DATA SHEET

Inmanta Service Orchestrator

Eliminate complexity to deliver faster

At-a-Glance

Inmanta Service Orchestrator empowers telecom operators and service providers to speed up service delivery and reduce the total cost of ownership through efficient, end-to-end automation. No longer is automation limited to silos and vendor-specific solutions – you can now integrate with various domains and best-in-class components from any vendor.

ADVANTAGES:

- **Minimize time to cash** by automating and streamlining end-to-end service delivery
- **Reclaim control** with flexible and vendor-agnostic architecture
- **Reduce TCO** through intent-based programmability and thanks to high reusability
- **Rapidly build reliable services** and avoid network downtime triggered by human errors

Inmanta in action. Request live demo.

Today's customers expect instant delivery of feature-rich services tailored to their ever-changing needs. These expectations are major challenges for traditional network and service management practices as these fall short in dealing with the more and more complex and heterogenous networks. Telecom operators and service providers require end-to-end automation – across domains, without any human intervention – to enable agile and flexible service delivery.

Inmanta Service Orchestrator solves this challenge by empowering telecom operators and service providers to streamline the end-to-end service delivery across physical and virtual domains and multi-vendor environments. Inmanta's open and extensible architecture combined with powerful, intent-based service modelling provides the flexibility and efficiency to rapidly create, customize and roll-out new services, while eliminating costly operational errors.

Faster Time to Cash through End-to-end Automation

Telecom operators and service providers are operating in a landscape of highly distributed and heterogeneous infrastructure, spanning multiple domains and vendor-specific solutions. Managing services in such a complex and dynamic environment is not an easy task, at the expense of scaling up and flexibly responding to changing customer needs.

Inmanta Service Orchestrator ensures end-to-end consistency, higher flexibility and a shorter time to cash by enabling **end-to-end** automation of all service delivery aspects:

- Multi-domain: designed to interact across physical and virtual domains, such as WAN, edge, access network, NFV, cloud, containers, and datacenter.
- Holistic: A single, unifying automation solution, providing service orchestration, network orchestration, NFV orchestration (NFVO), as well as generic VNF management (gVNFM), cloud orchestration and configuration management. No other automation tools required.
- Full lifecyle: Manage advanced service lifecycle, covering creation, on-boarding, provisioning, modification, scaling, upgrading and decommissioning.

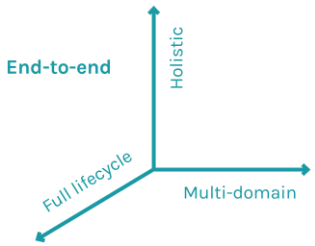

Figure 1: The 3 dimensions of end-to-end orchestration

Reclaim Control with Vendor-agnostic Architecture

To avoid vendor lock-in, service providers have to select an unbiased service orchestrator. Unlike some vendors' solutions, which come with a preferred ecosystem, Inmanta Service Orchestrator is truly open and vendor agnostic for all network layers, domains and OSS/BSS. Service providers can integrate with 3rd party solutions as well as a wide range of open-source technologies to build a best-in-class, all-encompassing solution.

Pluggable Adapters

Inmanta Adapters allows service providers to interact with any network element or with any software, e.g. commercial EMS/NMS, SDN controllers, cloud management APIs (including VIM). Inmanta Adapters support various communication protocols and data models, e.g. NETCONF/YANG, RESTful API and CLI. Customers can select from a wide portfolio of adapters available today.

Open APIs

Inmanta provides RESTful Northbound and East-West APIs to interoperate with OSS/BSS, CMDB, analytics and assurance. In addition, Inmanta Service Orchestrator automatically exposes RESTful management APIs for each orchestrated service to enable on-demand control through self-service portals. These APIs strictly adhere to the OpenAPI specification and are aligned with the TM Forum and MEF LSO standards to ensure interoperability.

