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Laniakea: applications management development

Galaxy [1] is the prevailing workflow manager within the Life Science Community, enabling the execution of complex analyses even for users with limited computational knowledge, coupling its user interface with the native support for different resource managers. Its usage is also emerging in different Research domains, as for example Astrophysics, Climate and Material science.

Laniakea [2], already employed by several Italian Institutions [3] for their daily usage, leverages the INDIGO PaaS Cloud Stack to perform the on-demand deployment of production grade Galaxy instances from an easy-to-use web interface, complementing the user-friendliness of Galaxy, with ease in creating the instance and managing it.

Moreover, given the sensitive nature of data often analyzed with Galaxy, we further extended the PaaS Dashboard for supporting automated deployment of encrypted storage volumes and user secrets management, exploiting Hashicorp Vault for storing passphrases. We describe here the latest developments of the Laniakea Dashboard implementation, allowing our users to perform instance and application management straight from the interface, without the need to access the virtual instance command line.

We introduce the Laniakea Utils API [4], which mediates the interaction between the Dashboard and the installed software on the virtual machine (VM). Developed exploiting the Flask micro-framework, the API executes pre-defined operations on the VM on behalf of the user, accepting connection only from the Dashboard and using the flaat [5] python application for authenticating the routes with IAM tokens.

References:

[1] The Galaxy Community , The Galaxy platform for accessible, reproducible and collaborative biomedical analyses: 2022 update, *Nucleic Acids Research*, Volume 50, Issue W1, 5 July 2022, Pages W345–W351, <https://doi.org/10.1093/nar/gkac247>

[2] Marco Antonio Tangaro, Giacinto Donvito, Marica Antonacci, Matteo Chiara, Pietro Mandreoli, Graziano Pesole, Federico Zambelli, Laniakea: an open solution to provide Galaxy “on-demand” instances over heterogeneous cloud infrastructures, *GigaScience*, Volume 9, Issue 4, April 2020, g1aa033, <https://doi.org/10.1093/gigascience/g1aa033>

[3] Tangaro, M.A., Mandreoli, P., Chiara, M. et al. Laniakea@ReCaS: exploring the potential of customizable Galaxy on-demand instances as a cloud-based service. *BMC Bioinformatics* 22 (Suppl 15), 544 (2021). <https://doi.org/10.1186/s12859-021-04401-3>

[4] <https://pypi.org/project/laniakea-utils/>

[5] <https://github.com/indigo-dc/flaat>

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