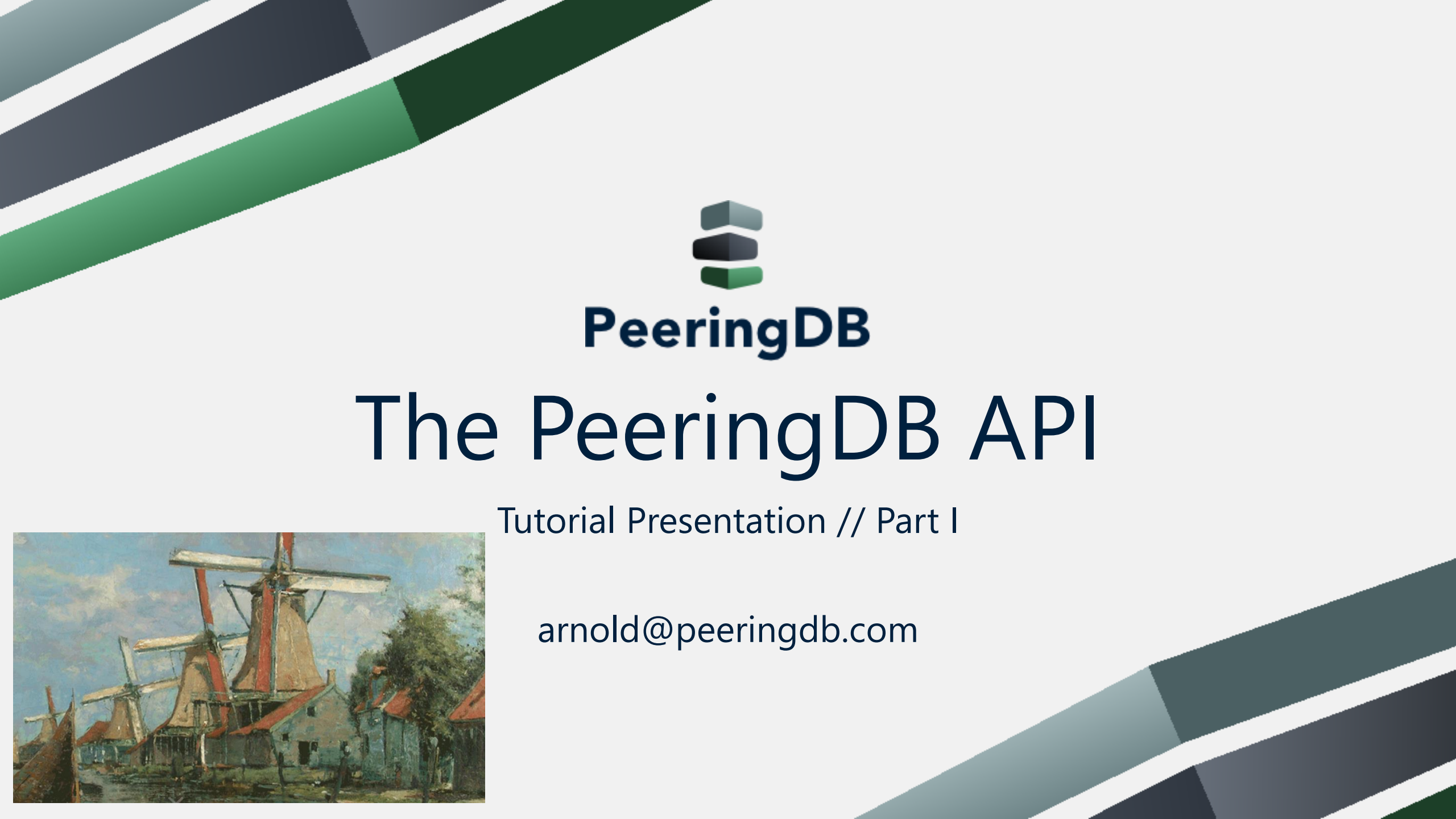


# The PeeringDB API

Tutorial Presentation // Part I

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# Agenda

- Introduction
- 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

# 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

# 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 (default)
  - 1-4: expand all sets and related objects according to level of depth specified

