

Whitebox OLT

ONIE & ONL

Open Network Install
Environment
&
Open Network Linux

LXC

Linux container
compliant



Telco Grade Hardware
Ready to
INSTALL ANYWHERE



Precision Time Protocol
Support for
Mobile Backhaul

Zyxel offers

Fiber

Mesh Wi-Fi 6

5G NR/4G LTE

Wi-Fi 7



**Technology
expertise**



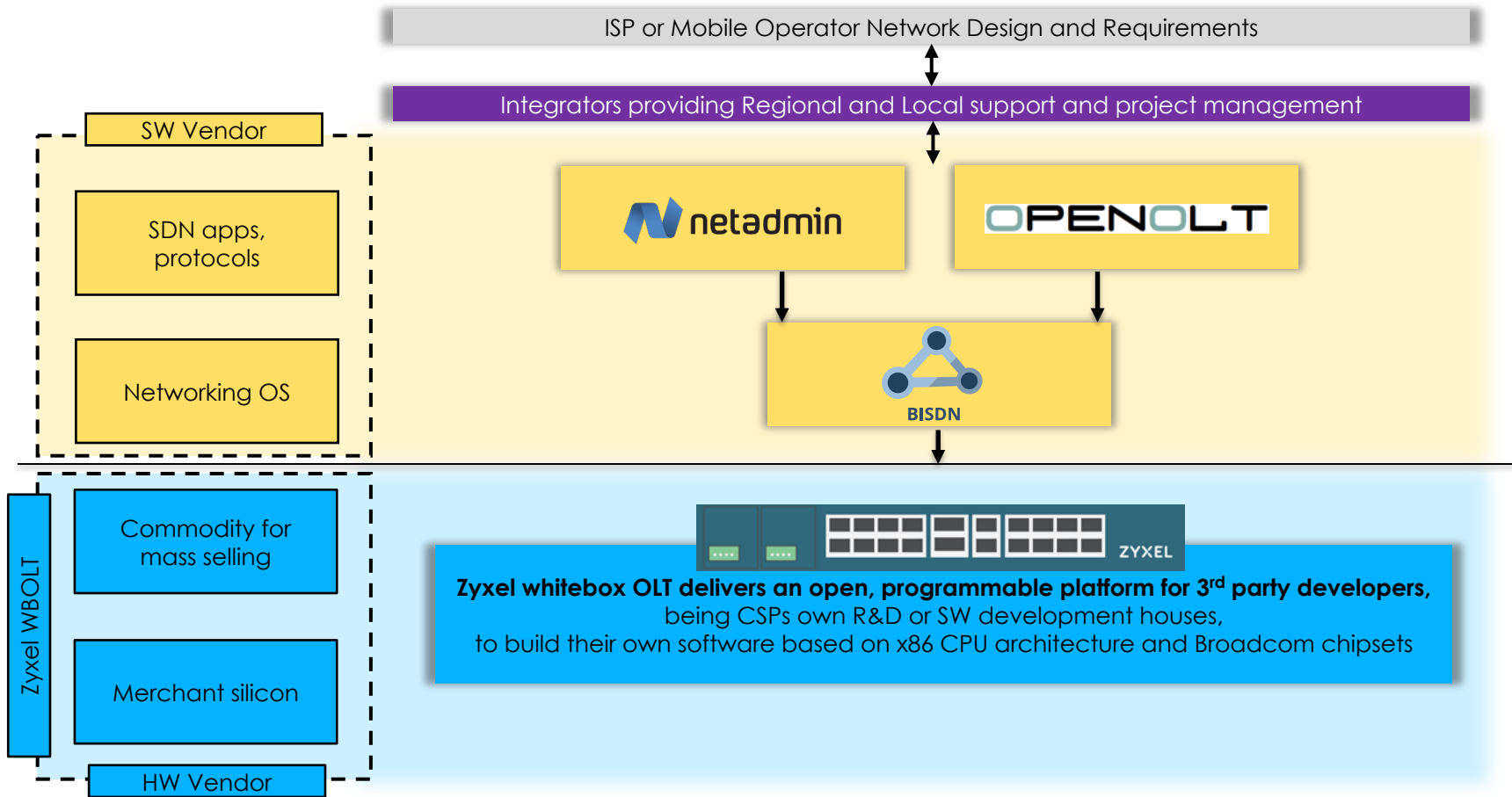
**End-to-end
solutions**



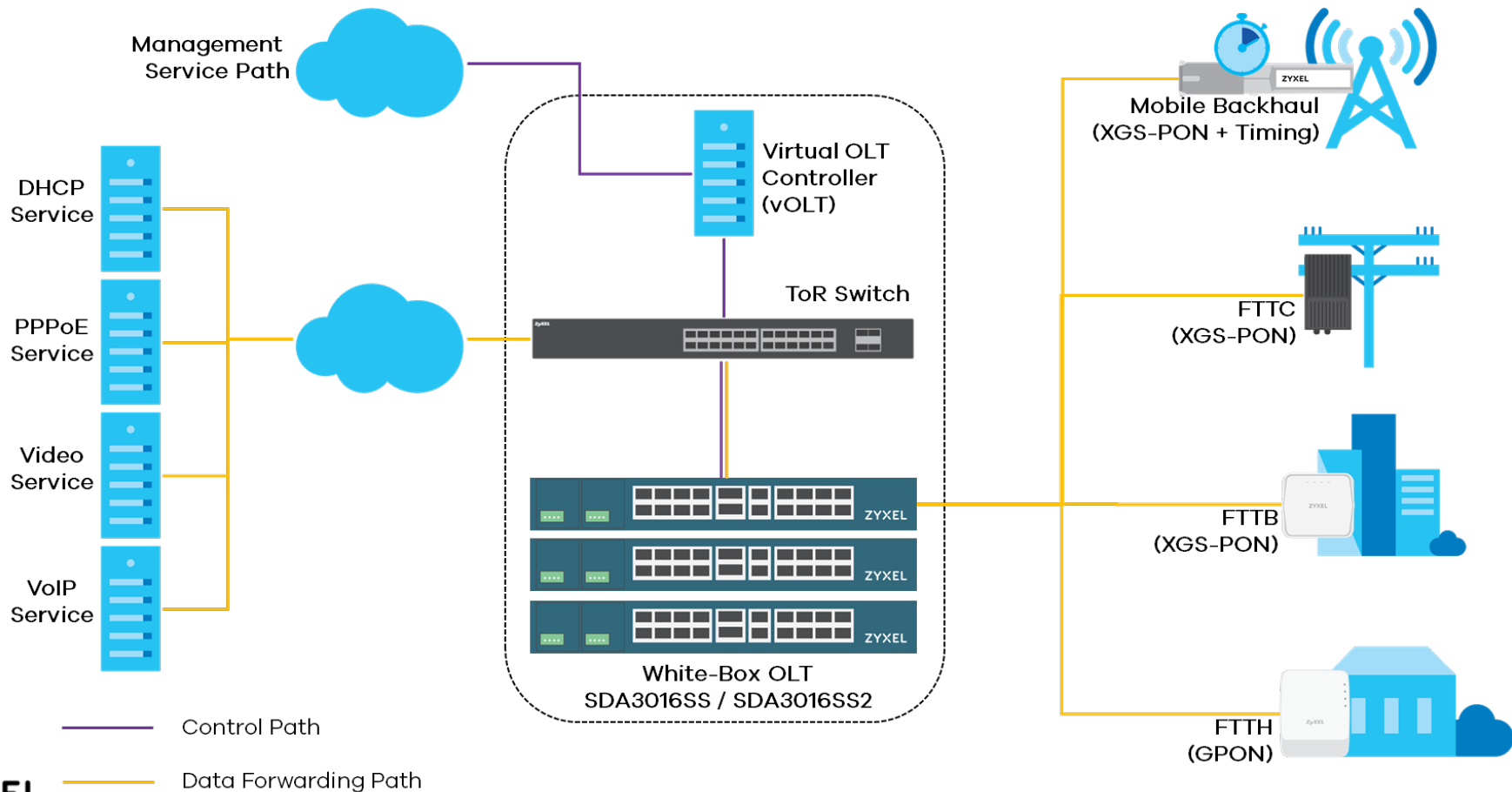
**Customer-centric
mindset**

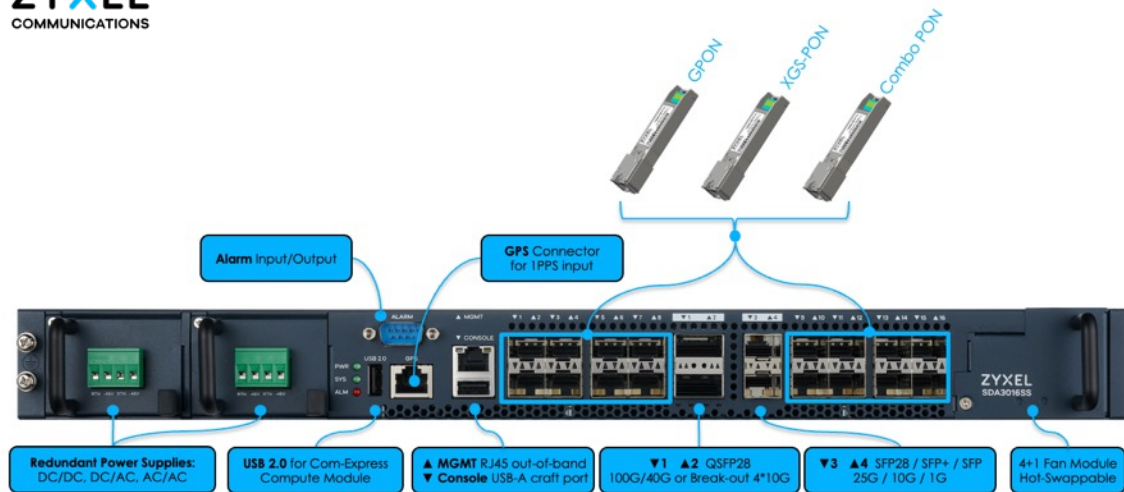


**Service and
technical supports**



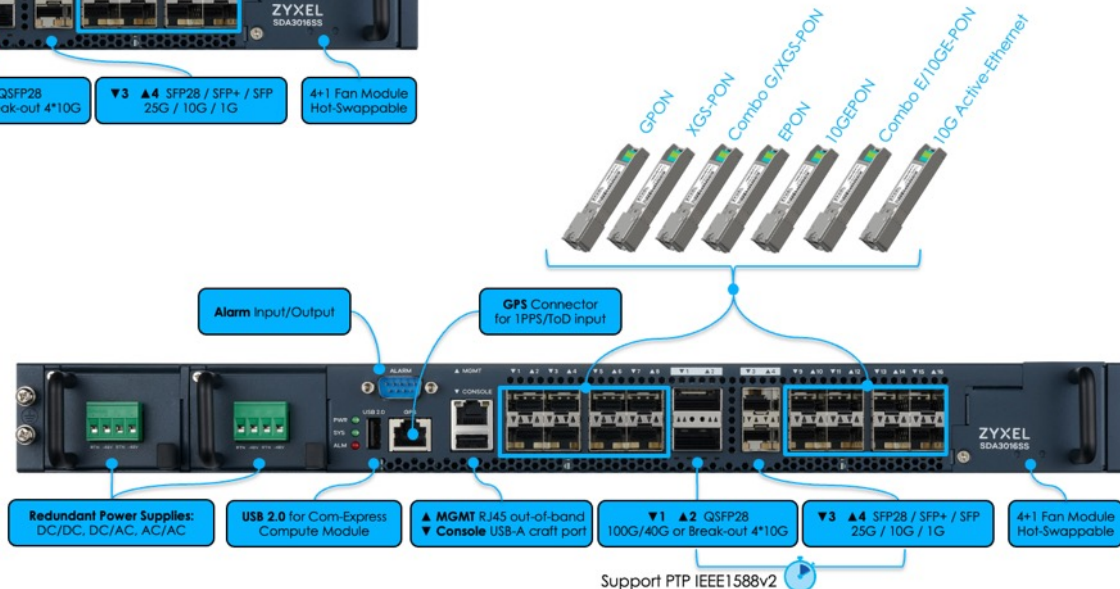
Disaggregated OLT Topology





SDA3016

SDA3016SS





Netadmin Systems

Platform for your fiber journey

Netadmin Systems

- Founded in 2004 as an operator spin-off, based in Sweden (HQ on Linköping).
- Software vendor focused on Fiber Network Operators with an agile delivery and development approach in close cooperation with our customers.
- Purpose-built & pre-integrated modularized OSS/BSS product suite with our origin in the Open Access business but handles Vertical Retail business models equally well.
- Enabling profitable business growth through the automation of business and operational processes.
- Since 2015 part of Lumine Group, a portfolio of Volaris Group and a subsidiary of Constellation Software Inc.
- Today 40 employees backed by a strong owner that holds acquisitions forever which gives a foundation for long term partnerships and “software for life”



