Structuring and implementing the Brazilian Academic Cloud

Strategy, modelling, challenges and services
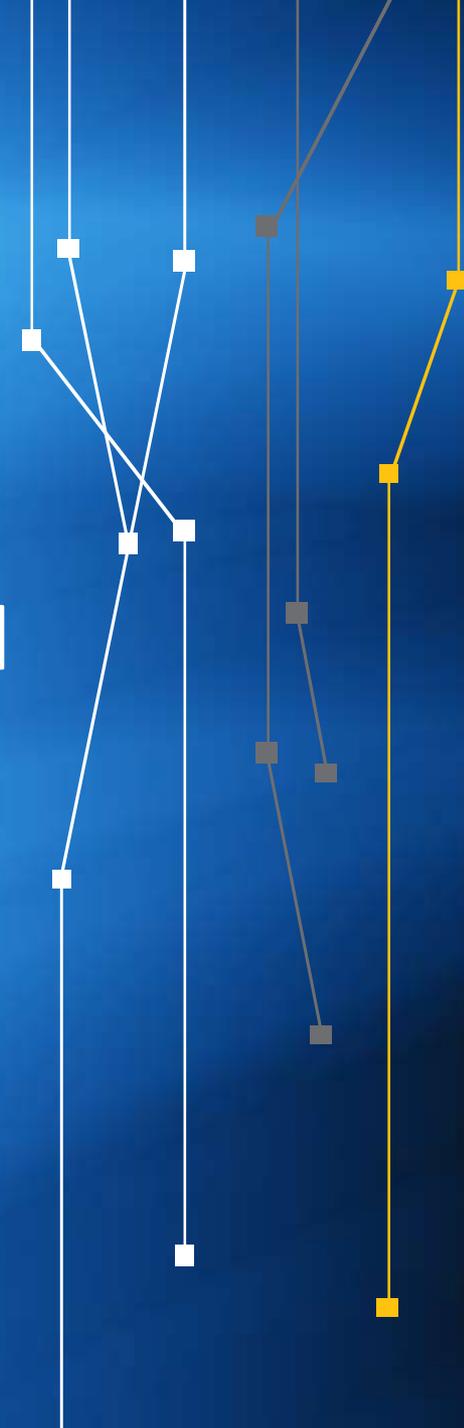
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Rede Nacional de Ensino e Pesquisa (RNP)

- **Connect more than 1.300 points, of around 350 public and private institutions (universities and research institutes) through an advanced multi-gigabit national backbone.**

- **RNP also offers advanced services on top of this network, potentially benefiting more than 3.5 million users, the services include VoIP, web conferencing, video conferencing, telepresence rooms, video on demand (VoD), colocation, live streaming, federated authentication for most of the services and eduroam.**
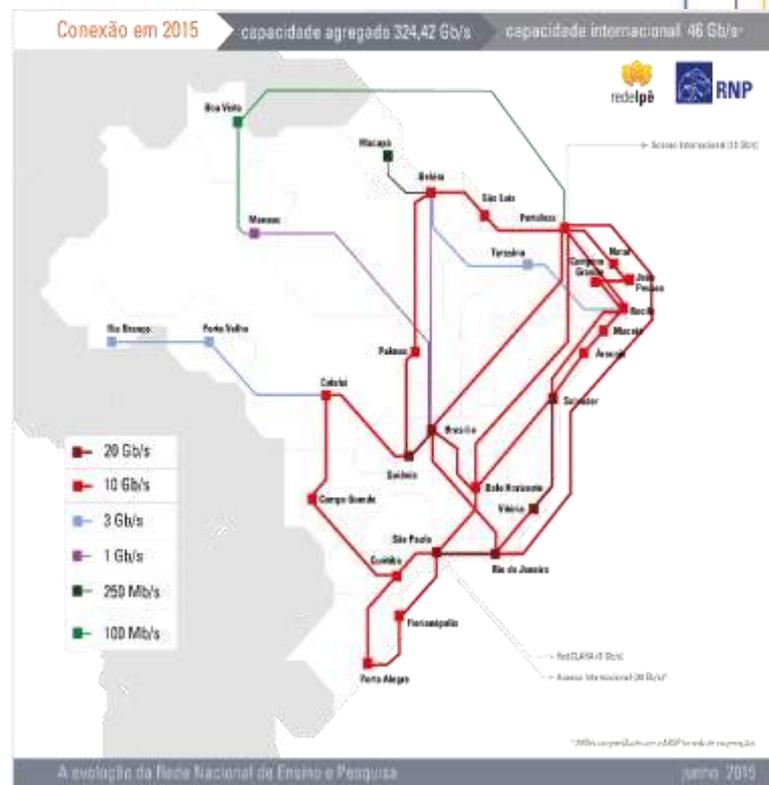
RNP Cloud Challenge

Stakeholders

- Public R&E institutions, can be, at the same time or separately, customers and providers of infrastructure and services;
- Research groups, that contribute with their scientific application's requirements;
- R&E funding agencies, that regulates the current research-funding model, which need to be changed based in the cloud paradigm;
- RNP that has the coordination role, being responsible for the cloud architecture definition, contracting and operating its services.

