

OS³E / NDDI Glossary

Partnership / Substrate / Service Terms

Network Development and Deployment Initiative (NDDI) Partnership: The partnership between Indiana University, Internet2 and the Clean Slate Program at Stanford University to develop a next-generation network facility upon which to build multiple services.

NDDI Substrate: The Software-Defined Networking substrate that the NDDI Partnership develops and deploys. It will consist of OpenFlow control of network switches that are interconnected on a national scale.

Open Science, Scholarship, and Services Exchange (OS³E): A slice of the NDDI Substrate that will provide layer2 Ethernet service to the Internet2 community.

LHCONE: A distributed open science exchange requested by Large Hadron Collider Tier 2 Working Group (LHC T2 WG). The North American component is planned to be implemented on the OS³E NDDI slice in a fashion to be determined.

At-Scale Network Research Testbed: A potential future Internet2 service that could be supported by NDDI Substrate. It is likely that this service will be implemented atop a number of NDDI slices that are each focused on individual research projects.

Interoperable On Demand Network (ION): The existing Internet2 Layer 2 VLAN service. Circuits atop this network are typically short lived in duration.

NDDI Technical Terms

Software-Defined Networking: A term used to define an approach to networking in which the forwarding of packets is controlled by user-defined software. OpenFlow is a protocol that enables Software-Defined Networking.

OpenFlow: A protocol developed at Stanford University to provide an open way of adding a flow-table into commercially available networking equipment as an alternative method of controlling traffic. Key features are flexible methods of forwarding traffic and the ability to build/control flow-tables from one or more OpenFlow controllers. It is the standard to which all NDDI software is engineered to control the NDDI Substrate and provide services. For more information, see Stanford's [Openflow whitepaper](#).

Network Slice: A portion of an OpenFlow-enabled network that is isolated from other users. This enables multiple researchers and services to co-exist without disrupting one another.

Flow: A point to point virtual channel through an OpenFlow-enabled network that has a distinct ingress and egress location, built by populating flow table entries in the network. Flows can be identified and routed based on one or more characteristics such as VLAN tag, IP destination address, or TCP port.

VLAN: A specific type of circuit that is identified and routed based on an 802.1q Ethernet

VLAN tag.

Flowvisor: The system which allows for slicing of OpenFlow-enabled switches, by providing a control mechanism to allow multiple OpenFlow controllers to control separate parts of the same OpenFlow-enabled switch. This results in the ability to provide isolated network services over the same underlying substrate. For more information, see Stanford's [FlowVisor tech report](#) and [Flowvisor Demo Video](#)

OpenFlow Controller: The system which provides and receives OpenFlow-compliant commands from OpenFlow-enabled network equipment to control and route network traffic on the equipment.