

Case study
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CASE STUDY

The success story of a CNF automation



As digital transformation speeds up, businesses need scalable and resilient cloud-based network solutions for better performance and security.

They also need a vendor who understands and integrates with their unique work culture. This case study demonstrates how JSC Ingenium created an agile, agnostic, and customer-forward solution for one customer.

The customer

JSC Ingenium was approached by a Tier-1 Communications Service Provider (CSP) in the European market. The CSP wished to achieve full network automation using a cloud-native network function (CNF). They set some technical goals and also wanted to establish an ongoing relationship for technological development meeting their organisational needs.

Challenge and goals

The customer asked JSC Ingenium to start with a proof of concept for their cloud consumer telephony application system. They required telephony application services solutions providing a single large-cycle service unified over two separate (fixed/mobile) networks to simplify current and future handling.

Key deliverables included:

- A CNF tailored to their requirements,
- Integration with existing infrastructure,
- Full network automation,
- Reduced container image start-up times/sizes for rapid deployment and minimisation of service disruptions within customer-supported Kubernetes,
- High agility and scalability,
- Clear clarification, capacity testing, and automation able to support their existing CI/CD pipeline,
- Reliability and consistency,
- Safe and secure infrastructure with minimised security risk.

The customer wished to achieve a solution with a minimal developmental cycle. They wanted the solution to be easily pushed from code to a repository. They also aimed to have it tested and deployed within a short period and with zero downtime through automated processes.





JSC Ingenium places great emphasis on customer control. We successfully demonstrated that all artefacts necessary for the CNF could be housed within the customer's repository with full visibility and access to the API base. This enables the customer to support any application within their CNCF environment. They can also deploy as they choose, leaving them with an agnostic, agile, and shiftable end product ready for any CaaS environment.

JSC Ingenium's solution

JSC Ingenium began by evaluating the customer's overall technological and cultural requirements, along with their work environment. We focused on microservices for flexibility, scalability, and easy maintenance, following industry best practices like GitOps, CI/CD methods, and declarative formats. Their independence allows for agility and resilience with minimal disruption on deployment. Once the design environment was created, the customer received a standardised Helm-chart packaging and configuration file for the CNF using containerized blocks that are widely supported.

Automated deployment and testing ensure that software and configuration files are validated automatically, eliminating the need for manual intervention. Then, they are deployed in their area-specific Kubernetes environment. We showcased this solution's capacity to handle diverse workloads and its auto-scalability by comparing expected and actual loads per worker node.

This successfully demonstrated the automated deployment, configuration, and update process for CNFs on their Container as a Service (CaaS) platform, and how application parts can be removed from the cluster. This ensures that deployments are consistent,

repeatable, and less prone to human error, boosting resource management and allowing the customer to manage an application's lifecycle.

To address cybersecurity concerns, we demonstrated that no pod operates in a privileged mode, with logs efficiently directed to Kubernetes via stdout/stderr. Prometheus-compliant metrics data for monitoring and evaluation were used. Data is transmitted to a customer-owned Kafka bus in the desired JSON format and includes both standard monitoring (logging, metrics collection) and advanced functions (tracing and event-driven alerting). Heterogeneous data is collected from system components with minimum latency, ensuring the customer can always access clear information about the system.

A robust versioning system was used. By labelling each build, automated tools can track, manage, and deploy the correct versions of software components. Versioning also allows for easier cross-environment consistency. If issues arise, they are simple to track, greatly increasing reliability. Updates can be deployed rapidly and frequently. It also makes customer-vendor interaction easier and boosts transparency and communication, delivering on the customer's collaborative goal.

Results

The customer was left with not only a holistic solution that met all stated goals but also an agile, agnostic product not locked to proprietary frameworks. Instead, it is easily deployable on their existing infrastructure and portable to new environments.

By making smart use of Helm-charts to achieve their desired end-to-end automation, JSC Ingenium was able to bypass the need for a proprietary controller system. Instead, in the design phase of any new deployment, the customer can simply describe the desired outcome to be handled by machine-based configuration.

While this is common within end-user IT environments, it is a revolutionary introduction to the telco space.

- CNF microservices can be independently scaled for resource efficiency/performance.
- Compartmentalisation improves robustness and uptime.
- One CNF component cannot down the whole system.
- Fast development cycles are achieved through independent deployment.
- There is no vendor lock-in – CI/CD stacks can be chosen to suit CSP needs.
- The solution is agile with risk-reduction built in.

Conclusion

While this was a tier-1 customer, the flexibility and scalability of JSC Ingenium's solution is cost-effective working across a variety of operator sizes. No customer is locked to proprietary frameworks, yet room for growth and easy deployment of desired changes remains. CNF is a key enabler for digital transformation initiatives. It helps organisations stay competitive and supporting DevOps, containerization, cloud-native development, and other modern practices.

Each step of this project delivered a robust, efficient, and secure CNF that addressed their technical needs. It also ensured that cultural nuances were respected and incorporated, ensuring a holistic cloud transformation journey.

This project underscored our ability to understand and cater to the needs of customers in the cloud-native era. We triumphed by integrating technological excellence with a deep understanding of the customer's needs and values.



About JSC Ingenium

JSC Ingenium, drawing from 25 years of expertise, has established a strong presence in telecommunications, specialising in 4G and pioneering 5G network solutions. Their flexibility, innovation, and vision empower communication service providers to seamlessly transition to 5G Core Networks and cloud-native solutions.

Let JSC Ingenium kickstart your digital transformation. Reach out to us today.



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