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# CONNIO TESTS PERFORMANCE OF IOT MANAGEMENT PLATFORM

Connic enables lot solutions and deployment for organizations by integrating data from places, internet objects, apps, and external systems. Connic deployed their IoT platform at CENGN to test the performance and scalability of their solution.

Connio is a British Columbia-based company that specializes in helping organizations leverage the power of the Internet of Things (IoT). They have created an IoT platform that builds intelligent systems to report on information collected from connected objects. Connio collects, manages, and processes the data produced from connected objects like IoT sensors and presents the information in a digestible format allowing organizations to extract the value from their IoT deployments and solutions. The company was founded in 2014 and spent two years on intensive research and development to craft a platform for organizations to improve deployment and management of their IoT offerings.

### MANAGING IOT DATA

The arrival of the IoT wave has created ample opportunity for organizations to implement connected technologies and become more efficient and better informed. IoT technologies allow organizations to interconnect devices and setup sensors to collect mass amounts of data. Several sectors have flourished by embracing IoT for data collection, this is especially the case in the areas of smart agriculture and mining, connected healthcare, and manufacturing. However, before IoT information can be used to make decisions it has to be processed and managed into a palatable format using some sort of data management platform. As the IoT sector continues to grow, it's essential for the systems that manage the information to mature at the same pace as the sensors and devices that produce the data.

### CONNIO PLATFORM

Connio has developed a platform that eases deployment of IoT solutions for device vendors, systems integrators, connected enterprises, and telecom companies. The platform is a data consolidation point and reports on everything that happens from the sensor to application, including:

- Rapid IoT application development and management
- Device management and security
- API management and access control
- Process control for Industrial IoT
- Big data management and custom analytics
- Billing and sub account management

Beyond this, Connio is network and device agnostic meaning that the platform is versatile and can collect, process, and manage data from various systems without any special adaptations. Connio can collect data from not only software but hardware as well. Using digital twin technology, it can process data from sensors embedded in physical equipment to monitor things like wear and tear on machines or bottlenecks in manufacturing processes.



### VALIDATING THE CONNIO PLATFORM ON THE CENGN CLOUD

There were two main objectives for Connio in their CENGN project:

- 1. Determine the optimal cluster set up of their platform.
- Understand the optimum resources that should be allocated for each type of service container. This will allow their clients to get the maximum 2. value from their platform.

To complete their testing, Connio was provided two bare metal servers within a project slice on the CENGN infrastructure. Their platform was deployed using Docker Swarm Mode with nodes installed in Docker containers allowing the distribution of microservices. Traffic was produced by a Gatling traffic generator and sent to a public cloud where client requests were generated before entering the CENGN infrastructure for the Connio platform to collect the data.

Connio completed three types of testing:

- 1. Performance Testing. This allowed Connio to see how guickly their solution can collect, manage, and process data. This was an initial function test within the CENGN infrastructure.
- Horizontal Scalability Testing. The number of nodes were increased to test the optimal traffic distribution and the High Availability (HA) 2. features of the platform.
- 3. Vertical Scalability Testing. The CPU and RAM of each node was changed to measure throughput of requests per second in order to optimize resources per node.



After deploying their solution successfully at CENGN, Connio began sending traffic from Gatling to their solution measuring the number of requests their solution could process per second. Connio ran several test cases experimenting with the system resources of their solution to find what combination of REST, key authority, and device backend delivered the best performance. The different combinations of the cluster were then tested for performance and scalability as the level of traffic, number of nodes, and CPU and RAM of the nodes were increased and decreased.

## **MOVING THEIR SOLUTION FORWARD**

Over the course of their 4-week project on the CENGN infrastructure, Connio was able to use the dedicated project slice to experiment with the performance of their solution. Connio fine-tuned the cluster deployment of their solution and fixed any issues that were uncovered throughout the testing. A simulated customer environment has allowed Connio to understand how their technology performs when operating under high traffic levels. However, the main value is that they now know the optimum resources that should be allocated for different customer scenarios. Connio can now offer their clients more informed configuration suggestions that will reduce the total ownership cost of their large IoT infrastructures.





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