How aggregation works

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Aggregation is the real time combining of data from multiple constituent links together to form a single, logical connection. There are three distinct processes:

Data is split up, at the packet level, into separate streams. Those streams are sent simultaneously over the multiple constituent links connected to the EVX.

The data is recombined into its original form before being sent on to the Internet, cloud or another node on the same network.

This process operates in both directions – upstream and downstream.

Aggregated vs traditional connectivity

A traditional connection is set up by connecting a DSL modem to a broadband-enabled phone line, or a leased line terminating on a carrier supplied NTE. To share this connection across the network, a router or firewall device sits between the modem and the network. This is how most single line connections work.

Aggregating two or more lines together involves installing additional broadband or leased lines and an on-site device – an EVX – to do the aggregation work.

Each line in the aggregated connection has its own modem or NTE, all of which are connected to the EVX. The EVX, coupled with a carrier-grade core EVX, hides the multiple lines from the local network, acting as a "default gateway". In the traditional, single line setup described above, this role is fulfilled by the DSL modem. The firewall has an IP address, or a block of them, and sends all its internet requests to the EVX, through a single ethernet cable.

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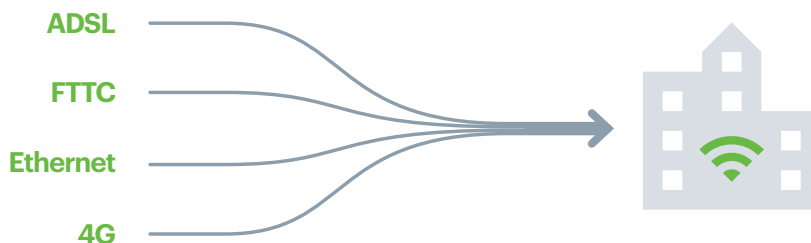
A single encrypted connection with multiple lines

Data sent from the local network is split up and distributed over multiple internet connections by the EVX. The data is reconstructed into a single stream for transmission to its destination, by one of many central core EVXs in our software defined network.

The process is bidirectional, operating on both upstream and downstream communications, and is fully encrypted end to end with the latest AES 256bit encryption standards.

The local EVX and the core EVX server hide the multiple lines from both the local network and the Internet, allowing the customer's devices to send and receive data exactly as they would over a single connection, but with the benefit of much enhanced bandwidth and uptime.

What happens when a line fails?

The on-site EVX and the core EVXs constantly monitor the lines with tiny, invisible packets of data. When they detect a problem with a line, they stop the traffic flow on that line while continuing to pass traffic on the others, making the line failure completely transparent to users.

This happens in less than a third of a second as standard and is fully customisable depending on bandwidth usage requirements and how sensitive the detection mechanisms need to be.

Clearly the failed line must be restored as soon as possible, so for this to work effectively, it is essential to select a provider who will closely monitor all lines in the aggregated connection and work closely with carrier partners when faults arise.

With constant, high quality monitoring, many faults can be resolved without the customer even knowing about them. Others may genuinely be issues on the customer's network – power outages, for example. Effective monitoring ensures the customer is made aware of such issues without delay.

Load balancing?

While they are sometimes confused, aggregation and load balancing are very different.

In a load balancing setup, each individual data session is allocated to a single line. Each line has its own IP address, making hosting and resiliency near impossible, and this setup will never match the speed capability of an equivalent aggregated solution.

With a unique IP address for each constituent link, no user will ever be able to use more bandwidth than that delivered by a single link, and should a link go down, its IP address and any traffic using it are lost in their entirety.

Complex IP schemas

A genuinely aggregated connection gives extensive IP flexibility, allowing the connection to be tailored closely to business requirements. Fully routed IPs, NAT IPs and private IPs are all available, in any combination.

For example, if a customer has a VPN, requiring a fully routed IP on the firewall, and also a WiFi network which needs internet access, but which should not infringe on WAN security, the fully routed IP can be delivered alongside a private IP range for the WiFi access points, all connected to the EVX.

Layer 2 and stretched VLANs are also possible, all terminating on the same EVX appliance and all using the aggregated bandwidth fed to it.

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