INFN Cloud
Sync & Share "aaS"

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Introduction

Traditionally CS3 focuses on large Sync & Share infrastructures to be used by large scientific and educational communities

INFN Cloud offers fully automated, self managed Sync & Share services to small to medium communities, often for a specific purposes

This presentation will focus on how Sync & Share services are deployed on INFN Cloud

What is INFN Cloud? (See Diego Ciangottini slides)

- A production-quality set of resources and solutions providing:
  - A **core backbone**, with ancillary and special-purpose services.
  - A **multi-site, federated Cloud infrastructure**.
    - INFN Cloud can transparently federate INFN sites as well as public or private Clouds (e.g.: AWS, Google Compute Cloud, Microsoft Azure, and others)
  - A **customizable portfolio of services** accessible via web interfaces, terminal or API.
  - A **fully distributed organization for the support and management** of both infrastructure and services.
  - A set of **rules that define access resources and policies**, according to INFN, national and European laws.

This page collects all policies and procedures that have been validated by the INFN Cloud Project Management Board and that are currently in place across the INFN Cloud infrastructure.

Title	Applies To	Notes
INFN-Cloud Procedure to manage scheduled downtimes	Infrastructure/Users	v. 1.0 02/02/2022
INFN-Cloud Rules of Participation	Infrastructure/Users	v. 1.2 19/01/2022
INFN Cloud Security Recommendations	Infrastructure/Users	v. 1.0 09/06/2021
User Community Operation Level Agreement	Users	v. 1.0 13/04/2021
		v. 1.0 13/04/2021
		v. 1.0 13/04/2021
		v. 2.0 29/09/2021
		v. 1.1 13/04/2021
		v. 1.1 13/04/2021

Welcome to the INFN Cloud Use Cases Documentation

You'll find here useful information regarding the use-cases supported on the INFN Cloud infrastructure.

Table of Contents

- Getting Started
- How To: Create VM with ssh access
- How To: Deploy Sync&Share aaS
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- How To: Use the Notebooks as a Service solution
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- How To: Deploy a Kubernetes cluster
- How To: Deploy an Apache Mesos cluster
- How To: Deploy a Spark cluster + Jupyter notebook
- How To: Deploy Elasticsearch & Kibana
- How To: Deploy RStudio Server
- How To: Instantiate docker containers using custom docker-compose files
- How To: Instantiate docker containers using docker run
- How To: Access cloud storage from a scientific environment
- How To: Request the "nomination to be system administrator"
- How To: Request the "nomination to be system administrator" (italian version)

INFN is offering to its users a comprehensive and integrated set of Cloud services through its dedicated **INFN Cloud infrastructure**.

The **INFN Cloud portfolio**, available via an **easy-to-use web interface** but also exploitable via command-line interfaces, is defined upon clear user requirements.

