

MAKING DATA WORK SMARTER FOR YOU

Jason Hook outlines how to use Open Platform Communications Unified Architecture and Amazon Web Services to connect to industrial devices in order to control plant processes and benefit from real-time data analysis



Jason Hook, Senior Project Manager at Global Graphics Software

We are all interested in optimising what we do. We want to design better products, improve quality, get more from our existing investments, be faster, more reliable, safer, and potentially more profitable. But where might the insights that drive these improvements come from?

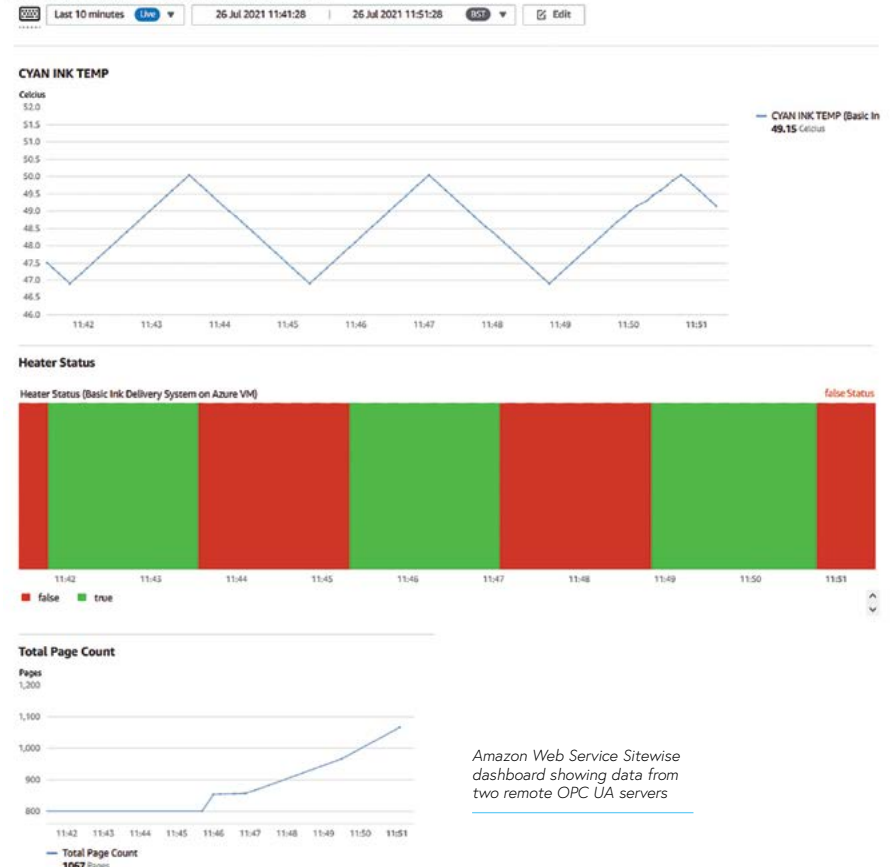
If you have industrial devices in your factory or plant that can be connected to a network, then it might be from collecting and analysing the data those devices generate. The valves, temperature sensors, motors, vision systems, presses, ink delivery systems and other industrial components you own may already generate data that over time might help you discover valuable patterns or correlations.

CONTROLLING DEVICE COMMUNICATION

But how do many of these devices communicate? There are a small number of options including Open Platform Communications Unified Architecture (OPC UA).¹ If you aren't already familiar with OPC or Amazon's IoT SiteWise² I've included some information at the end of this article but essentially, we can use a secure, distributed client-server framework to create something larger than the sum of its smaller parts.