Users

- Institutional users (IT managers of R&E institutions) – Use traditional workloads and architectures;
- Individuals (e.g. researchers and their labs) – Use dynamic and non-standard workloads and architectures.
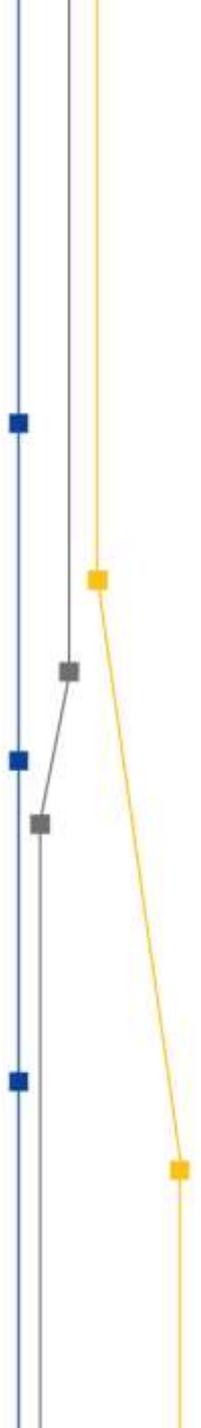
RNP Cloud Strategy

- The hybrid model allows RNP to act as a public (commercial) contract broker for "low risk" services
- Through the community model, universities and research institutes can offer their own datacenter infrastructure (in full or partially)
- The federated model ensures the required level of security and trustiness among all the partners as well as to the users through RNP's federated services
- This strategy is also an answer to the geographical distribution requirement for a redundant and reliable cloud
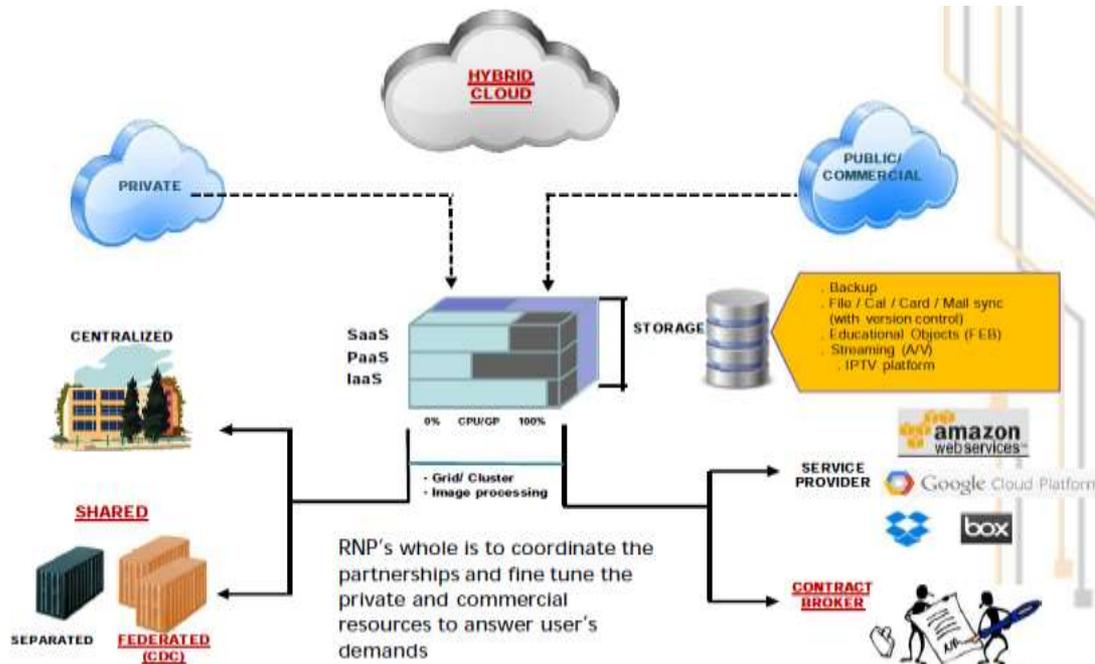
Implementation and Service Definition

