Team Vision Statement

Project Title / Name: Beegol Buddies
Team name, members names/emails

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Team Lead: Edwin Yee

Project Description

- Project Problem Statement
    - Our project aims to aid clients of >1 million subscriber Internet Service Provider (ISP) who suffer disconnections every day. Their current implementation of alarms and diagnostic platforms struggle in identifying the root cause of the disconnection. Beegol collects the time-stamps of disconnects and messages which can be mapped to the log errors of these clients. **Using this information, we want to use LLMs to interpret these messages and identify the root cause.**

- Why is the problem important? (https://beegol.com/cases/#usecases):
    - Many **broadband customers experience disconnection issues**, however, most of the time, the provider lacks the proper tools to analyze the problem. Many times, **service providers do not have real-time monitoring of their customers and fail to identify drops in connection**. When the customer contacts the service provider, it is not known where the actual problem is and what is causing significant delays. Beegol is able to use AI and real time monitoring to help customers who have experienced problems identify the type of problem and the common point of failure.

- How the problem is solved today (if it is)
    - Restarting your modem and router
    - Call your network service provider

Project Outcome

- The goal of our project is to use artificial intelligence to provide network diagnostics for connection drops and disconnects.
- We are looking to create software which parses the messages from the error logs and passes them into a LLM, such as ChatGPT. The LLM will translate the logs into human readable messages.
- Using the key messages and the LLM translation, we will formulate a hypothesis for the root-cause of the network problem.

