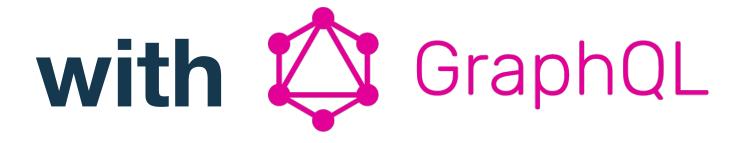
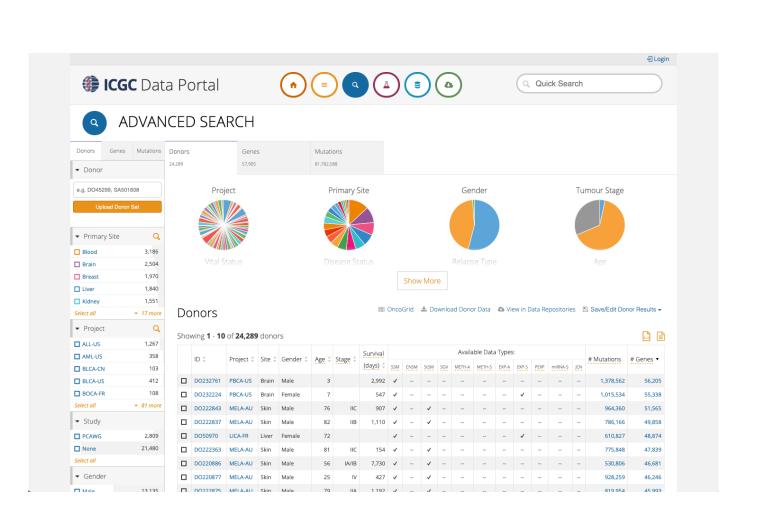
## Conquering Micro-services



