



**Metso
Halves Project
Development Time
with Skkynet's
IIoT Solution**



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Metso has recently completed a large Advanced Process Control (APC) project in half the typical time, and at substantially reduced cost, by using real-time IIoT from Skkynet. With Skkynet's SkkyHub™ real-time cloud, they were able to execute most of the project from their head office in France, despite the physical process being in the Middle East. By leveraging the real-time data collection and distribution in SkkyHub they had multiple engineers working in parallel on GUI, sensor and data modeling and analysis—all using an exact replica of the live plant. As the project progressed, the insights gained by the engineers allowed them to suggest improvements to the control system beyond the original project goals. Upon completion of the project, Metso's engineers can keep the

replica of the customer's control system and GUI in their office in France. At a moment's notice they can switch on the data flow through SkkyHub to have an instant real-time view of the process. Even with 25,000 active tags, the maintenance and analysis team experiences sub-second updates and interaction similar to being on site.

By using SkkyHub, Metso cut their project time by 50%, and exceeded customer expectations by meeting tight deadlines and providing top-level expertise throughout the duration of the project. In addition, they have established a means to conduct ongoing remote maintenance, and expand into big-data analytics, for continuous process improvement. This work flow and outcome demonstrates the true potential of the IIoT.

Background

Several years ago, executives and developers at Metso were looking for a full-featured, web-based HMI that they could integrate into their OCS-4D© product. OCS-4D© is an advanced process control expert system tailored to the needs of the mining industry, and is used in mineral processing plants to monitor and control crushing, grinding, flotation, dewatering, pyro metallurgy, and related tasks. The HMI they had been using was no longer suitable, and they found that SkkyNet's DataHub® with its WebView™ HMI met their needs well. Metso and SkkyNet reached an OEM agreement in which the DataHub was integrated into the OCS-4D© product, and renamed "OCS-4D© DataLink".

Last year Metso won a contract to implement a processing system for a large ore processing operation located in the Middle East. The timeline was short, as the customer needed a complete system up and running in 6 months, a job that would normally take at least a year. Meeting this deadline would require three of Metso's top developers working full time on the project. These developers were based at the company's home office in France, and for reasons of cost and convenience, the company was reluctant to send their people abroad for 6 months. So they turned to SkkyNet for a solution, and implemented the SkkyHub service as a way to connect to OCS-4D© DataLink, allowing them to develop and monitor the system remotely.

Implementation Stage 1 - Development

The DCS used for regulatory control of the ore processing system exposed 80,000 variables as OPC tags, through an ABB OPC server. Metso's APC optimization layer required access to about 25,000 of those tags to power both the expert logic in OCS-4D© and the HMI. On a typical project, a Metso developer working locally would then simply connect directly to the data. Instead, to get the live data to the office in France, they configured OCS-4D© DataLink at the customer location to make a secure, outbound tunnelling connection to SkkyHub. In the Metso offices, the development team made a similar, secure outbound connection from their local copy of OCS-4D©

DataLink to receive the live data, in real time, and feed it to their OCS-4D© system. The result was an exact replica of the entire customer system, mirrored and tunnelled from the mine in the Middle East to the office in Olivet, France, updating continuously in real time.

With the complete project data set at their disposal, the three developers could get to work. Because the data was available through SkkyHub, they each had a full copy of the live data. Unlike a typical project, where developers have to take turns using the system data, this unique arrangement allowed each of them to work independently on their part of the project. One worked on the expert system logic, another on visualization, while the third focused on sensors and data modelling for the other two.

"It was really a nice fit because we had not been able to do parallel development before," said Fred Theodore, Senior Engineer, Advanced Process Control, and lead developer. "Normally we have OCS-4D© running, but two people cannot be connected at the same time, and can't develop their applications simultaneously on the same computer. The fact that the real-time data source was available to several people at the same time was a real benefit."

