Aerogel NLNet Application

By Noel De Martin

This document contains the same information I submitted in the NLNet website for the call of October 1st, 2024. It only has one additional section, Timeline and other proposals, and it is more readable because I'm using hyperlinks rather than plain text.

Abstract

Can you explain the whole project and its expected outcome(s).

Aerogel is a framework to make interoperable local-first applications using the Solid Protocol (for now).

One question that often comes up for newcomers in both the Solid and local-first communities is "How can I start making an application?". Unfortunately, there isn't a clear answer.

Many people are excited by the prospects and ideals that these technologies provide. But getting started involves learning many new concepts, and piecing together different libraries that may or may not work cohesively.

Additionally, UX and interoperability are usually an afterthought. This results in an ecosystem of half-baked apps that are very experimental, and thus end users are also taken aback after dipping their toes into this world. Even though many agreed with the vision, it ends as an anecdote and doesn't translate to real adoption.

This projects aims to be an easy answer to this question. Allowing newcomers to have a working application in minutes, abstracting complex concepts within simple APIs, and using best practices to have good UX and interoperability out of the box.

In a nutshell, Aerogel wants to be the Ruby on Rails of the Next Generation Internet.

Background

Have you been involved with projects or organisations relevant to this project before? And if so, can you tell us a bit about your contributions?

I have been making Solid Apps since 2019, you can learn more about my journey with Solid in a talk I gave at FOSDEM 2023: From Zero to Hero with Solid.

All this time, I have been working a 4-day workweek in my day job, so everything I've done has been a side-project. Recently, I decided to move on from my job, and focus my efforts in Solid full-time. You an also find more about that in this blog post: The End of The Chapter.

I have already started working on the framework, in fact you can find it in GitHub in NoelDeMartin/aerogel. Rather than starting from nothing, the ideas I'm implementing with the framework are extracted from everything I've learned making Solid Apps all these years. You can also learn more about my philosophy and approach for the framework in a talk I gave in the 2nd Solid Symposium: Thoughts on Solid Developer Experience.

The difference from what I've been doing so far and what I intend to do now, is that I'll focus on making things useful for others. I have been releasing libraries and apps as a byproduct of my work. But my main goal has always been to scratch my own itch. This new phase will certainly be a continuation of that, but I also intend to provide solutions beyond my own necessities. That also includes making an effort to spread the word and bring these ideas to new people.

Here are some highlights of my contributions in the Solid community:

- I created a library implementing the Active Record design pattern: Soukai.
- I released 3 apps
  - Solid Focus (a Task Manager, currently rebuilding it from scratch)
  - Media Kraken (a Media Tracker)
  - Umai (a local-first Recipes Manager)
- I gave some talks:
  - Media Kraken (Solid World February 2021)
  - From Zero to Hero with Solid (FOSDEM 2023)
  - Thoughts on Solid Developer Experience (2nd Solid Symposium)
  - Solid CRDTs in Practice (2nd Solid Symposium)

Other than these, I've also been working in the open and you can find more content in my blog, journal, and YouTube channel.

Costs and Sustainability

Requested Amount: 50.000€

Explain what the requested budget will be used for? Does the project have other funding sources, both past and present?

The main cost for this project will be my own labor, given that I intend to work on it full-time and I don't have any other sources of income. So far, all the work I've done related to this has been supported by my 4-day workweek, and I haven't asked for any financial contributions.

Besides that, I am able to do most of the work necessary to complete the project on my own; but I'd like to get some external help in areas I'm not an expert in. In particular, design and marketing. This won't be a huge part of the project, but there are many

things besides the code that I believe are important for the success of the project (landing page, website, documentation, branding, etc.).

Finally, I'd like to make some outreach efforts. That could involve attending conferences, contacting institutions, or organizing hackathons.

Beyond this initial period, my intention is to make it into a self-sustainable project that doesn't rely on grants. However, the way in which that will happen depends a lot on the market response. There are countless ways to make Open-Source sustainable, but not all business models can work for all the projects. Personally, I'd prefer to keep everything as open as possible; but the feasibility of that remains to be seen.

It goes without saying, but of course everything that comes out of this initial period will be free and open source. If I need to resort to more restrictive approaches, it will be derivate and tangential work.

Comparison to existing solutions

Compare your own project with existing or historical efforts.

In the abstract, I say that I'm using the Solid Protocol "for now" because the point of my solution is not to make Solid Apps. It's to make interoperable local-first apps.

