# *Progress is cumulative for IoT software platform provider*

Bernd Gross is the chief executive of Cumulocity which has emerged as a leading global IoT software platform provider, serving hundreds of customers, with more than 3,000 developers subscribed, and over 1,500 commercial tenants deployed across more than 20 data centres worldwide. Here, Emil Berthelsen, the principal research analyst at Machina Research explores how the company has developed and its future plans

From a small start-up with early designs created in the Mountain View offices of Nokia Siemens Networks in 2010, Cumulocity's ecosystem now includes a wealth of device partners, network and connectivity partners, application partners, system integrators and independent software vendors (ISVs). These partnerships support it in meeting the requirements of enterprises and service providers focused on creating profitable IoT businesses.

The Cumulocity IoT software platform is designed as a ready to use product, with flexible deployment options and open APIs to avoid lock-ins. The platform is a highly scalable solution, based on the principles of multi-tenancy and automation as inherent in efficient IoT operations, and built around a strong ecosystem of partners.

### Anticipating customer needs from the beginning

Scan the IoT platform market in 2016, and the list

of potential providers is almost endless, including numerous new entrants and a handful of early pioneers like Cumulocity. Unlike most of its competitors, Cumulocity began life as a start-up as part of Nokia Siemens Networks, growing to a sizeable 90-employee company before being spun-off by its management team, and establishing its headquarters in Dusseldorf, Germany in 2012. One of its key features, expressed through the company name, is that its early design of an IoT platform was based on a cloud architecture and data at velocity.

With remarkable foresight, Cumulocity chose a parallel design path for its platform, building on the advantages of cloud services which we will return to, and also recognising that enterprises in particular would potentially opt for on-premise or private cloud solutions. Having this dual deployment option became an early advantage for the company.

These enterprise decisions around trusting cloud ▶

services or requiring an on-premise solution emerged time and time again, particularly when enterprises considered the make or buy routes that often formed part of the investments in new and competitive technologies. The management team of Cumulocity had recognised these market requirements, and designed in 2013-14 an IoT application platform structure on three very simple yet highly effective guidelines: scalability, efficiency and open interfaces.

## Scalability as a key feature in IoT

Internet of Things continues to deliver on early predictions as more and more devices become connected to the interwoven networks, and as the number of applications and amount of data continues to grow at exponential rates. These substantial shifts in volumes, far from comparable to any increases seen before, are what makes scalability a premium feature in any robust and competitive IoT application platform. Added to

the scalability challenge is also the multi-dimensionality of what is being scaled – the diversity of devices, applications, protocols and data types. Where perhaps one provider may have built scalability for one particular aspect of IoT, it is the combination of all these factors which ultimately test the features and functions of device management, data management, and application management.

## Efficiency and automation

Enabling scalability in IoT operations cannot be the end goal – the next step for any service provider must be to ensure that the operations themselves are efficient and ultimately fully automated, managing all layers within an IoT application stack. This means making best use of storage and processing capabilities through multi-tenancy infrastructures, building high degrees of automation into the processes themselves to manage operations at this scale ▶

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**Figure 1: Cumulocity's open IoT platform**
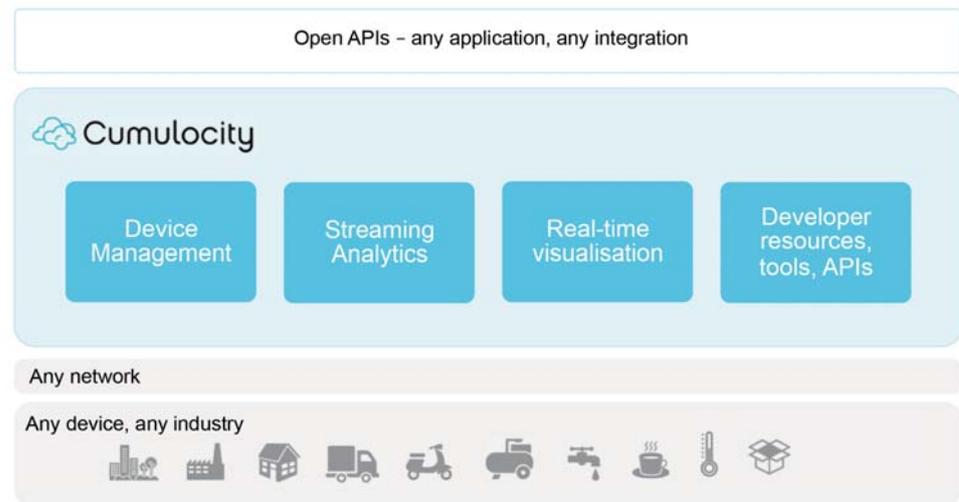


