ADDRESSING CLOUD PROVIDERS LOCK-IN

Relaxing customers requests based-on providers constraints for NaaS discovery

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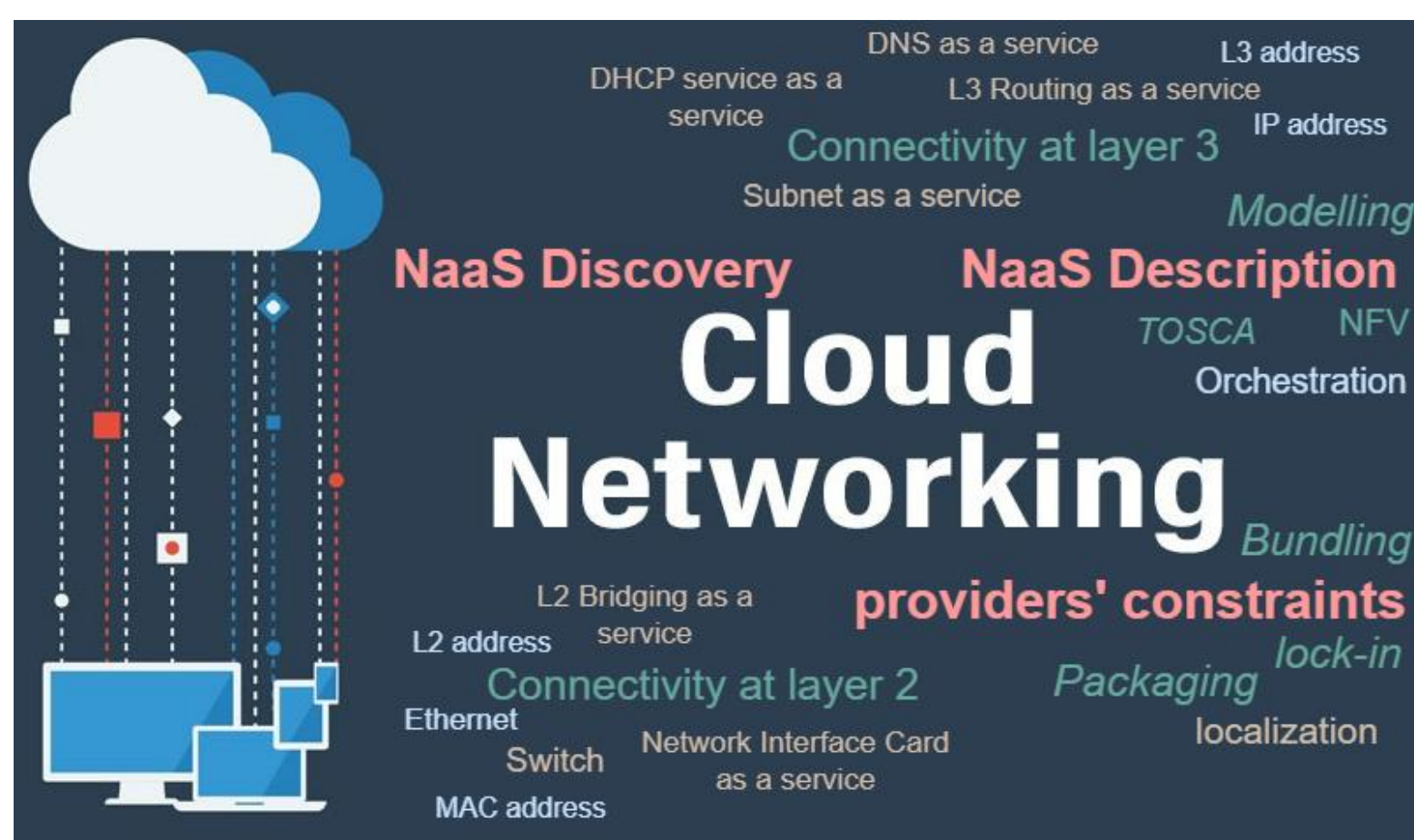Boualem Benatallah

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1. NaaS CHALLENGES

1. Network as a Service (NaaS) enables cloud customers to connect their distributed services across multiple clouds without relying on their own infrastructures.

