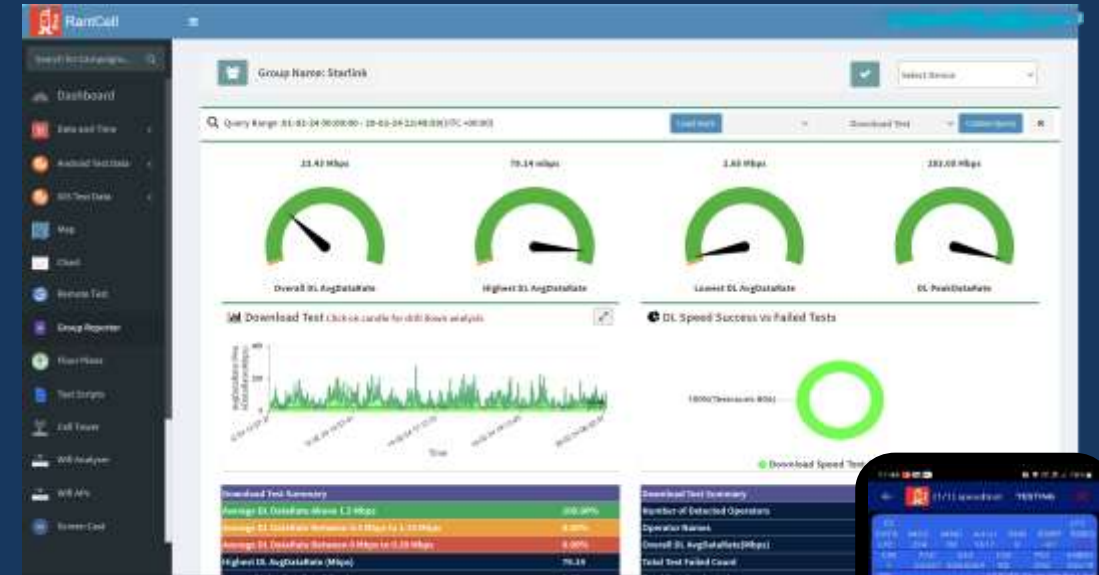


# RantCell for Satellite broadband Performance Measurement case study

Starlink Satellite broadband performance analysis.



RantCell product of Megron Tech Ltd UK

[www.rantcell.com](http://www.rantcell.com)

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# About Us

- Established in 2010, RantCell is a leading innovator in the field of Mobile/broadband user KPI measurement.
- We specialized in developing cutting-edge products designed to optimized network performance, enhance satellite performance monitoring and to help optimize user experiences.
- Global team of 100+ with extensive technical expertise
- Consistently invests 30% in R&D / innovation.



# About Us

- 8+ years partnership tenure with top 20% of our clients and 15+ years with top 4 clients.
- CSAT at 4.6/5; 60% of our customers are extremely likely to recommend our services.
- Contact us at [sales@rantcell.com](mailto:sales@rantcell.com)
- <https://www.rantcell.com>





# Satellite Communication Landscape

## Satellite Connectivity Today:

- With the growing demand for global connectivity, satellite communication plays a critical role in bridging the digital divide
- Satellite enables reliable data transmission and voice communication across remote and underserved areas, making them indispensable for various industries



# Challenges in Satellite Performance Measurement

## Challenges :

- Despite the advantages of satellite communication, monitoring and measuring satellite performance pose significant challenge
- Factor such as signal latency, data throughput, reliability of connection, coverage area, interference level, and voice quality require careful measurement and optimization to ensure seamless connectivity experience.



# Why RantCell

- RantCell is our solution designed to address the challenges of Satellite performance measurement
- It provide comprehensive insight into satellite data throughput, signal latency and other user experience KPIs. Empowering organization to optimize their satellite communication network effectively

# RantCell Features

- **Real-time monitoring:** Gain instant visibility into satellite performance metrics, including data through put and voice call quality
- **Advanced Analytics:** Access detailed reports and analytics for informed decision making and optimization
- **Customizable Dashboard:** Tailor the interface to suit your specific monitoring and reporting needs
- **Automated Alerts:** Receive proactive alert for satellite performance anomalies and degradation
- **Multi site deployments:** Monitoring and measurement.