Support for Brownfield Environment

Inmanta Service Orchestrator can be plugged into a legacy environment without replacing or disrupting the current infrastructure and without requiring the full on-boarding of network elements. Supporting brownfield roll-out ensures a smooth and fine-grained roll-out of the orchestrator by gradually onboarding additional use cases, avoiding risky "big bang" changes.

Reduce TCO with Intent-based Programmability

Total cost of ownership (TCO) is driven by the efficiency of new service development as well as maintenance and enhancement of existing services. Inmanta optimizes service development and maintenance for telecom operators and service providers through its unifying, model-driven methodology for intent-based orchestration.

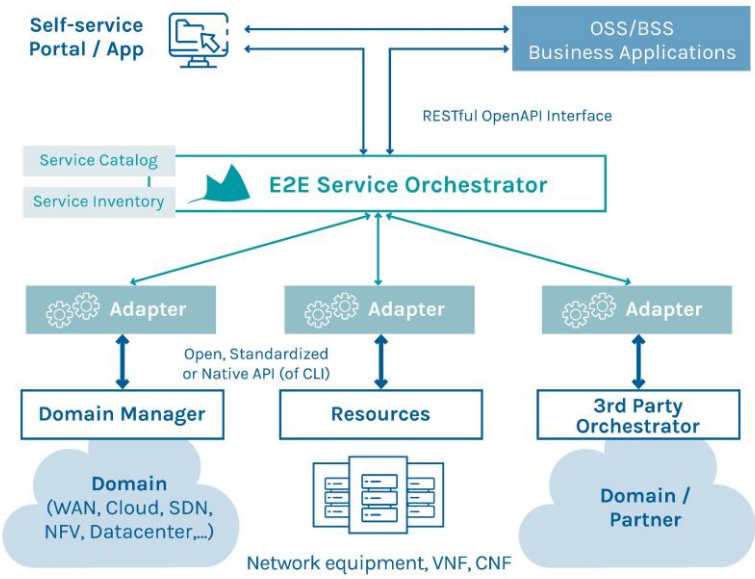

Figure 2: Inmanta Service Orchestrator streamlines end-to-end service delivery across multiple domains and vendors, leveraging a flexible architecture based on open APIs and a wide variety of adapters.

Unlike other orchestrators that use a modelling language optimized either for cloud environments or for network domains, Inmanta connects both worlds thanks to a single, powerful domain-specific language (DSL) to simplify service creation and management. Inmanta DSL leverages the best

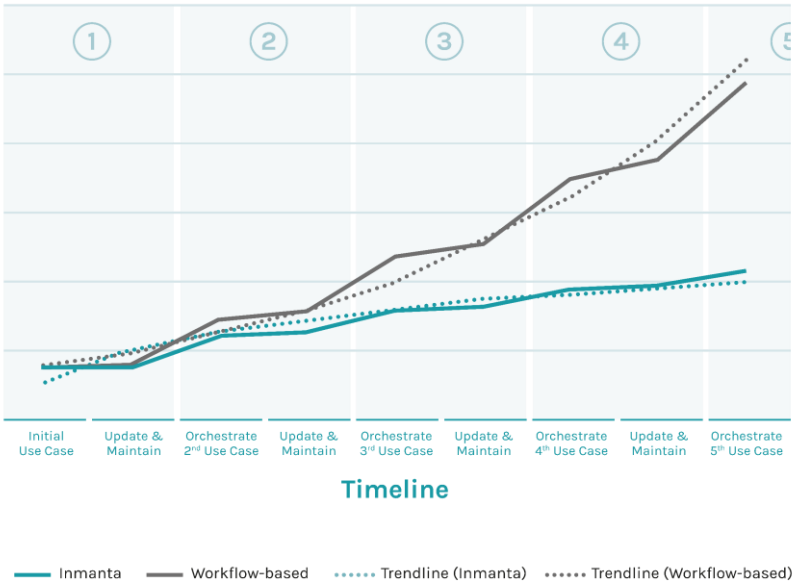

Figure 3: Comparison of TCO of Inmanta versus typical workflow-based orchestrators that lack proper re-usability across multiple use cases.

practices in software engineering and DevOps. It is based on infrastructure as code (IaC) principles to provide a unified way to automate multi-domain and multi-vendor services. The embedded DSL enables telecom operators and service providers to easily develop modular building blocks that make abstraction of low-level details, enabling **re-usability** across services and use cases, which is a pre-requisite to keep TCO under control.

