Service Description Ethernet P2P.

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DreiBusiness.
Macht's einfach.

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1. Basic service EthernetP2P.

1.1 General.

The Drei-Service EthernetP2P offers fixed connections between two locations (P2P), based on Ethernet technology with symmetrical bandwidths from 1 MBit/s up to 10 GBit/s.
In the process, the locations can be linked up via copper or glass fiber infrastructure.
Within the scope of the existing technical and operational capabilities, Drei provides the customer with a connection to the EthernetP2P service of Drei, at the sites requested by the customer. The site of a connection is denoted by giving the exact address and the location in the building designated for the task. EthernetP2P connections are set up between the terminals by Drei, in accordance with the customer's details provided.

1.2 Topologies.

Apart from the fixed connection between two points, point-to-point connections can also be set up between a central unit and an external facility, using Ethernet P2P. In this process, any number of P2P connections of this type can be aggregated in a central location; by this means, classic "star" topologies can be set up. A central location linked up in this way can also have a backup line at its disposal ("double star" topology).

EthernetP2P Connection

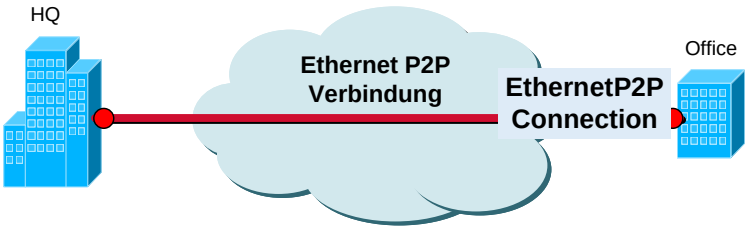

Figure 1: P2P connection

Star-Topology

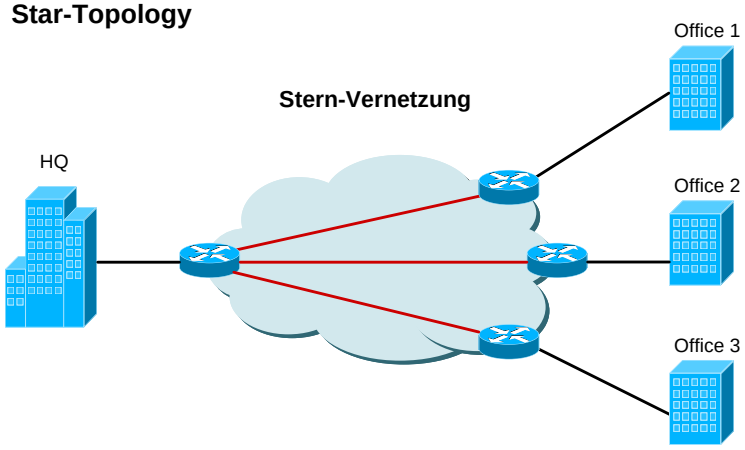

Figure 2: Star Topology

Double Star-Topology

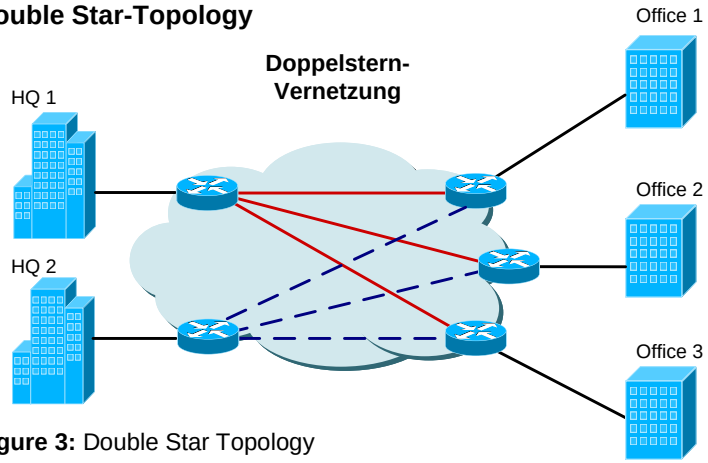

Figure 3: Double Star Topology

1.3 Other topologies.

Other topologies are available upon request: it is possible to build an MP2MP (VPLS) configuration. For such a configuration it is necessary to specify all relevant parameters between the Drei solution design and the customer in a written side letter.
It is also possible that Drei delivers CPEs (routers) in addition to the EthernetP2P service. These routers have to be bought by the customer and can build a Layer3 service over the EthernetP2P service. In this case Drei is only responsible for the router HW maintenance. The service delivered is the Layer2 EthernetP2P. Drei does either deliver any Layer3 functionality nor is Drei responsible for the Layer3 configuration. Also the equipment will not be added to Drei's network management.

1.4 Variants for implementation.