# Benefits of RantCell

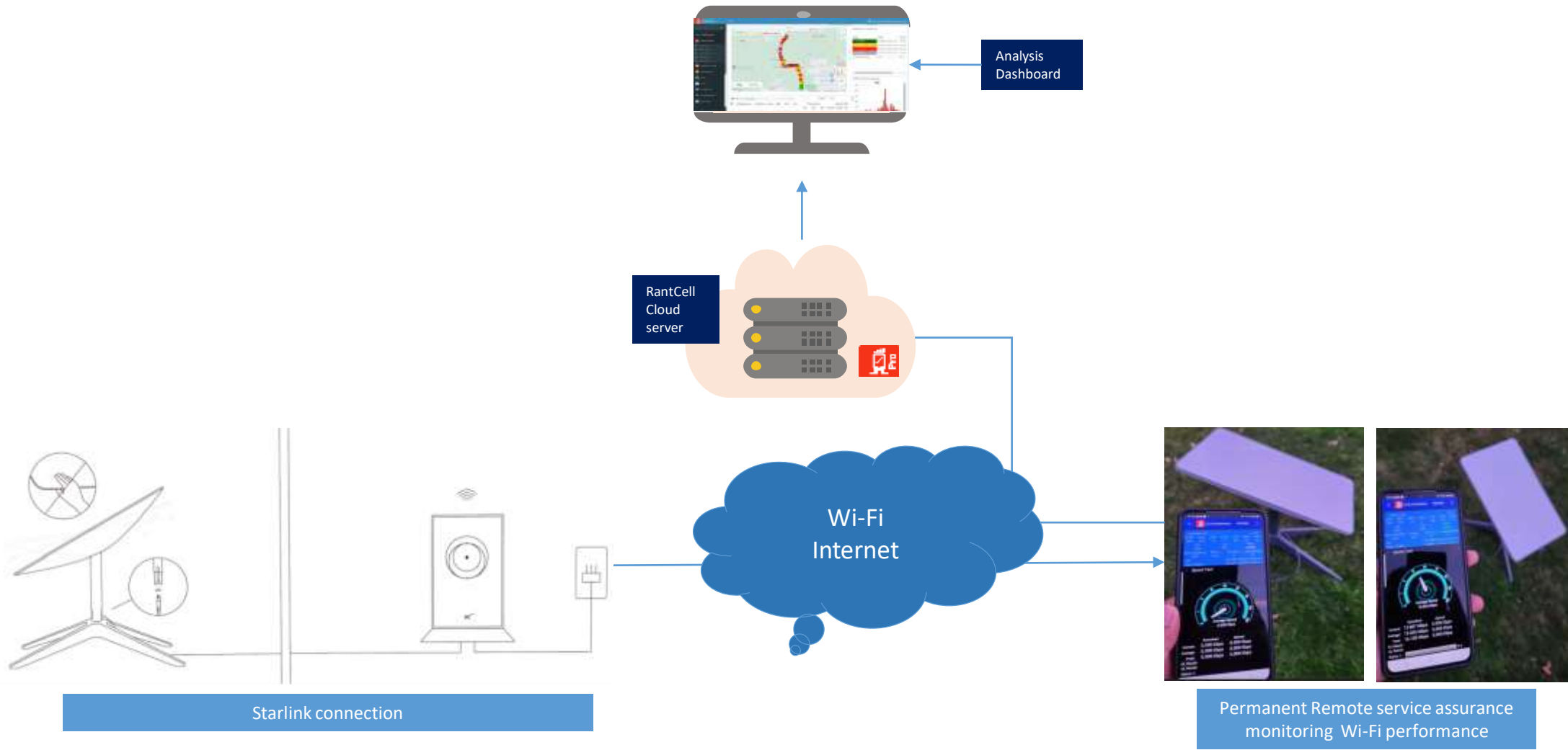
- Enhanced Connectivity :- Ensure seamless satellite transmission and voice communication for users worldwide
- Improved Network Efficiency :- Optimize satellite resource allocation and bandwidth utilization
- Cost Saving :- Identify and address satellite performance inefficiencies to reduce operational cost



# Why we chose Starlink for measurement

- Global Reach
- High Visibility
- Innovative Technology
- Growing Market demand
- Potential Collaboration Opportunities
- Offers high-speed internet access where terrestrial ISPs are unavailable.

