



News release

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CelsiusPro has implemented new cutting-edge architecture for big data processing

CelsiusPro has further expanded its position as a leading insurtech company by developing and implementing the most advanced architecture and technology platform for event-based stream processing of global environmental data.

The Swiss insurtech company CelsiusPro specializes in providing parametric insurance solutions and advisory services to mitigate the risks of adverse weather and natural disasters. Environmental data is the key element to unlock the index-based insurance market for weather and NatCat perils. CelsiusPro's data base contains all relevant climate data worldwide, and in order to calculate the required metrics, big data is needed. To retrieve and handle the mass of data in an optimal and efficient way, CelsiusPro has developed a new high-tech data architecture platform. The key steps have been successfully implemented, further optimization is ongoing.

The core modules of CelsiusPro's proprietary technology platform are the state-of-the-art big data architecture, the in-house data base, the fully digitized White Label Platform (WLP), and the web-based Environmental Monitoring System (EMS). This system provides access to over 30 different regional and global data sets, covering more than 20 meteorological and environmental parameters such as precipitation, earthquake, tropical cyclone, vegetations indices and wildfires. Currently, CelsiusPro is loading more than 180 million new datapoints into their data base every day – and the number of regions and parameters observed is continuously increasing, which will allow their clients even faster access to key data worldwide.

The data is used in CelsiusPro's EMS for real-time climate monitoring. Large datasets can be accessed for interpretation and risk analysis, the visualization of climate, vegetation and NatCat data, as well as for the detection of tropical cyclone paths, anomalies, vegetation deficits, and more. The EMS is a powerful tool for decision-making and also allows its users, such as insurers, brokers, corporations, financial institutions, governments and NGOs, to create automated reports and alerts.

Sebastian Glink, Director Business Development & Technology at CelsiusPro, explains: «We have designed and implemented an optimized and scalable *Big Data Lambda Architecture* for the entire data processing. The fundamental change to the previous architecture is the switch to event-based

stream processing, created on a series of data points using a cloud-based *Kafka Cluster* as a central data hub.» This hub is designed to store and process data streams and to provide an interface for loading and exporting data streams to third-party systems. A data lake consisting mainly of the NoSQL database program *MongoDB* is used to host the data in the cloud; common tasks for the access, transformation, analysis, aggregation or calculation of the data have been migrated to micro services using *Docker* as technology, making it easier to create, deploy, and run applications by using containers.

Multiple applications can access the data stream real-time, the dockerized micro services are connected via application programming interfaces (APIs) and can be put together individually as required by different business needs. The technology stack CelsiusPro is using for this architecture is highly sophisticated and specialized, also employed by the world's leading big data companies such as Google, Netflix, LinkedIn or PayPal.

CelsiusPro's technological set up is highly flexible and scalable – thereby confirming the company's leading position as a cutting-edge insurtech company. The users benefit from very quick access to the entire data collection for further analysis. Also, the data is not only used in EMS, but also in CelsiusPro's White Label Platform by insurance clients around the world for pricing and settlement of parametric insurance products.

About CelsiusPro:

CelsiusPro is a Swiss insurtech company, specialized in providing technology to structure, execute and administer parametric solutions mitigating the financial impact of adverse weather, climate change and natural catastrophes for more than ten years. CelsiusPro's White Label Platform is highly scalable across various geographical regions, perils, products, insurers and re-insurers. The systematic but flexible approach covers globally tropical cyclones, earthquakes, yield and weather products and allows CelsiusPro to roll out parametric Nat Cat, climate and agriculture insurance schemes with low additional effort and short implementation time. CelsiusPro's consulting services include feasibility studies, product design, insurance scheme design, individual risk assessments, process digitalization and education services.

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