It is based on **composable, scalable, open-source** solutions and can be easily extended either by the INFN Cloud support team or directly by end users.
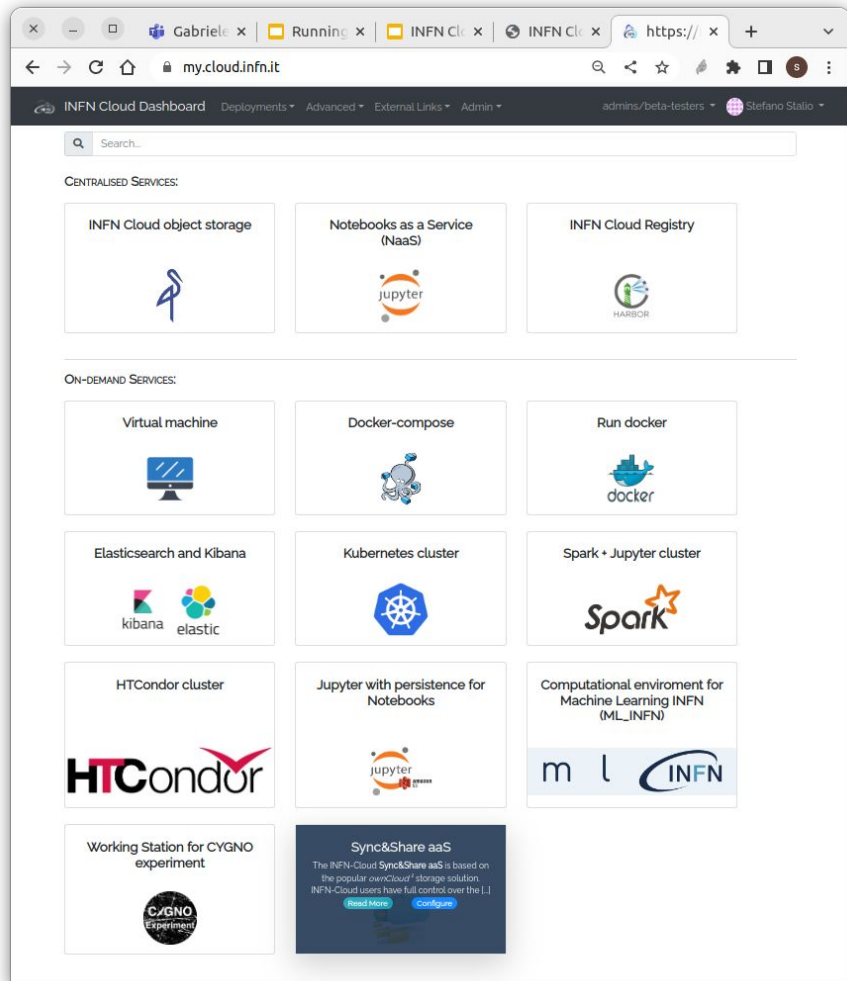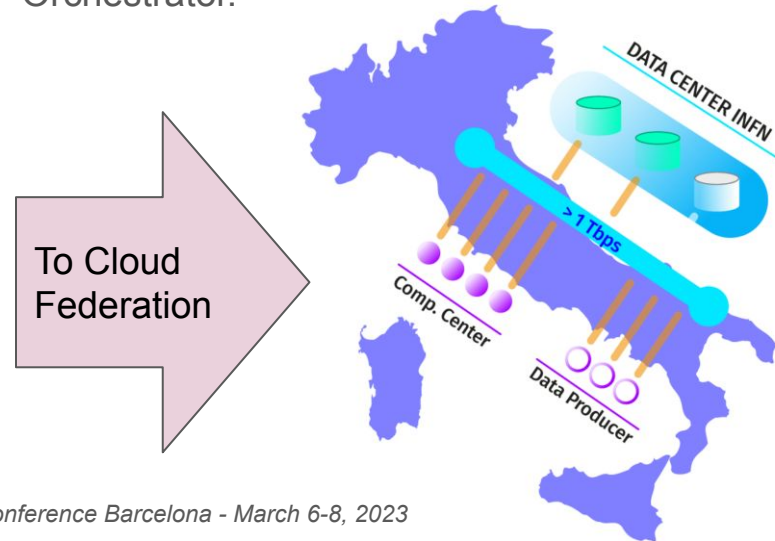
The **INFN Cloud Dashboard** is backed by a cloud service orchestrator

The **Orchestrator** is in charge of distributing **Paas** level services among the available IaaS infrastructures

The **INFN Cloud IaaS infrastructures** are configured to accept service requests from the Orchestrator.

To Cloud Federation

DATA CENTER INFN

> 1 Tbps

Comp. Center

Data Producer

Sync and Share "aaS"

- Among the services offered by the INFN Cloud Dashboard, mostly devoted to scientific computing, Sync & Share is among the ones that capture the interest of many communities

- User communities often want a dedicated Sync & Share instance to be managed internally, sometimes for limited periods

- **Ease of use and full automation** encourages the request for dedicated, self-managed Sync & Share services
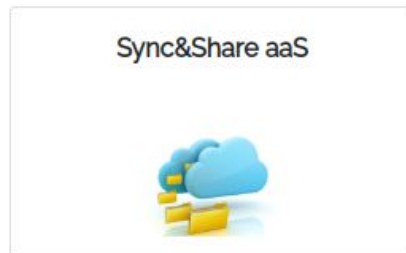
Sync&Share aaS

Sync and Share "aaS"

- Takes less than 5 minutes to configure.
  - **No technical expertise required**
  - **Documentation available**
- Takes 10 minutes to deploy
- Feature rich
- Built via docker-compose inside a single VM with external S3 backend
- **Immediately ready for use**

- Fit for small communities needing a dedicated Sync & Share service for a specific purpose
- **Not fit for hundreds of users and tens of TBs**

