



ELIXIR Beacon Network

ELIXIR All Hands 2019



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The background

- ELIXIR Beacon is GA4GH driver project and in ELIXIR we started new 3-years implementation project in the beginning of 2019
- One of the main objectives of that project is build ELIXIR Beacon Network and establish a basis to operate that as a service
- Last summer we published the first draft of Beacon Network specification and now we have first implementation ready



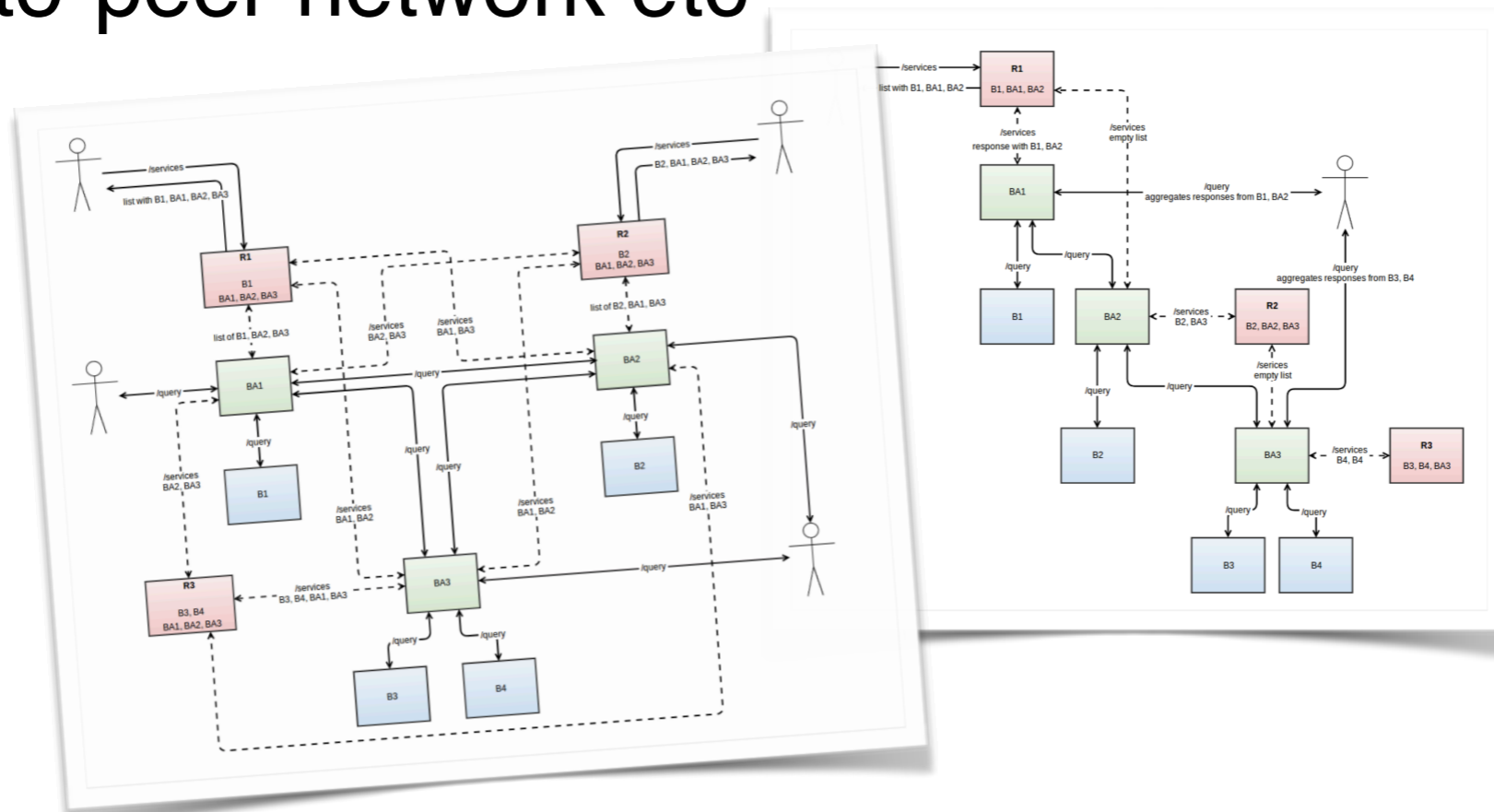
Why ELIXIR Beacon Network

- We want to ease data discoverability in Europe and in ELIXIR Core Data Resources
- Provide seamless integration into existing services (e.g. handover to EGA) and leverage ELIXIR Infrastructure services, like ELIXIR AAI
- We are working on two parallel tracks:
 - Increasing the size by expanding the Network with European Beacons
 - Improving quality by bringing data from EGA to the Network



Network design

