Carrier Line Services

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Contract	Contract for Data Services Contract for Mietleitungen FMG

Contents

Introduction

1. This technical manual describes the technical details for the planning and realisation of the telecommunications service provider (telco) in connection with the Carrier Line Service and Carrier Line Service TCA (both hereinafter referred to as CLS).

1.1 Referenced standards

[1]   EN 300 386: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Telecommunication network equipment; ElectroMagnetic Compatibility (EMC) requirements"

[2]   EN 302 099: "Environmental Engineering (EE); Powering of equipment in access network"

[3]   IEEE Standard 802.3 (2002 Edition), IEEE Standard for information technology—Telecommunications and information exchange between systems—Local and metropolitan area networks—Specific requirements— Part 3: Carrier sense multiple access with collision detection (CSMA/CD) access method and physical layer specifications, SECTION THREE: This section includes Clauses 34 through 43 and Annexes 36A through 43C.

[4]   IEEE Standard 802.3ae (2002 Edition), IEEE Standard for information technology—Telecommunications and information exchange between systems—Local and metropolitan area networks—Specific requirements— Part 3: Carrier sense multiple access with collision detection (CSMA/CD) access method and physical layer specifications, Amendment: Media Access Control (MAC), Parameters, Physical Layers, and Management, Parameters for 10 Gbit/s Operation.

[5]   ANSI INCITS 352-2003, Information Technology - Fibre Channel - Physical Interface (FC-PI)
(formerly NCITS Project 1306-D).

[6]   ANSI INCITS 404 – 2004 presently: draft proposed NCITS Standard for Information Technology – Fibre Channel – Physical Interface-3 (FC-PI-3) Rev. 1, Nov. 2004.

[7]   ANSI INCITS 364 – 2003 Information Technology - Fibre Channel 10 Gigabit (10GFC)
(see also drift propose NCITS Standard for Information Technology).

[8]   ANSI INCITS 450 – 2009 Information Technology - Physical Interfaces - 4 (FC-PI-4)
International Committee for Information Technology Standards (formerly NCITS)

[9]   IEEE Std 802.3ba™-2010. (Amendment to. IEEE Std 802.3™-2008). IEEE Standard for. Information technology.

[10]   ANSI INCITS 230-1994/AM 2-1999 Information Technology - Fibre Channel - Physical and Signaling Interface (FC-PH) - Amendment 2 (supplement to ANSI X3.230-1994) (formerly ANSI X3.230-1994/AM.
ANSI INCITS 296-1997 (R2007) Information Technology-Single-Byte Command Code Sets Connection (SBCON) Architecture (formerly ANSI X3.296-1997).
ANSI X3.303:1998, Fibre Channel—Physical and Signalling Interface-3 (FC-PH-3).

2 Technical service attributes

2.1 Implementation and architecture

1. CLS is based on the highly redundant transport platforms WDM.
2. CLS is a transparent point-to-point connection with pre-agreed, symmetrical transfer capacities (Layer 1 services)

2.2 Service handover

1. Handover of the CLS service to the end customer at the service access Point (SAP) with a Customer Premise Equipment (CPE).
2. The CPE is connected via optical access line to the local exchange of Swisscom (PoP). If the handover takes place at multiple exchanges, these are connected via the highly redundant Swisscom backbone (Swisscom network).
3. The technical solutions displayed in the illustrations are not exhaustive.