Customers

75+

Installations

15+

Countries

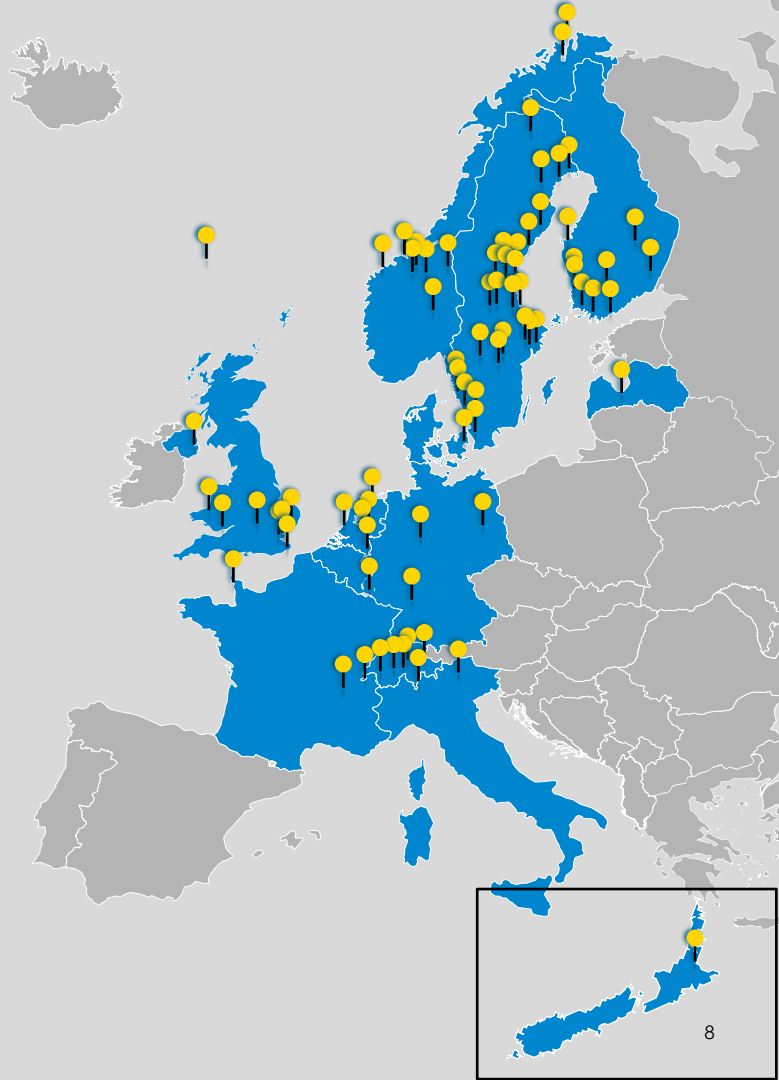
Communication Operators



City Networks

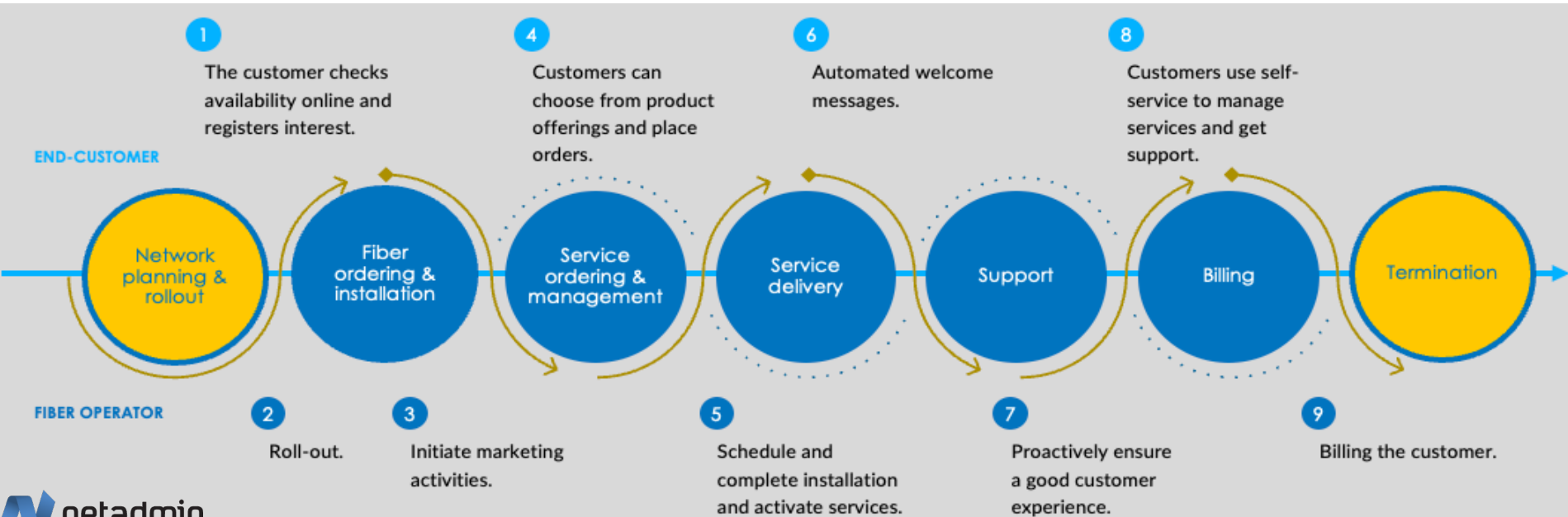


Vertically Integrated

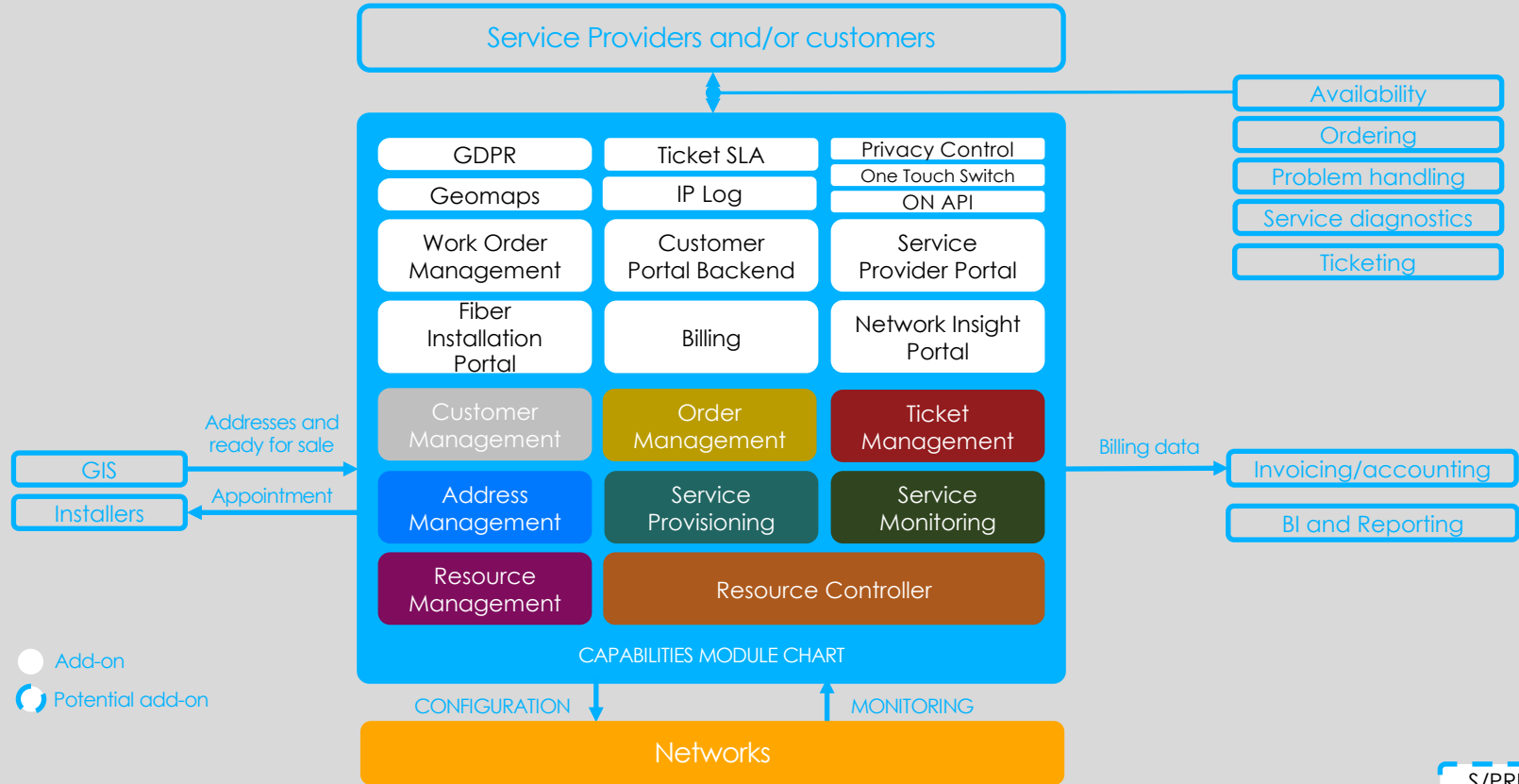


Customer Journey

1. The **Product offerings** can be differentiated based on the status and attributes of the location/address and can include bundles and campaigns.
2. Excellent **Customer Experience** is achieved through an integrated platform that covers availability, ordering, installation, invoicing, network activation and in-life support.
3. Important to **keep the customer informed** when status changes, e.g. availability, order placement, reminders, re-schedule, installation and assure that the customer is happy.
4. **Self-service** for all important processes is essential if you should grow fast and manage the growing customer base.
5. Automation from **Order to Invoice** minimize various problems and ensure that the customer is both paying and happy.



