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GAIN INTERNET OF THINGS INSIGHT FROM MACHINE LEARNING WITH SAP AND RED HAT

TECHNOLOGY BRIEF

Extracting valuable data to create predictive models and gain insight into real-world events and processes requires machine learning.

INTRODUCTION

Across industries, Internet of Things (IoT) devices collect massive volumes of detailed data about their characteristics and operating conditions. The data from each device can be compared with a large dataset collected from similar devices, or things. However, extracting valuable data to create predictive models and gain insight into real-world events and processes requires machine learning.

Red Hat and SAP have collaborated to create a solution for using machine learning to analyze IoT data. This partner solution brief includes an overview of this solution applied to TrackMan, a golf analysis tool for professional players.

MACHINE LEARNING AND THE INTERNET OF THINGS

IoT and machine learning can support many real-world use cases across industries. For example, Positive Train Control takes advantage of IoT data to automatically stop a train before certain accidents occur, improving the safety of passenger trains. For industrial and transportation use cases, predictive maintenance can be performed by analyzing detailed equipment operating characteristics and comparing them with large datasets of operational and maintenance data. Vital signs and medical history for a stroke patient might be compared against large, anonymized patient datasets to provide life-saving treatment. In retail, point-of-sale (POS) transactions can be flagged as fraudulent in real time using machine learning on customer history and the latest fraud patterns.

Red Hat and SAP offer a flexible architecture to meet the demands of IoT use cases across industries. Red Hat® JBoss® Fuse is a lightweight, flexible platform that integrates the diverse data types and messaging capabilities of the many IoT device protocols. Organizations can then collect, analyze, and act on this data by applying business rules using Red Hat JBoss BRMS. With JBoss BRMS, data can be filtered or summarized before being stored or used to initiate action at the edge—for example, by sending alerts if values from an IoT device reach certain predetermined thresholds. To support these software solutions, Red Hat provides rigorous security for IoT data at every level, from operating system to messaging infrastructure.

Used with Red Hat's enterprise software, SAP® technology can further enhance your IoT data capabilities. SAP SQL Anywhere, a lightweight and flexible database, stores IoT data at the edge based on the desired use case and environment connectivity. Data can then be transmitted to SAP Cloud Platform using SAP Landscape Transformation (SLT) replication server or SAP Cloud Platform Smart Data Integration (SDI). SAP Leonardo Machine Learning—built into SAP Cloud Platform—provides embedded machine learning capabilities for advanced analytics.

LEARN MORE:

- Red Hat JBoss Fuse
  redhat.com/fuse
- Red Hat JBoss BRMS
  redhat.com/BRMS
- Apache Camel
  camel.apache.org
- Eclipse Kura
  eclipse.org/kura
- SAP Leonardo
  sap.com/leonardo
- SAP HANA
  sap.com/hana
- SAP Cloud Platform
  cloudplatform.sap.com
- SAP SQL Anywhere
  sap.com/products/sql-anywhere.html
- TrackMan
  trackmangolf.com

IOT MACHINE LEARNING EXAMPLE: TRACKMAN

TrackMan, an analysis tool for professional golfers, uses specialized radar to capture more than 25 data points about a golf club and ball—such as the club angle and speed of a swing, ball speed, and distance. An individual player's data can be compared with the data of the top golfers to help the player improve their swing.

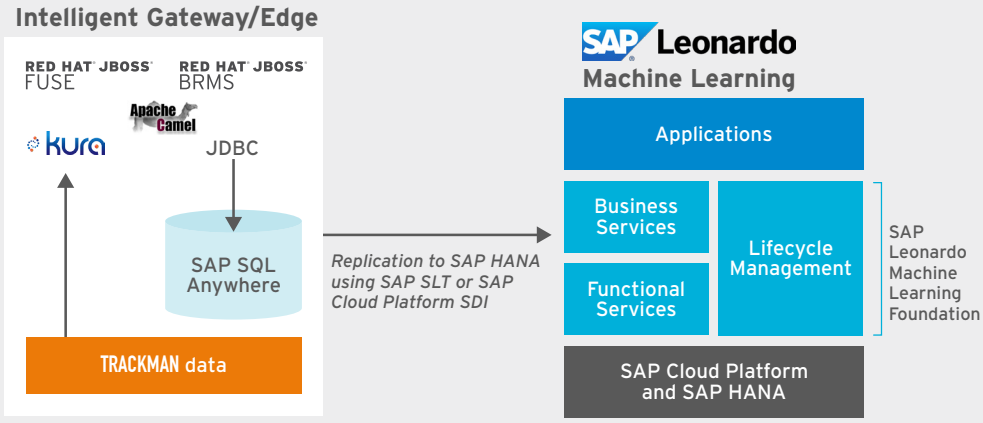


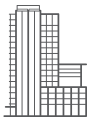
Figure 1. Red Hat and SAP Trackman architecture overview

At an equipped golf course, TrackMan radar monitors send data in JavaScript Object Notation (JSON) format to an intelligent IoT gateway using the WebSockets application programming interface (API).

The IoT gateway runs Red Hat JBoss Fuse through integration with Eclipse Kura, an open source Java™-based framework. JBoss Fuse includes Apache Camel, an enterprise message routing framework that offers connectors for many device protocols—such as Java Message Service (JMS), representational state transfer (REST), constrained application protocol (CoAP), Advanced Message Queuing Protocol (AMQP), and MQTT.

JBoss Fuse subscribes to TrackMan messages using the Camel Kura component. Business rules can then be applied using JBoss BRMS to filter those messages. Next, Camel's Java Database Connectivity (JDBC) component formats the messages and inserts them into SAP SQL Anywhere for persistence at the edge.

The individual golfer's data is then transmitted from SAP SQL Anywhere to SAP HANA running on SAP Cloud Platform using SAP SLT replication Services or SAP Cloud Platform SDI. SAP Leonardo Machine Learning compares the characteristics of the player's performance with large TrackMan datasets—information on millions of shots collected over several years. Using predictive or corrective analytics, SAP Leonardo creates a tailored training plan to help that player improve.



ABOUT RED HAT

Red Hat is the world's leading provider of open source software solutions, using a community-powered approach to provide reliable and high-performing cloud, Linux, middleware, storage, and virtualization technologies. Red Hat also offers award-winning support, training, and consulting services. As a connective hub in a global network of enterprises, partners, and open source communities, Red Hat helps create relevant, innovative technologies that liberate resources for growth and prepare customers for the future of IT.

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Red Hat and SAP offer proven enterprise technology and professional services to help you take advantage of powerful machine learning capabilities and gain insight into your IoT data.

To learn more, email sap@redhat.com or visit redhat.com/sap.

ABOUT SAP

As market leader in enterprise application software, SAP (NYSE: SAP) helps companies of all sizes and industries run better. From back office to boardroom, warehouse to storefront, desktop to mobile device, SAP empowers people and organizations to work together more efficiently and use business insight more effectively to stay ahead of the competition. SAP applications and services enable more than 365,000 business and public sector customers to operate profitably, adapt continuously, and grow sustainably.

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