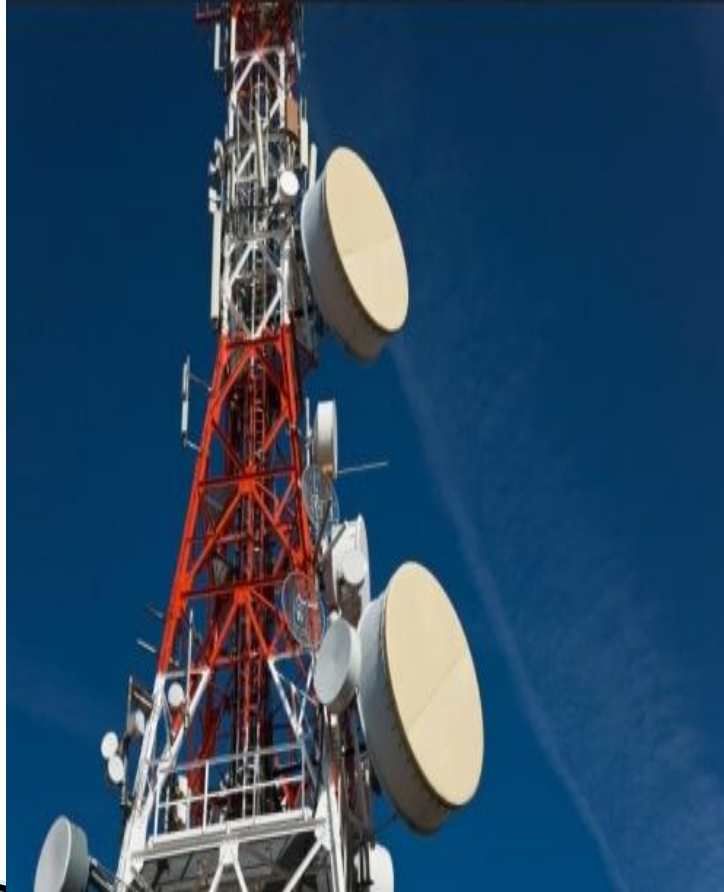


Cogniyug

Case Study of
A Telecom Infrastructure Management Company

Background

Customer : A Leading Telecom Tower Management Company in India



Customer's Business

- Serves to Telecom Operators
- Provides Network Operations Services
- Routine Maintenance Services
- Responsible for the uptime of the Network Infrastructure (mainly, the Telecom Towers)
- Stringent SLAs to meet
- Has to ensure 99% uptime
- Responsible for the 'passive' components only (mainly, power related)
- Has to produce various reports such as 'uptime', 'power alarm', 'DG run hours' etc
- Each telecom tower is called 'a site' and each state/ province is called a 'circle'.
- In the event of power failures, must keep the site up and running with alternate electricity supply (using batteries or DG)

Problem Statement

- Unstructured Data from multiple sources (OSS logs, XLS, Trouble ticket systems etc).
- GBs of data every day
- Lot of manual efforts to generate the basic reports (error prone and cumbersome)
- Root Cause Analysis of critical events was impossible due to shear volume of the data
- Lack of correlations between 'outage' and 'other' messages
- Lack of ability to visualize the trends and deviations from the desired patterns
- Need predictive intelligence
- Need BI reporting solutions to generate various BI reports from unstructured data



Cogniyug, the Solution

Salient features of Cogniyug

- ✓ Ability to consume data from diverse data sources
- ✓ Ease of search with advanced grammar
- ✓ Patent pending algorithm to recognize patterns and correlations
- ✓ Single click Root Cause Analysis of critical failures
- ✓ Ability to detect deviations from normal/expected behaviour
- ✓ Ability to predict critical events
- ✓ Ability to create custom Business Intelligence reports



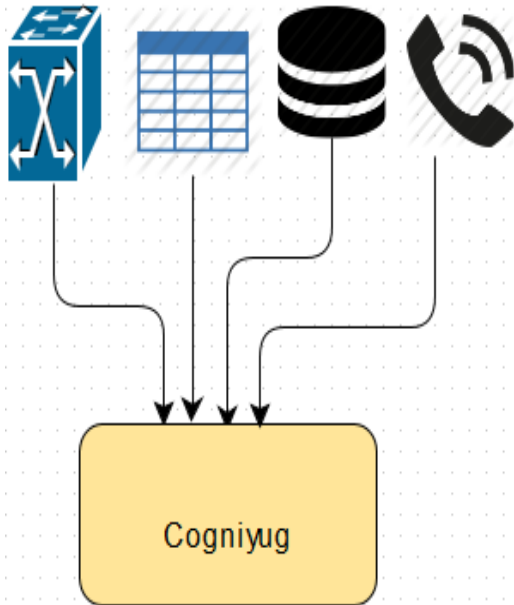
BIG Data Analytics platform for analyzing telecom logs in real time

