

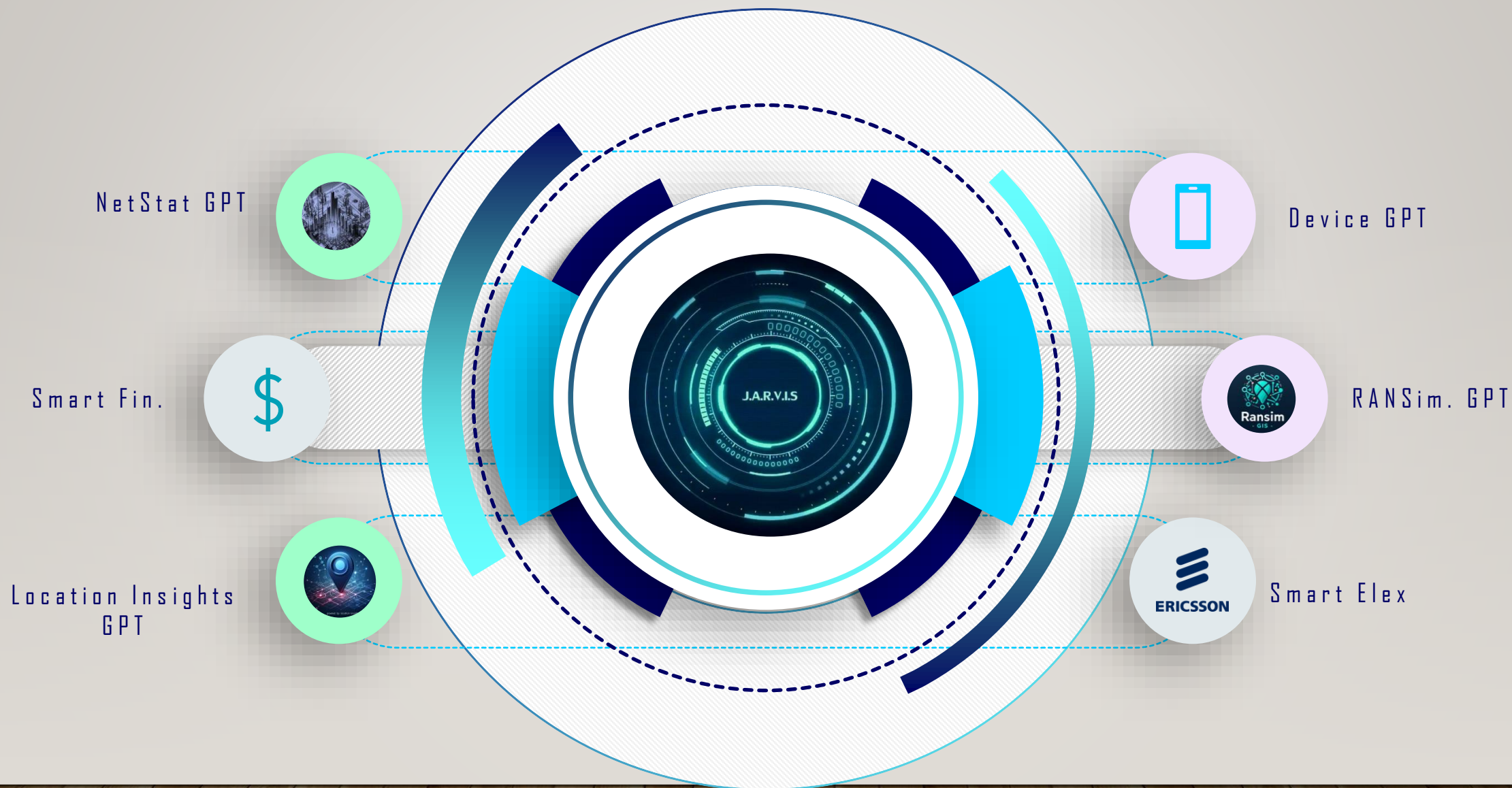
The J.A.R.V.I.S Initiative

RAN Engineering and Innovation

Abhishek Paul

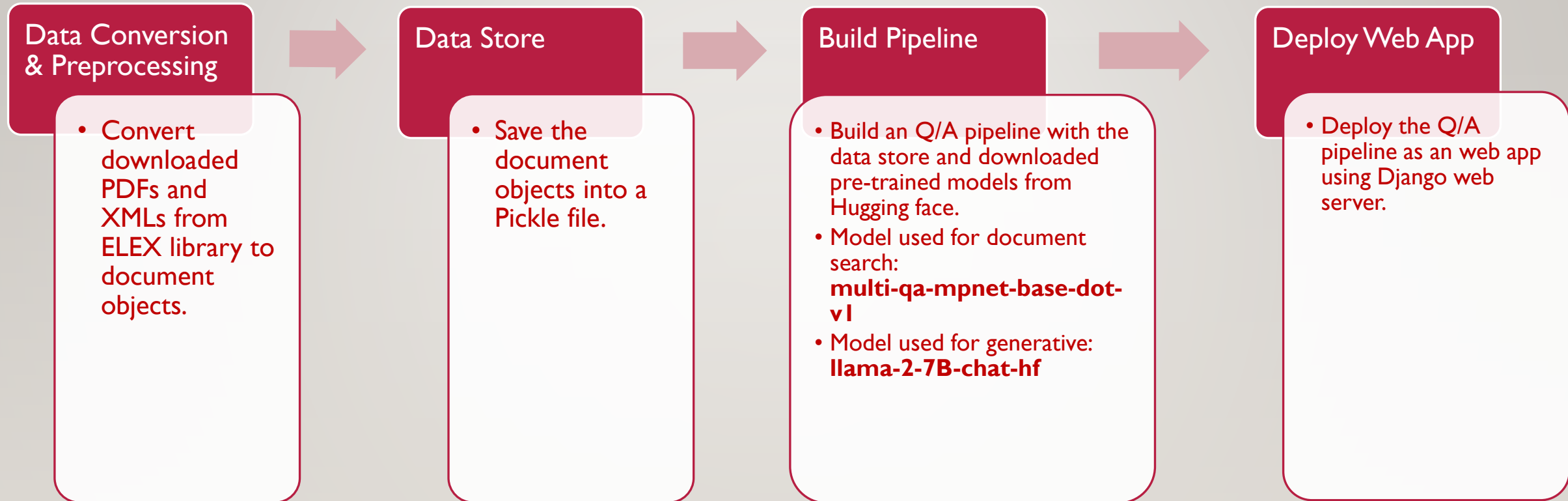
April, 2024

Just A Rather Very Intelligent System



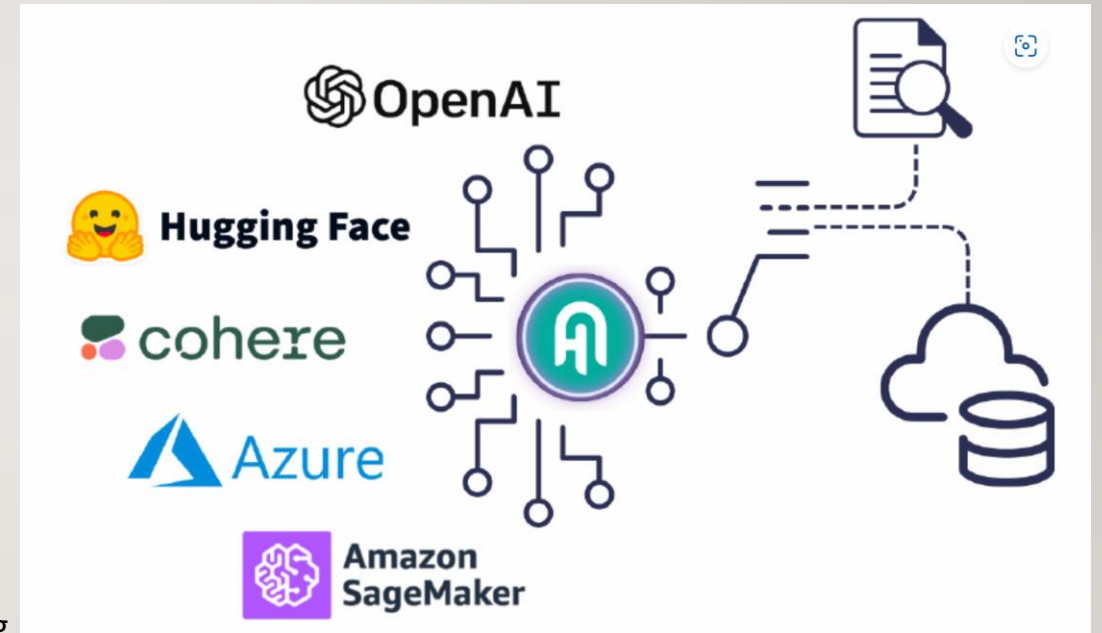
BUILDING THE CHATBOT

The Workflow



BUILDING THE CHATBOT

- Supporting Framework- Haystack
 - Why Choose Haystack?
 - **Open-Source Efficiency:** open-source, production-ready solution.
