Service description

Vodafone Dedicated Ethernet

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1. General information

Vodafone provides the customer with the Dedicated Ethernet service based on the Vodafone-OTN/DWDM network (OTN = Optical Transport Network and DWDM = Dense Wavelength Division Multiplexing). The service provides the technical conditions required to establish a connection between two customer locations using the interfaces:

- Ethernet
- Fibre channel

Vodafone reserves the right to make changes to the technology and infrastructure used to provide the service, provided that such changes do not conflict with any legitimate interests of the customer. In the event of such a change, e.g. due to technical or regulatory requirements, the customer shall be obliged to cooperate within the scope of what is considered reasonable.

Vodafone offers the access required to use the service, in the bandwidth desired by the customer, using different service parameters and within the scope of existing technical and operational possibilities.

Depending on the technical possibilities at the location to be connected, the Dedicated Ethernet product is provided with different access variants:

- Glass fibre from Vodafone
- Dark fibre from third parties
- OTN – leased lines (OTU.1, OTU.2) from third parties

The service is offered as a "basic" tariff variant. The connection line required to use the service is charged separately.

1.1. Installation of end equipment

Vodafone installs a demarcation device close to the transmission path terminal point. The device is intended as the customer's network termination for connecting equipment or LANs. If a transmission path terminal point is not in the vicinity of the location requested by the customer, (access line length 3 metres), the customer undertakes to provide in-house cabling from the transfer point to the desired place of use. Alter-natively, Vodafone can arrange for a partner company to carry out additional installation work and charge for this separately.

The customer is to provide sufficient power supply at the installation site for the 230 volt demarcation device and shall be responsible for possible power failure scenarios. Furthermore, the installation site for the demarcation device must not fall below -5 degrees Celsius or exceed 40 degrees Celsius.

The demarcation device remains Vodafone's property. The configuration of the demarcation device is the sole responsibility of Vodafone and may not be changed by the customer. Vodafone undertakes round the clock management (24 house/7 days a week) for the demarcation device.

1.2. Performance parameters

Typical throughput times (one-way frame delay) in the individual distance zones are:

Metro: < 1 ms (up to 200 km)

Regional: < 3 ms (up to 500 km)

Supraregional: < 10 ms

In the individual customer offer, the theoretical throughput times can be determined based on the specified route length. Throughput times are guaranteed within the scope of technical and operational possibilities.

2. Product definition

2.1. Dedicated Ethernet – data services

Dedicated Ethernet provides the customer with a transparent point-to-point (P2P) Ethernet connection in accordance with the agreed bandwidth.

The interconnecting transport network is based on OTN and DWDM technology which enables the transmission of data streams such as Ethernet traffic. The advantages of the technology used essentially consist of full bidirectional transparent transmission as well as minimal delays in data transport.

2.1.1. Bandwidths and interfaces

Data services for the Dedicated Ethernet product with Ethernet interfaces according to IEEE 802.3 are provided, depending on the transmission speed, with the following physical interface types:

Bandwidth	Interface	Fiber Type	Range	Plug Type
1 GE	1000 Base-T, Electrical	-	0,1 Km	RJ45
	1000 Base-SX, 850nm	Multimode (MM)	0,5 Km	LC/PC
	1000 Base-LX, 1310nm	Singlemode (SM)	10 Km	LC/PC
10 GE	10G Base-SR, 850nm	Multimode (MM)	0,3 Km	LC/PC
	10G Base-LR, 1310nm	Singlemode (SM)	10 Km	LC/PC
100 GE	100G Base-LR4	Singlemode (SM)	10 Km	LC/PC

2.1.2. Features/characteristics and configuration

The following features and characteristics are supported for data services in the individual bandwidths:

Performance features	Data Service: 1 Gbps	Data Service: 10 Gbps
Bandwidth	1 GE	10GE
Physical Port Speed	1 GE – 1,25 Gbps	10GE LAN – 10.31 Gbps
		10GE WAN – 9.95 Gbps
Interface	1000Base-T, electrical, RJ45	
	1000Base-SX-MM-850nm-LC/PC	10G-Base-SR-850nm-LC/PC
	1000Base-LX-SM-1310nm-LC/PC (Default)	10G-Base-LR-1310nm-LC/PC
MTU	9600 (standard)	
Service	Transparent Point to Point connection	
Layer 2 + 3 transparent	yes	
Guaranteed troughput	yes	
Granularity	1 GbE – ODU0	10GbE – ODU2
CIR / CBS / EIR / EBS	no observation	
VLAN Modell	transparent for VLAN	
CoS	transparent for CoS	
OAM	transparent for OAM	
L2CP	transparent for OAM	
Service protection	yes - optional	
Link Loss Forwarding	yes – optional (standard on)	
ALS	yes – customer interface – optional (standard off)	
3rd Party Networks	yes (Fiber or OTM 0.1)	yes (Fiber or OTM 0.2)
MEF 2.0	Transparent for MEF 2.0 parameters	
L1 encryption	no	