I recently completed a pilot project to add OPC UA capabilities to our Smart Print Controller (SPC) software product and created

Simulated Cyan Ink Temp and Heater Status



Amazon Web Service SiteWise dashboard showing data from two remote OPC UA servers

a simple simulation of a single Ink Delivery System (IDS) using the OPC Foundation's software development kit.³ SPC can be used by a Press Operator to queue and process documents ready for printing and adapt the configuration of each job to obtain the best

Azure so that it was easily accessible, configured an AWS [Amazon Web Services] Greengrass server to collect the data and created an AWS SiteWise dashboard to display the data.³ Starting with very little knowledge of AWS I built the dashboard

"Industrial devices you own may already generate data that might help you discover valuable patterns or correlations"

results. SPC can be controlled via OPC UA and publishes data about its activities via OPC UA. The IDS simulation publishes data about cyan ink temperature and an accompanying heater which switches on and off in response to upper and lower limits I set.

DATA DISPLAY DASHBOARD

For this project, I needed to demonstrate how these capabilities could be used by a customer already familiar with Amazon's SiteWise product. To do this I installed our software on a Windows virtual machine in

shown in the accompanying image.

There are three graphs from the two data sources. Using the top two graphs I'd tweak the heater settings to keep the temperature closer to a steady 50°C. The graph at the bottom shows SPC printing a number of jobs over time, and this might be useful for revealing how busy the attached press is at various times of the day.

My dashboard can be shared and worked on by colleagues in the business or external customers and they can create their own dashboards from the data I've made available

which includes MYK ink delivery systems.

EASE OF USE

AWS isn't the only way to use OPC data or even the only cloud-based service. Microsoft has been an important contributor and supporter of the OPC Foundation. There are several commercial and free OPC clients that allow you to connect to devices and subscribe to the data they publish. SCADA (Supervisory Control and Data Acquisition) software can be used to monitor, gather and process real-time data as well as control processes in your plant via OPC UA.

One day, in the not-too distant future, I imagine we will see appliances that you will be able to drop into your network and with minimal configuration have the appliance discover your OPC enabled components and start analysing the data for you. The Artificial Intelligence in the appliance might spot correlations between multiple items of data over a period of time that you might only ever spot by accident. We aren't there yet but it is possible with effort to create a tool to help you develop and explore your current environment and the rewards are potentially huge.

BUILDING YOUR OWN AWS SITEWISE

A step-by-step walkthrough of the process of building your own AWS SiteWise instance is a little beyond the scope of this article but all I needed to get started was one or more OPC UA Servers, in this case our SPC and IDS simulation, an Amazon account and a credit card. Quite a lot can be achieved with the free tier you do have to provide credit card information and I incurred some modest costs by the time I created the dashboards. Something like \$12 [£9] a month with an expectation those costs would increase in year two.

I found the AWS documentation a little hit and miss. I knew what I wanted to create, and I found some getting started guides including <https://aws.amazon.com/blogs/iot/introducing-aws-iot-AWS-SiteWise-edge/>. Once I found the right combination of documents it was quite straightforward.

"One day we will see appliances that you will be able to drop into your network and with minimal configuration have the appliance discover your OPC enabled components and start analysing the data for you"

Despite the challenges and within a couple of days I had a useful tool demonstrating the usefulness of OPC UA. In retrospect, if I'd stumbled across the right documentation or the step-by-step blog post I will write for publication on <https://blog.globalgraphics.com> next month then I would have been much quicker! ■

References

- 1 OPC is the interoperability standard for the secure and reliable exchange of data in the industrial automation space and in other industries. <https://opcfoundation.org>
- 2 AWS IoT SiteWise is a managed service that makes it easy to collect, store, organize, and monitor data from industrial equipment at scale to help you make better, data-driven decisions. www.amazon.com
- 3 Global Graphics is a recent member of the OPC Foundation which has more than 750 members across industry and 50 million installations of its software.

Jason Hook is Senior Project Manager at Global Graphics

Further information:

Global Graphics Software, Cambridge, UK
tel: +44 1223 926460
email: Jason.hook@globalgraphics.com
web: www.globalgraphics.com



COLORS MADE FOR LIFE

SCREEN · DIGITAL · PAD

UNLIMITED DESIGNS WITH ORGANIC GLASS INKS

UV-curable and solvent-based.
Setting standards in highest resistance,
metallic effects and utmost productivity.

Packaging Glass · Drinkware · Flat Glass
Touch Panels · Laminated Glass · Interior Glass

Your link to ink: marabu-inks.com

