

sonata

agile service development and orchestration in 5G virtualized networks



Project overview

October 2017

Name Surname (Organisation)

HORIZON
2020



SONATA in short



SONATA is an open source project that offers an integrated NFV Service Platform with a novel Network Service Software Development Kit (SDK) and a MANO Framework supporting rapid service development and deployment, in an open and flexible manner, by following a micro-service and REST-based architecture and a DevOps approach.

Key Features

- First **integrated approach** in the NFV landscape that includes **service composition, testing and orchestration**.
- Invaluable tools to **support** developers **in the creation and testing of services**.
- **Flexible** architecture and **modular design**.
- **Openness and multi-vendor compatibility**.
- **Customization opportunities** depending on customer's needs, existing assets or future requirements.
- **DevOps model for Telecom** that enables the agile management of the full service lifecycle, increasing productivity and time-to-market.
- **Multi-organizational by design** enabling network operators the creation of an ecosystem with external and internal developers improving collaboration and a more competitive offering.



Core Objectives

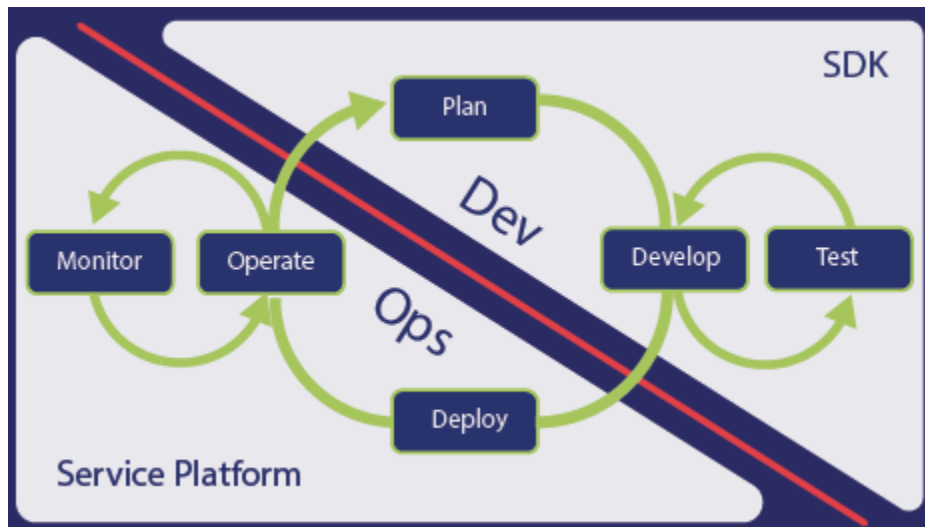
- **Reduce time-to-market of networked services:** SONATA offers a valuable SDK for service developers to easily create and deploy networked services on top of telecom operators' resources. It also promotes a DevOps model to integrate service development and management operations of virtual network functions.
- **Optimize resources utilization and reduce costs of service deployment and operation:** SONATA Service Platform orchestrates and maps complex services to connectivity, computing and storage resources and automatically re-configures running services.
- **Accelerate industry adoption of software networks:** SONATA supports the full lifecycle of a service and allows NFV integration and interoperability with already existing network management systems.



