



PeeringDB

PeeringDB Workshop

How is PeeringDB organised? // Track 1

APRICOT 2020
APNIC 49

arnold@peeringdb.com

25
YEARS

MELBOURNE
AUSTRALIA

12 – 21 February 2020

Agenda

- Please always use the tutorial DB at <https://tutorial.peeringdb.com>
- What is PeeringDB?
- Organisation
 - History
 - Association
 - Committees

What is PeeringDB?

Mission statement: “PeeringDB, a nonprofit member-based organization, facilitates the exchange of user maintained interconnection related information, primarily for Peering Coordinators and Internet Exchange, Facility, and Network Operators.”

Why should I have a record in PeeringDB?

- As a network a PeeringDB record makes it easy for other networks to find you, and helps you to establish peering / interconnection
- As a colocation provider a PeeringDB record creates visibility, and helps you to attract additional networks and Ixes
- As an IX a PeeringDB record provides information about your participants, and colocations where your service is available
- Provides a user friendly GUI and a powerful API for automasation



Governance and Membership

- PeeringDB is a United States 501(c)(6) volunteer organization that is 100% funded by sponsorships
- Healthy organization, building financial reserves and executing the long term strategic plan
- Membership rules
 - A corporation, limited liability company, partnership or other legal business entity may be a Member of the Corporation
 - Membership is determined by having both an active PeeringDB.com account and an individual representative or role subscription to the PeeringDB Governance mailing list
 - 344 addresses subscribed to the Governance mailing list (as of April 16, 2019)
 - Governance list is at <http://lists.peeringdb.com/cgi-bin/mailman/listinfo/pdb-gov>
 - More information available at <http://gov.peeringdb.com/>

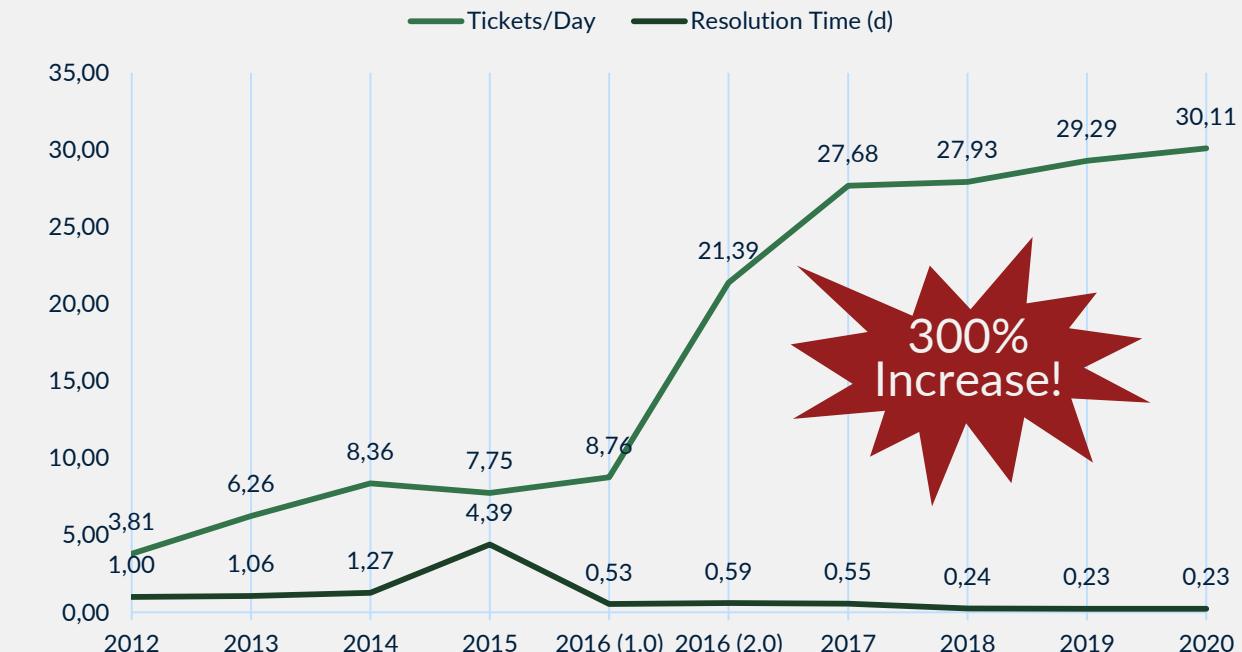
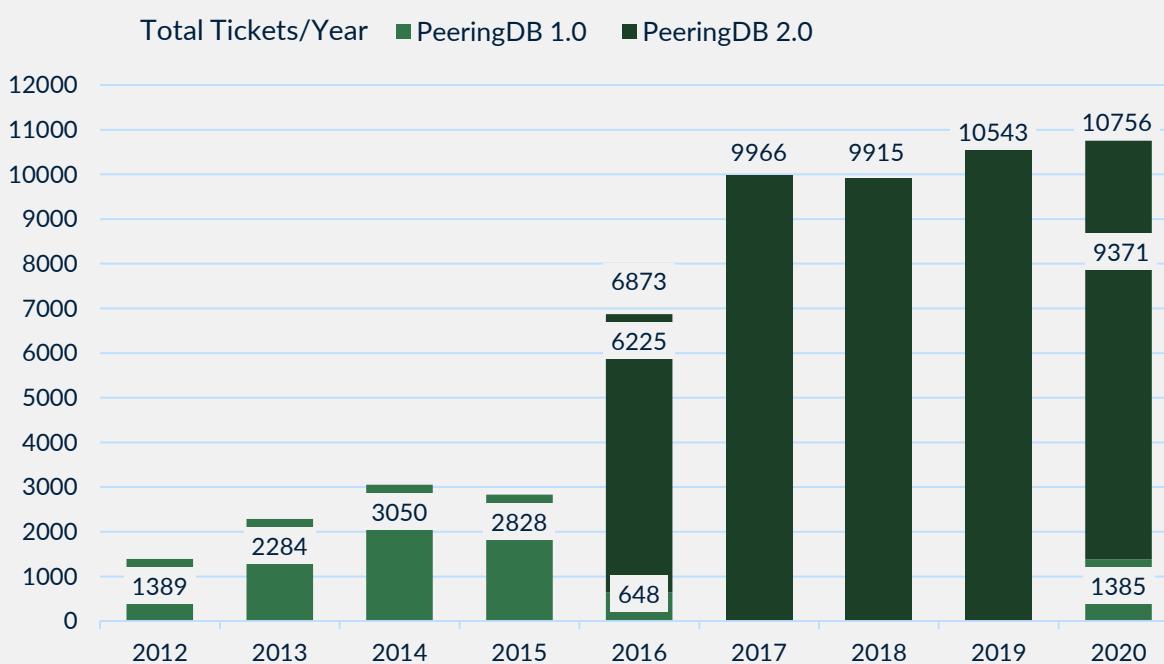
Governance

- The Members
 - Any corporation, limited liability company, partnership or other legal business entity may be a Member
 - One (virtual / online) member meeting per year
- The Board
 - Sets strategic directions and overlooks financial issues
 - Half of the board is elected every year
- The Committees
 - Responsible for the day to day work
 - Admin Committee
 - Operations Committee
 - Outreach Committee
 - Product Committee

Committees

Admin Committee	Operations Committee	Outreach Committee	Product Committee
<ul style="list-style-type: none">Manage administration of user accounts and PeeringDB recordsAnswer support ticketsCleansing and completion of PeeringDB records <p>Leads: Stefan Funke (Chair) Contact: admincom@lists.peerengdb.com</p>	<ul style="list-style-type: none">Manage PeeringDB infrastructure <p>Leads: Job Snijders (Chair) and Aaron Hughes (Vice Chair) Contact: pdb-ops@lists.peerengdb.com</p>	<ul style="list-style-type: none">Manage marketing and social mediaDevelop and maintain presentations, workshops and webinarsCoordinate presentations and attendance at events <p>Leads: Greg Hankins (Chair) and Bijal Sanghani (Vice Chair) Contact: outreachcom@lists.peerengdb.com</p>	<ul style="list-style-type: none">Manage roadmap and development prioritiesAsk for input from the community on desired featuresWrite SoWs to solicit bids to complete requested features <p>Leads: Stephen McManus (Chair) and Matt Griswold (Vice Chair) Product Manager: Filiz Yilmaz Contact: productcom@lists.peerengdb.com</p>

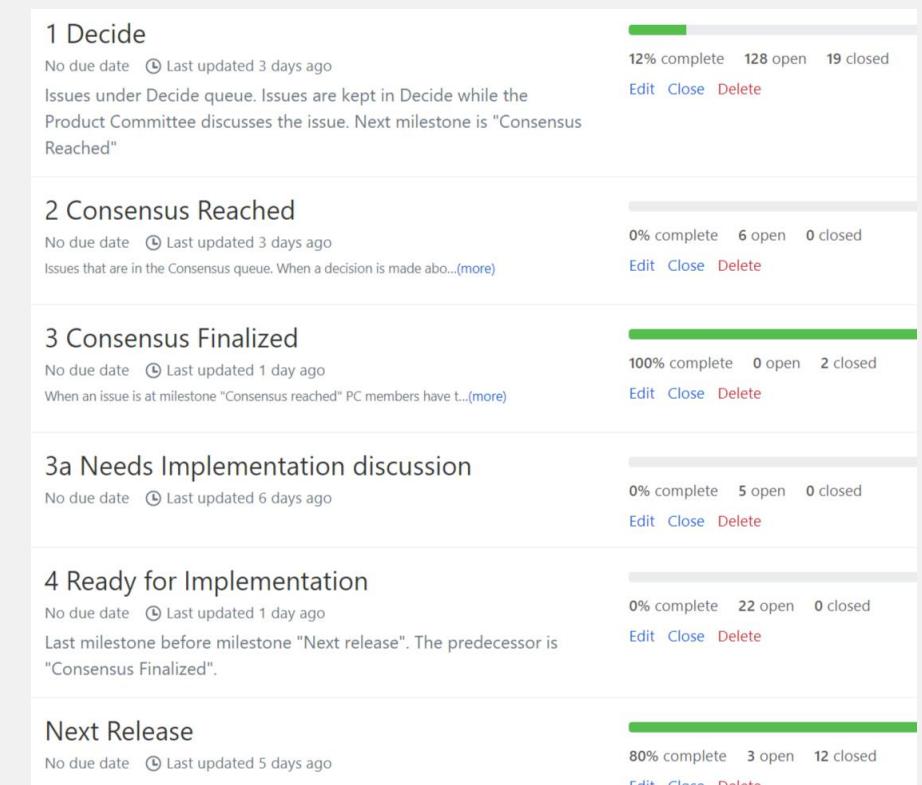
Support Ticket Statistics



- Admin Committee volunteers are based around the world in a variety of time zones with diverse language skills
- Goal is to resolve support tickets within 24 hours

Product Development Workflow

- All issues tracked using GitHub at <https://github.com/peeringdb/peeringdb/issues>
 - Anyone can open a feature requests or file a bug report
 - Open and transparent process for product development
 - Workflow is at <http://docs.peeringdb.com/workflow/>
- Product Committee issue process
 - Evaluate and prioritize the requests
 - Request a quote for development costs
 - Request budget from the board
 - Manage implementation and scheduling
- Your input is needed on features!



