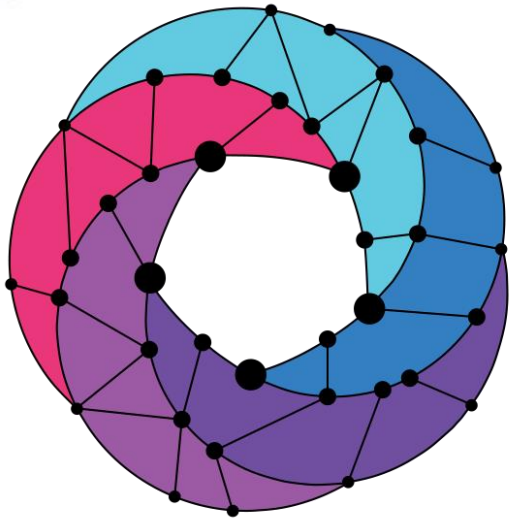

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π-Edge Platform and OSM for Security Analytics Automation in Network Slicing

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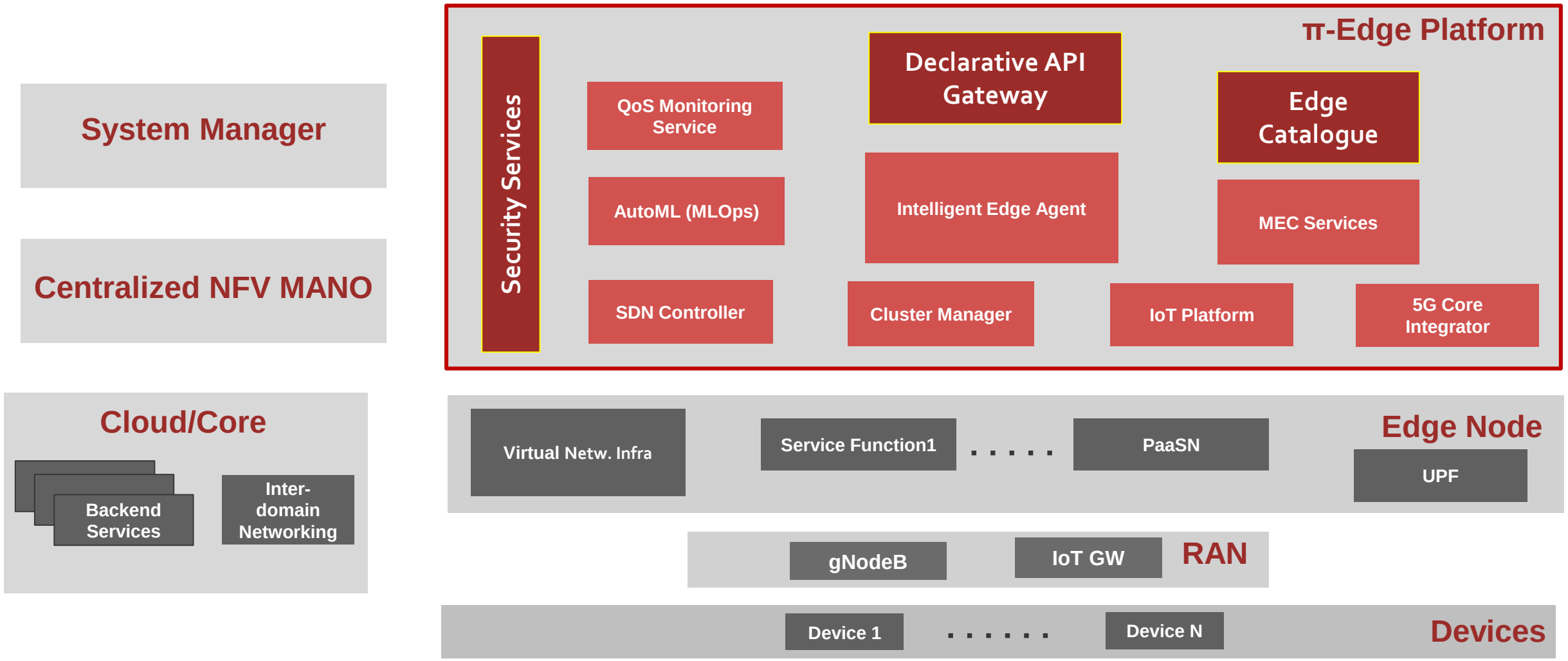
Overview

