

Open Source
MANO

OSM#10 Hackfest

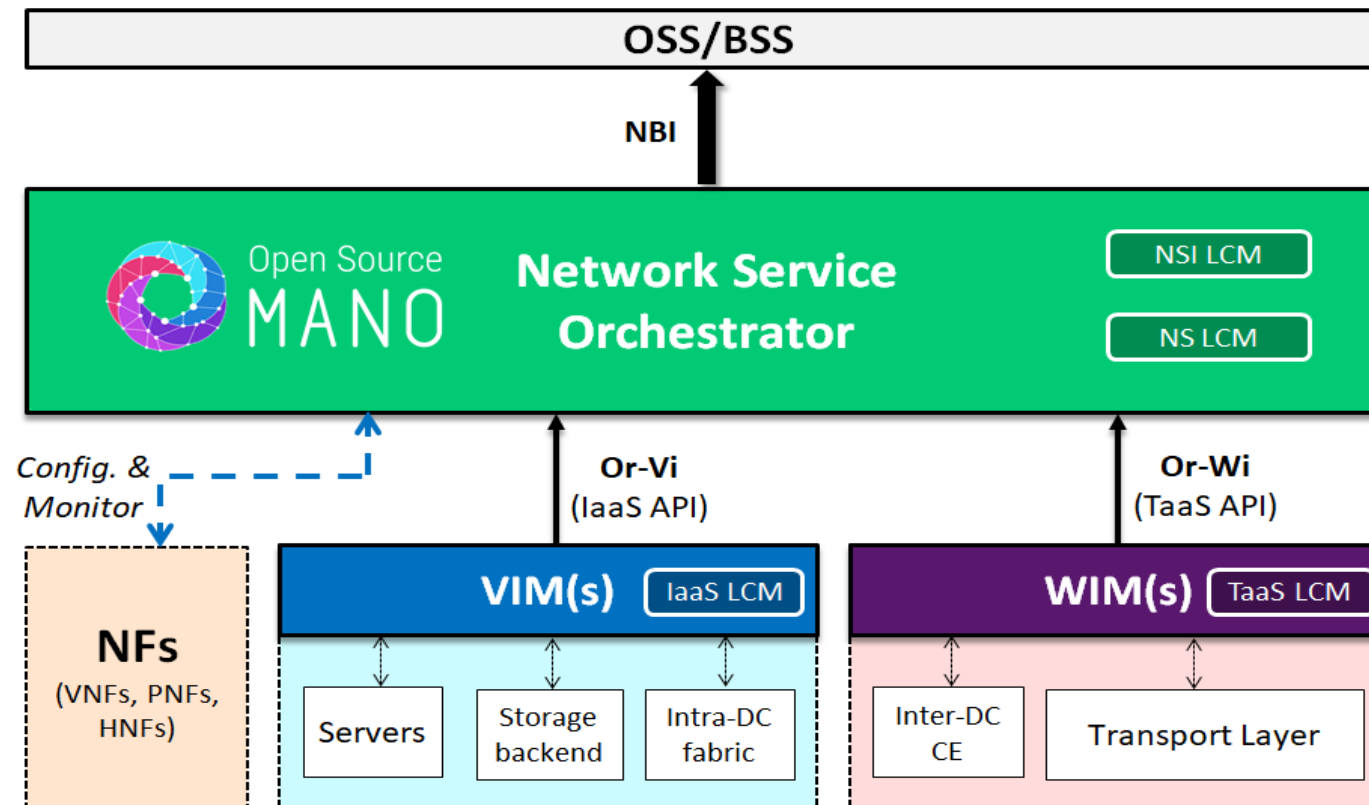
Hackfest Content Overview

Mark Beierl (Canonical)



What is OSM?

A community-driven production quality E2E Network Service Orchestrator for telco services. It focuses on delivering operational-ready virtualized Network Services.



