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DE-CIX API Handbook

We make interconnection easy. Anywhere.

www.de-cix.net

Simplifying IX services

DE-CIX offers an API (Application Programming Interface) to order, configure, and cancel interconnection services easily.

It is based on IX-API, an industry standard developedfor provisioning interconnection at Internet Exchanges;it supports fully end-to-end automated processes. This handbook will tell you what the DE-CIX API is and how you can use it to provision your services.

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DE-CIX API – what is it about?

Benefits for DE-CIX customers

With the DE-CIX API, we will replace the manual, error-prone, and time-consuming provisioning of multiple services.

For our customers, the DE-CIX API offers the following benefits:

➔Instant configuration or change of IX services without human interaction
➔Vastly reduced time for the configuration, change, and cancellation of services – from days to minutes
➔24/7/365 availability
➔Less effort per transaction leads to more cost-efficiency
➔Increased transparency due to instant feedback
➔Possibility to integrate IX services in your portals

In addition, as the DE-CIX API is based on the IX-API standard, you will reduce implementation costs by using one single API language for multiple Internet Exchanges

How does it work?

The DE-CIX API provides an interface for provisioning key services at DE-CIX. It supports fully end-to-end automated processes and enables networks to configure, change, and cancel services at multiple IXs.

In particular, this means that if you have an existing access port at DE-CIX, you can make use of the DE-CIX API to configure multiple services yourself via your own portal. Even your customers can configure such services in the portal.

At the moment, you can use the DE-CIX API to do the following:

➔Configure a new peering (***GlobePEER***) service via an existing access installed at a specific DE-CIX location, e.g., Frankfurt, Madrid, New York, etc.
➔Configure a new remote peering (***GlobePEER Remote***) service via an existing access installed at a specific DE-CIX location but peering effectively at a location that is connected to this DE-CIX location, e.g., Frankfurt is connected to Madrid, New York, Palermo, etc.
➔Configure a new Cloud (***DirectCLOUD***) service via an existing access installed at a specific DE-CIX location, e.g., Frankfurt, Madrid, New York, etc.

The above-mentioned services can also be upgraded, downgraded, and terminated.

➔Any change or termination of a service will require a notice period depending on our (***Global Terms and Conditions***) and will therefore only be processed at the end of the notice period.
➔Further products like ***VPNI*** and ***the Microsoft Azure Peering Service*** are in development and will be released in due course.

Billing: The services will be billed quarterly in advance in line with the price list agreed in your contract.

Requirements

➔The DE-CIX API is only available to customers and partners of DE-CIX.
➔The above includes an existing or new access port to DE-CIX (which can soon be ordered via the DE-CIX API).
➔Implementation of the client software for the DE-CIX API specification
➔Regular orders with DE-CIX
➔The DE-CIX API terms apply

Once you have decided to use the DE-CIX API:

1. Login to the DE-CIX self-service portal to request an API key and to agree to the DE-CIX API terms **https://portal.de-cix.net/api_keys**.
2. Download the DE-CIX API key and the associated secret.
3. You can then integrate the DE-CIX API. Depending on the API version you are using, the API endpoints for your requests are **https://api.de-cix.net/api/v1/** for peering services and **https://api.de-cix.net/api/v2/** for cloud services. Please note that these need separate credentials.

Backend – getting started

Explore the specs

To implement the DE-CIX API, please have a look at the IX-API documentation. IX-API is a REST API following OpenAPI v3 standards. We provide a “Swagger UI” style interface (powered by ReDoc) for easy ***exploration***.

The examples in the documentation will give you a clear picture of the endpoints and what data they provide or expect. Also, the glossary provides you with an overview and the IX-API definitions.

Here are some starting points for exploring:

➔List facilities
➔List your connections (LAGs)
➔Get details about a connection
➔Add a MAC address
➔Get details about your network service configuration

Get the sandbox

We have a sandbox as an implementation reference. Developers who want to write a program which speaks to the IX-API can do so in the sandbox. Link: **https://ix-api.net/** under API Documentation or here: **https://gitlab.com/ix-api/ix-api-sandbox**.