2. NaaS providers impose constraints and limitations on the interconnection services offering.
   - provide NaaS as *pure bundles* (i.e., packages)
   - make NaaS fonctionalities heavily dependent on their location.

3. Constraints imposed on NaaS are not visible to customers before the deployment phase.

4. This locks customers at the networking layer and consequently at higher layers.

5. We need a dedicated service discovery to
   - identify the providers constraints that prevent a customer's request from being matched.
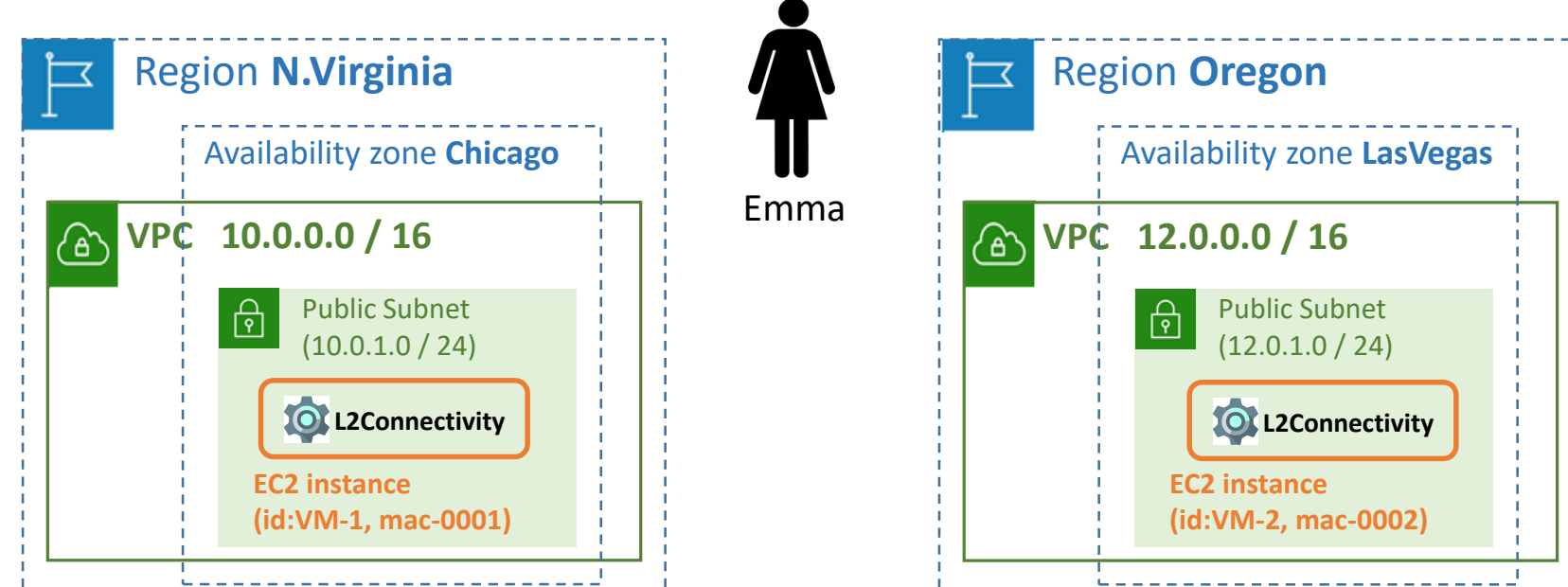   - recommend relaxing plans for discovery requests to retrieve compliant NaaS.

