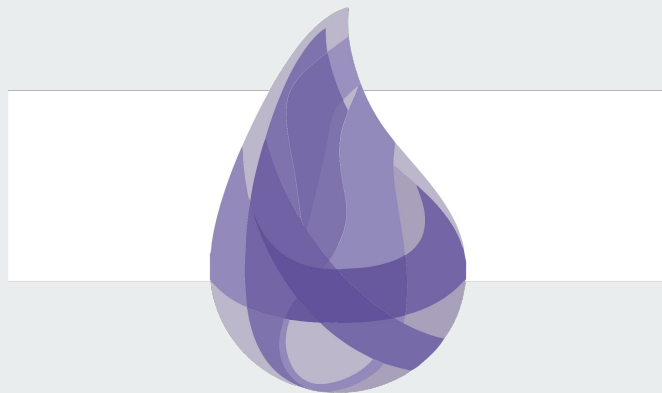




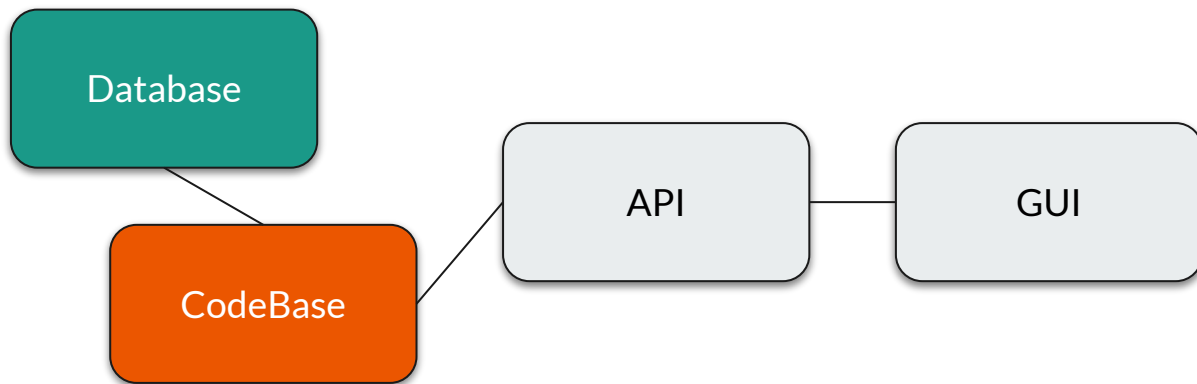
Betunfair

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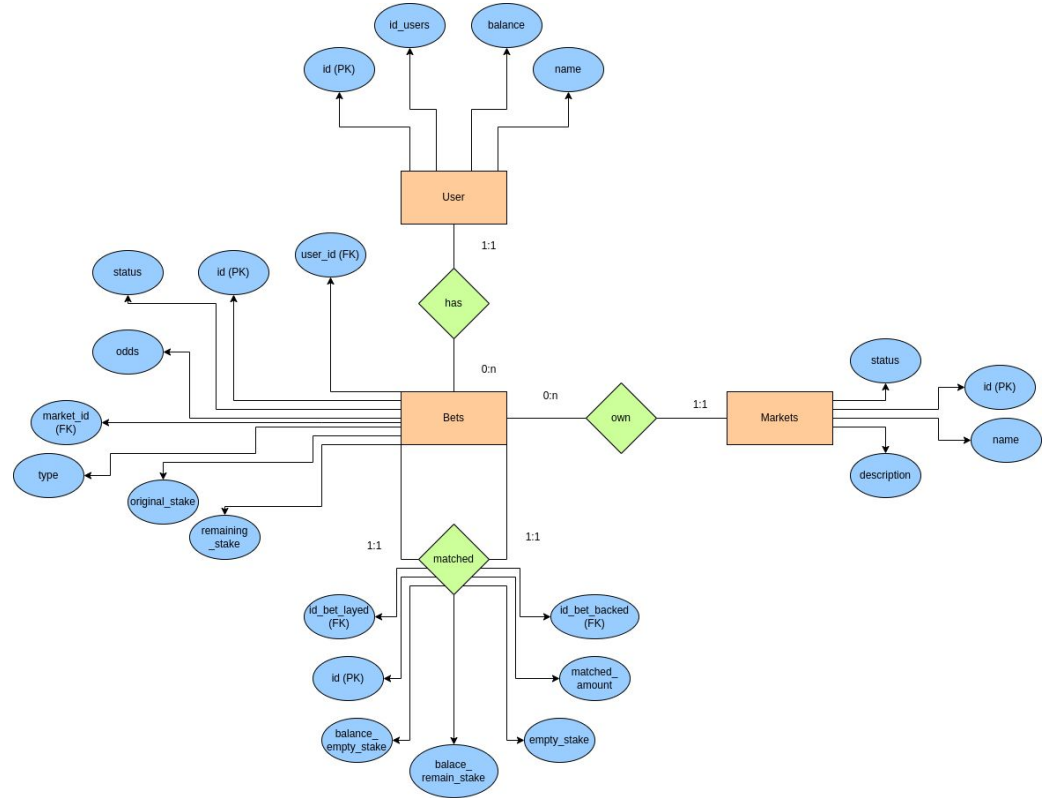
Why Phoenix?