Deep dive



Let us dive deeper into the solution and use cases

Data Import into Cogniyug



Data Sources:

- ✓ OSS Logs generated by following telecom switches:
 - ✓ Nokia Siemens
 - ✓ Ericsson
 - ✓ ZTE
 - ✓ Huawei
- ✓ XLS files generated by various manual /semi automated processes.
- ✓ Data from ticketing system (Remedy)
- ✓ Call Data Records (CDR)

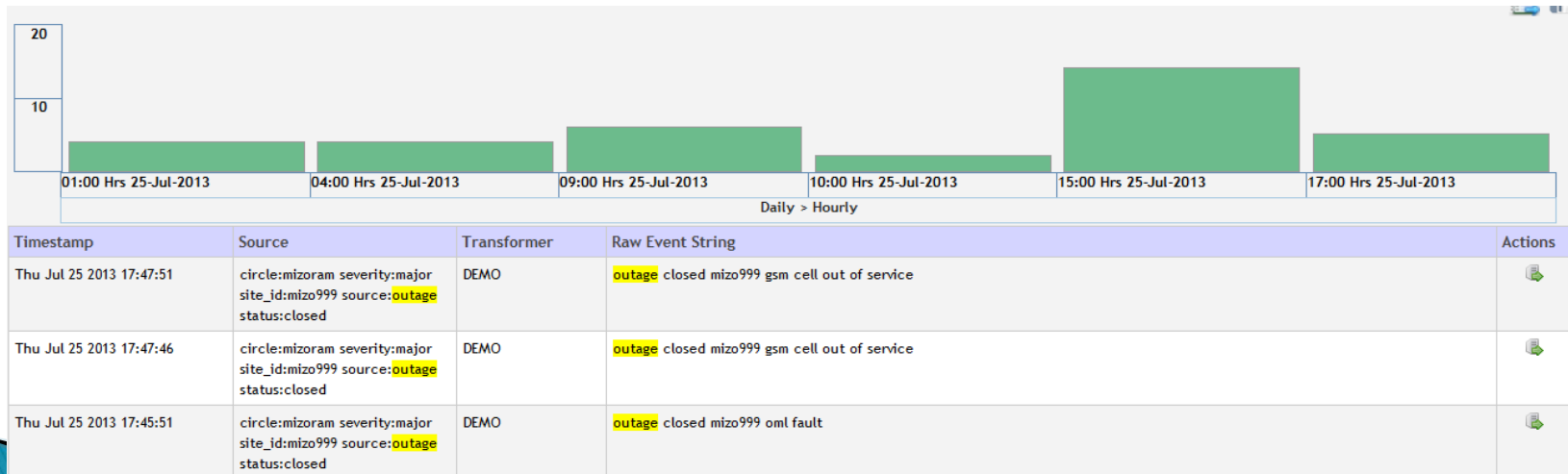
Preprocessing of the Data:

- ✓ Normalization
- ✓ Enrichment and Metadata tagging
 - ✓ Type, Severity etc
 - ✓ site id
 - ✓ Circle
 - ✓ Owner

Pre-processed data is imported into Cogniyug for various operations to be performed on it.

Search and visualization

- ✓ Multiple simultaneous web users
- ✓ Quick Search through GBs of OSS logs
- ✓ Complex search criteria with advanced grammar
- ✓ Saved searches
- ✓ Visualize time relevance and density
- ✓ Understand and visualize some other vital statistics such as periodicities, peaks etc



Root Cause Analysis (RCA)

Many critical events are being analyzed using the RCA feature of Cogniyug. Example:

- ✓ A mobile site/tower going down (oml fault)

TechLineage's patent pending algorithm was able to uncover complex casual relationships with vital statistics such as

- ✓ Confidence
- ✓ Time relevance and
- ✓ Support

Business Impact:

- ✓ Reduced Mean Time To Resolution from hours to minutes
- ✓ Insight into recurring failures

Causes for " outage open fake999 oml fault"

ID: 0 | Transformer: fake999.DEMO_1 | Pattern Support: 3 | Mutual Confidence: 1.00 | Timestamp: Fri Jul 26 2013 23:00:41

info open fake... → outage open fa... → outage open fa...

