Comprehensive Analysis for FroggyTalk: System Performance, VoIP Metrics, User Engagement & Support

Introduction

As a candidate for the Technical Operations Engineer position at FroggyTalk, I am inspired by the company's vision of making affordable, high-quality VoIP services accessible to underserved communities. Combining my technical expertise in data analysis and passion for leveraging metrics to optimize operations, I've crafted this analysis to demonstrate my ability to drive actionable insights.

The report outlines performance across FroggyTalk's core pillars:

1. **System Performance**
2. **VoIP Metrics**
3. **User Engagement**
4. **Customer Support**

Each section is supported by simulated datasets, analyzed with Power BI, and presented with a focus on actionable outcomes. This analysis demonstrates how these metrics align with FroggyTalk's commitment to reliability and user satisfaction while also identifying opportunities for improvement.

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1. System Performance Analysis

Metrics Derived:

- **Uptime %**: Displays the percentage of time the system was operational.
  Formula:
- Uptime % = Total Uptime / (Total Uptime + Downtime)

Derived from EventStartTime and EventEndTime.

- **Mean Time to Resolve (MTTR)**: Measures the average time taken to resolve issues.
  Formula:
- MTTR = Total Downtime / Number of Failures
- **Mean Time Between Failures (MTBF)**: Indicates the average time the system operates without failure.
  Formula:
- MTBF = Total Uptime / Number of Failures

Visuals Used:

- **Gauge**: Uptime %.
- **Cards**: MTTR and MTBF.
- **Line Chart**: MTBF distribution by month.

Recommendations:

- Complement Power BI with **Amazon CloudWatch Logs Insights** for real-time event tracking and deeper system diagnostics.
- Use automated alerts for Uptime % thresholds.

Transition to Real-World Dataset: Replace simulated data with server logs from FroggyTalk's AWS infrastructure, leveraging log streams from **CloudWatch** and **EC2 metrics**.

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2. VoIP Metrics Analysis

Metrics Derived:

- **Mean Opinion Score (MOS)**: Assesses user-perceived call quality on a scale of 1–5.
  Formula:
- MOS = AVERAGE (Call Quality Scores)
- **Round Trip Time (RTT)**: Measures the time a signal takes to travel to its destination and back.
  Formula:
- RTT = AVERAGE(RTTMilliseconds)
- **Packet Loss Rate**: Tracks data loss during transmission.
  Formula:
- Packet Loss % = (Lost Packets / Total Packets Sent) * 100

Visuals Used:

- **Stacked Area Chart**: RTT & Packet Loss Rate by month.
- **Clustered Column Chart**: Average MOS by month.

Recommendations:

- Integrate **Wireshark** for deeper VoIP traffic analysis, isolating issues like high RTT or packet loss.
- Deploy **VoIP monitoring tools** such as **SolarWinds VNQM** for comprehensive insights.

Transition to Real-World Dataset: Ingest live data from SIP gateways, RTP streams, and FroggyTalk's VoIP call servers into Power BI using APIs or scheduled data refreshes.

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3. User Engagement Metrics

Metrics Derived:

- **Daily Active Users (DAU)** and **Monthly Active Users (MAU)**: Indicate user retention and activity.
  Formula:
- DAU = COUNT (Users Active Per Day)
- MAU = COUNT (Users Active Per Month)
- **User Growth Rate**: Measures the percentage growth in active users.
  Formula:

- Growth Rate % = (Current Month Users - Previous Month Users) / Previous Month Users
- **Churn Rate**: Tracks the percentage of users who have stopped using the service.
  Formula:
- Churn Rate % = (Churned Users / Total Users) * 100

Visuals Used:

- **Line Chart**: DAU & MAU by month.
- **Card**: Growth Rate.
- **Pie Chart**: Active vs. Churned users.

Recommendations:

- Integrate user data with **HubSpot CRM** for enriched engagement tracking.
- Implement AI-driven churn prediction models to proactively address at-risk users.

Transition to Real-World Dataset: Replace simulated data with login and churn records from FroggyTalk's user database, ensuring real-time updates for engagement monitoring.

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4. Customer Support Metrics

Metrics Derived:

- **First Call Resolution (FCR)**: Measures the percentage of tickets resolved on the first attempt.
  Formula:
- FCR = (Tickets Resolved on First Call / Total Tickets) * 100
- **Customer Satisfaction Score (CSAT)**: Tracks user feedback post-ticket resolution.
  Formula:
- CSAT = AVERAGE (Satisfaction Scores)

Visuals Used:

- **100% Stacked Column Chart**: Resolved vs. Not Resolved tickets.
- **Gauge**: Average CSAT Score.

Transition to Real-World Dataset: Replace simulated data with live ticket logs from FroggyTalk's support systems, including timestamps, resolution details, and satisfaction surveys.

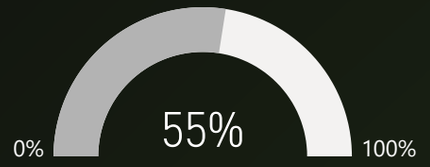
Conclusion

This analysis leverages FroggyTalk's existing technologies and aligns with its goals to deliver reliable VoIP services. By integrating complementary tools and transitioning to real-world data, this framework can scale with FroggyTalk's growth. I am confident in my ability to deliver actionable insights, streamline operations, and contribute to the company's vision of connecting communities through innovation.