Key Contributions

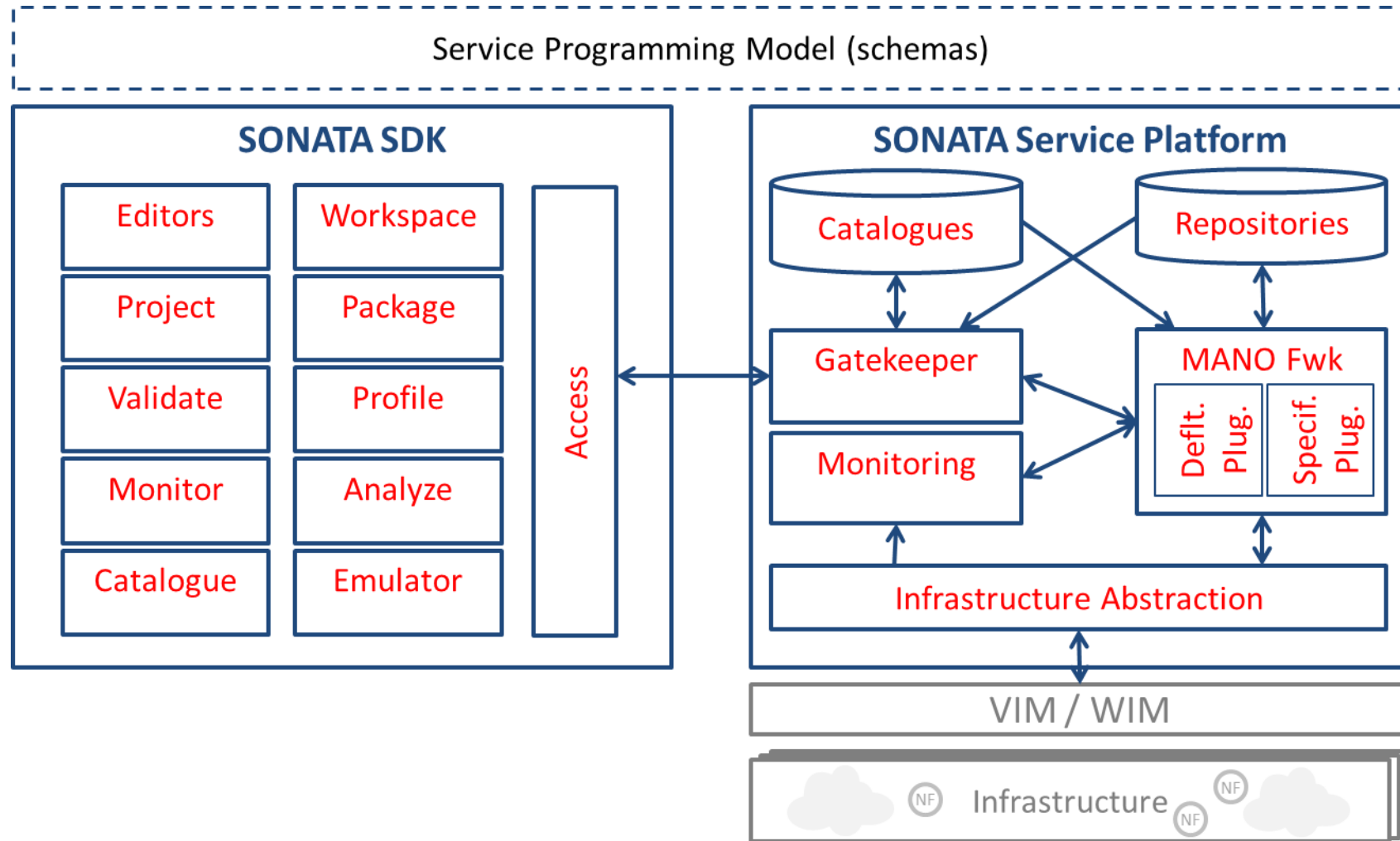
SONATA offers an integrated NFV Service platform that includes both :

- A novel **Network Service Development Kit (SDK)** that provides a valuable set of tools that assists developers in the development and testing of complex NFV services.
- A highly modular and customizable **Service Platform** with a MANO orchestrator for deployment and management of complex network services over multiple PoPs.



SONATA also implements a **extended DevOps model with a multi-organisational design** that increases efficiency and collaboration, facilitates the launch of new services and accelerates the adoption of NFV technologies.

SONATA High Level Architecture



SONATA Service Platform (I)



SONATA Service Platform offers the functionality to:

- **Orchestrate and manage network services during their life-cycle;**
- **Interact with the underlying virtual infrastructure** through Virtual Infrastructure Managers (VIM) and WAN Infrastructure Managers (WIM) to efficiently use a heterogeneous set of virtual resources;
- **Store** available **network services** and functions in dedicated catalogues;
- **Show the status of** the deployed **network services/functions**, the **virtual infrastructure** and the **virtual resources** through a set of repositories;
- **Interact with the outside world** through a single entity, called the Gatekeeper.

SONATA Service Platform (II)



SONATA Service Platform is where:

- **Users** are **created, authenticated** and **authorized**;
- **Packages**, containing (network) services and (virtual network) functions descriptions, are **on-boarded, validated and stored in the catalogue**. A service or a function can bring with it a specific manager, which may change the default behaviour the SP has for specific aspect of that service's or function's lifecycle (e.g., placement, scaling, etc.);
- **Services from the catalogue** are **instantiated** (with licences verified) **and orchestrated**, through the MANO, **in the abstracted infrastructure**;
- **Instantiation records** are **generated and stored**, providing instantiation data to the other components;
- **Monitoring data** is **collected and** securely **provided** on demand **to the service developer**, thus allowing quick and frequent service improvements;
- **KPIs** are **collected**, to show the overall business performance of the system.