 - **Model Exploration:** Dive into advanced NLP models like BERT, RoBERTa, and LLMs (e.g., GPT-4, Llama-2).
 - **Versatile Tasks:** Simplify Information Extraction, Question Answering, and Semantic Document Search.
 - **Unified Development:** Streamlined development with integrated tools - Data Uploading, Preprocessing, Building Pipelines, etc.



SMARTELEX OVERVIEW

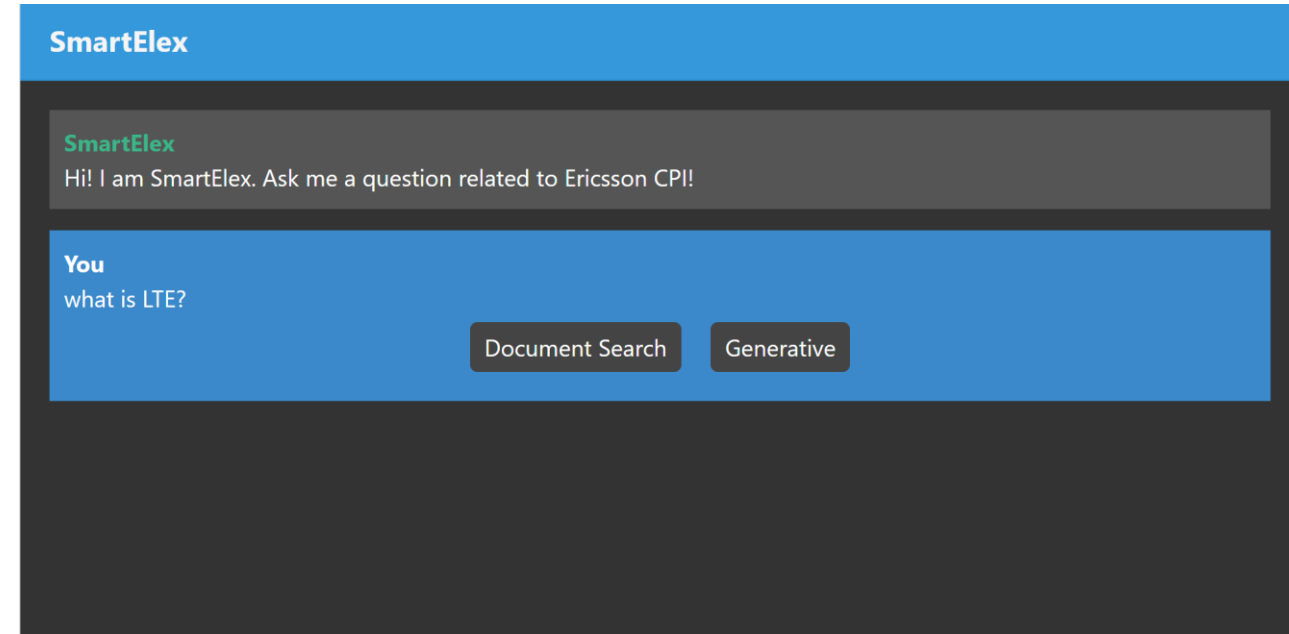
- Generates Answers for Ericsson CPI Questions
- Two Answering Options:

1. Document Search

- Utilizes Transformer Model
- Pros: Fast, Exact Text Extraction
- Cons: Doc Dependency

2. Generative

- Employs LLM (Large Language Model)
- Pros: Contextual Responses
- Cons: Slower, Requires GPU Power



Demo

class EUTRANCellTDD

long
noNotification
nonPersistent
readOnly

pmUeThpVolUICa

The UL DRB volume used for UL carrier aggregation UE throughput. Comprised of MAC SDU volume received on Uu, excluding volume received in first 4 data receptions of UL buffer transfer and TTI emptying UL buffer.

