
A9784A	FiberChannel Add on Combo Base-T FiberChannel

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Card	Interface
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System board

AB545A
AD331A
AD332A
A7011A
A7012A
AB290A
AD193A
AD194A
AD337A
AD338A
AD339A
AD221A
AD222A
AD393A

Core I/O on Rx3600, rx6600, rx2800i2

PCIx 4-port 1000 Base-T
PCIx 2-port 1000 Base-T
PCIx 2-port 1000 Base-SX
PCIx 2-port 1000 Base-SX
PCIx 2-port 1000 Base-T
PCIx Combo 2p 1000BT , 2p U320 SCSI
PCIx Combo 1p 1000BT, 1p 4GB FC
PCIx Combo 2p 1000BT, 2p 4GB FC
PCIe 2-port 1000BT
PCIe 2-port 1000 BSX
PCIe 4-port 1000BT
PCIe Combo 1p 1000BT, 1p 4GB FC
PCIe Combo 2p 1000BT, 2p 4GB FC
PCIe Combo 2p 1000BSX, 2p 4GB FC

Product Documentation

For detailed information, including installation, configuration and troubleshooting, see the following documents at the [HP-UX Auto Port Aggregation \(APA\) Software](#) page:

- HP Auto Port Aggregation (APA) Administrator's Guide for HP-UX 11i v1 and v2
- HP Auto Port Aggregation (APA) Release Notes for HP-UX 11i v1, 11i v2, and 11i v3

Support Matrix

For detailed information on the different combinations that are support for each of the drivers and the minimum versions for each such combination, please refer to the APA support matrix for more details:

<http://www.hp.com/products1/serverconnectivity/adapters/APASupportMatrix.xlsx>

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