

Quo vadis, IX-API?



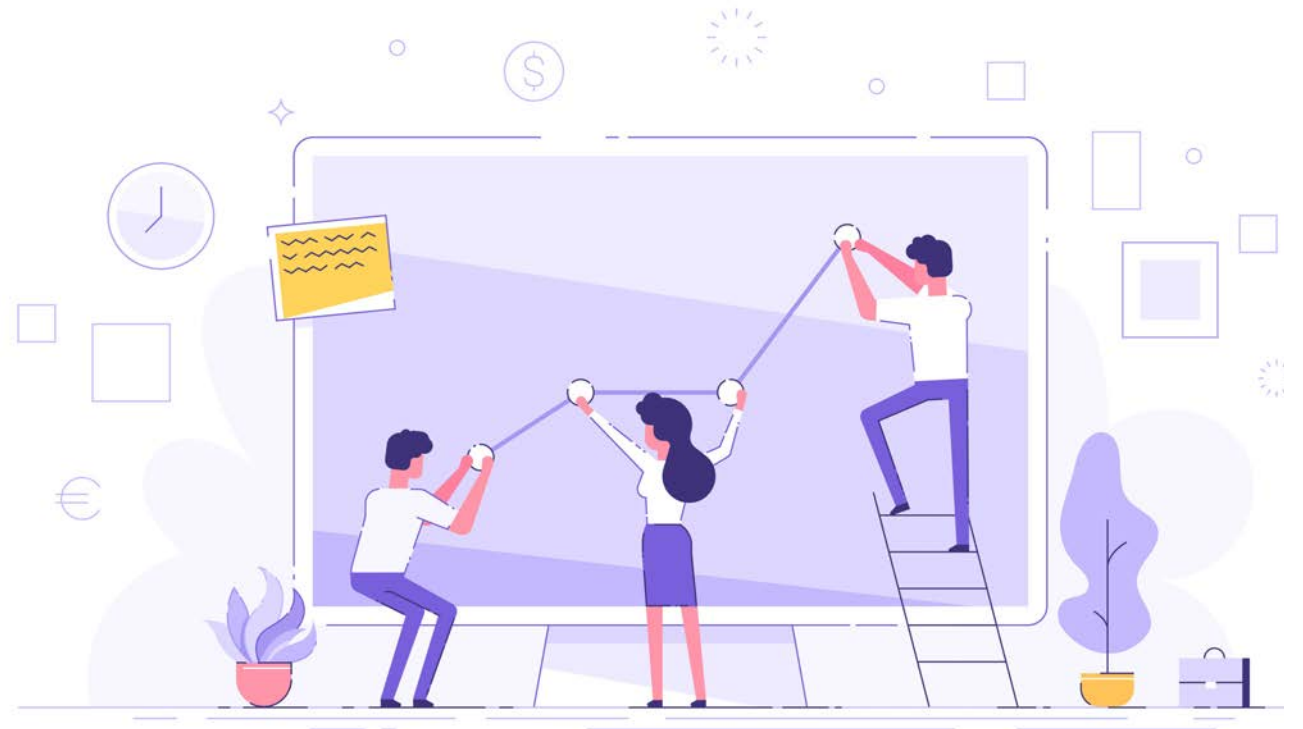
Steven Bakker, AMS-IX

European Peering Forum 2022

IX-API in a nutshell



- Joint effort of AMS-IX, DE-CIX and LINX
- Create an industry standard to provision, configure, and monitor interconnection services
- Introduced 2019 (EPF14, Estonia)
- <https://ix-api.net>



Changes since v2.1.0 (2021)