Become a PeeringDB Sponsor!

- Diamond Sponsorship - \$25,000 / year
 - Limited to 2 sponsors
 - Very large logo on top line of Sponsors page with URL
 - Diamond Sponsor badge display on all records
 - Social media promotion
- Platinum Sponsorship - \$10,000 / year
 - Large logo on second line of Sponsors page with URL
 - Platinum Sponsor badge display on all records
 - Social media promotion
- Gold Sponsorship - \$5,000 / year
 - Medium logo on third line of Sponsors page
 - Gold Sponsor badge display on all records
 - Social media promotion
- Silver Sponsorship - \$2,500 / year
 - Small logo on fourth line of Sponsors page
 - Silver Sponsor badge display on all records
 - Social media promotion



Microsoft Diamond Sponsor

Organization	Microsoft Corporation
Also Known As	8068 8069
Company Website	
Primary ASN	8075

DE-CIX Frankfurt Platinum Sponsor

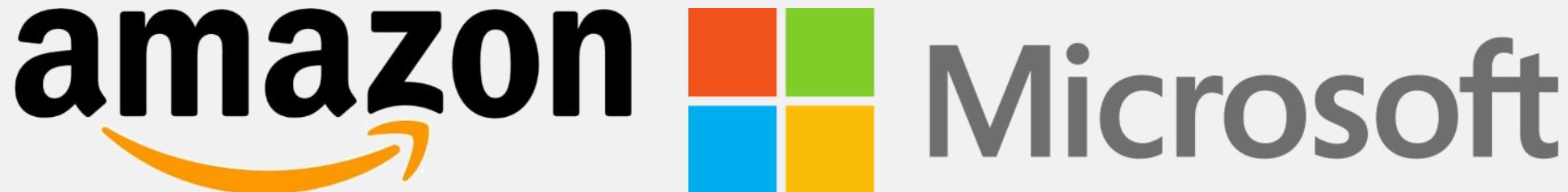
Organization	DE-CIX Management GmbH
Long Name	Deutscher Commercial Internet Exchange
City	Frankfurt
Country	DE
Continental Region	Europe
Media Type	Ethernet



Proud Sponsor of
PeeringDB Contact sponsorship@peeringdb.com for sponsorship info!

Thank you to our sponsors!

Diamond
Sponsor



Platinum
Sponsors



Gold
Sponsors



Silver
Sponsors



DE-CIX Academy

PeeringDB Workshop

Learning the Ropes // Track 2

arnold@peeringdb.com

PeeringDB



Where

Agenda

- Please always use the tutorial DB at <https://tutorial.peeringdb.com>
- Registering
 - Yourself
 - Your organization
- Adding information
 - About your organization
 - About your network / Autonomous System
 - Adding your peering policy
- Internet Exchanges and Facilities
 - Add where your network is present
- Retrieve information
 - Present what you have learned about another network

Registering

The screenshot shows the PeeringDB homepage. At the top right, there is a 'Register or Login' button, which is circled in red. A large green arrow points from the bottom left towards this button. The page features a search bar, a 'PeeringDB' logo, and a main content area with sections for 'Most Recent Updates', 'Networks', and 'Exchanges'. The footer contains links for privacy policy, contact information, and social media.

Search here for a network, IX, or facility.
[Advanced Search](#)

Register or [Login](#)

PeeringDB facilitates the exchange of information related to peering.

Specifically, we are a database of networks that are peering, where they are peering, and if they are likely to peer with you. If you don't know what peering is, and/or you don't currently engage in peering, this probably won't have any meaning for you.

You are currently viewing a read-only view of the data contained here. If you are a peering network who would like to create an account, [you may register for one here](#). Please register ONLY if you are a peering network.

Still have questions? [Read our FAQ](#)

MOST RECENT UPDATES

NAME	LAST UPDATED
Jan Gilla (209844)	18 minutes ago
RESELLGLOBAL (209757)	39 minutes ago
eircom Ltd (5466)	50 minutes ago
LONAP Route Collector (8330)	1 hours ago
Tempest (8620)	1 hours ago
John Dublin (Citywest)	1 hours ago
Isalink (FSL)	15 hours ago
TE-ALX CLS	17 hours ago
moji1	19 hours ago
CyrusOne NJ-1	1 days ago

EXCHANGES

NAME	LAST UPDATED
THAI-IX	12 hours ago
CAIX	1 days ago
UNMETERED Exchange	1 days ago
GABIX	3 days ago
UNIFI-IX	4 days ago

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All Rights Reserved. By using this service, you agree to adhere to our [AUP](#).

[2.11.0 - Privacy Policy](#)

[Sponsors](#)
[Partners](#)
[Resources](#)
[Status](#)
[Documentation](#)
[API Documentation](#)

[Contact Us](#)
support@peeringdb.com

Global System Statistics

STATISTIC	VALUE
14277 Peering Networks	
687 Public Exchange Points	
25991 Unique Public Exchange Presences	
3017 Private Facilities	
23647 Private Facility Presences	

Registering

Create account

Username

Password

Confirm password

For speedy validation, it is required that you use a work e-mail address. If you plan to register your ASN with PeeringDB, it is recommended that you use an email-address that exists in your ASN's public contact details.

Email

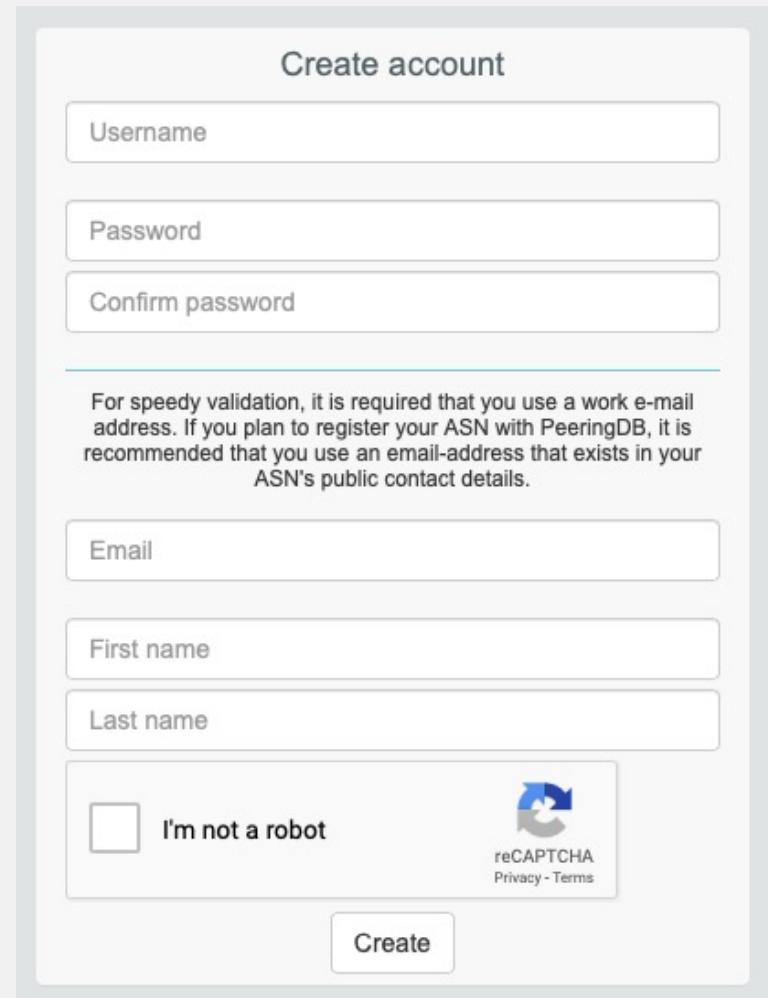
First name

Last name

I'm not a robot

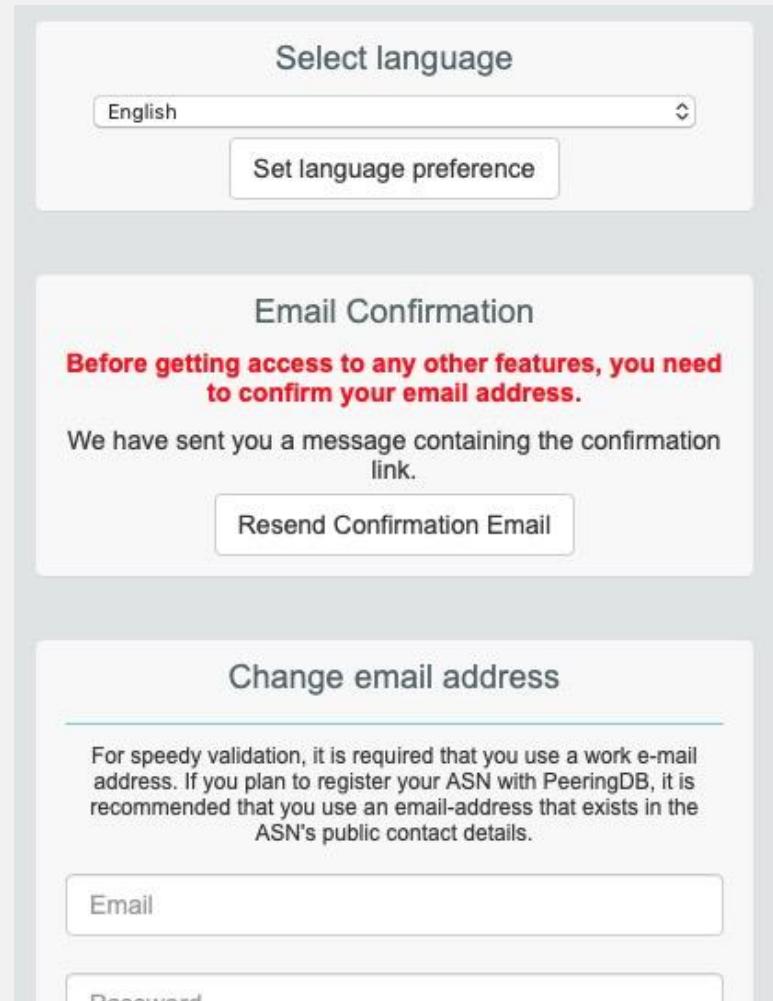
reCAPTCHA
Privacy - Terms

Create



- Choose an username
- Password must be at least 10 characters long
- Use a **real work e-mail address**
 - Ideally the one you registered the ASN with
 - And put in your first and last name
 - You receive a confirmation email
 - Click on the link in the email

Registering



- You can choose a language
 - If your language is not available yet and you want to help – let us know!
 - Not all languages are fully translated
- To re-send the confirmation email, click the button
- Further options here:
 - Change email address
 - Change password
- You have to click the link in the email to continue!