- Easy integration with database (Ecto)
- Automatic API over HTTP
- Seamless integration with our Betunfair's Elixir codebase



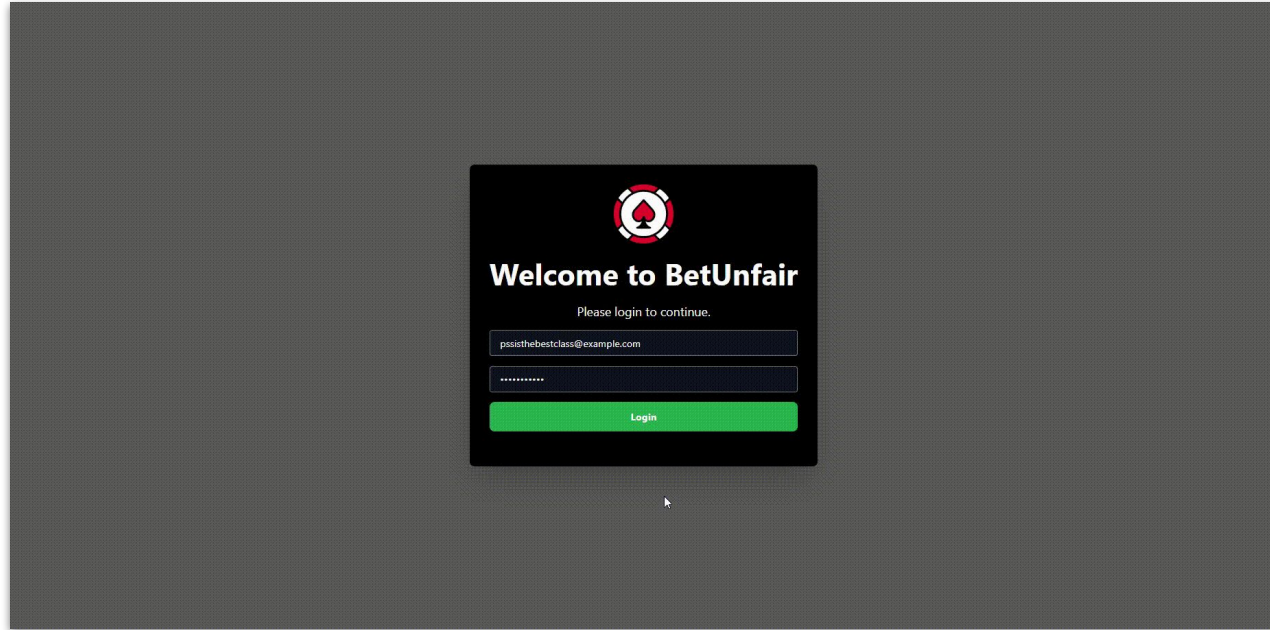
Database Structure

- Users has bets.
- Markets own the bets.
- Bets will be filled.
- The algorithm matched the bets.