Features /1

- Support for ownCloud and NextCloud
- OIDC or local login
- Integrated monitoring and alerting

Features /2

- Remote S3 backend for data and backup
- Data distributed and replicated over two data centers in different italian cities
- Periodic DB and configuration backup
- Outgoing mail server configured

The Sync & Share service is provisioned via docker-compose on a single VM

DNS automation via an xip.io like mechanism. x509 Let's Encrypt certificates managed automatically via Traefik

S3 remote storage backend

DB and configuration backup on S3

Bologna

Bari

Distributed Swift Cluster
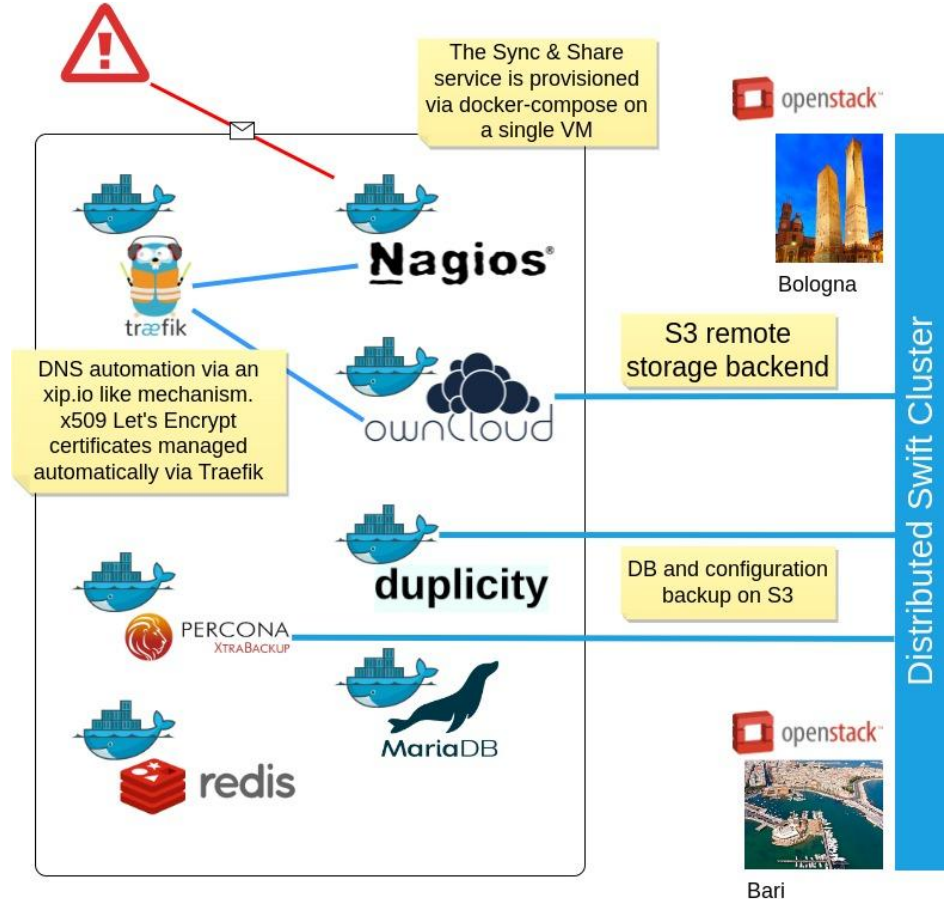
Features /3

- x509 certificate automation via Let's Encrypt / Traefik
- xip.io/nip.io-like DNS
  - no need to interact with a DNS DB

https://data.90.147.174.100.myip.cloud.infn.it	Points to Sync & Share
https://status.90.147.174.100.myip.cloud.infn.it	Points to monitoring

Security

- Encrypted connections
- Periodic network security scans
- Authenticated scans (= from inside the VM) if requested by user
- Strict security groups
- Fail2ban on ssh (to be tested on https)
- Centralized logs
- User support for updates and solution of vulnerabilities

Conclusion and Contacts

- Alternative approach with many independent Sync and Share instances has interesting aspects
- Limited scaling and resilience can be issues, but communities know in advance and can opt for similar services that already exist inside INFN or ask for help building a resilient architecture on INFN Cloud.
- Solution proves to be robust
- Users seem to like full automation and features

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