High Speed Video and Image Processing

On Oracle Big Data Platform

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Safe Harbor Statement

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Growing Volumes of Video and Image Data

- Drones
- Surveillance cameras
- Stock images
- Corporate archives
- License plates
Some Challenges

• Large volumes of data (addressing scale)

• Diversity in types of video/image processing

• Moving video data across the network (out of the scope of this presentation)
Video and Image Processing
• Face recognition
• License plate identification
• Fingerprint matching
• Optical character recognition
• Specialized processing

Input

Identified faces, license plate text, matching timestamps, etc

Input

6x compute power

Identified faces, timestamps, individual frames
Scale-out Capability of Apache Hadoop

18x compute power on Oracle Big Data Appliance
Multimedia Analytics Framework

• Enables processing of video and image data in Hadoop

• Leverages Hadoop parallelism for high speed processing
  – Ships with OpenCV (www.opencv.org)
  – Integrate third party software into framework

• Massive storage and InfiniBand network of Oracle Big Data Appliance enables processing and management of petabytes of multimedia data

Part of Oracle Big Data Spatial and Graph
Multimedia Analysis Framework

How it Works

Input

Split

Process

Output

HDFS

JSON or CSV or image with labels, timestamp in video
Multimedia Analytics Framework

Benefits

• Faster video processing
  – Processing massive video/image volumes ideal for Hadoop architecture

• Extensible framework
  – Use with a variety of third party video/image processing engines

• Use framework without specialized Hadoop skills
  – Gain Hadoop scalability without Hadoop-specific management and programming skills

• Integrate video/image processing with Big Data applications
Integrate with Video/Image Processing Technology

Display/visualize

Oracle Analytics products

Hadoop APIs for data ingest

Partnership module

Hadoop platform
Demo

Face Recognition with OpenCV
Integrate with Video/Image Processing Technology

Hadoop APIs for data ingest

Display/visualize

Oracle Analytics products

Face Recognition with OpenCV

Hadoop platform

Oracle
Partner
Part of Oracle Big Data Cloud Service

Big Data Cloud Service
(Includes Big Data Spatial and Graph, Multimedia Analytics Framework)
Building Applications
License Plate Recognition
Integrate with Video/Image Processing Technology

Hadoop APIs for data ingest

Display/visualize

Oracle Analytics products

Hadoop platform

License Plate Recognition
Number Plate Demonstration Overview

Captured Images
Number Plates

Big Data Lite VM with
Oracle Spatial & Graph & license plate recognition

Exploration (Citizen Data Science) via
Big Data Discovery

Oracle DB 11G

11G Database
Number plate fact & customer fact data to
‘Detect & Act’ on fines

Send Email to recipient if
‘number plate matches fine’

Oracle SQL Developer
DB Queries
Optical Character Recognition

With Apache Tesseract
Integrate with Video/Image Processing Technology

Hadoop APIs for data ingest

Display/visualize

Oracle Analytics products

Hadoop platform

Apache Tesseract

Partner

Oracle
Partnership with Griaule
Griaule Biometrics S/A

- Specialized in software for large scale biometric identification systems (Big Data Biometrics)
- Provides technology for Systems Integrators who provide solutions to the end customer
- 15 years researching biometrics, with over 20 certifications (FBI, NIST, FVC, etc.)
- Largest ABIS in the world using fingerprint as primary technology for deduplication
- Multimodal fingerprint, face and voice technologies
Architecture

- Easily integrated
- Plan to integrate with all Griaule’s identification systems (facial, voice, fingerprint and more)
- Full access to Griaule’s intelligence systems
Demo

“What's Brightest in America

Griaule face recognition with Multimedia Analytics framework in Oracle Big Data Spatial and Graph
Roadmap

- Real-time analysis of streaming video
- Spark streaming integration
Summary

• Multimedia Analytics Frameworks enables fast video and image processing in Hadoop

• Extensibility API for third party software integration enables many different types of processing

• Video and image data can be analyzed along side other Big Data types
Integrated Cloud
Applications & Platform Services