Network Functions Virtualization using ProtoRINA

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Use Case: Firewalling as a Service

- Firewalls improve network security by controlling the incoming and outgoing network traffic, and protects the internal private network from exposure to the public
- As shown in Figure 4, application VNF is a firewalling process registered as the firewall for the enterprise network. VNF enrolls a foreign user application App A before it can access application App 1 (or other applications running on the enterprise network). After enrollment, IPC 5 is created to join the DIF via IPC 6. Then App A is able to communicate with App 1 through the underlying DIF, and the connection between App A and App 1 is mapped to a flow (IPC 5 – IPC 6 – IPC 1) in the underlying DIF
- Mechanisms and policies that support Firewalling as a Service:
  - RINA directory service
  - Authentication (DAF and DIF)
  - DIF neighbor discovery
  - Access control (enforced by underlying IPC processes)

Experiments over GENI

- VMs from three instaGENI aggregates (NYU, Gatech and Wisconsin). Enterprise network is running on NYU aggregate, end-user network is running on Wisconsin aggregate, and datacenter network is running on Gatech aggregate

References