TrackIt

Internship report
Epitech 3rd year
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Section 1: New employee on-boarding

I. Introduction

Hello there!

Welcome to TrackIt! In this document I will explain to you who we are, what we do and how we do it. Do not hesitate to send me a message if you have any questions. Enjoy reading!

1. The company

TrackIt is a technology company founded in 2014 by Ludovic François whose main activity is consulting in Cloud Computing on AWS.

Amazon Web Services, known as AWS, is a division of the American company Amazon, specialized in on-demand cloud computing services. They offer a very wide variety of services that allow anyone to have an IT infrastructure without having to own physical machines.

Our team is strongly experienced with cloud technologies, storage and monitoring solutions. We work on analysis and consulting on Cloud infrastructure. We also carry out projects for multiple customers in order to migrate or create new infrastructures.

The main source of projects comes from our partner MissionCloud, which is also a Cloud consulting company. I will talk more about this in part III. In addition to these assignments for customers, we also develop the open-source product TrackIt. I will come back to this in detail in part II.

2. The team

The team is not very big and there is a good atmosphere. Apart from Ludovic François and Brad Winett who are the heads of the company, there is no real hierarchy.

We have a very complete team in terms of competences because everyone has their own specialty which allows us to be very efficient on projects. Almost all our developers are French, but as our customers are often American, we speak exclusively English.

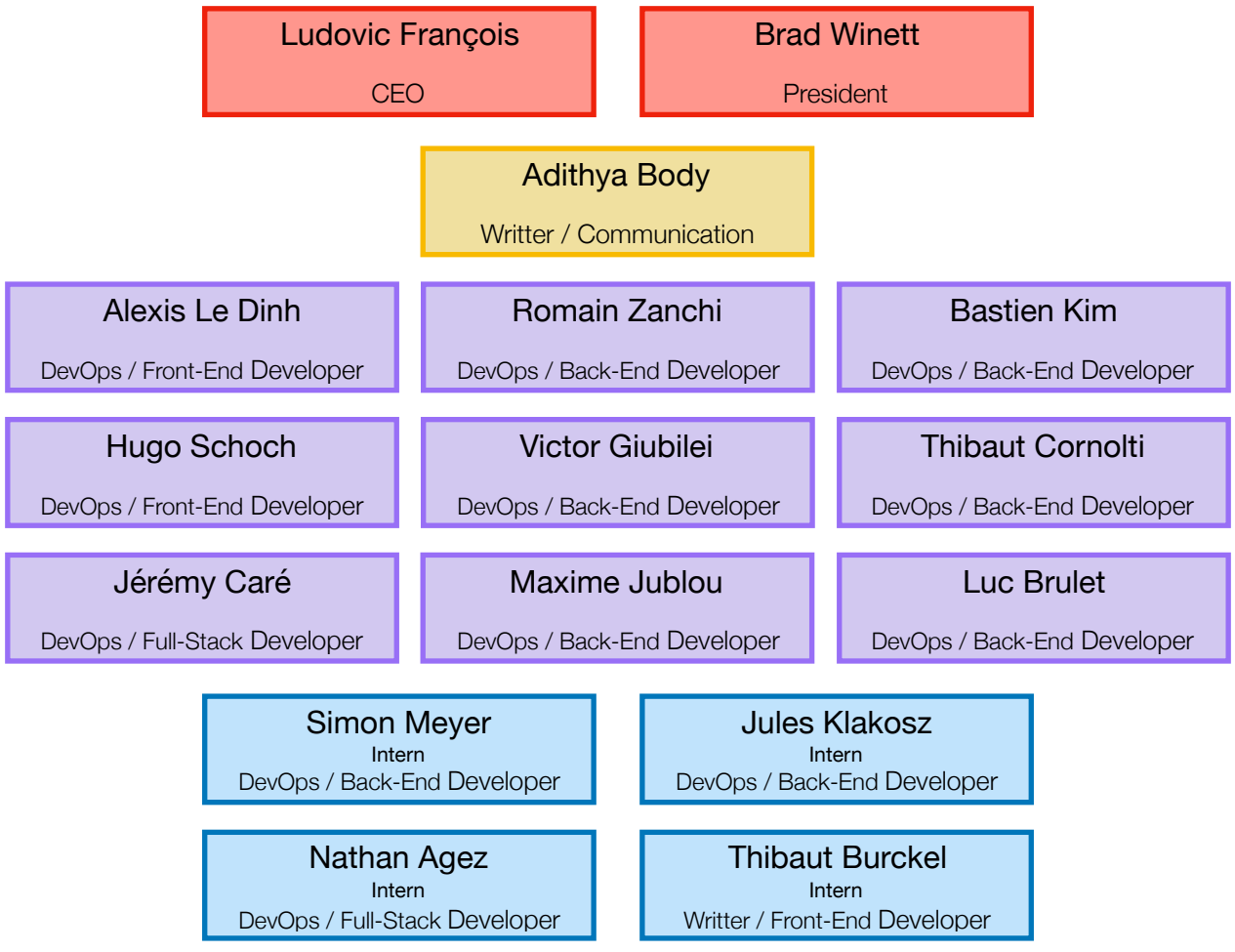

Fig. 1: Company organisation chart

3. Our workflow

Our workflow is very easy to understand.