- Motivation
- π-Edge Platform for Edge Computing Automation
  - High Level Architecture
  - Edge Catalogue
  - Security Services
- OSM for automated Security enrichment of **slices** at the Edge
  - Use case architecture/ workflow
- Demo

Motivation

- π-Edge: Edge Management Platform for **Edge Automation**:
  - Platform-as-a-Service (PaaS) delivery model*
  - Automation, maintainability & interoperability with centralized orchestrators (e.g., OSM)
  - Minimization of management overhead
- Declarative Security Services for Netw. Slices at the Edge
  - Edge Ecosystems & multi-tenant, multi-party environments → Trust, reliability & robustness to security threats
  - High level declaration of security services → Zero-Touch Slice LCM

π-edge Platform: HL Architecture



π-edge Platform: Edge Catalogue

- Edge Catalogue contains:
  - Service Functions
    - Smallest units of a deployment (container/pod, VM etc…)
  - PaaS Services
    - Each consists of chain of Service Functions (one or more container/ VMs towards an application logic)
  - Edge Nodes
    - Represent the supported edge nodes of the edge cluster

Service Function:

```
{
  "service_function_name": "Kibana",
  "service_function_image": "kibana:7.15.2",
  "service_function_type": "Container",
  "application_ports": [
    5601
  ],
  "autoscaling_policies": [
    {
      "policy": "maximize-performance",
      "monitoring_metrics": [
        {
          "metric": "cpu",
          "limit": "1000m",
          "request": "600m",
          "util_percent": 60,
          "is_default": true
        }
      ]
    }
  ],
  "volume_dependency": false,
  "required_env_parameters": [
    {
      "name": "ELASTICSEARCH_URL",
      "value": "http://elasticsearch:9200"
    }
  ]
}
```

PaaS Service:

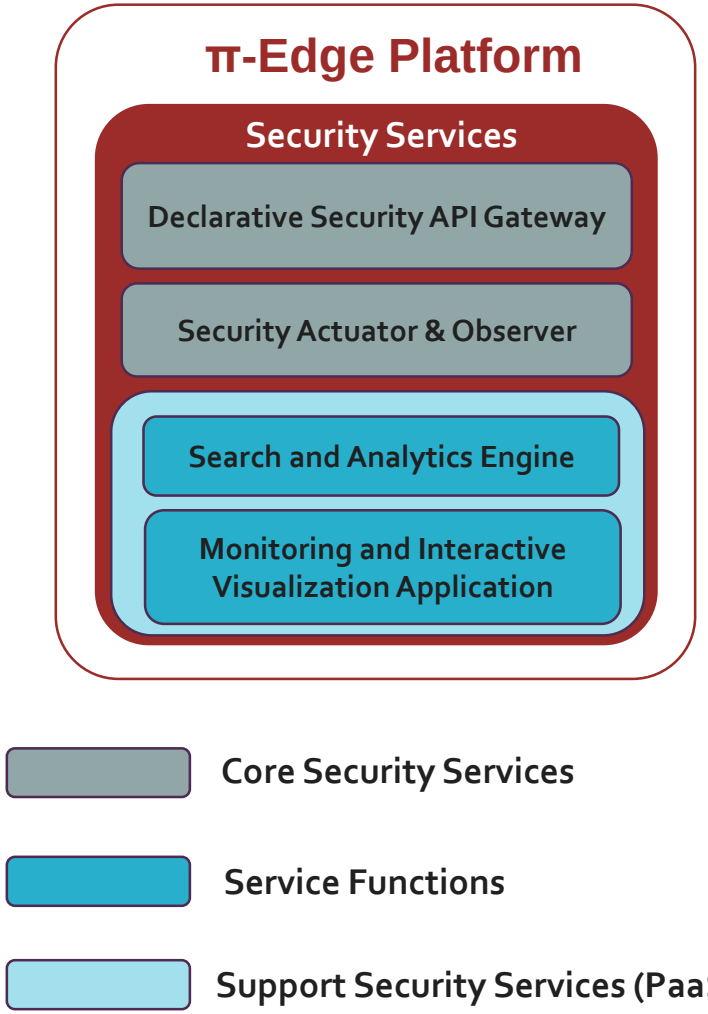
```
{
  "paas_service_name": "Support-Security-Services",
  "paas_service_policy": "maximize-performance",
  "service_functions": [
    [
      {
        "service_function_identifier_name": "ElasticSearch",
        "volume_mount": "2000Mi"
      },
      {
        "service_function_identifier_name": "Kibana"
      }
    ]
  ]
}
```