# 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

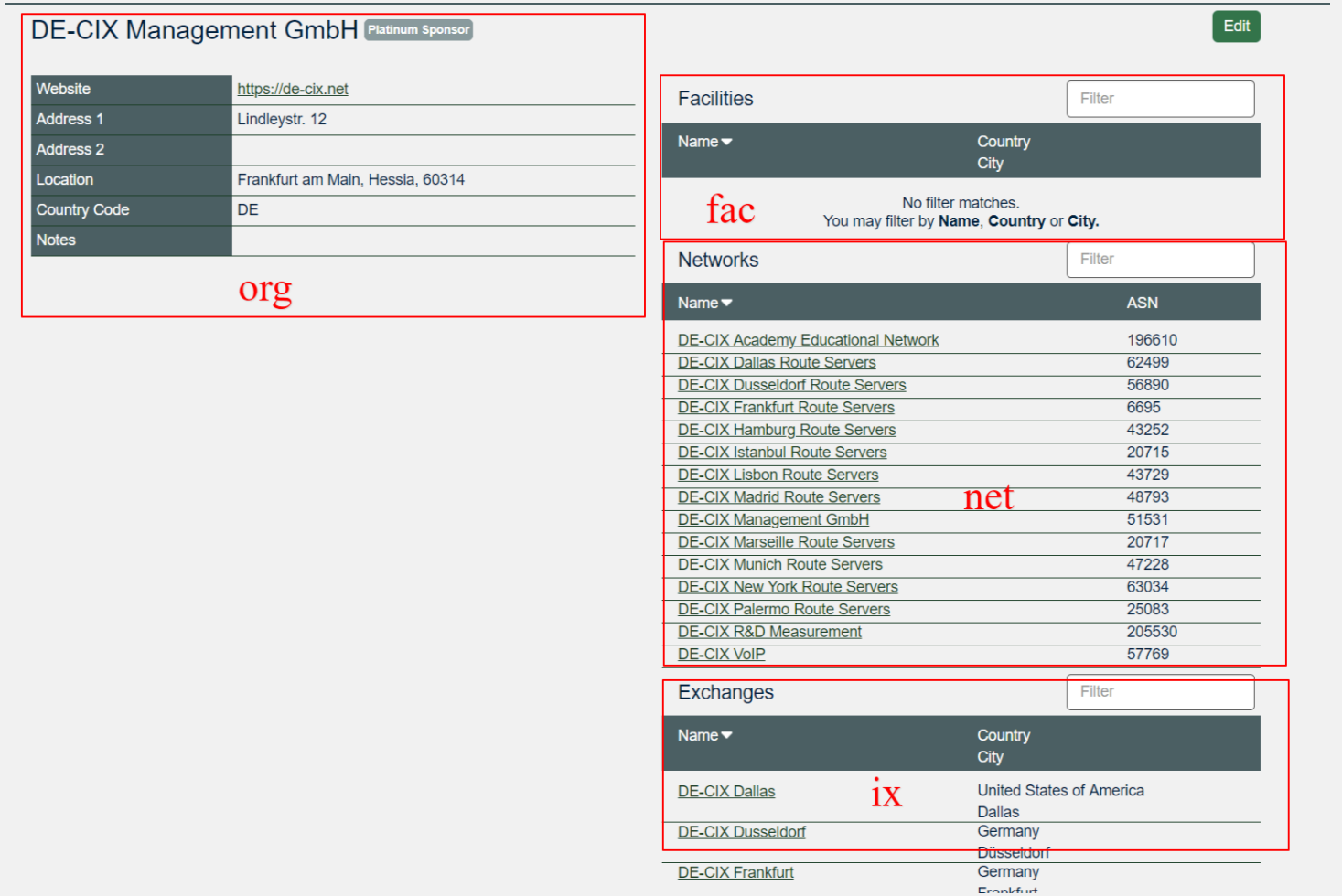
# Derived Objects

- 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
- 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