EthernetP2P is a product which includes the following variants for implementation

1.4.1 Leased Line connection.

The fixed line connection is implemented via a Drei partner's leased line; in this arrangement there is no connection to the Drei Ethernet Backbone.

1.4.2 Client access via leased line, by means of backbone transport.

In this variant, customer access to the Drei Ethernet backbone is implemented via one or several leased lines.

1.4.3 Customer access via Drei E.SHDSL.

In this variant, customer access to the Drei Ethernet backbone is implemented via Drei E.SHDSL with the use of subscribers' unbundled connection lines.

1.5 Features.

The basic service for EthernetP2P includes the following features:

- The provision of a digital fixed connection between two customer locations with defined data rate (bandwidth).
- The provision of a defined interface for each customer location.
- Adherence to the respective service parameters in accordance with the service class.

1.6 Interfaces.

Name	Interface electr./opt.	Interface physical	Tech-nology	Bandwidth LAN-Port	Bandwidth WAN-Port	Specification
Ethernet	10Base-T	RJ45	Kupfer	10 MBit/s	2,4,6,8 Mbit/s	IEEE802.3u
Fast Ethernet	100Base-TX	RJ45	Kupfer	100 MBit/s	20, 30, 40, 50, 100 MBit/s	IEEE802.3u

	100Base-FX	LC/SC	LWL	100 MBit/s	20, 30, 40, 50, 100 MBit/s	IEEE802.3u
	100Base-SX	LC/SC	LWL	100 MBit/s	20, 30, 40, 50, 100 MBit/s	IEEE802.3u
Gigabit Ethernet	1000Base-T	RJ45	Kupfer	1000 MBit/s	100, 200, 500, 1000 MBit/s	IEEE802.3ab
	1000Base-LX SM 1310nm	LC/SC	LWL	1000 MBit/s	100, 200, 500, 1000 MBit/s	IEEE802.3z
	1000Base-SX MM 850nm	LC/SC	LWL	1000 MBit/s	100, 200, 500, 1000 MBit/s	IEEE802.3z
	1000Base-ZX SM 1550nm	LC/SC	LWL	1000 MBit/s	100, 200, 500, 1000 MBit/s	IEEE802.3z
	10GBase-SR MM 850nm	LC/SC	LWL	10 GBit/s	2, 5, 10 GBit/s	IEEE802.3ae
	10GBase-LR SM 1310nm	LC/SC	LWL	10 GBit/s	2, 5, 10 GBit/s	IEEE802.3ae
	10GBase-ER SM 1550nm	LC/SC	LWL	10 GBit/s	2, 5, 10 GBit/s	IEEE802.3ae
	10GBase-SW MM 850nm	LC/SC	LWL	10 GBit/s	2, 5, 10 GBit/s	IEEE802.3ae
	10GBase-LW SM 1310nm	LC/SC	LWL	10 GBit/s	2, 5, 10 GBit/s	IEEE802.3ae
	10GBase-EW SM 1550nm	LC/SC	LWL	10 GBit/s	2, 5, 10 GBit/s	IEEE802.3ae

This table describes the typical transfer; however, it is possible to select another interface and this is explicitly defined in the proposed solution. The standard transfer is effected up to 100 MBit electronically 10/100; 100 MBit and above, optically.
Available subject to agreement and an additional price: electronic 1000Base-T.

