NFVI Simulator

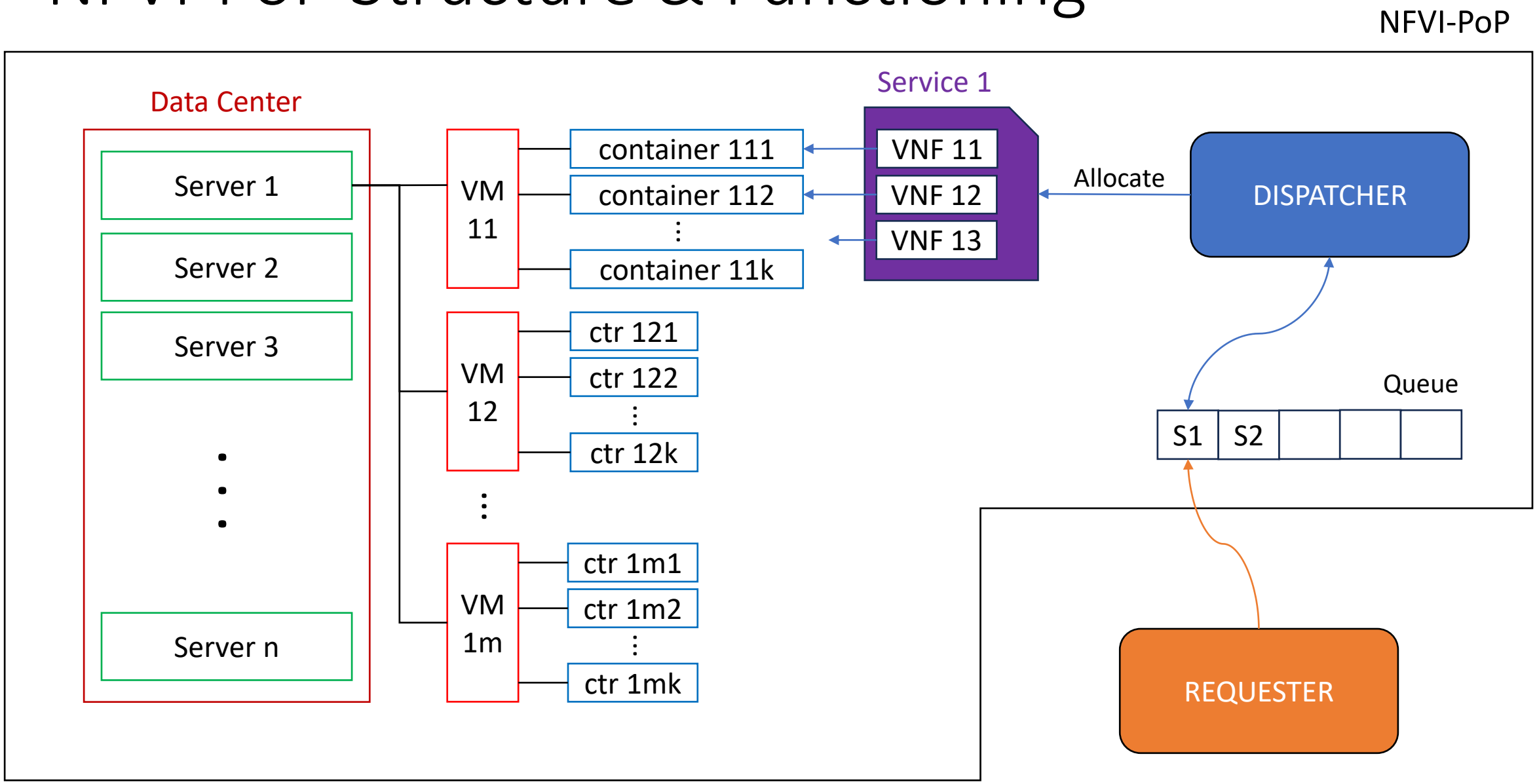
Structure and Functioning of NFVI Point of Presence and Dataset Structure derived from Simulations

NFVI-PoP Structure & Functioning

The NFVI-Pop is composed by:

- 1 Data Center that can own a decided number of Servers
- *N* Servers, each one defined as $server_i$ $(\mathrm{i}=1,\ldots,\mathrm{n})$
  -Servers are characterized by a set of resources that are:
  RAM, CPU, Storage and Network interfaces
- *NxM* Virtual Machines, each one defiened as vm_{ij} $(\mathrm{j}=1,\ldots,\mathrm{m})$
- *NxMxK* Containers, each one defined as ctr_{ijl} $(\mathrm{l}=1,\ldots,\mathrm{k})$
- 1 Dispatcher that takes care of allocation and deallocation of Network Services
- 1 Queue used to hold incoming services requests waiting to be served

NFVI-PoP Structure & Functioning



NFVI-PoP Structure & Functioning

The REQUESTER generate *n* Requests aiming to allocate a Service in the NFVI-PoP:

- Services are defined as S_i (i=1,…,n)
- Each Service has *m* Virtual Network Functions (VNFs) defined as VNF_{ij} (j=1,…,m)
- VNFs are of different types and require different amounts of resources
- Services have a duration that represent the time it has to be active in the system

The DISPATCHER takes the first request in the queue and (if possible) allocate the requested Service in a single VM by instantiating each VNF on the first available container of that VM

After the Service's time has passed, the DISPATCHER takes care of de-allocating the service and frees the containers occupied

In this process of Allocation/Deallocation Servers' resources are continuously held and released

Dataset Structure

The Dataset is built by running different simulations and contains the following entries:

- Number of Servers
- Servers' RAM (GB)
- Servers' CPU (cores)
- Servers' Storage (GB)
- Servers' Network interfaces
- Number of VMs instantiated
- Type of VM
- Number of VNF
- Type of VNF
- Number of Services running in the system
- Allocation Policy
- Request Rate (λ)
- Size of request
- Total consume of resources
- Service duration
- Service cost
- Energy cost
- Availability of renewable energy