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The INFN Cloud platform: state of the art and services implementation

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The National Institute for Nuclear Physics (INFN) has developed and manages "INFN Cloud," a federated cloud infrastructure that provides resources and a customizable service portfolio to the scientific communities it supports. The INFN Cloud platform's federation middleware is based on the INDIGO PaaS Orchestration system, which integrates multiple open-source microservices and allows handling high-level deployment requests from users while orchestrating the deployment process across various IaaS platforms.
As part of our involvement in national and European projects, we are enhancing the INFN Cloud platform by introducing new functionalities and developing additional microservices. This evolution stems from the need to replace obsolete PaaS components, leading to the integration of modern technologies, including artificial intelligence, to enable more efficient solutions while also improving user experience, accessibility, and automation.
In particular, in this contribution, we provide details on the newly introduced services (the federation registry and feeder), the work done to integrate them into the PaaS Orchestration system, the updates to the Orchestrator dashboard aimed at introducing new features, and the introduction of the monitoring and the AI-ranker services to improve the provider ranking system. Additionally, new PaaS services have been designed, implemented, and made available to end users, such as the Kubernetes Cluster one that enables the transparent offloading of Kubernetes workloads to remote computation systems.

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