

Telecom 5G Network

Metadata

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Sept 2024

Client: Internal Telecom Domain 5G Network
My Role: Research and Signature Movement

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Background

Metadata is the additional information about the message that can be used in the processing of the messages without going deep into the message at the applications. The application use this metadata for the enrichment of the other messages, filtering the messages, in the correlation of the transactions. The data enriched using metadata can help in enhanced troubleshooting of the network scenario.

User: The "admin" user or any other user with admin privileges must be used to configure the metadata attributes configuration

Usage of this feature: Used for the configuration

Problem statement

- Not able to correlative the message
- Not able filter the attribute and cant check the correlation
- Not able to find out correlation corresponding ID and remaining message with correlation ID

Discovery

Overview

- Global Configuration: Metadata configuration is a global, one-time creation process managed by the admin.
- Purpose: It facilitates attribute correlation across various configurations.
- Admin Control: Only admins can create or update metadata configurations; no other user roles have access to this functionality.
- Impact of Updates: Any changes made by the admin to the metadata configuration will cascade and affect all connected configurations.

Integration with Data Feeds

- Users can select metadata while creating a data feed by checking the relevant checkbox.

Metadata Configuration Steps

1. Choose Available Metadata Attributes:
 - Select attributes required for the configuration.
2. Attribute Types:
 - Direct Attributes: Includes all attributes except previous_hop.
 - Indirect Attributes: Only previous_hop.
3. Handling previous_hop:
 - If previous_hop is selected:
 - Admin must choose applicable rules.
 - Admin can adjust the priority of these rules.
 - Rules: There are 4 rule types with adjustable priorities.
4. Apply Configuration:
 - Once all selections and settings are finalized, click "Apply" to complete the Metadata Enrichment Configuration.

Key Notes

- The configuration process ensures that metadata attributes can be used seamlessly in other connected setups.
- Direct and indirect attributes determine the flexibility and rules associated with metadata application.
- Updates to metadata configuration require careful consideration due to their widespread impact.

User Goal

As a Data Director Operator, I need to enhance the messages with additional metadata for which is received from data source, so that the data director and 3rd party applications should be able to process the messages with additional information further with minimum effort, higher discoverability and consistency

As a 3rd party consumer, I need to receive the filtered data with complete details without extra efforts for debug, so that I can use this data with minimum effort further debug process.

User 3rd party consumer

Goal Receive the complete details without extra effort

Motivation I can use this data for my further process

As a DD 3rd party consumer, I need to add advanced filtering to the particular transactions without extra compute resource & time consume, so that I can get the filtered transaction with additional details in my message with less compute and less time consume.

User 3rd party consumer

Goal Add advance filter for my particular transactions

Motivation I will get include additional details in data with in lesser time

User

Who are you solving a problem for?

Goal

What are they trying to achieve?

Motivation

Why do they need to accomplish this goal?

Shape of Data

Q: How much time users spend on the process without going deep enrichment of messages ?

Q: How many user enable metadata configuration ?

[DIMENSION]

[ACTION]

Time for *process of the message filtering*

[VALUES]*

10
millisecond
Min

20
millisecond
Max

15
millisecond
Typical

[DIMENSION]

[ACTION]

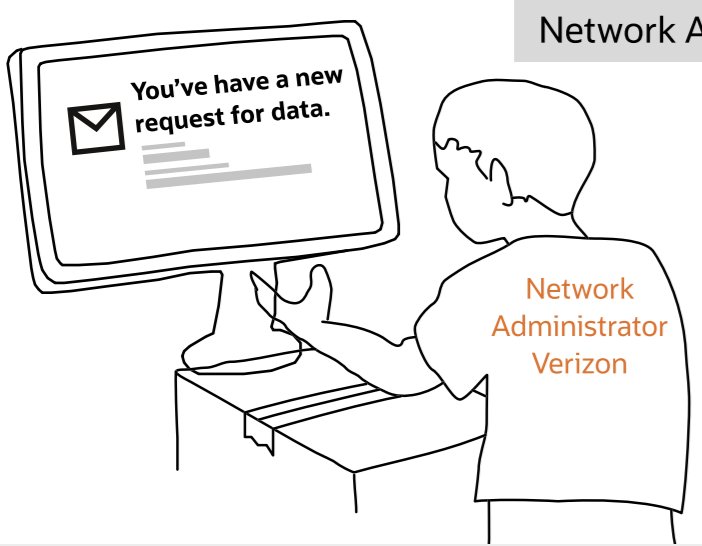
Sequence of *engagement on the metadata*

