Create personalized customer experiences with the help of Big Data processing and machine learning on AWS

Philipp Behre, Solutions Architect, Amazon Web Services

September, 2016
Agenda

• Gain deeper insights into customer behavior and preferences
• React near real-time on customer activities and insights
• Build smart applications that personalize interactions with customers near real-time
Three types of data-driven decision making

Retrospective analysis and reporting

Amazon Redshift
Amazon RDS
Amazon S3
Amazon EMR
Three types of data-driven decision making

Retrospective analysis and reporting
- Amazon Redshift,
- Amazon RDS
- Amazon S3
- Amazon EMR

Here and now real-time processing and dashboards
- Amazon Kinesis
- Amazon EC2
- AWS Lambda
Three types of data-driven decision making

Retrospective analysis and reporting
- Amazon Redshift
- Amazon RDS
- Amazon S3
- Amazon EMR

Here and now real-time processing and dashboards
- Amazon Kinesis
- Amazon EC2
- AWS Lambda

Predictions to enable smart applications
- Amazon Machine Learning
AWS Big Data Analytics

AWS provides the broadest platform for big data analytics in the market today.
Most Data today is Produced Continuously

Just a few examples ...

Mobile Apps

Web Clickstream

Application Logs

The Diminishing Value of Data

Recent data is highly valuable
- If you act on it in time
- Perishable Insights (M. Gualtieri, Forrester)

Old + Recent data is more valuable
- If you have the means to combine them
### Streaming data scenarios across segments

<table>
<thead>
<tr>
<th>Scenarios</th>
<th>Accelerated Ingest-Transform-Load</th>
<th>Continual Metrics Generation</th>
<th>Responsive Data Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Types</td>
<td>IT logs, applications logs, social media / clickstreams, sensor or device data, market data</td>
<td>Advertising metrics like coverage, yield, conversion</td>
<td>Analytics on user engagement with ads, optimized bid / buy engines</td>
</tr>
<tr>
<td>Ad/ Marketing Tech</td>
<td>Publisher, bidder data aggregation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consumer Engagement</td>
<td>Online customer engagement data aggregation</td>
<td>Consumer engagement metrics like page views, CTR</td>
<td>Clickstream analytics, recommendation engines</td>
</tr>
<tr>
<td>IoT</td>
<td>Sensor, device telemetry data ingestion</td>
<td>IT operational metrics dashboards</td>
<td>Sensor operational intelligence, alerts, and notifications</td>
</tr>
<tr>
<td>Gaming</td>
<td>Online customer engagement data aggregation</td>
<td>Consumer engagement metrics for level success, transition rates, CTR</td>
<td>Clickstream analytics, leaderboard generation, player-skill match engines</td>
</tr>
</tbody>
</table>
Collect and Analyze
– retrospective understanding and decision making
Continuously stream and collect data

**Zero administration:** Capture and deliver streaming data to Amazon S3, Redshift, Elasticsearch w/o writing an app or managing infrastructure.

**Direct-to-data store integration:** Batch, compress, and encrypt streaming data for delivery in as little as 60 seconds.

**Seamless elasticity:** Seamlessly scales to match data throughput w/o intervention.
Generate time series analytics

- Compute key performance indicators over time windows
- Combine with historical data in Amazon S3 or Redshift
Process near real-time
– understand here-and-now and make static decision
Expose streaming data for processing

Send clickstream data to Kinesis Streams
Kinesis Streams stores and exposes clickstream data for processing
Custom application built on Kinesis Client Library makes real-time content recommendations
Readers see personalized content suggestions

Easy administration: Create a stream and set capacity levels. Scale to match your data throughput rate & volume.

Build real-time applications: Process streaming data w/ Kinesis Client Library (KCL), Apache Spark/Storm, AWS Lambda,...

Low cost: Cost-efficient for workloads of any scale.
Analyze data directly in the stream

Apply SQL on streams: Easily connect to a Kinesis Stream or Firehose Delivery Stream and apply SQL skills.

Build real-time applications: Perform continual processing on streaming big data with sub-second processing latencies.

Easy Scalability: Elastically scales to match data throughput.
Feed real-time dashboards

• Validate and transform raw data, and then process to calculate meaningful statistics
• Send processed data downstream for visualization in BI and visualization services
Create real-time alarms and notifications

- Build sequences of events from the stream like user sessions in a clickstream or app behavior through logs
- Identify events (or a series of events) of interest and react to the data through alarms and notifications
Taking the next step
Predicting user behavior helps in delivering personalized experiences for users
Machine learning and smart applications

Machine learning is the technology that automatically finds patterns in your data and uses them to make predictions for new data points as they become available.

Your data + machine learning = smart applications
Deliver personalized experiences based with smart applications

Build real-time predictive applications: Perform continual processing on streaming big data with sub-second processing latencies and predict outcomes

Personalized experiences: Integrate predicted result and automate decisions to create a personal interaction/response with individual users near-real time
Analyze and predict real-time and personalize customer experiences

- Build sequences of events from the stream, like user sessions and behavior, in a clickstream or app and get predictive suggestions
- Deliver content based on predicted ‘best fit’ to create a personalized user experience
Summary

• AWS provides a broad, deep and proven portfolio for processing big data
• Dedicated services allow fast and easy configuration of real-time analysis and interaction scenarios
• Build smart applications, predicting user behavior with machine learning and create personalized experiences

Start building today!!
Thank you! Do you have Questions?