Streaming Analytics for the Internet of Things

Gain real-time insights into streaming Big Data, events, and business processes to monetize IoT initiatives

IoT Analytics Challenges

- Analyzing event streams continuously and incrementally
- Analyzing different types of data in a wide variety of formats
- Providing aggregate and individualized analytics
- Responding to discovered insights using automated processes
- Providing end-users with a picture of current performance, highlighting anomalies and exceptions
- Scalability and high availability for large-scale deployments

Benefits of Streaming Analytics Platform

- Streaming Big Data Analytics using an event-driven architecture
- Distributed and scalable data integration framework to tap into various sources of data and events
- Integrated BPM engine that delivers intelligent, real-time responses
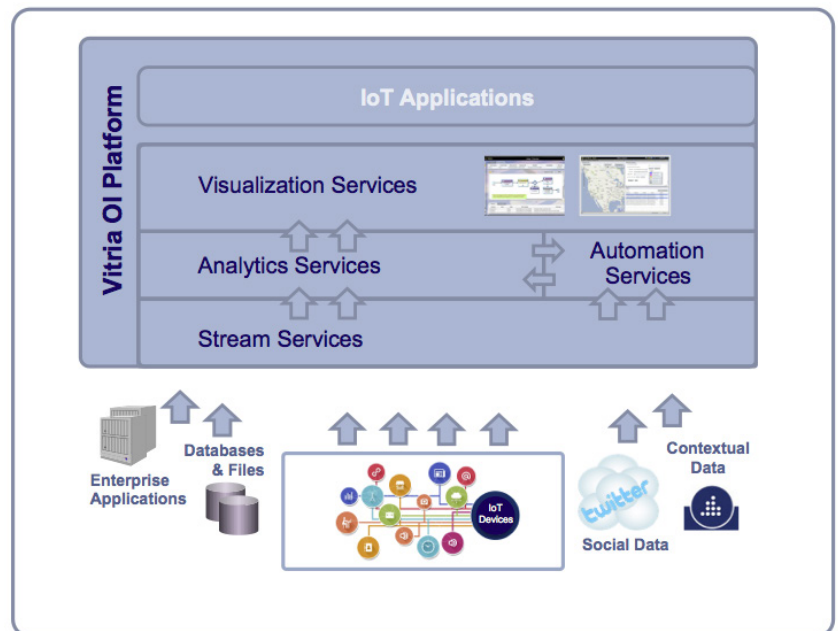- Interactive, role-based dashboards

Vitria Operational Intelligence

Vitria OI analyzes streaming Big Data, events, and business processes, enabling organizations to make informed decisions based on both historical and streaming information to provide a complete operating picture. Vitria OI lets users uncover and analyze actual threats and opportunities from live, streaming data and proactively respond through automated actions.

Vitria OI: The Complete Analytics Platform for IoT

Much of the value from the Internet of Things (IoT) will come from the data, making Big Data analytics a main ingredient for the success of IoT initiatives. The ability to analyze Big Data from enterprise assets and other "things" will be critical for organizations seeking to gain value from IoT initiatives. Organizations must create business value by analyzing Big Data at three levels: for an individual asset, for a network of assets, and for everything (e.g., things, people, systems, and processes), but not without a new set of analytics challenges.

Vitria OI is a unified software platform that brings together capabilities for continuous, real-time analysis of streaming data with the ability to take immediate process-based action on the discovered insights. The major architectural components within Vitria OI that enable streaming analytics for IoT initiatives are shown below:
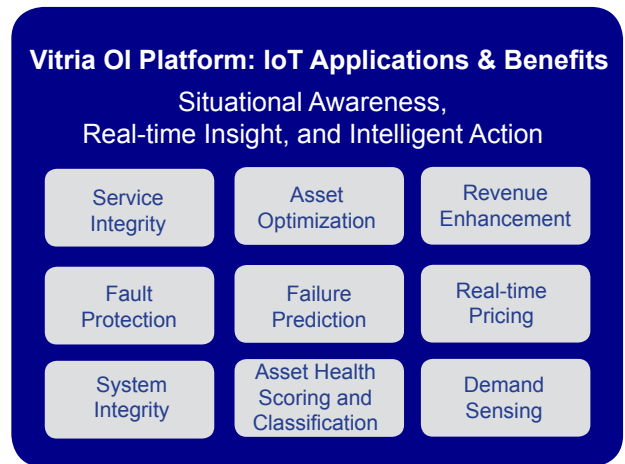

Vitria OI Architecture for Internet of Things

Vitria's Stream Services ingest data from sensor networks using standard IoT protocols. Vitria's Analytics Services filter, correlate, aggregate, enrich, pattern match, and geo-locate the sensor data through a high-performance streaming analytics engine. Automated actions based on policies, processes, and workflows are then kicked-off via the Automation Services. Vitria's Visualization Services provide complete data visibility through live, interactive dashboards. All of this is achieved through a scalable architecture to capitalize on the volume, variety, and velocity of incoming data and events.

IoT Applications and Sample Use Cases

By continuously processing and analyzing streaming IoT data as it is generated, Vitria OI enables organizations to drive improved operational performance and health, better system security, incremental business value, and even new revenue streams. Utilizing advanced analytics techniques based on predictive analytics, prescriptive analytics, and machine learning, Vitria OI powers advanced IoT use cases, including failure prediction, maintenance optimization, asset optimization, and targeted 1-to-1 marketing.

Vitria OI Platform: IoT Applications & Benefits
Situational Awareness, Real-time Insight, and Intelligent Action

Service Integrity	Asset Optimization	Revenue Enhancement
Fault Protection	Failure Prediction	Real-time Pricing
System Integrity	Asset Health Scoring and Classification	Demand Sensing

- **Smart Grid / Meter Monitoring:** The IoT is especially relevant to the Smart Grid since it allows systems to gather and act on energy and power-related information in an automated fashion with the goal to improve efficiency, reliability, economics, sustainability, and most importantly, security of the production and distribution of energy. Using Advanced Metering Infrastructure devices connected to the Internet, energy utilities can support all phases of meter data analytics – from data acquisition to the final provisioning of energy consumption information to utility applications or end customers. Vitria OI helps energy utilities capture and analyze interactions across the Smart Grid in real-time. It combines and correlates consumer profile, SCADA, sensor, and device data to create a 360°-view of the Smart Grid presented through live, role-based dashboards.

- **Smart Buildings, Campuses, & Cities:** Smart cities are urban areas where multiple sectors, such as transportation, public safety, and utilities, must cooperate to achieve sustainable outcomes by sharing their operational data and information, and analyzing this information to develop context-driven services. With an increasing volume and variety of data that an expanding IoT architecture is producing, smart cities will need to implement predictive analytics and machine learning capabilities to enable the extraction of timely information to immediately act. The business impact of a smart city will be driven by the ability to automate and deliver better services to its citizens. Vitria OI brings together capabilities for continuous, real-time analysis of streaming data with the ability to take immediate process-based action on the discovered insights.

- **Asset Tracking for Logistics & Transportation:** Radio frequency identification (RFID) tags use radio frequency waves to automatically transfer data between a tag (i.e., physical asset) and a reader to identify, track, and locate the tagged item in real-time. Major initiatives that use this technology include tracking assets, loss prevention, inventory management, transportation, and logistics. With Vitria OI, retailers and other organizations with a complex global supply chain can continuously monitor their assets and processes to instantaneously detect shortages, overages, or missed shipments, especially when dealing with priority orders.