We provide a Docker image to facilitate local exploration and adoption of the API. The sandbox allows you to create tokens for (local) authentication. It comes with a skeleton configuration for a quick start.

You can then import the IX-API specifications into Postman or a similar tool and let it point at your local installation.

Follow these steps:

➔Make sure that **https://docs.docker.com/install/overview/** and Postman are already installed.
➔Follow the steps in the README (part of ***the sandbox repository***) using the public image at Dockerhub.
➔Go to http://localhost:8000/ and check whether the sandbox is running.
➔Use the bootstrapping scripts to give you a quick start on a demo environment.
➔The README file gives you in-depth information about the sandbox for IX-API.

API Documentation

The following API documentation assets are available ***here***:

➔V2
➔API Sandbox
➔OpenAPI Specification
➔OpenAPI Specs Download JSON
➔OpenAPI Specs Download YAML
➔V1
➔API Sandbox
➔OpenAPI Specification
➔OpenAPI Specs Download JSON
➔OpenAPI Specs Download YAML

Glossary

IX-API works through the processing of entities, which we have attempted to design and name as clearly as possible. However, there will be some differences in terminology between different groups of users, so the explanations below clarify how terms are used within the scope of the IX-API schema and documentation.

The definitions are provided in the order of easiest readability; some cross-referencing is inevitable.

Customer
A company that buys services from an IX (and may resell them to other customers).

Contact
An entity of a company fulfilling a given role and undertaking a specific responsibility within or on behalf of a customer. This will typically be a department or agent of the customer company rather than an individual, except in the case of smaller customers.

Several subtypes of contact exist, and a customer may not need to supply every type. However, ordering certain services may require the customer to specify contacts of multiple types:

- ➔***Legal***
  The business entity within the customer who is responsible for the legal contract with the IX.
- ➔***Billing***
  The recipient of invoices.
- ➔***Implementation***
  The contact responsible for provisioning, setting up the BGP testing, routing, etc.
- ➔***NOC***
  The contact responsible for troubleshooting an ongoing, live service.
- ➔***Peering***
  The contact responsible for coordinating peering with other customers.

Product
A network or peering-related product of a defined type sold by an IX to its customers.

Products will have a defined product type; the only type so far defined is ‘Exchange LAN,’ for the provision of peering services.

An example of an ‘Exchange LAN’ product would be each distinct peering infrastructure available from an IX.

Network Service
An instance of a product, accessible by one or multiple users, depending on the type of product

In the case of Exchange LAN products, each network service is accessed by all users of the related product, meaning there is a one-to-one mapping between products of this type and their related services.

Future product types may support multiple closed or private instances within a product, meaning that there will be one network service for each such instance of a product.

Network Feature
A piece of functionality made available to customers within a network service. Any network service may offer multiple network features of a given type.

Certain features may need to be configured by a customer to use each service.

The only type of network feature currently specified is a route server, which can be defined as operating in either Public or Collector mode.

Network Service Config
A customer’s configuration for usage of a network service, e.g., (for an Exchange LAN service) the configuration of (a subset of) a connection for that customer’s traffic.

Network Feature Config
A customer’s configuration for the usage of a network feature, e.g., (for a route server feature) the configuration of a route server session for a given network service configuration.

Connection
A functional group of physical network connections collected together into a LAG (aka trunk).

Demarcation Point (aka Demarc)

The point at which customer and IX networks meet, e.g., a physical port/socket, generally with a specified bandwidth.

Facility

A data center, with a determined physical address, from which a defined set of PoPs can be accessed.

Metro Area

A city-level region used to determine the location of facilities and products.

PoP

A location within a facility connected to a single network infrastructure, with defined reachability of other facilities. A single room may contain multiple PoPs, each linking to a different infrastructure.

Device

A network hardware device, typically a switch, located at a specified facility, connected to one or more PoPs

MAC address

A MAC address. Addresses may have a defined validity period to support migrations or changeovers.

IP address

An IPv4 or IPv6 address, usually supplied by the IX.

As with MAC addresses, IP addresses may have a defined validity period to support migrations or changeovers.

External Reference

A free-text reference used by a customer for their own purposes, typically to label or locate an entity.

External references are under customer control and have no function effect on the entities that they reference.