Registering

Set language preference

You have confirmed your email address!

Affiliate with organization

To affiliate with an existing organization, please enter the ASN or organization name below.

To register a new network organization, please enter the ASN and organization name below.

To register a new facility or exchange organization, please enter the organization name below (ASN is optional).

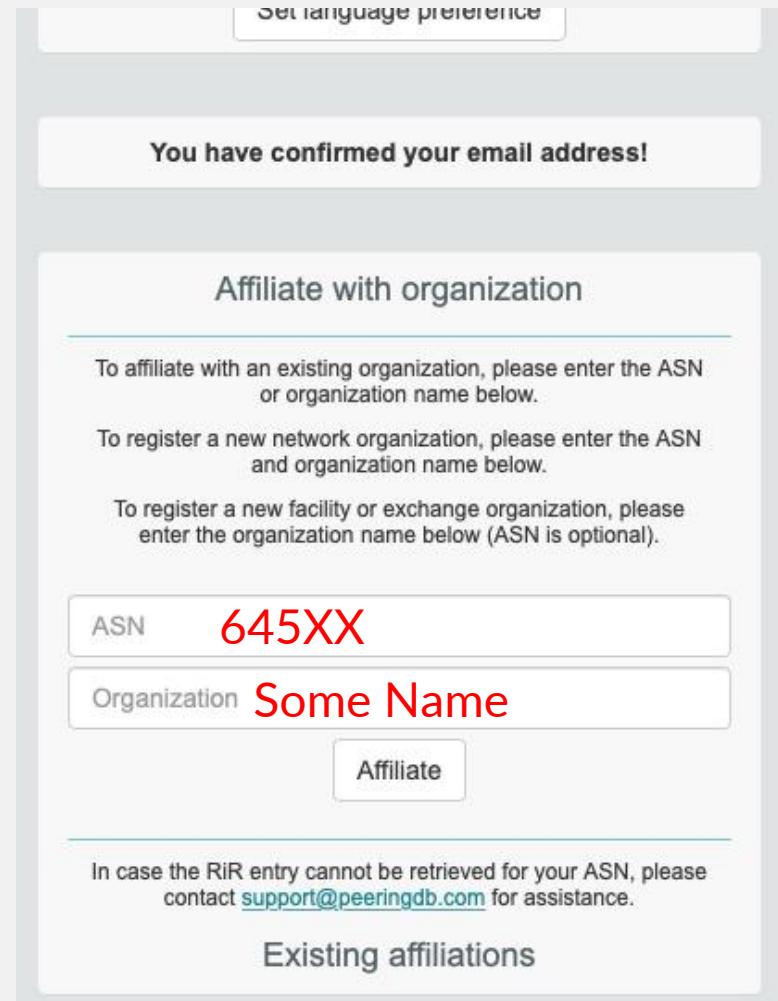
ASN **645XX**

Organization **Some Name**

Affiliate

In case the RIR entry cannot be retrieved for your ASN, please contact support@peeringdb.com for assistance.

Existing affiliations



- Once your email is confirmed:
- Get affiliated with an organization
 - Your company
 - Which is already in PeeringDB
- Or is new to PeeringDB
 - Can be an ISP – enter your AS number!
 - Or a Datacenter
 - Or an Internet Exchange

Registering

Affiliate with organization

To affiliate with an existing organization, please enter the ASN or organization name below.

To register a new network organization, please enter the ASN and organization name below.

To register a new facility or exchange organization, please enter the organization name below (ASN is optional).

ASN

Organization

Affiliate

In case the RIR entry cannot be retrieved for your ASN, please contact support@peeringdb.com for assistance.

Existing affiliations

Your affiliation with [ACME Alternative Hosting](#) has been approved.



- Once approved, you can edit your organization
- Click on your organization to continue...

Your Organization

- Enter information about your organization – click on edit

ACME Alternative Hosting

Some of the data on this page is incomplete, please update the fields marked with ⓘ to improve data quality.

Website ⓘ

Address 1 ⓘ

Address 2

Location ⓘ

Country Code ⓘ

Notes

Facilities

Name ▾

Country

City

Nothing matched your filter

You may filter by Name, Country or City

Networks

Name ▾

Filter

ASN

[ACME Alternative Hosting](#)

64501

Exchanges

Name ▾

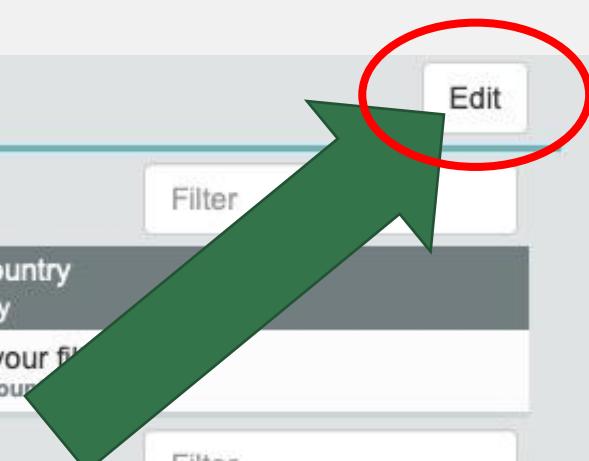
Country

City

Nothing matched your filter

You may filter by Name, Country or City

Edit



Your Organization

ACME Alternative Hosting

Website ⓘ	<input type="text" value="http://www.example.com"/>
Address 1 ⓘ	<input type="text"/>
Address 2	<input type="text"/>
Location ⓘ	<input type="text"/> <input type="text"/> <input type="text"/>
Country Code ⓘ	<input type="text"/>
Notes	Markdown enabled
<input type="text"/>	

- Lets focus on the left side of the screen
- Enter the required information (use either your Sheet or your real company information)
- Use the notes field to promote your company as a peer (if you want to)
 - You can use Markdown (see handout for URL)

Your Organization

The screenshot shows a company profile edit form for "ACME Alternative Hosting Inc." with several fields and their current values:

- Website:** http://www.acme.example
- Address 1:** Vienna
- Address 2:** (empty)
- Location:** Vienna
- State:** (empty)
- Postcode:** 01000
- Country Code:** Austria
- Notes:** Markdown enabled
ACME Hosting
* Best hosting provider ever
* Open peering policy
* Peer with us!

Green arrows point from the right side of the slide towards each of the data entry fields, indicating where users can click to change the information.

- You can also change your company name
- Enter some information and click “Save”

Network Information

- Now it gets interesting
- With your basic company information now in, let's add information about your network
- Click on your network name – beside your AS number on the right side

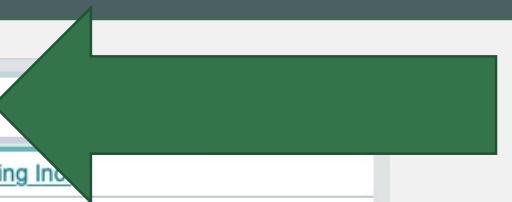
The screenshot shows the PeeringDB interface. On the left, there is a sidebar with company information for "ACME Alternative Hosting Inc." including fields for Website, Address 1, Address 2, Location, Country Code, and Notes. The Notes section contains a bulleted list: "ACME Hosting", "Best hosting provider ever", "Open peering policy", and "Peer with us!". A large green arrow points from the "Notes" section towards the network search results on the right. On the right, there are two search panels. The top panel is for "Facilities" and shows a table header with columns for Name, Country, and City, followed by a message: "Nothing matched your filter. You may filter by Name, Country or City". The bottom panel is for "Networks" and shows a table header with columns for Name, ASN, and AS Number, followed by a single result row for "ACME Alternative Hosting" with ASN 64501.

Website	http://www.acme.example
Address 1	Vienna
Address 2	
Location	Vienna 01000
Country Code	Austria
Notes	ACME Hosting <ul style="list-style-type: none">• Best hosting provider ever• Open peering policy• Peer with us!

