UAE-IX Technical Policy and SLA

Contents

1. Definitions:

The following terms and phrases shall have the meanings ascribed to them below when used in this Policy:

Co-location Service	:	the rack hosting service offered by UAE-IX partners within the same premises as the IX Platform.
Data Centres	:	the physical premises where the IX Switching Fabric is located, to which the Participant is physically connected and its environment
Data Centres Provider	:	the operator of the SFData Centres.
IX Patch Panel	:	The patch panel that provides direct physical connectivity to the IX Switching Fabric, where Participants connect their equipment.
IX Port or Port	:	A physical port on the IX Switching Fabric.
IX Route Server	:	A server that stores and directs information among Border Gateway Protocol (BGP) routers. The IX Route Server is an integral part of the IX Platform ;
Multicast VLAN	:	the local area network on the Peering Platform that is dedicated for Peering multicast IPv4 and IPv6 traffic;
Participant	:	Any person who Peers with other Participant(s) using Internet Exchange Services provided by UAE-IX pursuant an Agreement with UAE-IX ; Customer is a Participant
Peering Subnet	:	address range dedicated for the Peering LAN;
Peering LAN	:	the local area network on the Peering Platform that is dedicated for Peering unicast IPv4 and IPv6 traffic ;
Peering Arrangement	:	Any bi-lateral or multi-lateral agreement made between Participants of the UAE-IX pursuant to which Participants peer IP traffic with each other using the IX Platform;
Regional Internet Registry		an organization that manages the allocation and registration of ASN and IP addresses for specific region as recognized by ICANN as a regional internet registry;
IX Switching Fabric	:	The realm of the UAE-IX equipment, with border at the UAE-IX Patch Panel Port;
Service Availability or Uptime	:	The period of time during which Scheduled Maintenance is taking place, the IX Switch Fabric and IX Port operate as intended and pass Participants traffic, excluding Scheduled Maintenance Time;
Scheduled Maintenance	:	The period of time during which Scheduled Maintenance is taking place, the IX Platform is not performing as intended and traffic

Time		among Participants is effectively obstructed. Scheduled Maintenance Time will be communicated to Participants as provided in the General Terms & Conditions.
UAE-IX Policies	:	All UAE-IX policies set forth in the Technical Policy & SLA and the General Terms & Conditions.
Sandbox Environment	:	An environment where a Participant's systems connected to the IX Platform can transmit and receive traffic to the IX Platform without affecting the IX Platform or any of the other Participants and without being connected to the Peering LAN;
Service Credits	:	an amount which will be credited towards the Charges payable by the Participant for the Service in accordance with section 12 of this document
Service Credit Days	:	The number of days by which the initial service term will be extended where the Service has failed to meet the availability metrics in accordance with section 12 of this document
Service Order	:	the document that describes the specific services that will be provided to the Participant and that UAE-IX Coordinator will fulfil pursuant to an Agreement with UAE-IX Coordinator.
Target Service Commencement Date	:	The date on which UAE-IX Coordinator provides the Participants an access to the Peering LAN on the IX Platform;
Transit Link	:	a link that is used to transmit or receive Transit Traffic
Transit Traffic	:	IP traffic where the originating party can see upstream routes over the peering connection; and
UAE-IX	:	The UAE-based UAE-IX Platform and all services generated from or provided through this platform.
UAE-IX Coordinator	:	The licensed UAE legal entity contracting with Participants to provide UAE-IX Platform Services.
UAE-IX Platform	:	All the networks, systems, cables, servers operated by the UAE-IX to enable a Participant to Peer with other Participants.

2. Purpose & Scope:

This Policy applies on Participants of UAE-IX.

In order to maintain the security and stability of the IX Platform, ensure smooth operations of the UAE-IX Platform and reach the Service Levels targets, the Participants must adhere to certain protocols and standards while connecting to IX Platform.

The purpose of this Policy is to detail all technical-related requirements and policies that must be adhered to by Participants of UAE-IX. This includes but is not limited to policies relevant to:

   a. Access;

   b. technical standards and protocols;

   c. Connectivity;

   d. Peering;

   e. Information security;

   f. Locating equipments; and

   g. Configurations of equipments and interfaces.

