FlowPilot Packet Load Balancer

ATCA Hub & Payload Blades

Data Sheet

High bandwidth traffic flow separator and load balancer

- Balance traffic to multiple AdvancedTCA® blades for packet monitoring and processing

- Maintain flow context and packet sequence

- Fully transparent for external network elements

- Separate traffic into application groups

- Redundant 160G external Ethernet connectivity

- 480Gbit/s internal bandwidth for packet processing

Artesyn's FlowPilot Packet Load Balancer is a software add-on for ATCA® hub and payload blades that provides packet classification and load balancing towards individual cores in the system, maximizing system throughput efficiency without the need for costly external flow management appliances.

The ability to monitor and process data streams on the fly is essential in many application areas. Wireline and wireless carriers have an interest to provide contractually agreed services and quality. Bump in the wire security applications (such as firewall, packet filtering, data intercept) protect, monitor and optimize a network, while remaining invisible to network traffic passing through. Service providers are interested in statistics about subscriber behaviors. SDN and NFV enabled network infrastructure require packet flows to be managed at the switch level to ensure that traffic arrives at the right compute nodes without unnecessary processing or onwards routing. The complexity of these tasks and the constant increase of the packet rate due to the rapidly increasing market demand for higher bandwidth require multiple packet processing engines to process packet streams in parallel.

Associating packets with communication flows is often still done in software and the overall performance typically is limited by the capacity of a single computer. Multi computer solutions are highly desired to scale up the performance of a single packet processing element in response to the rapidly increasing market demand for higher bandwidth. This implies the design and development of new network elements that rely heavily on scalable packet processing hardware.
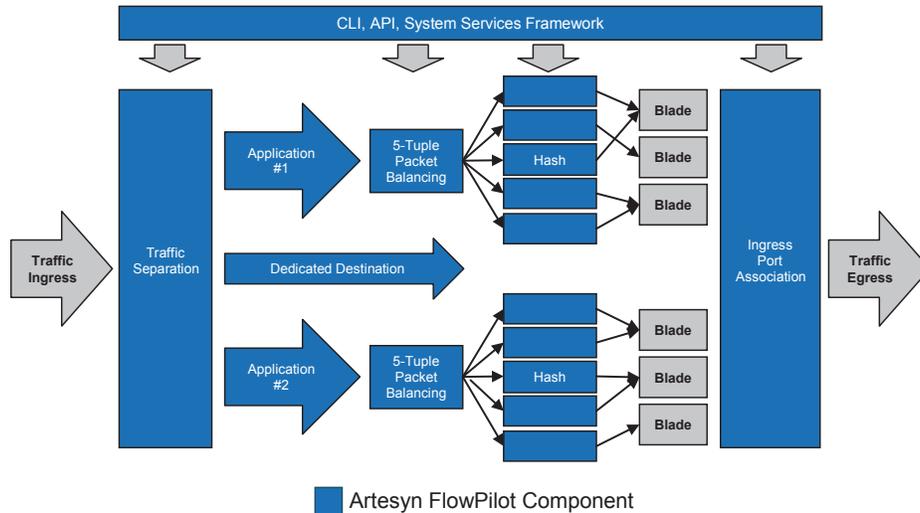
Artesyn's FlowPilot packet load balancer package, available as part of Artesyn's Centellis® range of AdvancedTCA platforms, is the ideal solution. FlowPilot resides within the switching hardware of the ATCA-F140 hub, working to identify the application group of incoming packets. These packets are then load-balanced (according to user-defined rules) amongst a set of dedicated processing blades within the system. Carrier Grade High Availability is assured by FlowPilot, utilizing dual-redundant hub blades and fail-over between packet processing blades.