Name	Country	City
Nothing matched your filter You may filter by Name, Country or City		

Name	ASN	AS Number
ACME Alternative Hosting	64501	

Network Information



ACME Alternative Hosting	
Organization	ACME Alternative Hosting Inc.
Also Known As ⓘ	
Company Website ⓘ	http://www.example.com
Primary ASN	64501
IRR Record ⓘ	
Route Server URL ⓘ	http://www.example.com
Looking Glass URL ⓘ	http://www.example.com
Network Type	Not Disclosed
IPv4 Prefixes ⓘ	0
IPv6 Prefixes ⓘ	0
Traffic Levels	Not Disclosed
Traffic Ratios	Not Disclosed
Geographic Scope	Not Disclosed
Protocols Supported	<input type="checkbox"/> Unicast IPv4 <input type="checkbox"/> Multicast <input type="checkbox"/> IPv6
Last Updated	2018-12-12T12:48:07Z
Notes	Markdown enabled

- Again, click on „Edit“ (top right)
- Here is a lot of information to enter
- Most is self-explanatory
- But some is not that obvious
 - Title here is your **network name**
 - Does not have to be the same as your company name
 - Some companies run more than one network
 - Or use a different name for their networking business

Network Information

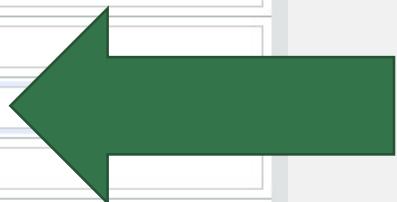
ACME Alternative Hosting	
Organization	ACME Alternative Hosting Inc
Also Known As ⓘ	
Company Website ⓘ	http://www.example.com
Primary ASN	64501
IRR Record ⓘ	
Route Server URL ⓘ	http://www.example.com
Looking Glass URL ⓘ	http://www.example.com
Network Type	Not Disclosed
IPv4 Prefixes ⓘ	0
IPv6 Prefixes ⓘ	0
Traffic Levels	Not Disclosed
Traffic Ratios	Not Disclosed
Geographic Scope	Not Disclosed
Protocols Supported	<input type="checkbox"/> Unicast IPv4 <input type="checkbox"/> Multicast <input type="checkbox"/> IPv6
Last Updated	2018-12-12T12:48:07Z
Notes	Markdown enabled



- Use this field for an alternative name
- Or an „old“ name if you changed names
- Or leave it empty
- Company website – remember this is PeeringDB
 - Put in the URL your peers should see
- AS number – your main one
 - If you have more, you can add a 2nd entry later
 - This field will probably be removed

Network Information

ACME Alternative Hosting	
Organization	ACME Alternative Hosting Inc.
Also Known As ⓘ	ACME Hosting
Company Website ⓘ	http://www.acme.example
Primary ASN	64501
IRR Record ⓘ	AS64501:AS-ACME-HOSTING
Route Server URL ⓘ	http://www.example.com
Looking Glass URL ⓘ	http://www.example.com
Network Type	Not Disclosed
IPv4 Prefixes ⓘ	0
IPv6 Prefixes ⓘ	0
Traffic Levels	Not Disclosed
Traffic Ratios	Not Disclosed
Geographic Scope	Not Disclosed
Protocols Supported	<input type="checkbox"/> Unicast IPv4 <input type="checkbox"/> Multicast <input type="checkbox"/> IPv6
Last Updated	2018-12-12T12:48:07Z
Notes	Markdown enabled



- IRR Record

- Your AS-Macro (also called AS-Set)
- You have registered in *IRR* database
- Of your RIR (Regional Internet Registry)

- Route Server URL - if you have one
- Looking Glass URL

Network Information

ACME Alternative Hosting	
Organization	ACME Alternative Hosting Inc.
Also Known As ⓘ	ACME Hosting
Company Website ⓘ	http://www.acme.example
Primary ASN	64501
IRR Record ⓘ	AS64501:AS-ACME-HOSTING
Route Server URL ⓘ	http://www.example.com
Looking Glass URL ⓘ	http://www.example.com
Network Type	Content
IPv4 Prefixes ⓘ	3
IPv6 Prefixes ⓘ	3
Traffic Levels	100-1000Mbps
Traffic Ratios	Mostly Outbound
Geographic Scope	Regional
Protocols Supported	<input checked="" type="checkbox"/> Unicast IPv4 <input type="checkbox"/> Multicast <input checked="" type="checkbox"/> IPv6
Last Updated	2018-12-12T12:48:07Z
Notes	Markdown enabled

- Fill in the rest
 - Either according to your sheet
 - Or choose your real network
- In „Notes“ you can use Markdown
 - You can give your peers free text information
 - Like details about your peering policy
 - More about your peering policy further down below

Peering Information

The screenshot shows the 'PeeringDB Configuration' section. It includes a 'PeeringDB Configuration' heading, a 'Allow IXP Update' checkbox (which is unchecked), and an 'IXP Update Tools' section containing 'Preview' and 'Postmortem' buttons. A green callout bubble with the text 'Allow IXP Update here' points to the 'Allow IXP Update' checkbox.

Peering Policy Information	
Peering Policy	
General Policy	Open
Multiple Locations	Not Required
Ratio Requirement	No
Contract Requirement	Not Required

- Now we add information about Peering!
- Important: Allowing IXP Update helps maintaining DB accuracy
- So please allow if you trust your IXPs
- Currently the so-called IX-F importer is disabled

Peering Information

The screenshot shows the 'PeeringDB Configuration' section. At the top, there is a green oval labeled 'Tools for the IXP Update'. Below it, under 'IXP Update Tools', there are two buttons: 'Preview' and 'Postmortem'. A large green arrow points from the 'Postmortem' button towards the list of features on the right.

The screenshot shows the 'Peering Policy Information' section. It contains five rows of policy details:

Peering Policy	
General Policy	Open
Multiple Locations	Not Required
Ratio Requirement	No
Contract Requirement	Not Required

- **Preview** lets you see what will happen with the next import
- **Postmortem** shows what happened at the last import
- Use the dropdowns to publish your peering policy
- In case of selective/restrictive you may use the notes field above

Contact Information

Contact Information

Role	Name	Phone E-Mail
Abuse	Abuse Desk	
	Public	abuse@acme.example
Role	NOC	
Name	Network Operations	
Email	noc@acme.example	
Phone	+43 1 2341668	
Visibility	Users	

Add Contact

- **Very important!**
- To inform peers how to contact you
 - In a number of roles
- You can add as many as you need
 - „Add Contact“ to store and next
 - Public, for logged in users, or private
- You do not have to fill out all fields
- But please:
keep contact info up to date
- Do not forget to „save“ when complete

Review what you have entered

- You now have entered:
 - Information about your organization, like:
 - Address
 - Website
 - Free form text
 - Network information
 - Your AS number
 - Number of prefixes you announce,
 - Traffic info
 - Peering information, like peering policy
 - Contacts for your peers
- Please check if everything is correct

Add peering at an IXP

Public Peering Exchange Points Filter

Exchange ▾ ASN	IPv4 IPv6	Speed RS Peer
Nothing matched your filter You may filter by Exchange, ASN or Speed		
Exchange	VIX AT Vienna Internet Exchange	
Local ASN	64501	
IPv4	192.203.0.222	
IPv6	2001:7f8:30:0:1:1:6:fbff	
Speed (mbit/sec)	1000	
RS Peer	<input checked="" type="checkbox"/>	

Add Exchange Point

- Click on „Edit“ at the top right again
- Enter an IXP name in Exchange
 - And select the IXP you are connected to from the list
- Enter speed, IPv4 and IPv6
- Select “RS Peer“ if you are peering with the route server
- **Click on „Add Exchange Point“!**
- And then click on „save“.

Presence at a datacenter

Facility	Country
ITandTEL TechCenter Linz 64501	AT Linz

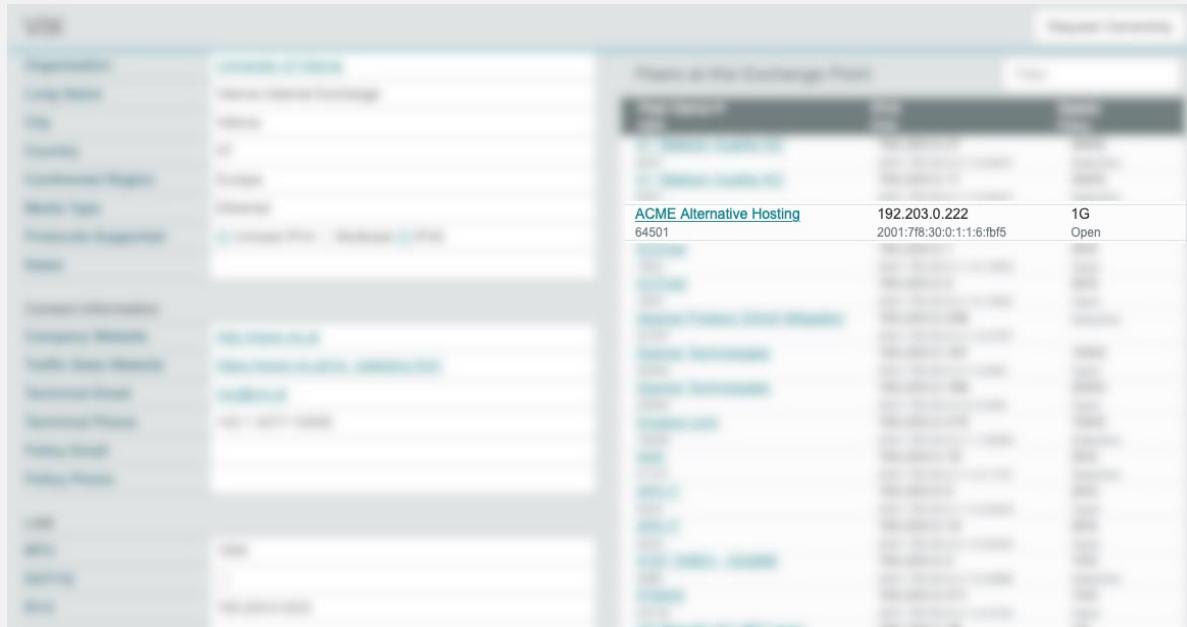
Filter

Klagenfurt

- Kelag Klagenfurt
Arnulfplatz 2
- Klagenfurt Stadtwerke
Gabelsbergerstrasse 50a

- Now again click on „edit“
- Scroll down and enter a city or datacenter name in „Facility“
- Select the facility you are in from the list and....
- ...click on „Add Facility“
- When you have added all facilities click on „Save“

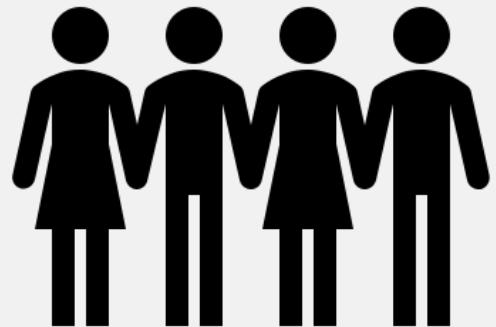
Check what you have entered



- Click on the name of the IXP you entered
- Find your entry in the list
- Do the same for the facilities you are in

Now lets see if others find you...

