



PeeringDB

The PeeringDB API

Workshop // Track 2

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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

jq

- 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

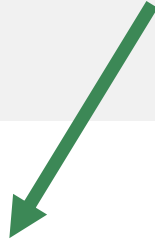
- Of type OBJ_set
- Example: *net_set* will hold network objects
- Depth (for endpoint /api/OBJ)
 - 0: don't expand anything (default)
 - 1: expand all first level sets to ids
 - 2: expand all first level sets to objects
- Depth (for endpoint /api/OBJ/id)
 - 0: don't expand anything
 - 1-4: expand all 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
        ]
      }
    }
  ]
}
```

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*
 - 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

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

File 22106.json

- 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

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

org

[Edit](#)

Facilities

Filter

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

Networks

Filter

Name	ASN
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

net

Exchanges

Filter

Name	Country	City
DE-CIX Dallas	United States of America	Dallas
DE-CIX Dusseldorf	Germany	Dusseldorf
DE-CIX Frankfurt	Germany	Frankfurt

ix

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
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	

fac

Peer Name	ASN
euNetworks Group	13237
LWL.com GmbH	50629
OMCnet Internet Service GmbH	15388
Vodafone Global Network	1273
Vodafone Kabel Deutschland GmbH	31334

netfac

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


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 Platinum Sponsor

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
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="checkbox"/> Unicast IPv4 <input type="checkbox"/> Multicast <input type="checkbox"/> IPv6
Last Updated	2019-02-15T12:19:05Z
Notes	<ul style="list-style-type: none">• We only peer with the route servers• Any 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	

netixlan Edit

Public Peering Exchange Points

Exchange ASN	IPv4 IPv6	Speed RS Peer
DE-CIX Dusseldorf DE-CIX Dusseldorf Peering LAN 196610	185.1.58.105 2001:7f8:9e:0:3:2:0:1	100M 
DE-CIX Frankfurt DE-CIX Frankfurt Peering LAN 196610	80.81.196.61 2001:7f8::3:2:0:1	1G 
DE-CIX Hamburg DE-CIX Hamburg Peering LAN 196610	80.81.203.11 2001:7f8:3d:0:3:2:0:1	100M 
DE-CIX Munich DE-CIX Munich Peering LAN 196610	80.81.202.115 2001:7f8:44:0:3:2:0:1	100M 
DE-CIX New York DE-CIX New York Peering LAN 196610	206.82.104.220 2001:504:36:0:3:2:0:1	100M 
MSK-IX Moscow MSK-IX peering network 196610	195.208.210.43 2001:7f8:20:101::210:43	

Private Peering Facilities

Facility ASN	Country City
Interxion Frankfurt (FRA1-12) 196610	Germany Frankfurt

poc

netfac

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

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 type="radio"/>	1500
<input type="radio"/> Enable IX-F Import ixlan Preview		

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

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

Peers at this Exchange Point Filter

Peer Name ASN	IPv4 IPv6	Speed Policy
Vodafone Germany DE-CIX Frankfurt Peering LAN 3209	80.81.192.117 2001:7f8::c89:0:3	600G Selective
Vodafone Germany DE-CIX Frankfurt Peering LAN 3209	80.81.193.117 2001:7f8::c89:0:4	600G Selective
1&1 Versatel Deutschland GmbH DE-CIX Frankfurt Peering LAN 8881	80.81.193.80 2001:7f8::22b1:193:80	500G Selective
1&1 Versatel Deutschland GmbH DE-CIX Frankfurt Peering LAN 8881	80.81.195.188 2001:7f8::22b1:0:1	500G Selective
Akamai Technologies DE-CIX Frankfurt Peering LAN 20940	80.81.192.28 2001:7f8::51cc:0:28	400G Open
Amazon.com DE-CIX Frankfurt Peering LAN 16509	80.81.194.152 2001:7f8::407d:0:1	400G Selective
Amazon.com DE-CIX Frankfurt Peering LAN 16509	80.81.195.152 2001:7f8::407d:0:2	400G Selective
Cloudflare DE-CIX Frankfurt Peering LAN 13335	80.81.194.180 2001:7f8::3417:0:1	400G Open
Facebook Inc DE-CIX Frankfurt Peering LAN	80.81.194.40 2001:7f8::80a6:0:1	400G Selective

netixlan

ixfac

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",
      "81": "AS-MCDEM@ARTM"
```

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

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

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

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"  
},
```