Business Premium Access

Additional product information



Business Premium Access (BPA)
Table of contents

01. General information

02. Accesses and LAN interfaces

03. IP services

04. Handover of IP services on the remote device

05. Redundancy solutions

06. Quality of Service (QoS)

07. IP data throughput

08. Customerinformation about IP services

09. Hotlines

01. General information

Depending on the customer’s use case, the offered IP services can be combined with each other in an extremely flexible manner via a single access with the Business Premium Access Portfolio.

This results in the following synergies

- Lower volume of termination equipment.
- Better utilization of the available technological space (rack space).
- Lower energy needs (electricity/air conditioning).
- Lower ongoing costs.
- The IP services can be rapidly amended for a new use case provided that the access has the required bandwidth.

Back to the table of contents

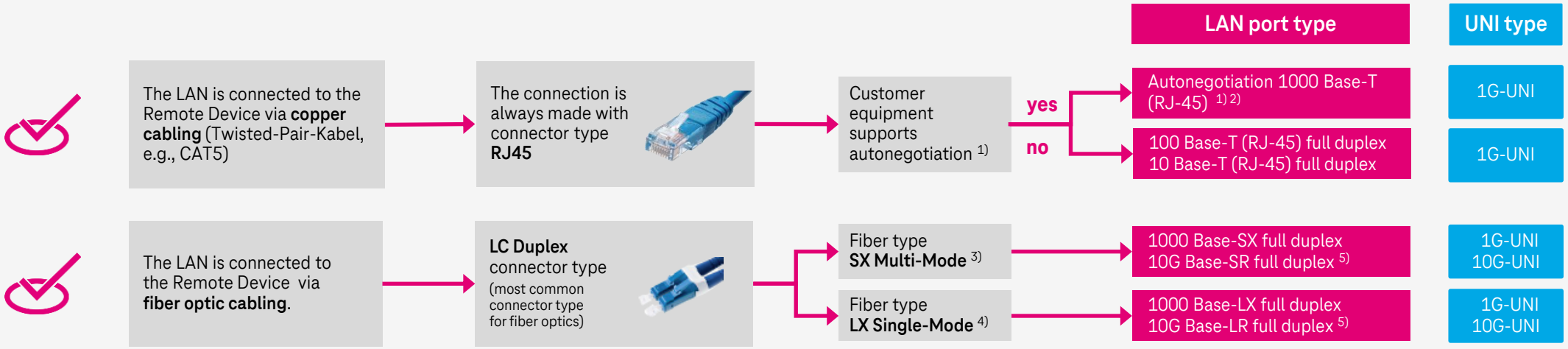
02. Business Premium Access LAN interfaces

The connections are terminated at the customer locations with actively managed remote devices (RD).

The offer comprises symmetrical bandwidths from 2 MBit/s to 10 GBit/s.

To connect your network (LAN) with the remote device, it is important that the correct physical interface is stated when commissioning the order.

The customers can select from the following LAN interfaces (port types):



LC: **L**ucent **C**onnector

Information: Adapters to convert from LC to the older SC/PC connector standard are available on the free market (e.g., FO patch cable single mode, duplex, LC/APC-SC/APC; length 0.5 m for < 10 euros)

1) Autonegotiation = automatic selection of the right port speed
2) The 1000 Base-T interface (copper with RJ-45 socket) is **always** technically implemented with autonegotiation
3) Range of around 500 m with 1000M and around 300–400 m with 10G; most utilized fiber type; less expensive than single mode fibers
4) Range of around 5 km with 1000M and around 10 km with 10G; most commonly used on expansive company premises; more expensive than multi mode fibers
5) For 10G LAN interfaces, a UNI-10G port must be configuratively selected on the the RD

Back to the table of contents

03. IP services

Depending on the use case (internet only, voice only, or internet and voice), the customer can commission different variations of the “Internet Connect” and “Voice VLAN” IP services on the access. VLAN technology is used here in order to transmit the IP services together via a single LAN port.

IP services for Business Premium Access Portfolio:

03.1 InternetConnect

Highspeed internet with symmetrical bandwidths in levels from 2 MBit/s to 10 GBit/s.
Additional optional services such as DDoS defense, additional IP addresses, or changeable QoS profiles are also offered.

03.2 Voice VLAN

Top-quality voice quality thanks to reserved transmission capacity of between 10 and 1,000 parallel calls from the CompanyFlex telephony service which are transmitted via a separate VLAN. Depending on the number of parallel calls, an inherent InternetConnect with 0.5 MBit/s, 1 MBit/s, or 2 MBit/s is always made available for the necessary registration of the IP PBX.
Voice VLAN does not include a telephony service. This must be ordered separately.

