

IXP Technical Requirements OIX-1 for Non-profits

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This standard defines the technical requirements for a Non-profit IXP to be certified by Open-IX. The purpose of the requirements is to provide publicly available information on what the participants of a certified IXP can expect, and not to describe in detail how the IXP is designed, built or operated. IXPs can comply with the Open-IX standards to serve different communities with different requirements, from a small single datacenter IXPs serving a local community to a large IXP located in multiple datacenters in a metro area.

The keywords used throughout the document are as defined in RFC 2119.

The IXP SHOULD follow the Best Current Operational Practices for an Internet Exchange, posted at http://nabcop.org/index.php/Main_Page.

Definition of an IXP

A physical network infrastructure operated by a single entity with the purpose to facilitate the exchange of Internet traffic between Autonomous Systems (ASs). The intention is to connect more than two ASs, and there MUST be a clear and open policy for others to join.

To achieve Non-profit Status for this certification:

- (1) Is not owned or controlled by a colocation provider; and
- (2) Has either
 - (a) no recurring charges for connected networks, pass-through cost-recovery charges exempted; or
 - (b) a maximum yearly revenue of \$100,000 US or local equivalent.

Services

Minimal Service Offering

The IXP MUST provide the minimum services described below. This also allows the IXP operator to provide additional services, or methods of interconnection.

Public Exchange VLAN (IX)

A switch platform which allows any-to-any interconnection. Customer interfaces with Ethernet frames tagged for the public exchange VLAN MUST be forwarded in accordance with the traffic rules indicated in this document.

Additional Service Offering

The IXP MAY provide additional services, as long as they are described on a publicly available website of the IXP.

Private VLAN (PVLAN)

A private switch platform, whereby any two or more parties may consent to interconnect through either the same physical port that delivers their access to the Public Exchange VLAN or alternatively dedicated physical port(s). If a PVLAN service is offered, in case there are exactly two parties in the private VLAN the connection MUST be delivered guaranteed congestion free. In case of more than two parties the service MAY be best effort.

Physical Interface

The IXP MUST offer IEEE 802.3 Ethernet connectivity on a common switch infrastructure. Service offerings MAY be available at any IEEE defined rate, including IEEE 802.3ad or IEEE 802.1AX link aggregation of any of these rates.

The complete service offering MUST be described on a publicly available website. The information provided MUST contain: link rate and physical media (copper, fiber and fiber type). The information SHOULD describe how each port type is connected to the fabric.

Traffic Forwarding

The IXP MUST forward frames with the following Ethertypes:

- 0x0800 IPv4
- 0x86dd IPv6

Valid frames with Ethertype 0x86dd may be suppressed on the Public Exchange VLAN using snooping, or alternate methods used to implement IPv6 Neighbor Discovery.

If there is no provision to handle ARP in any other way, the IXP MUST forward frames with the following Ethertype:

- 0x0806 ARP

If the IXP has reason to limit certain traffic, the IXP MUST publish on a publicly available website what traffic is not allowed and or not forwarded on the exchange platform.

If the IXP applies a MAC address locking mechanism on a participants port, then the IXP MUST make known to customers the process to update MAC addresses.

Customer Interface

The IXP MUST provide a clear demarcation point between the IXP services and the customer. This can be either directly on the exchange or via a common demarcation point available to the participants.

Infrastructure

Switching Platform

The IXP switching platform MUST have backplane capacity to sufficiently handle the aggregate traffic of all customer facing ports, without oversubscription. If individual switching elements contain multiple switch fabric modules, the same conditions MUST apply during single component failures.

The IXP MUST run any inter-switch links congestion free.

The IXP SHOULD have redundant power feeds fed from discrete sources (A and B) for all exchange infrastructure. If the IXP does not have redundant power feeds on any components, it MUST describe where not on a publicly available website.

If the IXP does not have full path diversity between two discrete switching elements in different physical locations, this MUST be described on the IXPs publicly available website.

The IXP MUST describe on a publicly available website the infrastructure and the redundancy measures implemented to overcome single component failures.

IP Address Space

In order to be independent of any of the connected parties, the IP space used on the “Public Exchange VLAN” MUST be PI space or other IP space directly assigned by a RIR for the purpose of operating an IXP. This applies to both IPv4 and IPv6. The IXP operator is responsible for obtaining address space from the respective RIR, as well as providing all material for justification, documentation, and applicable fees as required by the RIR.

Route Server

If a route server service is offered then it MUST support both IPv4 and IPv6, and 16-bit and 32-bit ASNs. The AS number used for the route server implementation MUST be a unique AS number assigned by one of the RIRs for the purpose of operating an IXP. The IXP SHOULD use a 16 bit ASN.

The IXP SHOULD have at least two route servers. The route servers SHOULD be in diverse locations, and connected to discrete switching elements. If the IXP does not have route servers in diverse locations, or does not have two route servers connected to discrete switching elements, it MUST be described on the IXP’s publicly available website.

The IXP MUST publish the route server setup on a publicly available website.

Operations

NOC

The IXP MUST publish a telephone number, email address or any other means that provides immediate access to technical support, on a website available to its participants, on how to contact operational staff that is capable of managing the IXP infrastructure. The access method MUST be available 24x7, note this does not mean staff needs to be available 24x7, but the IXP MUST publish staff hours.

The IXP MUST provide and publish a procedure to announce service affecting maintenance to its participants.

Monitoring

The IXP MUST monitor the exchange platform for performance degradation and service affecting events.

The IXP MUST provide a procedure to inform its participants on performance degradation and service affecting events.

Statistics

The IXP MUST publish on a publicly available website the participants on the peering platform and the relevant AS numbers.

The IXP MUST publish on a publicly available website the total sum of all incoming and outgoing traffic in bps from all connected networks on the public peering VLAN. The traffic sum MUST include the traffic on customer facing ports only and MUST be made up of 5 min average traffic measurements. A distinction MUST be made between the traffic on the public peering VLAN and any other interconnection service.

Website

The IXP MUST have available and maintain a publicly available website where at least the subjects mentioned in this document MUST be addressed.

Miscellaneous

The IXP MUST have and maintain an accurate entry in a peering contact and configuration directory such as <https://www.peeringdb.com>. This entry MUST contain a list of all facilities with a point of presence.