



Customer Success Story

Daffodil enables Chalo to build a GPS middleware application in order to ensure 99.9% system uptime

CHALO

Customer: Chalo

Country: India

Industry: Travel & Transportation

Our Role: Software Engineering



About the Client

Chalo is a public transport tracking application that streams the real-time location of public transport vehicles on a mobile app. The app informs the users about the Estimated Time of Arrival (ETA) of public vehicles such as buses, metro trains, inter-city trains etc. It has been equipped in more than 15,000 public vehicles in 17 cities across India and is helping people to find out an optimal way to reach their destination on time.

15,000+

GPS devices data to be streamlined

99.9%

system uptime

<2 seconds

average ping time from GPS devices



“Writing this to recognize and appreciate the team’s effort and commitment to the project. With continuous changes and multiple dependencies, the team has managed to keep on the project on track and maintain steady progress, which I would like to laud. While there is more to go, I feel confident that we will get there smoothly.”

Vinayak Bhavnani,

Co-founder & CEO, Zophop

The Situation

In a world where even a few-second delay can cause users to steer away from digital interactions, “fast” is no longer the standard that one can apply to digital businesses. This need for real-time response is not just a consumer concern; indeed, many companies are beginning to rely more heavily on the ability to collect, analyze and act on data instantaneously.

In order to update the users about the estimated time of arrival of the public transport vehicles, the Chalo team needed a middleware that fetches the data from GPS devices and converts it into a standard format. One of the major challenges associated with fetching the data from the GPS devices was that different GPS devices follow different protocols to transfer data and while some of them send data in real time, others relay data in chunks after a short interval.

This difference in protocols had another challenge attached, i.e. identification of ports & IP addresses to which parsed data should be transferred. If the operators would do this manually, i.e. identify ports and IP addresses for configuration of protocols, it would have resulted in human errors. In order to overcome these challenges, Team Daffodil had to:

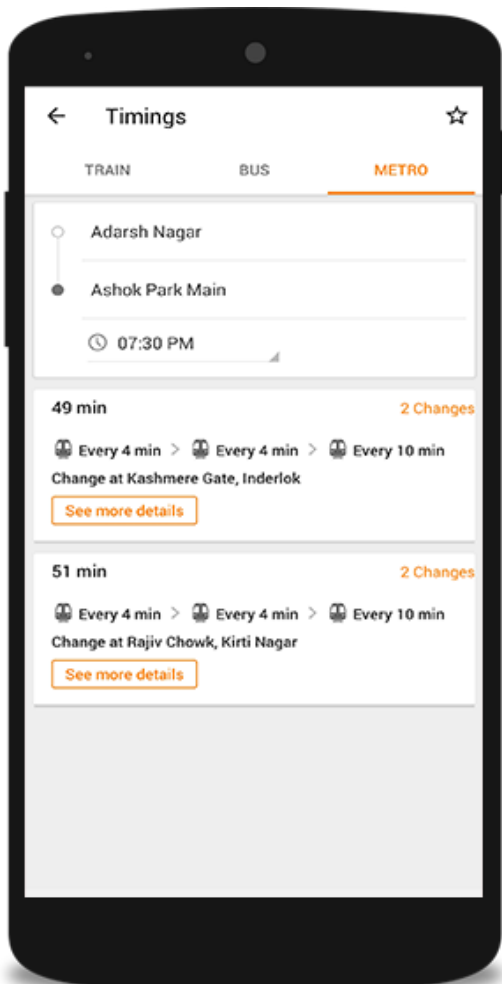
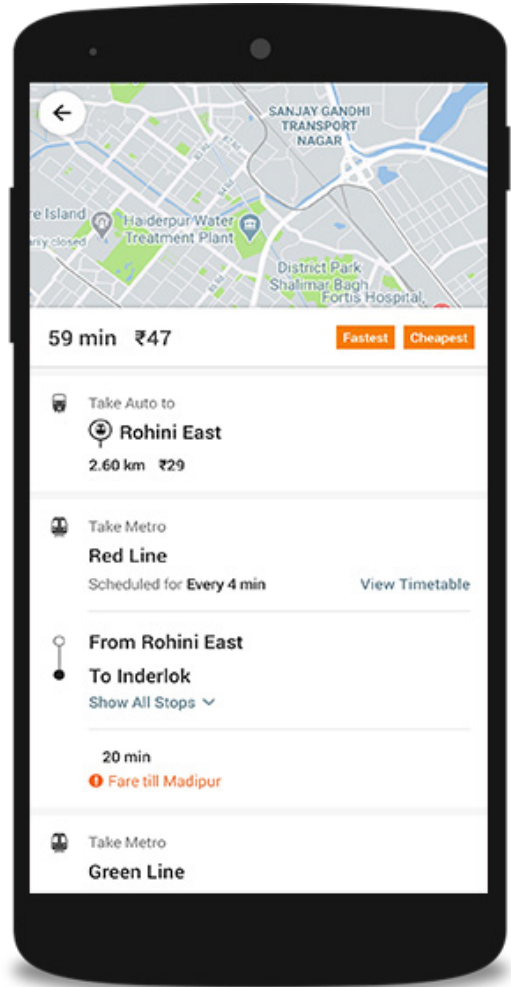
- Identify the ports to which the data from varied protocols should be transferred and avoid any chances of error in data transfer to the ports.
- Ensure 99.9% system uptime to ensure that real-time data is shared with the users. Any delay in the data (for even 5 seconds) makes it unusable for the operations team to use it.
- Build a real-time dashboard to make it transparent for the operators that the data is seamlessly flowing between the devices and server.