- The Network architecture is divided into three separate components: Registry, Aggregator and Beacon(s)
- The design supports different network topologies: open and closed networks, hierarchical networks, peer-to-peer network etc



The specification

- Beacon Network design document and OpenAPI specification
- The implemented endpoints:
- Also full support for three access tiers with ELIXIR AAI (open, registered and controlled)



teemukataja commented on Jan 16 • edited ▾

Endpoints that have been implemented according to the [specification drafted from the design document](#).

Common (Aggregator and Registry)

- GET /servicetypes
- GET /info
- POST /services
- GET /services
- GET /services/{id}
- PUT /services/{id}
- DELETE /services/{id}
- GET /networks

Registry-specific

- POST /networks
- POST /networks/{networkId}
- GET /networks/{networkId}
- PUT /networks/{networkId}
- DELETE /networks/{networkId}

Aggregator-specific

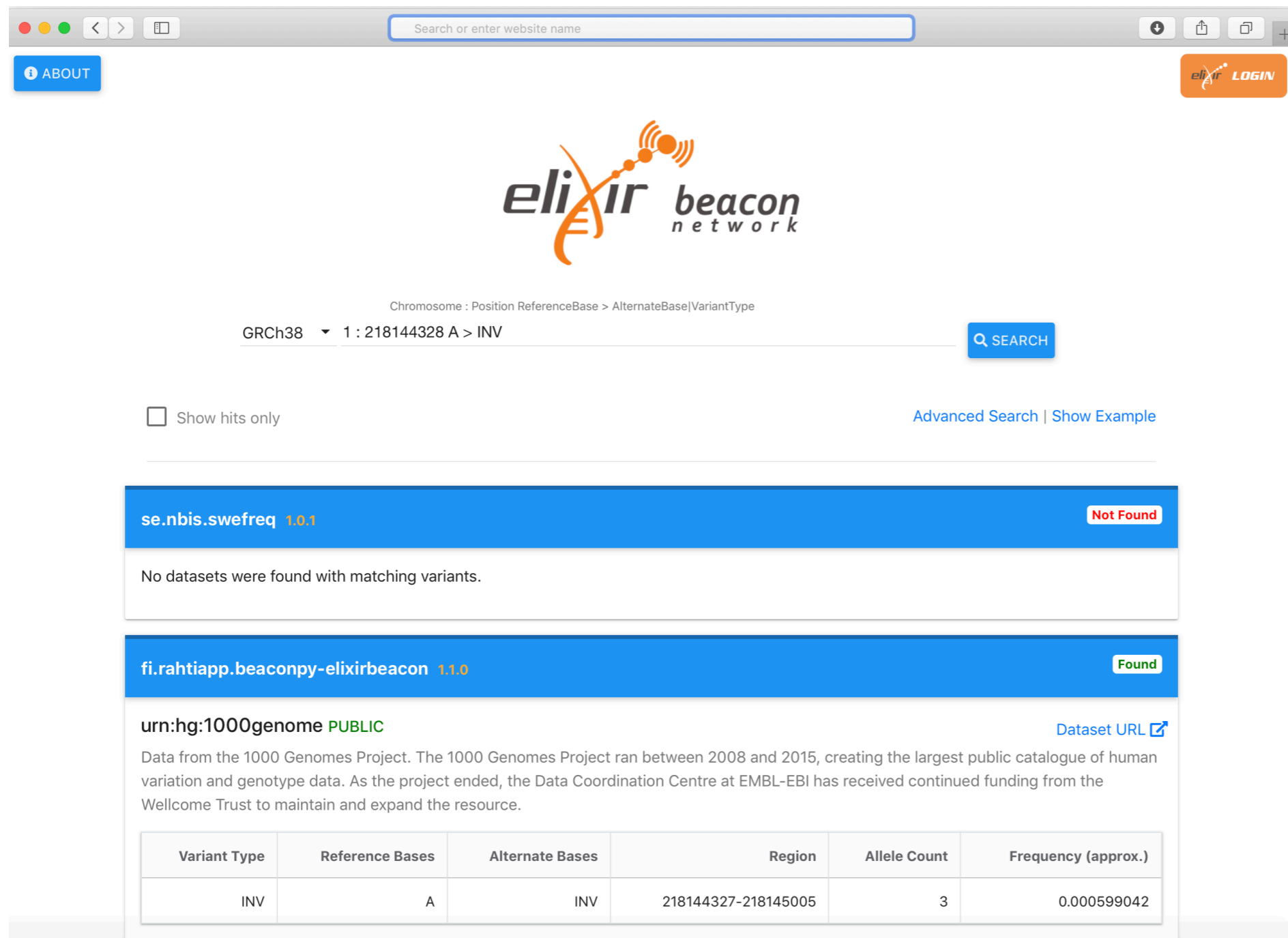
- GET /query (relay to Beacon)
- DELETE /beacons (invalidate cached beacons)

