Solution Brief

Communications Service Providers
Multi-access Edge Computing

Nabstract Traffic Influence Service Will Automate MEC Traffic

Heart of the solution is the Nabstract Traffic Influence Service (TIS) software module that provides a context-driven traffic management service to enhance network automation in a multi-access edge compute (MEC) environment

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The adoption of multi-access edge computing (MEC) by communications service providers (CoSPs) and cloud service providers (CSPs) has moved from conceptualization into commercial deployment. This infrastructure, which places high-performance servers at locations close to where data is created, affords the service provider an opportunity to not just offer high-speed connectivity, but also offer new services that have the potential to provide significant new revenues.

MEC provides a business opportunity for both CSPs and CoSPs to leverage their geographic points of presence. For CSPs, this opportunity is to extend their reach by developing distributed cloud services, and for the CoSP, the opportunity is to virtualize a variety of network systems, most critically the radio access network (RAN) needed for 5G.

Deploying thousands of edge servers is an expensive undertaking, and both CoSPs and CSPs will potentially need partners, including cell tower infrastructure companies, municipalities that have adopted smart city technologies, hyperscale data centers, and enterprises.

This decision comes down to how many edge locations and how much capital expense the CoSP can devote to the MEC network. For many CoSPs/CSPs, the solution will be balanced between building their own MEC infrastructure and partnering with other MEC ecosystem companies that offer “MEC-as-a-service” offerings.

This will require software that can expose network and services resources of the MEC server efficiently to partners. This software will need to deliver smart traffic management and context-driven policy definition to ensure that edge applications have the resources to monetize use cases. This software must be dynamic and event-based to ensure that applications residing on the edge cloud will have access to intelligence to efficiently use available network and service functions.

Given some level of partnership in the MEC buildout, the CoSP needs to ensure that its edge servers feature multi-tenancy/co-location of edge clouds. From a network standpoint, this would mean sharing of compute, data plane, and UPF resources with edge co-owners. This would require essentially a different approach to network and traffic policy planning by the CoSP. Edge aware, or dynamic, applications will use the traffic management software to subscribe to services run in the MEC, like traffic influence and location.

The services of this software are enabled by new application programming interface (API) standards from the European Telecommunications Standards Institute (ETSI) and the 3rd Generation Partnership Project (3GPP). Specifically, these rules guide the application function (AF) capability and network exposure function (NEF), which deliver traffic influence services that are specified in 3GPP Release 15, Release 16, and the ETSI MEC standards.

These APIs can expose network and service functions at all edge locations and in the cloud. The software's services have an emphasis on traffic management by applications based on context of the compute, network, and location environment.

ETSI and 3GPP have defined QoS and dynamic traffic steering in MEC and 5G. The new standards mean that policy definition and enforcement is not limited to the 5G Core where the policy and charging rules function (PRCF) or the policy charging function (PCF) have been used to distribute and enforce policies.

Instead, user equipment (UE), edge nodes, network, and cloud data centers can use their real-time telemetry capabilities to define "context-based" traffic policies that can influence protocol data unit (PDU) sessions in a run-time environment.

The MEC plays an essential role in the edge cloud to execute this. It is also required that edge applications get open APIs to integrate with MEC platforms and the 5G core to execute on-demand intelligent traffic steering methods.

The Nabstract Traffic Influence Service (TIS)

Nabstract is a company formed to develop network abstraction tools and it has launched its Nabstract Traffic Influence Service (TIS) that leverages Intel® Xeon® processors and has worked closely with Intel to integrate with Open Network Edge Services Software (OpenNESS), an open source software initiative by Intel for accelerating networking capabilities at the edge.

To support the intelligent traffic management needs for CoSPs, Nabstract has developed a context-driven, intuitive traffic management software that can be integrated into a MEC server to enhance network automation. The Nabstract TIS software module comprises a suite of APIs, smart algorithm-based controllers, software agents for policy enforcement at the edge server, and a software development kit (SDK) to assist with deployment.

The TIS connects all Nabstract and third-party APIs. The software is integrated with OpenNESS, an edge computing software toolkit that enables highly optimized and performant edge servers to onboard and manage applications and network functions with cloud-like agility across any type of network.