# Test environment setup





# Test Configuration



1. Starlink Wi-Fi connection
2. Weather conditions are noted
3. Location Swindon , United Kingdom
4. Test devices:
  - Samsung Galaxy S21 5G with RantCell pro app to perform tests on Starlink Wi-Fi network.
5. Test Duration :
  - Test performed between Feb 4, 2023, 16:00 pm to Feb 12, 2023 , 04:00 a
6. Type of tests performed
  - Latency test (Ping 32 byte) (Automated Scheduled test every 15mins)
  - Speed test for Uplink/Downlink has been performed (Automated test Scheduled test every 15mins) scheduled for 30secs data transfer of 1.5GB file over Starlink network.parameter captured during test



# Latency Test Performed between Feb 4, 2023, 16:00pm to Feb 12, 2023, 04:00am

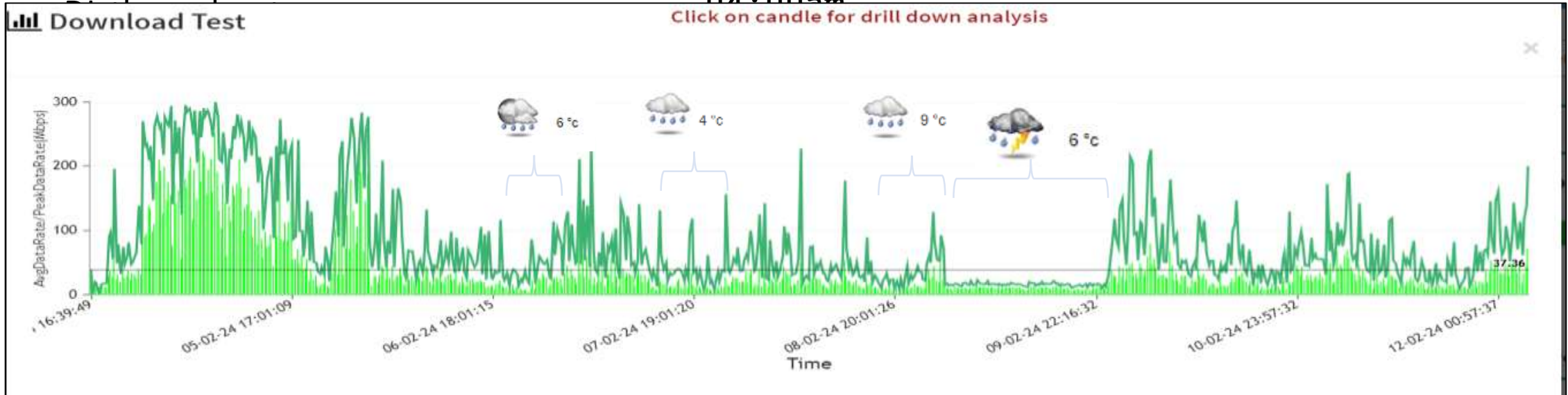


- **Latency Test :**
- Stability : **99.82% ping success rate**
- RTT Average(ms) : **48.37**
- RTT Max(ms) : **173**
- RTT Min(ms) : **22**
- Total number of tests conducted : **695**
- Number of failed count: **0**

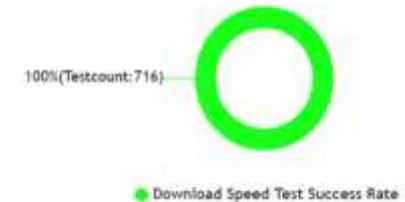
- Ping latency has no impact regardless rainy days and busy hours
- Average latency of 48.37ms is highly acceptable , which is comparable to 4G mobile networks.
- Very negligible packet loss even during heavy rains.



Download speed test performed between Feb 4, 2023, 16:00pm to Feb 12, 2023 , 04:00am