First, we use Slack to communicate. It is a business communication platform that you can use on a browser, mobile or desktop application. It allows us to communicate easily and quickly. Everything is organized by channels, and you can send private messages to team members. Each project has its own channel.

In order to be able to follow the progress of everyone on their tasks and to help each other in case of difficulty, we have set up a routine. Every morning when you start working you post on the #dev-standup channel what you have planned to do during the day. In the evening you write what you did and what you were not able to do.

In addition to these messages in #dev-standup, we organize a call with the whole team every evening at 6 pm with Zoom, it is a telecommunication tool that we use a lot between us and with the customers.

II. TrackIt

1. The concept

TrackIt is a web application that allows you to analyze, understand and optimize your AWS invoices by showing you where you spend your money, why, but more importantly how you can optimize your spending. With its easy-to-use interface, you can quickly see more details about your invoices (list of the products, their region, their usage statistics, ...).

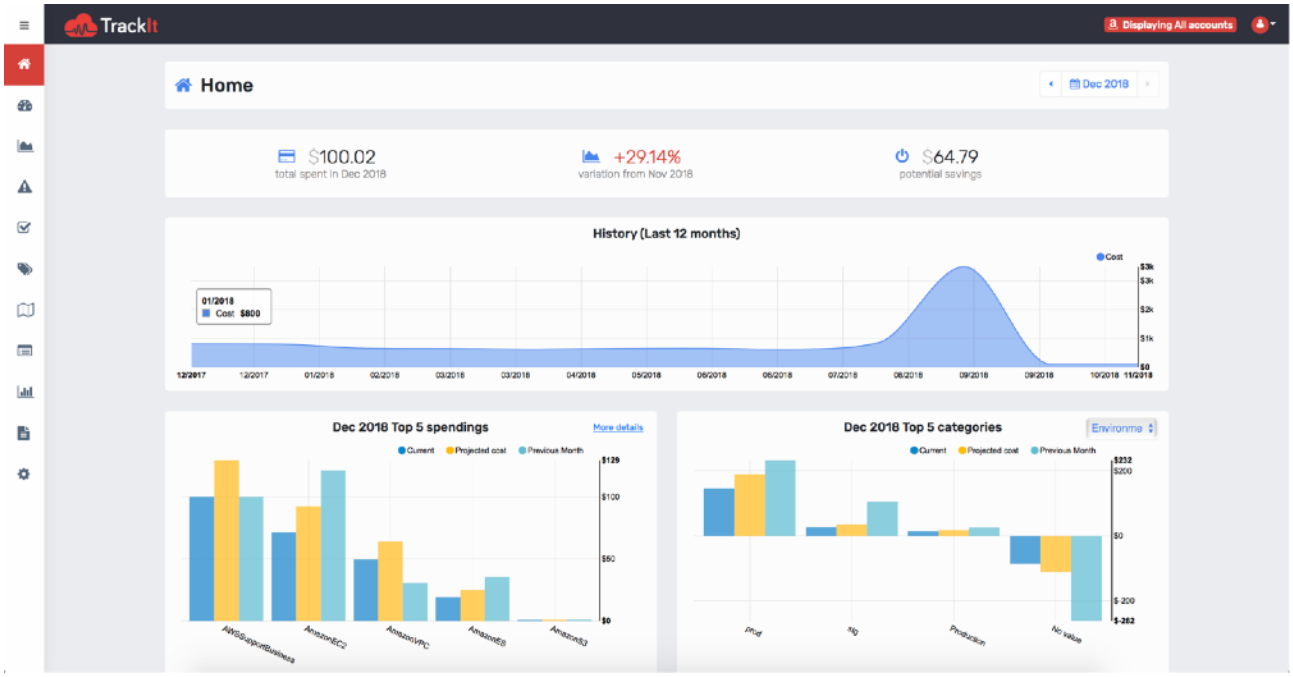

Fig. 2: Main page of TrackIt application

TrackIt is an open-source project publicly available on github.com and anyone can use it on trackit.io for free. It is used by very large companies which can spend more than hundred thousand dollars per month on AWS. The interest of this project is that it is a demonstration of our team's technical knowledge in Cloud Computing. This makes it easier for us to contact companies that might be interested in our services.

2. The FrontEnd

The Front-End of TrackIt is developed using ReactJS. We also use the redux-saga library which allows to manage the data inside the application as well as the API calls. There are also unit tests that are automated on GitHub using CircleCI.