Phase 1

2015

Pilot Services
- Web Conference

Phase 2

2016

Pilot Services
- Cloud E-mail
- Cloud Storage
- Elastic Computing

Experimental Services
- Web Conference

Phase 3

2017

Pilot Services
- Cloud Applications Hosting
- Virtual Desktop

Experimental Services
- Cloud E-mail
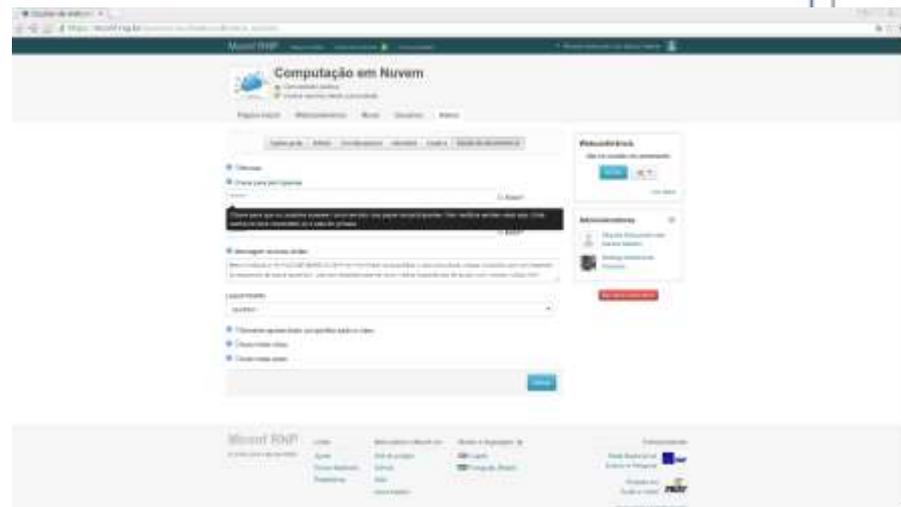- Cloud Storage
- Elastic Computing
- Virtual Desktop

**Production Services**
- Web Conference

RNP Cloud Services Status - Web Conference

- Mconf is a platform based on open source technologies and developed by a Brazilian research group, funded by RNP, the platform is running as a pilot for RNP's staff since October 2014 and will replace the old platform (Adobe Connect) in November 2015

- The service has a self-service portal and the users can create communities, manage other users on communities, delegate administration of communities, record and manage web conference sessions and more. Additionally all activities are logged, bringing accounting capabilities

- During the pilot and experimental service many enhancements were implemented, such like a better user interface, a WebRTC module to improve the audio quality, a mobile app, etc

RNP Cloud Services Status – Cloud Storage

- CNC is a platform based on open source technologies and developed by a Brazilian research group, funded by RNP, the pilot will stats in the first quarter of 2016, for now the software is in final test phase.

- The service has a federated self-service portal and the users can upload, download, visualize, share and synchronize their files. Additionally the service has federated desktop and mobile apps and a federated administration portal which administrators can manage quotas, users and groups in a federated environments and visualize administrative reports and metrics.

- During the test and experimental phase many enhancements were implemented, such like implement a multi-tenant and multi-container model using swift as a backend for OwnCloud, free iOS client, etc.
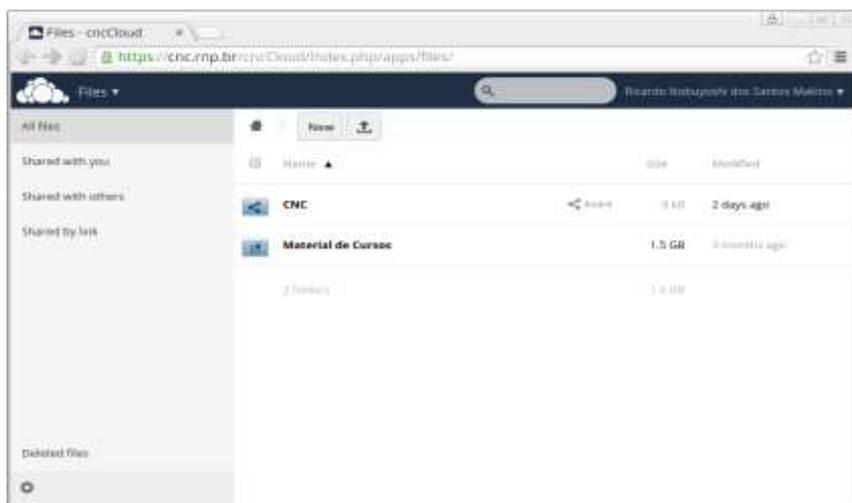
RNP Cloud Services Status – Elastic Compute

- The Elastic Compute service aims to provide virtual machines to the R&E community, allowing researchers to accelerate tests and simulations, which today depends of the acquirement of new hardware, which in some cases impact their research.