Netadmin Module Overview



Product Composition

1. Netadmin can be used in different scenarios
– **Wholesale and/or Retail + OSS and/or BSS.**
2. Netadmin takes care of Order, Customer, Address and Resource Management including a Product and Service Catalogue and provisioning flows for Resource Activation. Netadmin also has an integrated Ticket Management and Monitoring solution.
3. **Purpose-built integrated platform** for network operators that result in less integrations and customizations.
4. Covers the **Order-to-Cash** process in combination with a payment provider and the **Problem-to-Resolve** process.
5. Netadmin interacts with the network either through Element Management Systems or direct integration. Netadmin has experience with all the big network vendors.
6. Netadmin offers a set of add-ons; Work Order Management, Customer Portal Backend, Fiber Installation Portal and some markets specific add-ons, e.g. One Touch Switch for the UK market (built upon an EU directive).





Pluggable OLT Abstraction (pOLTA)

Zyxel SDA

BISDN – experts in whiteboxing networks!

2012: Self-funded and independent since inception

- Initial growth via R&D for service providers
- 25 employees by Q1 2024
- Mix of industry veterans (4 PhDs) and young engineers, multi-disciplinary team

2017: Product development of BISDN Linux whitebox operating system

- Latest release 5.1 as of Dec, 2023

2019: Carrier solutions based on BISDN Linux

- XGS-PON OLT in partnership with  **TIBIT** communications inc
- BNG: Broadband Network Gateway in partnership with 
- Legal Interception Gateway in partnership with (and for) 

2021: Open Core strategy for BISDN Linux

- Free and open source network OS
- Value-added applications for telco functions and system integration
- Demonstrations of vOLT @Swisscom, LI-Box @DT, vBNG @BBWF (w/ Vodafone+Intel)

