

Phoenix - An open source orbital cloud infrastructure

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Phoenix is a project launched last October as part of the Federation initiative.

The Phoenix project aims to design, build and put into orbit the first bricks of **an orbital cloud** (a shared IT infrastructure in orbit). This cloud will be based on a decentralized and modular architecture.

Any organization on a global scale could contribute to its deployment by incrementally adding **standardized and open source bricks** to the infrastructure (space or ground segment).

It aims at providing **space-to-space and space-to-ground IT container services**, which could be put to multiple uses (Image computation, trajectory computation, signal processing...).

Its main components are:

- **IT architecture:** each satellite will constitute a “node” of the infrastructure, similar to the physical components of a terrestrial IT infrastructure, mainly an information processing and/or storage node (server), and a communication node (switch).
- **Space platform:** hardware design of what is specific to a server / switch in orbit: power supply, protection against environmental hazards (temperature, radiation, debris ...), attitude control, possibly propulsion. Potentially we could consider the virtualization of the on-board computer (no dedicated physical on-board computer).
- **Communication system:** intra-constellation communication and communication with the ground.
- **Ground Segment:** definition of the operating modes of our satellites, the link with other space actors (tracking, collision detection, various interferences...).

Currently the project is at the early design phase. We are using the model-based system engineering methodology to perform an operational analysis, and from there deep dive into sub-systems.

Our **current roadmap** includes :

- Testing the early software layer from an existing orbital platform (ISS, satellite...) in 2021
- Launching a 2U proof of concept in 2023
- Launching the first nodes of the operational constellation in 2026

And we are looking for all interested contributors to join us to make this sky-reaching project real! No skill nor diploma required, only passion and the will to dedicate time and energy to moving the project forward.

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