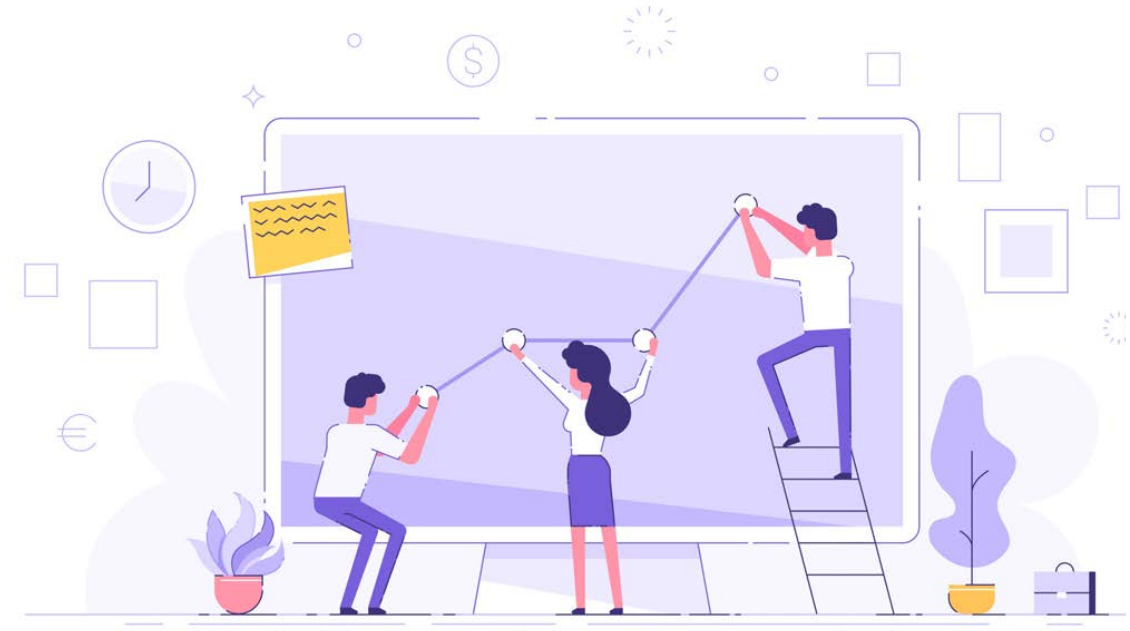
- **Spec v2.4.0 released**
 - <https://docs.ix-api.net/2.4.0/>
- **Statistics!**
 - Ports, connections, network services
 - Time series
 - Aggregate load
- **End-point discovery**
 - Allows for partial implementation of the spec.
 - Adopters can implement “operational” API without “commercial” API.



Miscellaneous v2.4.0 features



- **IX-API v2.4.0:**
 - 150+ commits since v2.1.0
 - Changes to OpenAPI schema structure
 - Easier to consume for code generation
 - Various tweaks based on feedback
 - Improved documentation
 - Types, states, authentication
 - Separate namespace for extensions
 - e.g. `/.../v2/extensions/inxn-servicekey-v1`



Statistics



- Packets/octets per second, in/out
- `../v2/{obj}/{id}/statistics`
 - Aggregate (average over a time period)
- `.../v2/{obj}/{id}/statistics/{aggregate}/timeseries`
 - Time series

```
GET /network-services/{id}/statistics

Response samples
200 401 403 404

Content type
application/json

{
  - "aggregates": {
    - "5m": {
      "title": "5 Minutes",
      "precision": 300,
      "total_samples": 1,
      "created_at": "2019-08-24T14:15:22Z",
      "next_update_at": "2019-08-24T14:15:22Z",
      "average_pps_in": 1730224,
      "average_pps_out": 17456,
      "average_ops_in": 1734882240,
      "average_ops_out": 173220
    },
    + "30d": { ... }
  }
}
```

```
GET /network-services/{id}/statistics/{aggregate}/timeseries

Response samples
200 401 403 404

Content type
application/json

{
  "title": "5 Minutes",
  "precision": 300,
  "created_at": "2019-08-24T14:15:22Z",
  "next_update_at": "2019-08-24T14:15:22Z",
  "origin_timezone": "Europe/Amsterdam",
  - "samples": [
    - [
      "2019-08-24T14:15:22Z",
      120302,
      42980203,
      320302,
      84990203
    ]
  ]
}
```