[VALUES]*

70%+
Typical / Majority

Current Scripts

1 Network Admin

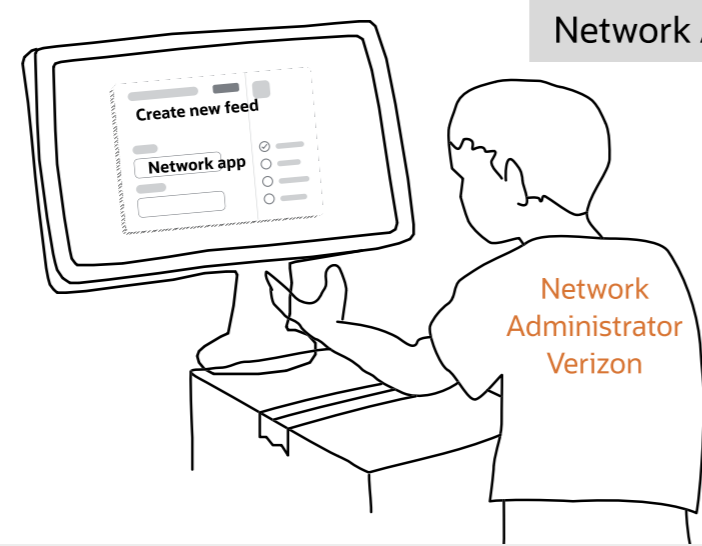


Network Administrator
Verizon

You've have a new request for data.

Jose, the Network admin at Verizon receives an email request from Mr. Kali (Network Monitoring Dept.) to create a new feed using domain **AT&T.mnc.mcc.com.** to get its roaming details to analyze an issue.

2 Network Admin



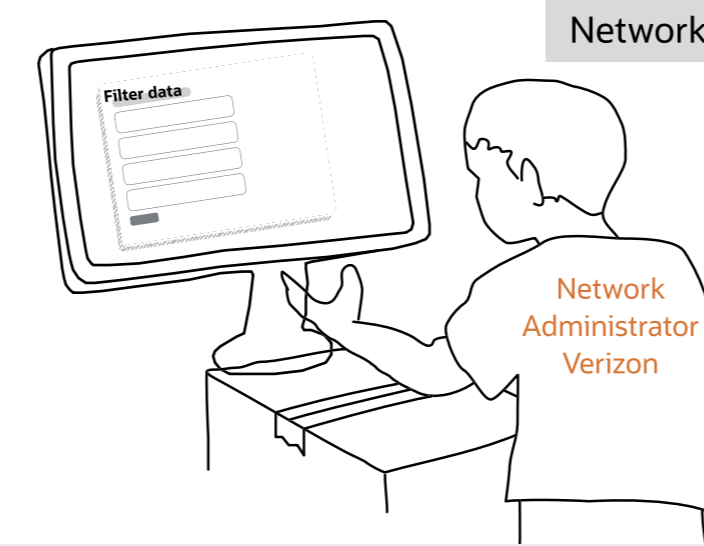
Network Administrator
Verizon

Create new feed
Network app

Jose uses Data Director (DD) to create a new data feed using the domain and saves it in the system. However, he has no visibility about **what data is already being used in other feeds when he creates the new feed. Because of this the same process need to be done repeatedly.**

🕒 SPENT 15 MIN ...