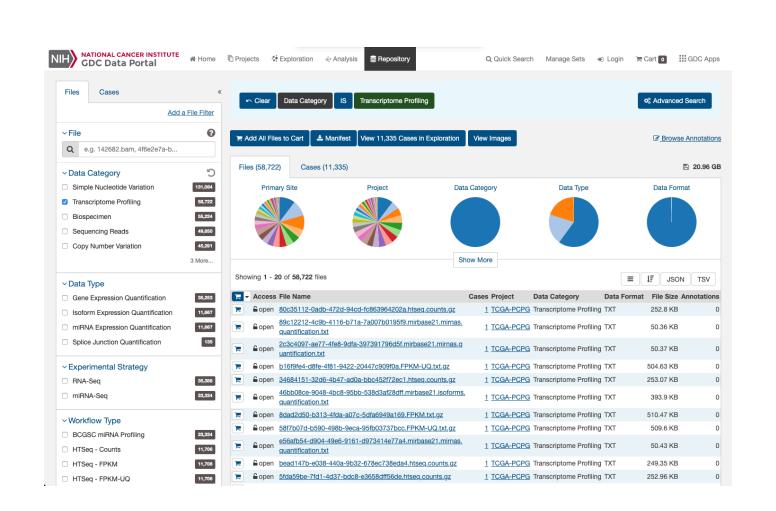
Our plan for ARG®









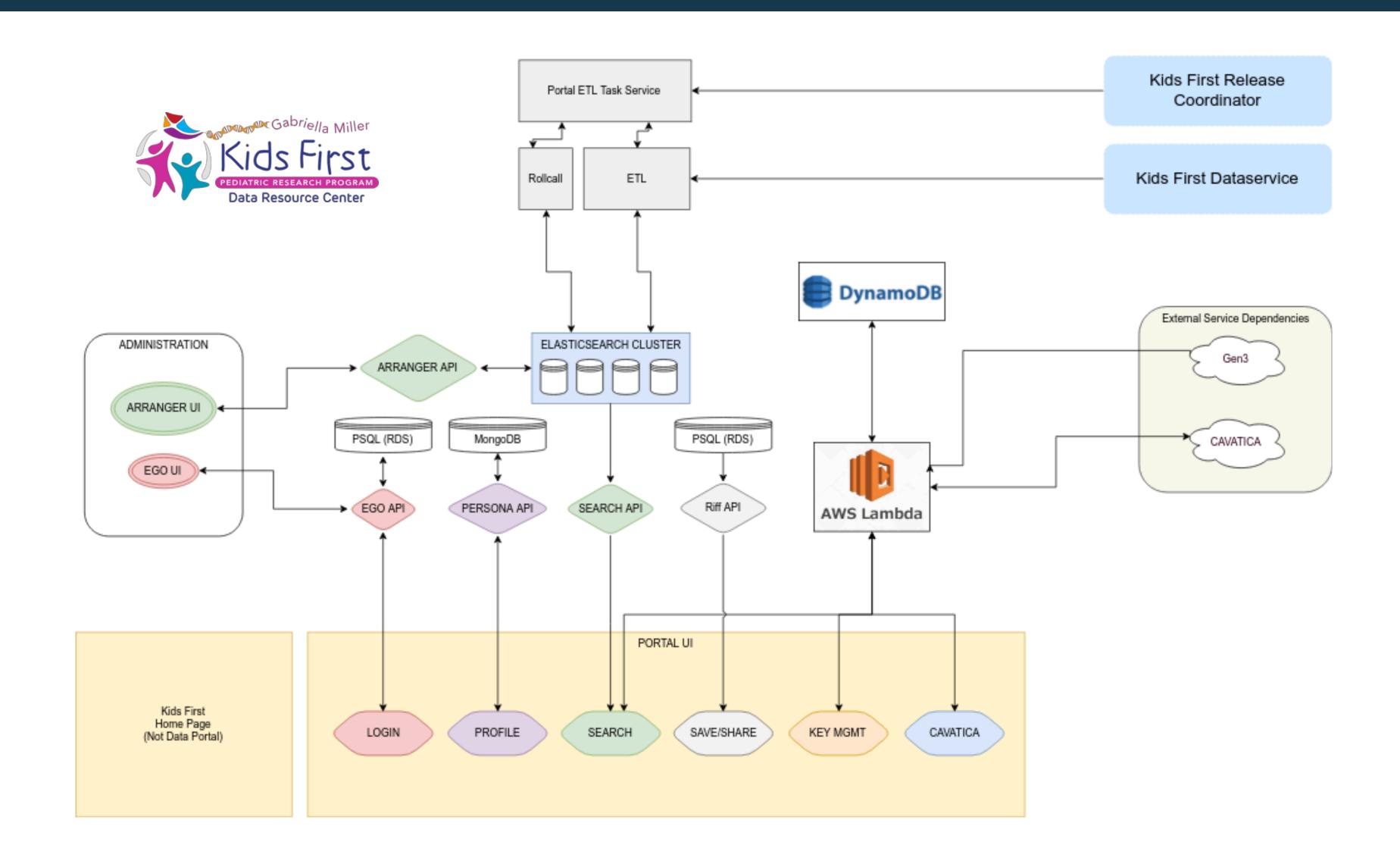




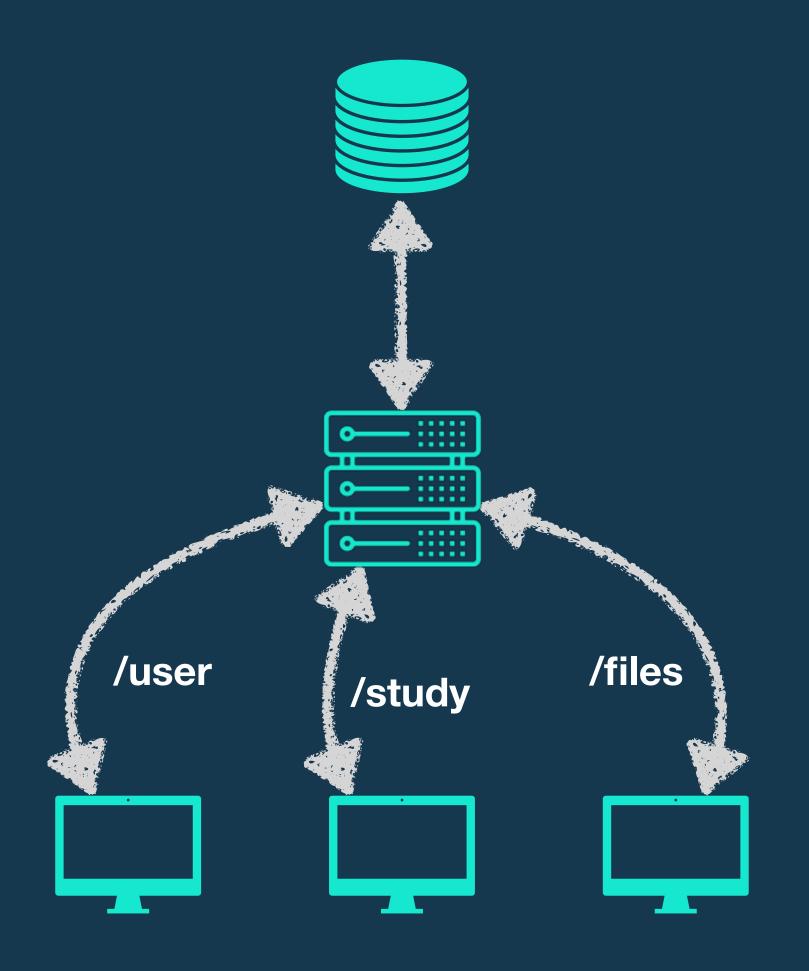
ilter BROWSE ALL	«										
Clinical Filters File Filters		<b>34,471</b> Files			\$ 8,018 Participants		2,831 Families			<b>904.37 TB</b> Size	
Study Name	Q	Showing 1 - 20 of 34,471 files					ANALYZE IN CAVATICA DOWNLOAD Columns V				Export TSV
☐ Pediatric Brain Tumors:	# FILES 14,144		File ID	Participants ID	Study Name	Proband	Family Id	Data Type	File Format	File Size	Actio
CBTTC  Congenital Heart Defects	5,196	0	GF K06ZJS2Q	PT_1F9D96X3	TARGET: Acute Myeloid Leukemia	Yes	FM_4H42S7Y6	Aligned Reads	bam	174.67 GB	<u> </u>
Orofacial Cleft: European Ancestry	3,885	0	GF CVK895RR	PT_2K21M65V	TARGET: Acute Myeloid Leukemia	Yes	FM_BZ5BJY13	Aligned Reads	bam	11.31 GB	<u> </u>