Back to the table of contents

04. Handover of IP services on the remote device

Remote devices (RD) are used as network terminations in various individual market products.

The RD is a hardware system that terminates business ethernet and business IP services (layer 2 and layer 3 services) at the premises of the customer.

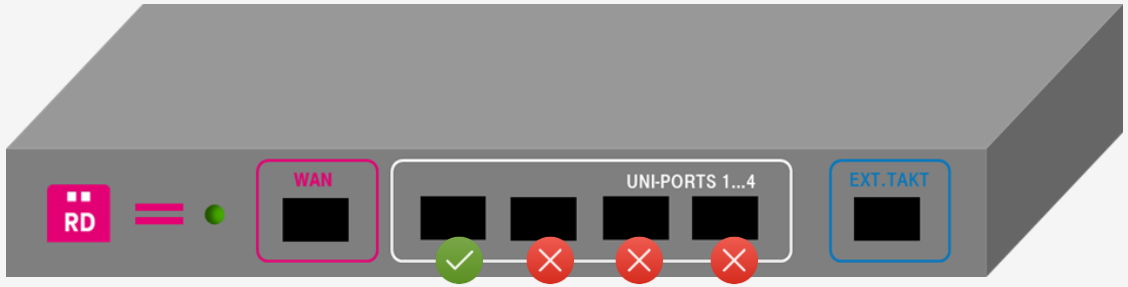
The designation of the logical LAN port no., at which the termination takes place, is communicated with the final information for provisioning.

As a rule, these are the logical LAN port no. “1” for accesses with bandwidths up to 1 GBit/s and “101” for accesses with 10 GBit/s. Information on the fixed "mapping" of logical port numbers to the physical accesses on the RD used is also included in the BNG Remote Devices data sheet .

For the layer 3 BPA product, technical reasons mean only one LAN port is ever made available to connect the customer network.

The configuration can not be changed on the RD as this configuration is saved in the network. In the event of a reboot or service update, the default setting with a single active LAN port would always be installed again.

Configuration of the LAN ports on the RD for Business Premium Access.

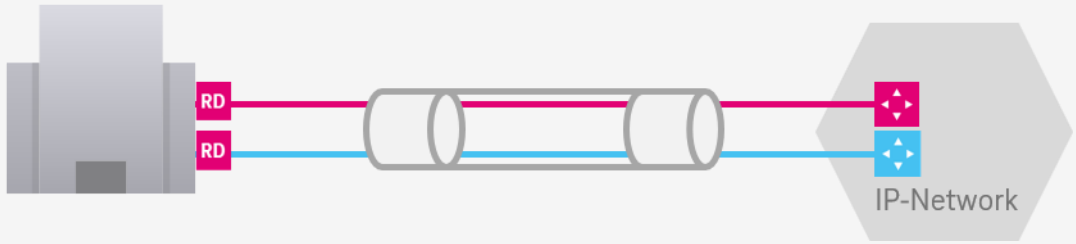


Back to the table of contents

05. Redundancy solutions (1/4)

Gold

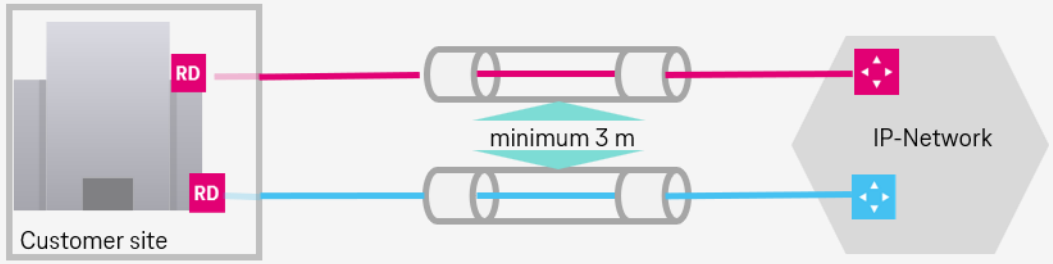
“Gold“ Configuration



The **Gold configuration** increases the reliability of a customer connection to 99.8% through two separate connections to different network nodes. The cable paths are not routed separately but are implemented in the same cable or over shared fiber-optic links. The active components - the remote device and the network node - are designed with redundancy.