3 Network Admin



Network Administrator
Verizon

Filter data:

Jose needs to apply filters in the Data Filter section, but he's **unsure if any reusable filters already exist, which makes his work feel repetitive.**

🕒 SPENT 10 MIN ...

System

Based on the feed, Data Director (DD) starts forwarding any matching data from the 5G network to the app.

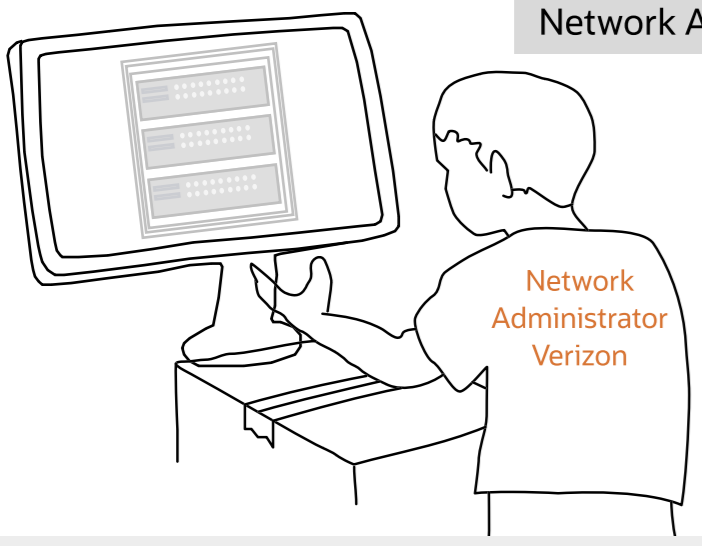
🕒 As soon as save in the system

System

When processing huge data, DD gets slow and this leads to inefficient system processing as too many steps and repeated processing are involved in the process. **This increased complexity leads to inefficient processing, causing delays and slower performance in the system.**

🕒 20 MILLISECONDS

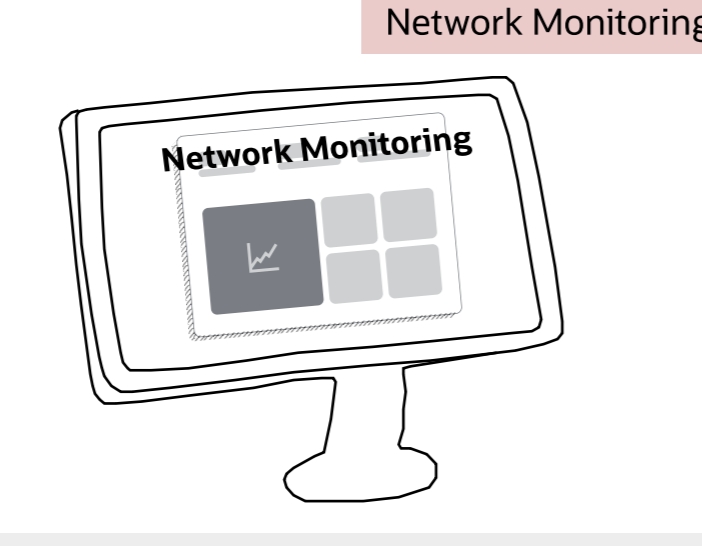
4 Network Admin



Network Administrator
Verizon

Jose **doesn't really know how the feed is behaving**, he feels **insecure about the data quality, processing time, and the resources being consumed**, but at this moment, he can only wait.