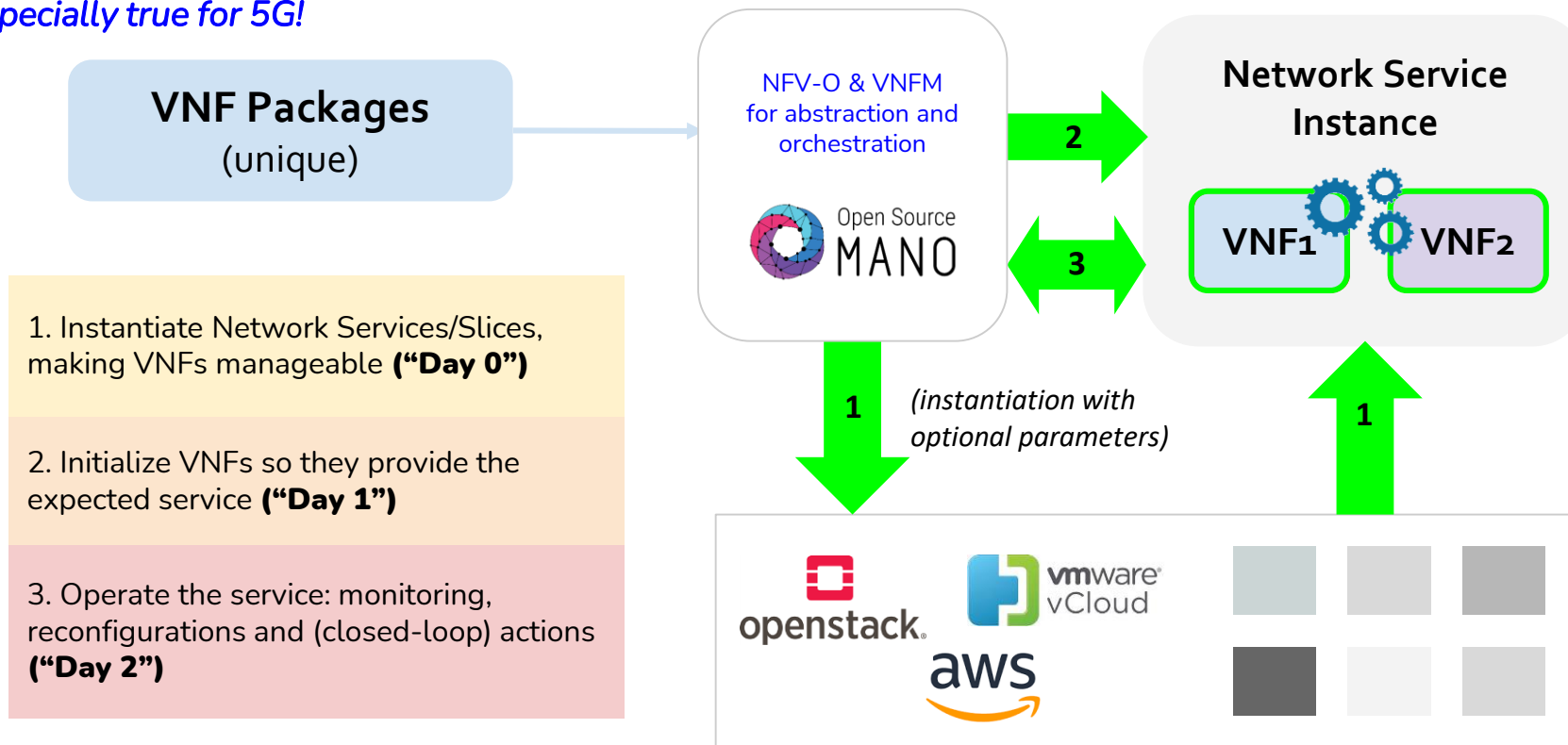
Benefits of OSM

- A well-known Information Model (IM), aligned with ETSI NFV, allows operators to model Network Services without worrying of the virtualization of resources and the underlying infrastructure.
- Capable of modelling and automating the full lifecycle of:
 - Network Functions (virtual, physical or hybrid),
 - Network Services (NS)
 - Network Slices (NSI)
- Includes all the way from their initial deployment (Instantiation / Day-0, and Day-1), to their daily operation and monitoring (Day-2).