Platin

“Platinum” Configuration



In the **Platinum configuration**, which offers 99.9% availability, redundant connections between the customer site and the network node are routed via two separate paths. The routes have a minimum distance of three meters and there are no crossings or synchronizations in the line route [1)]. Compliance with these specifications is ensured and monitored. The network-side redundancy analysis begins and ends at the property line.

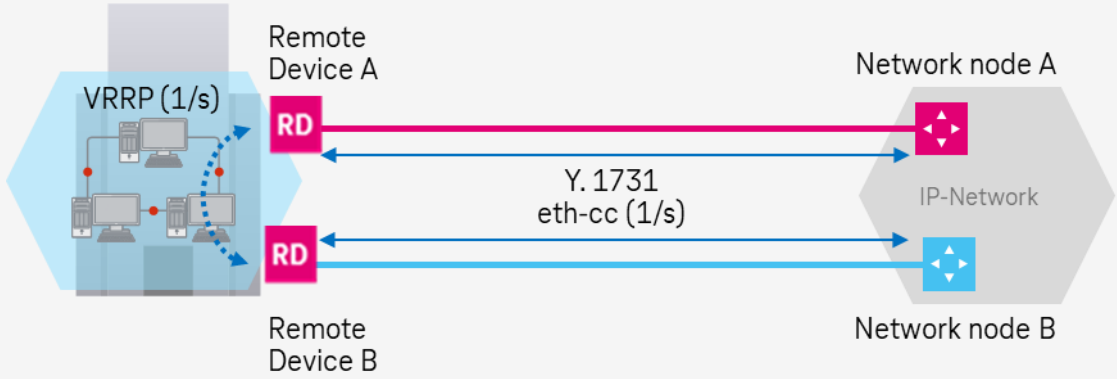
[1)] A continuous route-disjoint route is only possible for those sections of the cable where there are no technical and geographical barriers. In a few exceptional cases, the two cables may run parallel or there may be isolated crossings. In such cases, the customer will be informed of this as part of the quotation, and the work will only be carried out with the customer’s consent.

For technically functioning operation, it is necessary that an information exchange of the communication required for the VRRP protocol is possible on the remote device LAN side, via the customer network at Ethernet level. Both remote devices must be in the same Ethernet broadcast domain.

RD Remote Device Network node

Back to the table of contents

05. Redundancy solutions (2/4)



- VRRP LAN side: Monitoring of the connection between Remote Device (RD) A and Remote Device B. The RD in the first way reacts to the virtual IP address and the virtual MAC. Once per second, this RD sends a VRRP Master Advertisement with a priority of 254. The RD in the second way "listens" to these advertisements. If there are no 3 advertisements in a row, the RD sends its own advertisement with priority 253 and takes over the virtual IP address and the virtual MAC.
  The RD with the highest priority takes over the master function and thus the virtual addresses.

- Y.1731 WAN side: The connection between RD and BNG is monitored via eth-cc in accordance with Y.1731. The eth-cc packets are sent once per second. If no eth-cc packets have been received for 3.5s, the non-receiving side will send an RDI (Remote Defect Indicator) signal in the next eth-cc packet. This lets the remote station know that the connection is disrupted. If the error occurs in the first way, these packets trigger rerouting in the backbone. In addition, the priority sent to VRRP Advertisement in the paths where RDI is set is lowered by a value of 10. Therefore, the second way takes over the virtual addresses via VRRP.

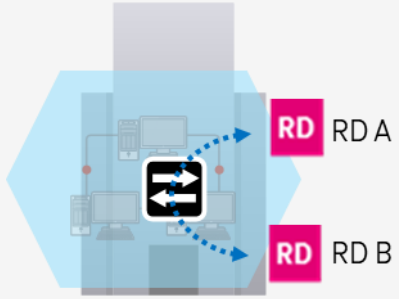
The redundancy solution recognizes problems in both the customer network and the access network. Problems in the core network cannot be recognized in some cases.

Customer Network Network node RD Remote Device

zurück zum Inhaltsverzeichnis

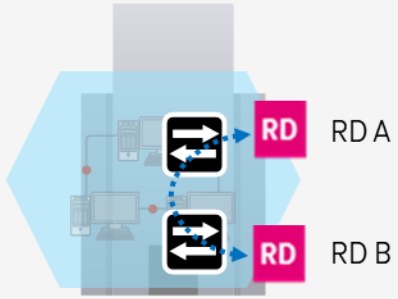
05. Redundancy solutions (3/4)

Connection scenarios for customers:



