

SERVICE DESCRIPTION

TLLIX SERVICES



SERVICE DESCRIPTION

FOR

TLLIX SERVICES



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## 1. GENERAL

### 1.1 SCOPE OF APPLICATION OF THIS SERVICE DESCRIPTION

This document (the "Service Description") describes Linxtelecom TLLIX Services. This Service Description is an integral part of the Agreement with respect to TLLIX Services entered into by Linxtelecom and Participant.

Linxtelecom reserves the right to amend this Service Description from time to time upon notice. For those changes that will materially affect the Service, Linxtelecom will seek the consent of Participant.

### 1.2 BASIC OUTLINE OF THE TLLIX SERVICE

Linxtelecom TLLIX Services provide Participant access to the facilities and services necessary to exchange IP traffic with peers in the TLLIX location in Tallinn, Estonia. The TLLIX location offers strict security, tight environmental control, high-speed connectivity and battery and generator back-up power. Optionally, Linxtelecom may provide professional services to TLLIX participants, such as installation support, remote hands and monitoring.

### 1.3 DEFINITIONS AND TECHNICAL ABBREVIATIONS

In addition to the terms elsewhere defined in this Service Description and in the General Terms and Conditions which form part of the agreement with a Participant, the capitalized terms and technical abbreviations in the table below shall have the following meanings.

Definition	Description
<b>Acceptance Test</b>	Technical and administrative activities to verify compliance of a delivered service with its specifications.
<b>Cabinet Footprint</b>	Pre-wired facilities put at the disposal of Participant for the purpose of installing its cabinet, rack and Participant Equipment in the TLLIX location: this as further described in Section 2.3 hereof.
<b>Cross-Connect</b>	Fiber, coaxial or UTP connection made, maintained and administered by TLLIX between designated points on a TLLIX Optical or Digital Distribution Frame (ODF or DDF).
<b>Demarcation Point</b>	Hand-over point of a given Service to Participant.

<b>DDF</b>	Digital Distribution Frame.
<b>Fault</b>	Any power or cross-connect interruption or material degradation affecting (part of) the Participant Equipment installed in the TLLIX location.
<b>FTP</b>	File Transfer Protocol
<b>HTTP</b>	Hyper Text Transfer Protocol
<b>ICMP</b>	Internet Control Message Protocol
<b>IP</b>	Internet Protocol.
<b>ITU-T</b>	International Telecommunication Union – Telecommunication Standardisation Sector.
<b>Kbps</b>	Kilobit per second (also abbreviated as Kbit/s).
<b>Mbps</b>	Megabit per second (also abbreviated as Mbit/s).
<b>MRC</b>	Monthly Recurring Charge. Feature dependant fixed value, usually taking the form of a rental or subscription fee.
<b>NRC</b>	Non Recurring Charge. Feature-dependant fixed value, usually related to installation work.
<b>ODF</b>	Optical Distribution Frame.
<b>Participant or Customer</b>	A party that has entered into an agreement with Linxtelecom Estonia OÜ for the provision of a TLLIX Service .
<b>Participant Equipment</b>	Equipment of a Participant installed or to be installed at the TLLIX location in Tallinn, Estonia.
<b>Participant Guide</b>	Information guide provided to Participant on or around the time of hand-over of the TLLIX Service and updated from time to time by Linxtelecom which explains TLLIX technical support and escalation procedures, and provides Participant with a list of contacts in respect thereof.
<b>Participant Interface</b>	The interface made available by TLLIX to Participant at the Demarcation Point, to which Participant can connect the Participant Equipment.
<b>SLA</b>	The Service Level Agreement, forming an integral part of this Service Description (see Section 3).
<b>Third Party</b>	Any contractor, subcontractor, service provider, agent, supplier, counsel, or consultant contracted by Linxtelecom or Participant in connection with the TLLIX Service.

