Consider a streaming data scenario where a multinational company needs to process and analyze tweets in real-time across the globe to gauge customer sentiment towards their products.

How might Spark Streaming handle such large volumes of continuously flowing data, especially considering data partitioning and the handling of late data?

How would Spark SQL and DataFrames be employed to structure this data for analysis?

Finally, could Spark MLlib's machine learning capabilities be applied to classify the sentiment of these tweets?

Discuss the potential technical challenges and benefits of such a system, particularly focusing on aspects like data serialization and deserialization, handling of transformations and actions, and query optimization with Catalyst Optimizer.