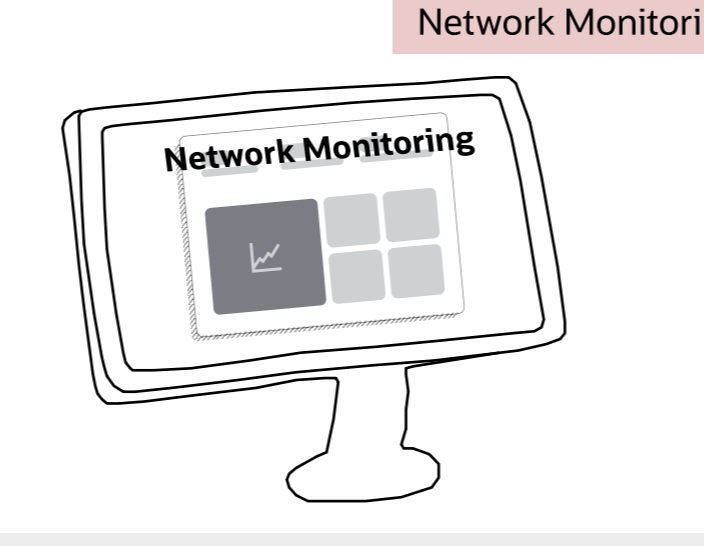
5 Network Monitoring Dept.



Network Monitoring

The network monitoring team begins receiving roaming data and starts using it into their tool. **The network team is not sure if they are getting ALL required data.** They believe that the information they are receiving is good enough as they are receiving a huge amount of information from the feed.

6 Network Monitoring Dept.

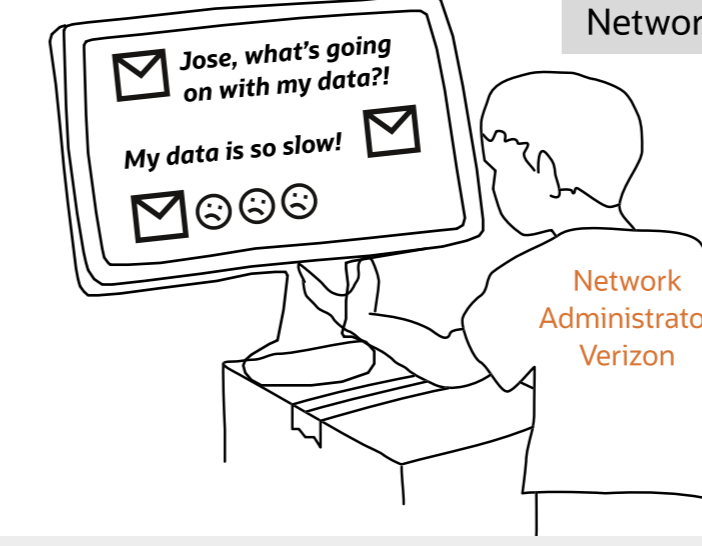


Network Monitoring

After a long and heavy process, **the network monitoring team feels that the information they have received is not accurate to use further analyse the issue.**

🕒 Later that day

7 Network Admin



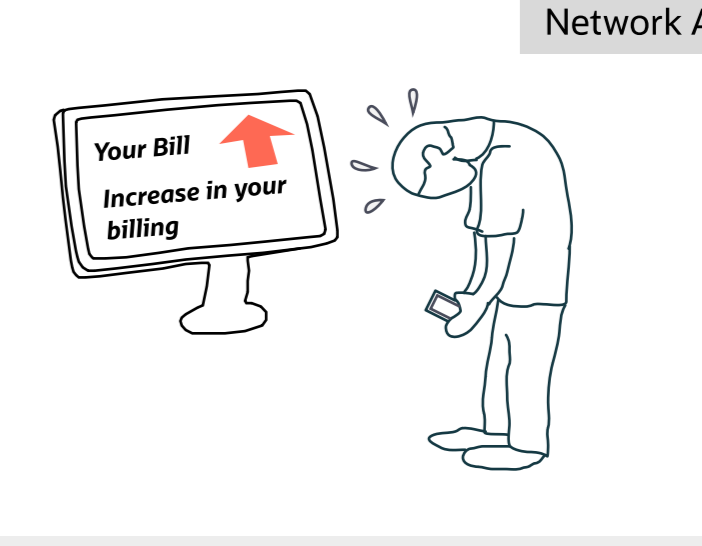
Network Administrator
Verizon

Jose, what's going on with my data?!
My data is so slow!