2.2.1 Handover of the service outside of a Swisscom local exchange

1. If the service is handed over outside of the Swisscom exchange, this will always take place with a CPE at a customer site or the Point-of-Presence (PoP) of the telco operator (see Figure 1).
2. The telco operator is responsible for the electrical power supply (incl. installation) and the provision of an appropriate rack (19 inch or table version depending on the CPE) for the CPE.
3. The installation within the building, from the cable entry point (into the building) to the CPE, and also the installation between the CPE and the equipment of the telco operator or the customer equipment (CE) are also in the responsibility of the telco operator and must be made available by it.
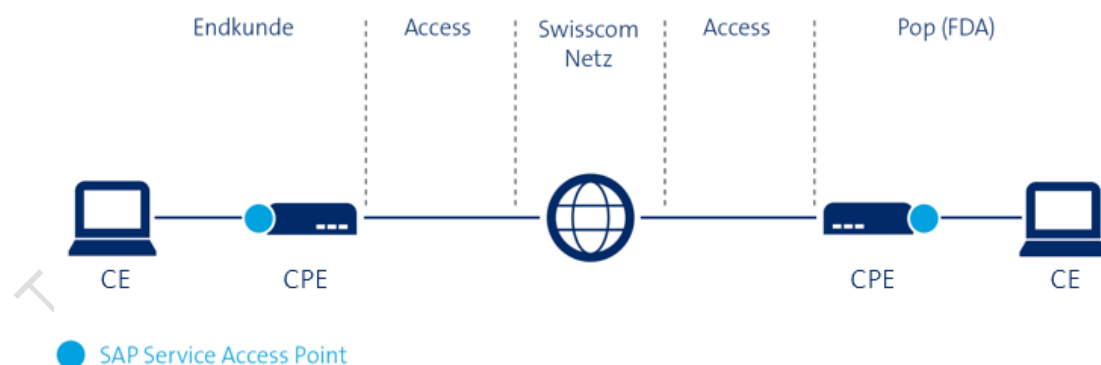4. Swisscom does not provide any remote power supplies.

Figure 1: Handover of the CLS outside the Swisscom exchange

2.2.2 Handover of the service within a Swisscom local exchange

1. The handover takes place at the customer interface in a room rented by the telco operator or its end customers within the local exchange (see Figure 2).

2. The type of handover must be based on the specific requirements of each customer.

3. There are two typical types of handover and implementation, which are applied based on the type of interface, the location of the end customer, the required quality of service, and the distances of the transfer cable within the transfer point. Swisscom decides which type of transfer to apply.

4. Most interfaces can be transferred directly at the Service Access Point (SAP) without the need for a CPE (see Figure 2 "Direct transfer to SAP").

5. If necessary, the required interface is provided on the CPE and the service is transferred accordingly (see Figure 2 "Transfer on the CPE").

6. If the SAP is on a CPE, the telco operator must provide an appropriate rack (19 inch or table version) for the CPE as well as the electrical power supply.

7. For the realisation of the CLS service within the local exchange, Swisscom will install cabling[1] for the telco operator between the Swisscom distributor and the rented room of the telco operator or its end customer. Details can be found in the area agreement.
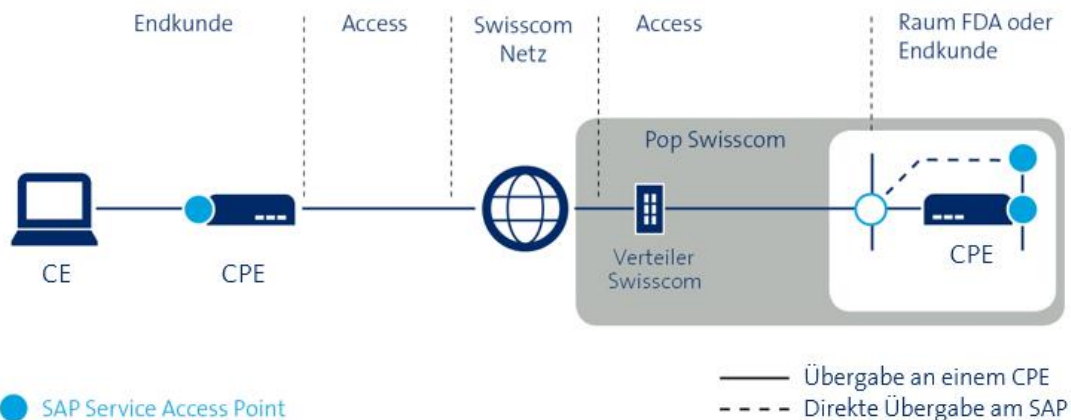

Figure 2: Handover of the CLS within the Swisscom exchange

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[1] Cabling within the local exchanges are not covered by this service.