FroggyTalk
International calling & more

System Performance Analysis & VoIP Metrics

Uptime %



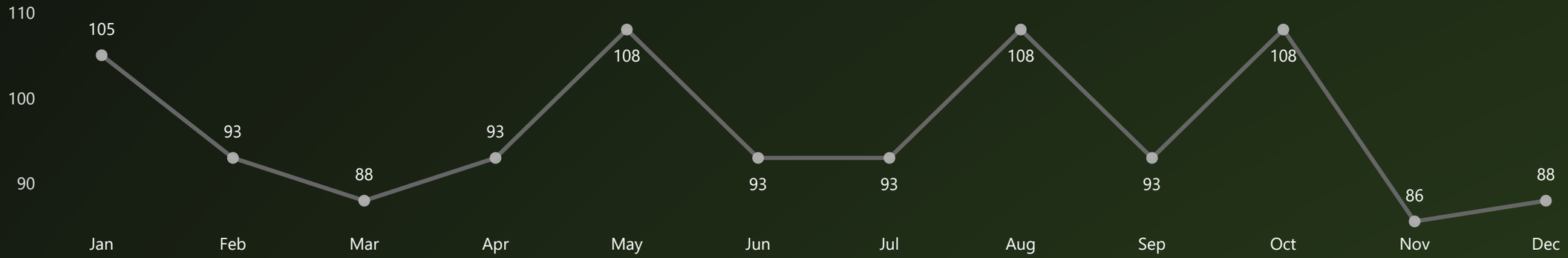
43.00
MTTR (Minutes)

89.87
MTBF (Minutes)

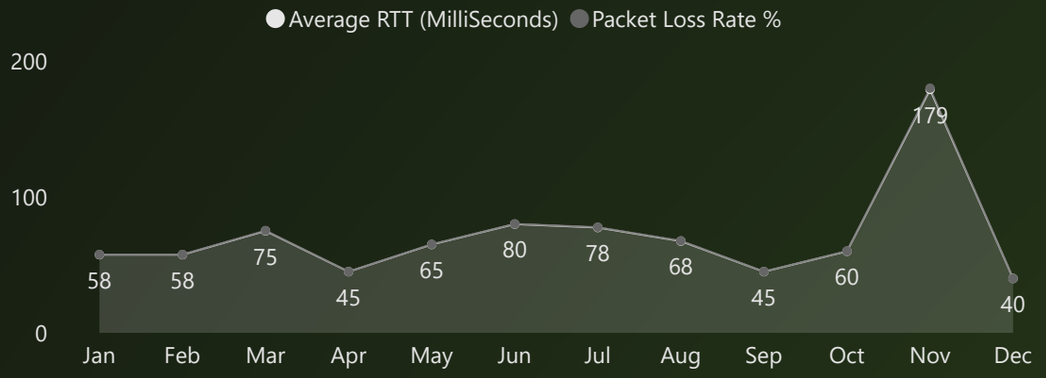
All

Failure | Repair

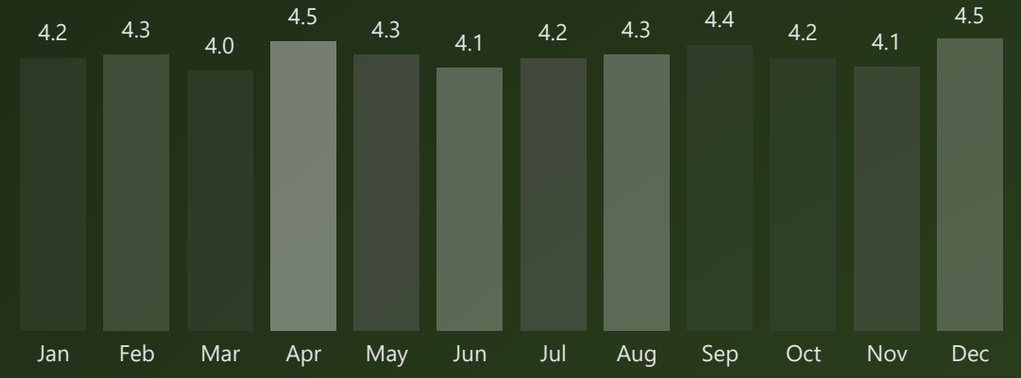
Mean Time Between Failure (Minutes)



RTT (MilliSeconds) & Packet Loss Rate



Mean Opinion Score (1 - 5)



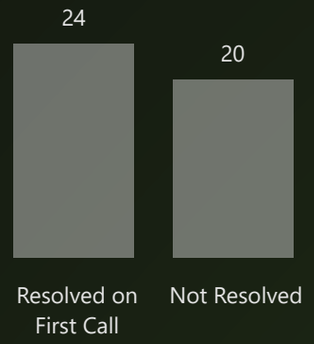
User Engagement & Customer Support

43%
Churn Rate

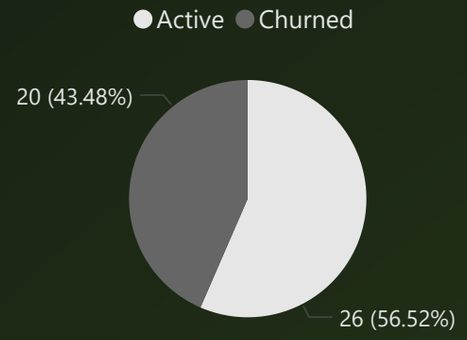
6.98%
User Growth Rate

Australia	Canada	Germany	India
Brazil	France	Ghana	Japan

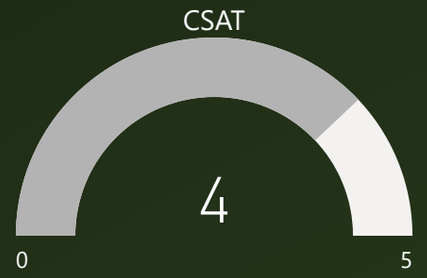
Resolved vs Unresolved



Active vs Churned



CSAT



Daily Active Users & Monthly Active Users