

Developments in Cloud Napoli: Manila and GPU Passthrough

In operation since summer 2023, Cloud Napoli is now running on OpenStack 2024.1 “Caracal”(the latest SLURP release at the time of writing) on EL9.

In the last year there have been two major changes: the adoption of *Manila* for shared filesystems management, now in production, and first tests of GPU passthrough.

Manila

Manila is the OpenStack component to manage shared filesystems.

It supports several storage backends (eg. CEPH, dCache as NFS, GlusterFS, NFS) and exposes them as flexible shares (supported NFS, CIFS, CephFS, GlusterFS, HDFS or MAPRFS).

This happens through a service VM connected to each project’s private network that interacts with the storage backends and exposes them as a standard share available only to the other VMs in the project.

Manila allows to centralize management of shares in OpenStack, including quotas of different projects, and makes the backend transparent to the users.

In fact when needed shares can be migrated between different backends without changing the endpoint to the user, so that no changes happen on the VMs.

This comes with additional complexity though and we would so in this work we share our experience, showing advantages/disadvantages and the setup we chose for production, with possible future developments.

GPU Passthrough

Although OpenStack has a dedicated component for managing “accelerators”

(such as GPUs and FPGAs) called *Cyborg*, it also supports a simpler approach using PCI pass-through combined with *Nova* configuration.

Preliminary tests have been conducted to add a GPU to an existing compute node.

While this solution is not yet production-ready, we have drafted some initial conclusions.

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