DL Speed Success vs Failed Tests

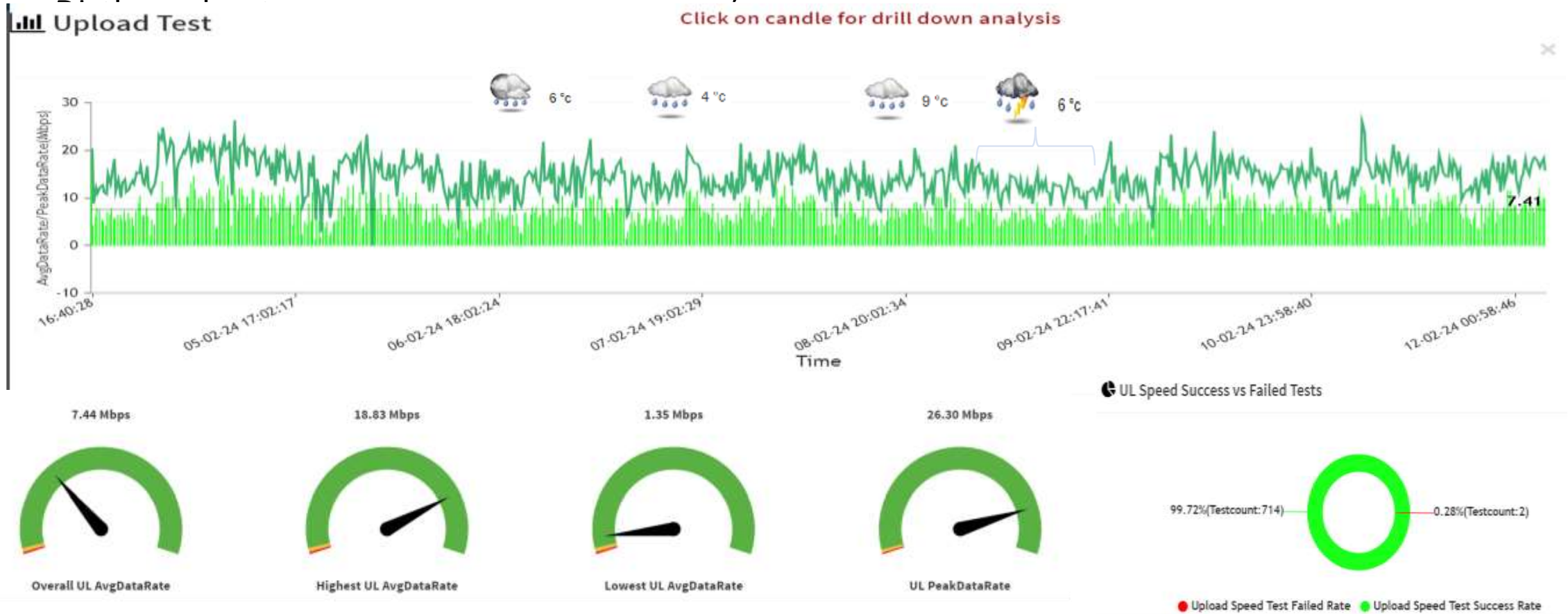


- RantCell app performed **716** DL speed tests in a period of 7 days
- **299.91** Mbps is the **peak** bit rate captured in download test
- Stability: **100%** success rate **99.72%** high speed
- Overall average data throughput is 36.37mbps.
- Cloud conditions play a role degrading the data download throughput performance.





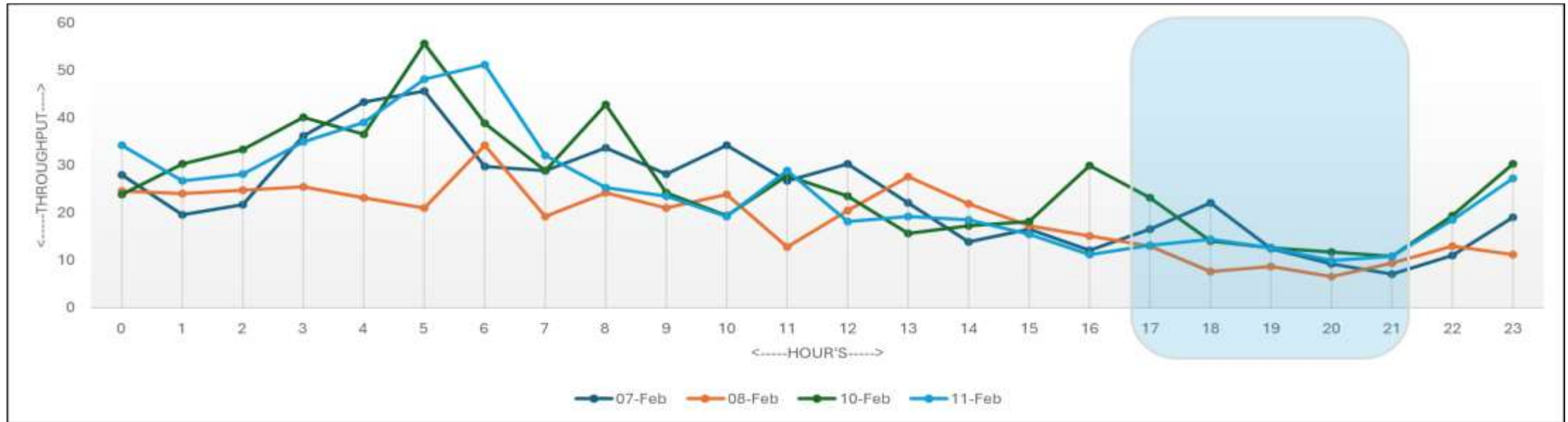
# Upload speed test performed between Feb 4, 2023, 16:00pm to Feb 12, 2023, 04:00am



- RantCell app performed **714** UL speed tests in a period of 7 days out of 716
- **26.3** Mbps is the **peak** bit rate and average is **18.83Mbps** measured among 714 test samples
- Stability: **99.72%** success rate **99.86%** high speed and 2 upload tests failed.
- Overall upload is following same trend upload throughput has no impact regardless rainy days and busy hours