1.7 Connection bandwidths.

Bandwidths	
2 Mbps	50 Mbps
4 Mbps	100 Mbps
6 Mbps	200 Mbps
8 Mbps	500 Mbps
10 Mbps	1 Gbps
20 Mbps	2 Gbps
30 Mbps	5 Gbps
40 Mbps	10 Gbps

Remarks: upon request, other bandwidths can also be tested.

1.8 Service classes.

Parameter	Service classes			
	Default	Business2	Business1	VLL
CIR	10%	50%	90%	100%
Delay	<100ms	<50ms	<25ms	<25ms
Packet Loss	< 2%	< 1%	< 0,1%	< 0,1%
EVC Type	Multipoint			
Max. Amount MAC Adressen	8k /Connectivity/Domain [1)]			
Max. Frame Size	1526			
VLAN Trunk	802.1q (transparent)			
CoS Tags	802.1q (transparent)			
Flow Control	by arrangement			
QinQ	by arrangement			
VCRestore	by arrangement			

1) For access type Virtual Unbundling – VULL, there is a limit of 8 MAC addresses per access

Without exception, all parameters included in the table are guaranteed in the CIR bandwidth.
Packet Loss is indicated as a % of the CIR Max. Frame Size, other values possible by agreement
The VLL class, referred to in the table, is dependent on whether it can be implemented in technical terms; thus implementation cannot be guaranteed at all customer locations.

1.9 Service level agreements.

For EthernetP2P, Service Level Agreements are offered on an optional basis; you will find an exact description of the services which the Service Level Agreements include, in the “Description of services: Service Level Agreement EthernetP2P“.

1.10 Customer enquiries and disturbance reports.

When the service is “handed over”, the customer obtains information (contact person, telephone number, etc.) for contact, in the event of enquiries and any disturbances to the service.

2. Producing the EthernetP2P connection.

At each location within the country, Drei sets up an EthernetP2P connection, so far as this is economically justifiable. In this regard, what must particularly be taken into consideration is the type of access technology (copper, glass fiber), as well as the opportunity to use the existing connection line infrastructure and services.
The connection is set up in coordination with the customer. See General Terms & Conditions Business.

2.1 General preconditions in terms of construction.

For the set-up of a EthernetP2P connection, it is a requirement that the customer location provides a storage room or operation room which is clean, dry and sufficiently ventilated. The customer must ensure that an operating temperature range of +5°C to +40°C is maintained and that none of the equipment ever goes below thawing point. If air conditioning proves to be necessary, it is the responsibility of the customer to provide it.

2.2 Access.

Access to the Drei facilities is regulated in the General Terms & Conditions of Business.

2.3 Power supply.

The (230 VAC) power supply connection, necessary for setting up access and switching on, as well as the earthing, is to be provided by the customer at a distance of less than 1.5 m; this is in the form of a

“Schuko” protective contact-type socket, preferably one which is separately fused, in the same current circuit as the end equipment which is to be switched on. If the customer wishes to have the Ethernet P2P service available during an interruption to mains power supply, a corresponding uninterruptible power supply (230 VAC) must be provided.

2.4 Network termination.

The network termination serves as the terminal for the EthernetP2P service and it fixes the boundary of responsibility between Drei and the customer.
The network termination is set up in the form of a connection socket (e.g. device interface of the switch-on appliance). All network appliances on the Drei side, i.e. also the switch-on appliance itself, up to the network termination (i.e. on the network side), are in Drei’s area of responsibility.
If the “in-house“ cabling work is carried out by the customer, then this partial area also remains the customer’s responsibility.

2.5 Installation.

The EthernetP2P connection is made in accordance with the customary rules for installation (standard installation) in the surface-mounted version. The classification of the cable corresponds to the EN 50173 standard.
Any cabling that may be available can be used, after Drei has checked and confirmed its suitability.
If it is the wish that, within the buildings, the cables for the subscriber’s connection line are to be put into pipework or cable channels, or if this is necessary for other reasons outside of Drei’s scope of responsibility (e.g. it is a precondition made by the authority entitled to require it) the corresponding pipework or cable channels are to be provided by the customer. If this service is provided by Drei, it is invoiced to the customer separately.