SONATA Service Platform (III)



SONATA Service Platform main modules:

- **Gatekeeper:** controls and enforces whoever (and whatever) wants to interact with the SP and guarantees the quality of the submitted packages, by validating them against a schema (syntactically), the topology of the described service and its integrity;
- **Catalogues:** stores and manages (smart delete: only packages with services that do not have running instances can be deleted) package files, its meta-data as well as service's and functions' meta-data;
- **MANO Framework:** the orchestrator, who manages each service's lifecycle, including when the service and/or its functions bring specific managers with them to be used in certain segments of their lifecycle. Please note the clear separation between the two levels, the Network Function Virtualization Orchestrator (NFVO) and the Virtual Network Function Manager (VNFM) and Controller. This separation was originally recommended by ETSI, and it effectively corresponds to two very different levels of abstraction that is important to be kept separate;

SONATA Service Platform (IV)



SONATA Service Platform main modules (cont.):

- **Infrastructure Abstraction:** hides the complexity and diversity of having to deal with multiple VIMs and WIMs;
- **Repositories:** stores and manages service and function records, resulting from the instantiation, update and termination processes;
- **Monitoring:** collects, stores and provides monitoring data for the services and functions instances.

SONATA SDK

SONATA Service Development Kit main modules:

- **CLI:** SONATA SDK's command line interface tools to aid in developing network services and VNFs;
- **Editor:** SONATA's web-based editor for service and function descriptors
- **Emulator:** emulation platform to support network service developers in locally prototyping and testing complete network service chains in realistic end-to-end multi-PoP scenarios;
- **Analyzer:** analysis framework to study a service's behaviour.



SONATA 3.0

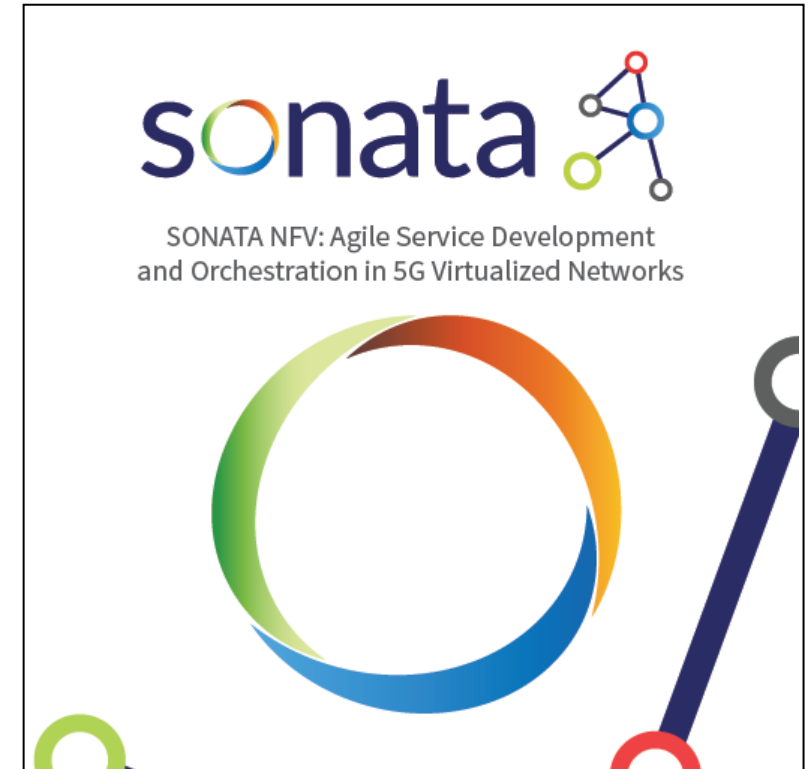
Latest upgraded release which includes all the software components developed, integrated, tested and qualified within the time horizon of the project. All these components are published under **Apache 2.0** licence in a **public GitHub repository**, freely available for download and ready to be installed.