3. Effective date

This Policy shall be effective on the effective Date of the Agreement to which it is attached.

4. Disabling IX Ports

Where a Participant is non-compliant with one of the IX Policies, UAE-IX Coordinator reserves the right to disable IX Ports of Participants and / or take any other corrective measures at the sole discretion of UAE-IX Coordinator. UAE-IX Coordinator will contact the Participant representative(s) to inform them about the non-compliance prior to disconnection, and provide Participant with a ten (10) day opportunity to cure before disconnection.

5. Physical Access Policy

Physical access to the IX Platform sites is strictly restricted to staff and third parties authorized   by UAE-IX only. Participant's cable termination to the IX Platform may only be performed by   staff or third parties authorized by UAE-IX.

Note: access to Participants' platforms is not covered by this Policy; such access is governed by the agreement between the Participant and the Data Centres Provider (refer to clause 7 - Co- location Policy) [WHERE IS THIS DOCUMENT?]

6.   Co-location Policy

6.1.   Depending on their network architecture and requirements, Participants may require acquiring Co-location Service to host equipment within the facility where UAE-IX has presence.

6.2.   UAE-IX does not provide a Co-Location Service to Participants. Such services are offered by the Data Centre Providers where UAE-IX has a presence. Participants may seek such services through the Data Centres Provider directly.

6.3.   UAE-IX Coordinator may collaborate with the Data Centres Provider to provide a one-stop-shop solution for Participants. Quotations for such a service will be provided on a case-by-case basis upon request.

7.   Connectivity Policy

7.1.   **General Provisions**

7.1.1   Each Participant must obtain one IX Port on the IX Platform. Participants may request more than one IX Port for redundancy or capacity or load-balancing purposes. UAE-IX will provide ports subject to availability and to this Policy.

7.1.2   UAE-IX allocates IX Ports to Participants directly. It is prohibited to resell an IX Port to any other party whatsoever, including other Participants unless authorized by UAE-IX

As access to IX Platform will only enable the Participant to exchange traffic to part of the Internet. As such Participants will be required to reach the Internet through alternative means such as transit links provided by other parties locally or internationally.

7.1.3   The IX Platform shall not be used to exchange Transit Traffic

7.2.   **Provisioning New Ports**

7.2.1   Any new connections will be put into quarantine condition. In this situation, the Participant's connections are isolated from other Participants by being confined within an isolated network (Sandbox Environment). This is required in order to conduct tests to verify whether the Participant's connections and configurations are compliant with the Technical Policy including but not limited to:

a.   compliance of the equipment with layer 2 requirements (e.g. IPv4 ARP, IPv6 NDP, Ethernet framing, MAC layer addresses);

b.   compliance of the equipment with layer 3 requirements (e.g. IP address requirements); and

c.   compliance of the equipment with higher layer requirements (e.g. BGP with a route server process, handling of BGP announcements/confederations).

7.2.2   The necessary technical verification will take up to five working days, and two working days for preparing equipment to be fully integrated into the switching environment, accordingly the Participants will be notified for preparation and full operation.

7.3.   **Connectivity Services outside the IX Platform**

7.3.1   UAE-IX does not provide connectivity services outside the IX Platform.

7.3.2   The Participant will be responsible for obtaining connectivity up to the IX Patch Panel.

7.3.3   Participants may seek connectivity services from Data Centres Provider or one of the providers Licensed by the TRA. UAE-IX Coordinator will provide or publish the necessary contact details for this purpose.

7.3.4   Termination to the IX Patch Panel will be carried out by parties authorized by UAE-IX.

8.   Interfaces and Switching Policy

8.1.   **One network per port:** Each IX Port will allow only one network; that is each IX Port will be restricted to an individual MAC address and IP as specified by the Participant. Frames forwarded from attached Participant Device to an individual IX Port shall all have the same source MAC address.

Interface types: UAE-IX Coordinator shall provide IX Ports to Participants as either 1GE- SX or 10GE-SR

8.2.   **Interface settings:** With respect to Participants' Ethernet interfaces, Participants shall explicitly configure speed and duplex. Auto-sensing configurations shall be disabled.