2023: Founding of BISDN Bilbao

- Focus on pOLTA product for FTTx



Universal disaggregated OLT

Easily combine different PON and switch hardware options

Multiple Service Orchestrators

- Netadmin, Nokia Altiplano, Cisco NSO, Intraway Symphonica, OpenOLT

Multiple PON technologies

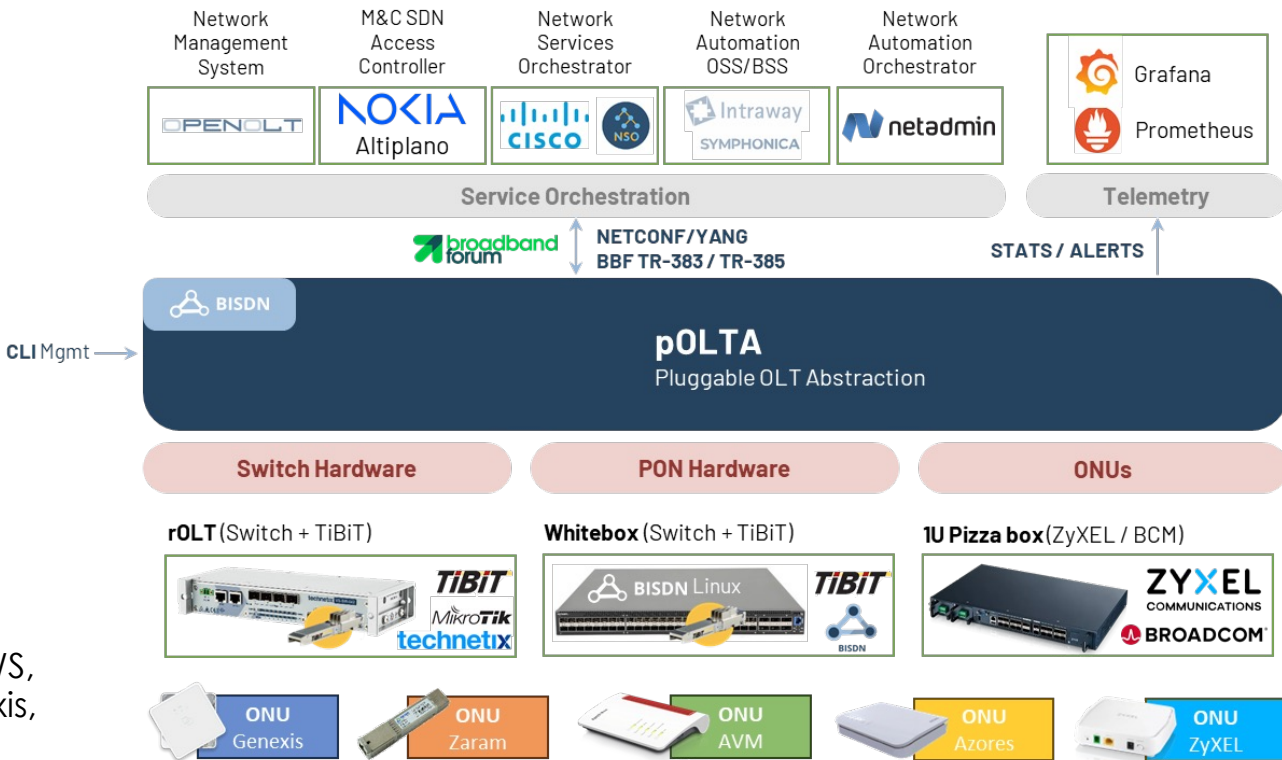
- GPON, XGS-PON, 25G PON
- Common NBI

Multiple platforms

- Switch: Technetix, Mikrotik, Broadcom
- PON: TiBiT, Broadcom BAL

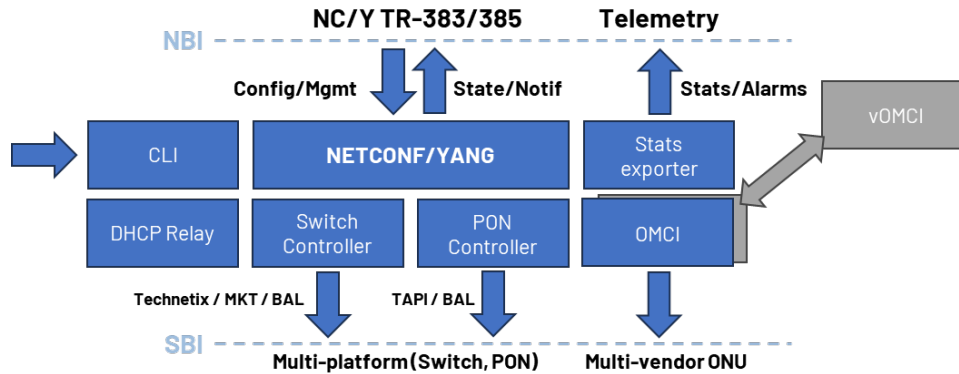
Multi-vendor ONU support

- Zyxel, CIG, AVM, Azores, BFWs, Zaram, DDKT, Icotera, Genexis, HALNY

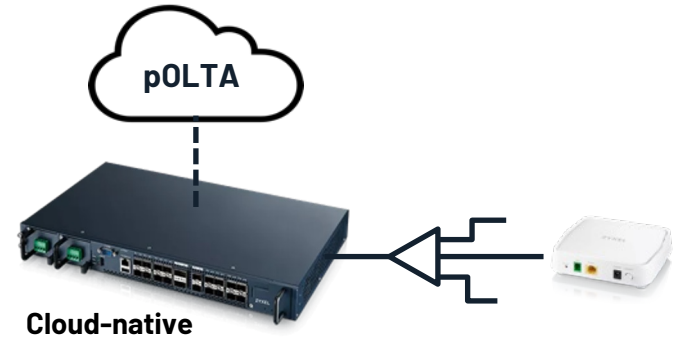
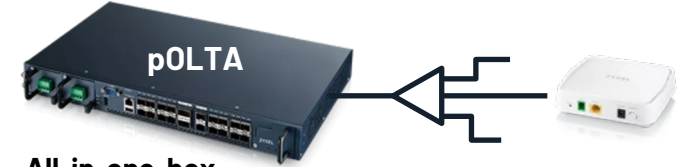


pOLTA architecture

OLT disaggregation



pOLTA deployment options on Zyxel SDA3016SS



Customer On-boarding Journey

Using The Order Wizard

Address Search

Availability
Check

Product
Ordering

Provisioning &
Activation

Provisioning &
Activation
(Configuration)

Billing
Activation

Live customer

Get fiber Product offerings Customer service netadmin|nine Log in

Get ultrafast broadband for your home

Enter your postal code and street to see the fiber to your address.

Postal code

12345

Street address

Hauptstraße

Hauptstraße 1

Hauptstraße 2

Get fiber Product offerings Customer service netadmin|nine Street 2 2 12345 City Log in

Fiber Installation

€ 400 / month € 2000 Start fee

1 Month(s) contract 1 Month(s) period of notice

Monthly fee:

Start fee:

Delivered to

Street 2
12345 City
COUNTRY

Billed to

Anton M
Street 2
12345 C
anton@j
303490:
34334

Terms, conditions & privacy policy

Back

Customer On-boarding Journey Using The Customer Portal

Get fiber Product offerings Customer service netadmin|nine Street 2 2 12345 City Log in

THANK YOU

Thank you for your order!
Your order number is #915

You will receive an order confirmation and login details to "My Pages" to your e-mail. You can follow the progress of your order by logging in to "My Pages".
Don't hesitate to contact us if you have any questions.

Information
Privacy & cookie policy

netadmin
Wallenbergstraße 4

f t i y

Address Search

Search

Street

Haupt

Search for addresses where street starts with the specified string

Results (2)

Name	City	Postal code	Street	Street number	Entrance	Apartment number	Apartment address	Building Na
Hauptstraße 2 12345 Mühlbach	Mühlbach	12345	Hauptstraße	2				
Hauptstraße 1 12345 Mühlbach	Mühlbach	12345	Hauptstraße	1				

Showing 1 - 2 / 2, sorted on Name ▲

First Previous 1 Next Last

Close

Shortcut tip: Pressing **s** also opens this dialog box

Search

Address Search

Availability
Check

Product
Ordering

Provisioning &
Activation

Provisioning &
Activation
(Configuration)

Billing
Activation

Live customer

Availability Check

Place Order



Previous

Next

Cancel

Select the products that you would like to order.