- The service plans to start the pilot in the first half of 2016. RNP chooses Apache CloudStack as the software platform that will provide the service. The project team has ended the deployment of all systems and finished the test and homologation phase.

- The service will support federated authentication by default and will provide a variety of service offerings, like compute offerings since 1vCPU and 512MB of RAM to 6vCPU and 12GB of RAM, disk offerings from 10 GB to 2 TB of capacity, network offerings with firewall, load balance, DNS, NAT, VPN and others.

RNP Cloud Services Status – Cloud E-mail

- The Cloud e-mail service is under construction and the main goal of the service is to provide a cloud based e-mail service that will allow the RNP'c customers to host e-mail boxes to their staff, lecturers, researchers and post graduate students.

- The service must have a self-service model where each institution that subscribe the service will be able to set their own domains, manage their users, connect your own LDAP database, manage spam, white and black lists, customize their web interface for the users, manage message features like attachment size, etc.

- Currently RNP has defined the software platform that will provide the service. It was chosen after a careful evaluation of requirements which selected Zimbra Enterprise platform. The project team has ended the deployment of all systems and finished the test and homologation phase. The next steps is to finish the business and management models and start to migrate the accounts from some institutions to validate the processes and procedures and improve the service.
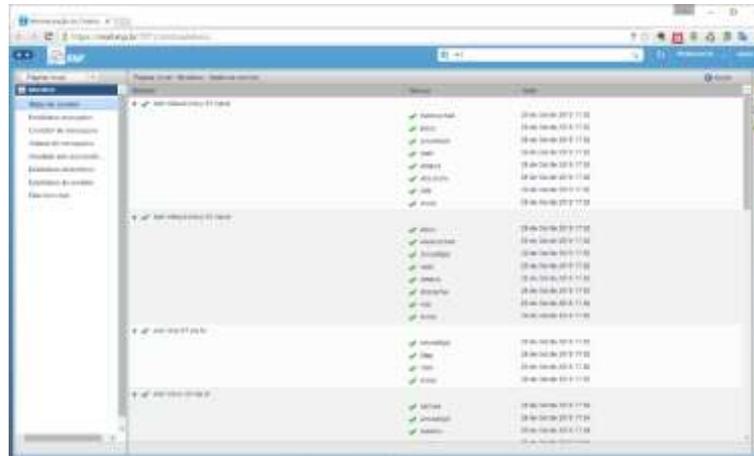
Final Remarks

- **The hybrid, community and federated strategy was chosen as the most flexible and suitable for the current Brazilian NREN operation and funding models.**

- **The cloud implementation and services selected to be initially offered were presented, as well as their current status and next steps planned.**

- **RNP believes that the Brazilian academic cloud will improuve the security and the national sovereignty. It will also reduce current fragilities that many public R&E institutions demonstrate regarding the safety of an ever-increasing amount of strategic and vital information, as a consequence of a lack of adequate e-infrastructure services and support.**

Thank you!
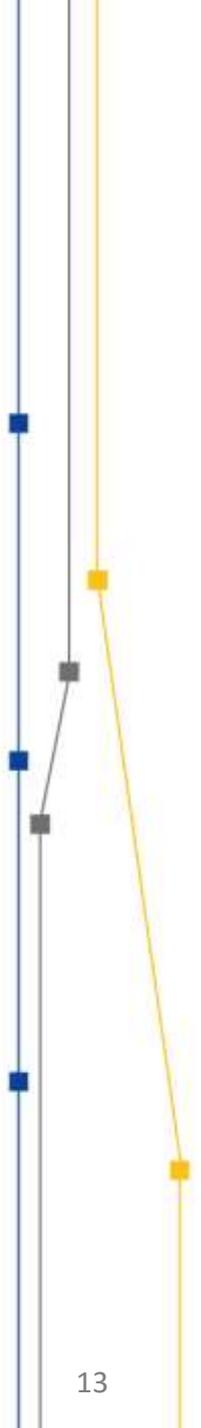
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