- Write your AS number on a sheet of paper
- All stand up and form a circle
- Give the person opposite to you your AS number
- and receive their AS number
- Use PeeringDB to learn about
 - Their organization
 - Their network



What to find out

- You should answer the following questions:
 - What is the main business of their organization / network
 - What is their peering policy
 - What is the size of the networks in terms of
 - Traffic
 - Prefixes
 - Where are they present
 - IXPs
 - Facilities
 - Would you peer with them?
 - According to your own peering policy
 - Why? / Why not?

Present what you have learned

- Present to the group what you have learned
- About the organization and network you have received
- The person who has entered the information checks
 - If everything is correct
 - If anything important is missing

Add your facility

Manage

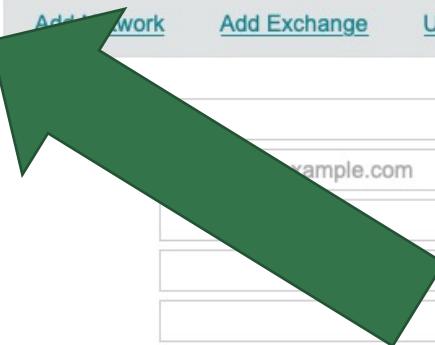
Add Facility Add Network **Add Exchange** Users Permissions

Name	example.com
Website	example.com
Address 1	
Address 2	
City	
State	
Zip-Code	

Add a new Facility
need to be approved
or the API listings

To be listed as a Facility
data center and/or peering point

Submit Facility



- If you run your **own** datacenter
- Why not add it to PeeringDB?
- Go to your organization page
- Scroll down to „Manage“
- Choose „Add Facility“

Add your facility

Manage

Add Facility

Add Network

Add Exchange

Users

Permissions

Name

ACME Alternative Datacenter

Website

<http://www.acme.example>

Address 1

Old Road 301

Address 2

City

Vienna

State

Zip-Code

A-1001

Country

▼

CLLI Code

NPA-NXX

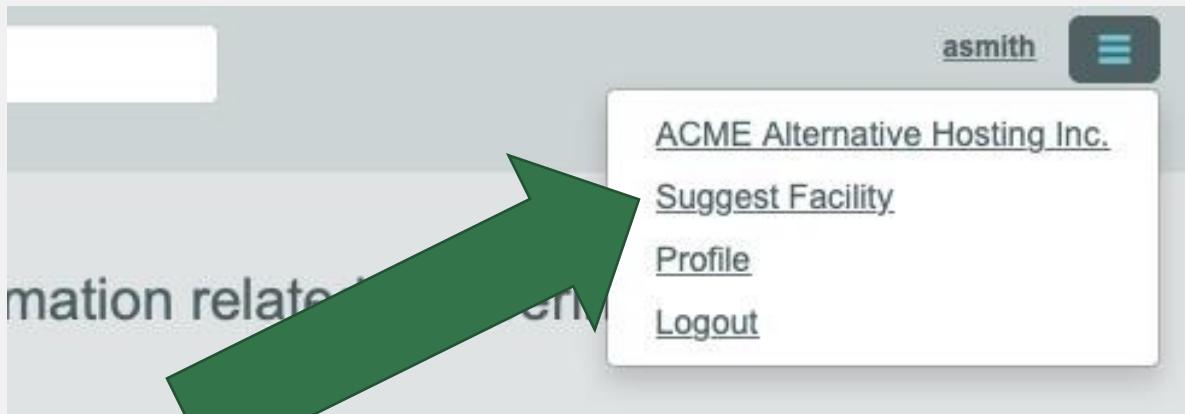
Add a new Facility to your Organization. Note that the newly created Facility will need to be approved by PeeringDB staff before it will appear in the search results or the API listings

To be listed as a Facility in PeeringDB we would expect that you offer colocation, data center and/or meet-me-room services to the public.

Submit Facility

- Fill in applicable fields
- CLLI and NPA-NXX: deprecated
- Click „Submit Facility“
- Entry will be reviewed
- And added or declined

Suggesting a facility



- For facilities **not your own**
- **But you are in or know about**
- Choose „Suggest Facility“
- Needs to be reviewed by PeeringDB staff

Suggesting a facility

Name
Website
Address 1
Address 2
City
State
Zip-Code
Country
CLLI Code
NPA-NXX

ACME Alternative Datacenter

<http://www.acme.example>

Old Road 301

Vienna

A-1001

Austria

Suggest Facility to be added to the database. Your suggestion will be reviewed by the PeeringDB Administration Committee. It will then either be finalized and entered into the database, or declined. No further action is required on your part.

In order to be approved we would expect that the suggested Facility offers colocation, data center and/or meet-me-room services to the public.

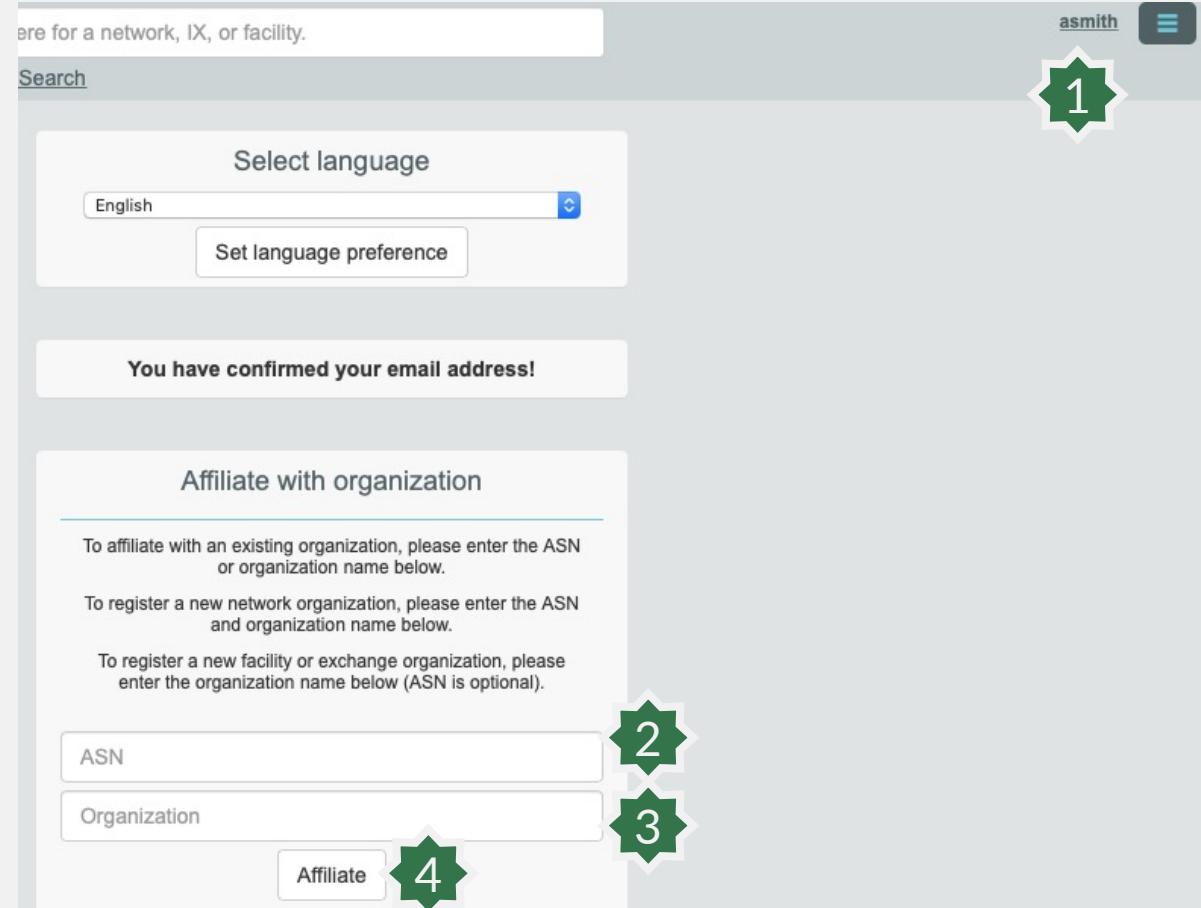
Suggest Facility

- Fill in applicable fields
- CLLI and NPA-NXX: deprecated
- Click „Suggest Facility“
- Entry will be reviewed
- And added or declined

Adding users

- You do not have to be the only person working with PeeringDB
- Other users from your organization may also register!
- Users can be „admin“ or „member“
 - The first user automatically will be an „admin“
- Administrators are allowed to edit all fields (of your organization)
- Members rights can be as restrictive or as open as you need them to be
- Let's try it out
- Request affiliation with the organization you just presented

Affiliate with an organization



- Go to your profile page (1)
- Request affiliation
 - Either use the AS number (2)
 - Or name and select (3)
 - Click on „Affiliate“ (4)
- Admin of organization gets an email if there is one. Otherwise PeeringDB support
- Checks, and either approves or denies

Approve affiliation requests

Manage

Add Facility Add Network Add Exchange Users Permissions

Users requesting affiliation

Name	Email	Date	
Wolfgang Tremmel wtremmel	wolfgang.tremmel@de-cix.net Yes	2018, Dec. 14	<input type="button" value="Approve"/> <input type="button" value="Deny"/>

Users in Organization

Name	Email	Group	
Adam Smith asmith	asmith@garf.de	admin	<input type="button" value="Remove"/> <input type="button" value="Save"/>

- Go to your organization page
- Scroll down to the „manage“ section
- Click on the „Users“ tab
- Either approve or deny new users

User administration

Manage

Add Facility Add Network Add Exchange **Users** Permissions

Users requesting affiliation

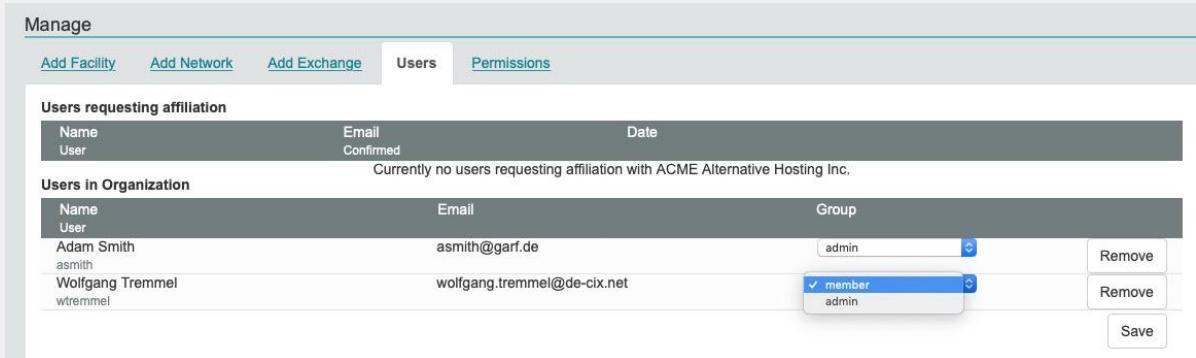
Name	Email	Date
User	Confirmed	

Currently no users requesting affiliation with ACME Alternative Hosting Inc.