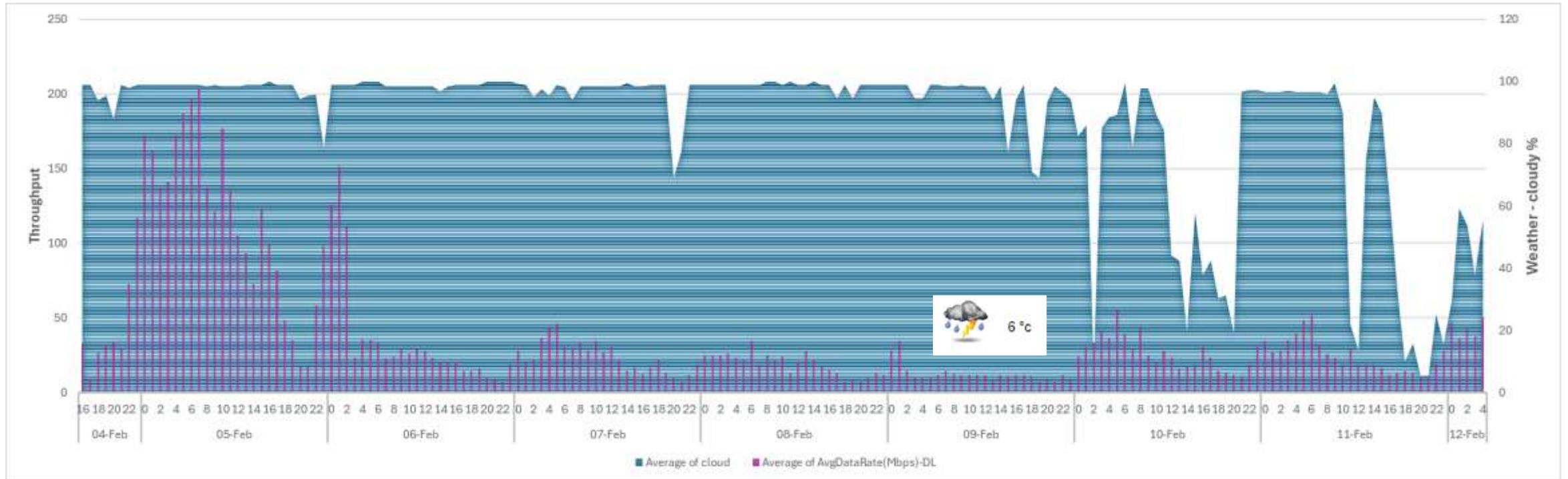
# Downlink Throughput Analysis in Busy Hours



- Data downlink throughput gets degraded at busy hours that is between 19:00pm to 21:00pm hrs of weekdays.
- Throughput captured at busy hours is between 6 Mbps to 12Mbps, peak speed at busy hour is 12.57Mbps
- Even at busy hours there were no tests failure noticed.



# Throughput in Busy Hours



- On the first day 5<sup>th</sup> Feb 2024 of test on Starlink, we can observe high throughput upto 203.76Mbps
- 9<sup>th</sup> we have bit low speed as it was a rainy day but still, we were able to use good network connectivity an average of 12Mbps
- 10<sup>th</sup> & 11<sup>th</sup> was weekend and large percentage of the day was clear day with temperature between 3 to 9°C
- Throughput is at good range i.e.10 Mbps to 50 Mbps, At busy hours on weekend throughput does degrade.



# Conclusion

How easy is it to setup ?

Setting up Starlink kit was straight forward with Starlink app.

Is Starlink connection stable enough compared to fixed line broadband connections ?

Yes, we monitored availability of connection for more than 15days and we did not see any service outages. Connection was quite stable throughout our testing.

# Conclusion

Do you recommend Starlink over fixed wired broadband providers?

No, unless if your home is in rural or remote location. We noticed heavy rainy conditions the throughput drops but still usable connectivity. Hence weather conditions can influence on the performance of Starlink and this will not be the case in fixed wired broadband.

Is it possible to use Starlink as backhaul connectivity to 4G base station ?

Yes , it could be used mainly due to stability perspective. But performance of 4G base station now be dependent on weather conditions.

# Next Steps

- RantCell's next steps includes conducting drive tests to measure performance during drive testing in UK motor ways and rural areas.
- Building a solution to monitor multiple Starlink kits from a centralized location.
- If you want to know more , please email us at [sales@rantcell.com](mailto:sales@rantcell.com)

