

Optimal Plus

Optimal Plus builds a foundation for IIoT analytics and actionable intelligence—and drives manufacturing excellence—with Vertica.



Overview

Production issues are costly in the semiconductor and electronics industries. With its test management and manufacturing intelligence solutions, Optimal Plus helps suppliers improve product quality, yield, throughput, and performance. The company's software also enhances planning and decision making, while unmasking operational risks.

Headquartered in Holon, Israel, Optimal Plus last year processed data on 50 billion ICs and boards, which was up 15 billion year over year. Compared to homegrown data-collection alternatives, the company's holistic software enables seamless visibility across distributed supply chains. Developed for the Industrial Internet of Things (IIoT), the software connects to various plant assets, sensors, and devices to record, store, and analyze continuous streams of data.

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MICHAEL SCHULDENFREI

Chief Technology Officer
Optimal Plus

Challenge

The company's legacy database, Microsoft SQL Server, was adequate for basic operational needs. However, the largest customer was approaching 60 TBs of compressed data (300-400 TBs of uncompressed data), which pushed SQL Server past its limits. The IT team had to decide which data to delete or shorten retention times, limiting the amount of historical information accessible for analytics. In addition to resolving data retention issues, Optimal Plus also sought to improve its predictive algorithms to ensure supreme uptime of plant assets. The company considered EXASOL, ParAccel, and Vertica solutions.

Solution

“We chose Vertica, the market leader in column store compressed databases,” says Michael Schuldenfrei, Chief Technology Officer for Optimal Plus. “Vertica delivers incredible performance on structured data and can scale effectively to meet our future requirements. We found it to be the most enterprise-ready solution.”

During tests, Schuldenfrei and Alon Malki, the company's Chief Architect, saw that they could load and process data in the database at speeds which were significantly faster than with their legacy database.

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At a Glance

■ Industry

Software Technology

■ Location

Holon, Israel

■ Challenge

Improve the delivery of time-sensitive data and analytics of semiconductor/electronics manufacturing data

■ Solution

Integrate a scalable, high-performance data analytics engine with the company's solutions

■ Results

- + Aids collection, organization, and storage of data from 50 billion semiconductors and printed circuit boards a year
- + Outpaces indexing, granularity, and query response times vs. legacy database—analytics on 2 billion data points done in less than a minute
- + Runs a performance demo in 2.5 minutes against 200,000 equipment test results
- + Fosters uptime of plant assets by enabling models of historical data vs. streaming data and algorithms that predict equipment faults

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MICHAEL SCHULDENFREI

Chief Technology Officer

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volumes of data,” Schuldenfrei asserts. “This helps accelerate the speed of decisions and analytical insight.”

Regarding the solution’s fast query speeds, Schuldenfrei explains, “We can answer every query in scales that we couldn’t before. A million data points would take 30 seconds in SQL and processing a billion would take forever. We calculated 17 different statistical functions on 2 billion data points in less than a minute, which is faster than our previous system would have taken or any other system I’m aware of would have taken just to retrieve the data.”

Results

Optimal Plus is now able to run analytics which would have never completed execution in SQL Server, according to Malki.

“We’ve removed the limitations we had before with the amount of data we could store and the size of queries we can do for customers,” Malki says.

Optimal Plus addressed its scalability requirements, as Vertica uses commodity servers instead of expensive, specialized brands. That will make horizontal scalability cost efficient and practically endless. Additionally, the high compression rate of Vertica can generate significant savings.

“The compression rate is so good in Vertica that databases are much smaller than the real data you inject into them. That can lead to significant savings in hardware and licensing costs,” Schuldenfrei says.

Using Vertica, Optimal Plus can compare historical data with almost-instant test information to predict faults and prevent downtime. Optimal Plus analysts create historical baselines, form models from the history, and launch the models into customer facilities to receive actionable insights.

Malki notes that 95% of customer data resides in Vertica, which functions as an index on top of Hadoop software. “We’ve successfully piloted the combined Vertica-Hadoop solution for a customer,” Malki says. “We’ll drive this out fully over the next couple of months.”

The company plans to create a “hot” environment by storing recent data for fast ad hoc queries. Older data will be stored in a “cold” environment, utilizing Hadoop for longer retention. “This arrangement will leverage Vertica’s ability to query data off Hadoop, which it does extremely well,” Malki says.

In production environments where errors can cause profit loss, Optimal Plus customers are enjoying prompt analytics with a solution that integrates numerous data islands.

“Companies demand that analytical tools integrate with their ecosystems and we deliver that. We’re delighted with the platform and Vertica team. They’ve supported us each step of the way,” Schuldenfrei concludes.

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