OF-Config (OpenFlow Configuration and Management Protocol)

The OpenFlow Management and Configuration Protocol (OF-Config) is a special set of rules that defines a mechanism for [OpenFlow](http://whatis.techtarget.com/definition/OpenFlow) [controllers](http://whatis.techtarget.com/definition/controller) to access and modify [configuration](http://searchexchange.techtarget.com/definition/configuration) data on an OpenFlow [switch](http://searchtelecom.techtarget.com/definition/switch).

One of the most common methods of implementing a [software-defined network (SDN)](http://searchsdn.techtarget.com/definition/software-defined-networking-SDN) is to [decouple](http://whatis.techtarget.com/definition/decoupled-architecture) the[control plane](http://searchsdn.techtarget.com/definition/control-plane-CP) from a physical network and place management in a centralized controller. Often, that controller uses OpenFlow as a [southbound](http://whatis.techtarget.com/definition/northbound-interface-southbound-interface) protocol to direct specific flows between [nodes](http://searchnetworking.techtarget.com/definition/node) on the network. Although OpenFlow determines how [packets](http://searchnetworking.techtarget.com/definition/packet) are forwarded between individual sources and destinations, it doesn’t provide the configuration and management functions that are needed to allocate [ports](http://searchnetworking.techtarget.com/definition/port) or assign [IP addresses](http://searchunifiedcommunications.techtarget.com/definition/Internet-Protocol). OpenFlow configuration protocols, like OF-Config, help with this and give network engineers an overall view of every area of the network. They also offer provide engineers with the ability to set policies and manage traffic across devices.

The OF-Config protocol is being developed by the [Open Networking Foundation](http://whatis.techtarget.com/definition/Open-Networking-Foundation-ONF). is used to manage [physical](http://searchtelecom.techtarget.com/definition/switch) and [virtual switches](http://searchservervirtualization.techtarget.com/definition/virtual-switch) in an OpenFlow environment.

The OpenFlow protocol assumes that an OpenFlow switch (e.g. an Ethernet switch which supports the OpenFlow protocol) has been configured with various artifacts such as the IP addresses of OpenFlow controllers. The motivation for the OpenFlow Configuration Protocol (OF-CONFIG) is to enable the remote configuration of OpenFlow switches. While the OpenFlow protocol generally operates on a time-scale of a flow (i.e. as flows are added and deleted), OF-CONFIG operates on a slower time-scale. An example is building forwarding tables and deciding forwarding actions which are done via Openflow protocol while enabling/disabling a port generally does not need to be done at the timescale of a flow and, hence, is done via OF-Config protocol. OF-CONFIG defines an OpenFlow switch as an abstraction called an OpenFlow Logical Switch. The OFCONFIG protocol enables configuration of essential artifacts of an OpenFlow Logical Switch so that an OpenFlow controller can communicate and control the OpenFlow Logical switch via the OpenFlow protocol. OF-CONFIG introduces an operating context called an OpenFlow Capable Switch for one or more OpenFlow switches. An OpenFlow Capable Switch is intended to be equivalent to an actual physical or virtual network element (e.g. an Ethernet switch) which is hosting one or more OpenFlow Logical Switches by partitioning a set of OpenFlow related resources such as ports and queues among the hosted OpenFlow Logical Switches. The OF-CONFIG protocol enables dynamic association of the OpenFlow related resources of an OpenFlow Capable Switch with specific OpenFlow Logical Switches which are being hosted on the OpenFlow Capable Switch. OF-CONFIG does not specify or report how the partitioning of resources on an OpenFlow Capable Switch is achieved. OF-CONFIG assumes that resources such as ports and queues are partitioned between multiple OpenFlow Logical Switches such that each OpenFlow Logical Switch can assume full control over the resources that is assigned to it.

OF-CONFIG 1.2 makes simplifying assumptions about the architecture of OpenFlow switches. The specification is deliberately decoupled from whether the switch supports virtualization models or specific hybrid operational models, for example. The service which sends OF-CONFIG messages to an OpenFlow Capable Switch is called an OpenFlow Configuration Point. No assumptions are made about the nature of the OpenFlow Configuration Point. For example, it may be provided by software acting as an OpenFlow controller or it may by a service provided by a traditional network management framework. In some deployment contexts, the OpenFlow Configuration Point and OpenFlow controller may belong to different administrative entities, e.g., provider and customer, respectively. Interactions between the OpenFlow Configuration Points and OpenFlow controllers is outside the scope of OF-CONFIG 1.2, but is expected to be addressed in future versions of the specification. Figure 2 shows the basic abstractions detailed in OF-CONFIG 1.2 and the lines indicate that the OpenFlow Configuration Points and OpenFlow Capable Switches communicate via OF-CONFIG. The configuration settings then take effect on targeted logical switch(es). OpenFlow Controllers and OpenFlow Logical Switches communicate via OpenFlow.