Ewing Sarcoma: Genetic Risk	3,141				-						
Syndromic Cranial Dysinnervation	2,403		GF 3BMEXD82	PT_56JXQQ7R	TARGET: Acute Myeloid Leukemia	Yes	FM_QRCTEPNJ	Aligned Reads	bam	876.26 MB	<u> </u>
	<b>⊕</b> 5 More		GF CYCCXXF0	PT_8EJ85RHF	TARGET: Acute Myeloid Leukemia	Yes	FM_RGKSHNBK	Aligned Reads	bam	138.6 GB	<u> </u>
Diagnosis Category	Q		GF YXYT4QH4	PT_5FG8W7CV	TARGET: Acute Myeloid Leukemia	Yes	FM_KAEXDQD2	Aligned Reads	bam	142.64 GB	<u> </u>
	# FILES		GF S2T478Y3	PT KH3HFR33	TARGET: Acute	Yes	FM ZX10EQ5T	Aligned Reads	bam	168.22 MB	
Cancer	16,526		GF 32147613	P1_KHSHFKSS	Myeloid Leukemia	res	FM_ZX10EQ51	Aligned Reads	Dam	166.22 IVIB	<u> </u>
Structural Birth Defect	6,154		GF FV0KKXA2	PT_5N1VVNTH	TARGET: Acute	Yes	FM_91MAX0SX	Aligned Reads	bam	341.55 MB	_