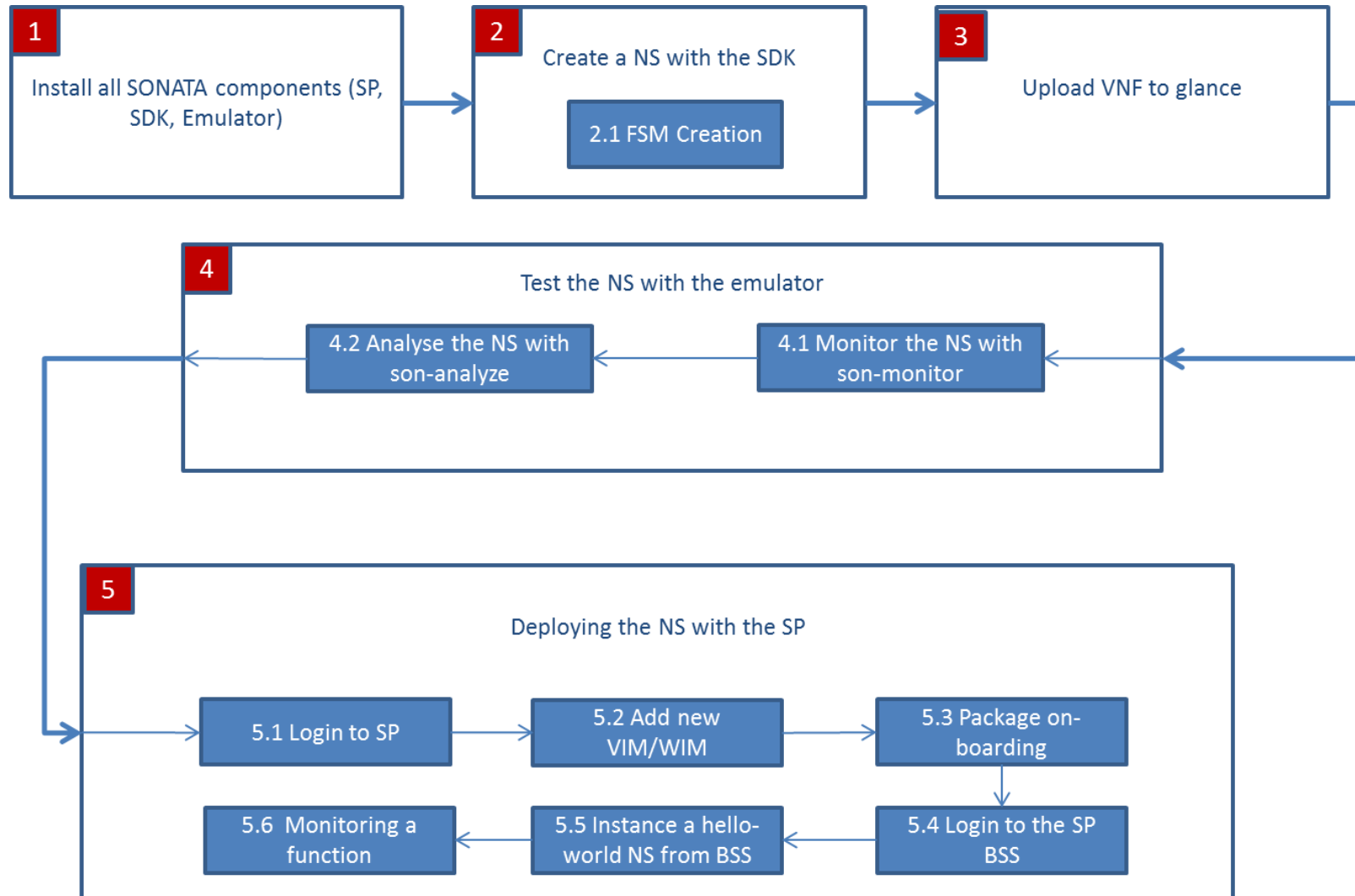
- **New great functionality** that makes SONATA more attractive with a product-like code that can be easily adopted and used by other organisations and projects.
- **Lower usage entry-barrier**, thanks to its easy and automated installation process, compelling and complete documentation tutorial videos provided.
- **Higher reliability and stability**, due to the final stage of validation and qualification included in the SONATA development pipeline.
- Many SDK tools extended to **interoperate with other platforms** beyond SONATA scope, for example OSM.
- Additional interfaces for ensuring **interoperability with OSS and SLA management systems**, facilitating the integration with other external systems (i.e. Billing).

SONATA 3.0 Tools

- [Quick Guide](#): How to install and use SONATA 3.0
- [SONATA 3.0 Service Platform installation video](#)
- [SONATA 3.0 SDK and Emulator installation videos](#)
- [SONATA 3.0 Network Service Deployment video](#)
- Technical support: Support@sonata-nfv.eu
- Virtual Machine (in progress)



Start using SONATA 3.0



About us

- SONATA is an EU-funded project (Horizon 2020) and part of the 5G-PPP initiative.
- 30 month work plan, started in June 2015.
- 15 partners representing telecom operators, manufacturers, system integrators, service providers, SME developers, research and academic institutes.



Learn more about SONATA

- **Project website:** <http://www.sonata-nfv.eu/>
- **GitHub landing Page:** <https://sonata-nfv.github.io/>
- **Twitter:** <https://twitter.com/sonataNFV>
- **LinkedIn:** www.linkedin.com/in/sonata-nfv
- **YouTube:** https://www.youtube.com/channel/UC_vQQq7mjvHt4JzEkp4kppQ
- **ResearchGate:** <https://www.researchgate.net/project/H2020-SONATA>
- **Newsletter:** <http://www.sonata-nfv.eu/newsletter/30>

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