Inmanta DSL enables network architects and engineers to map a high-level service design into a service orchestration model in a declarative way. This service orchestration model describes the **intent** (aka desired state) including the relationships and dependencies between resources. No need to provide a specific sequence of individual steps as this is automatically derived by Inmanta Service Orchestrator based on the current state of the infrastructure and services.

Inmanta's intent-based programmability provides out-of-the-box self-healing, safe roll-back, detailed dry run and seamless service upgrades for enhanced **stability and resilience**.

Rapidly Build Feature-rich Communication Services for New Revenue Streams

The ability to quickly scale up and flexibly respond to changing customer demands determines whether telecom operators and service providers can uncover new revenue streams and reduce the time to bill. Inmanta provides telecom operators and service providers a range of DevOps tools for engineering and operations:

- A Software Development Kit (SDK)
- Integrated Development Environment (IDE), including support for MS Visual Studio® Code
- A unit testing framework for service models and dashboards
- Release management through Git-based version management, full traceability and CI/CD support for multiple environments (development, testing, staging and production)

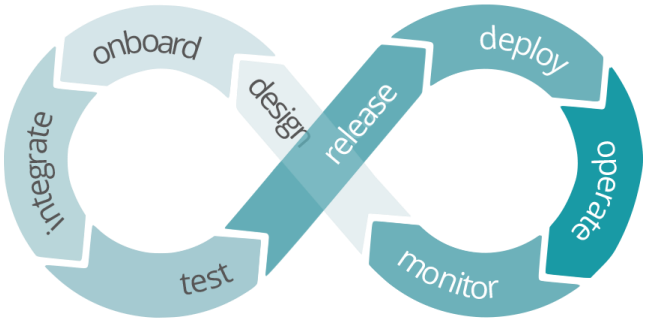

Figure 5: Telecom operators and service providers can test, deploy and operate their services using Inmanta Service Orchestrator, fully in line with DevOps and continuous delivery.

Use Cases

Inmanta helps telecom operators and service providers to realize their transformation to fully automated networks and services, that are easier and more efficient to operate. A few examples of real-world Inmanta deployments by service providers:

Network on Demand (NoD)

Orchestrate network services on demand across multi-vendor infrastructure and enable customers to make real-time changes to bandwidth, add and remove interconnection locations, and activate value-added services (e.g. firewall, SD-WAN) through a self-service portal or APIs.

Cloud Connect

Provision on demand a carrier-based interconnect (CBCI), a direct connection between the customer's enterprise network and one or more cloud service providers.

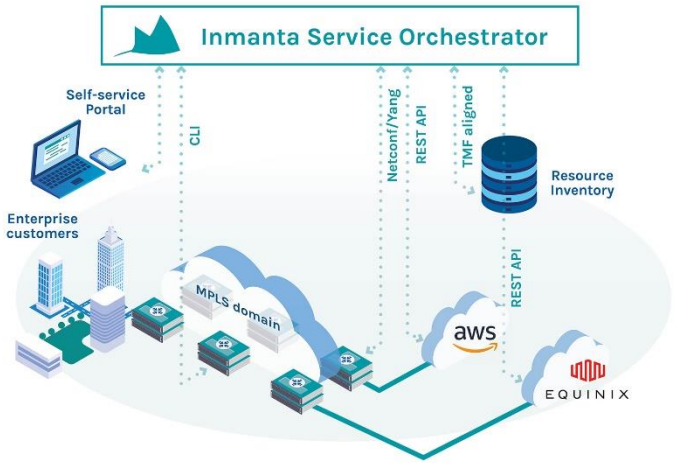

Figure 4: End-to-end orchestration of cloud connect service

Private Mobile Networks

Automate the end-to-end deployment of entire private 4G LTE/5G networks at enterprises in manufacturing, utility, military, airport, healthcare etc. Inmanta Service Orchestrator provisions and activates the vRAN and vEPC components, configures the small cells and rolls out the network services on top.