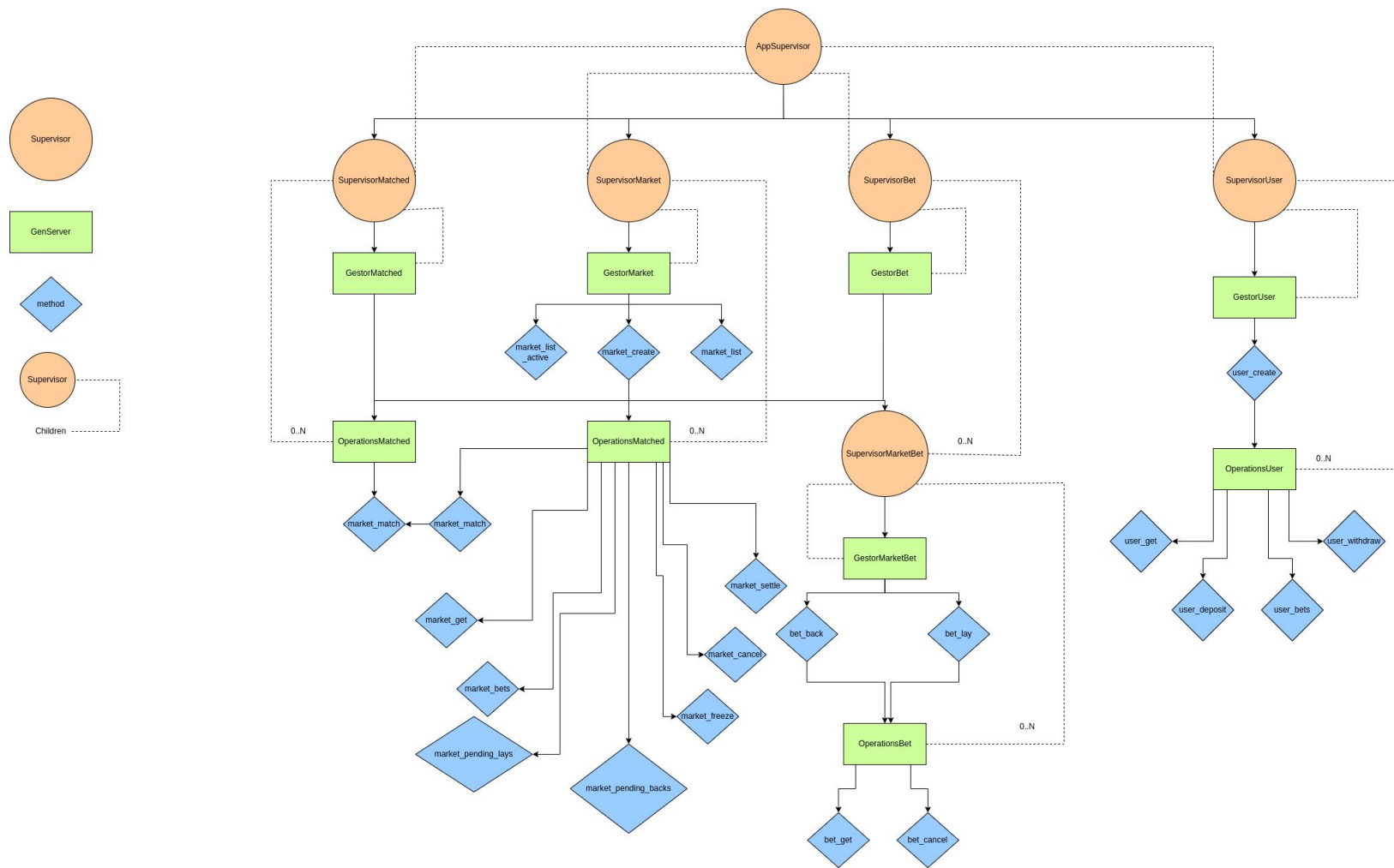


Routes & GUI

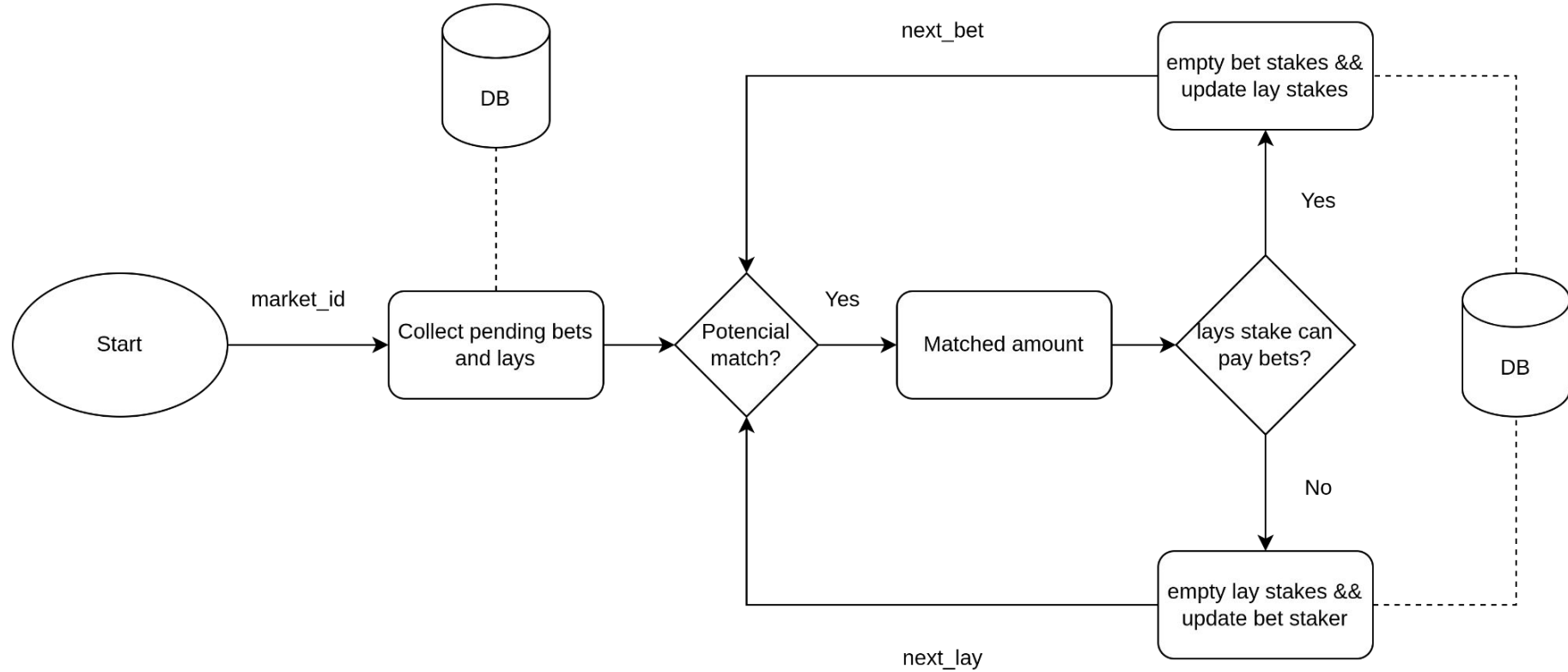
- The enrouter has post and gets.
 - Buttons and uris.
- The GUI is made for an user user.



Supervisors and process architecture



Matching Algorithm



Matching Algorithm: Example

	bets		lays		
user	d	e	a	b	c
odds	1.3	1.5	1.5	1.4	1.9
stakes	19.0	50.0	21.0	13.0	40.0