After 3 months, Jose has created many feeds and filters for multiple depts. **Each feed and filter execute many steps to fulfil a feed request. This has considerably slowed the system down.**

🕒 3 Month Later

8 Network Admin



Your Bill
Increase in your billing

When Jose receives the end of quarter bill, he observes that the **amount payable is much higher than expected because of inefficient system and high processing time.**

He wish Data Director was more efficient!

Future Scripts

1

Network Admin

Network Administrator
Verizon

Jose, the Network admin at Verizon receives an email request from Mr. Kali (Network Monitoring Dept.) to create a new feed using domain **AT&T.mnc.mcc.com.** for roaming details and Needs this data feed to analyze an issue.

2

Network Admin

Network Administrator
Verizon

Jose looks at the existing feeds. **The system shows him the domain and provide recommendations for existing filters that may be useful.**

🕒 SPENT 5 MIN ...

3

Network Admin

Network Administrator
Verizon

Jose creates a feed and **reuses an existing filter to the feed.**
He can also **deploy DD metadata list** to the feed
Note: He created dd-metadata list earlier

🕒 SPENT 5 MIN ...

System

As soon as saved in the system, automatically system start processing data by Optimize filter logic by consolidate conditions by applying dd-metadata techniques, the DD system can handle large datasets **more effectively, making it faster and more reliable,** even with complex filtering and multiple data feeds.

🕒 5 MILLISECONDS

4

Network Admin

Network Administrator
Verizon

Jose is assuming that the system processing quickly in this stage because **dd-metadata has clear input to process the data** and send the data to particular department.

5

Network Monitoring Dept.

The network monitoring team while using this data in there tool they realised that the required data **now receiving quickly and accurately** and This allowing the team to proceed confidently with the data in their processes to resolve the issue which they have facing currently.

🕒 Later that day

6

Network Admin

Network Administrator
Verizon

After three months, Jose has added numerous feeds and filters, some of which can be reused, making tasks easier and quicker when handling new requests from multiple departments. **Each feed and filter now executes in minimal steps to fulfill a request, significantly improving performance.**

🕒 After 3 months

7

Network Admin

When Jose receives the end-of-quarter bill, he notices that the **payable amount is lower than expected due to significantly improved system performance.**

Signature Movement

Less compute resource required for filter processing with more details which will **impact on the cost**

Less time taken by the filter feature to process the messages means **decreases the latency**.

The 3rd party consumer may make use of the **optionally** included dd-metadata for post processing.

DD Metadata Request via Email from 3rd Part Consumer
Verizon

Email Notification
• Email sent to Data Director

Alerted by email

Data Director Operator
Receive the email from department for filter the particular transaction

Create

Create DD-metada Configuration flow

Create dd-metadata global configuration

- Create global configuration one time
- Adding items
- Add Attribute
- Add priority rules

Save

Apply the configuration settings

- Save the configuration after adding the available attribute and change the priority based on the requirements

Start Count

Ready
• dd-metadata configuration is ready for include in the data feed configuration

Start Adding dd-metadata



List of transaction

- Find the data feed which need to add the dd-metadata
- Or create new data feed

Add Filter

Create data feed

Filter Page

- Find the suitable filter as per requirement

Create data feed

- Create data feed and Save in the system

Data Filter Page

- Add data feed into this filter

Data Filter Page

- Find the reusable filter which is suitable for requirement
- Create/Select the filter as per requirement and add data fed

Save

Save

Started filter with dd-metadata

- Added dd-metadata in the data feed configuration and will start now to add dd-metadata in the transaction
- Start filtering the data received from sources

After added dd-metadata

Transaction data (After dd-metadata included)

- List of transaction data after filter

Sending to the 3rd party via data director