Edge Node:

```
{
  "serial": "146.124.106.179",
  "name": "compute1",
  "location": "Peania_19002_Athens",
  "id": "237d11c4-aca6-4845-9538-ba7b3e89c0b6"
}
```

Security Services

- Declarative Security API GW
  - Receives request for activating/deacticating a “secured” slice
- Security Actuator & Observer
  - Configures slice VNFs (routes rules, enables security analysis)
  - Informed about the “security” status of each slice
- Search and Analytics Engine for DB persistence
- Monitoring and Interactive Visualization Application
  - Usable GUI for exploring security analytics

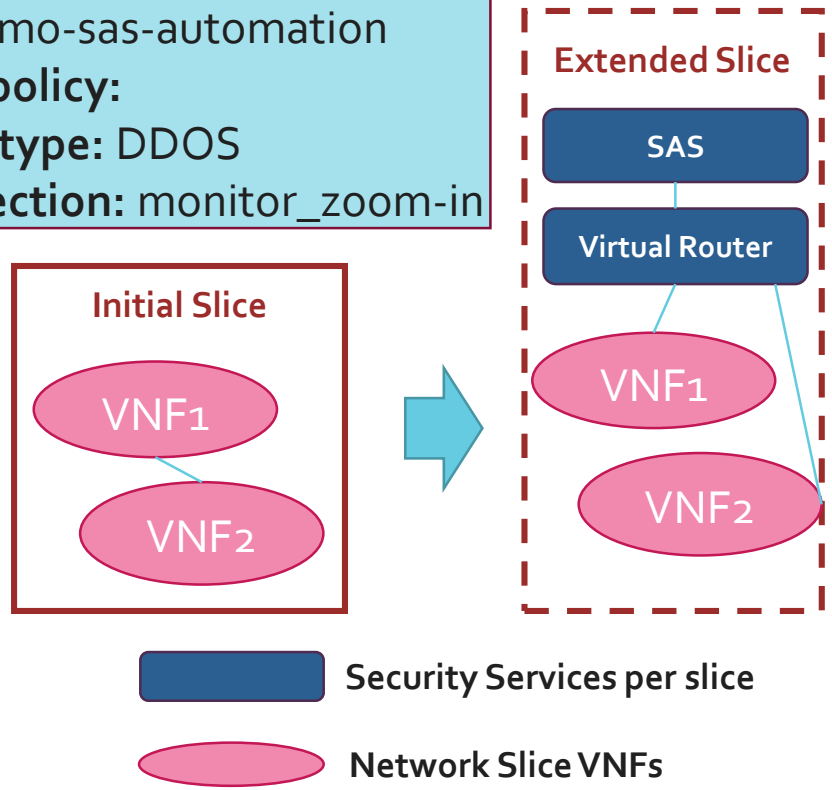