Category

Select

Service provider

Dorftel

Max Bandwidth

Select

Consumer type

Select

Campaign

Any

Yes

No

Available

Any

Yes

No

Clear

	Category	Provider	Product	Available	Bundled products	Max Bandwidth	Earliest delivery	Start price	Price	Campaign
Add	Internet	Dorftel	Dorftel Internet 2000	Yes		2000	2024-05-07	30,00 EUR	39,00 EUR	No
Add	Internet	Dorftel	Dorftel Internet 1000	Yes		1000	2024-05-07	30,00 EUR	29,00 EUR	No
Add	Internet	Dorftel	Dorftel Internet 500	Yes		500	2024-05-07	30,00 EUR	27,00 EUR	No



Order settings



Cancel subscriptions



Select products



Select addons



Product options



Work Orders



Billing details



Customer



Confirm

Address Search

Availability
Check

Product
Ordering

Provisioning &
Activation

Provisioning &
Activation
(Configuration)

Product Ordering

Place Order

PreviousFinishCancel

Review the order



A preliminary check showed that the order probably will be able to be delivered

Order Details

Connections

Name	Bundled products	External reference
Dortel Internet 2000		

Configuration

Requested delivery date:

Ignore binding times and notice periods:

Installation address

Country: DEUTSCHLAND
City: Mühlbach
Postal code: 12345
Street address: Hauptstraße
Floor:
Apartment address:

Customer

Corporate customer: No	Address:
First name: Anton	Hauptstraße 1
Last name: Müller	12345 Mühlbach
SSN:	DEUTSCHLAND
Customer number: 123	Invoice address:
E-mail:	Hauptstraße 1
Phone number:	12345 Mühlbach
Mobile:	DEUTSCHLAND



Order settingsCancel subscriptionsSelect productsSelect addonsProduct optionsWork OrdersBilling detailsCustomerConfirm

Address Search

Availability
Check

Product
Ordering

Provisioning &
Activation

Provisioning &
Activation
(Configuration)

Provisioning and Activation

Order Details: 20

Save

Execute

Acknowledge

Cancel

Delete

Status

Information

Configuration

Job type: Connection

Status: Completed

Dependencies: None

Priority: 5

Configuration status NA SP

Jobs

✓ Resource booking

✓ Activate GPON Service

✓ Add Subscriber to RADIUS

Jobs

Tickets

Address status

Referencing subscriptions

Characteristics

		Order ID	Package	Status	Type	Execution time	Last attempt	Cancelled	Priority
Details	Delete	20	Provisioning Package Internet	Completed	Connection	2024-05-07 17:30:39	2024-05-07 17:30:44	No	5

Address Search

Availability
Check

Product
Ordering

Provisioning &
Activation

Provisioning &
Activation
(Configuration)

20

Provisioning &
Activation

Provisioning and Activation (Template and Flow Configuration)

Package Blocks

1: Simple block Resource booking

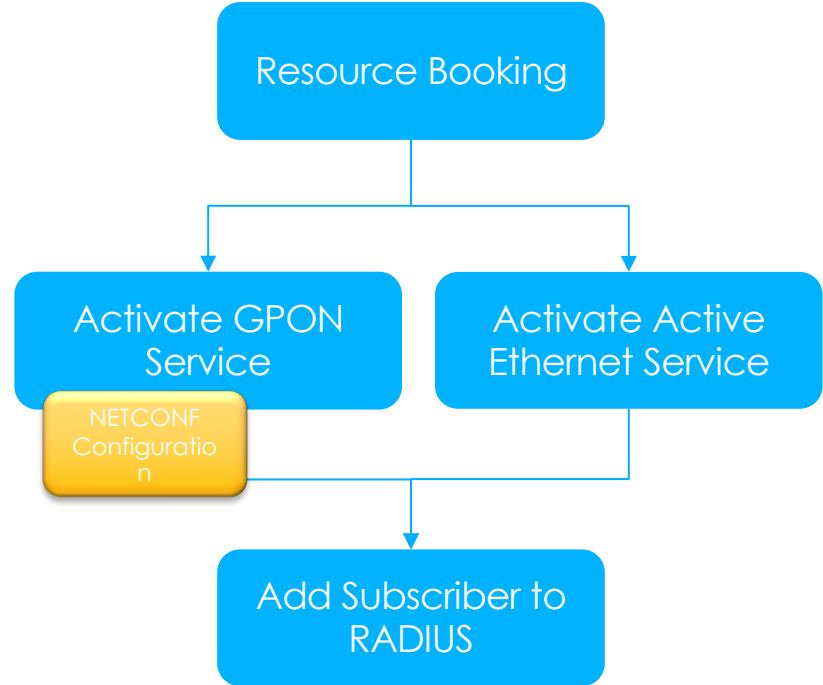
2: Conditional block

Block: ☒ Conditional

3 conditional blocks

Conditional block	Subscription >>...ame (SysId: 45)
Activate Active Ethernet Service	"Access Active Ethernet" D
Activate GPON Service	"Access GPON" D
Activate	*

3: Simple block Add Subscriber to RADIUS



Address Search

Availability
Check

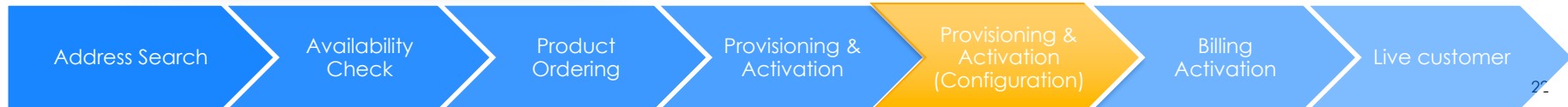
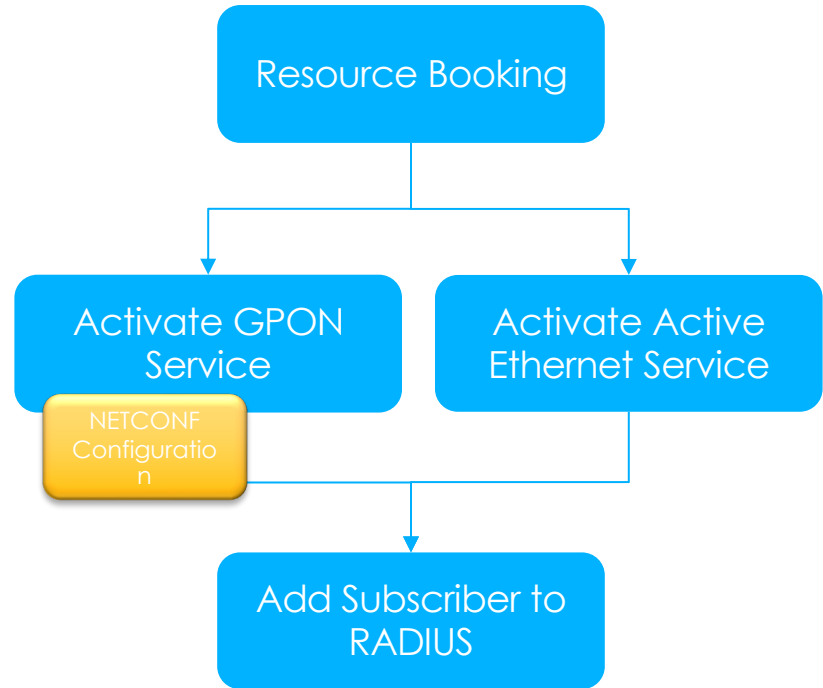
Product
Ordering