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<b>TLLIX</b>	TaLLinn Internet eXchange; location for the exchange of internet traffic between Participants
<b>TLLIX Rack</b>	Standard (19" or ETSI) rack owned by Linxtelecom, put at the disposal of Participant for the purpose of installing its Participant Equipment in the TLLIX location, this as further described in Section 2.3 hereof.
<b>TLLIX Service</b>	Any service provided or to be provided to a Participant as described in this Service Description
<b>UPS</b>	Uninterrupted Power Supply
<b>UTP</b>	Unshielded Twisted Pair, Category 5

## SERVICE DESCRIPTION

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## 2. SERVICE SPECIFICATION – TLLIX SERVICE

### 2.1 GENERAL

The TLLIX Service offers Participants access to a switched Gigabit Local Area Network in a controlled environment with tight management of environmental parameters, security, connectivity, power and additional facilities and services in the TLLIX location in Tallinn, Estonia.

### 2.2 SERVICE COMPONENTS

The TLLIX Service has the following components:

		Standard	Optional	NRC	MRC
1	Environmental control, access security, fire and smoke detection	+			
2	24*7*365 management	+			
3	Access to www.tllix.net	+			
3	Rack space in shared facility		+	+	+
4	Optical cross-connect to TLLIX LAN	+			
5	UTP cross-connect		+	+	+
7	Mains power 230Vac 50Hz	+			
	UPS 230Vac 50 Hz		+	+	+
	Battery power -48Vdc	+			
8	Installation Services		+	+	
9	Remote Hands Services		+	+	+
10	Monitoring and Alert Services		+	+	+
11	Private VLAN		+	+	+
12	Additional port		+	+	+

The service components required by Participant will be indicated on the Order Form.



## 2.3 STANDARD SERVICES

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### TLLIX STANDARD SERVICE

The TLLIX high-speed LAN is built using a redundant architecture with stackable Cisco switches. The design is highly scalable and capacity can easily and quickly be adapted in step with demand. TLLIX is fully monitored 24\*7\*365.

Participant may present a Gigabit Ethernet interface at the TLLIX location to which Linxtelecom will cross-connect a port of the TLLIX LAN switch. On his port, Participant will receive at least all packets pertaining to the TLLIX Public (Internet) VLAN. As an Option, he may order the VLAN Trunk service and create additional (private) VLANs.

### ACCESS TO WWW.TLLIX.NET

Participants have access to a secure web site at [www.tllix.net](http://www.tllix.net) which enables them to view their account status, order additional services and view port usage statistics. A news bulletin will be posted on this web site to keep participants abreast of developments in areas of common interest.

### SECURITY AND SAFETY

The TLLIX location is monitored 24\*7\*365 and is equipped with a card-key access system. Physical access is strictly regulated and restricted to Linxtelecom Personnel and Personnel designated by Participant.

Fire and smoke detectors and an automatic inert gas based fire suppression system minimize the risk of damaging any co-located equipment or interrupting any services provided in or from the TLLIX location.

A remotely monitored intruder alarm system detects unauthorized access attempts into the TLLIX location.

### CLIMATE CONTROL

Linxtelecom shall use all reasonable endeavours to ensure that the environmental conditions within the TLLIX location are maintained at constant levels to minimize temperature cycle induced aging of the Participant equipment. TLLIX location's redundant air-conditioning systems have been designed so that the ambient temperature in the TLLIX facility is maintained at 20 +/- 2°C respectively, at all times.

### POWER SUPPLY



At all Cabinet Positions and Racks in the TLLIX facility, mains power supply will be available throughout. The mains power will be derived straight from the Tallinn local utility mains supply (230 Vac@50Hz). TLLIX will forward this local mains power 'as is', including any spurious, black-out and brown out characteristics and without any guarantee. Service interruptions caused by failure of the Tallinn local utility mains power will not be taken into account for the calculation of Availability as defined in Section 3.3.