The Solution

Daffodil created a middleware application that parses the data received from 15,000+ GPS devices into a standard format (JSON format). This data is either used by Chalo mobile app to keep the users informed about the estimated time of arrival (ETA) or is used by public transport operators in different cities.

For continuous monitoring of data flowing between the device and servers, a dashboard was created for the operators and admin team in over 40 cities. Once a GPS device is configured, the dashboard displays the following information:

- It informs the operators about successful configuration (i.e. if the configured device is communicating with the server).
- On the basis of how updated the data is, data status is maintained through different signals, i.e. green denotes that the device is online, yellow denotes that a device is sending invalid or delayed data, and red denotes that the device is not sending data.



- It Provides real-time device details such as device position, live location of the buses on the map with info like device ID, vehicle number, where a vehicle last was last tracked, packet status, lat/long, etc.
- The dashboard updates the number of devices that are sending data to the server. It maps the GPS devices with vehicles and informs about which device is associated with which bus, what's the SIM number, who is the network provider etc.

As Chalo expands to more and more cities, it is required to provision new ports to redirect incoming data from devices to servers. The dashboard application has been developed in such a way that no code rewrites are required to make this happen. Configuration changes and service restarts are good enough to move data from new devices to their corresponding ports. Even if the data needs to be shared with multiple partners, a simple configuration change can put this into effect. At times when the device isn't working, the operators can restart the devices through the dashboard.

For backup and analysis, the data in its raw format is stored on the cloud (AWS). This backup is used by team Chalo and the public transport operators for the analysis process, which may include calculating the distance traveled by each bus (in a day or week), the total number of locations sent by a device in a day, check for healthy device count, distance traveled by a vehicle, etc. This keeps the team informed about healthy device-server configuration, helps in calculating the driver/conductor incentives, etc.

The Impact

With Daffodil as their technology partner, Chalo has been successfully able to parse data from thousands of GPS devices in a uniform format. The dashboard developed by Daffodil updates the operators about the status of data that flows to the server (real-time data, delayed data etc.) along with live location of the vehicles with details such as vehicle number, last arrived, delay, packet status, lat/long, etc. There are 15,000+ GPS devices installed in different cities across India where each GPS device sends a location packet every 5 seconds. The middleware is parsing data received from thousands of such GPS devices, ensuring that people are updated with real-time location of the public transport vehicles.



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Technology Stack













- Java
- ReactJS
- PostgreSQL

About Daffodil

Daffodil Software is a software engineering partner to 100+ organizations across the globe and has been helping them in making their software products more robust, teams more productive and processes more efficient. Our ability to look beyond technologies to deliver innovative solutions with scale and speed has been lauded by our clients as well as the tech community worldwide.

Since our inception, we have invested in organic growth; building on our engineering capabilities, organizational processes, and culture required to deliver a truly collaborative ecosystem for solving technology challenges. At the core of Daffodil lies a culture rooted in innovation, learning and a result-oriented mindset.

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