Users in Organization

Name	Email	Group
User		
Adam Smith asmith	asmith@garf.de	admin
Wolfgang Tremmel wtremmel	wolfgang.tremmel@de-cix.net	member

Remove Save



Manage

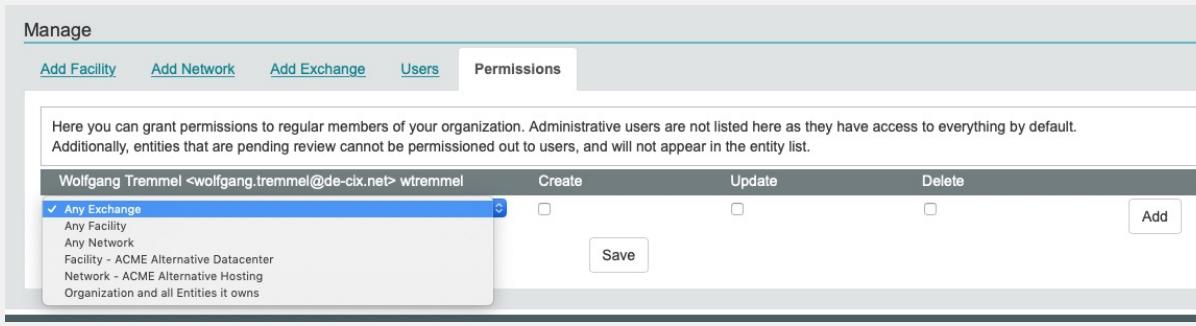
Add Facility Add Network Add Exchange **Users** Permissions

Here you can grant permissions to regular members of your organization. Administrative users are not listed here as they have access to everything by default. Additionally, entities that are pending review cannot be permissioned out to users, and will not appear in the entity list.

	Create	Update	Delete
Wolfgang Tremmel <wolfgang.tremmel@de-cix.net> wtremmel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Add Save

Any Exchange
Any Facility
Any Network
Facility - ACME Alternative Datacenter
Network - ACME Alternative Hosting
Organization and all Entities it owns



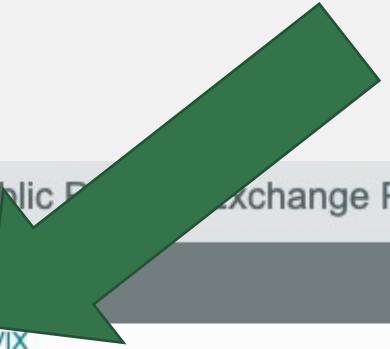
- Users can be admins or members
- Use the dropdown to change
- For members – you can add permissions
- Use the permissions tab to grant create, update and/or delete to selected of any entities
- Do not forget to „save“ your changes

Removing Users

The screenshot shows the 'Manage' section of the PeeringDB website. The 'Users' tab is selected. Under 'Users requesting affiliation', there is no data. Under 'Users in Organization', two users are listed: 'Adam Smith' (Email: asmith@garf.de, Group: admin) and 'Wolfgang Tremmel' (Email: wolfgang.tremmel@de-cix.net, Group: member). To the right of each user's row are 'Remove' and 'Save' buttons. A large green arrow points from the text 'Click on „Remove“ on the right side' to the 'Remove' button for the user 'wtrummel'.

- Be sure you are logged in as an admin
- Go to your organization page
- Scroll down to the „manage“ section
- Click on the „Users“ tab
- Click on „Remove“ on the right side
- And do not forget to „save“
- The user is only deleted from your organization
- If you want to remove a user completely, email PeeringDB support

More removing...



Public IP Exchange Points

Filter

Ex AS	IPv4	Speed
VIX 64501	192.203.0.222 2001:7f8:30:0:1:1:6:fbff	1000 <input checked="" type="checkbox"/>

Exchange

Local ASN

IPv4

IPv6

Speed (mbit/sec)

RS Peer

Add Exchange Point

- If you leave an internet exchange:
 - please remove your peering IP addresses
- Go to your network page
- Click on „Edit“ (top right)
- Click on the  beside the entry of the exchange
- Confirm and do not forget to „Save“

More removing...

- Facilities, Contacts, all the same
- Click on „Edit“
- Click on the remove symbol at the entry
- Click on “Save“

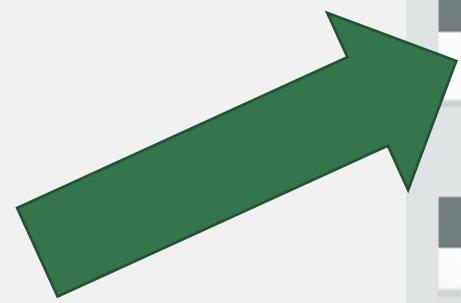
Contact Information

Role ▾	Name Visibility
Abuse	Abuse Desk Public
Role	Abuse

Private Peering Facilities	
Facility ▾	ASN
ITandTEL TechCenter Linz	64501
Klagenfurt Stadtwerke	64501
Facility	
<input type="text"/>	

Removing – more information

- Objects are only *marked deleted, but stay in the DB*
- **You cannot simply re-add them**
- Please contact support@peeringdb.com if you need help



Facilities		Filter
Name ▾	Country	
<input checked="" type="checkbox"/> ACME Alternative Datacenter	Austria	
Networks		Filter
Name ▾	ASN	
<input checked="" type="checkbox"/> ACME Alternative Hosting	64501	



PeeringDB

The PeeringDB API

Workshop // Track 3



Agenda

- Please always use the tutorial DB at <https://tutorial.peeringdb.com>
- Introduction
- jq
- JSON
- HTML Operations
- Record Types
 - Basic Records
 - Derived Records

Introduction

- Why API (Application Programming Interface)?
 - The GUI is nice for human beings
 - Automation needs structured data
- Makes it easy to integrate PeeringDB in your environment

- Light-weight and flexible command-line processor
- awk, sed and grep equivalent to JSON data
- A jq program is a filter
 - Needs an input and produces an output
 - Maybe piped
 - Looks weird sometimes, like „add/length“ produces average of an array
 - Simplest filter is „.“ which is the Identity
 - Maybe used to pretty print JSON output
- See <https://stedolan.github.io/jq/manual> for an introduction
- Ex: `curl -sG https://peeringdb.com/api/org --data-urlencode fields=id | jq -c '[.data[] | .id] | length'`

JSON

- Open standard file format
- Short for JavaScript Object Notation
- Filenames use the extension .json
- Language independent data format
- Basic data types
 - Number
 - String
 - Boolean
 - Array
 - Object
 - null

```
{  
  "firstName": "John",  
  "lastName": "Smith",  
  "isAlive": true,  
  "age": 27,  
  "address": {  
    "streetAddress": "21 2nd Street",  
    "city": "New York",  
    "state": "NY",  
    "postalCode": "10021-3100"  
  },  
  "phoneNumbers": [  
    {  
      "type": "home",  
      "number": "212 555-1234"  
    },  
    {  
      "type": "office",  
      "number": "646 555-4567"  
    },  
    {  
      "type": "mobile",  
      "number": "123 456-7890"  
    }  
  "children": [],  
  "spouse": null  
}
```

Basics

- In general <https://peeringdb.com/api/OBJ>
 - OBJ is case insensitive
 - So called endpoint: /api/OBJ
- Output always fits in one object
 - Meta is optional
 - Data always an array

```
{  
  meta:  
    {  
      status:  
      message:  
    }  
  data:  
    [  
      {},  
      {}  
    ]  
}
```

Authentication

- Authentication via basic HTTP authorization
- Guest access does not need any authentication
- Examples
 - curl -sG <https://username:password@peeringdb.com/api/poc>
 - curl -u username:password <https://peeringdb.com/api/poc>
 - Put credentials in ~/.netrc
 - machine peeringdb.com login username password password
- Recap: only access to contact information may be restricted
 - Endpoint /api/poc
 - You need to be authenticated for view „user“

Operations

- All HTML operations are supported
 - GET
 - Requests a representation of the specified resource
 - POST
 - Used to submit an entity to the specified resource
 - PUT
 - Replaces all current representations of the target resource with the request payload
 - DELETE
 - Deletes the specified resource

GET

- GET
 - Multiple objects
 - Endpoint /api/OBJ
 - Single object
 - Endpoint /api/OBJ/id

Optional URL parameters for GET

- **limit**
 - Integer value
 - Limits to n rows in the result set
- **skip**
 - Integer value
 - Skips n rows in the result set
- **depth**
 - Integer value
 - Nested sets will be loaded
 - See Nesting slide

Optional URL parameters for GET

- **fields**
 - String value
 - comma separated list of field names
 - only matching fields will be returned in the data
- **since**
 - Integer value
 - Retrieve all objects updated since specified time
 - Unix timestamp in seconds
- **fieldname**
 - Integer or string value
 - Queries for fields with matching value

Nested Data / Depth

- Of type `OBJ_set`
- Example: `net_set` will hold network objects
- Depth (for endpoint `/api/OBJ`)
 - 0: don't expand anything (default)
 - 1: expand all first level sets to ids
 - 2: expand all first level sets to objects
- Depth (for endpoint `/api/OBJ/id`)
 - 0: don't exand anything
 - 1-4: expand all sets and related objects according to level of depth specified
 - 2 is default