Optionally, a UPS can be offered. The specifications of the UPS power are: 230Vac +/- 15%, 50+/-2Hz). In the event that the primary input to the UPS fails, a back-up generator will start automatically to guarantee uninterrupted supply while keeping the UPS batteries charged.

At each Cabinet Position and Rack, uninterrupted battery power is optionally available at -48Vdc+/-15% via separate 10A circuit breakers.

The back-up generator has the capacity to supply the Participant Equipment and keep the batteries charged in case the primary mains input to the TLLIX location fails. The generator capacity has been designed to accommodate the power draw of a fully loaded TLLIX location.

## 2.4 OPTIONAL SERVICES

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### MONITORING AND ALERT (M & A) SERVICES

Upon request, Linxtelecom can monitor the state and connectivity of certain Participant Equipment 24\*7\*365. To this effect, Linxtelecom will periodically issue requests to the Participant Equipment monitored and log the responses. In case Participant Equipment does not respond a set number of times, or response performance exceeds a set threshold, Linxtelecom will alert Participant by e-mail and/or SMS message.

Monitoring and Alert Services will be charged on a subscription (MRC) basis. The requirement for M&A Services must be indicated on the Participant Order.



### PRIVATE VLANS

TLLIX imposes no limitations on private peering arrangements between participants; TLLIX purely acts as a L2 facilitator. A Private VLAN enables direct traffic exchange between two or more TLLIX participants over a dedicated VLAN on the TLLIX infrastructure. A Private VLAN can be implemented on an existing port using IEEE802.1Q-tagging.

If Participant wishes to set up one or more private VLANs with other participants, he should order the VLAN Service option and specify the number of ports on the VLAN. The requirement for the VLAN Service option should be indicated on the Order Form.

### DUAL/MULTIPLE CONNECTION

The standard TLLIX service is delivered via a single physical connection to a single port on the Participant Equipment. For enhanced availability or capacity, or for implementing a dedicated port private VLAN, some Participants may need an additional port.

Participants requiring multiple port connections should tick the applicable box on the Order Form.

### INSTALLATION SUPPORT SERVICES

Upon request, Linxtelecom staff may assist Participant with the installation of the Participant Equipment. Linxtelecom will have certified power engineers and telecommunications engineers, trained in applicable work practices, on site when required. The requirement for power or telecommunications related Installation Support Services shall be indicated on the Order Form. Linxtelecom staff will keep a record of their time spent and will request Participant to sign off on their time sheet at the completion of a project or on a weekly basis. Installation Support Services will be charged on an hourly basis.

### CO-LOCATION RACK SPACE

Rack space is available in standard 19" (or ETSI) telecommunications racks in single or multiple HU (1 HU = 1,75") racks side-by-side, with front and rear access and 1 meter common work space in front of and at the back of the racks.

All Racks will be pre-wired with mains power, earth connection and optical cross-connects to the TLLIX LAN switch. Any required additional cross-connects will be installed by Linxtelecom personnel upon request against standard charges and must be indicated on the Participant Order.

The total length of any cross-connect between any two Racks in the TLLIX location will normally not exceed 50 meters.



**CROSS-CONNECTS**

TLLIX will provide, maintain and administer all cross-connects in the TLLIX location in accordance with the following specifications:

<b>Cross-connect specifications</b>		
<b>Circuit type</b>	<b>Cross-Connect</b>	<b>Mechanical Characteristics</b>
Balanced electrical	UTP	Cat-5 punch block
Unbalanced electrical	4.2mm Coaxial	75 Ohm mini-BNC
Optical	MM Fiber	FC
Optical	SM Fiber	ST

The total length of any cross-connect between any two cabinets in the TLLIX facility, will normally not exceed 50m.

**CROSS-CONNECT DEMARCATION POINTS**

The cross-connects shall be presented to the Participant at the overhead punch blocks or connector blocks on the designated Rack.