Adding further, finer-grained, flow management - FlowPilot is also deployed on Artesyn's Intel® Xeon® based ATCA-7470/7475 packet processing blades. A highly efficient, low latency hashing algorithm is used to direct packet flows to individual cores within those blades. FlowPilot software remains transparent to both the packet-processing application and external network equipment. Packet content is examined only to determine flow - packets are processed and leave the system unaltered by FlowPilot.
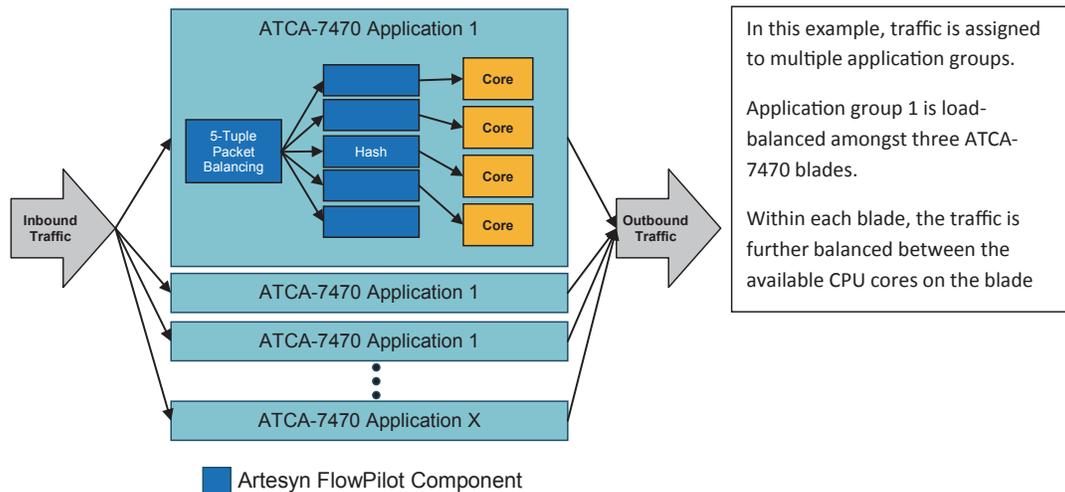
Use-case example: in an NFV enabled system, an application can be deployed on Virtual Machines residing on a number of payload blades within the system. FlowPilot is then configured to recognize packets destined for that application, and will load balance traffic towards the blades in the application group.

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Artesyn FlowPilot F140 Architecture

Artesyn FlowPilot Component

Artesyn FlowPilot ATCA-7470/7475 Architecture

In this example, traffic is assigned to multiple application groups.

Application group 1 is load-balanced amongst three ATCA-7470 blades.

Within each blade, the traffic is further balanced between the available CPU cores on the blade

Artesyn FlowPilot Component

Benefits

- Line-speed Packet Load Balancing; Zero impact on latency, application processing times and CPU consumption

- Load balancing between multiple application groups to ensure maximum resource utilization with reduced system bottlenecks (caused by queuing on overloaded blades, or unnecessary processing of packets on application blades)

- Flexible rules for identifying application groups from layer 2, 3 and 4 parameters

- The packet balancer assigns flows to a specific blade/core ; each packet in a flow is guaranteed to be directed at the same blade/core to ensure continuity of traffic ordering

- Physical association of ingress and egress ports, to maintain equipment transparency

- Dynamic re-assignment of packet flows in the case of blade failure or unbalanced flows between blades , ensures failures do not lead to overload on remaining blades

Highlights

- Ease of configuration via Command Line Interface or Artesyn's System Services Framework management application

- Application transparency – packets arrive unaltered and in the same order

- Incoming traffic can be split into single or multiple application groups, packets being load-balanced amongst the processing blades serving a given application

- Each application group has its own sophisticated packet-balancing hash table for load balancing, with built-in blade health checks

- Application groups may be assigned a dedicated destination (blade) if the application requires it

- Full data path redundancy provided by dual ATCA switches on the same ATCA backplane

- Refer to the ArteysnATCA-F140 datasheet for full details on the networking performance of this blade

The Artesyn Experience

Artesyn has over 30 years of experience serving the telecommunications industry and has hundreds of thousands of products deployed in the world's communications networks. With that long experience comes a deep understanding of our customers' requirements for on-time, consistent and high quality product coupled with excellent customer support. We deliver on all counts from our own world-class factory and seasoned support experts.

Artesyn strives to speed our customers' time to revenue and make your development process as flexible as possible. Our System Services Framework is just one example of how we respond to our customers' needs for products and services. All these features and experiences are supported globally with local system architects and FAEs to keep you on schedule.

We're a very flexible and agile organization. We recognize that you may need your system to have your own unique branding. No problem. We're used to that. We have services that allow you to define the look and feel that's consistent with your company's branding and aesthetic standards. Our flexibility isn't just limited to look and feel. Integration services, unique support requirements, longevity of supply, drop shipments and many more services are designed to make it easy to do business with us and quick for you to get to market and deploy smoothly.

Ordering Information

Item	Description
SL-FPF140-04-001-STD	FlowPilot for ATCA-F140,40G, single blade license
SL-FPF140-01-001-STD	FlowPilot for ATCA-F140,10G, single blade license

SOLUTION SERVICES

Artesyn Embedded Technologies provides a portfolio of solution services optimized to meet your needs throughout the product lifecycle. Design services help speed time-to-market. Deployment services include global 24x7 technical support. Renewal services enable product longevity and technology refresh.

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