



# Software API Framework Lexicon Implementation Agreement

Revision 1.0

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# 1 Revision History

<b>Revision</b>	<b>Date</b>	<b>Reason for Changes</b>
1.0	09/16/2002	Created Rev 1.0 of the implementation agreement by taking the Software Framework Lexicon (npf2001.142.02) and making minor editorial corrections.

## **2 Introduction**

This document defines terms that are used in SwAPI documents, specifically in the documents generated by the Framework TG. The Lexicon has been categorized into three sections, Physical, Logical and Other.

## 3 Physical

### **Blade**

Defined as a circuit board that performs one or more of forwarding, control or management planar functions.

### **Chip**

*Synonym:* integrated circuit.

### **Chipset**

Two or more complementary chips that together accomplish a selected function.

### **Control Processor**

A general-purpose processor used to host control plane functions and protocols. In other words, a processor that executes applications that controls the behavior of packet processing of a network device. May or may not be packaged with the network processor.

### **Coprocessor**

Semiconductor component that is optimized for a specific function and works in conjunction with a processor.

### **General Purpose Processor**

Programmable silicon based device that is suitable for general purpose computing such as arithmetic computations and word processing. These types of devices are usually capable of executing many different applications.

### **Integrated Circuit**

An electronic circuit that consists of many individual circuit elements, such as transistors, diodes, resistors, capacitors, inductors, and other active and passive semiconductor devices, formed on a single chip of semi conducting material and mounted on a single piece of substrate material.

### **Network Co-Processor**

Defined as an adjunct processor that is designed for a specific purpose (such as encryption or compression/decompression). Typically the co-processor works in conjunction with a Network Processor or custom IC and typically is not capable of forwarding packets on its own.

### **Network Processor**

Programmable or configurable semiconductor based device that is designed and optimized for the processing of network data (packets). Network processor optimizations include hardware and instruction set support for high-speed packet classification and packet modification.

### **Network Processing Node**

System built using network-processing technology; switch, router, special purpose network appliance.

### **Physical Port**

Provides the electrical / optical interconnect to the network.

### **Switch/Fabric**

Specialized semiconductor component, which directs packets through the network processing device.

## 4 Logical

### **Control Plane**

The control plane maintains information for the purpose of effecting changes to the forwarding plane's behaviour. It constantly adapts to changes in the status of its own interfaces and network topology information as seen through protocol exchanges with its peers.

### **Database/table**

One or more large structured sets of persistent data, usually associated with software to update and query the data.

### **Data Path**

Inclusive set of operations that can be performed on network traffic without respect to the execution environment of the data.

### **Distributed Forwarding plane**

A distributed collection of physical and logical entities like tables, NPs, which function as single forwarding entity.

### **Filter**

Criteria against which packets are matched.

### **Flows**

A stream of packets between two points that can be characterized in some way.

### **Forwarding Information Base**

Database that contains destination information that may be derived from the routing information base and used by the forwarding plane.

### **Forwarding Plane**

The forwarding plane receives protocol data units on input interfaces, processes (classification, direction, modification and traffic management) them, and discards or dispatches them either to a control processor or to output interfaces.

### **Frame**

In data transmission, the sequence of contiguous bits delimited by, and including, beginning and ending flag sequences. Note:

- A frame usually includes an information field, and usually consists of a specified number of bits between flags and contains an address field, a control field, a frame check sequence, and flags.
- Frames usually consist of a representation of the original data to be transmitted, together with other bits which may be used for error detection, control, or other purposes. Additional bits may be used for routing, synchronization or overhead information not directly associated with the original data.

### **High Level Pattern Specification Language**

An abstract language used to describe packets for use in defining filters.

### **Logical Interface**

An entity, which comprises of one or more physical ports.

### **Logical Port**

Defined as an endpoint to a logical connection. In IP networks, a UDP or TCP port identifies an endpoint. For example, port 80 identifies HTTP traffic.

### **Management Plane**

The management plane supports the configuration and provisioning of the network node by operators and administrators. It permits monitoring of network operation, the gathering and distribution of statistics related to control plane and forwarding plane operation.

### **Micro Flow**

A stream of packets belonging to one instance of an application.

### **Network Application**

A set of network processor independent algorithms that interact with the network to provide a networking service. Network applications can have both control plane as well as forwarding plane functions.

