



OST
Ostschweizer
Fachhochschule

Arachnid

Distributed Systems

May 18, 2026

Overview

- Crawler respecting robots.txt
 - Delays between crawls
 - Admins can submit urls to crawl
- Build index
- Search index
 - Postgres TsVector

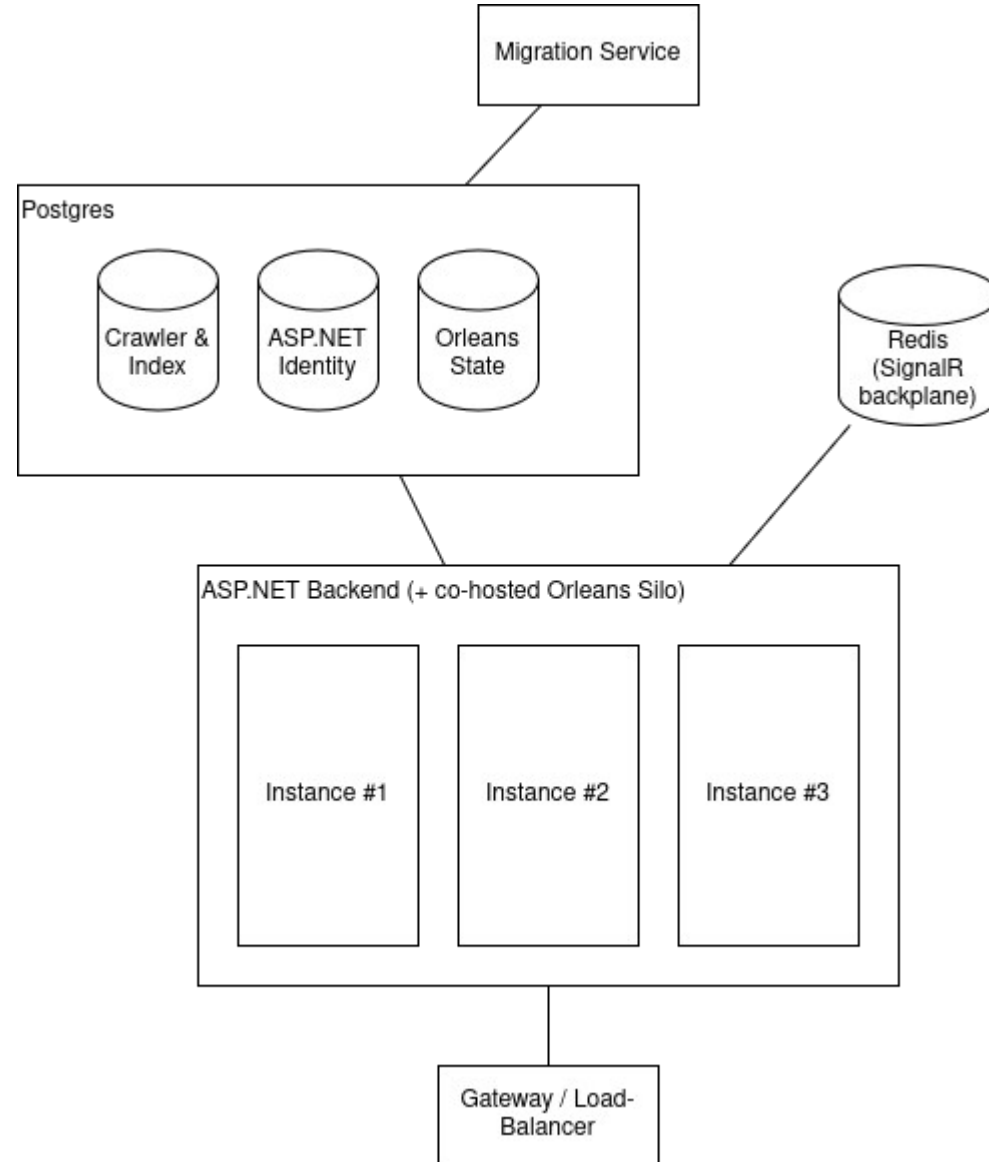
Design Decisions

- Aspire for orchestration
 - No Azure required, but documentation lacking
- Monorepo
- Postgres & EF Core
- ASP.NET Identity for Authentication/Authorization
- Orleans Actor Framework
- Blazor Server (bad idea)

```
>  Arachnid.AppHost
>  Arachnid.Crawler.Testing
>  Arachnid.Crawler
>  Arachnid.Data
>  Arachnid.Gateway
>  Arachnid.GrainInterfaces
>  Arachnid.MigrationService
>  Arachnid.ServiceDefaults
>  Arachnid.Web
```