[Source: Cumulocity, 2017]

and speed, and perhaps most of all, ensuring secure and robust operations between device connectors, device managers, analytical tools, storage and processing capabilities, data visualization and integrations. It is the ability to pull together all of these capabilities into one common framework which makes Cumulocity a key IoT application platform contender to consider.
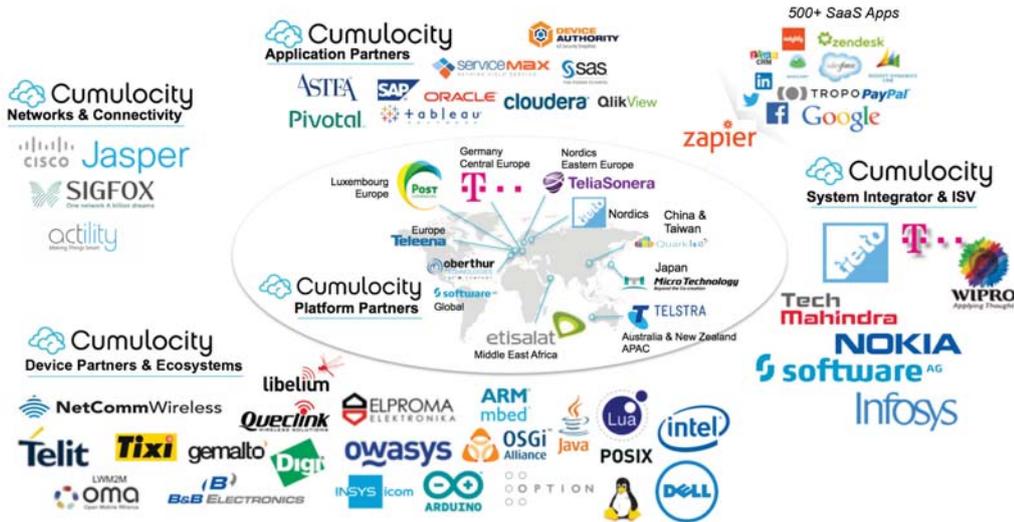
### Keep an open environment through open interfaces

Another important discovery identified by Cumulocity early on in its IoT application platform development was the importance of ecosystems and open environments for the platform. The platform was scalable, efficient and automated. To deliver the real benefits and opportunities in IoT, the stronger platforms would also need to be highly extensible. In other words, platforms had to enable enterprises and service providers to quickly integrate and make full use of other IoT applications provided by other ecosystem partners through open environments or Application Programming Interfaces (APIs). Building these technical capabilities were certainly challenges for Cumulocity, although using cloud infrastructures and data management expertise provided important advantages. **Figure 1** illustrates this extensibility through open application programme interfaces (APIs) and the any network, any device approach.

Another significant contribution Cumulocity

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developed as part of an open environment approach was to create an ecosystem of partners who not only support the business in terms of channel partners but equally important, help build and deliver the wealth and diversity of applications which enrich this entire market for enterprises. This truly global and rich set of partners adds considerable value to the IoT application platform through compelling IoT applications, growing developer communities and ultimately, managed interoperability between various IoT worlds. This diversity and richness of the ecosystem is best illustrated with a view of Cumulocity's growing ecosystem as shown in **Figure 2.**

With these three key features of scalability, efficiency and open interfaces, Cumulocity created a path for enterprises as well as service providers of IoT-enablement based on Platforms-as-a-Service (PaaS) and discrete elements of Software-as-a-Service (SaaS) such as the additional functionality available for device management. This additional functionality included, for example, automation on activating devices and identifying signal issues. Given the criticality for some IoT applications of consistent and resilient transfer of data to ensure timely billing, ensuring that devices were connected with the required signal strength became a fundamental capability of Cumulocity's services. It has to be said that despite the as-a-service deployment option, Cumulocity maintains that it strictly follows a product approach, and looks to enable the simple, efficient and quick deployment of its solution for its customers. ▶

**Figure 2: Cumulocity's ecosystem of partners**



[Source: Cumulocity, 2017]

## Building a global market

From 2015, growth of the company has been the strategic priority. With an improved user interface and greater flexibility in deployment options for enterprises and service providers, including hybrid or edge architectures with distributed rules and abstracted protocols, Cumulocity has steadily built a strong market presence in several countries. It is worked closely with channel partners such as **Deutsche Telekom** – on its Cloud of Things solution – and **Software AG** in Germany, as well as **TeliaSonera** and **Etisalat** in other markets. Dedicated agents in China, India, Japan and Australia have added to these initiatives, and already locally present in seven countries, Cumulocity looks to extend its global footprint to an additional five countries in 2017.

To support these developments, Cumulocity now has agreements with 20 cloud hubs globally, enabling the management of data to be conducted to regional data policy regulations. In addition, Cumulocity shows the openness of its platform in the different cases by, for example, enabling several of the emerging low-power, wide area (LPWA) connectivity technologies including SigFox, Actility, LoRa and NB-IoT. This removes the potential for radio technology vendor lock-in for its enterprise customers.

## Market development

The next 12 months will see a maturing of IoT including the replacement of many early, in-house developed platforms which may not have the attributes of evolved device management, streaming analytics, real-time visualisation and developer resources and tools including APIs. With its platform, and a developing ecosystem of partners, developers and service providers, Cumulocity seeks to add new and innovative micro-services to its horizontal platform to assist customers secure the success of their IoT initiatives. These include data management and monetisation through data service exchanges, and facilitate its partner ecosystem to more freely offer their value-add service components for the platform.

As an early pioneer, Cumulocity continues to lead IoT. From a start-up in 2010, the management team and engineers behind the platform have combined the strengths of the original platform design, scalability and flexibility through cloud and on-premise deployment options with the unique characteristics of IoT markets, that is the diversity of devices and networks to building-in the agility and openness required to extend the platform to new services and applications. The result is a globally recognized and emerging IoT application enablement platform, adopted by a growing community of end user enterprises and service providers and underpinned by a global developer community.

Where does Cumulocity go from here? It continues to hone the development of its IoT application enablement platform from its considerable experience in real-world customer projects to enable enterprises to build their connected businesses upon it, and for service providers to lay the foundations of profitable IoT businesses. ■

**www.cumulocity.com/iotnow**