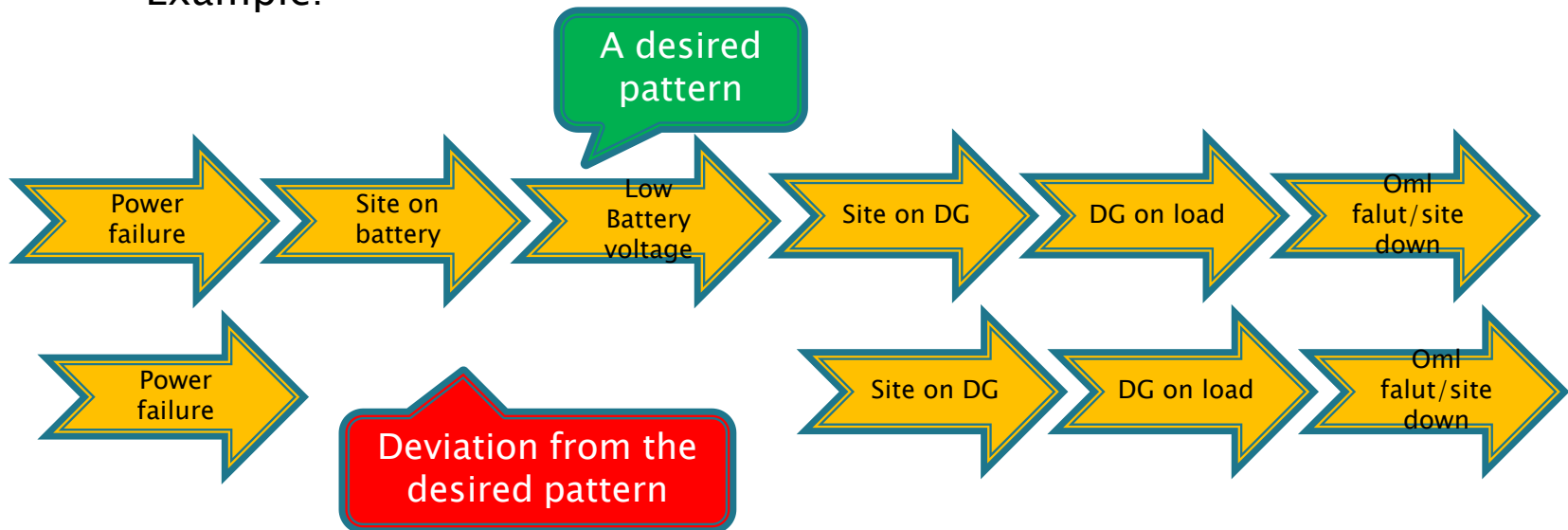
Time Relevance

Confidence

Deviation from Desired patterns

- ✓ Cogniyug spots desirable trends/patterns
- ✓ Data of every site (tower) is compared with desired patterns
- ✓ Deviations are spotted instantaneously (for power failures in this case)

Example:



Deviation Analysis:
Site did not switch to Battery. Perhaps, the Battery is not working properly.

BI Reporting

- ✓ Customer uses reporting functionality of Cogniyug to run complex BI reports on the stored log data
- ✓ A set of complex 'saved searches' are associated with different 'report types'
- ✓ Different reports are scheduled to run at desired intervals
- ✓ Cogniyug Data can be exported and stored into the external data stores such as files, RDBMS or pipes (for quick processing)
- ✓ External commands/scripts can be defined to act on the exported data.
- ✓ Customer uses 'pipes' to read and process the data using complex python scripts that generate desired reporting output
- ✓ Various complex BI reports such as
 - ✓ Uptime
 - ✓ SLA reporting
 - ✓ Energy Audits
 - ✓ DB Run hours
 - ✓ Patterns / Co-relation for repetitive outages
 - ✓ etcare generated.

Future direction

- ✘ Customer is still not able to use the full potential of Cogniyug because he does not have access to 'live streaming data' (Customer imports data by uploading the OSS log files every 24 hours)
- ✓ There are plans to consume the 'live streams' of the data and then customer would be able to use Cogniyug for
 - ✓ Real Time Predictive Alerts
 - ✓ Online anomaly detection
 - ✓ Keep a real time Watch on Expected patterns

Deployment, Scalability etc

- ✓ Deployment : 'On Premise' (for Data Privacy and Security reasons cloud deployment is ruled out)
- ✓ During the POC we ran everything on a single Linux system with following configuration:
RAM : 8GB, CPU :4C/8T, Storage: 100GB

- ✓ H/W in production

WebServer, Application Server, Cassandra DB and the File Reader are deployed on a single server with following configuration:

RAM 16GB, Storage 6TB, CPUs 4C/8T

Pattern mining Grid was installed on a separate server with following configuration:

RAM 16GB, Storage 1TB, CPUs 4C/8T

The proposed H/W should be good enough to process 60GB data per day and retain the data for at least 3 months

What next?

- ▶ Most probably, you will be dealing with logs from Ericsson, Huawei, ZTE or Nokia–Siemens switches (or may be some other type of telecom switches)
- ▶ If you have access to the OSS logs, we would be keen to perform a **free POC** using your data, either in **your premises OR in our cloud**.
- ▶ We promise to show **value within 24 hours** from the time we consume the data into Cogniyug
- ▶ We value your data and maintain high confidentiality about your data. We sign necessary non–disclosure agreements (NDA) and comply with all the necessary procedures to protect the privacy of your data.
- ▶ Write to us on rajesh_kulkarni@techlineage.com to initiate a dialogue regarding the POC

Thank you !
Question ??

Write to us on info@techlineage.com