3. ADAPTATION PLANS IDENTIFICATION

REWRITING UNMATCHED REQUESTS

Our recommended relaxation plans for Emma's request w.r.t the identified provider's constraints

Plan-1
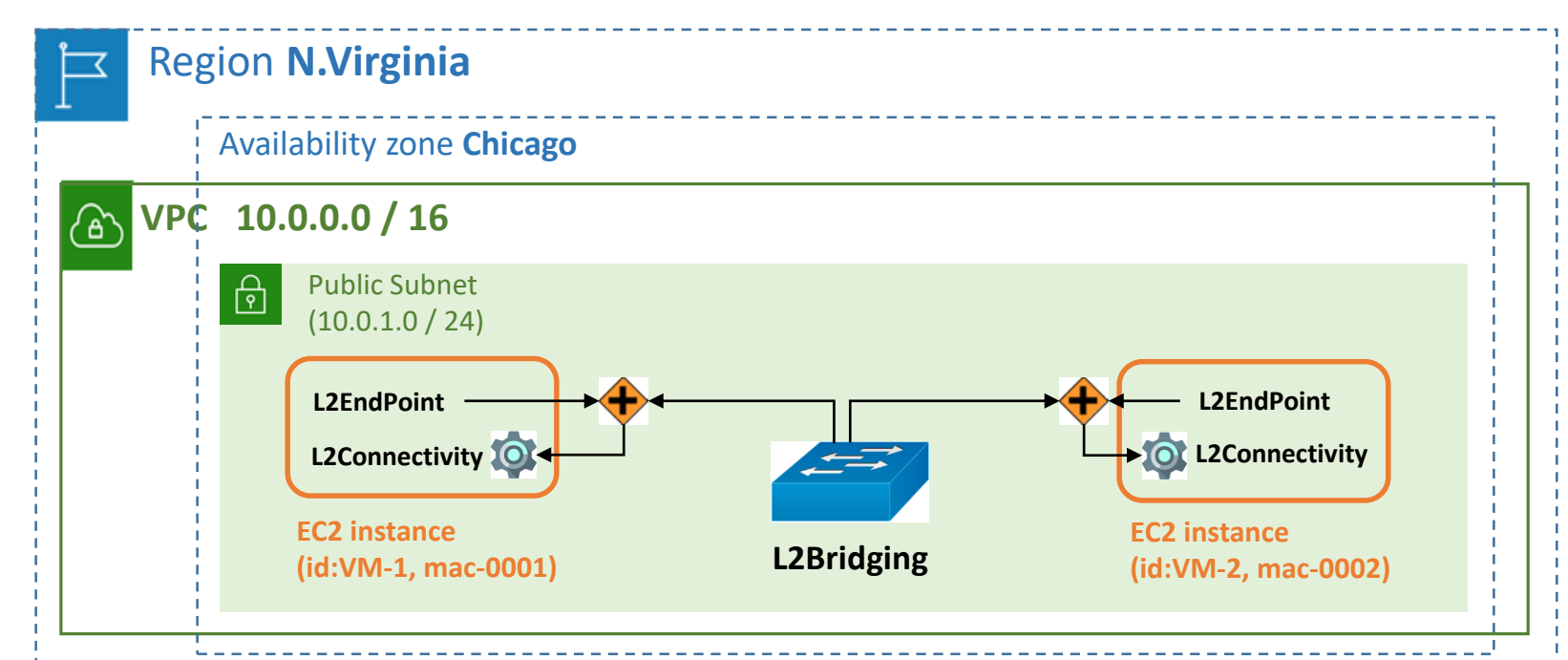
☹ Moving a VM to another region can be costly
(sometimes more expensive than purshasing a new VM in the target region)

Plan-2

Kind of L3 connectivity NaaS

☹ More advanced plan but with more services that the customer did not ask for (hence, more expensive too)

2. PROVIDERS CONSTRAINTS IDENTIFICATION

IDENTIFICATION OF PROVIDERS' CONSTRAINTS

Customer's request

Looking for establishing an **L2 Connectivity between** two different AWS virtual machines
- VM1 in the North of Virginia (precisely in the availability zone Chicago)
- VM2 in Oregon (precisely in the availability zone LasVegas)

Emma

AWS Provider's response

Without our approach of providers' constraints identification

VS

With our approach of providers' constraints identification

Impossible to fulfill Emma's request.