8.3.   **Ethertypes:** Frames forwarded to IX Port shall have one of the following ethertypes

a)   0x0800 - IPv4

b)   0x86dd - IPv6

8.4.   **Unicast only:** Frames forwarded to IX Ports shall not be addressed to a multicast or broadcast MAC destination address except multicast ICMPv6 Neighbour Discovery packets where a Participant interface is connected to the Multicast VLAN, in which case Ethernet frames may be forwarded which are destined to multicast group addresses.

8.5. **No link-local traffic:** Except IPv6 ND, Traffic for Link-Local Address shall not be forwarded including but not limited to the following link-local protocols:

a) IRDP

b) ICMP redirects

c) IEEE802 Spanning Tree

d) Vendor proprietary discovery protocols, for example but not limited to
   o Discovery protocols, for example but not limited to CDP and EDP
   o VLAN/trunking protocols, for example but not limited to VTP and DTP

e) Interior routing protocol broadcasts, for example but not limited to OSPF, ISIS, IGRP, EIGRP

f) BOOTP/DHCP

g) PIM-SM

h) PIM-DM

i) DVMRP

j) ICMPv6 ND-RA

k) UDLD

l) L2 Keep alives

where a Participant interface is connected to the Multicast VLAN, in which case PIM-SM and MSDP may be run on the interface.

9. Peering and Routing Policy

9.1. UAE-IX Coordinator follows open-peering policy where Participants may establish Peering Arrangements between each other either by:

a.   Using the Route Servers, or

b.   Bi-lateral arrangement as long as the arrangement does not violate UAE-IX Policies,

except where required by the TRA or by law, as in that case Participants must follow the directions and policies set by the TRA or by law.

9.2. IXP has set up Route Servers for peering; Participants must peer with these servers.

9.3. UAE-IX Coordinator is mandated to follow any instructions or directions or regulations set by the UAE TRA. UAE-IX Coordinator will enforce any of these instructions with respect to peering and switching and provide further details such as mechanisms to enforce such instructions, directions or regulations on the Participant in this clause of the Policy.

9.4. Participant shall not advertise the Peering Subnet, just as Participant would not advertise a subnet that does not belong to them. The Peering Subnet belongs to UAE-IX Coordinator; it is up to UAE-IX Coordinator to advertise it if it sees fit to do so.

9.5.   All exchange of routes across the IX Platform shall be via BGP-4, except where a Participant interface is connected to the Multicast VLAN, in which case PIM-SM and MSDP may also be run on that interface.

9.6.   ASNs used in BGP-4 sessions across the IX Platform shall not be from ranges reserved for private use (Private ASN). The only exception to this is when a BGP speaker is collecting routing information for analysis and not for immediate routing decisions. In this case the BGP speaker may use a private ASN. If it does so it shall not advertise any routes.

9.7.   IP address space assigned to the Peering LANs shall not be advertised to other networks without prior explicit permission of UAE-IX.

9.8.   All routes advertised across the IX Platform shall point to the router advertising them unless agreement has been made in advance in writing between UAE-IX Coordinator and both route Participants involved. For the avoidance of doubt, the IX Route Servers are not routers and shall advertise routes pointing to the advertising router.

9.9.   All routes to be advertised in a peering session across the UAE-IX shall be registered in the RIPE or other public routing registry.

9.10. Participants may use more than one ASN for their peering provided that all ASNs presented share the same network operation centre and peering contact details.

   9.10.1 Traffic shall only be forwarded to a Participant when permission has been given by the receiving Participant

   9.10.2 by advertising a route across the IX Platform

9.11. Disputes and disagreements raised between the Participants in relation to Peering Arrangements on the IX Platform should be settled as provided in the Agreement.

9.12. Traffic shall not be routinely exchanged between two IX Ports owned by the same Participant.

9.13. Participants shall not advertise the Peering Subnet.

9.14. Source addresses of IP packets originating from the Participant interface to the IX Platform must be officially assigned by one of the Regional Internet Registries.

