NTT DaTa

CreEdgeOn

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NTT Data "Create Edge On" platform, (abbreviated into CreEdgeOn, crasis of "creation") is a Deployment Manager, capable to automate the delivery process of software components belonging to use case applications, as well as to virtualized or containerized Network Functions related to (Open) RAN, Core Network and Transport infrastructures. The main property of CreEdgeOn is that the deployment process is executed according with a network topology schema, namely Network Service Descriptor (NSD), which correlates the required connectivity matrix with the software components to be deployed.

Distributed Edge-based Deployment

Deployment Edge Computing and 5G form a potent technology combination, with a key role in service provision across distributed operations and here, as well, major changes are taking place. Edge concept goes over the idea of physical devices, located at geographically distributed places in the network. 5G enforces the Edge as the boundary between common shared resources and customer access. Such approach is confirmed by MEC applications, for proximity constraints and mobility management, but also supported by Open RAN (O-RAN) deployment of Network Functions such as Distributed/Centralized Unit (DU/CU), as well as User Plane Function (UPF) nodes of a distributed Core Network domain. Edge Computing allows to deliver applications close to the point of use, which is especially important where QoS constraints or the need for low latency, near immediate response is required for particular use cases (alerts for production assets is a very common example). It is now possible to use Edge Computing to deploy distributed MEC (Multi-Access Edge Computing) applications to locations right across the network. This enables applications to "move with" connected users, enabling them to stay continuously engaged and able to interact with their applications, no matter where they go. Network topology drives the deployment execution.

How CreEdgeOn works

CreEdgeOn is capable to execute workflows according with the requested Network Service Descriptor (NSD) instance, including connectivity graphs, IP addressing rules, VNF (virtual machine based) or CNF (container based, CaaS) information and finally the platform (or platforms) designated to host the whole deployment. Indeed, deployment process is aligned with NSD lifecycle. CreEdgeOn exposes ETSI standard northbound APIs for managing NSD instance creation, change, or deletion.
It is also provided with a GUI front-end, for local allowed administrators. The workflows are based on multi-platform workflows with Infrastructure as Code (IaC) technology or cloud-based containerization through ArgoCD declarative system forCaaS modeling.

Multi-platform support

CreEdgeOn works over OpenStack®, Linux KVM® and VMware vSphere® for virtual machine based deployment (VNF components), with the adoption of IaC templates. It works over Kubernetes® containers (CNF components), both on-prem (K8S) and Edge or cloud (CaaS), preferably over Amazon Web Services technology (AWS EKS®, ECS® and serverless over AWS Fargate®). Hybrid deployment models are also supported. Google GCP® and MS Azure® are also supported, providing a high level of flexibility and scalability. Target is to reduce vendor lock-in. CreEdgeOn works over Kubernetes® containers (CNF components), either on-prem (K8S) or Edge/Cloud (CaaS) deliveries, preferably over Amazon Web Services technology (AWS EKS®, ECS® and serverless over AWS Fargate®). It also works over OpenStack®, Linux KVM® and VMware vSphere® for legacy virtual-machine based deployment (VNF components), with the adoption of IaC templates. Hybrid deployment models are also supported. Multi-vendor scenario is supported with differentiated Southbound APIs for every platform.