Nabstract TIS allows the CoSP and CSP to create applications and policies that enable a MEC server to conduct fast traffic steering, local area data network (LADN)-based management, uplink classifier (UL-CL), and 5G multihoming policies. The TIS is designed for integration with MEC servers that are shared by a wide range of partners, including edge cloud partners or MEC/application function (AF)-based partners.

Nabstract TIS integrates with various types of edge applications, an example that Intel and Nabstract have partnered on is integrating computer vision (CV) functionality based on Intel® Distribution of OpenVINO toolkit, which facilitates the optimization of deep learning models on Intel® architecture-based hardware from a framework and deployment using an inference engine.

Figure 1 depicts Nabstract TIS functionality that allows a CoSP to manage a multi-partner relationship based on a framework of intent-based, technology agnostic APIs to allow discovery of available resources in the edge cloud. The TIS module provides GUI-based configuration and rule engine for implementing AF network exposure function (NEF)-based traffic influence services. Nabstract TIS allows edge applications to subscribe in order to create context-driven policy decisions.

Nabstract TIS is a microservice-driven module that can integrate into upstream orchestration systems and different MEC software stack and 5G core systems.

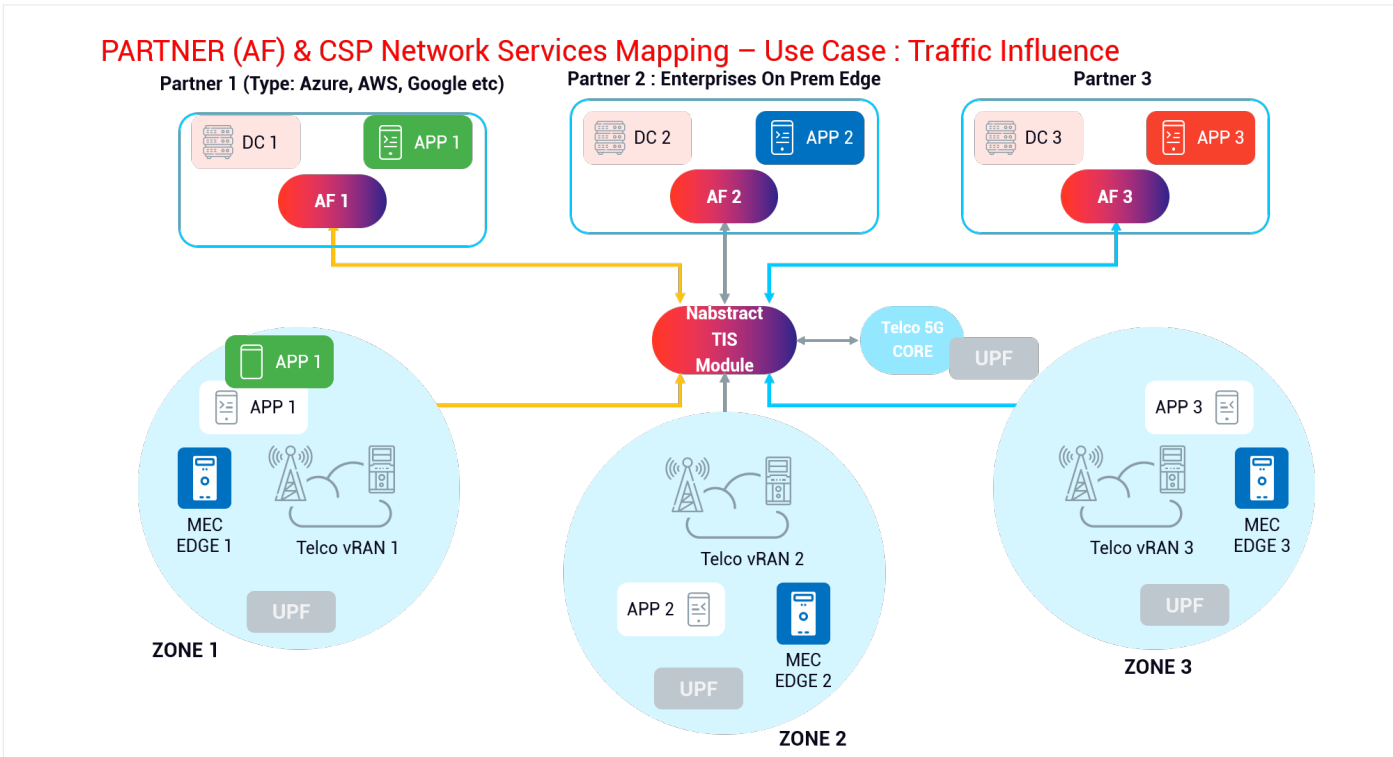

Figure 1. Nabstract TIS multi-partner framework.

