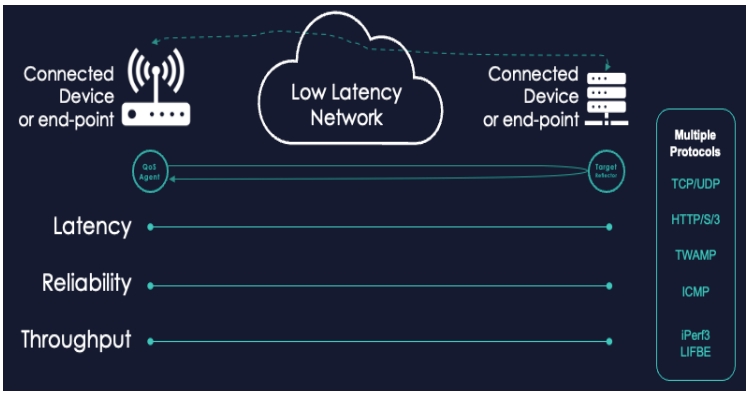
Use of AI/ML/GenAI within LatenceTech's Analytics

LatenceTech offers an AI-based analytics solution focused on connectivity performance. Low latency networks are a growing focus from industrial and consumers since several new innovations require seamless and ultra-fast connectivity including interacting with chatbots, autonomous cars, collaborative robots, mobile games, teleoperation of remote equipment etc. Large variations in latency and throughput will make these services unusable or even dangerous. At LatenceTech, we monitor the quality of connectivity in real time for any IP networks (5G, WIFI, Fiber, Satellite), use AI/ML to perform diagnostics and predictions and Generative IA to offer suggestions to resolve issues. Our solution is, real-time, 100% software, covers key pillars of network quality (latency, reliability and throughput) and 10x more efficient than other tools such as SpeedTest™.

Real time and Real User data to enable best in class Telco AI features

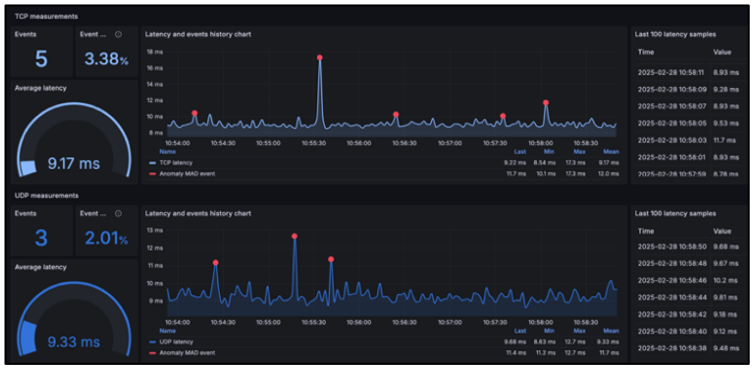
LatenceTech's solution performs real-time quality of service data collection to feed its AI/ML models (described below). Called active monitoring or real user monitoring (RUM) as most data is gathered from the connected devices. Multi-protocol measures can be taken continuously (multiple times per minute) without impacts to other users.

This approach is different from traditional service assurance solutions collecting network quality data every 5 or 15 minutes and only from network nodes. This type of data and collection frequency is not sufficient to enable Telco AI features that can enable best in class services in support of connected innovations.



Real-time IA in anomaly detection

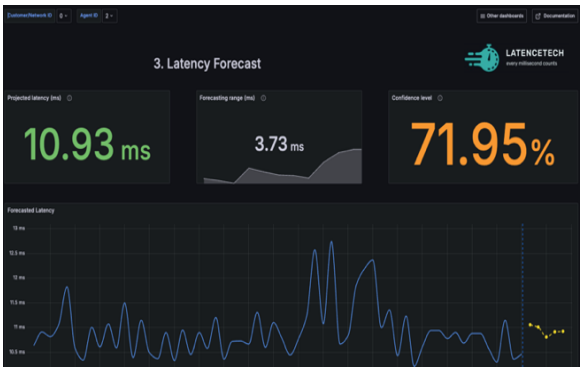
AI/ML methods are used in real-time to perform anomaly detection of latency and throughput variations. Latency peaks or spikes are detected automatically and if the exceed preset thresholds (in number or level), alarms can be generated. The anomalies are also used to calculate new quality indicators such as "latency stability" and "network volatility". We also use the anomalies to feed our diagnostics capabilities. It shows our usage of ML to detect and could anomalies for TCP and UDP protocols displaying the latest measurements with the ability to present an historical view up to last the 90 days.



Real-time IA in latency predictions

To reduce the potential impacts of network degradations on connected services or equipment, LatenceTech's solution used a mix of Deep Neural Network (DNN) and statistics methods to perform forecasting of connectivity performance for the next few minutes. Our approach is based a combination of DNN & Stats using the LSTM approach. The resulting forecasts or predictions are then compared with pre-set thresholds and again, alarms or notification can be sent to the network operator, network orchestrator or directly to the connected device.

The forecasts currently focus on latency as it is a good proxy of the overall connectivity performance. The system averages collected measures in the last 10 minutes (configurable) from multiple protocols and tries to predict the next 30 seconds up to 90 seconds. The confidence level of the prediction is always displayed and can be used in the decision to send (or not) an alarm. Here the system predicts the average latency level for the next 30 seconds to be at 11ms with a confidence level of 72% (level will vary based on the network stability and historical data).



Typical use of these predictions was done for connected autonomous vehicles where the prediction of network degradation was used as a new data input in ADAS system, now able to take actions such as slow down or reduce risky maneuvers. Another use is to support teleoperation of remote equipment for example in mining. The teleoperator has visibility of the current and predicted connectivity quality and latency and can take appropriate actions when degradations occur to maintain safe operations.

GenAI in network diagnostics and resolution insights

Measuring real time metrics and making predictions is a great add-on compared with traditional non-real time monitoring solution. However, the question often comes to "what then"? i.e. what can you do to improve or optimize your network based on this information? Where should I dig? Our solution addresses this need by using Generative AI with a fine-tuned LLM (based on OpenAI gpt4o + RAG) with knowledge of network management, with latest and historical measurements and key performance indicators. The system will generate charts showing measured versus expected quality levels and will generate a report containing and Executive summary with SLA levels, Analysis of Application, Network latency & throughput, Key Observations and Insights, Recommendations for Improving Connectivity Performance. **Contact us for a live demo.**