# GUI to API // fac

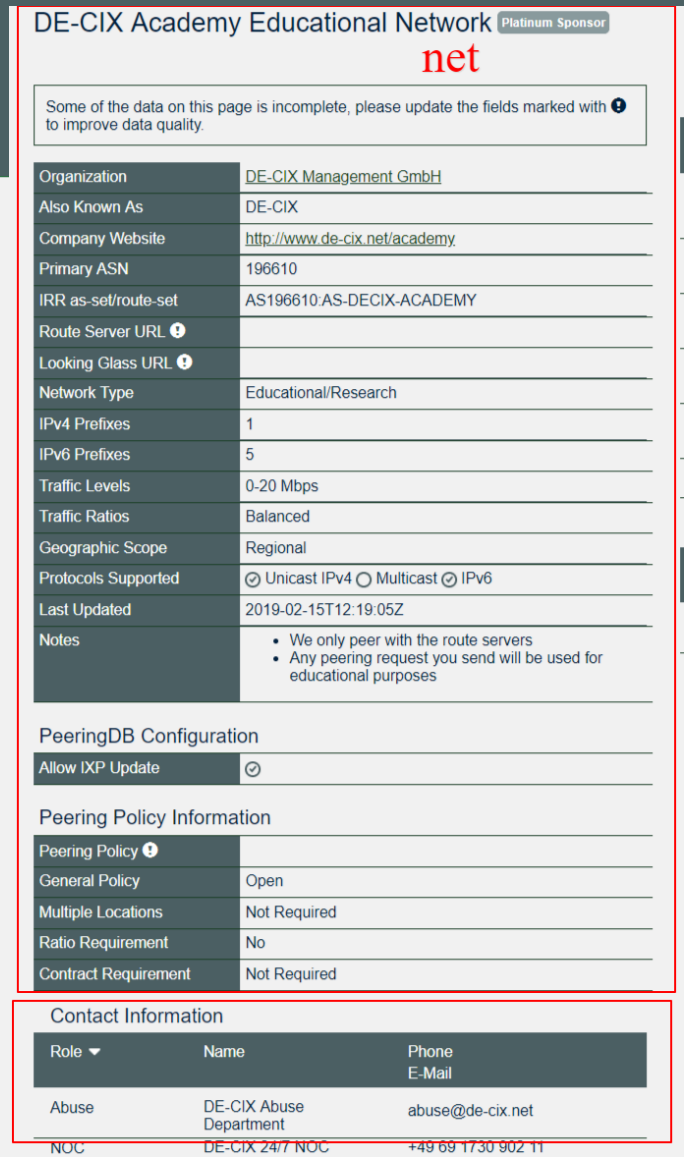
- https://peeringdb.com/fac/752

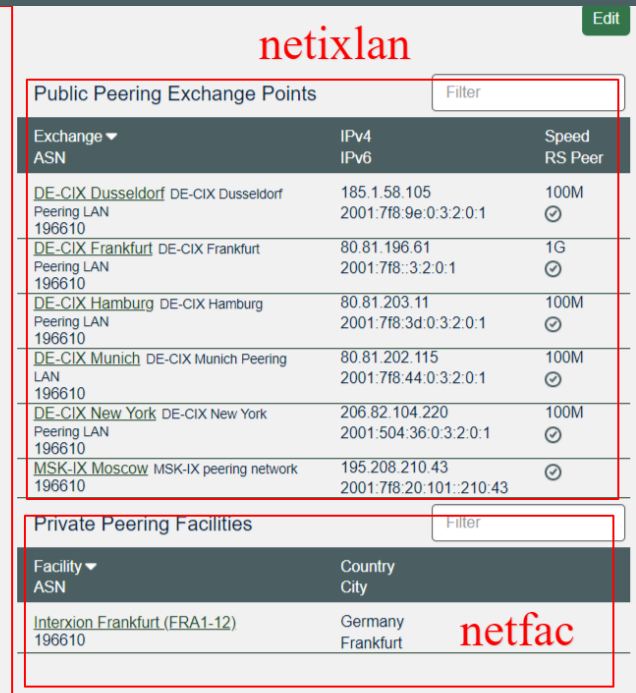
- Add pretty and depth for human friendly output
- https://peeringdb.com/api/fac/752
- https://peeringdb.com/api/ixfac?fac_id=752
- https://peeringdb.com/api/netfac?fac_id=752