Diagnosis (Source Text)	Q				Myeloid Leukemia						•
, ,	# FILES		GF DGTRKWXP	PT_WZYJ5RYV	TARGET: Acute Myeloid Leukemia	Yes	FM_7DPH4AYD	Aligned Reads	bam	384.77 GB	<u> </u>
Low-grade     glioma/astrocytoma (WHO     grade I/II)	3,863		GF R6MVTMBR	PT_D655D9E8	TARGET: Acute Myeloid Leukemia	Yes	FM_15169T53	Aligned Reads	bam	260.15 MB	<u></u>
☐ Medulloblastoma	2,099		GF M7XTW100	PT_0XMV1JG0	TARGET: Acute	Yes	FM_ZW5794M2	Aligned Reads	bam	267.14 MB	_
☐ High-grade glioma/astrocytoma (WHO grade III/IV)	1,665				Myeloid Leukemia						•
	'		GF 4CYJ20V8	PT_JY1633AF	TARGET: Acute Myeloid Leukemia	Yes	FM_BSZGPE65	Aligned Reads	bam	2.45 GB	<u> </u>
<ul> <li>Ependymoma</li> </ul>	1,298	0	GF R6WHX0WZ	PT_C7Q1NG6Z	TARGET: Acute	Yes	FM_R3JE9TXS	Aligned Reads	bam	286.64 MB	_