Performance features	Data Service: 100 Gbps
Bandwidth	100 GE
Physical Port Speed	100 GE – 103.125 Gbps
Interface	100GBase-LR4-1310nm-LC/PC
MTU Size	9600 (standard)
Service	Transparent point to point connection
Layer 2 + 3 transparent	yes
Guaranteed throuhput	yes
Granularity	100 G (ODU4)
CIR / CBS / EIR / EBS	-
VLAN Modell	transparent for VLAN
CoS	transparent for CoS
OAM	transparent for OAM
L2CP	transparent for OAM
Service Protection	yes - optional
Link Loss Forwarding	no
ALS	Yes – customer interface – optional (standard on)
3rd Party Networks	only Fiber
MEF 2.0	No MEF specification
L1 encryption	no

2.2. Dedicated Ethernet – fibre channel services

Fibre channel (FC) is a service offered for Storage Area Networks (SAN) in a data centre environment and is available at data rates FC200, FC400 and FC800. Fibre channel is an interface and service type.

Fibre channel is designed for serial, continuous highspeed transmission of large amounts of data.

2.2.1. Bandwidths and interfaces

Fibre channel services for the Dedicated Ethernet product are provided, depending on the transmission speed, with the following physical interface types:

Bandwidth	Interface	Fiber Type	Range	Plugin Type
FC 200	2G Fiberchannel, 1310nm	Singlemode (SM)	10 Km	LC/PC
FC 400	4G Fiberchannel, 850nm	Multimode (MM)	0,5 Km	LC/PC
	4G Fiberchannel, 1310nm	Singlemode (SM)	10 Km	LC/PC
FC800	8G Fiberchannel, 850nm	Multimode (MM)	0,3 Km	LC/PC
	8G Fiberchannel, 1310nm	Singlemode (SM)	10 Km	LC/PC

2.2.2. Features/characteristics and configuration

The following features and characteristics are supported for fibre channel services in the individual bandwidths:

Performance features	FC 200	FC400	FC800
Bandwidth	2G	4G	8G
Physical Port Speed	2.12 Gbps	4.25 Gbps	8.5 Gbps
Interface		4G Fiberchannel, 850nm-LC/PC	8G Fiberchannel, 850nm-LC/PC
	2G Fiberchannel, 1310nm-LC/PC	4G Fiberchannel, 1310nm-LC/PC	8G Fiberchannel, 1310nm-LC/PC
Service	Transparent point to point connection	Transparent point to point connection	Transparent point to point connection
Layer 2 + 3 Transparent	yes	yes	yes
Guaranteed throughput	yes	yes	yes
Granularity	ODU1	ODU-flex	ODU2
3rd Party Networks	Fiber or OTM0.1	Fiber or OTM 0.2	Fiber or OTM 0.2
L1 encryption	no	no	no
MEF 2.0	no MEF specification		

3. Service Level Agreements

Depending on the technical implementation of the bandwidth required by the customer, the service levels "Classic", “Classic Plus”, "Classic Protected Core" and "Classic-Premium Advanced" are available.

The service levels differ in terms of both service availability and fault clearance times. Service availability is the actual time that the Dedicated Ethernet service has been available in relation to the total theoretically possible service availability determined for an evaluation period of twelve months (operating year). The first operating year begins with the operational provision of the service, and the second operating year begins twelve months after operational provision.

A customer connection is defined as access to the Vodafone fixed network at a customer location, regardless of the number of devices connected to the customer connection at the location.

A connection is considered available if data can be transferred from this connection to at least one other connection within the customer network. Maintenance, installation and amendment times are excluded from connection availability. Vodafone reserves the right, after prior notification to the customer (of at least seven calendar days in advance), to interrupt the operation of a customer connection, at most once a month and except on workdays (Monday to Friday) from 6:00 to 19:00 hours and Saturdays from 6:00 to 14:00 hours. The interruption period may not exceed six hours per month, per connection.

The fault clearance period is the time between the customer's fault report and rectification of the fault by Vodafone.

The agreed fault clearance period shall not apply if the connection or service can continue to be used by automatically switching to redundant facilities provided by Vodafone (e.g. via an additional connection). In this case, the original connection at the Classic Plus or Classic Premium Advanced service level is to be restored within 12 hours.

3.1. SLA Classic

The Classic service level connection availability is 98.5%. The fault clearance period for service level Classic is 12 hours. In the event of cable damage, the fault clearance period is 24 hours.

3.1.1. SLA Classic Express

The Classic service level connection availability is 98.5%. The fault clearance period for service level Classic Express is 8 hours. In the event of cable damage, the fault clearance period is 24 hours.