Contract Reference

A value representing the contract covering a particular entity, supporting the case where the IX and customer may have multiple contracts covering different services or configurations.

LICENSING

IX-API is licensed under ***Apache 2.0*** (open and liberal license). If you make changes that affect compatibility, please inform ***the participating IXs*** and, of course, your customers.

Front-end DE-CIX – what you need to know

DE-CIX products are based on an access port to DE-CIX. The size can be either 1GE, 10GE, or 100GE. As a DE-CIX reseller and/or API user, you would usually use (optional:a bundle of) 10GE or 100GE access ports. Some might alsouse two separately installed ports with the same capacity for redundancy purposes.

In addition to this access, the API will configure the service for your customer (DE-CIX sub-customer). Those are (depending on the type of reseller you are):

→***GlobePEER*** (requires an ASN from the sub-customer)
DE-CIX offers peering on the most advanced Layer 2 switching platforms in the industry. The GlobePEER service enables networks to peer with hundreds of networks almost instantly via the DE-CIX route servers. The need to negotiate bilateral peering agreements is significantly lower.

→***GlobePEER Remote*** (requires an ASN from the sub customer)
At select locations, customers can peer at an additional DE-CIX location with their existing access. The DE-CIX platforms in Frankfurt, Hamburg, Munich, Dusseldorf, Marseille, Madrid, Lisbon, Palermo, Istanbul, New York, Dallas, and Chicago are interconnected. With an access at one of these locations, you can peer remotely at every other one of these locations with GlobePEER Remote.

→***DirectCLOUD***
DE-CIX provides private access to cloud services. This means you can use your existing access to DE-CIX to connect to several cloud service providers like Amazon Web Services or Microsoft Azure via the DE-CIX Apollon platform – just via an additional VLAN to the DE-CIX Cloud Exchange. And if you need flexibility with your cloud connections, try our DirectCLOUD Flex service.

→***VirtualPNI***
If networks want to peer privately or connect directly to a network at a different DE-CIX enabled site, they can do so with a VLAN, using the VirtualPNI service. At select locations, it is even possible to order a VLAN to a network that is connected to a different DE-CIX location worldwide.

→***Microsoft Azure Peering Service*** (requires an ASN from the sub customer)
The first dedicated Closed User Group at DE-CIX, used for a certain service, has been established for the Microsoft Azure Peering Service. By exchanging data with Microsoft directly, the service enables a one-hop connection with the highest possible quality regarding security, bandwidth, and latency.

All available and current service descriptions are available for download here: **https://www.de-cix.net/en/de-cix-service-world/service-overview**.

Ordering

Select one of the services and choose a size for the VLAN (different sizes available per product)

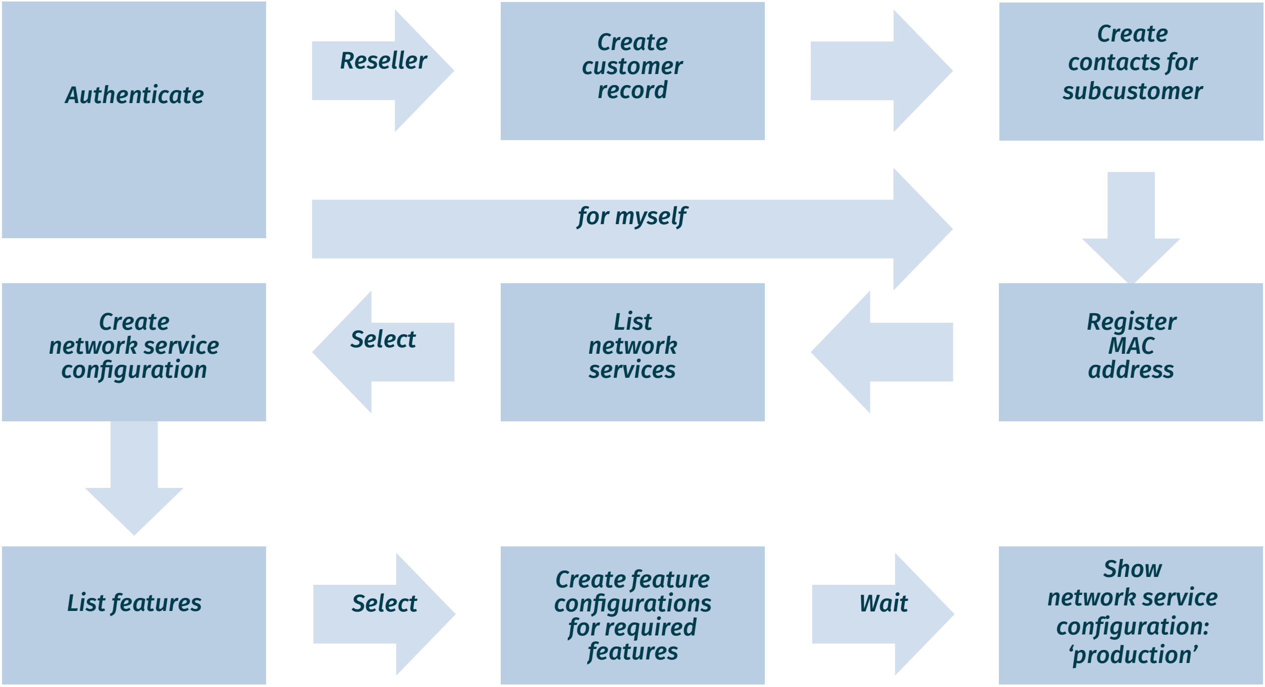
Required information for peering services