Nested Data / Depth

<https://peeringdb.com/net/947?pretty>



<https://peeringdb.com/net/947?pretty&depth=0>

```
{  
  "meta": {},  
  "data": [  
    {  
      "id": 947,  
      "org_id": 1187,  
      "name": "DE-CIX Frankfurt Route Servers",  
      "aka": "DE-CIX",  
      "website": "https://fra.de-cix.net",  
      "asn": 6695,  
      "looking_glass": "https://lg.de-cix.net",  
      "route_server": "https://www.de-cix.net/en/locations/germany/frankfurt/routeserver-gu",  
      "irr_as_set": "AS-DECIX",  
      "info_type": "Route Server",  
      "info_prefixes4": 240000,  
      "info_prefixes6": 50000,  
      "info_traffic": "1 Tbps+",  
      "info_ratio": "Balanced".  
    }]
```

```
{  
  "meta": {},  
  "data": [  
    {  
      "id": 947,  
      "org_id": 1187,  
      "org": {  
        "id": 1187,  
        "name": "DE-CIX Management GmbH",  
        "website": "https://de-cix.net",  
        "notes": ""},  
      "net_set": [  
        947,  
        5547,  
        6978,  
        6979,  
        8383,  
        8703,  
        8919,  
        8920,  
        9840,  
        9841,  
        10018,  
        13190,  
        13251,  
        19331,  
        20739  
      ],  
      "fac_set": [],  
      "ix_set": [  
        31,  
        74,  
        248,  
        804,  
        1131,  
        1149,  
        1150,  
        1214,  
        1249,  
        1277,  
        2531  
      ],  
      "address1": "Lindleystr. 12",  
      "city": "Frankfurt am Main",  
      "state": "Hessen",  
      "country": "Germany",  
      "lat": 49.8917,  
      "lon": 8.5417  
    }]
```

Query modifiers

- numeric fields
 - __lt: less than
 - __lte: less than equal
 - __gt: greater than
 - __gte: greater than equal
 - __in: value inside set of values (comma separated)
- string fields
 - __contains: field value contains this value
 - __startswith: field value starts with this value
 - __in: value inside set of values (comma separated)

POST

- Used to create an object
- Endpoint /api/OBJ
- Required parameters
 - Depending on OBJ
 - For *org* you need the *name*
 - For *fac*, *ix*, *net* you need the *org_id*
 - For *fac* you need the *name*
 - For *ix* you need the *name* and *prefix*
 - For *net* you need the *asn*
- Example
 - `curl -sn -X POST -H "Content-Type: application/json" -d @22106.json \ https://tutorial.peeringdb.com/api/org`

```
{  
    "name": "Org-22106"  
}
```

File 22106.json

PUT

- Used to edit object
- Endpoint /api/OBJ/id
- Updates data in OBJ/id
- You have to send all the data, not just the change
- Example
 - curl -sn -X PUT -H "Content-Type: application/json" -d @22106.json \ https://tutorial.peeringdb.com/api/org/22114
- Operation of PUT is idempotent

```
{  
    "name": "Org-22106",  
    "address1": "23 Mulholland Drive",  
    "city": "Los Angeles",  
    "country": "US"  
}
```

File 22106.json

DELETE

- Used to delete objects
- Endpoint /api/OBJ/id
- Example
 - curl -sn -X DELETE -H "Content-Type: application/json" \
https://tutorial.peeringdb.com/api/org/22114

Object Types

- Basic Objects
 - org, fac, ix, net, poc, as_set
- Derived Objects
 - ixlan, ixpx, netixlan, netfac

Basic Objects

- org
 - Root object for fac, ix, net
 - Holds information about organisation
- fac
 - Describes a facility / colocation record
 - More useful information are in derived records netfac
- ix
 - Describes an Internet Exchange
 - More useful information are in derived records ixlan, ixpfx and netixlan
- net
 - Describes a network / ASN
 - More useful information are in netfac and netixlan
- poc
 - Describes various role accounts (point of contact)
 - Currently only for net objects
- as_set
 - Array of all AS-SETS corresponding to a network / ASN
 - Only introduced recently

Derived Objects

- **ixlan**
 - Describes the LAN of an IX
 - One IX may have multiple ixlan
 - May go away with PeeringDB 3.0
- **ixpfx**
 - Describes the IP range (IPv4 and IPv6) for an ixlan
 - One ixlan may have multiple ixpfx, both for IPv4 and IPv6
- **netixlan**
 - Describes the presence of a network at an IX
- **netfac**
 - Describes the presence of a network at a facility

GUI to API // org

- <https://peeringdb.com/org/1187>
- Add pretty and depth for human friendly output
- <https://peeringdb.com/api/org/1187>
- https://peeringdb.com/api/fac?org_id=1187
- https://peeringdb.com/api/net?org_id=1187
- https://peeringdb.com/api/ix/org_id=1187

DE-CIX Management GmbH Platinum Sponsor

Website <https://de-cix.net>
Address 1 Lindleystr. 12
Address 2
Location Frankfurt am Main, Hessa, 60314
Country Code DE
Notes

org

Facilities Filter
Name ▾ Country
City
fac No filter matches.
You may filter by Name, Country or City.

Networks Filter
Name ▾ ASN
net
DE-CIX Academy Educational Network 196610
DE-CIX Dallas Route Servers 62499
DE-CIX Dusseldorf Route Servers 56890
DE-CIX Frankfurt Route Servers 6695
DE-CIX Hamburg Route Servers 43252
DE-CIX Istanbul Route Servers 20715
DE-CIX Lisbon Route Servers 43729
DE-CIX Madrid Route Servers 48793
DE-CIX Management GmbH 51531
DE-CIX Marseille Route Servers 20717
DE-CIX Munich Route Servers 47228
DE-CIX New York Route Servers 63034
DE-CIX Palermo Route Servers 25083
DE-CIX R&D Measurement 205530
DE-CIX VoIP 57769

Exchanges Filter
Name ▾ Country
City
ix United States of America
Dallas
DE-CIX Dusseldorf Germany
Düsseldorf
DE-CIX Frankfurt Germany
Frankfurt

GUI to API // fac

- <https://peeringdb.com/fac/752>
- Add pretty and depth for human friendly output
- <https://peeringdb.com/api/fac/752>
- https://peeringdb.com/api/ixfac?fac_id=752
- https://peeringdb.com/api/netfac?fac_id=752

euNetworks Colocation Hamburg Edit

Organization	euNetworks Group	fac
Website	http://www.euNetworks.com	
Address 1	Wendenstraße 408	
Address 2		
Location	Hamburg, 20537	
Country Code	DE	
Geocode	Updated geocode data for this entity will be obtained shortly	
CLLI Code		
NPA-NXX		
Notes		

Networks Filter

Peer Name ▾	ASN
euNetworks Group	13237
LWLcom GmbH	50629
OMCnet Internet Service GmbH	15388
Vodafone Global Network	1273
Vodafone Kabel Deutschland GmbH	31334

Local Exchanges Filter

Exchange ▾	Long Name	Networks
DE-CIX Hamburg	Deutscher Commercial Internet Exchange Hamburg	104
ECIX-HAM	European Commercial Internet Exchange Hamburg	60

netfac

ixfac

GUI to API // net

- <https://peeringdb.com/net/13251>
- Add pretty and depth for human friendly output
- <https://peeringdb.com/api/net/13251>
- https://peeringdb.com/api/poc?net_id=13251
- https://peeringdb.com/api/netixlan?net_id=31
- OR <https://peeringdb.com/api/netixlan?asn=196610>
- https://peeringdb.com/api/netfac?net_id=13251
- OR
https://peeringdb.com/api/netfac?local_asn=196610

DE-CIX Academy Educational Network <small>Platinum Sponsor</small>		
net		
Some of the data on this page is incomplete, please update the fields marked with ⓘ to improve data quality.		
Organization DE-CIX Management GmbH		
Organization	DE-CIX Management GmbH	
Also Known As	DE-CIX	
Company Website	http://www.de-cix.net/academy	
Primary ASN	196610	
IRR as-set/route-set	AS196610:AS-DECIX-ACADEMY	
Route Server URL ⓘ		
Looking Glass URL ⓘ		
Network Type	Educational/Research	
IPv4 Prefixes	1	
IPv6 Prefixes	5	
Traffic Levels	0-20 Mbps	
Traffic Ratios	Balanced	
Geographic Scope	Regional	
Protocols Supported	<input checked="" type="radio"/> Unicast IPv4 <input type="radio"/> Multicast <input checked="" type="radio"/> IPv6	
Last Updated	2019-02-15T12:19:05Z	
Notes	<ul style="list-style-type: none">We only peer with the route serversAny peering request you send will be used for educational purposes	
PeeringDB Configuration		
Allow IXP Update	<input checked="" type="checkbox"/>	
Peering Policy Information		
Peering Policy ⓘ		
General Policy	Open	
Multiple Locations	Not Required	
Ratio Requirement	No	
Contract Requirement	Not Required	
Contact Information		
Role ▾	Name	Phone E-Mail
Abuse	DE-CIX Abuse Department	abuse@de-cix.net
NOC	DE-CIX 24/7 NOC	+49 69 1730 902 11

Public Peering Exchange Points		
Filter		
Exchange ▾	IPv4	Speed
ASN	IPv6	RS Peer
DE-CIX Dusseldorf	DE-CIX Dusseldorf	185.1.58.105
Peering LAN	2001:7f8:9e:0:3:2:0:1	100M
196610		ⓘ
DE-CIX Frankfurt	DE-CIX Frankfurt	80.81.196.61
Peering LAN	2001:7f8:3:2:0:1	1G
196610		ⓘ
DE-CIX Hamburg	DE-CIX Hamburg	80.81.203.11
Peering LAN	2001:7f8:3d:0:3:2:0:1	100M
196610		ⓘ
DE-CIX Munich	DE-CIX Munich Peering	80.81.202.115
LAN	2001:7f8:44:0:3:2:0:1	100M
196610		ⓘ
DE-CIX New York	DE-CIX New York	206.82.104.220
Peering LAN	2001:504:36:0:3:2:0:1	100M
196610		ⓘ
MSK-IX Moscow	MSK-IX peering network	195.208.210.43
196610		2001:7f8:20:101::210:43
		ⓘ
Private Peering Facilities		
Filter		
Facility ▾	Country	
ASN	City	
Interxion Frankfurt (FRA1-12)	Germany	
196610	Frankfurt	netfac

poc

GUI to API // ix

- <https://peeringdb.com/ix/31>
- Add pretty and depth for human friendly output
- <https://peeringdb.com/api/ix/31>
- https://peeringdb.com/api/ixlan?ix_id=31
- https://peeringdb.com/api/ixpfx?ixlan_id=31
- https://peeringdb.com/api/ixfac?ix_id=31
- https://peeringdb.com/api/netixlan?ix_id=31