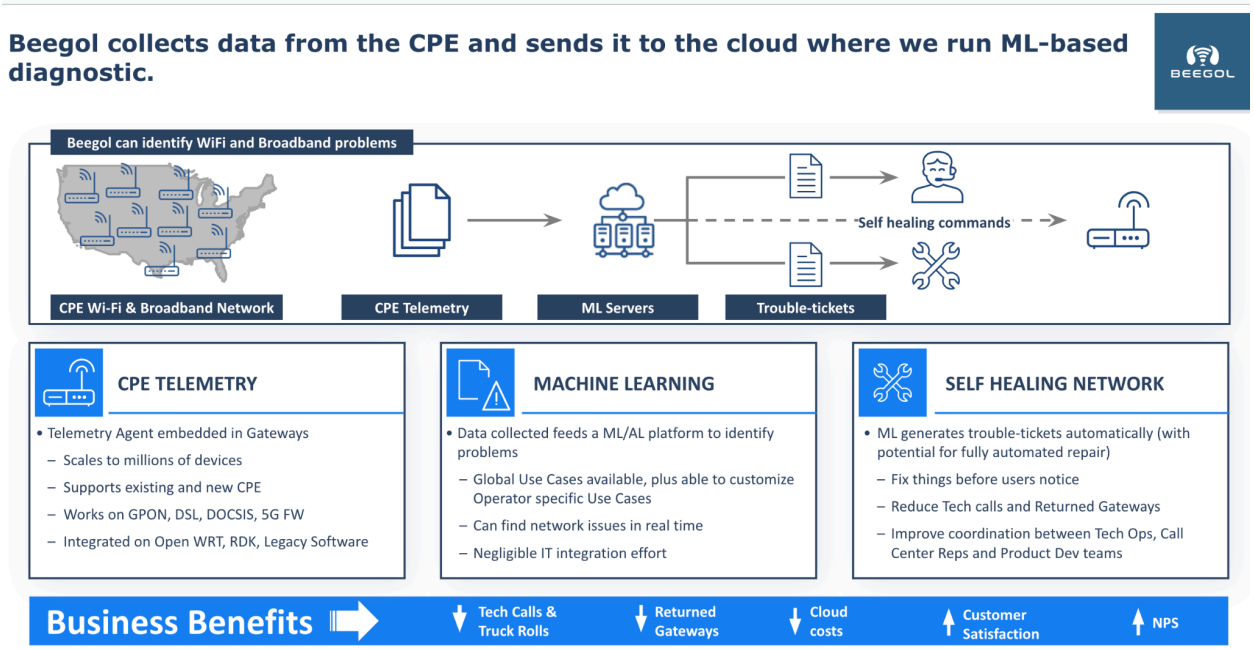
Initial project milestones

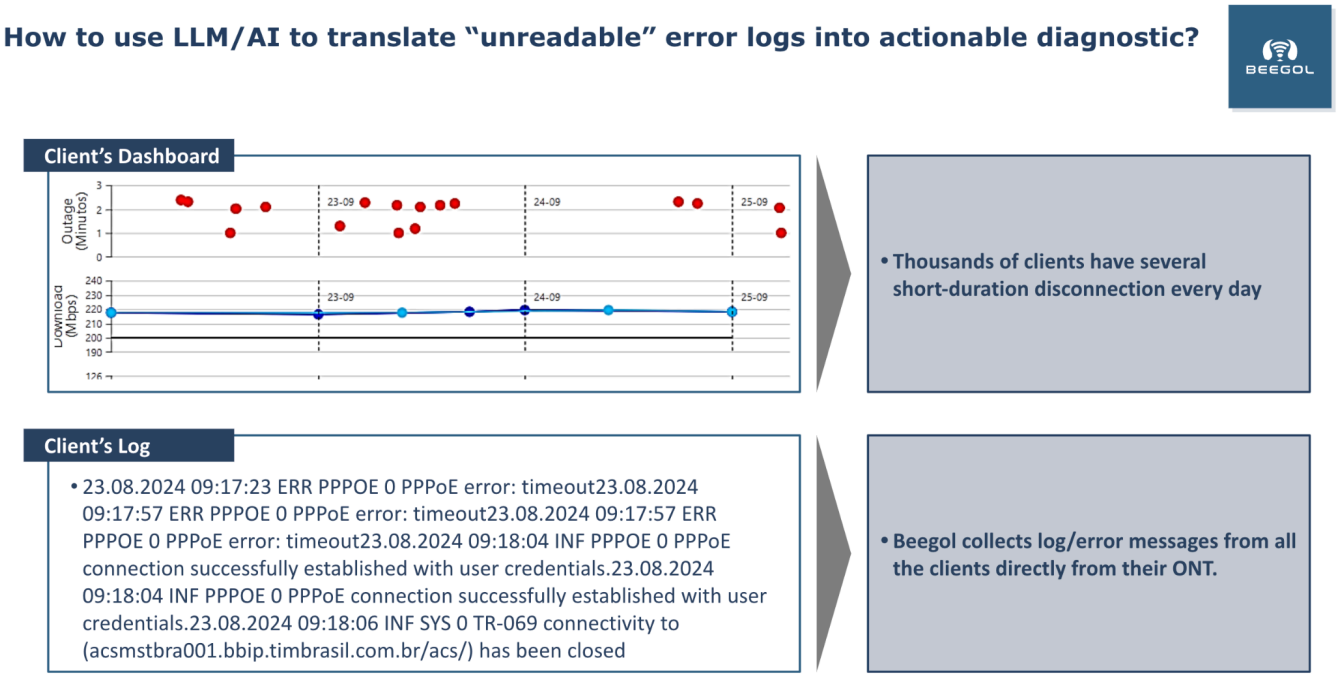
1. Set up the code to run the LLM: Project involves state of the art LLMs applied to a network problem on a real-world use case.
2. Learn about common networking errors: Beegol will supply the basic network knowledge
3. Classify network errors into different categories to make it easier for the LLM to identify the errors
4. Design and test different strategies for each network error category
5. Write code to parse the original error message: Students will develop the code to filter and parse the messages
6. Try different LLMs for this tasks including multi-modal
7. Run the LLM with network data (log messages and time stamps): Beegol will provide all data – log messages and time-stamp of disconnections
8. Fine-tune the LLM to achieve better performance
9. Evaluate LLM performance on a self-created benchmark
10. Test edge cases and ensure robustness of the LLM framework