Unit: 1 kilobit (1 000 bits)

Condition: Continuous measurement for carrier aggregation UE aggregated to cell level.

Counter type: ACC

Scanner: Not included in any predefined scanner

Counter is reset after measurement period: Yes

Counter category:

Type: Traffic, Area: Utilization, Scenario: Volume

Type: Traffic, Area: Integrity, Scenario: Throughput

Type: KPI, Area: Integrity, Scenario: Uplink Throughput

You

what is pmUeThpVolUICa?

Document Search

Generative

Managed Object
Models -
pmUeThpVolUICa

Managed Object
Models -
pmUeThpVolUICa

Managed Object Models
- pmFlexUeThpVolUICa

Managed Object Models
- pmFlexUeThpVolUICa

Managed Object
Models -
pmUeThpVolUI

SmartElex

pmUeThpVolUICa : The UL DRB volume used for UL carrier aggregation UE throughput. Comprised of MAC SDU volume received on Uu, excluding volume received in first 4 data receptions of UL buffer transfer and TTI emptying UL buffer. Unit: kilobit (1 000 bits)
Scanner: Not included in any predefined scanner. Belongs to Class: EUTRANCellFDD



Download File

You

what is pmUeThpVolUICa?

Document Search

Generative

SmartElex

Response 1: Based on the document provided, "pmUeThpVolUICa" represents the UL DRB (Downlink Radio Bearer) volume used for UL carrier aggregation (CA) UE throughput. This volume is calculated by aggregating the MAC SDU (Message Session Control Unit) volume received on the Uu interface, excluding the volume received in the first four data receptions of the UL buffer transfer and TTI (Transmission Time Interval) emptying UL buffer. The unit of measurement for pmUeThpVolUICa is kilobit (1000 bits), which is consistent with the unit used in the Managed Object Models reference document. In the context of the EUTRANCellFDD class, pmUeThpVolUICa is not included in any predefined scanner, indicating that it is a customized measurement for a specific use case or scenario. Therefore, the answer to the question "what is pmUeThpVolUICa" is: pmUeThpVolUICa represents the UL DRB volume used for UL carrier aggregation UE throughput, calculated by aggregating the MAC SDU volume received on the Uu interface, excluding the volume received in the first four data receptions of the UL buffer transfer and TTI emptying UL buffer, and measured in kilobits.

Response 2: Based on the provided information, "pmUeThpVolUICa" appears to be a measurement of the total volume of user plane data transmitted by a UE (User Equipment) in a TDD (Time-Division Duplex) cell, specifically for UL (Uplink) carrier aggregation. According to the Managed Object Models reference document, "pmUeThpVolUICa" is a measurement of the volume of MAC SDU (Media Access Control Service Data Unit) data received on the Uu interface, excluding the volume received in the first four data receptions of the UL buffer transfer and TTI (Transmission Time Interval) emptying UL buffer. The unit of measurement is in kilobits (1000 bits). Therefore, "pmUeThpVolUICa" can be interpreted as the total amount of user plane data transmitted by a UE in a TDD cell through UL carrier aggregation, taking into account the exclusion of the first four data receptions and TTI emptying of the UL buffer.

References: Managed Object Models., Managed Object Models.

Execution Time: 35.51 sec.

Document Search

Generative

3GPP Delay Recommendations

This section provides the GBR and non-GBR delay recommendations from 3GPP 23.203 as described in Table 10.

To derive the Packet Delay Budget (PDB) that applies to the radio interface, a delay of 20 ms for the delay between a PCEF and an RBS should be subtracted from an identified PDB. This is the average delay between the situation where the PCEF is located close to the RBS, approximately 10 ms, and the situation where the PCEF is located far from the RBS, for example in a roaming scenario with home-routed traffic. The one-way packet delay between Europe and the US west coast is approximately 50 ms. The average delay estimation takes into account that roaming is a less typical scenario. The expectation is that by subtracting this average delay of 20 ms from a given PDB, this leads to a desired end-to-end performance in most typical cases. The PDB defines an upper boundary. Actual packet delays, particularly for Guaranteed Bitrate (GBR) traffic, should typically be lower than the PDB specified for a QoS Class Identifier (QCI) as long as the UE has sufficient radio channel quality.