In terms of infrastructure, we use CloudFront on AWS which allows us to serve build files from anywhere in the world in an optimized way.

Actually, there are no plans for new features, so you probably won't develop anything on it, that's why I don't go into detail. If you ever have to develop something on the Front-End and you have a question, Hugo is the best person to answer it.

3. The Backend

TrackIt's Back-End is developed using Golang, often abbreviated to Go. It is a programming language developed by Google. This language has the advantage of being easy to learn and understand, but also to be compilable for any type of environment without having to install any dependency on it.

This Back-End program contains both the Rest API that allows the Front-End to retrieve the data to be displayed, but also the tasks that will allow us to retrieve the data from AWS to store it in our databases.

If you have any questions about the code, I think I'm in the best position to answer them. I did a lot of work on it a year ago during my first internship here.

At the infrastructure level, the API as well as the automatic jobs that update the data are managed by Kubernetes. It is an open-source system allowing to automate the deployment, scaling and management of containerized applications. I didn't really have to work on this during my internship so if you have any questions, please contact Victor.

About databases, we have a very basic database using mySQL for user data. For AWS usage data we store it on ElasticSearch. It is a database that allows you to make very complex queries on large amounts of data.

III. MissionCloud

As I said in introduction, we have many projects proposed to us by our partner MissionCloud. They are a cloud consulting company that is very well known and therefore has more customers than they can handle. They take care of the project management part like defining tasks or monitoring progress and we work on development part.

The kind of project as well as the duration is quite variable. I am going to present you the three projects I had the chance to work on these last months.

1) Koupon Media

Koupon Media is a digital platform that enables brands and retailers to deliver coupon to consumers directly from their smart phones at retail stores. Retailers and brands get access to real-time reports about their current campaigns.

The problem they were facing was that they had a very large Big Data pipeline to provide their client data with analysis. However, this pipeline is not very suitable, they have no visibility on the errors that occur in it and finally they have to readjust their pipeline for each of their customer.

Not being specialized in Big Data, I spent two whole weeks to learn about the technologies they were using and to analyze how their pipeline was working.

At the end of this analysis time, I have created a complete documentation of their pipeline. They themselves did not know how their pipeline was working globally because each step is managed by different teams.

After this documentation phase, I therefore proposed various solutions for improvement. They decided to implement Airflow. It is an open-source tool developed in Python by the Apache company to manage pipelines. I reproduced their whole pipeline with Airflow, and they now have a better visibility of their pipeline, they receive email notifications when an error occurs and the modules are generic to adapt easily to each customer.

2) Jukin Media

Jukin Media is a company that buys the rights of viral videos in order to resell them to television channels or to broadcast them on one of their multiple youtube channels such as FailArmy.

To optimize their efficiency in terms of video analytics, they decided to start using Media2Cloud which is an open-source project created by AWS that automates video analytics to extract key elements. The issue with this project is that it uses CloudFormation to be deployed on AWS. CloudFormation is an « Infrastructure as Code » framework. It allows to « code » an infrastructure that can be automatically deployed on AWS. However, Jukin Media uses another "Infrastructure as Code » tool. Our mission was to adapt the Media2Cloud project to their tool which is Terraform.

This project allowed me to discover the concept of « Infrastructure as Code » and to learn how to use these two technologies. I really enjoyed this project, and I have already started to apply this knowledge for personal projects.

3) Fashion Nova

Fashion Nova is a well-known clothing brand, especially in the United States. The problem they face is that their infrastructure is not able to hold every request during Black Friday because it is not scalable enough. We have to rework the entire ordering Back-End to be « serverless ».

The concept of « serverless » is that the code that we will create do not need physical infrastructure reserved to run. AWS will automatically manage the resources allocated to the execution of the code. This system theoretically allows to scale the number of simultaneous requests to infinity without having to anticipate increase or decrease of visitors. Moreover, this kind of infrastructure is not very expensive.

The difficulty with this project is that time is very limited, and we have to be extremely productive. The project being very important, we are several companies working on different pieces of the Back-End. This makes it much more difficult to obtain information about the incoming or outgoing data that we have to manage despite the many calls we have every week.

This project started two weeks ago and should be finished by August. I hope all goes well.

Section 2: New project

Dear Ludovic,

I saw on the dedicated Slack channel that we have landed a new contract with Escaper. I took the liberty of reading the specifications of this project that you shared and I got very interested. As I understand it, the goal is to architect and code the complete Back-End of an Escape Game SEO application. As you well know, Back-End architecture is a domain that I'm passionate about and I'm very enthusiastic about the project itself.

I guess I proved my skills in terms of development and design of Back-End architecture while working on TrackIt's Back-End and on Koupon Media's infrastructure during my internship.

So I would like to know if it was possible to take the lead on this project and to work on it full time. If you accept, I sincerely think that you will be satisfied with your choice.

Sincerely yours,

Simon Meyer