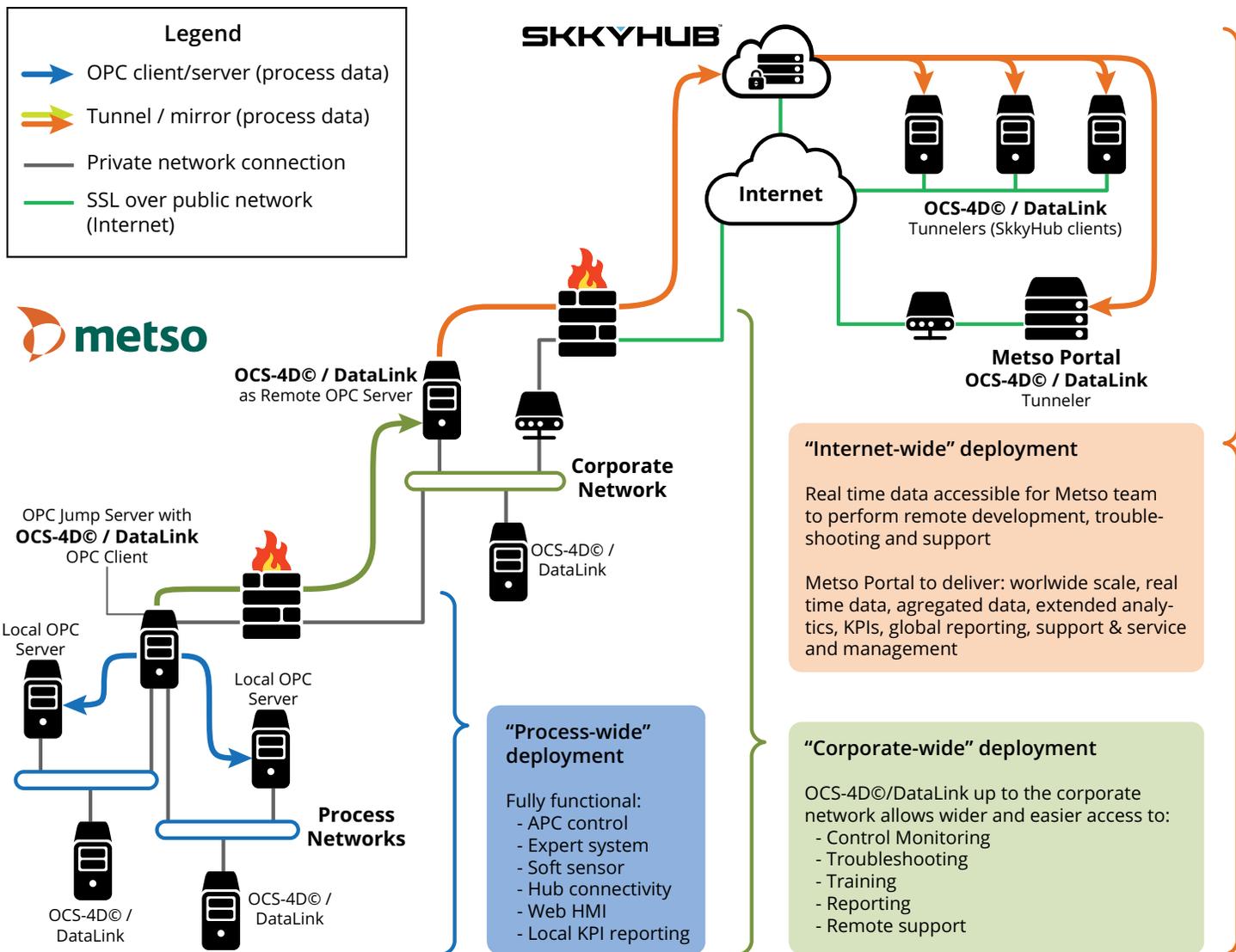
The connection between OCS-4D© and SkkyHub supports secure, bi-directional data flow, allowing authorized personnel to write data back to the system. However, because this level of technology was still new to the client, they requested that the connection be configured as read-only. Using the bi-directional capability of the system would have facilitated and sped up the development process even more, but the Metso team was able to get along without it reasonably well.

Implementation Stage 2-Deployment and Monitoring

For the initial test deployment, the system was delivered to the customer by one team member who travelled to the Middle East and worked on-site for a couple of weeks. During that time, and for the ensuing months, the team back in France used a cloned copy of the system to continually monitor the logic and ensure that everything worked properly, while the customer's staff learned how to use the application.



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“It was as if we were sitting beside them in the control room,” said Theodore, “and through live monitoring, we were able to continue developing the application, thanks to the real-time connectivity. In fact, I was travelling at the time, and was able to continue my work, uninterrupted, from the USA and Africa, as well as from our home office in France.”

“This approach is very flexible,” Theodore continued, “because at any point we could tell the client, ‘This loop is not performing the way we like it, could we investigate it with you?’ Maybe it would be a kind of secondary process loop that we could test here while something else was happening on the real system. Sometimes nobody had even asked us to develop anything, but we got an idea, something completely out of scope. As long as the data was coming in, we had the ability to test the idea, evaluate performance, and then contact the client, saying, ‘Here are some things we should do.’ The client would be surprised, because we hadn’t even come on site.”

These updates and improvements were all included with the final delivery of the system, which was turned over to local staff for normal operation and routine maintenance. Since the final sign-off, the data connection between OCS-4D@ DataLink and SkkyHub has been deactivated, but it is still configured. It can be reactivated at any time, whenever an authorized Metso team needs it to provide service or support. Through this secure, outbound tunnel to SkkyHub, the developers can see what is happening in real time, monitor the logic, and efficiently interact with the system, as necessary.

