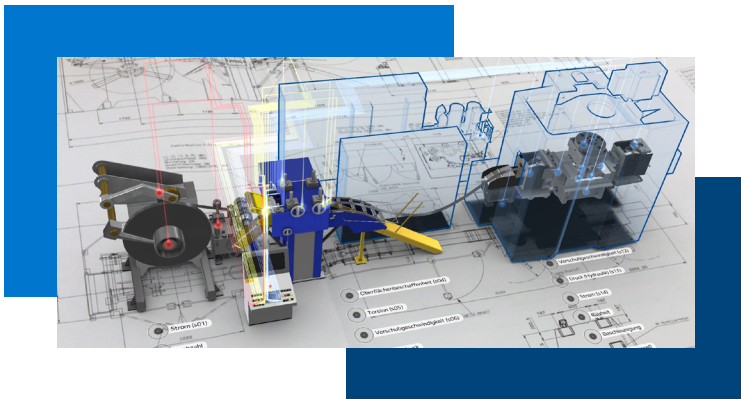


Delivering real time data insights at the industrial edge

The Streaming Data Platform (SDP) delivers real time analytics at the edge to manufacturers



Experts from Dell and WZL implemented the Dell Streaming Data Platform (SDP), an edge computing cluster which is capable of ingesting, storing, and analyzing continuously streaming data in real-time.

Business needs

WZL sought a way to help manufacturers gain insights from real-time production data at the edge. These insights would allow them to adjust processes as required while managing large data volumes and IT infrastructure at scale.

Business results

- SDP ingests, stores and analyses the data — about 80 TB per day — in near real-time
- Enables near real-time analytics and corrective measures in production processes
- Up to 1,000 characteristic values are collected for immediate abnormality detection
- Allows the transfer and repurposing of data pipelines
- Simplifies IT administration and development efforts
- Supports manufacturing process optimization and waste reduction goals

Customer profile

**Laboratory for Machine Tools (WZL)
of RWTH Aachen University**

Public Research | Germany



“Processing everything as a stream, the Streaming Data Platform makes it easy for us to use one processing model to create new analytics pipelines.”

Dr. Daniel Trauth

CDO and Director for Digital Transformation, Laboratory for Machine Tools and Production Engineering, RWTH

Solutions at a glance

- [Dell Streaming Data Platform](#)
- [Dell PowerScale Storage](#)
- [Dell PowerEdge Servers](#)

Capturing massive data volumes in real-time

At The Laboratory for Machine Tools and Production Engineering (WZL) of RWTH Aachen University, research is conducted by scientists, mathematicians, and software developers — all working together to gain new insights from machine, product, and manufacturing data.

As part of WZL's manufacturing processes, fine blanking incubators generate large amounts of data that must first be recorded at the sharp end and processed extremely quickly. Specialized sensors for vibrations, acoustics and other manufacturing conditions can generate more than 1 million data points per second.

Manufacturing data like this is often processed in small, localized batches — but this wasn't enough for WZL's engineers. They wanted a solution that would enable them to implement and use extremely low-latency streaming models without much in-house development.

Ensuring continuous monitoring and optimization

Dell's SDP solution enables WZL to ingest data from all of their machines and hardware into a stream where it can be analyzed at the edge. This allows them to continuously monitor their machinery, identifying anomalies before they can impact the manufacturing process.

With conditions like speed and temperature under constant AI supervision, the machinery is able to automatically adjust itself to prevent any interruptions. By monitoring the machines in this way, WZL have also enhanced their predictive maintenance capabilities.

Through their collaborative implementation of the Streaming Data Platform, WZL now have the ability to monitor, optimize, and drive new value from their production data at the edge.



“We wanted to use high-frequency data to help manufacturers analyse changes in their processes, monitor output and process quality, and make adjustments in real time.”

Philipp Niemietz

Head of Digital Technologies,
Laboratory for Machine Tools and
Production Engineering, RWTH

Rapidly streaming and analyzing data at the edge

With a long-standing relationship with Dell Technologies, WZL knew that the team working on the Streaming Data Platform would be able to help. After participating in its alpha and beta programs, the solution was successfully deployed on-premises and in the cloud.

By connecting Dell Streaming Data Platform to a fine blanking machine, up to 1,000 characteristic values are recorded every 0.4 milliseconds. This data is immediately stored and pre-analyzed in real-time at the edge on PowerEdge servers, enabling further evaluation using AI and ML. These characteristic values leverage huge amounts of streaming image, xray and IoT data to detect and predict abnormalities throughout the metal stamping process. To provide the near-infinite "DVR-like" storage and playback of these varied data types, PowerScale storage was selected to handle the long-term storage needs for the Streaming Data Platform, providing room for years of historical data capture, analysis and time-based ML model development.

About 80 TB of data is generated on the fine blanking line in a 24-hour operation. Although model calculation is very CPU-intensive and time-consuming, it takes place almost instantaneously thanks to the Streaming Data Platform's edge connectivity.

The on-premises system consists of Dell PowerEdge R640 servers with 240 processor cores, 1.563 TB RAM, 3.84 TB SSD memory, 360 TB HDD memory and six Nvidia Tesla GPUs. It also includes an SDP that is optimized to analyse large amounts of data using AI. The platform connects all components and services, all the way from the smart IoT sensor to cloud integration. It also includes a software platform that is optimized to analyze large amounts of data using AI — connecting components and services all the way from the smart IoT sensor to cloud integration.



“No matter how many sensors we use, once we set up the analytics pipeline and the data streams, we don't have to address any load-balancing issues.”

Philipp Niemietz

Head of Digital Technologies,
Laboratory for Machine Tools and
Production Engineering, RWTH

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