



NetACE TONAS™

Telecom Operations & Network Automation Solution

Executive Summary

The telecommunications industry is undergoing a major transformation as a result of the rising adoption of 5G networks and the Internet of Things (IoT). This shift has created a pressing demand for network automation and OSS transformation. To stay competitive in the market and meet the evolving needs of the digital age, Telecom Operators and Telecommunication Service Providers (CSPs) are seeking solutions that can support their journey towards the future of digital services. It is crucial for these organizations to embrace cutting-edge solutions that can streamline their operations, minimize costs, and improve the customer experience.

Telecom, 5G and Next Generation OSS Market Trends

The Telecom, 5G and OSS market trends are evolving rapidly as the world continues to digitize. The advent of 5G networks is driving the demand for new and innovative solutions that can manage these complex networks effectively. With 5G networks delivering higher speeds, lower latency, and increased capacity, they are also much more complex and software-based, which makes it imperative for Telecom Operators to have modern, easily-scalable Operations Support Systems (OSS) in place.

The 5G-era networks are opening up new opportunities for telecom operators to move up the value chain and interface with vertical industries. These new business models require more nimble and flexible Operations Support Systems (OSS) that can rapidly implement and support commercial Service Level Agreements (SLAs) with enterprise partners. The trend is also shifting towards AI-powered operations, leveraging sophisticated analytics technologies like AI/ML to drive network automation and enhance customer satisfaction.

Issues Faced by Telecom Operators

Telecom operators are facing various challenges as they embark on their journey to the future of digital services and 5G networks. The industry is undergoing rapid transformation with the advent of 5G-era networks, which are much more complex and feature-rich compared to their predecessors. The complexity of these networks, combined with the need to deliver faster time to market and new types of business models, has put significant pressure on traditional Operations Support Systems (OSS) to evolve. The challenges faced by telecom operators include:

Managing operational expenses: The traditional NOC and SOC models of operation are significant cost centers for telecom operators. They must look for ways to reduce operating expenses (OpEx) and refresh their Operations Support Systems (OSS) to take advantage of automation and intelligence.

Keeping up with the fast-paced technology advancements: With the rapid pace of technological advancements, telecom operators must make sure their Operations Support Systems (OSS) are flexible and capable of adapting rapidly to new services and cutting-edge network technologies. This involves streamlined onboarding processes and increased automation, as well as a reduction in efforts and costs.

Handling the increased complexity of 5G Networks and ensuring swift delivery of services to Consumers: The rapid rise of 5G networks has brought with it a new level of complexity, requiring innovative and efficient solutions to manage these networks effectively. To meet the growing demand for high-speed and reliable services, Telecom Operators must ensure that their Operations Support Systems (OSS) can effectively handle the increased complexity of 5G networks.

Staying compliant with changing regulations and standards in the Telecom Industry: In the fast-evolving telecom industry, regulations and standards are constantly changing. Keeping up with these changes is critical for Telecom Operators to ensure the smooth and efficient functioning of their networks. The key industry standards, such as TMF, ETSI and 3GPP, set the guidelines for network management, service delivery and technical specifications. Having an Operations Support Systems (OSS) that is compliant with these standards is essential for Telecom Operators to ensure that the network is managed in a consistent and standardized manner, improving overall efficiency and reducing the risk of errors. Furthermore, compliance with industry standards also helps Telecom Operators to avoid potential legal issues and penalties for non-compliance.

Enabling Network-as-a-Service (NaaS): NaaS is transforming the telecommunications industry, providing a flexible and cost-effective way to consume and provide network services. NaaS enables telecom operators to monetize their networks in new ways and expand their reach into new market segments, optimize network performance and user experiences through a cloud-like subscription model.

Adapting to DevOps style operations: The industry is also anticipating the adoption of DevOps-style operations, which involves smaller incremental changes to systems, rather than the traditional large, infrequent upgrades. Telecom operators must ensure their OSS is equipped to support this new style of operation.

These challenges require telecom operators to evolve their OSS and network automation process to keep pace with the rapidly changing industry landscape. With the right OSS and network automation solution in place, telecom operators can overcome these challenges and stay ahead of the curve in delivering innovative digital services.