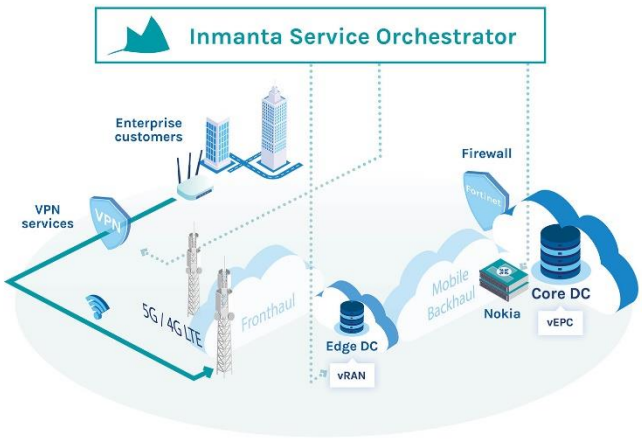

Figure 6: End-to-end orchestration of private 5G/4G LTE networks.

Virtual Private Cloud (VPC)

Orchestrate Virtual Private Clouds (VPC) across multiple domains, e.g. datacenters, backbones and cloud platforms. Inmanta Service Orchestration provisions the virtual machines on top of OpenStack or VMware, sets up the Layer 2 connectivity through an MPLS backbone to the customer network and configures the firewalls.

Supported Adapters

- Cloud platform: Amazon Web Services®, Kubernetes®, OpenStack®, VMware® vSphere
- Carrier-Based Cloud Interconnect (CBCI): AWS Direct Connect, Equinix® ECX, Google® Cloud Interconnect, Azure® ExpressRoute
- Network vendors: Cisco IOS-XR/NX-OS/IOS, Nokia® SR-OS, Huawei® S6720, Junos® OS, Cumulus Networks®, HPE® Comware
- VNF and CNF: FortiGate®, Checkpoint®, Metaswitch vIMS, Accelleran dRAX (vRAN)
- Inventory systems: NetBox, TMF 639
- OS: Amazon® Linux, CentOS®, Debian®, Fedora®, RHEL®, Ubuntu®

Please contact Inmanta for an exhaustive list.

System Requirements

Inmanta Service Orchestrator runs on bare-metal servers or virtual machines (VM). Multi-host clusters are supported for high availability and very large-scale setups.

Minimal system requirements for lab and pre-production	2 CPU cores, 4 GB memory, 10 GB disk, Linux OS
Recommended system requirements for production	8 CPU cores, 64 GB memory, 1 TB disk, Linux OS
3rd party software dependencies	Python 3, PostgreSQL v10

All third-party software used by Inmanta Service Orchestrator is licensed under a OSI-approved copyright license. Inmanta recommends using Red Hat Enterprise Linux (RHEL) 8 for production environments. Inmanta uses OpenID Connect for authentication and SSO to manage and control orchestration permissions through JSON Web Tokens (JWT).

Find out more.
How end-to-end automation helps you lead the game

Connect with Inmanta

Closed Loop Automation x2

Inmanta Analytics & Intelligence provides a lot of operational data in addition to the configured state information that is by default monitored and validated by Inmanta Service Orchestrator.

The objective is to not only continuously validate and remediate the configured state information, but also to act upon telemetry/analytics inputs to ensure compliance to the intent (i.e. desired state and behaviour).

Inmanta Analytics & Intelligence has been built on top of industry-proven open-source components.