DE-CIX Frankfurt Platinum Sponsor

Edit

Organization	DE-CIX Management GmbH
Long Name	Deutscher Commercial Internet Exchange
City	Frankfurt
Country	DE
Continental Region	Europe
Media Type	Ethernet
Protocols Supported	<input checked="" type="radio"/> Unicast IPv4 <input type="radio"/> Multicast <input checked="" type="radio"/> IPv6
Notes	For peering with the DE-CIX Frankfurt route servers, please see: DE-CIX Frankfurt Route Servers

Contact Information

ix

Company Website	https://fra.de-cix.net
Traffic Stats Website	https://www.de-cix.net/en/locations/germany/frankfurt/statistics
Technical Email	support@de-cix.net
Technical Phone	+49 69 1730 902 11
Policy Email	sales@de-cix.net
Policy Phone	+49 69 1730 902 12

LANs

Filter

Name	DOT1Q	MTU
DE-CIX Frankfurt Peering LAN	<input checked="" type="radio"/>	1500
<input type="radio"/> Enable IX-F Import		

ixlan

Preview

IPv4	80.81.192.0/21
IPv6	2001:7f8::/64

ipxpx

Local Facilities

Filter

Facility ▾	Country	City
COLT DC Frankfurt	Germany	Frankfurt
Digital Realty FRA (Lyoner Strasse)	Germany	Frankfurt am Main
Digital Realty FRA (Wilhelm-Fay-	Germany	Frankfurt am

ixfac

Peers at this Exchange Point

Filter

Peer Name	IPv4	Speed▲
ASN	IPv6	Policy
Vodafone Germany DE-CIX	80.81.192.117	600G
Frankfurt Peering LAN	2001:7f8::c89:0:3	Selective
3209		
Vodafone Germany DE-CIX	80.81.193.117	600G
Frankfurt Peering LAN	2001:7f8::c89:0:4	Selective
3209		
1&1 Versatел Deutschland GmbH DE-CIX Frankfurt Peering LAN	80.81.193.80	500G
8881		
1&1 Versatел Deutschland GmbH DE-CIX Frankfurt Peering LAN	80.81.195.188	500G
8881		
Akamai Technologies DE-CIX	80.81.192.28	400G
Frankfurt Peering LAN	2001:7f8::51cc:0:28	Open
20940		
Amazon.com DE-CIX Frankfurt	80.81.194.152	400G
Peering LAN	2001:7f8::407d:0:1	Selective
16509		
Amazon.com DE-CIX Frankfurt	80.81.195.152	400G
Peering LAN	2001:7f8::407d:0:2	Selective
16509		
Cloudflare DE-CIX Frankfurt	80.81.194.180	400G
Peering LAN	2001:7f8::3417:0:1	Open
13335		
Facebook Inc DE-CIX Frankfurt	80.81.194.40	400G
Peering LAN	2001:7f8::80a6:0:1	Selective

netixlan

Basic records in detail // ix and org

```
"data": [
  {
    "id": 31,
    "org_id": 1187,
    "name": "DE-CIX Frankfurt",
    "name_long": "Deutscher Commercial Internet Exchange",
    "city": "Frankfurt",
    "country": "DE",
    "region_continent": "Europe",
    "media": "Ethernet",
    "notes": "For peering with the DE-CIX Frankfurt route servers, please see:\n\n[DE
    "proto_unicast": true,
    "proto_multicast": false,
    "proto_ipv6": true,
    "website": "https://fra.de-cix.net",
    "url_stats": "https://www.de-cix.net/en/locations/germany/frankfurt/statistics",
    "tech_email": "support@de-cix.net",
    "tech_phone": "+49 69 1730 902 11",
    "policy_email": "sales@de-cix.net",
    "policy_phone": "+49 69 1730 902 12",
    "net_count": 805,
    "created": "2010-07-29T00:00:00Z",
    "updated": "2018-06-19T11:53:46Z",
    "status": "ok"
  }
]
```

```
"data": [
  {
    "id": 1187,
    "name": "DE-CIX Management GmbH",
    "website": "https://de-cix.net",
    "notes": "",
    "address1": "Lindleystr. 12",
    "address2": "",
    "city": "Frankfurt am Main",
    "country": "DE",
    "state": "Hessia",
    "zipcode": "60314",
    "created": "2006-11-01T23:37:13Z",
    "updated": "2017-07-02T00:03:27Z",
    "status": "ok"
  }
]
```

Basic records in detail // fac

```
"data": [
  {
    "id": 752,
    "org_id": 8540,
    "org_name": "euNetworks Group",
    "name": "euNetworks Colocation Hamburg",
    "website": "http://www.euNetworks.com",
    "clli": "",
    "rencode": "",
    "npanxx": "",
    "notes": "",
    "net_count": 5,
    "latitude": null,
    "longitude": null,
    "created": "2010-07-29T00:00:00Z",
    "updated": "2019-09-25T22:00:34Z",
    "status": "ok",
    "address1": "Wendenstra\u00dfe 408",
    "address2": "",
    "city": "Hamburg",
    "country": "DE",
    "state": "",
    "zipcode": "20537"
  }
]
```

Basic records in detail // net and poc

```
    "data": [
      {
        "id": 13251,
        "org_id": 1187,
        "name": "DE-CIX Academy Educational Network",
        "aka": "DE-CIX",
        "website": "http://www.de-cix.net/academy",
        "asn": 196610,
        "looking_glass": "",
        "route_server": "",
        "irr_as_set": "AS196610:AS-DECIX-ACADEMY",
        "info_type": "Educational/Research",
        "info_prefixes4": 1,
        "info_prefixes6": 5,
        "info_traffic": "0-20 Mbps",
        "info_ratio": "Balanced",
        "info_scope": "Regional",
        "info_unicast": true,
        "info_multicast": false,
        "info_ipv6": true,
        "notes": "* We only peer with the route servers\n* Any peering request you send will be used for educational purposes",
        "policy_url": "",
        "policy_general": "Open",
        "policy_locations": "Not Required",
        "policy_ratio": false,
        "policy_contracts": "Not Required",
        "created": "2017-04-20T19:44:59Z",
        "updated": "2019-02-15T12:19:05Z",
        "status": "ok"
      }
    ],
    {
      "id": 25826,
      "net_id": 13251,
      "role": "Policy",
      "visible": "Users",
      "name": "Wolfgang Tremmel",
      "phone": "",
      "email": "academy@de-cix.net",
      "url": "",
      "created": "2018-07-24T09:26:21Z",
      "updated": "2018-07-24T09:26:21Z",
      "status": "ok"
    }
  ]
```

Basic records in detail // as_set

```
{  
  "meta": {},  
  "data": [  
    {  
      "196610": "AS196610:AS-DECIX-ACADEMY",  
      "262150": "AR-EPEC2-LACNIC",  
      "393223": "AS-CWICA",  
      "32780": "AS-HSI",  
      "196621": "AS196621:AS-CUSTOMERS",  
      "327698": "AS-327698",  
      "32787": "AS-PROLE",  
      "327700": "AFRINIC",  
      "32798": "RS-USCS-ALL",  
      "5467": "AS-MIPT",  
      "32806": "AS27822",  
      "32808": "AS-UTBB",  
      "42": "AS-PCH",  
      "262189": "LACNIC",  
      "46": "AS-RUTGERS",  
      "262195": "AS-ITXAR1",  
      "393269": "AS-DAILYMOTIONUS",  
      "57": "AS-NLG-PARTICIPANTS",  
      "327740": "ORG-TA38-AFRINIC",  
      "62": "AS-C1",  
      "393280": "AS393280 in Level3",  
      "72": "AS-SLB",  
      "327754": "AS-RMS-Powertronics",  
      "327693": "AfriNIC::AS-ECHOSP/RS-ECHOSP",  
      "01": "AS-MCRENQAPTM"  
    }  
  ]  
}
```

<https://peeringdb.com/api/as-set>

```
{  
  "meta": {},  
  "data": [  
    {  
      "42": "AS-PCH"  
    }  
  ]  
}
```

<https://peeringdb.com/api/as-set/42>

Derived records in detail // ixfac, ixlan and ixpfx

```
"data": [
  {
    "id": 41,
    "ix_id": 26,
    "fac_id": 63,
    "created": "2010-07-29T00:00:00Z",
    "updated": "2016-03-14T20:33:57Z",
    "status": "ok"
  }
]
```

```
{
  "id": 31,
  "ix_id": 31,
  "name": "DE-CIX Frankfurt Peering LAN",
  "descr": "",
  "mtu": 1500,
  "dot1q_support": false,
  "rs_asn": 0,
  "arp_sponge": null,
  "created": "2010-07-29T00:00:00Z",
  "updated": "2018-07-08T10:22:35Z",
  "status": "ok"
}
```

```
{
  "id": 312,
  "ixlan_id": 31,
  "protocol": "IPv6",
  "prefix": "2001:7f8::/64",
  "created": "2011-06-22T00:00:00Z",
  "updated": "2016-03-14T21:57:28Z",
  "status": "ok"
}
```

Derived records // netfac and netixlan

```
{  
  "id": 30451,  
  "name": "Interxion Frankfurt (FRA1-13)",  
  "city": "Frankfurt",  
  "country": "DE",  
  "net_id": 13251,  
  "fac_id": 58,  
  "local_asn": 196610,  
  "created": "2018-07-24T09:25:24Z",  
  "updated": "2018-07-24T09:25:24Z",  
  "status": "ok"  
}
```

```
{  
  "id": 163,  
  "net_id": 5  
  "ix_id": 31  
  "name": "DE-CIX Frankfurt: DE-CIX Frankfurt Peering LAN",  
  "ixlan_id": 31,  
  "notes": "",  
  "speed": 20000,  
  "asn": 3303,  
  "ipaddr4": "80.81.193.183",  
  "ipaddr6": "2001:7f8::ce7:0:2",  
  "is_rs_peer": true,  
  "created": "2010-07-29T00:00:00Z",  
  "updated": "2019-01-18T11:19:59Z",  
  "status": "ok"  
},
```