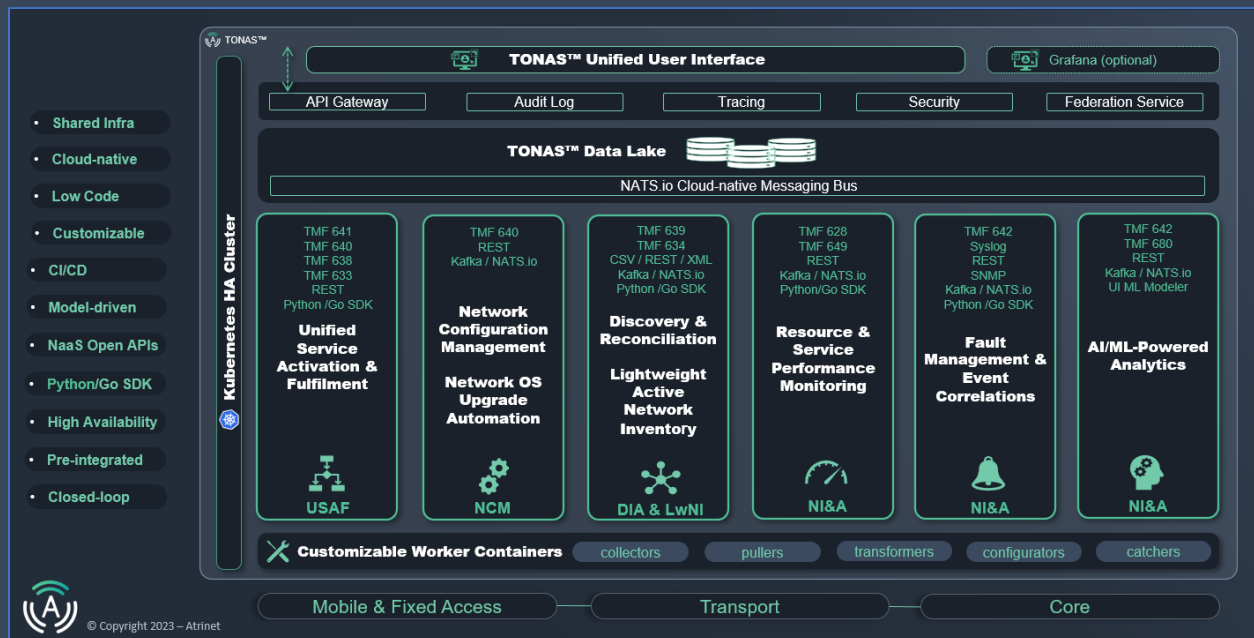
Introducing NetACE TONAS™

NetACE TONAS™ is a state-of-the-art Telecom Operations and Network Automation Platform or simply a Digital OSS, designed and developed by Atrinet to help Telecom Operators navigate the rapidly evolving digital landscape and leverage the opportunities offered by 5G and IoT. The solution is built on a modern, cloud-native architecture, enabling it to take full advantage of the latest advances in IT technology. This provides Telecom Operators with a highly flexible, scalable, and low-code OSS platform that can support their evolving business needs and drive their digital transformation journey forward.

NetACE TONAS™ is designed to be fully aligned with the latest DevOps methodologies and numerous industry standards such as TM Forum, ETSI and 3GPP. This ensures fast and flexible integration into the existing infrastructure, while also enabling seamless integration with third-party systems and partners.

Atrinet offers several open and cloud-native solutions within NetACE TONAS™, including Inventory Data Integrity Assurance (DIA), Unified Service Activation & Fulfillment (USAF), Network Insights & Assurances (NI&A), AI/ML-driven Analytics (AIOps) and Network Configuration Management (NCM). These solutions are designed to help Telecom Operators optimize their operations and reduce both their operating expenses (OpEx) and capital expenses (CapEx) by automating manual processes and consolidating multiple systems into a single open platform.

NetACE TONAS™ Modular Cloud-Native Solution Architecture



NetACE TONAS™ Common Visualization, Federation and Security

is the foundation upon which all of the modular products in the NetACE TONAS™ solutions are built. It comprises of a unified user interface (UI) that is based on React, an open-source front-end JavaScript library for building user interfaces using UI components.

One of the key components of the TONAS™ Common Visualization, Federation and Security framework is Keycloak, an open-source software product for single sign-on with Identity and Access Management specifically designed for modern applications and services. Keycloak is now under the stewardship of Red Hat and is used as the upstream project for their RH-SSO product.

The TONAS™ Common Visualization, FEDERATION and Security framework also uses Google's NATS messaging system, a highly performant, scalable and easy to use system that is implemented in the Go programming language. Client libraries to interface with NATS are available for many major programming languages.

PostgreSQL, a free and open-source relational database management system, is also an important component of the TONAS™ Common Visualization, Federation and Security framework. It is known for its emphasis on extensibility and SQL compliance.

Camunda Zeebe (optional), the workflow and decision engine of the TONAS™ Common Visualization, Federation and Security framework, provides the performance, resilience, and security that enterprises require for their process orchestration efforts. Its horizontally scalable architecture, designed for high throughput, makes it ideal for complex and demanding use cases.