- →***VLAN ID***
- →***Sub-customer details:***
  - →Company
  - →Street
  - →Postal code
  - →City
  - →Country
  - →Hotline (optional)
  - →NOC email
- →***Specific service details:***
  - →AS number
  - →Peering email
  - →Router FQDN:
  - →Router IPv6
  - →AS-Macro
  - →RIR
  - →MAC address
- →***Required contact information:***
  - →Reseller technical contact (email)
  - →Sub-customer implementation contact (email)
  - →Sub-customer administrator contact for the customer portal login (full name, email)

SLA information can be found here:
https://www.de-cix.net/en/terms-and-conditions

Service creation workflow

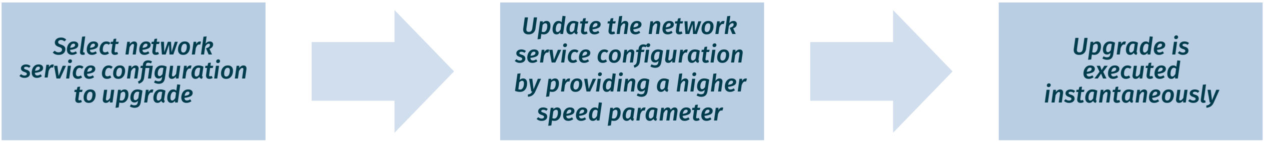
The following process starts when you enter your information:


Authenticate
Reseller
Create customer record
Create contacts for subcustomer
for myself
Register MAC address
List network services
Select
Create network service configuration
List features
Select
Create feature configurations for required features
Wait
Show network service configuration: 'production'

These workflows can be viewed in the redoc as well.