### **Network Processing Algorithm**

Set of instructions that are implemented in software or hardware whose purpose is to process the packets. Examines state data to determine how the packets are processed.

### **Network Processor Software**

Software that executes on a network processor.

### **Packet**

A sequence of binary digits, including data and control signals, that is transmitted and switched as a composite whole. Note: The data, control signals, and possibly error control information, are arranged in a specific format.

### **Packet Processors**

A functional block that performs a specialized task on packets.

### **Peer-to-Peer communication**

Communication between two entities with a well defined set of procedures and information exchange.

### **Protocol Data Units (PDUs)**

1. Information that is delivered as a unit among peer entities of a network and that may contain control information, address information, or data.
2. In layered systems, a unit of data that is specified in a protocol of a given layer and that consists of protocol-control information of the given layer and possibly user data of that layer.

### **Protocol Stack**

1. An implementation of at least one protocol that spans two or more layers of the OSI Reference Model.
2. A set of network protocol layers that work together.
3. The OSI Reference Model that defines seven protocol layers is often called a stack, as is OSPF that is used to update route tables.

### **Quality of Service (QOS)**

Performance specification of a logical communication interface or system. Note: QOS maybe quantitatively indicated by interface or system performance parameters such as latency, jitter, bit error ratio, availability, packet throughput rate, and packet loss probability.

### **Routing Information Base**

Database that contains the reachability information of certain address prefixes in terms of next hop, cost of the path/hop count and other attributes of the route.

### **Sockets**

Mechanism for creating a virtual connection between processes.

### **Software Interface**

A boundary between two software entities that interact with each other. This interface may be via passing of message control blocks, calling of code points, or some other method of passing information from one entity to another.

### **Virtual Circuits**

A connection oriented network service, which is implemented on top of a network which may be connection oriented or connection less.



## 5 Other

### Bridge

1. In communication networks, a device that:

- links or routes signals from one ring or bus to another or from one network to another,
- may extend the distance span and capacity of a single LAN system,
- performs no modification to packets or messages,
- operates at the data link layer of the ISO Open Systems Interconnection Reference Model (Layer 2),
- reads packets, and
- passes only those with addresses on the same segment of the network as the originating user.

2. A functional unit that interconnects two local area networks that use the same logical link control procedure, but may use different medium access control procedures.

### Classification

The function of applying filters to network packet.

### Event

1. An occurrence or happening, usually significant to the performance of a function, operation or task.

Note: An event:

- may be persistent or temporary, thus allowing for functions, such as surveillance, monitoring, and performance measurement,
- may generate reports,
- may be spontaneous or planned,
- may trigger other events, and
- may be triggered by one or more other events.

### Messaging

Communication between processors (i.e. Control Processor and Network Processor or between Network Processors) conveying a range of configuration, dynamic state and hardware status.

### Microcode

Software that is executed on an embedded processor or a network processor.

### Modifier

A packet processor (functional block) whose function is to modify packets.

### Next Hop

A reference from a network entity to another network entity at the same OSI layer that data for a set of destinations should be forwarded to as the way to reach those destinations.

### Router

In data communications, a functional unit used to interconnect two or more networks. Note:

- Routers operate at the network layer (layer 3) of the ISO Open Systems Interconnection Reference Model.
- The router reads the network layer address of all packets transmitted by a network, and forwards only those addressed to another network.

### **Shaper**

A functional block that delays packets within a traffic stream to cause it to conform to some defined traffic profile.

### **Split Network Architecture**

The separation of the set of entities that are primarily responsible for the forwarding of packets into a “Forwarding Plane”, from the set of entities that are primarily responsible for setting state into the “Control Plane”. – includes data plane, control plane, and management plane.

### **Subscriber**

An entity that requests notification of the occurrence of an event.

### **Throughput**

1. The number of bits, characters, or blocks passing through a data communication system, or portion of that system. Note:

- Throughput may vary greatly from its theoretical maximum.
- Throughput is expressed in data units per period of time; e.g., in kilo, mega or giga bits per second.

2. The maximum capacity of a communications channel or system.

3. A measure of the rate at which a system can process or transmit information.

### **Traffic Management**

Functions that implement quality of service (QOS) to network packets. These functions include but are not limited to buffer management, traffic scheduling and packet modification.