

GÉANT approach to Cloud R&E traffic

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LHCOPN-LHCONE meeting – Taipei (TW)

13-14 March 2016

The context

- Growing demand from the R&E community to use Cloud Services
 - Computing on demand (IAAS)
 - Storage
 - Share & sync
 - SAAS
- GÉANT is building a framework for the European R&E community to get better access to CS
 - Aggregate demand to get better price
 - Cut the data movement charge costs
 - Peer with providers to get better network performances
- CERN has issued a tender for acquiring Cloud Computing resources
 - Peering with GÉANT/NREN was a requirement on the providers
- EMBL-EBI is running a PoC for Cloud integration
 - Likely to start a massive procurement end of 2016

New/upcoming Cloud services

- Cloud Catalogue
 - <https://catalogue.clouds.geant.net/>
 - Directory on cloud SPs listing their capabilities and how they match the requirements set out by the NRENs

- Access to IaaS
 - Aggregation of demand from NRENs
 - Tender to be issued 19th April 2016
 - No single winner, all qualified provider will join the framework agreement
 - 3 commercial models available to NRENs to make the services available to their connected institutions
 - Referrer (NREN only act as intermediary, facilitating the liaison of the user with the provider)
 - Reseller (also involved in contracting and billing of the service)
 - Underwriter (the NREN purchases the service, then re-sell to its users)

- As a general rule, peers are only advertised to customers/connectors, not to other peers (no-transit policy)
- Partners from outside Europe should be able to reach the Cloud (virtual) user's resources, like they were physical resources
- Once a VM is created by an R&E user, then it's R&E traffic (regardless where it's hosted)
- **Rented car/owned car problem**
 - If you rent a car, you should be allowed to go wherever you could go with your own car!
 - Buying Cloud resources is, to some extent, like "renting" servers (mainly referring to IaaS, here)
 - Users should be enabled to work with them like with any "owned" or in-house server

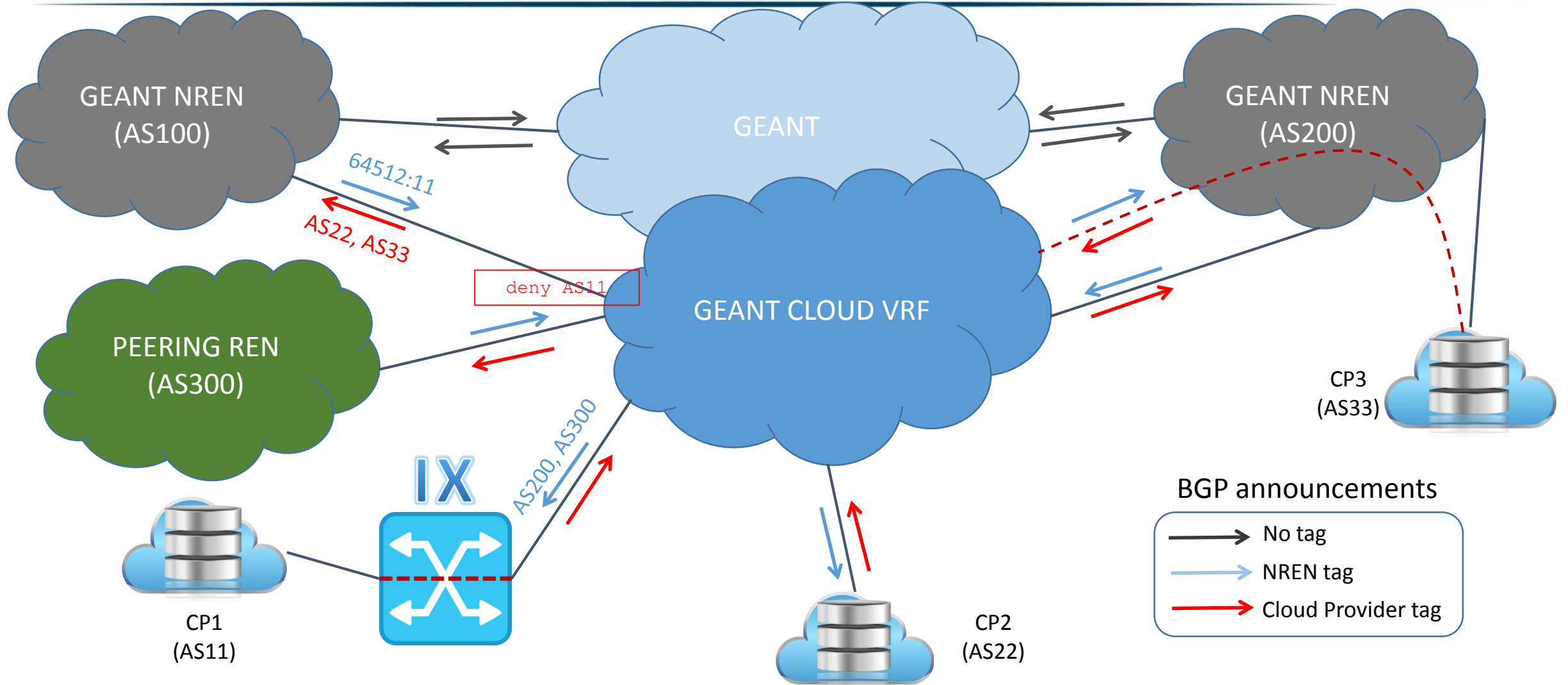
The requirements

- Need to comply with the GEANT/NRENs AUP
 - No commercial-to-commercial traffic
 - But not all NRENs are created equals...
- Not all the NRENs are willing to enable the transit to commercial entities
 - An Opt-in/out mechanism is needed
- Not all the partner NRENs outside of GEANT could be willing to receive those prefixes
- The providers can be connected in a number of ways
 - Direct peering with GÉANT
 - Peering via IX
 - Peering with an NREN
 - The technical solution should be able to accommodate all three kind of connections

The GÉANT solution

- A new GÉANT policy is on trial at the moment
 - Triggered by CERN tender
 - Approved by the GÉANT Board as an interim policy
- A new VRF has been created to accommodate the connection to Cloud Providers
 - Same usual AS number (20965) – unlike the IAS VRF
- We have an existing VRF for the commercial peerings already in place
 - The general peering policy has some limitations that make it unfit for the Cloud VRF
- Each NREN and partner can choose if to peer or not (**opt-in**)
- The BGP community scheme allows a fine-grained control
 - An NREN can stop BGP advertisements to a specific CP
 - Filtering the CP prefixes on the NREN access port will block all the traffic between them (**opt-out**)

Network diagram



- After the end of the current CERN tender, we'll do an extensive analysis of the outcomes
 - Manpower, time, costs, etc.
- The outcome will be presented to the GÉANT Board and the General Assembly, that should take a final decision on a long-term cloud policy
- **Recently, Amazon has agreed with GÉANT to waive data egress charges!**



Thank you
Questions?

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This work is part of a project that has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No. 691567 (GN4-1).