How do you plan to articulate and design a solution

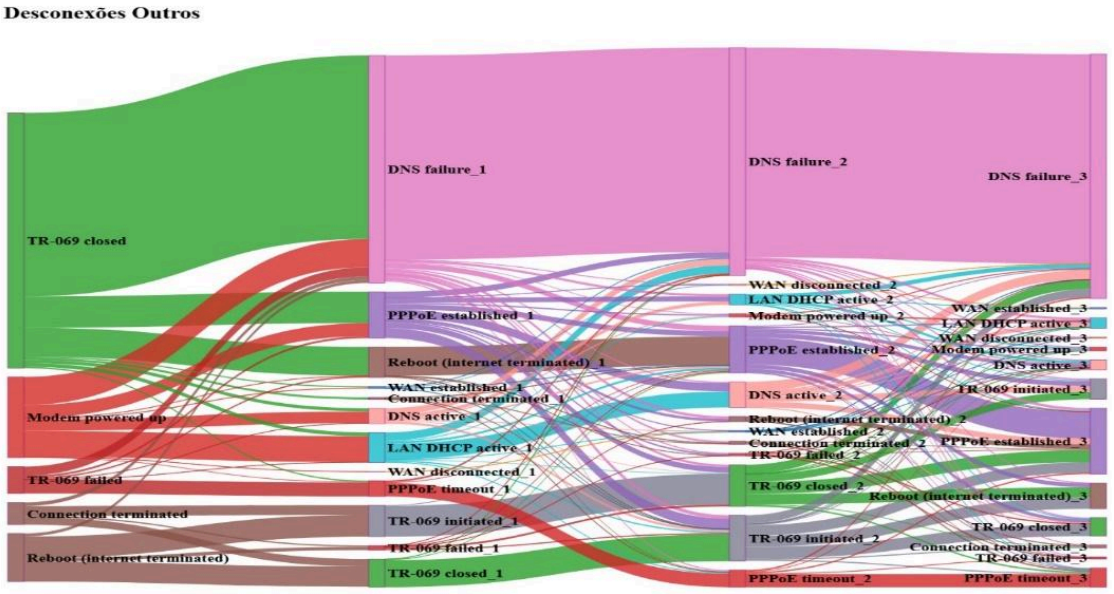
- We plan to test many different strategies such as prompt engineering and fine-tuning for a variety of LLMs
- List of technologies
    - Python 3
    - Pytorch
    - Flask
    - Firebase
    - Pandas
    - Numpy
    - Matplotlib
    - Large Language Models (LLMs)
        - ChatGPT - GPT 3.5
        - GPT 4.0
        - Gemini
        - Claude
        - Llama
        - Mistral
        - Phi
        - Falcon
        - Command
        - Grok
        - DBRK
- Describe process model you will employ to achieve milestones
    1. Start by importing the necessarily libraries and packages
    2. Import the network log training, validation, and test dataset
    3. Query the LLM API
    4. Extract the result from the LLM response

5. Present results to the user

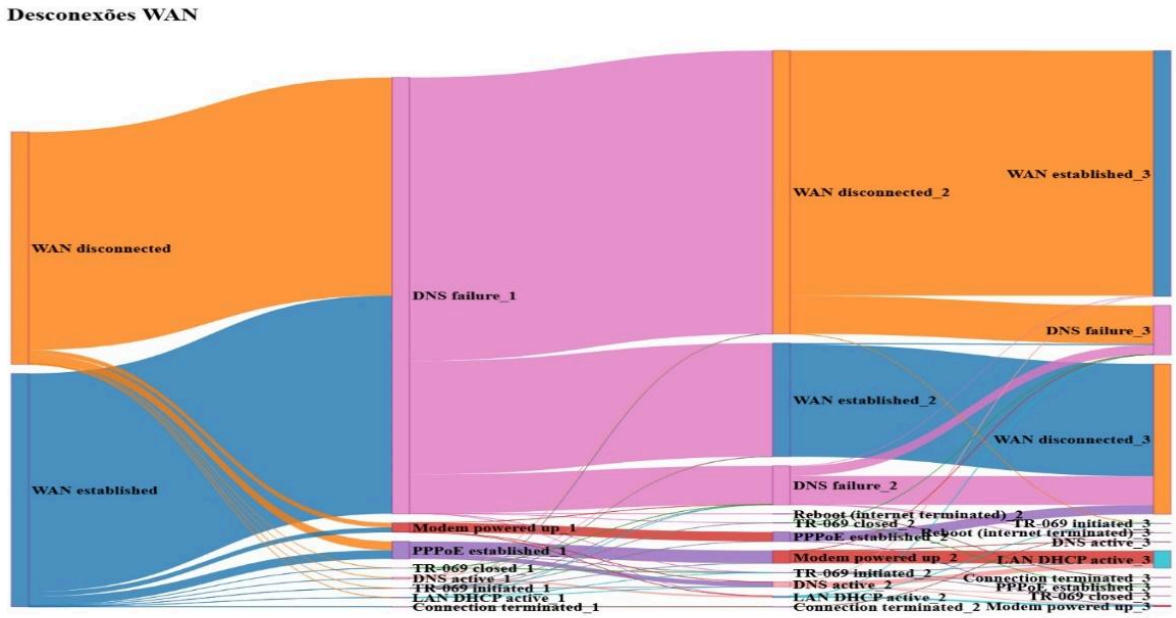




Error Logs (1/2)



Error Logs (2/2)



- Beegol team working on the project (please, include them in the emails and meetings)
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  - Javier.Munoz@beegol.com (Doctor in CS)