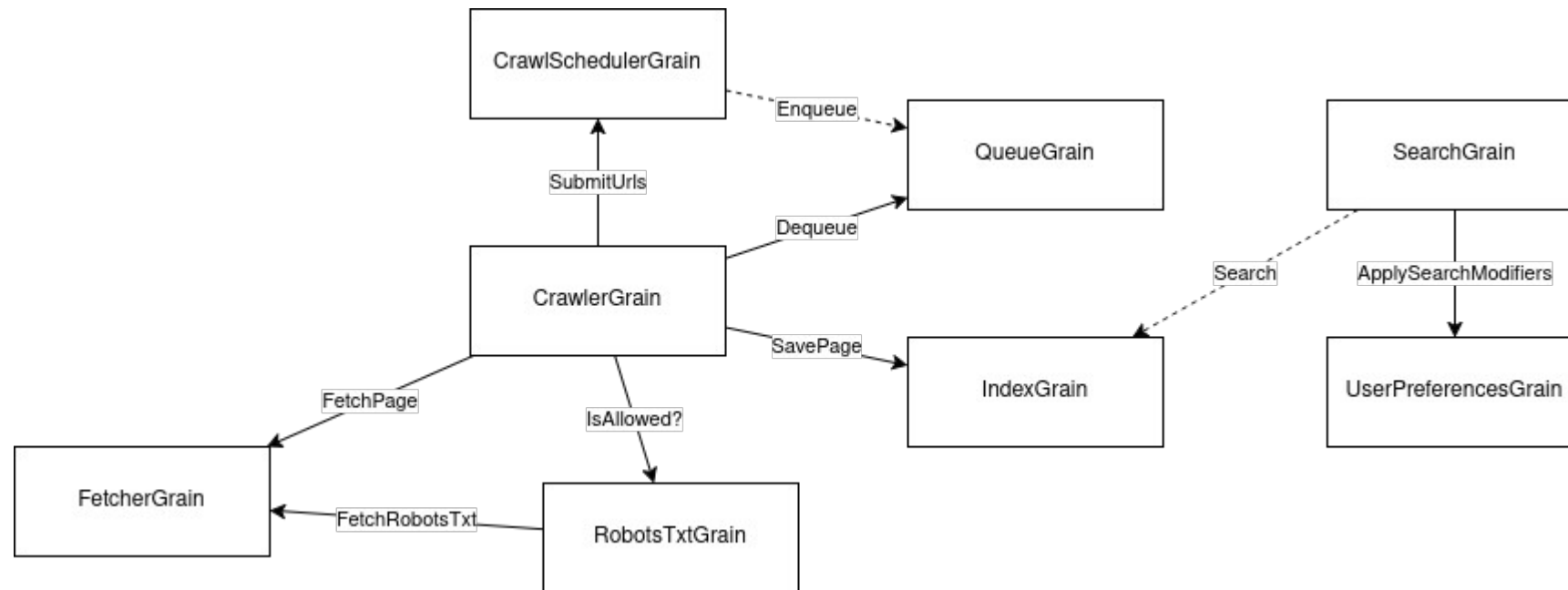
Monorepo: simply open
Arachnid.slnx in IDE

Architecture



Orleans

- Powerful, but difficult to setup when not using Azure
- Grains (Actors)



Postgres TsVector Search

```
var result = context.Index
    .AsNoTracking()
    .Where(p => p.SearchVector.Matches(EF.Functions.ToTsQuery(query)))
    .OrderByDescending(p => p.SearchVector.Rank(EF.Functions.ToTsQuery(query)))
    .Select(p => new { p.OgTitle, p.Title, p.CanonicalUrl, p.OgDescription })
    .AsAsyncEnumerable()
    .Select(p => new SearchResult(p.OgTitle ?? p.Title ?? p.CanonicalUrl, p.CanonicalUrl, p.OgDescription));
```

- Alternatively: PgVector

```
var embedding = ...
var result = context.Index
    .AsNoTracking()
    .Select(p => new {
        Page = p,
        Distance = p.Embedding.CosineDistance(embedding)
    })
    .Where(r => r.Distance < maxDistance)
```

YARP Load Balancer

- Session Affinity (required for SignalR + SignalR Redis Backplane)
- Health Checks
- User has to reload page, SignalR WS won't fix itself

JWT Authentication

- Blazor: stuck with cookie auth
- API endpoint: JWT auth

```
token=$(curl http://localhost:5079/api/auth/token -d "username=testikus&password=test" | jq -r '.token')  
curl -H "Authorization: Bearer $token" http://localhost:5079/api/search?q=test | jq
```

Load Test

- See `ab.out` / `wrk.out`

Demo

```
git clone ssh://git@gitlab.ost.ch:45022/colin.vanloo/arachnid.git && cd arachnid  
dotnet run --project Arachnid.AppHost
```

Q&A