3.2. SLA Classic Protected Core

The SLA Classic Protected Core provides two different routes through the Vodafone backbone core. As with SLA Classic, there is no backup in access. The Classic Protected Core service level connection availability is 99.0%. The fault clearance period for service level Classic Protected Core is 12 hours. In the event of cable damage, the fault clearance period is 24 hours.

3.3. SLA Classic Plus

An additional connection with the same bandwidth is provided for the customer's location. However, during interruption-free operation, only one connection can be used. The redundancy mechanism is managed by Vodafone. The additional connection (backup) is transferred at a PoP different to the primary path connection. (Disjoint routing).

The Classic Plus service level connection availability is 99.5%. In this service, the original condition (interruption-free operation of both connections) is restored within 12 hours. In the event of cable damage, the fault clearance period is 24 hours.

If both lines fail, at least one of the two connections must be available again after 8 hours.

3.4. SLA Classic Premium Advanced

Within the service level Classic Premium Advanced, Vodafone provides the customer with a connection with increased availability. An additional connection is provided for the customer's location.

The use of two separate entry points as well as node and edge disjunct access routing of both physical lines to the Vodafone backbone are an essential component of this service level.

During interruption-free operation, both connections can be used, i.e. the sum of both bandwidths is available.

During backup, communication is limited to the backup bandwidth. Implementing any required load-sharing and redundancy mechanisms is the responsibility of the customer.

The Classic Premium Advanced service level connection availability is 99.99%. The fault clearance period for service level Classic Premium Advanced is 2 hours. The agreed fault clearance period does not apply if one of the two connections can still be used. In this service, the original condition (interruption-free operation of both connections) is restored within 12 hours. If both connections fail, at least one of the two connections must be available again after 2 hours. In the event of cable damage, the fault clearance period is 24 hours.

4. Ethernet service features

4.1. Link State Pass Through and Automatic Laser Shutdown

Link Loss Forwarding or Link State Pass Through (LPT) is an Ethernet protocol that enables errors to be detected on the customer side and in the Vodafone-OTN/DWDM backbone, and to shut down the customer's port in a controlled manner so that the customer equipment recognizes the error. After the problem is solved, a controlled restart takes place automatically. LPT is available as standard for bandwidths of 1 Gbps and 10 Gbps.

Automatic Laser Shutdown (ALS) is a protective mechanism that automatically switches off the laser when the fibre connection is opened thereby preventing damage to health from the laser power. ALS on the customer side and in the Vodafone OTN/DWDM backbone is available for media services, fibre channel services and 100 Gbps and is activated by default.

The LPT function and the result of an error are described below.

Störung	Status A	Status B	Status C	Erläuterung
Link Down A	Down	Up	Down	In the event of fault A, signaling takes place via B, so that C shuts down the link.
Link Down B	Down	Down	Down	Fault B is signaled to A and C, so that A and C shut down the link.
Link Down C	Down	Up	Down	In the event of fault C, signaling takes place via B, so that A shuts down the link.

5. EasyTicket

5.1. General information

Vodafone provides the Easy Ticket online service tool to all enterprise customers.

Easy Ticket can be accessed from the public internet via the URL www.vodafone.de/1234.

With Easy Ticket the customer can create, process and close web-based incident tickets. After validation/ login, all products (access products/services) and reported service restrictions are shown to the user.

Easy Ticket can be used without time or location restrictions on any device with internet access. Customers can find further information about Easy Ticket and the user manual here: https://www.vodafone.de/business/hilfe-support/easy-ticket.html

5.2. Access

Login (without user credentials)

Easy Ticket can be accessed by unregistered users. For data protection purposes, two of three entries must be made during login.

When the entered data has been validated, all products (access products/services) for the validated customer number are shown to the customer.

Expert Login (with user credentials)

Registration is necessary for expert login. In this case the user is registered as administrator or power user. Administrators can set up, edit or delete other users.

6. Supervise Management

Vodafone provides the Supervise Management service to customers for active monitoring of their sites.

The service informs the customer's technical contact person by email about inaccessible demarcation devices operated by Vodafone. At the same time a trouble ticket is opened and troubleshooting begins.

Deviations from the actual service availability may occur in displaying / providing information by email due to technical circumstances (frequency of queries / checking of multiple systems).

The customer undertakes to permanently switch on all demarcation devices operated by Vodafone and leave them connected to the Vodafone-OTN/DWDM network. The customer will be invoiced for any repairs of faults caused by the customer.

7. Invoicing

The customer receives, as a rule, a monthly invoice from Vodafone. Sums not yet invoiced for services rendered during an earlier billing period can also be invoiced later.

8. Customer service and support

The customer can contact customer support via a service phone number with queries about the service or customer settings. The customer is to also identify himself/herself by the customer password which the customer has specified in the order form. Customer support is available 24 hours a day, seven days a week.