Better TV & Broadband with Kafka & Spark

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Hadoop as a Service
Early adoption
“Spark will replace map/reduce as the standard execution for Hadoop”

Doug Cutting – Sep 2015
HaaS 2.0

Denser Nodes
- doubled #cores
- trebled RAM

Same node count 😊
TV

Set Top Box

Broadband

Home Hub
TV & BB Data Pipeline Overview

- Gateway
- Kafka Producer
- Firewall
- CRM
- Enrichment data
- HDFS
- Hive Tables
- Impala
- ESB
- HAAS
- Kafka Broker
- Spark
- YARN Cluster
- Atomic metrics
- Raw data
- Rich data
- Producer
- Consumer
- Enrich
- Aggregate
- Every
- Flume
- Big XML payload
- HAAS
- Kafka Producer

#StrataData
Data Ingest Kafka - Raw topic
Data Serving – Impala Concurrency
Schema Design … on read … DEVOPS approach

- Flat (De-Normalised) Tables, table per query
- Queried with `SELECT * FROM .... WHERE ...`
- Table Dimensions (rows & columns)
- Table File formats optimised for table query pattern (up to 10 x difference)
  1. AVRO for tables being queried row oriented queries
  2. Parquet – default time series
  3. Parquet with snappy compression for deep time queries
Impala Tuning…

- There’s lots of options, the default will not be good enough
  - (it’s not as mature as an Oracle DB ;-)
- Isolate operational tenant loads with their own Dedicated Impala Resource Pool
  - “Dedicated SQL Queue” added to platform service portfolio
  - Chargeable platform feature (as its dedicated resource)
- Tuning Impala Daemons
  - Query Executor & Scanner Threads for MAX concurrency, shortest que
- HDFS Caching
  - Currently in test, expecting a 2-5x speed up, more importantly eliminates unnecessary physical I/O (these are hot tables keep them in memory)
Conclusions after months in production….

- Spark 1.6 very stable
- Impala requires a lot of tuning & table design to get working
- High demand to use the data for other customer experience work
- This solution runs on a multi-tenant cluster running hundreds of batch loads, and dozens of ad-hoc self-service analytics and data science users
  - i.e. the isolation using cgroups seems to work (mostly)
- Next Steps
  - Another similar data pipeline from internal network
  - Multi-tenant Kafka (Topic as a Service) to service more clients
  - Second Data centre Site with dual ingest for high availability
How BT delivers better broadband and TV using Spark and Kafka

Phillip Radley (BT)
12:05-12:45 Wednesday. 23 May 2018

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Thank you ☺

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