IX API ^v₂



Peering Manager & IX-API



- Support for IX-API v2 added in 1.6
- Improved IX-API information display
- Plans for splitting off IX-API client code
 - Separate (Python) library



Endpoint	
IX-API	DE-CIX
Network service	
Service ID	DXDB:PS:1
Product	DE-CIX Frankfurt
Name	Standard Peering Service Frankfurt
Metro area	FRA
Features	Show

DXDB:PAS:30431 - Production		✓ Configured
Outer VLAN	401	
Inner VLAN	0	
IP addresses	2001:7f8::89d0:0:1/64 - 80.81.193.10/21	
MAC address	94:F7:AD:58:87:81	

Terraform & IX-API



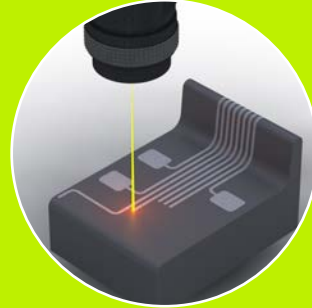
- Terraform provider sponsored by IX-API participants (AMS-IX, DE-CIX, LINX).
- Initial release expected Q4 2022.



IX-API Roadmap



Telemetry
(port state, live
flow data, etc.)



Layer 1 metrics
(optical light
power levels,
error counters)



L3 Features



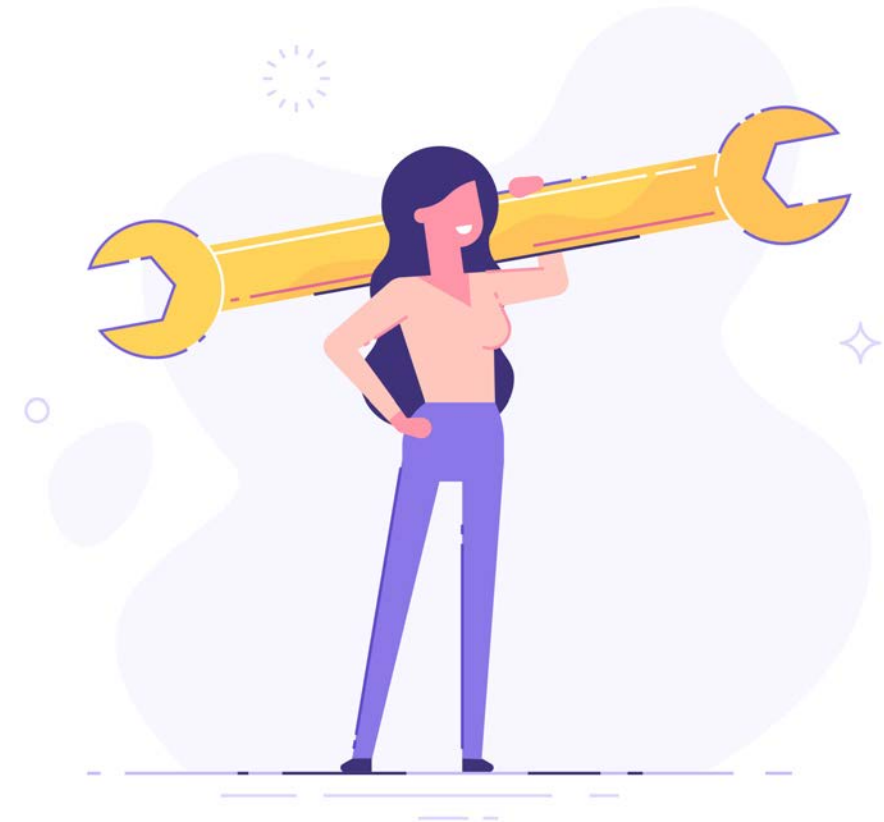
Peer-to-Peer
Flow Statistics



IX-API Source



- <https://gitlab.com/ix-api>
- 10 Projects, 0 private repositories:
 - Schema, test suite, reference client, sandbox (IXP emulator), website/hosting configs/doc...
- Apache 2.0, Python+Django/Django REST
- RESTful, OpenAPI, JSON & YAML specs