Security Services per Slice

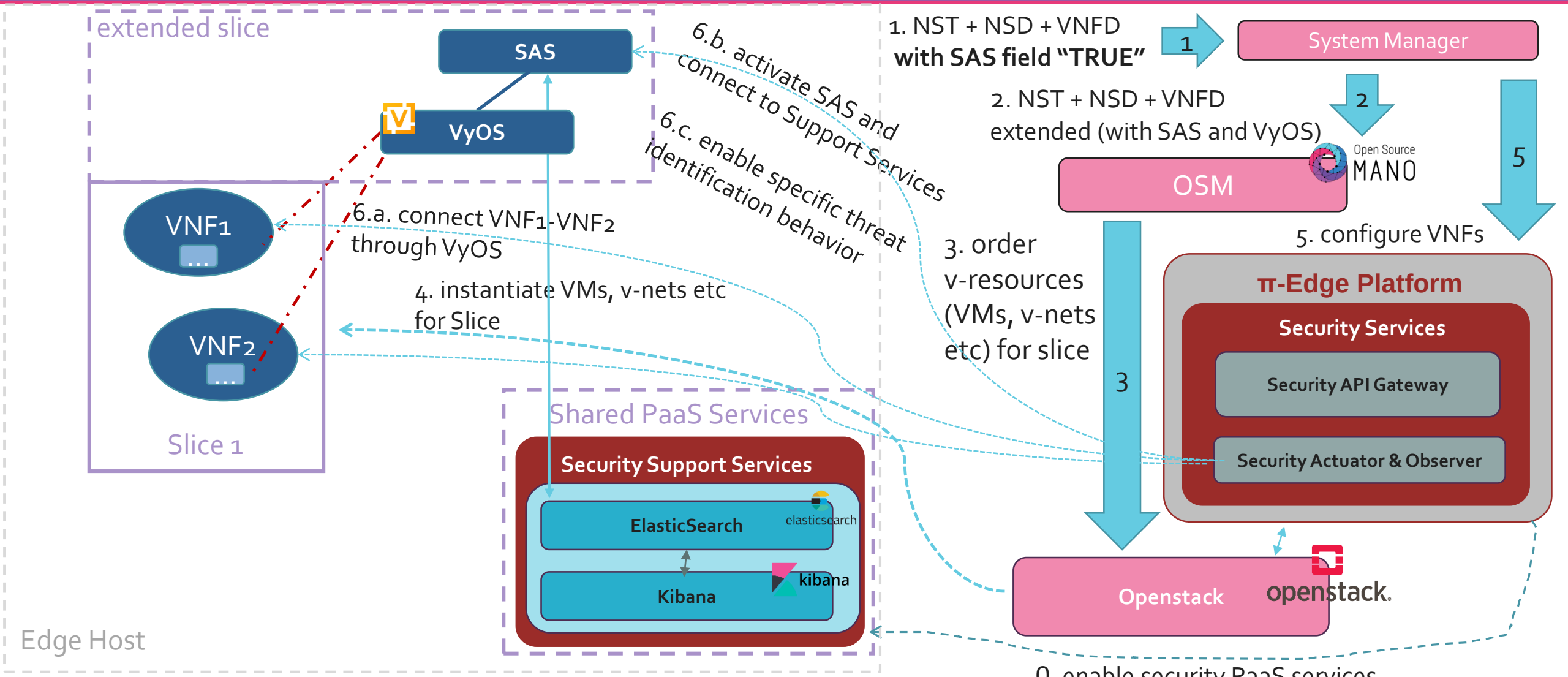
- Security Analysis Service (SAS)
  - Supervises the “secured” slice
  - Continuously analyzes user-plane traffic and checks for weird logs per slice
  - Connected to search and analytics engine
  - Decides when the slice should be characterized as “non-trusted”
  - Acts to slice when needed
- Virtual Router
  - Connects the slice (user) VNFs and forwards the traffic to SAS for analysis

nst.yaml

```
...
automation-service:
- id: demo-sas
  type: security
  name: demo-sas-automation
  security-policy:
  - threat-type: DDOS
    on-detection: monitor_zoom-in
```