Performance of the newly-installed APC system was measured by turning it on and off, and the results indicated that running OCS-4D@ showed an efficiency gain of up to 10% in almost all areas of the mineral processing system. “We did so well because we were able to process the live data through SkkyHub longer than on any previous project,” said Theodore. “It had been a challenge to get this level of performance in such a short period of time, and we succeeded, thanks to the real-time data that was available through OCS-4D@ DataLink (DataHub) and SkkyHub.”



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Future Plans

This Industrial IoT approach to development and implementation of OCS-4D© substantially increased the profitability of this project compared to other, similar projects. Metso is planning to implement it again soon, in such far-flung places as Peru and Indonesia. As Theodore explains, "We have local people at these sites, but not many, and they are busy with other projects as well. There are several ways we can help them using this kind of connection, because we can schedule a time and connect by the Internet from almost anywhere. To optimize our resources of time and manpower, it is better to connect people remotely, from the US or France, for example, and let them work with the local people."

"For the next stage," he continued, "we don't want to lose the data in the system, but rather use SkkyHub to make the connection to Big Data for analytics. We'd like to record as much as possible, so we can compare between sites, optimize performance, and do some kind of benchmarking. We want to be able to ring up the customer and say, for example, 'You have the system installed, running at this percent, while we know that at other plants with the same configuration, it is running better.' And of course there is the value of aggregating information. This information is crucial as we supply services and spare parts. We need to know the condition of the system at every point in time."

About OCS-4D©

OCS-4D© is a software solution from Metso used for Advanced Process Control (APC), including embedded expert systems with fuzzy logic, modeling and optimizing modules (MPC), vision and acoustics analysis algorithms—for mineral processing plants (crushing, grinding, flotation, dewatering, pyro metallurgy, etc.).

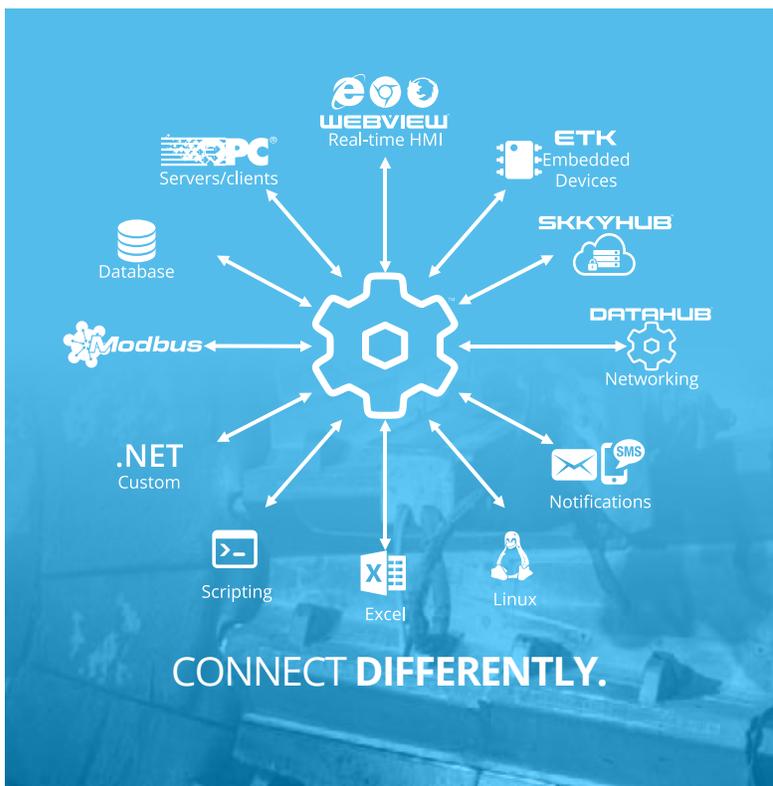
About Metso

Metso is a world leading industrial company serving the mining, aggregates, recycling, oil, gas, pulp, paper and process industries, with products ranging from mining and aggregates processing equipment and systems to industrial valves and controls, providing a broad scope of services and a global network of over 80 service centers and about 6,400 services professionals.

About Skkynet

Skkynet is a global leader in real-time data information systems. Skkynet Connected Systems include the award-winning SkkyHub™ cloud service that collects, processes, and distributes real-time information over networks, locally and remotely, as well as DataHub® and WebView™ proven middleware products that enable real-time data integration, distribution and visualization for industrial, embedded, and financial systems. These services and products allow data-intensive organizations to more safely and securely manage, supervise, and control industrial processes (SCADA systems), embedded devices (M2M), and financial information systems, with no programming required.

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