**REMOTE HANDS SERVICES**

On-site Linxtelecom Personnel will assist Participant in managing the Participant Equipment by performing manual actions as instructed by and under the remote (telephone) supervision of Participant. An authentication procedure will be followed to verify the caller’s identity. Remote Hands Services may include:

- resetting Participant Equipment;
- power cycling Participant Equipment; and
- exchanging removable media in Participant Equipment.

Remote Hands Services will be charged on a subscription (MRC) and on a per event (NRC) basis. Participant’s requirement for these services must be indicated on the Order Form.

**2.5 PRICE STRUCTURE AND BILLING**

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Charges for the TLLIX Service shall be specified in the Order Form.



Linxtelecom shall invoice the agreed MRC's on a monthly basis in advance. If the Ready For Service Date for any service falls on another day than the first (1<sup>st</sup>) day of a calendar month, the first invoice to Participant for the MRC's shall consist of the pro-rated portion of the aggregate applicable MRC's covering the period from the Ready for Service Date to the first (1<sup>st</sup>) day of the subsequent calendar month. The NRC (one time installation charge) shall be invoiced on or around the date of acceptance.

## 2.6 CUSTOMER CARE

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Linxtelecom Customer Care is Participant's single point of contact for all operational issues and can be contacted 24 hours per day, 7 days a week.

Linxtelecom monitors the performance of the TLLIX Service according to the SLA and will use all reasonable endeavours to correct any Fault it detects. If Participant identifies a Fault, Participant contacts the ICC or RCC as applicable. The ICC or RCC will immediately open a trouble ticket, provide the trouble ticket number to Participant for reference and start the Fault resolution process. At regular intervals, Participant is informed of the status of the Fault resolution process.

## 2.7 MAINTENANCE

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Linxtelecom may carry out non-service affecting maintenance at its discretion and without notice. However, Linxtelecom shall abide with the following procedures in respect of service-affecting maintenance

### SCHEDULED MAINTENANCE AND INSPECTIONS

Linxtelecom will periodically conduct scheduled maintenance or remodelling activities within the TLLIX location, during which time Participant may be unable to access and/or use the Participant Equipment, and/or during which time the Participant Equipment may temporarily need to be switched off. Linxtelecom shall, where reasonably possible, provide Participant with seven (7) days' notice prior to conducting such scheduled maintenance or remodelling activities. Participant shall provide all reasonable assistance to TLLIX when it carries out maintenance or remodelling activities.

A Fault caused by Scheduled Maintenance shall not be taken into account when calculating service availability (see Section 3, SLA).

Linxtelecom may make periodic inspections of the TLLIX facility and the Participant Equipment upon reasonable advance notice to Participant. Participant shall have the right to be



represented during such inspections. In case of an actual or suspected emergency, Linxtelecom may make such inspections immediately, but shall thereafter provide notice of the inspection to Participant.

### URGENT MAINTENANCE

'Urgent Maintenance' shall refer to any efforts to correct TLLIX location conditions which are likely to cause or are causing an interruption of the TLLIX Service and which require immediate correction.

Linxtelecom may undertake Urgent Maintenance at any time that Linxtelecom deems necessary and shall provide notice of Urgent Maintenance to Participant as soon as is reasonably practicable under the circumstances. Linxtelecom will keep Participant regularly informed of the status of such maintenance activities.

A Fault caused by Urgent Maintenance shall be taken into account when calculating service availability (see Section 3, SLA), unless the Fault is not attributable to the actions or omissions of Linxtelecom or its Personnel or is otherwise excluded from this calculation under the Agreement.

## **2.8 PARTICIPANT RESPONSIBILITIES**

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### 2.8.1 PARTICIPANT INFORMATION

Participant must timely provide Linxtelecom with detailed information regarding the Participant Equipment, Participant Personnel involved and logistics details, which information will be used during the provisioning of the TLLIX Service and/or in the operational phase.