The TONAS™ Common Visualization, Federation and Security framework and its solution modules can be deployed using either Kubernetes or Docker, and on popular public clouds like AWS, Azure, and Google Cloud.

TONAS™ Common Visualization, Federation and Security framework is equipped with Traefik, a cutting-edge reverse proxy and load balancing solution. Traefik streamlines the deployment of microservices and adapts seamlessly to your existing infrastructure, providing automated and dynamic configuration.

In addition, the TONAS™ Common Visualization, Federation and Security framework also supports TM Forum Open REST APIs, which enables organizations to benefit from an open and standardized API ecosystem, enabling faster and more efficient integration with other systems and solutions. With support for these APIs, organizations can take full advantage of the benefits of NaaS (network as a Service) and digital transformation, by leveraging the latest industry best practices, standards, and technologies.

NetACE TONAS™ Inventory Data Integrity Assurance (DIA) comprised of Federated Network Auto-Discovery & Inventory Reconciliation modules, ensures the accuracy and completeness of network inventory data and supports the automated and manual resolutions of data inconsistencies. The DIA can be easily integrated with one or more 3rd party Network Resource Inventories, fully automating the network discovery, synchronization and discrepancy resolution tasks.

NetACE TONAS™ Unified Service Activation & Fulfillment (USAF) offers Telecom Operators an unparalleled solution for streamlining service activation and fulfillment, resulting in faster delivery times and an improved customer experience. This cloud-native platform offers comprehensive support for service order management, including workflow orchestration, decomposition, enrichment, fallout management, and zero-touch network resource configuration. With support for both fixed and mobile services, and the ability to work with any vendor and technology, this solution is truly a one-stop-shop for all your service fulfillment needs.

NetACE TONAS™ Network Insights & Assurances (NI&A) provides actionable insights into network performance and service quality, enabling Telecom Operators to identify and resolve issues quickly and proactively.

TONAS™ AIOps is a cutting-edge analytics solution that utilizes AI/ML algorithms to analyze network data and detect anomalies in real-time. The AI/ML algorithms are trained to identify patterns in the data, recognize normal network behavior, and identify anomalies that may indicate impending failures. With TONAS™ AIOps, network administrators and other systems can receive predictive analytics and notifications about potential issues before they occur. By leveraging AI/ML algorithms, TONAS™ AIOps can analyze vast amounts of network data to detect issues and predict potential failures, saving time and resources by allowing closed-loop remediation to take preventative action. TONAS™ AIOps is a powerful tool for ensuring network reliability, and its advanced analytics capabilities provide valuable insights for network optimization and planning. TONAS™ AIOps is powered by Google TensorFlow, a popular open-source software library for dataflow and differentiable programming.

NetACE TONAS™ Network Configuration Management (NCM)

automates various network configuration processes, including device configuration, configuration backup and restore, network device upgrade automation, and network compliance validation, among others. By automating these tasks, the NCM module not only reduces the risk of human error but also enables quicker response times and better network management efficiency.

NetACE TONAS™ Adapters & Integrations Marketplace

The NetACE TONAS™ Adaptors Marketplace is a comprehensive solution that provides Telecom Operators with a vast array of implementation specifics for the NetACE TONAS™ modules, their use cases, and connectivity to various network functions, controllers, network management systems, and cloud applications. These multitenant adapters run in a scalable and resilient containerized environment using Docker or Kubernetes, making it easy for Telecom Operators or System Integrators to develop and onboard complex use cases and new network equipment with just a short training. With the ability to configure and manage everything from one place, Telecom Operators will benefit from increased efficiency and improved operations, resulting in reduced costs and increased revenue. Additionally, the marketplace's flexibility and scalability allow for easy integration with existing systems and technologies, making the transition to a modern OSS/network automation solution smooth and seamless.

NetACE TONAS™ Offers Unique Differentiations

NetACE TONAS™ offers a range of unique differentiators that sets it apart from other traditional OSS solutions in the market. These benefits include:

Modularity: NetACE TONAS™ is a uniquely modular platform that offers the ability to deploy its various components, such as DIA, USAF, NI&A, and NCM, separately or all together as a comprehensive solution. This flexibility allows Telecom Operators to choose the right set of capabilities that align with their specific business needs and requirements. The modules are also pre-integrated with each other and share a unified user interface (UI), enabling seamless cooperation in close-loop for zero-touch automation. Each of the modules also supports Open REST APIs and rapidly integrates with 3rd party systems.