2.6 Protective measures.

If the customer location is in an area at a higher risk from lightning, the protective measures and materials necessary to protect the Drei equipment are to be installed by a licenced electrical services company. The customer covers the costs for this.

2.7 Service handover.

After the installation is completed, the availability of the EthernetP2P service is checked in a service handover test, to ensure conformity to the quality requirements stated in the order. After the test is concluded positively, the handover of the services is completed by means of the service handover protocol.

2.8 Equipment.

The customer connects his/her items of equipment, using the corresponding connection cable, with the EthernetP2P network termination. Thus access is established to the Drei Service. In this regard, the item of equipment itself, including the connection cable, can either be under the scope of the customer’s authority, and in the customer’s area of responsibility, or be supplied as part of the solution from Drei.
The only items of equipment permitted to be connected to the EthernetP2P interface are those which display a valid CE approval marking and which conform to the indicated interface conditions (see Table under Item 2.5). In any case of doubt, the agreement of Drei must be obtained.

3. Appendix.

3.1 Appendix 1: Defintion of terms.

CIR

The Committed Information Rate (CIR) is the data volume of individual virtual connections, determined in the context of bit rate management. CIR is a static data rate which can be sent through the network by the user at any time. It is stated in bits-per-second and is not dependent on the physical bandwidth of the transport path.

Delay

This value denotes the time required between the entry of an IP packet at the corresponding Customer Edge (CE) router and the exit at any other CE router of the same customer or VPN respectively.

Packet Loss

This value gives the quantity of discarded IP packets which are measured between the entry point at the corresponding CE router and the exit at any other CE router of the same customer or VPN respectively.

EVC Type

The Ethernet Virtual Circuit type indicates which type of Ethernet connection is being set up.

max. quantity of MAC addresses

The quantity of hosts (MAC addresses) which are permitted to be contained in the Ethernet P2P service classes. In the VLL variant, service behaves transparently, a limitation of the number of hosts is not given here.

max. Frame Size

Size of the data frame which can be transmitted. Can be changed upon request.

VLAN Trunk

Permits the VLAN service to be used transparently, i.e. the customer has the possibility to tag VLANs of his/her own.

CoS Tags

These are the QoS classes defined in the Ethernet Standard, which give the customer the possibility to make a differentiation of the datastream.

3.2 Appendix 2: Norms

ITU-T G.704

Synchronous frame structures used at 1544, 6312, 2048, 8488 and 44 736 kbit/s hierarchical levels.

ITU-T G.707

Network node interface for the synchronous digital hierarchy (SDH).

ITU-T G.811

Timing requirements at the outputs of primary reference clocks suitable for plesiochronous operation of international digital links.

ITU-T G.821

Error performance of an international digital connection operating at a bit rate below the primary rate and forming part of an ISDN.

ITU-T G.826

Error performance parameters and objectives for international, constant bit rate digital paths at or above the primary rate.

ITU-T G.957

Optical interfaces for equipments and systems relating to the synchronous digital hierarchy.

ITU-T G.958

Digital line systems based on the synchronous digital hierarchy for use on optical fibre cables.

ITU-T G.991.2

Single-Pair High-Speed Digital Subscriber Line (SHDSL) transceivers.

EN 50173

Performance requirements for application-neutral cabling systems.

ISO 4903

Information technology, data communication, 15-pole DTE/DCE interface connector and contact number Assignments.

IEEE802.1Q

This standard defines the operation of Virtual LAN (VLAN) Bridges that permit the definition, operation and administration of Virtual LAN topologies within a Bridged LAN infrastructure.

IEEE802.1P

PPS (Packet prioritization standard). In this standard, data packets are given a priority marking. Thus the data packet can be allocated priority over other data traffic.

ETSI TS 101 526

Transmission and Multiplexing; Access transmission system on metallic access cables; Symmetric single pair high bitrate Digital Subscriber Line (SDSL).