As things stand right now, I believe Solid is the best thing we have towards that goal (as I explain in my blog post Why Solid?). However, I recognize that the ecosystem is evolving, and eventually a better solution may come up; or one that is more widely adopted. So I'm willing to switch the underlying protocol in the future.

The good news is that the engine to make all of this happen already exists, it's a library I created called Soukai. In technical terms, it implements a design pattern called Active Record that translates JavaScript objects into database queries. One of the translation layers that I have implemented thus far translates these objects into HTTP requests against a Solid POD, but this could be adapted to store data against other backends such as remoteStorage, ActivityPods, NextGraph, or Atomic Data.

I'd compare Aerogel with general purpose frameworks such as Ruby on Rails and Laravel. The difference being that it implements a new paradigm (hopefully, the future of the web). These frameworks made it possible for newcomers to create websites quickly, without little prior knowledge, and educated their communities with best practices.

Zooming into the Solid and local-first communities, there aren't many solutions that fulfill this role. One example of that is how they expose RDF and CRDTs, which are concepts that most people outside of these communities are not familiar with.

Finally, there are some ongoing projects that are already a perfect pair for Aerogel. For example, the Solid Data Modules is implementing Soukai models. A great workflow that could emerge in the future is creating an empty Aerogel app, and installing the relevant Solid Data Modules with the specific business logic.

Technical challenges

What are significant technical challenges you expect to solve during the project, if any?)

I have been working on the core technical challenges that underlie this project for years, so the truth is that the main challenge for this project is not something technical. Rather, it is to make a compelling solution that succeeds in helping newcomers create the applications they envision.

Tangentially, though, there are some technical aspects that could prove challenging. For example, most of the infrastructure and solutions that this framework will rely on have not been tested extensively. I have released applications in production, but I have little knowledge of who's been using these applications other than myself. The technology stack is also a bit dated, so part of making this more robust will be to update dependencies and bring the codebases up to date.

There are also some potential rabbit holes that I'm hesitant to get into, specially in this first iteration of the project. For example, I'm aware that people want to implement social features, but that's something I still have to explore myself (and I think it could be solved better with something like ActivityPub). Also, when most people hear of local-first and CRDTs, they think about real-time collaboration (particularly, text editing). My current approach wouldn't scale in data-intensive applications, and tackling that would probably complicate things further. However, many of these decisions may change depending on the community response.

All of this is to say that the point of this project is not to solve difficult technical challenges, but to bring this technology to everyone else and empower developers to use this in real-life scenarios.

Marketing strategy

Describe the ecosystem of the project, and how you will engage with relevant actors and promote the outcomes?

The current ecosystem for Solid and local-first is too focused on insiders, people who already know about these technologies and are familiar with the new paradigms. For newcomers who are seeking practical results, it's not easy to get started. Ironically, this project won't be targeted at these communities, but to people who resonate with their visions but don't want to get lost in the technical details.

The current ecosystem will also be very important, of course, because that's where most people land when they learn about these projects. My hope is that if I succeed in making it friendly for newcomers, it will become one of the go-to recommendations for beginners seeking assistance. These projects already seem to have a decent volume of inbound, so that combined with word of mouth should be enough to get started. Once the solution has been proven, I will think about other channels of outreach.

As to how I will engage with relevant actors and promote the project, I have already been involved in the Solid community for a while; so I'm confident most people will notice my work. Whether it gets traction or not will depend on the quality of the solution, and the willingness of the market to adopt the new paradigm.

The same is not true in the local-first community, where I have almost no contacts and I just recently started participating. As I mentioned in the technical challenges, though, the local-first community seems to be more interested in data-intensive scenarios; so I don't think this first iteration of the framework has as much potential there.

Regardless, I'll continue working in the open, and probably ratchet up my involvement in community events and conferences. I've also been thinking about some experimental channels of outreach, such as reaching out to universities interested in introducing their students to new technologies.

Timeline and other proposals

Please note that I intend to start working on this in January 2025, given that I’m currently on a sabbatical and thinking what to do after quitting my job.

You’ll notice that I’ve also submitted 2 other proposals: one for a Proxy Solid Server, and one for making better Solid Apps. I’ll only be able to work on one project, but I wanted to submit all 3 ideas because I’m interested to hear what you think.

This is the proposal I’m more excited about, but if you think it’s too risky, I’m willing to explore the other two. I’m also open to merging multiple proposals into one if it seems feasible.