and more...

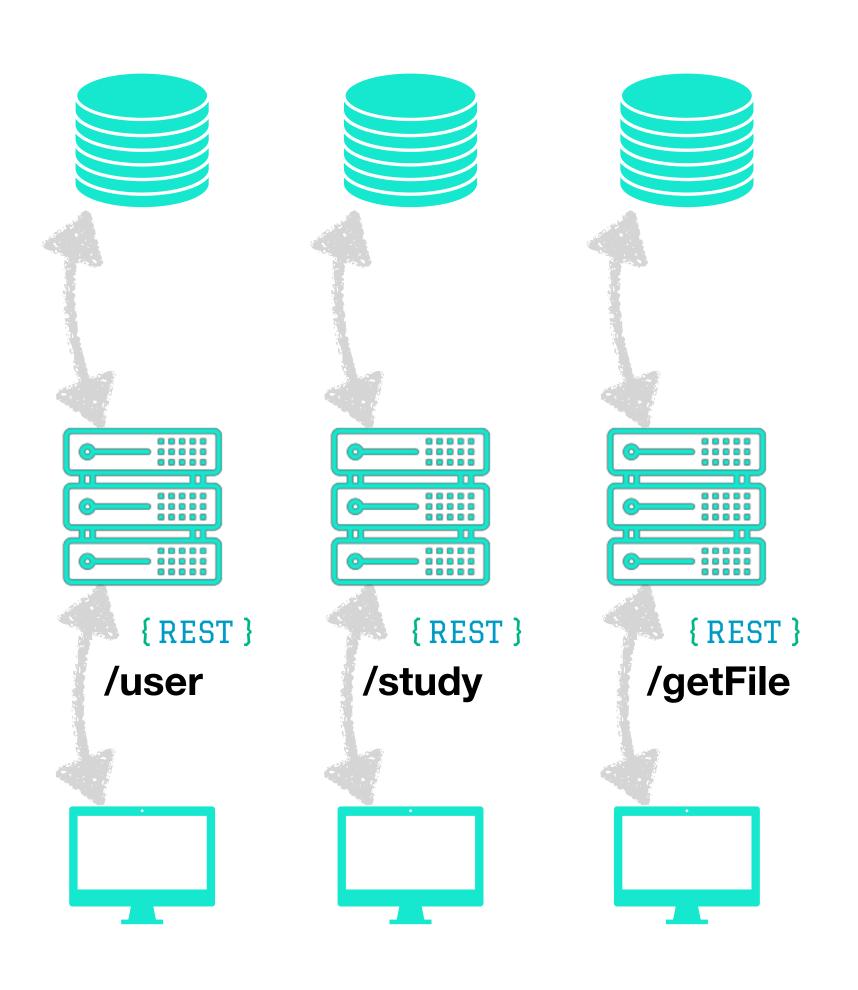
### Behind the scene



# Monolithic System



#### Micro-...what?

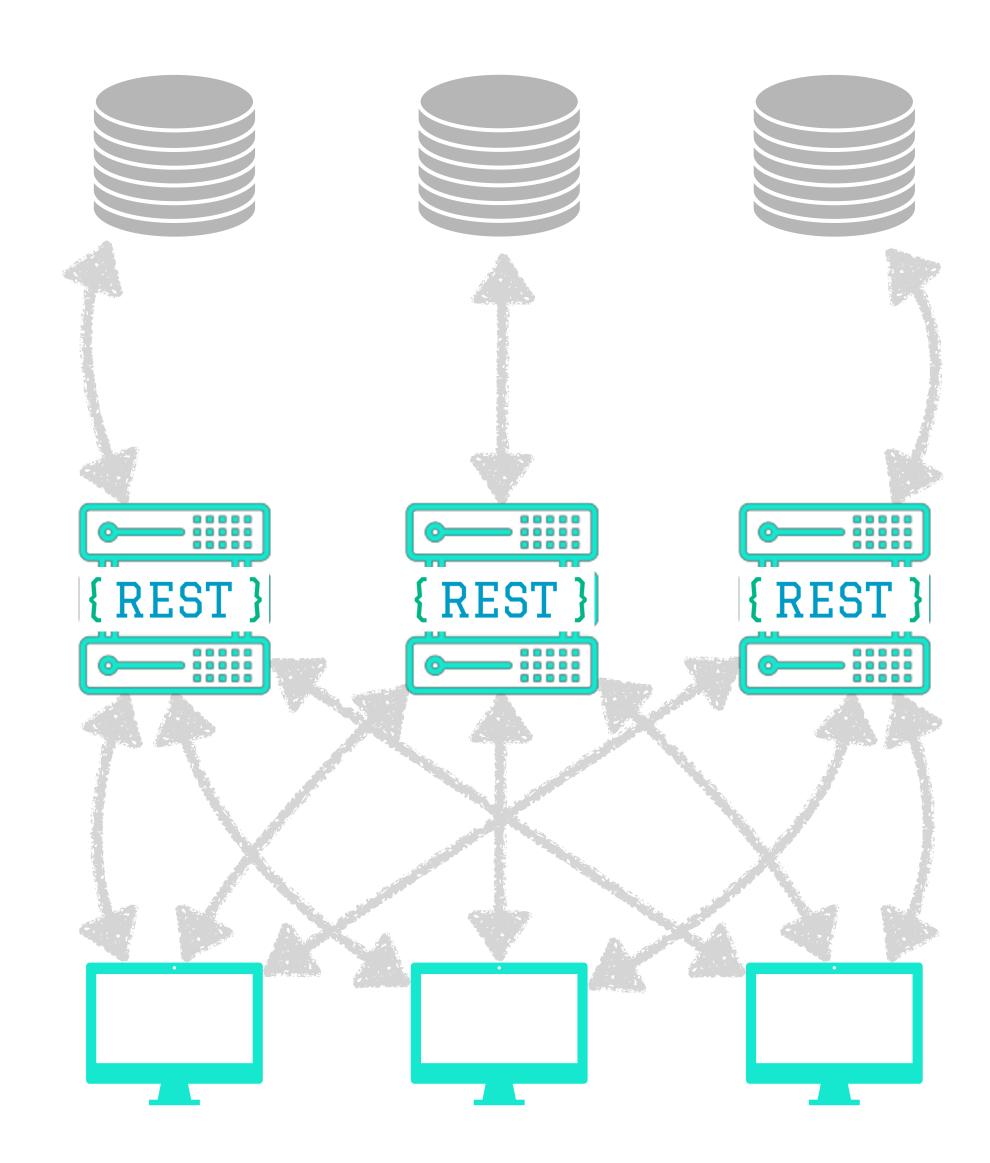


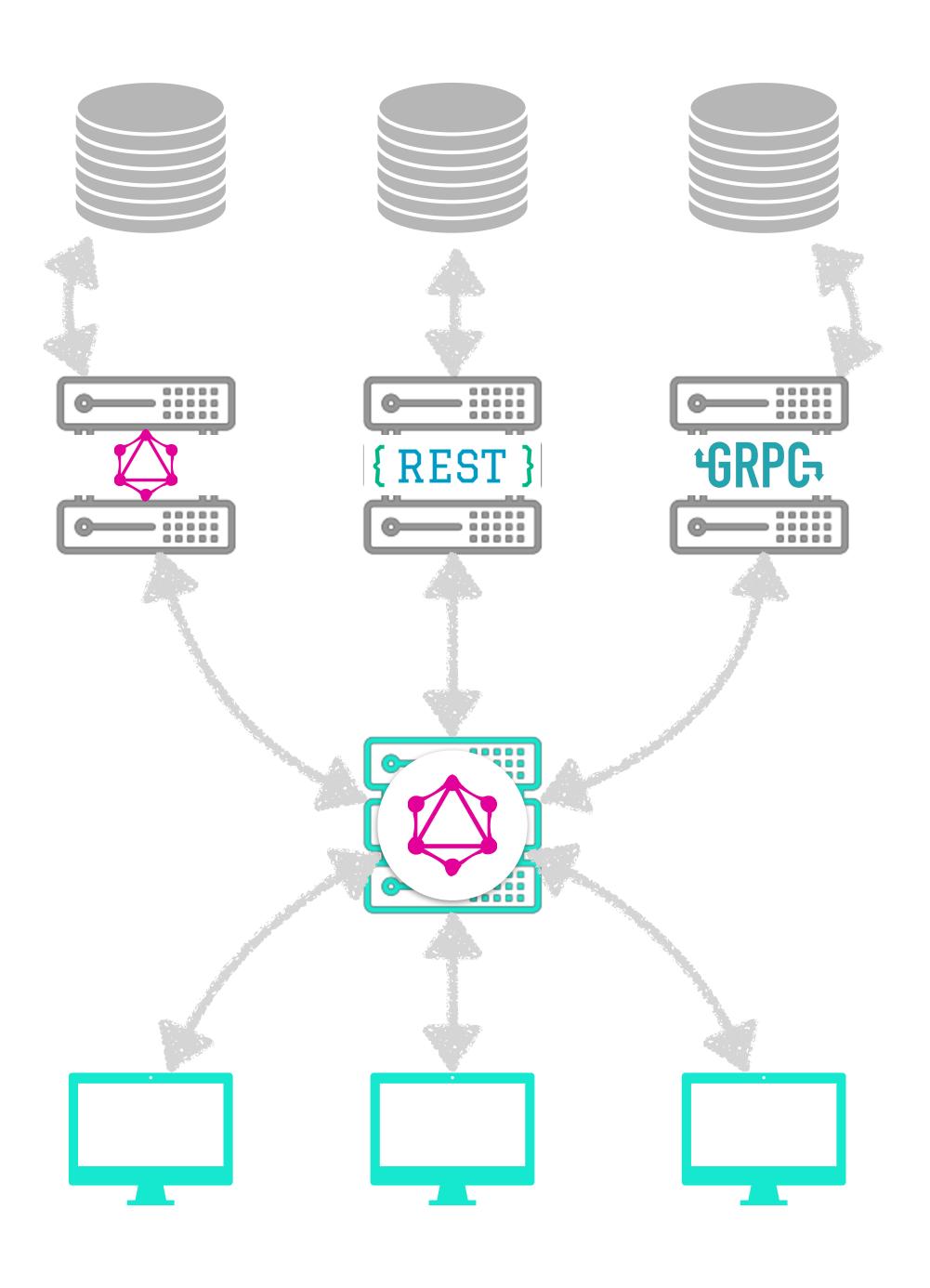
# Micro-services System

- Functionally decoupled
- Independently deployable
- Independently scalable

## Some challenge

- No place to handle cross-cutting concerns
- Front-end handles heavy business logic
- Inefficiencies with REST:
  - Over & under-fetching
  - Lack of API schema -> manual documentation





## The GraphQL Solution

- •An aggregation layer to handle cross-cutting concern
- ·Why GraphQL?
  - Explorable schema —> selfdocumenting
  - Schema Stitching:
    - •Modelling underlying services as an independent schemas
    - "Stitch" the schemas together as nodes in a graph
    - Network advantage: batched request



SONG

SCORE

**Submission System** 

Validation

System

Data

Dictionary

Clinical SONG

Data Access

Control

(DACO)