Beacon-specific

- GET / (info endpoint)
- GET /query
- POST /query

The implementation

- Live in <https://beacon-ui-beacon.rahtiapp.fi>



The screenshot shows a web browser window displaying the Elixir Beacon Network search interface. The browser's address bar contains the URL <https://beacon-ui-beacon.rahtiapp.fi>. The page features the Elixir Beacon Network logo at the top center. Below the logo, there is a search bar with the text "Chromosome : Position ReferenceBase > AlternateBase|VariantType" and a dropdown menu showing "GRCh38" and "1 : 218144328 A > INV". A "SEARCH" button is located to the right of the search bar. Below the search bar, there is a checkbox labeled "Show hits only" and links for "Advanced Search" and "Show Example".

The search results are displayed in two sections:

- se.nbis.swefreq 1.0.1** (Not Found): No datasets were found with matching variants.
- fi.rahtiapp.beaconpy-elixirbeacon 1.1.0** (Found):
 - Dataset: [urn:hg:1000genome PUBLIC](#) (Dataset URL)
 - Description: Data from the 1000 Genomes Project. The 1000 Genomes Project ran between 2008 and 2015, creating the largest public catalogue of human variation and genotype data. As the project ended, the Data Coordination Centre at EMBL-EBI has received continued funding from the Wellcome Trust to maintain and expand the resource.

Variant Type	Reference Bases	Alternate Bases	Region	Allele Count	Frequency (approx.)
INV	A	INV	218144327-218145005	3	0.000599042



Demo time



Operating as a service

- The long-term goal is to operate ELIXIR Beacon Network as a service
- For this we need to to:
 - Document processes (e.g. how to join to the Network)
 - Define metadata requirements for for individual Beacons (e.g. metada in info endpoints)
 - Define security requirements
 - Establish monitoring and helpdesk operations
 - Implement KPIs (defined in previous IS)
 - Estimate operational costs
- Timeline for <http://beacon-network.elixir-europe.org?>