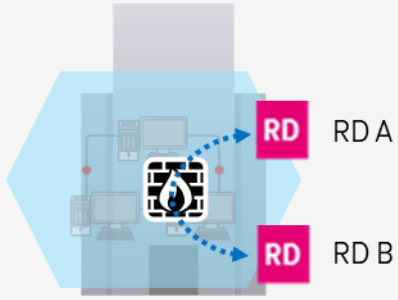
Connection RDs to a switch

- Layer 2 connection between the RDs via this switch
- Single Point of Failure: Switch



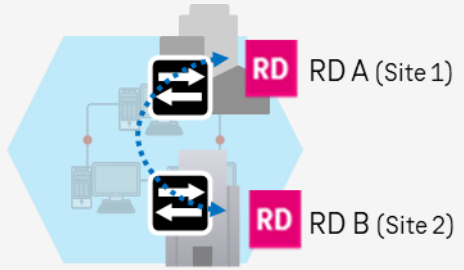
Connection of the RDs to separate switches

- Layer 2 connection between the RDs via these switches must be guaranteed
- Single Point of Failure: Connection between the switches



Connection RDs to a firewall / firewall cluster

- Layer 2 connection between the RDs via this firewall / firewall cluster
- Single point of failure depending on the firewall solution



RDs at separate sites

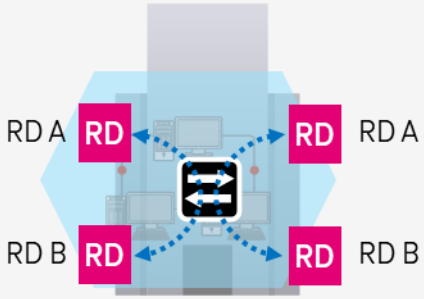
- Layer 2 connection between the RDs across the site must be provided by the customer
- Single point of failure: connection between the sites, local switches if necessary

Customer Network | Customer Switch | Customer Firewall | RD Remote Device

zurück zum Inhaltsverzeichnis

05. Redundancy solutions (4/4)

Good to know:



What should be considered if the customer wants to operate several redundant Internet accesses (DCIP, BPA) at a shared location via only one shared switch?

- As mentioned before, the switching between the first and second access is controlled via the IP protocol VRRP. Telekom configures consistently the VRRP Group 44 for IPv4 address spaces and the VRRP Group 66 for IPv6 address spaces for all redundant transmission routes.
- Therefore, despite different address quotas, conflicts in the network can occur if several redundant Internet accesses are operated via a common switch.
- To avoid such conflicts in the network, the customer has the option of forming a VLAN group per pair of first and second paths from the switch ports involved. This means that the broadcast domains are separated from each other, and the data traffic is then separated.

Customer Network Customer Switch Customer Firewall RD Remote Device

zurück zum Inhaltsverzeichnis

06. Quality of Service (QoS) (1/2)

04.1: Technical parameters for InternetConnect in Deutsche Telekom's German IT backbone

There are three QoS classes available when it comes to prioritizing the IP data packets in the transmission direction (upload):

Quality class	QoS labeling [1]		One-way delay [ms]	Jitter [ms]	Loss [%]	Characteristics/application
	DSCP value	IP precedence value				
Low delay (LD)	AF41	4	25 [2]	5 [2]	0.1 [2]	Minimization of latency and jitter for time-critical/real-time traffic (e.g., video)
Low loss (LL)	AF31	3	40 [2]	–	0.01 [2]	Minimization of the packet loss rate, longer run time (e.g., ERP systems)
Best effort	CS0	0	–	–	–	No particular requirement with regard to quality of service, applications only require bandwidth (e.g., email)

Please note:

1) Traffic that is not marked at all or marked differently shall be assigned to the best effort class.
2) It may be the case that the values listed are not achieved in the event of an overload.
3) IP precedence values that are not contained in the booked QoS profiles shall automatically be changed to IP precedence value 0 for the best effort class.

Back to the table of contents

06. Quality of Service (QoS) (2/2)

04.2 Quality profiles

There are different quality profiles available that vary by bandwidth reservation per QoS class. These QoS classes have the ability to “breathe”. If a certain QoS class has no traffic at a certain point in time, the reserved bandwidth can be used by the other two QoS classes. There are a total of six QoS profiles available:

Class	Profil 0 (Standardprofil)	Profile 1	Profile 2	Profile 3	Profile 4	Profile 5
Low Delay (LD)	0 %	45 %	90 %	0 %	45 %	0 %
Low Loss (LL)	0 %	45 %	0 %	90 %	0 %	45 %
Best Effort	100 %	10 %	10 %	10 %	55 %	55 %

Please note:

- Profile 0 is the standard profile. It does not have the LD or LL QoS class and is therefore free of charge.
- The QoS profiles 1-5 are identically priced in a flat rate model. The price points depend on the InternetConnect bandwidth.
- A profile 10 with QoS Voice is inherently included in Voice VLAN and cannot be changed.