Provisioning &
Activation

Provisioning &
Activation
(Configuration)

Provisioning and Activation (Template and Flow Configuration - NETCONF)

Package Blocks
1: Simple block NETCONF 1 config ONU ANI VANI
2: Simple block NETCONF 2 create ANI VANI link
3: Simple block NETCONF 3 create UNI interface
4: Simple block NETCONF 4 create UNI link
5: Simple block NETCONF 5 create QoS policy
6: Simple block NETCONF 6 config TDP
7: Simple block NETCONF 7 config TCONT
8: Simple block NETCONF 8 config GEMPORT
9: Simple block NETCONF 9 config NNI and PON
10: Simple block NETCONF 10 config forwarders
11: Simple block NETCONF 11 config ONU VLAN subif



Provisioning and Activation (NETCONF Driver)

NETCONF Driver Parameter Configuration

Driver: NETCONF / NETCONF 9 config NNI and PON

Save New Delete

Basic Information

Package: NETCONF

Type: NETCONF 9 config NNI and PON

Timeout: 60

Description:

Parameters Inputs Rules Transactions

Parameter type	Variable name	Input		
Device login password	loginpass	Device	Edit	Delete
Device login username	loginuser	Device	Edit	Delete
Device management address	address	Device	Edit	Delete
Device TL1 password	proxypass	Device	Edit	Delete
Device TL1 username	proxyuser	Device	Edit	Delete
Text	proxyhost	Proxy hostname	Edit	Delete
Text	devicetype	Device type	Edit	Delete
Text	outervlan	Outer VLAN	Edit	Delete
Text	innervlan	Inner VLAN	Edit	Delete

NETCONF Driver Code

Driver: NETCONF / NETCONF 9 config NNI and PON

Save

Code XML formatting Parameters

Ctrl + F11 for full screen
Ctrl+Space = Autocomplete for built-in PHP functions and parameters

```
12 $cli = new SSHv2();
13 $cli->setAddress($proxyhost);
14 $cli->setUserName($proxyuser);
15 $cli->setPassword($proxypass);
16 $cli->setAutoLearnPrompt(true);
17
18 if (!$cli->connect()) {
19     error("Could not connect");
20     returncode(100);
21 }
22
23 if (!$cli->login()) {
24     error("Could not login");
25     returncode(200);
26 }
27
28 $config = <<<EOD
29 <nc:config xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0">
30   <if:interfaces xmlns:if="urn:ietf:params:xml:ns:yang:ietf-interfaces">
31     <!-- Configure the NNI Network on the OLT to add an outer TAG -->
32     <if:interface nc:operation="merge" xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0">
33       <if:name>network.s$outervlan.c$innervlan</if:name>
```

Billing Activation

☆ Subscription: Dorftel Internet 2000 (Dorftel Internet 2000)

Save

Delete

Transfer subscriptions

Basic information

Billing Plan

←

May 2024	Jun 2024	Jul 2024	Aug 2024
7 May	Monthly fee 2000/2000 39,00 EUR		
7 May Startup fee 30,00 EUR6			

Address Search

Availability
Check

Product
Ordering

Provisioning &
Activation

Provisioning &
Activation
(Configuration)

Billing
Activation

Live Customer

☆ Customer: Anton Müller No related work orders SysId: 3

New Edit

Invoice details Contact details Messaging Billing Work Orders

Customer number 123

Name Anton Müller

SSN

Created 2024-04-30 15:35:48

Country DEUTSCHLAND

City Mühlbach

Postal code 12345

Street address Hauptstraße 1

Reference

Corporate customer No

Agreement number

password reset UI plugins



Subscriptions Subscription groups Addresses Devices Archived Subscriptions Tickets Orders Products Documents

⌕ 🏠 🔗 🔄 ✓

Dorfotel @ Hauptstraße 1 12345 Mühlbach

 Dorfotel Internet 2000 (Dorfotel Internet 2000)
Service: Dorfotel Internet 2000

39,00 EUR / Month Status: Connected, Activated

Number: 9 Created: 2024-05-07 Connected: 2024-05-07 Source: OM NA
Inv. cust. no: 123



Address Search

Availability
Check

Product
Ordering

Provisioning &
Activation

Provisioning &
Activation
(Configuration)

25

Ac

Reach out today



Contact: Detlef Horn

Detlef.horn@netadminsistemas.com

+49 176 8051 8865



BISDN GmbH
sales@bisdn.de

BISDN SL.
Info.bilbao@bisdn.de



isp@zyxel.eu