Nabstract TIS Optimized for Intel® Xeon® Processors

Nabstract specifies servers for its edge cloud deployments that utilize 2nd generation Intel® Xeon® Scalable processors for performance. The 2nd generation Intel Xeon Scalable processors are the basis for building virtualized, cloud-optimized, 5G-ready hardware platforms. The CPUs offer an architecture that scales and adapts with ease to handle the demands of the convergence of key workloads, such as applications and services, control plane processing, high-performance packet processing, and signal processing.

Solution Benefits and Business Impact

CoSPs around the world are in different stages of 5G deployment, now mostly offering services based on non-standalone networks that are based on existing 4G infrastructure, with standalone networks going online in 2021. Interoperability between 5G and the MEC infrastructure is important and will impact each CoSP's ability to deliver efficient and innovate new services.

One challenge is that the MEC will have different templates and slices, including content delivery network (CDN), industrial IoT (IIoT), gaming, AR/VR, vehicle to everything (V2X), and others. This will mean there will be different MEC types, vendors, and partners that a CoSP could deploy. All of this will need CoSP RAN and 5G core integration, which is challenging when there are different MEC providers involved. Including a MEC enablement layer in their network rollout for 5G and MEC is one option to fix this situation. Nabstract has been working to address this requirement, and the TIS module is the first product in its plans to address these requirements.

The Nabstract TIS modules provide network automation; provide a single management interface between partner functions such as MEC AF, RAN, and 5G core elements; and enable two key business and network integration processes:

- Pre-provisioning partner, application-based traffic policies on new partner acquisition.
- Software for real-time, context-driven traffic influence based on partner's edge apps environment changes.

The TIS module is the company's first prototype and is integrated with OpenNESS as the reference toolkit. The TIS module includes a complete partner management system to help the CoSP to define interoperability for the MEC and the 5G core. The TIS includes an automated traffic management rule engine as its primary functionality.

Nabstract is sharing details of its TIS module with CoSPs that are planning MEC deployments to allow them to include the functionality in their plans. Nabstract anticipates that the services provided by TIS will become a required function for 5G core and 5G MEC deployments. The company will license the software to CoSPs on a usage basis in addition to providing services. A future software-as-a-service (SaaS) offering is also under development.

The company plans to have a POC by Q1 2021 with a leading CoSP, with general availability expected shortly thereafter. This will be a major step forward for enabling interoperability for 5G and MEC, and will allow CoSPs to provide a unified set of MEC enablement APIs for edge application developers to leverage the CoSP 5G network capabilities.

Conclusion

CoSPs and CSPs are developing their MEC architectures either by developing their own edge cloud and/or in partnerships with various partners. To manage the cost, many CoSPs/CSPs will partner to build out this network.

From a network planning point, these providers will need a common control plane for traffic management for application workloads (hosted by them or cloud partner companies) on their MEC clouds to expose a wide range of services in order to deliver run-time traffic management policy changes. Conventional policy management systems cannot do this. The Nabstract TIS module will provide a single management interface to integrate with MEC platforms, RAN, and 5G core to provide a simplified interface for sharing a MEC network with partners and application developers. Powered by OpenNESS and Intel Xeon Scalable processors, Nabstract has developed a powerful solution to the challenge of traffic management in a shared MEC environment.

Learn More

Nabstract website: https://www.nabstract.io

Nabstract is a member of the Intel® Network Builders ecosystem: http://networkbuilders.intel.com

2nd generation Intel® Xeon® Scalable processors: http://intel.com/xeonscalable

OpenNESS: https://www.openness.org

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