Cloud-native Architecture: NetACE TONAS™ cloud-native design offers numerous benefits compared to traditional OSS solutions with legacy elements, positioning it as a highly cost-efficient, scalable, and operationally adaptable solution for telecom operators. With its ability to effortlessly scale, robust fault tolerance, and quick deployment and maintenance capabilities, NetACE TONAS™ significantly reduces operating expenses while providing exceptional performance.

Deployment Flexibility: NetACE TONAS™, with its modular, cloud-native architecture, provides support for a wide range of deployment models, including SaaS, private or public cloud, and on-premises, making it easy for operators to choose the model that best meets their specific requirements. Additionally, the platform's compatibility with Kubernetes or Docker environments ensures that it can be integrated seamlessly into existing infrastructure. This level of flexibility enables operators to align the deployment model with their specific needs, security requirements, and technical skills, thus providing them with maximum control over their technology investments.

DevOps Alignment: NetACE TONAS™ is fully aligned with DevOps methodologies, enabling development and operations teams to work closely together and apply small, incremental changes to systems on a regular basis. This is in contrast to traditional NetOps methods where changes are made in a small number of large, infrequent upgrades.

Significant OpEx Reduction: NetACE TONAS™ has the ability to automate manual processes and enable the consolidation of multiple systems into a single platform, which helps reduce operating expenses (OpEx) and capital expenses (CapEx). This not only drives operational efficiencies and cost savings, but also frees up valuable resources that can be redirected to developing and launching new revenue-generating services.

Zero Touch Automation: NetACE TONAS™ brings a new level of efficiency and automation to network operations with its zero touch automation capability. The close-loop cooperation between its various modules reduces the need for manual intervention, freeing up valuable resources and minimizing the risk of human error. This results in faster and more consistent operations, reduced downtime, and increased reliability for Telecom Operators.

Out-of-the-Box Integration Adapters: NetACE TONAS™ pre-built integrations with industry leading vendors is a huge advantage as it eliminates the need for custom integrations and reduces the implementation time, thus saving cost and resources.

Multitenancy: NetACE TONAS™, with its ability to support multiple tenants or customers within a single instance of the platform or module, providing isolated and secure environments for each tenant, and enables operators to maintain regulatory compliance and keep customer data separate. Additionally, the multitenant architecture provides enhanced scalability and allows operators to easily add new tenants or customers as they grow.

User Interface (UI) and federated view: NetACE TONAS™ provides a single, integrated view across the various OSS functions and network domains, enabling Telecom Operators to easily and efficiently manage their entire network infrastructure. This centralized view of the network helps to streamline operations, improve visibility and

reduce operational complexity, ultimately leading to more efficient network management and cost savings.

The Power of AI/ML-driven analytics: NetACE TONAS™ is powered by AI/ML, which makes it a highly robust solution for predictive analyses and automation. Our AI/ML system is powered by open-source solutions, such as Google's TensorFlow which provide several benefits.

Firstly, open-source solutions allow for flexibility in customizing the algorithms to suit specific business needs. This enables TONAS™ to provide tailored solutions that meet the unique requirements of each client.

Secondly, AI/ML enables TONAS™ to analyze vast amounts of data quickly and accurately, providing valuable insights and predictions. This results in better decision-making, improved efficiency, and increased productivity.

Thirdly, TONAS™ AI/ML algorithms can automate several tasks, reducing the need for manual intervention and saving time and resources. This results in increased operational efficiency and cost savings.

Finally, TONAS™ AI/ML algorithms provide highly personalized experiences for end-users, resulting in increased customer satisfaction and loyalty. This is crucial for the long-term success of any business.

Conclusion

At Atrinet, we are dedicated to helping our customers navigate the challenges of the digital era and realize their full potential in the fast-growing 5G and IoT markets. With NetACE TONAS™, we offer a solution that is fully aligned with the latest industry standards and will enable Telecom Operators and Communication Service Providers (CSP) to evolve toward a more agile and innovation-driven future. By leveraging the power of our cutting-edge OSS platform, Telecom Operators and Communication Service Providers (CSP) will be well positioned to deliver exceptional customer experiences and unlock new business opportunities.

About Atrinet

Atrinet is a leading provider of innovative, next-generation operations and network automation solutions for the telecom industry. With a strong focus on innovation and a commitment to delivering exceptional customer experiences, Atrinet has earned a reputation for delivering top-quality solutions that help telecom operators and CSPs simplify their operations and achieve their business goals. With a highly experienced team of experts and a state-of-the-art development center, Atrinet is dedicated to delivering the most advanced, reliable and scalable solutions for the telecom industry, making it the ideal partner for businesses seeking to achieve their digital transformation goals.

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