MANO

CreEdgeOn performs the
Management & Orchestration
(MANO) function identified by
the ETSI NFV standard for the
deployment of VNF components,
but extending its functionality
to manage CNF components
(containers, Pods, clusters) both
on-premise and cloud-based (Edge,
CaaS) or serverless. The standard
ETSI interfaces used for managing
NSD instances makes the platform
interoperable in any software
environment and with different
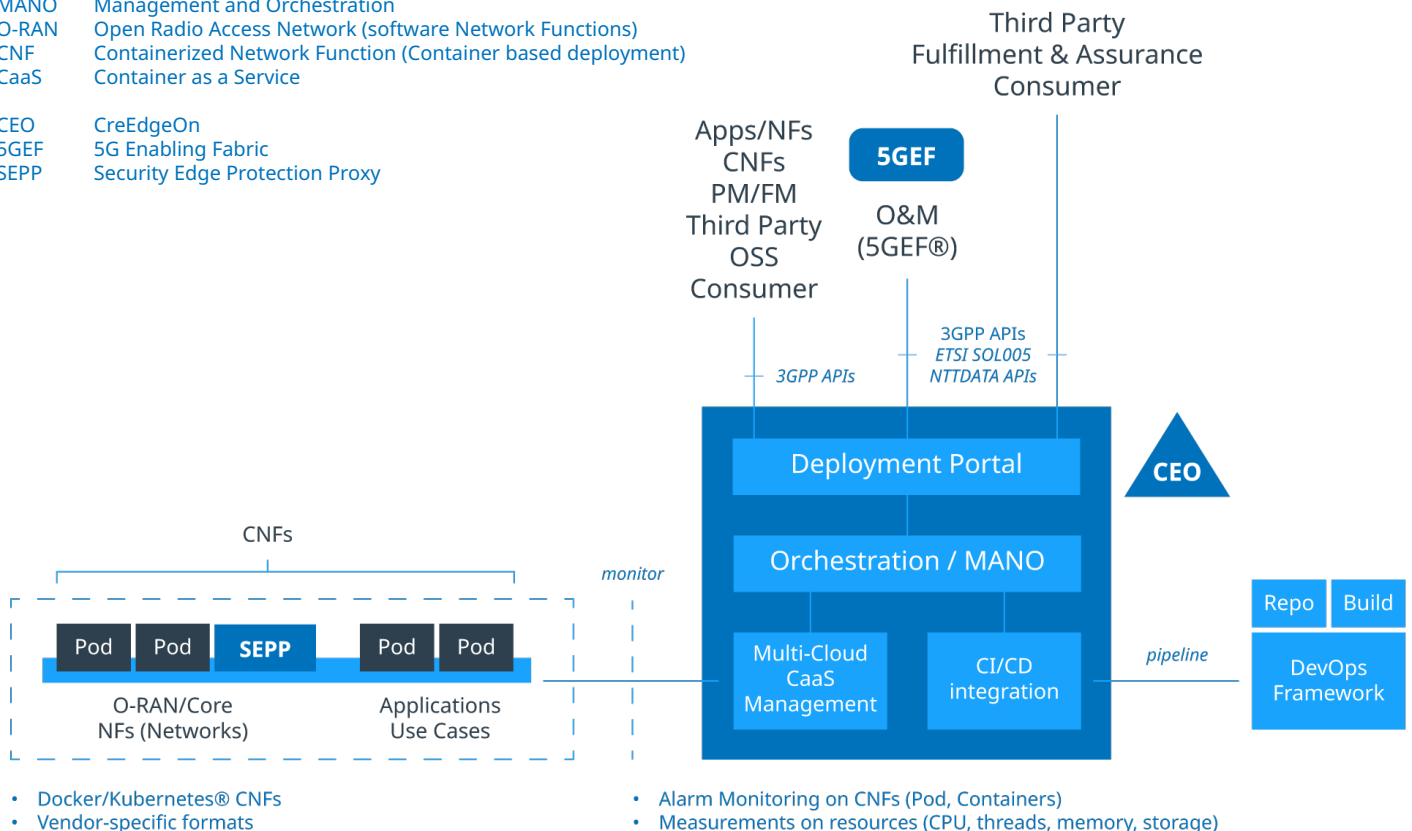technology vendors.

Customization

CreEdgeOn makes available
a series of parameters that
can customize the individual
deployment process according to
the characteristics of the platform,
the security needs (certificates,
tokens), based on the available
sizing and the scaling rules that
you intend to make available.
The implementation is done
automatically and apply run-time
by the CI/CD pipeline.

DevOps Pipeline

The deployment automation
is supported through a CI/CD
pipeline. CreEdgeOn makes
leverage on external repositories
(default: Gitlab®) for creating
images (build), then test, load and
deploy them. The pipeline also
supports CNF release changes for
Pod components, where new the
software versions are loaded and
deployed in rolling mode over all
the containers to update.

CI/CD	Continuous Integration/Continuous Delivery
Repo	Repository
Pod	Containerized group of processes running into a cluster
NF	Network Function
MANO	Management and Orchestration
O-RAN	Open Radio Access Network (software Network Functions)
CNF	Containerized Network Function (Container based deployment)
CaaS	Container as a Service
CEO	CreEdgeOn
5GEF	5G Enabling Fabric
SEPP	Security Edge Protection Proxy

Third Party
Fulfillment & Assurance
Consumer

Apps/NFs
CNFs
PM/FM
Third Party
OSS
Consumer

5GEF

O&M
(5GEF®)

3GPP APIs
*ETSI SOL005
NTTDATA APIs*

3GPP APIs

Deployment Portal

CEO

Orchestration / MANO

CNFs

monitor

Multi-Cloud
CaaS
Management

CI/CD
integration

Repo | Build

pipeline

DevOps
Framework

Pod | Pod | **SEPP** | Pod | Pod

O-RAN/Core
NFs (Networks)

Applications
Use Cases

- Docker/Kubernetes® CNFs
- Vendor-specific formats
- Alarm Monitoring on CNFs (Pod, Containers)
- Measurements on resources (CPU, threads, memory, storage)

Inventory

CreEdgeOn is capable to support inventory information related to the processing nodes (data center, edge servers, cloud resources), in order to get an updated resource profile for all the deployment nodes to engage. CreEdgeOn exposes APIs to be provisioned with such information, or otherwise it can invoke primitives towards external inventory systems to get updated. The exchange of SFTP file or XML-based files is also supported. The embedded GUI of CreEdgeOn drives such process. The choice of the most appropriate nodes where the software components are to be deliver, in case no other constraints are explicitly identified by the NSD instance, can be determined automatically based on inventory information and customization parameters trying to find the best fit for resources optimization.