2.3 Description of the Interfaces

1. The following Table 1 describes the available interfaces with the corresponding plug-in connection options.
2. The availability of the interfaces will be announced after the feasibility clarification or when the order is placed.

Net (Gross) Bandwidth [Gbit/s]	Interfaces	Interface Typ	SFP Module (Plug)	Medium	Distance
1 (1.25)	1G Ethernet	1000Base-T	Cat5 (RJ-45)	electric	100m
		1000Base-SX	MMF 850nm (LC)	optical	550m
		1000Base-LX[2]	SMF 1310nm (LC)	optical	10km
		1000Base-ZX[3]	SMF 1310nm (LC)	optical	80km
6.4 (8.5)	Fibre Channel 800	FC800/8GFC	MMF 850nm (LC)	optical	100m
		FC800/8GFC	SMF 1310nm (LC)	optical	10km
10 (10.312)	10G Ethernet	10GBase-SR	MMF 850nm (LC)	optical	550m
		10GBase-LR[2]	SMF 1310nm (LC)	optical	10km
		10GBase-ER[3]	SMF 1310nm (LC)	optical	40km
12.8 (14.025)	Fibre Channel 1600	FC1600/16GFC	MMF 850nm (LC)	optical	100m
		FC1600/16GFC	SMF 1310nm (LC)	optical	10km
25.6 (28.05)	Fibre Channel 3200	FC3200/32GFC	MMF 850nm (LC)	optical	100m
		FC3200/32GFC	SMF 1310nm (LC)	optical	10km
100 (103.125)	100G Ethernet	100Gbase-SR4	MMF 850nm (MPO)	optical	100m
		100GBase-LR4[2]	SMF 1310nm (LC)	optical	10km
		100Gbase-ER4 lite[3]	SMF 1310nm (LC)	optical	40km
		100Gbase-FR1[2]	SMF 1310nm (LC)	optical	2km

Table 1: Description of interfaces

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[2] Available as Direct Connect or with CPE version
[3] Only available as Direct Connect version without CPE

2.3.1 Further interface specifications

[1] **1GE, 10GE, 100GE**

Full Duplex is configured as the operating method on the Ethernet interfaces (1GE, 10GE and 100GE). Auto negotiation is configured according to Table 2 below and is not an optional selection.

Interfaces	Auto Negotiation	Operation Mode	Jumbo Frame
GbE el.	on, fix 1000M	Full Duplex	supported
GbE opt.	on	Full Duplex	supported
10GbE opt.	not relevant	Full Duplex	supported
100GbE opt.	not available	Full Duplex	supported

Table 2: Description of technical parameters

[2] **Latency**

[3] Latency depends on the transmission distance and the technical equipment used. The guideline is 5.0μs per km.

3 Technical limitations

3.1 Updating hardware and software

[1] Updating the hardware and software may result in a disruption to service. The telco operator will be notified accordingly.

4 Installation

4.1 Requirements

[1] If the CPE has two separate power supplies, two separately interlocked power supplies (230 VAC or optionally -48 VDC) are recommended.
[2] A rack (19 inch or table version, depending on the CPE) must be provided for the CPE.
[3] The plug type required for each interface is listed in Table 1.

4.2 Not included in the CLS

[1] Installation in the building of the telco operator or end user, from the cable entry point to the CPE.
[2] Cabling in the Swisscom exchange between the Swisscom distributor and the rented room of the telco operator or its end customers.
[3] Installation between the CPE and customer equipment (CE).
[4] Installation of power supply (230 VAC or -48 VDC, depending on the CPE) for the CPE.
[5] Power for the CPE at the two line end points.
[6] Rack (19 inch or table version, depending on the CPE).

4.3 Telco operator's infrastructure requirements

1. The telco operator is obligated to only connect equipment to the interfaces that meets the appropriate interface standards (see chapter 1.1) and at least the standards EN 300 386 [1] and EN 302 099 [2].

2. If these standards are not met and Swisscom equipment is damaged as a result, the telco operator is obligated to pay the appropriate sum in compensation.

3. If these standards are not met and this results in disruptions to service, Swisscom is entitled to take the connection out of commission.