The rate of non-congestion-related packet loss that may occur between an RBS and a PCEF should be regarded to be negligible. A Packet Error Loss Rate (PELR) value specified for a standardized QCI therefore applies solely to the radio interface between the UE and the RBS.

Table 10 Delay Recommendations from 3GPP 23.203

QCI	Resource Type	Priority	PDB	PELR	Example Services
1	GBR	2	100 ms	10 ⁻²	Conversational Voice
2		4	150 ms	10 ⁻³	Conversational Video (Live Streaming)
3		3	50 ms	10 ⁻³	Real Time Gaming
4		5	300 ms	10 ⁻⁶	Non-Conversational Video (Buffered Streaming)
5	Non-GBR	1	100 ms	10 ⁻⁶	IMS Signaling
6		6	300 ms	10 ⁻⁶	Video (Buffered Streaming) TCP-based (for example, WWW, e-mail, chat, FTP, P2P file sharing, progressive video, and so on)
7		7	100 ms	10 ⁻³	Voice, Video (Live Streaming) Interactive Gaming
8		8	300 ms	10 ⁻⁶	Video (Buffered Streaming) TCP-based (for example, WWW, e-mail, chat, FTP, P2P file sharing, progressive video, and so on)
9		9			

A QCI of 1–5 or 7 is typically associated with an operator-controlled service, that is, a service where the Service Data Flow (SDF) aggregate UL or DL packet

the GBR and non-GBR delay recommendations from 3GPP

According to the provided documents, the GBR and non-GBR delay recommendations from 3GPP are as follows:

Table 10 Delay Recommendations from 3GPP 23.203

QCI	Resource Type	Priority	PDB (ms)	PELR
1	GBR	2	100 ms	10 ⁻²
2	Non-GBR	4	150 ms	10 ⁻³
3	Non-GBR	3	50 ms	10 ⁻³
4	Non-GBR	5	300 ms	10 ⁻⁶
5	Non-GBR	1	100 ms	10 ⁻⁶
6	Non-GBR	6	300 ms	10 ⁻⁶
7	GBR	7	100 ms	10 ⁻³
7	Non-GBR	7	100 ms	10 ⁻³

Table 4 E2E QoS Guidelines

Resource Type	Priority Level	PDB (ms)	PER
GBR	High	80 ms	1%
Non-GBR	Medium	150 ms	5%

Note: The PDB values are one-way delays, and the PELR values represent the maximum allowed packet error rate.

Source Document

Query Search

LOCATIONINSIGHTS GPT

- Fed it the database schema for our LocationInsights database
- Utilized Vanna for training and LammalIndex as the base model
- Users can ask it a question and it will generate the sql query and return the answer





What is the average Rogers allband mean RSRP in each region?



The average Rogers all-band mean RSRP (Reference Signal Received Power) in each region can be calculated by analyzing the data from the `seed_data.planaid_10` table.

Main Answer: To calculate the average Rogers all-band mean RSRP for each province, we can run the following SQL query:

```
SELECT province, AVG(rogers_allband_mean_rsrp) AS avg_rogers_allband_mean_rsrp
FROM seed_data.planaid_10
GROUP BY province;
```

This query will group the data by province and calculate the average Rogers all-band mean RSRP for each province.

Analysis:

Upon analyzing the data, we can observe that:

- The lowest average Rogers all-band mean RSRP is in NL (-138.179787), followed closely by NWT and NU (-139.973629 and -139.984876, respectively).
- The highest average Rogers all-band mean RSRP is in ON (-124.387483), which is significantly higher than the other provinces.

Your question



- **Additional Features**

- **References:**

- Document search shows top 5 documents along with section names.
 - Generative displays the documents used as references.

- **Voting and feedback:**

- Collect user feedback through voting.
 - Use the feedback to train and refine the model.

- **Downloadable files:**

- Conveniently download files.
 - Easily access documents of interest.