Stacks	
d:1.3	c:1.9
e:1.5	a:1.5
	b:1.4

Matched: d -> c -> c new stakes: $40 - 19 * (1.3 - 1)$

	bets		lays		
user	-	e	a	b	c
odds	-	1.5	1.5	1.4	1.9
stakes	-	50.0	21.0	13.0	34.3

Stacks	
e:1.5	c:1.9
	a:1.5
	b:1.4

Matched: e -> c -> c new stakes: $34.3 - 50 * (1.5 - 1)$

	bets		lays		
user	-	-	a	b	c
odds	-	-	1.5	1.4	1.9
stakes	-	-	21.0	13.0	9.3

Stacks	
	c:1.9
	a:1.5
	b:1.4

Testing Approach: Black box method

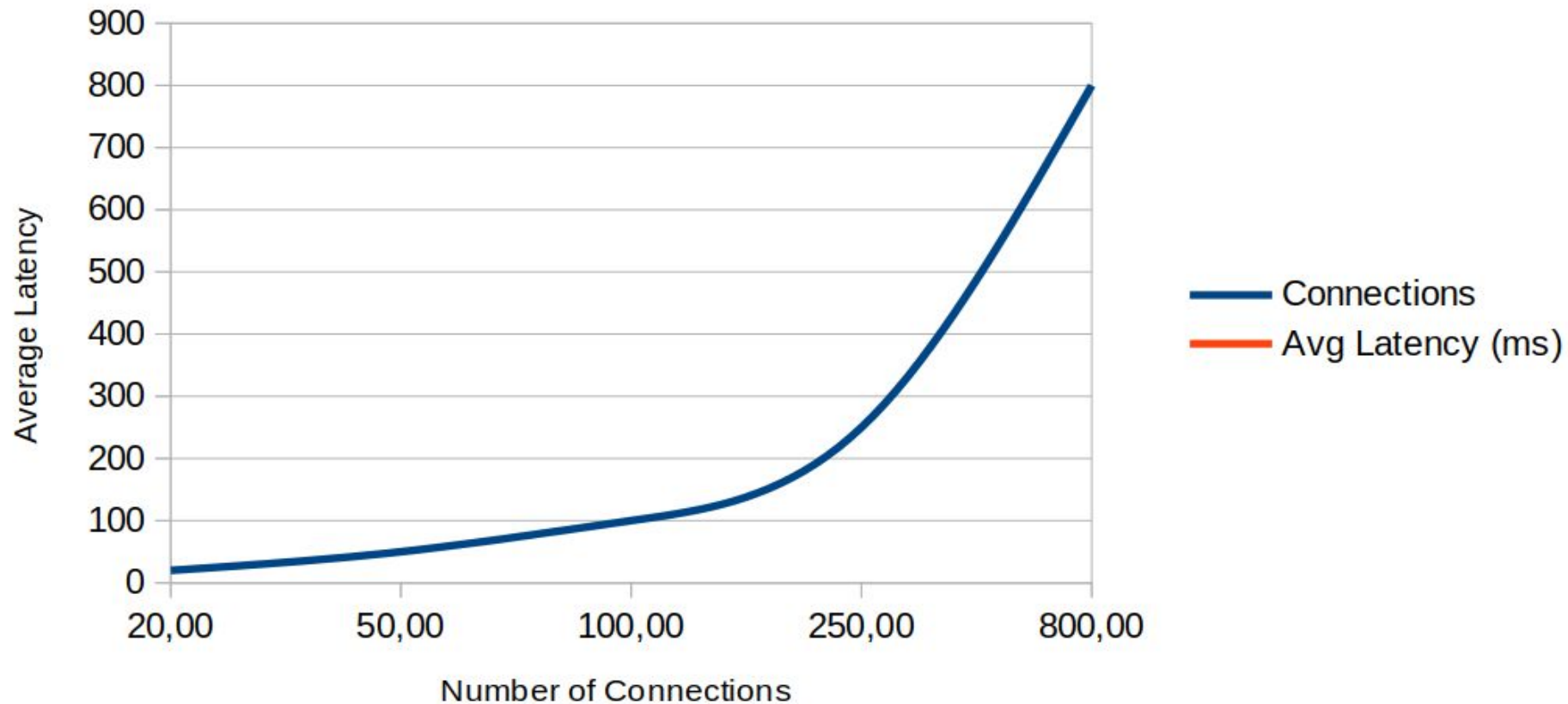


image source: <https://www.testbirds.com/en/blog/black-box-testing-enhancing-user-experience/>

Test	Connections (using 12 threads)	Duration	Avg Latency (ms)	Stdev Latency (ms)	Max Latency (ms)	Requests /sec	Total Requests	Data Transfer/ sec (MB)	Errors
0	20	30s	26.50	7.58	92.55	452	13595	3.60	0
1	50	30s	108.78	24.59	321.60	442	13282	3.52	0
2	100	30s	241.20	55.60	693.71	395	11891	3.15	0
3	250	30s	489.86	168.62	888.47	485	14604	3.86	0
4	800 (using 25 threads!)	15s	1.25s	290.53	1.97s	608	9183	4.84	0

API Benchmarking using wrk tool (<https://github.com/wg/wrk>): GET /markets

Benchmarking API



Possible Scalability Improvements

- Optimize SQL queries
- Caching techniques
- Distributing computing load to other nodes





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