Monitoring

CreEdgeOn collects and stores periodically several monitoring information from the infrastructure layer, mainly focused on resource usage (processing units, memory, data network, storage), traffic conditions and autoscaling procedures, in order to let the administrator be aware of the current situation of running virtualized components and underlying physical resources. CreEdgeOn GUI shows measurements through customizable dashboard and graphs.

Machine Learning for optimization

CreEdgeOn supports a native Machine Learning logic for deployment node selection and commission or decommission operations. It is based on the monitoring information, markedly related to traffic measurements form the infrastructure layer. The criteria are aimed to find the best fit among the requested service profile, the measurements and query an (embedded) AI engine to get the best fit for different service profiles. Analogously, the same information can apply to automatically allocate or deallocate processing resources, based on the real need. Default profiles comes for 5G recommendations: reduced latency (URLLC, Edge delivery), optimized band width (eMBB, connectivity parameters), higher number of registered devices supported (mMTC,IoT delivery), resource optimization (resource usage). The training preparation of the ML/AI logic is then based on inventory information, infrastructure measurements and customization parameters.
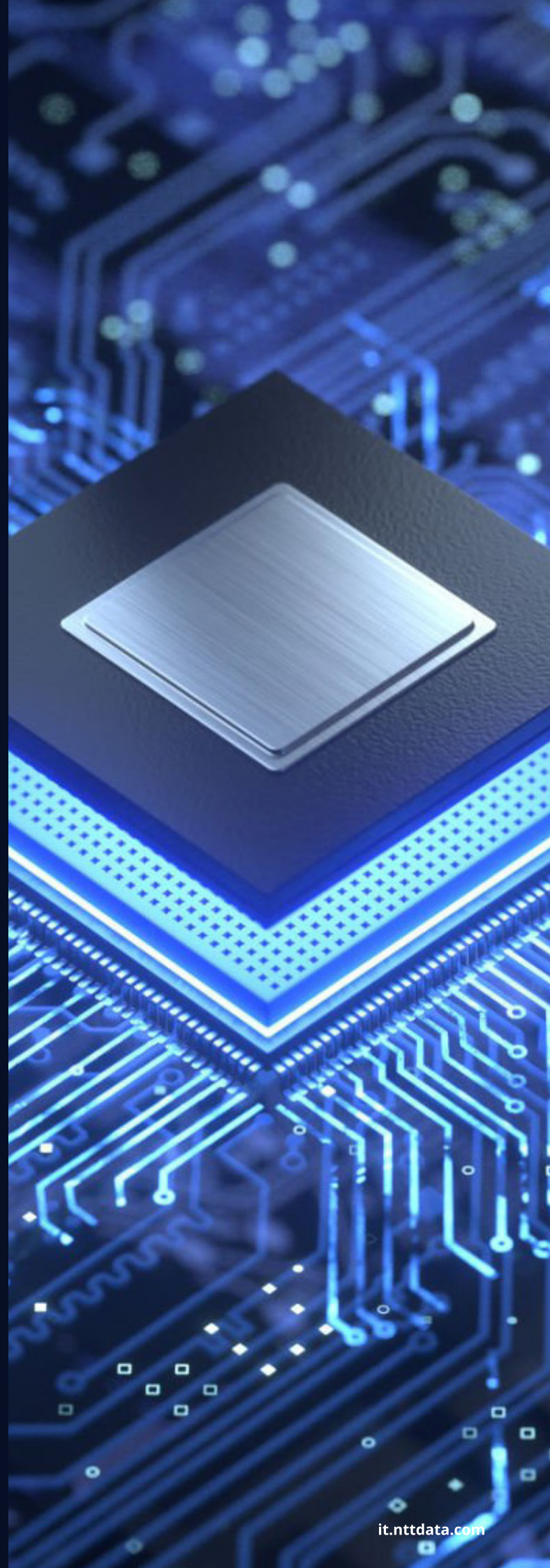
" CreEdgeOn is a focused product aimed to support Network and Service Management platform for the delivery of integrated solutions composed by Network Functions, connectivity services (network slicing) and applications for use cases. Edge deployment automation is supported. Multi-vendor and multi-platform are supported. This is the key to accessing the benefits of intelligent networked cloud fast, to deploy digital native services long before full-scale cloud transformation is complete, and to make use of cloudlike customer experiences at once.

NTTDATA

NTT DATA – a part of NTT Group – is a trusted global innovator of IT and business services headquartered in Tokyo. We help clients transform through consulting, industry solutions, business process services, IT modernization and managed services. NTT DATA enables clients, as well as society, to move confidently into the digital future. We are committed to our clients' long-term success and combine global reach with local client attention to serve them in over 50 countries.

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The NTT DATA Innovation Centre comprises a Strategy Headquarters, the headquarters that defines the technology strategy, and local centres in six countries (Japan, the United States, Italy, Germany, China and India), each one dedicated to specific technology areas with around 100 experts, mainly researchers, consultants and engineers. Thanks to joint R&D initiatives with leading companies, technology partners and collaboration with universities and start-ups, these centres will be among the first to gather information on advanced technologies to set future strategies. success and combine global reach with local client attention to serve them in over 50 countries.

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