### 2.8.2 PARTICIPANT EQUIPMENT

Participant will ensure that all Participant Equipment and cables placed in the TLLIX facility comply at all times with all relevant national and international regulations in force with respect to heat emission, use of flammable materials and emission of toxic fumes.

Participant will ensure that all Participant Equipment and cables placed in the TLLIX facility comply at all times with all relevant national and international regulations in force with respect to electromagnetic radiation.



### 2.8.3 PARTICIPANT TECHNICAL REQUIREMENTS

The TLLIX Technical Requirements for Participants are listed below. For reasons of readability these requirements are grouped by layer of the OSI Reference Model.

#### **1. Layer 1 (Physical connection)**

1. Supported interfaces are 1000BASE-T (copper), 1000BASE-SX (multimode) and 1000BASE-LX/LH (single mode).
2. Ethernet interfaces attached to TLLIX ports shall be explicitly configured with duplex, speed and other configuration settings and shall not be auto-sensing.

#### **2. Layer 2 (MAC layer)**

1. Frames forwarded to an individual TLLIX peering port shall all have the same source MAC address.
2. Frames forwarded to TLLIX peering ports shall not be addressed to a multicast or broadcast MAC destination address except as follows:
  - \* broadcast ARP packets
  - \* multicast IPv6 Neighbour Discovery packets
3. Frames forwarded to peering TLLIX ports shall have one of the following ethertypes:
  - \* 0x0800 - IPv4
  - \* 0x0806 - ARP
  - \* 0x86dd - IPv6
4. Traffic for link-local protocols shall not be forwarded to TLLIX peering ports except for the following:
  - \* ARP
  - \* IPv6 Neighbour Discovery

#### **3. Layer 3 (IP layer)**

1. Interfaces connected to TLLIX peering ports shall only use IP addresses and netmasks (prefix lengths) assigned to them by TLLIX.
2. IP packets addressed to TLLIX peering LAN directed broadcast address shall not be automatically forwarded to TLLIX ports.
3. Traffic shall only be forwarded to a TLLIX Participant when permission has been given by the receiving Participant either:



- a) by advertising a route across the TLLIX network
  - b) or explicitly in writing
4. Traffic shall not be routinely exchanged between two TLLIX ports owned by the same TLLIX Participant.
5. There is no obligation to exchange traffic with all other Participants.

**4. Layer 4 (BGP4)**

- 1. BGP4 is the only routing protocol that shall be used by Participant to exchange routing information in peering sessions.
- 2. AS numbers used in BGP4 sessions across the TLLIX peering network shall not be from ranges reserved for private use.
- 3. TLLIX Participants are encouraged to do the best to aggregate their routes in accordance with RFC2519 “A Framework for Inter-Domain Route Aggregation”.
- 4. IP-address space assigned to TLLIX LAN shall not be advertised to other networks without explicit permission of TLLIX.
- 5. All routes advertised across the TLLIX peering network shall point to the router advertising it UNLESS agreement has been made in advance in writing by TLLIX and the two members involved.
- 6. All routes to be advertised in a peering session across TLLIX shall be registered in the RIPE or other public routing registry.

**5. Other**

- 1. Network of Participant connected to TLLIX shall conform to the relevant standards laid out in STD0001 and associated Internet STD documents.



## **3. SERVICE LEVEL AGREEMENT**

### **3.1 GENERAL**

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The TLLIX Service is provided in accordance with this SLA. Any remedies due to Participant as a result of TLLIX failing to deliver the agreed service levels as defined in this SLA will be paid to Participant exclusively as credits against future charges or free of charge extension period(s).

A credit shall be deemed to apply only to the month in which the related trouble ticket was opened. The credit shall not include credits on any other MRC's charged to Participant for any un-affected services or un-affected portion(s) of the TLLIX Area. To be eligible for credits as specified within this SLA, Participant must request such credits and submit necessary supporting documentation in accordance with the procedure set-out in the Agreement.

