STACK4 and the D Programming Language (Part 1)

As of last year I am the proud developer of a mobile game app for android (and blackberry as of now). STACK4 is a rather simple little game based around the concept of connect-4 but adds 3D and consumable extras to the mix.

This post is about the biggest addition to the game since its launch last summer. In December 2013 I added a realtime multiplayer mode to the game (version 0.3.0).

The server backend for this endeavor is written in the D Programming Language. You may ask why this is... Well this was kind of a journey! This is gonna be a series of articles about how I developed that server and what kind of challenges occurred on the way.

Part1 elaborates roughly what other possibilities were evaluated and a brief not-so-technical overview about the development in D-land over the last year.

Typescript / Nodejs

I used nodejs a lot over the last 2 years and I really like it... performance-wise. What totally annoys me is Javascript. So naturally the first straw that I grabbed was Typescript which is basically JS with types that compiles down to bare JS. Using this, I implemented a first small browser game with interactive multiplayer gameplay called Beachwars-Online. Unfortunately TS is still JS and all the libraries out there are for JS and writing bindings annoyed the hell out of me. So I dreamt about having a framework as rich as node (+all the npm packages) but with a statically typed language.

Java / Vert.x

Next thing I evaluated was Java! Typesafe, strict OOP and an insane huge framework for all the needs, why not? Vert.x promised the event-driven performance I was used to from Node. In the end the VM and/or Vert.x were too resource hungry for my commodity hardware server. And by the time I was evaluating Java I got help by a friend who was no java coder nor was he willing to become one. So I thought to look for yet another solution.

PHP

My friend is very proficient in PHP and put that on the table too. But since I wanted to do realtime server connections and wanted to leave scripting languages behind PHP got sorted out pretty quickly too.

C/C++

I am a C++ coder at day and my friend also learned C in the days. But trying to find object-oriented wrappers for stuff like libuv was not as easy as I expected. Writing something myself seemed unreasonable for the task and not being able to use C++11 for it (remember the commodity = dated hardware) made me expect the worst. That is when I remembered something that cannot deny its C++ roots: D.

D

2013 was also a good year for D. The first real dconf was held in San Fransisco with a load of interesting talks and people! I recommend everyone to watch the video recordings!
The D reference compiler "dmd" matured a lot, stability-wise and by finally supporting x64 and shared libraries. The toolchains got orders of magnitudes better through the dub package manager\(^4\) that lent a lot of ideas from npm for nodejs (which is a good thing, since this works extremely well). Also in IDE land mono-\(^5\)d made my work with D a lot easier. It got very stable by now and the developer is insanely responsive (lets hope he never finishes university).

In october Andrei Alexandrescu announced the first commit of D code to the Facebook source repository\(^6\). In November, they even started to support D financially by putting bounties on compiler bugs\(^7\). Others followed.

Facebook is also the sponsor of the location for the D conference in San Fransisco. And I think it was the dconf talk of Vladimir Panteleev\(^8\) that first introduced me to vibe.d. The Vibe.d framework offers asynchronous I/O and all you need to write a webserver in D.

**TL;DR**

I know D for a long time, have used it a lot years ago, wrote my B.SC Thesis about it. Vibe.d\(^9\) offers me what I like in node.js albeit being written in a usable language for serious sized projects. Despite being asynchronous like node it also looses the callback hell by using a co-routine like design. It is more memory efficient than Java/Vert.x, PHP was no option, bare C not even close and D is the better language compared to the competitors anyway.

**Part2** is going to describe a little more in detail what the STACK4 server backend looks like and how I implemented it in D... stay tuned

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2. [http://dlang.org/](http://dlang.org/) \(^*\)
5. [http://mono-d.alexanderbothe.com/](http://mono-d.alexanderbothe.com/) \(^*\)
6. [http://forum.dlang.org/thread/i37h5s$2gd8$1@digitalmars.com#post-i37h5s:242gd8:241:40digitalmars.com](http://forum.dlang.org/thread/i37h5s$2gd8$1@digitalmars.com#post-i37h5s:242gd8:241:40digitalmars.com) \(^*\)
7. [http://forum.dlang.org/thread/i65mvq$du0$1@digitalmars.com#post-i65mvq:24du0:241:40digitalmars.com](http://forum.dlang.org/thread/i65mvq$du0$1@digitalmars.com#post-i65mvq:24du0:241:40digitalmars.com) \(^*\)