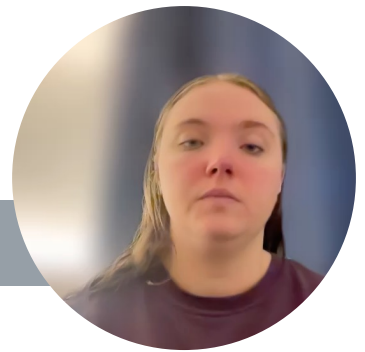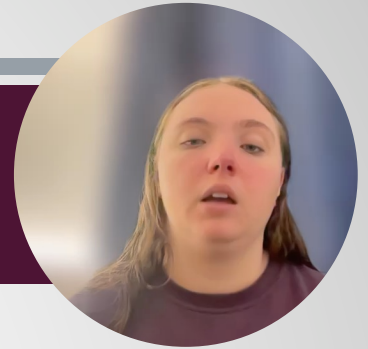DSC 650

INMAN, GRACIE

05/19/24

ARCHITECTURAL DESIGN PRESENTATION

PRESSING ISSUES

Increasingly vulnerable to fraudulent activity

- Possible consequences
  - Financial loss
  - Regulatory penalties
  - Damage to public image

Current challenges:

- High volume of transactions
- Fraud patterns can be complex
- User behavior analysis
- Complying with current regulations
- Achieving a real-time response

PROPOSED ARCHITECTURE

Hadoop distributed file system (HDFS)

Provides scalable storage for the large amount of transaction data

Hive
Warehousing solution that allows for querying and managing large datasets residing in HDFS

Yet another Resource Negotiator (YARN)

Manages resources for distributed computing

HBase
Allows for real-time reading and writing

Spark
Real-time processing and analytics

Kafka
Allows for real-time data ingestion and processing

Solr
Allows for real-time search and monitoring

NiFi
Allows for moving and transforming data between systems

DATA FLOW & REAL-TIME ANALYSIS

Data Ingestion (NiFi) –

Collects transaction data from various sources and moves it to Kafka

Real-time Streaming (Kafka) – Streams data to Spark

Real-time Processing (Spark) – Analyzes data in real-time to detect fraudulent patterns

Storage (HDFS & HBase) – Stores processed and raw data

Querying & Monitoring (Hive & Solr) – Allows for querying of data and real-time search monitoring

DATA STORAGE, RETRIEVAL, AND ADVANCED ANALYSIS

HDFS will provide scalable and fault-tolerant storage.

HBase will support real-time read-write access

Hive enables complex queries

Solr will enable real-time search capabilities

Crucial for fast data retrieval and updates

Important in detailed fraud analysis.

BENEFITS & CONCLUSION

Benefits

- Real-time fraud detection
- Enhanced security
- Regulatory compliance
- Improved customer trust
- Improved operational efficiency

Conclusion

- This fraud detection system uses advanced data processing and real-time analytics to improve current systems.
- As well as the benefits mentioned, this system will provide safeguarding of the bank's financial assets and reputation

THANK YOU!