In the event that Participant is entitled in respect of any given Affected Service to multiple credits under this document arising from a series of Faults or other events occurring in the same month, such credits shall not exceed the MRC of the Affected Service. Cumulative credits for all committed service levels set out in this SLA, payable in any calendar month, must exceed Euro 50 per Affected Service to be processed.

### **3.2 SERVICE DELIVERY**

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#### **SERVICE DELIVERY PROCEDURE**

Participant shall state in the Order Form the requested service date. After the Order Form is signed by Participant, and accepted by Linxtelecom, Linxtelecom may send a written notification to Participant (an 'Order Confirmation'), confirming the Committed Delivery Date ('CDD').

Prior to handing over the Service to Participant, Linxtelecom will perform power supply and connectivity tests. Linxtelecom will state the test results in a pre-filled Acceptance Certificate and sign it.

Linxtelecom will then notify Participant that the Service is Ready For Acceptance (RFA) and Participant will be invited to install Participant Equipment and execute its own acceptance test. On the same date (the 'RFA Date'), Linxtelecom will provide a signed copy of the Acceptance Certificate to Participant's representative(s).

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Participant has three (3) Business Days after the invitation date to install Participant Equipment and perform its acceptance tests (the 'Acceptance Tests') and to either i) accept the delivery of the Service by signing and returning to Linxtelecom the Acceptance Certificate, or ii) notify Linxtelecom that the Service does not comply with the specifications or other expressly agreed acceptance criteria.

If Participant can reasonably demonstrate that the relevant Service has failed to meet the acceptance criteria set out above, the reason for rejection must be detailed in writing on the Acceptance Certificate, which shall be signed by Participant and returned to Linxtelecom within the three (3) days Acceptance Test period. Linxtelecom shall then rectify the problem and announce a new RFA Date

In the event that after this three (3) Business Days period neither the Acceptance Certificate has been signed and returned to Linxtelecom nor the Acceptance Certificate has been returned with a documented rejection, the Service is deemed to be accepted at the end of the third day after the RFA Date.

The date the Participant's representative accepts the Service by signing the Acceptance Certificate or is deemed to have accepted the Service shall be designated the Ready for Service Date and the applicable MRC's shall accrue from such date in accordance with the Agreement. Until the Acceptance Certificate is signed, Participant is not allowed to start utilising the Service for any purposes other than testing.



### 3.3 SERVICE AVAILABILITY

#### SERVICE AVAILABILITY DEFINITIONS

Actual TLLIX Service availability figures are calculated on a calendar month basis and are based upon the TLLIX trouble ticketing system. ‘Service Availability’ is defined for each Service as the total time in a calendar month minus the aggregate unavailable time recorded in the TLLIX trouble ticket system (‘Unavailable Time’), divided by the total time in the calendar month. Unavailable Time begins when a trouble ticket is opened at the time of Participant reporting a Fault to the ICC or RCC as applicable. Unavailable Time ends when the relevant trouble ticket is closed after Fault clearance.

$$\text{Monthly Service Availability} = \frac{\text{Total Time in Month} - \text{Unavailable Time in Month}}{\text{Total Time in Month}}$$

Please note that the Unavailable Time resulting from Scheduled Maintenance and other grounds excluded in the Agreement is not taken into account for the calculation of Availability.

#### SERVICE LEVEL

The agreed Service Availability is calculated per individual Service and per calendar month.

Service Availability		
TLLIX LAN	Cross-Connect	UPS Power
99.9%	99.9%	99.9%

#### COMPENSATION

The following compensation scheme applies if the agreed Service Availability levels in respect of the relevant affected Service are not met.

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Deviation from the Agreed Service Availability Level (Level % below SLA)		Compensation (expressed as a % of the MRC applicable to the Affected Service)
Low	High	
SLA	< 0,499%	5.0%
0.500%	0.999%	10.0%
1.000%	1.499%	15.0%
1.500%	2.499%	20.0%
> 2.500%		25.0%