Back to the table of contents

07. IP data throughput

The maximum IP data throughput at one access or the InternetConnect service is defined in two ways: Physically and contractually.

It defines the net data volume (i.e., excl. data overhead) for a set period of time that an access/a service can transmit.

The stated transmission rate corresponds to the maximum transmission rate for the respective connection.

The IP data throughput is always lower than the maximum transmission rate and depends on how and for what purpose the customer uses the service (e.g., services used, size of IP packets).

Service parameters

Business Premium Access Connection variante	Transmission rate in MBit/s	Average data throughput for an Ethernet frame size (Layer 2) of 128 Bytes in MBit/s	Average data throughput for an Ethernet frame size (Layer 2) of of 1 518 Bytes in MBit/s
XXS (2M)	2	1.88	1.99
XS (4M)	4	3.76	3.98
S (8M)	8	7.53	7.96
M (20M)	20	18.82	19.90
L (1G)	980	727.27	977.42
XL (10G)	9,840	8,421.05	9,814.13

Back to the table of contents

8. Customer information via IP addresses (1/2)

The IP addresses for the access (IPv4 or IPv6) required for configuration/commissioning of a Business Premium Access will be communicated to you during product provisioning

In the case of a **GTC contract**, the **commercial contact person receives** with the **written order confirmation (by email)** information on:

- Order/contract data and ordered services
- Technical data (access ID, LAN port no., products, e.g., InternetConnect 300 M, QoS profile), and the
- IP addresses

Shortly before the **concrete configuration date** of the access, a separate letter entitled **“IP address assignment letter”** will generally be sent **(via email,** usually in the **night before the binding delivery date)** to the **technical contact** at the site and contains the following information:

- Order/contract data
- IP address assignment
- Standard gateway
- DNS resolution (resolver addresses) and
- Email backup service

Good to know

In case you lose the “IP address assignment letter” this can be requested again via the DK hotline 0800 33 01180 or by email: DK-IT@telekom.de .

Back to the table of contents

8. Customer information via IP addresses (2/2)

The “IP address assignment letter” provides all information concerning the commissioned access.
The customer can then forward this information to their service provider where necessary.
The data are not to be made public.

Example IP address assignment letter via email for individual connection (fictitious addresses)

ORDER/CONTRACT DATA

Customer number:	0123456789
Access ID:	AN_0001X9Z, AN-0001X9Z
Operation mode of the IP stack:	IPv4 and IPv6

YOUR ADDRESS ASSIGNMENT

inetnum:	62.123.192.0/29
netname:	Musterstadt
descr:	Musterfirma GmbH
Country:	DE
admin-c:	GV1234-RIPE GV1234-RIPE
tech-c:	
status:	Assigned PA

inet6num:	2021:X1:1234:0:0:0:0/48
netname:	Musterstadt
descr:	Musterfirma GmbH
Country:	DE
admin-c:	GV1234-RIPE GV1234-RIPE
tech-c:	
status:	Assigned

YOUR STANDARD GATEWAY

Interface IPv4:	62.123.192.1/29
Interface IPv6:	2021:X1:1234:0:0:0:1/64

YOUR STATIC ROUTES

IPv6 route:	2001:DB8:1234:0:0:0:0/48
destination IP:	2001:DB8:1234:0:0:0:8

Back to the table of contents

9. Hotlines

16.1 DK hotline

We are on hand to assist our customers with all queries concerning Business Premium Access.
We are available to provide support on the free hotline 0800 33 01180 or via email: DK-IT@telekom.de from Monday through Friday from 8:00 a.m. until 5:00 p.m.

Important: The customers should have the following information to hand to ensure quick implementation/support/processing:
Case number, access/connection ID, customer number

16.2 Fault hotline

In the event of problems with the Business Premium Access Portfolio product, we are available around the clock (24/7) for our customers with **T&C contracts** on 0800 330 6708.
For our customers with **TDS framework agreements** or **voice solution contracts (CVS/CPS)**, we are available around the clock (24/7) on the individually agreed number (part of both contracts).

Important: The customers should have the following information to hand to ensure quick implementation/support/processing:
Case number, access/connection ID, customer number

Back to the table of contents

Thank you