Queue

Manager

Workflow

Management

Dashboard

RDPC MEMBER

Manifest and

Transfer

Dashboard

RDPCs

R1

Datastore

SONG-R1

SCORE-R1

Workflow System

Centralized Services

ID Service

GENOMIC DATA

Submission

Portal Pages

Harmonization

Dashboard

SUBMITTERS

Submission

Dashboard

Programme

Dashboard

MIDDLE WARE

FRONTEND - ARGO SITE

R2

RDPC Datastore

SONG-R2

SCORE-R2

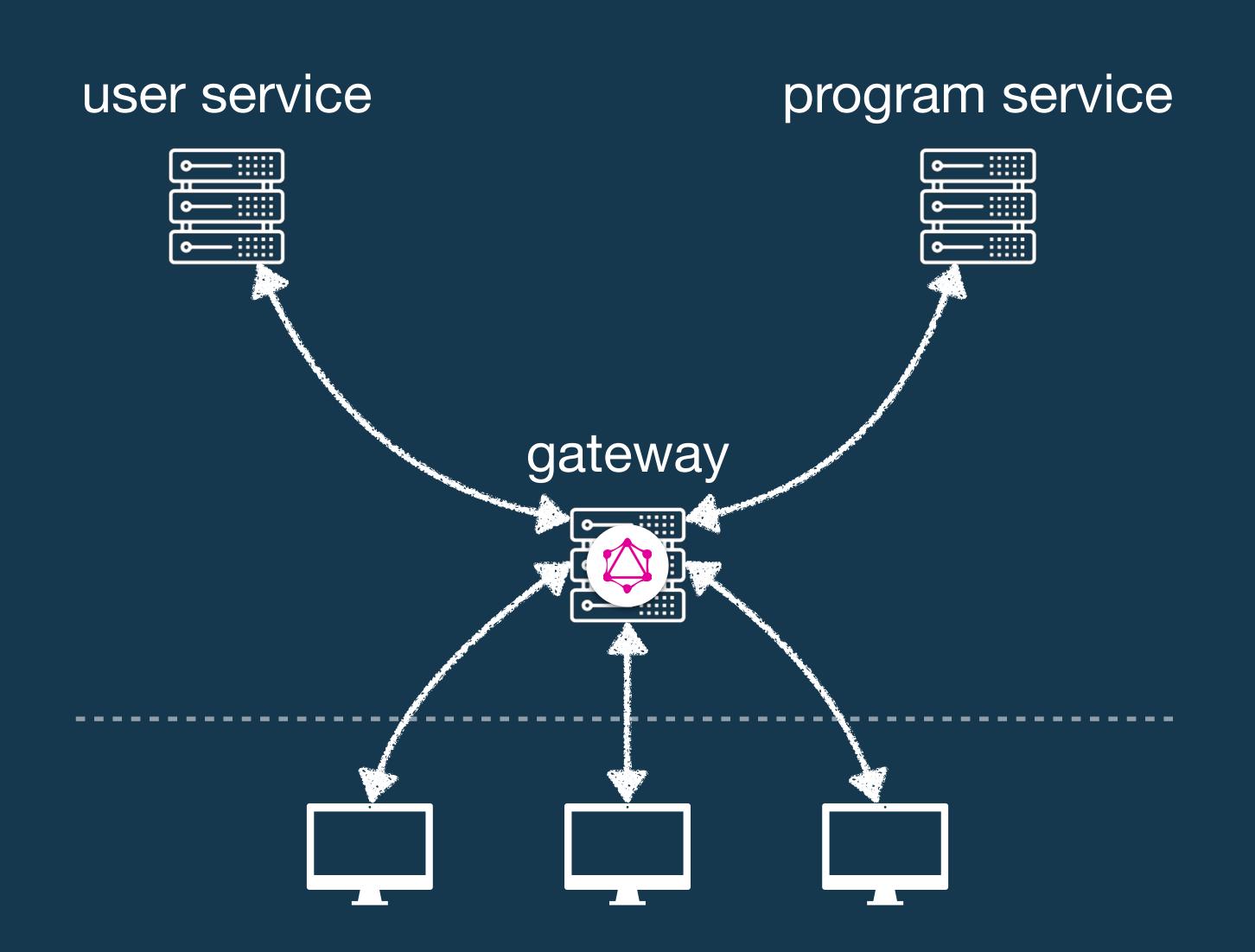
Workflow

System

Location Policy Engine

- CLINCAL DATA ---

### demo



#### The wins

- Explorability:
  - Better developer on-boarding
  - Collaboration with non-technical team members
- Central place for integration test —> higher quality software
- Network performance

thank you