OSM towards an automated enrichment of *slices* at the Edge:
Use case



OSM towards an automated enrichment of *slices* at the Edge:
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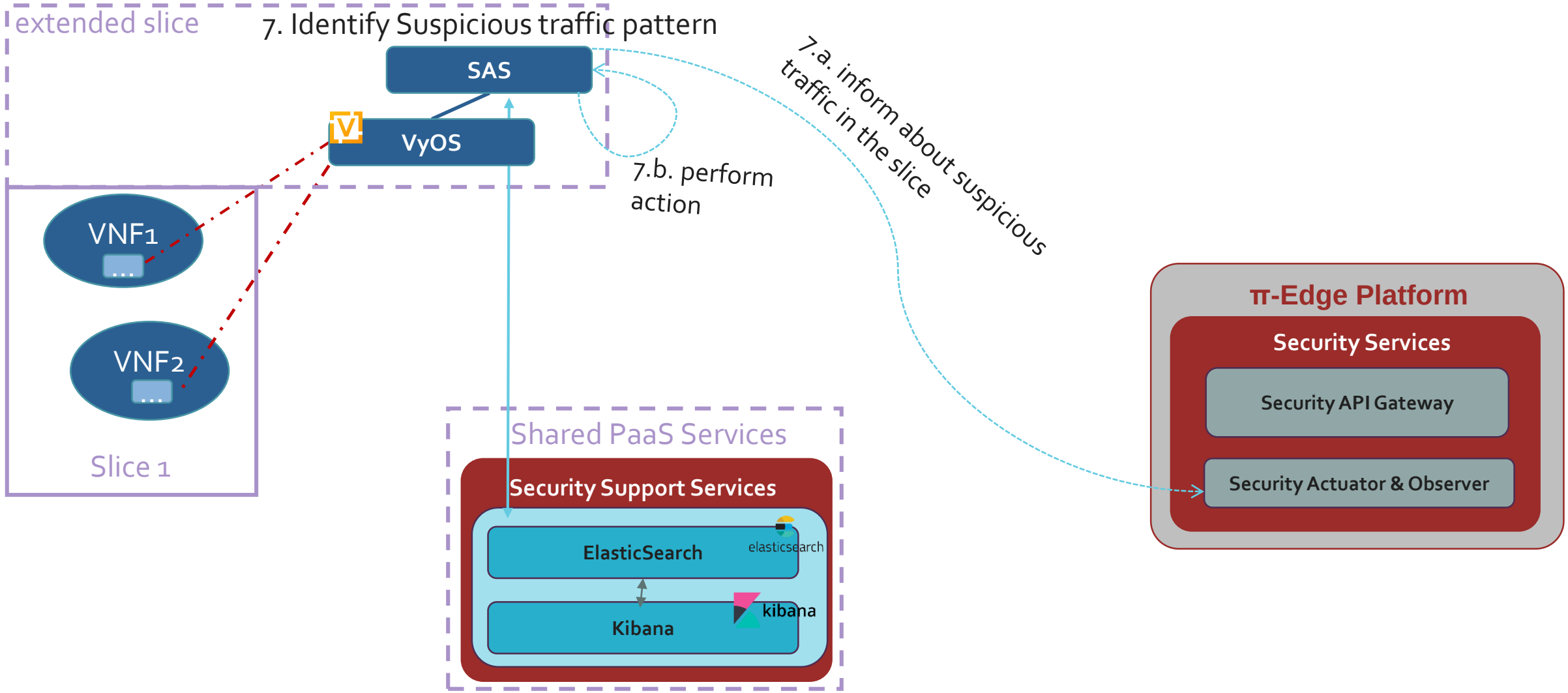
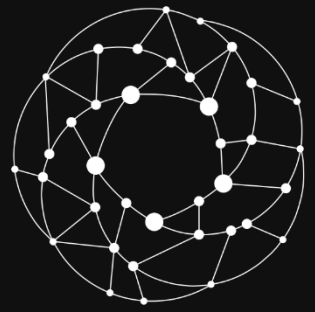


Time for the Demo!



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THANK YOU!

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