Impossible to fulfill Emma's request due to the following constraints:

« VMs should be in the same subnet (AZ and region) to be connected via their MAC addresses »

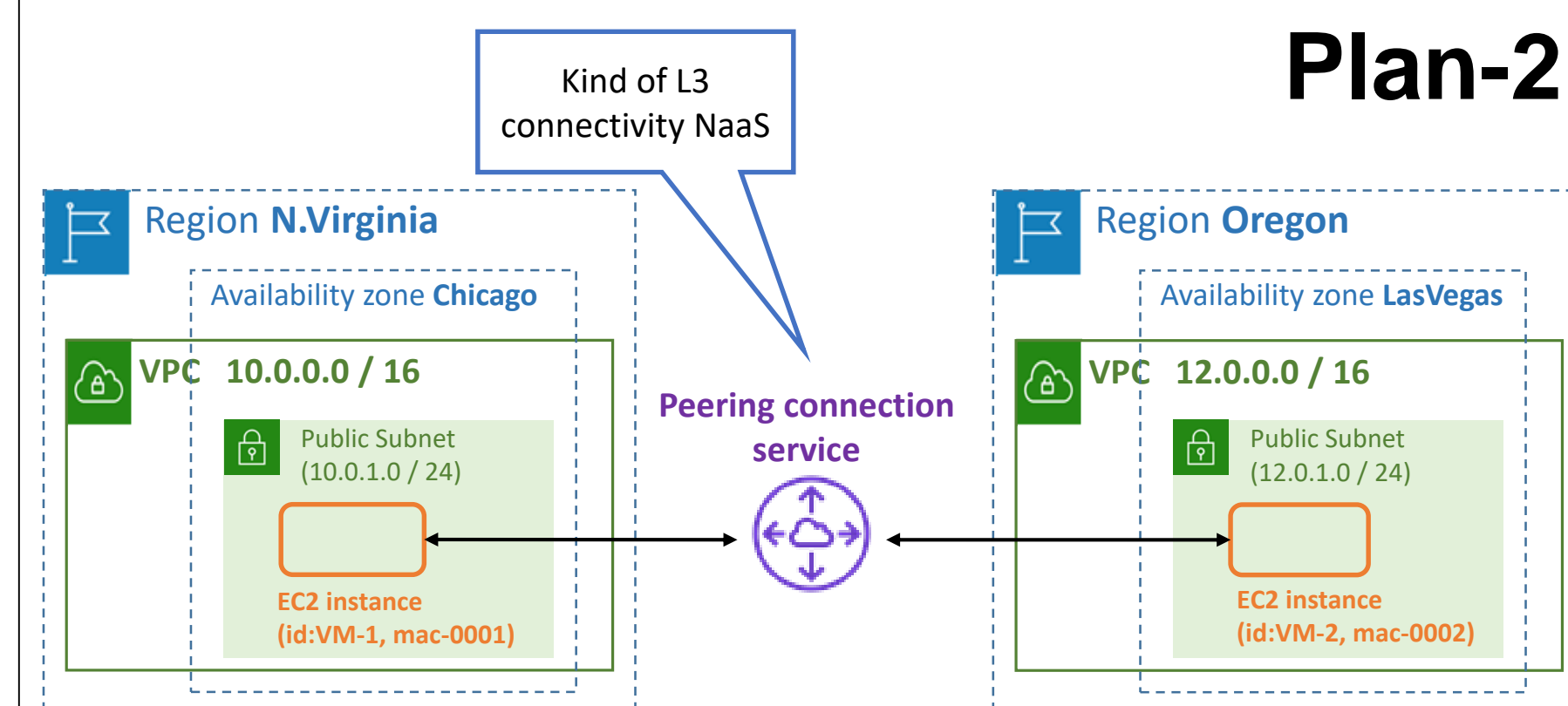« VMs in different regions (AZs and subnets) can be connected via their IP addresses using an L3 connectivity NaaS»

➤ **And a recommendation as remediation in step 3.**

"Enabling Multi-Provider Cloud Network Service Bundling". ICWS'22 conference
"Request relaxation based-on provider constraints for a capability-based NaaS services discovery". CAiSE'23 conference

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