IX-API at AMS-IX



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IX-API Implementation at AMS-IX

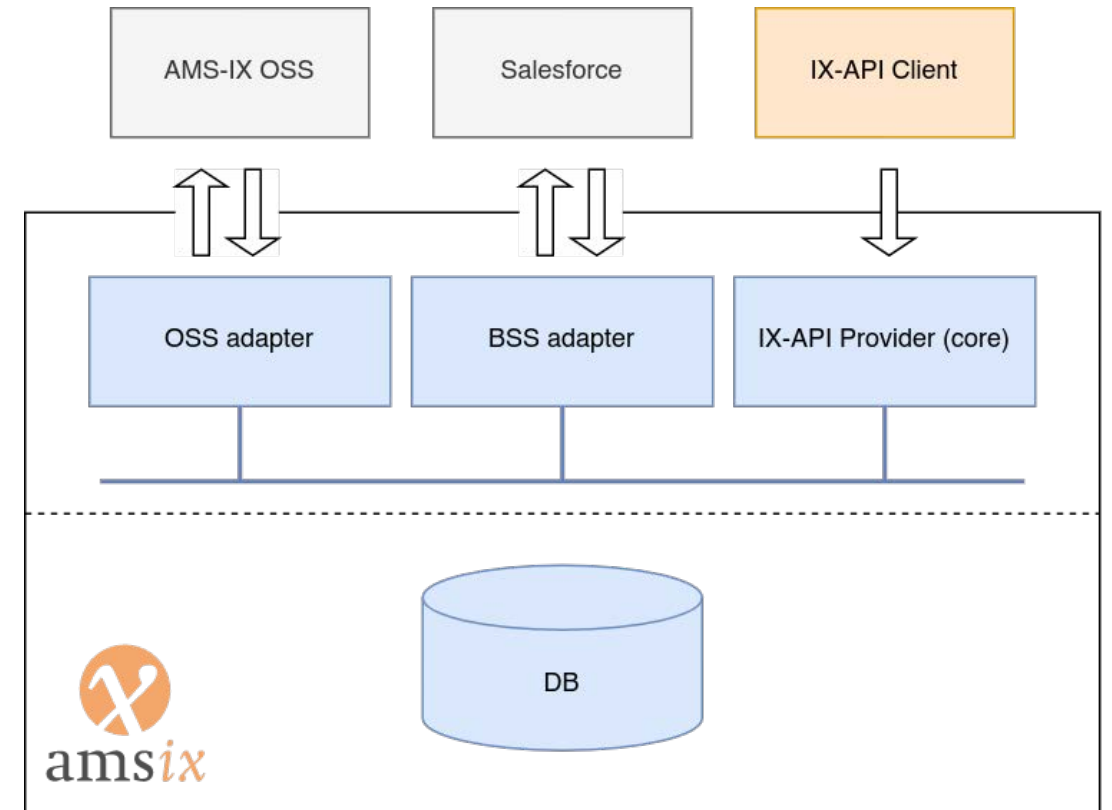


- v2 implementation from scratch
- Interfaces with BSS and OSS systems
- Challenges
 - Map IX-API data model on BSS and OSS models
 - Route actions to appropriate system

IX-API Implementation at AMS-IX



- Outsourced development to nextPacket
- Standalone IX-API server using CQRS
 - (Command Query Responsibility Segregation)
- Commands are handled by dedicated components (adapters) and sent to the relevant backends
- Queries are handled via local caches of objects ETL'ed from OSS and BSS
- Components communicate via message bus



AMS-IX Implementation Roadmap



- Finish Salesforce integration (Q4 2022)
- Add point-to-point support (p2p_vc)
- Add closed user group support (mp2mp_vc)
- L3 features?

<https://ix-api.net>

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