9.15. Participants must not Announce to Route Server Private IP Addresses, Private ASNs, and default routes

9.16. Participants must disable

   9.16.1 ARP Proxy; and

   9.16.2 IP Redirects;

9.17. BGP NextHop Rewrite is prohibited;

9.18. Traffic shaping is prohibited;

9.19. Interfaces connected to IX Ports shall only use IP addresses and netmasks (prefix lengths) assigned to them by UAE-IX. In particular:

9.19.1 IPv6 addresses (link & global scope) shall be explicitly configured and not auto-configured; and

9.19.2 IPv6 site-local addresses shall not be used

9.20. IP packets addressed to the Peering LAN directed broadcast address shall not be automatically forwarded to IX Ports.

10. Information Security

10.1. Participants shall not install 'sniffers' or similar devices in an attempt to monitor traffic passing through the IX Platform.

10.2. Participants and Supplier shall not carry out any activities that are in breach of the UAE laws and regulations.

11. Service Levels

11.1. **Outage Defined**. An Outage means the amount of time the Service is unavailable to support Customer traffic, meeting or exceeding the service performance specifications specified in this SLA. Availability objective for the Service is calculated and applicable between Customer demarcation points, inclusive of cross-connects provided by UAE-IX. Unavailability is signaled by the first of ten (10) severely errored seconds ("SES") in any fifteen (15) minute period and the end is signaled by nine (9) or fewer SESs in any fifteen (15) minute period. An SES is a second with a bit error ratio of greater than or equal to 1 in 1,000. Customer-supplied access links, scheduled maintenance and planned outages (subject to the Scheduled and Unscheduled Outage Cap described in the General Terms & Conditions) are excluded from this availability. UAE-IX will coordinate with Customer for scheduled maintenance, and planned outage(s) to minimize Customer impact.

An Outage also means an unscheduled period in which an SLA parameter is not being met. If any such Outage condition occurs, the subject Service will be deemed Unavailable and applicable Outage Credits will be calculated and applied.

11.2. Availability. Availability is calculated as follows:

Percentage Availability = $\frac{\text{(\# of minutes in the month) - (\# of qualified outage minutes) x 100}}{\text{(\# of minutes in the month)}}$

11.3. **Outage Credits**. In the event of an Outage, Customer will be entitled to a credit (the "Outage Credit") determined according to the following formula:

Outage Credit = Qualified Credit % x MRC of Affected Services

The amount of Qualified Credit Percentage will be determined in accordance with the below table (on a cumulative monthly basis):

Availability	Service Level Credit
If Availability is 99.99% or greater	0%
If < 99.99% but > or =to 99.7%	credit = 10%.
If < 99.7% but > or = to 99.2%,	credit = 25%.
If < 99.2% but > or = to 98.5%,	credit = 50%.
If < 98.5%,	credit = 100%.

The Outage Credit will apply to the monthly recurring charges for the affected service. The length of each Outage will be calculated in minutes. An Outage will be deemed to have commenced upon verifiable notification thereof by Customer to UAE-IX, or, when indicated by network control information actually known to UAE-IX network personnel, whichever is earlier. Each Outage will be deemed to terminate upon restoration of the affected Service as evidenced by appropriate network tests by UAE-IX. UAE-IX's trouble ticketing system will be the primary source of data for calculating Outage Credits. In the event of a discrepancy between UAE-IX and Customer concerning an unplanned outage time or duration, Customer and UAE-IX will work together in good faith to identify the cause of the discrepancy.

11.4. **Chronic Outage**. In the event Customer experiences Chronic Outages with respect to the Service, Customer will be entitled to terminate the Agreement, as defined in the Terms, or the affected Service Order without further obligation by providing Supplier with written notice following such Chronic Outages (a "Chronic Circuit Cancellation"). For purposes of this Section, a Service suffers from Chronic Outages if such Service experiences: (a) more than three (3) Outages over any thirty (30) consecutive day period; (b) more than twenty-four (24) aggregate hours of Outages over any ninety (90) consecutive day period; or (c) below 99.5% availability for three (3) months in any six (6) month period. Customer must exercise any termination right available to it under this Section within ninety (90) days after Customer first becomes eligible to exercise the applicable termination right.