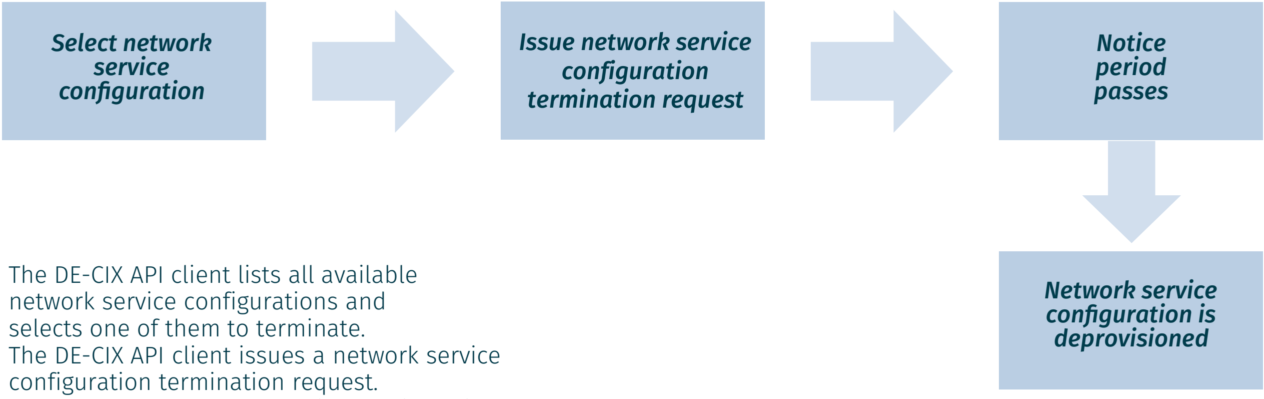
1. The DE-CIX API client authenticates with the DE-CIX API using its credentials (API key and API secret). For all subsequent requests, the client uses the received JWT token for authentication.
2. A customer record is created for each sub-customer (only for resellers).
3. Contact records (at least for the legal contact, but also for NOC or implementation contacts) are created for each sub-customer (only for resellers).
4. The DE-CIX API client registers a MAC address to be used for accessing peering LANs. This MAC address may be changed later.
5. The DE-CIX API client lists all possible network services in order to select the peering LAN to access. Each network service also lists required contact types (i.e., billing, NOC, implementation contacts).
6. The DE-CIX API client creates a network service configuration (providing the ID of the MAC address, a VLAN id, an ASN, and contacts (see step 5). Resellers provide their central billing contact in order to receive consolidated invoices.
7. The DE-CIX API client lists all possible network features in order to select route servers to configure.
8. The DE-CIX API client creates at least one network feature configuration for each required network feature.
9. The DE-CIX backend starts processing the request and initiates the provision of the network service configuration.
10. Once provisioning is completed, the state of the network service configuration changes to ‘production’.

Upgrade workflow


Select network service configuration to upgrade
Update the network service configuration by providing a higher speed parameter
Upgrade is executed instantaneously

1. The DE-CIX API client lists all available network service configurations and selects one of them to upgrade.
2. The DE-CIX API client updates the network service configuration by providing a speed parameter containing a value bigger than the old value.
3. The change is implemented immediately. The customer may utilize the higher rate-limit.

Termination workflow


Select network service configuration
Issue network service configuration termination request
Notice period passes
Network service configuration is deprovisioned

1. The DE-CIX API client lists all available network service configurations and selects one of them to terminate.
2. The DE-CIX API client issues a network service configuration termination request.
3. As a result, the network service configuration state property changes to 'decommission_requested'.
4. For the time of the notice period, the service is still fully functional.
5. Once the notice period has passed, the service is de-provisioned by the DE-CIX backend systems.

Termination periods are part of the **Terms and Conditions**. The termination workflow adheres to the TOC and services are still useable during your notice period.

Billing

DE-CIX bills partners and direct customers quarterly in advance. The invoice will be sent as a PDF document (if not otherwise required) on the first of each quarter. Sub-customers will not receive any invoice for DE-CIX services unless they have signed a direct contract with DE-CIX for any other product.

The invoice will be sent to the email address provided by the buyer when signing the Master Agreement and will be sent from **billing@de-cix.net**. However, the DE-CIX API requires clients to define a billing address for each service. In the reseller case, the reseller defines a central billing address and refers to that for each new service created for the sub-customer.

Please configure your spam filters to accept emails and PDF files from **billing@de-cix.net**.

Contract term and termination/ upgrades and downgrades

All services from DE-CIX have minimum terms and notice periods according to the Global Terms and Conditions (**https://www.de-cix.net/en/terms-and- conditions**). Upgrades are always allowed.

Additional information

Please note: Sub customers are not DE-CIX customers, so if they want to change to you from another reseller, they must contact their reseller about termination and moving the IP address.

DE-CIX contact details

For technical questions, please write to **support@de-cix.net**.

Sub customers can contact us directly, unless you want to be their first-level support and inform them accordingly.

For any commercial questions, such as prices, orders, terminations, down/upgrades, and changes, contact **sales@de-cix.net**.

If you have any additional questions about the DE-CIX API or the IX-API standard, please contact us at **api@de-cix.net**.