# 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

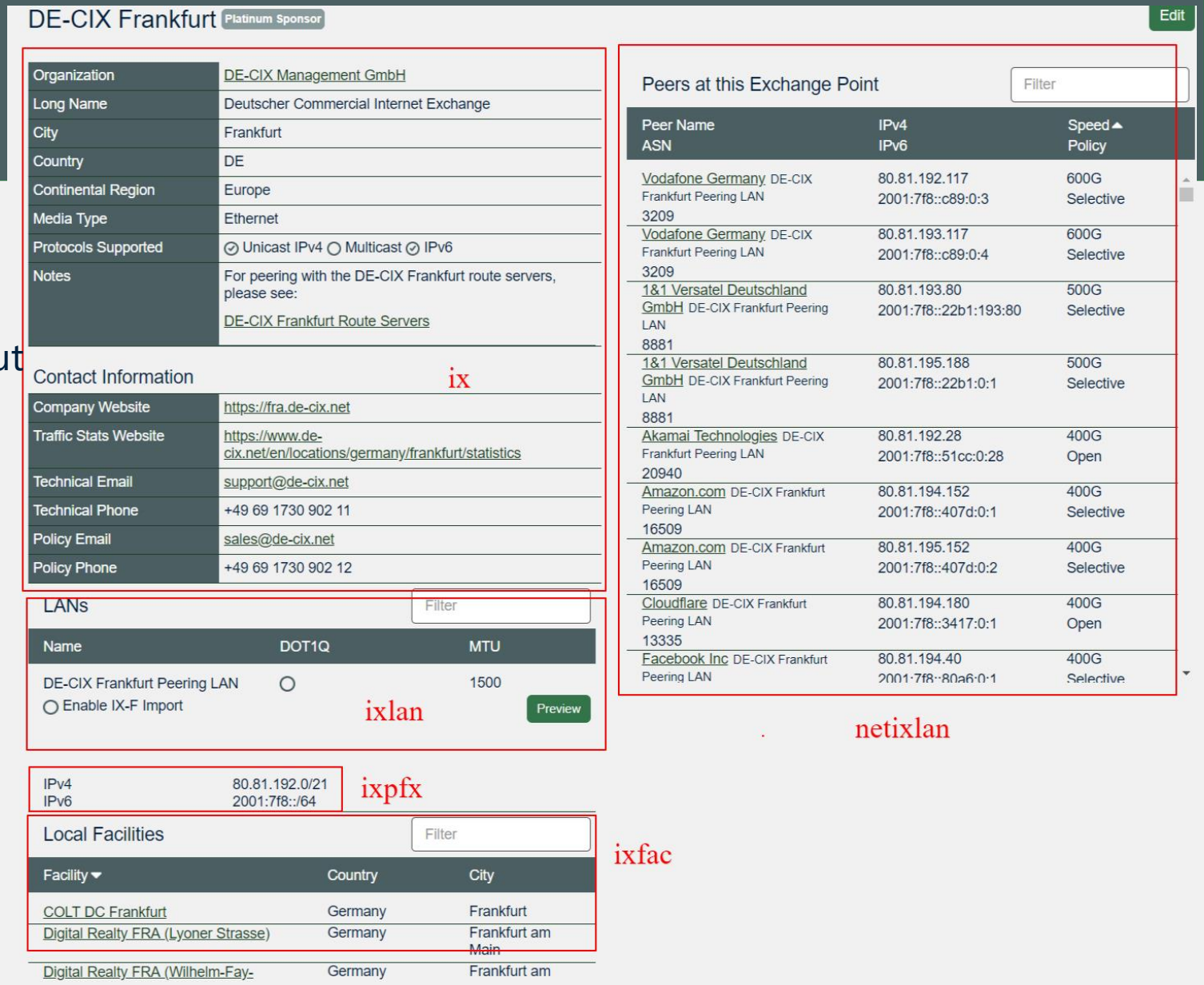


# GUI to API // ix

- 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



# 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-NCREN@ARIN"
```



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

# 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"
},
```