11.5. **Exclusions to Payment of Service Credits**

Service Credits will not be payable by UAE-IX Coordinator to the Participant in relation service availability for faults or disruptions to the UAE-IX Services caused by any of the following

11.5.1 the fault or negligence of the Participant, its employees, agents or contractors;

11.5.2 the Participant failing to comply with this Agreement;

11.5.3 a fault in, or any other problem associated with, the Participant's Equipment;

11.5.4 any event described as Force Majeure in the General Terms & Conditions;

11.5.5 a failure by the Participant to give UAE-IX Coordinator access to any equipment related to the provision of the IX Services after being requested to do so by UAE-IX Coordinator for the purposes of investigating and rectifying any fault; or

12. Fault Reporting and Management

12.1. Faults

Any suspected faults should be reported to UAE-IX Coordinator Technology Service Desk using the contact information provided in the Participant Reference Manual. When reporting a fault, the Participant should identify the affected UAE-IX Service and provide details of the fault.

12.2. Target Time to Repair (TTR)

UAE-IX Coordinator will endeavour to rectify any Service Affecting Fault within 5 hours of acknowledging the fault notification from the Participant

12.3. Fault duration

All faults recorded by the UAE-IX's systems will be reconciled against the corresponding fault ticket raised by UAE-IX Coordinator Technology Service Desk. The exact fault duration will be calculated as the elapsed time between when the fault is acknowledged by UAE-IX Coordinator's Technology Service Desk and the time when Service is restored.

Annex1: Schedule of Technical Terms and Protocols

serial	Abbreviation	Term	Reference
1	ARP Proxy	Address Resolution Protocol Proxy	RFC 1027
2	ARP	Address Resolution Protocol	RFC 826
3	AS	Autonomous System	RFC 1930
4	ASN	Autonomous System Number	RFC 1930
5	Ethernet	Ethernet	IEEE 802.3
6	IPv4	Internet Protocol Version 4	
7	IPv6	Internet Protocol Version 6	
8	LAN	Local Area Network	
9	VLAN	Virtual Local Area Network	
10	BGP	Border Gateway Protocol	RFC 4271
11	BGP-4	Border Gateway Protocol version 4	RFC 4271
12	MSDP	Multicast Source Discovery Protocol	RFC 3618
13	PIM-SM	Protocol Independent Multicast - Sparse-Mode	RFC 4601
	PIM-DM	Protocol Independent Multicast - Defence-Mode	
14	DVMRP	Distance Vector Multicast Routing Protocol	RFC 1075
15	DHCP	Dynamic Host Configuration Protocol	RFC 2131
16	BOOTP	Bootstrap Protocol	RFC 951
17	UDLD	UniDirectional Link Detection	RFC 5171
18	L2 Keepalives	Layer 2 keep-alives	

serial	Abbreviation	Term	Reference
19	ICMPv6 ND-RA	Internet Control Message Protocol version 6	RFC 4861
		Neighbour Discovery Protocol Router Advertisements	
20	IPv6 ND	Internet Protocol version 6 Neighbour Discovery Protocol	RFC 4861
21	VTP	Cisco's Virtual Local Area Network Trunk Protocol	Cisco
22	DTP	Cisco's Dynamic Trunking Protocol	Cisco
23	OSPF	Open Shortest Path First	RFC 2328 and RFC 5340
24	ISIS	Intermediate System To Intermediate System	RFC 1142
25	IGRP	Cisco's Interior Gateway Routing Protocol	Cisco
26	EIGRP	Cisco's Enhanced Interior Gateway Routing Protocol	Cisco
27	1GE-SX	A Fibre Optic Gigabit Ethernet Standard for Operation over Multi-Mode	IEEE 802.3z
28	10GE-SR	A Fibre Optic 10 Gigabit Ethernet Standard for Operation over Multi-Mode Fibre, Short Range	IEEE 802.3ae
29	-	Private IP Address	RFC 1918 and RFC 4193
30	-	Link-Local Address	RFC 3330
31	Private ASN	Private Autonomous System Number	RFC 1930