VNF Onboarding Workflow

- Network Functions Virtualisation will only scale if all of the functions can be automated.

...specially true for 5G!



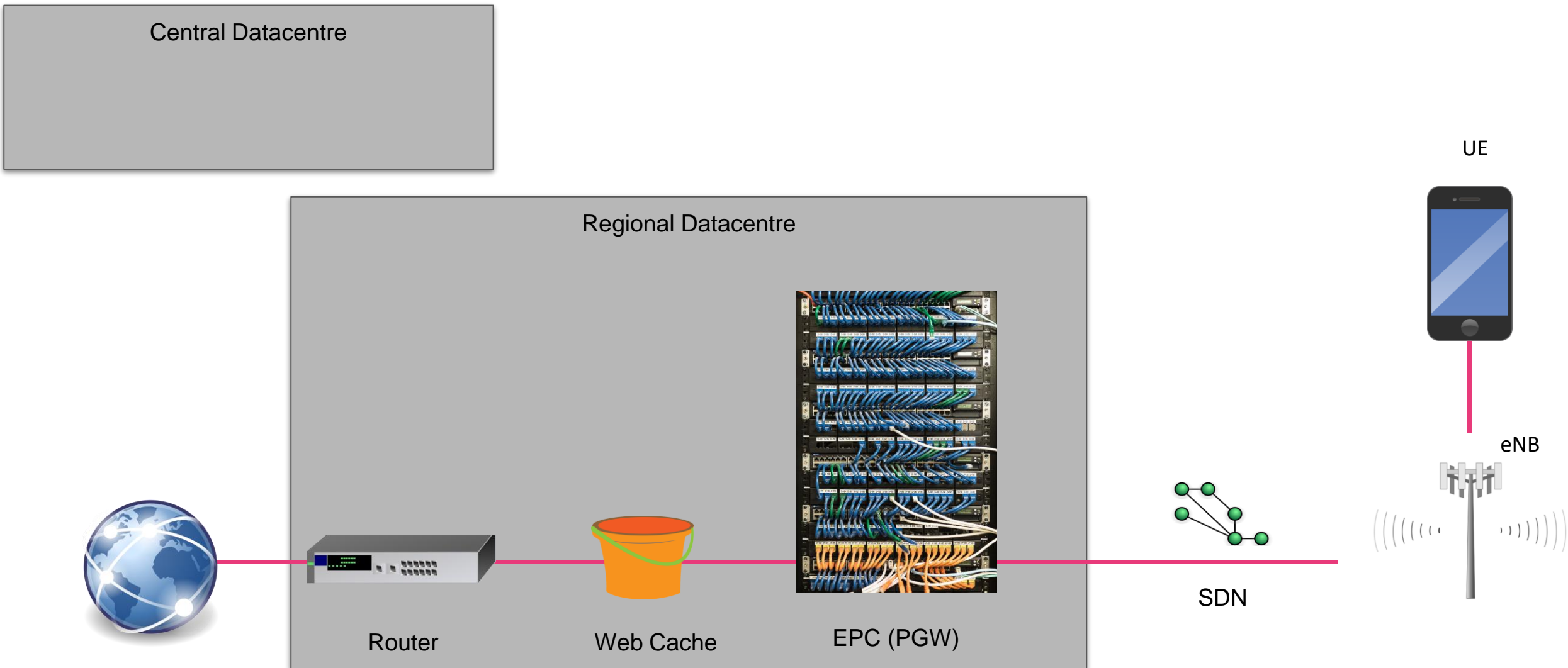
- Last mile workload-specific workflows and codepaths
 - Scripts, file changes, integration, config, backup etc
- OSM leverages Juju Charms to perform operations
 - Proxy
 - PNF or existing fixed functions with limited integration options
 - Charm acts on NF using a network protocol
 - Code must have its own execution environment
 - Native
 - Charm has direct access to function
 - App that can be installed on Win/Ubuntu/RHEL/CentOS, or
 - Docker image that can be driven by a charm directly
 - No need for external management port - actions run locally

The Scenario for the Hackfest

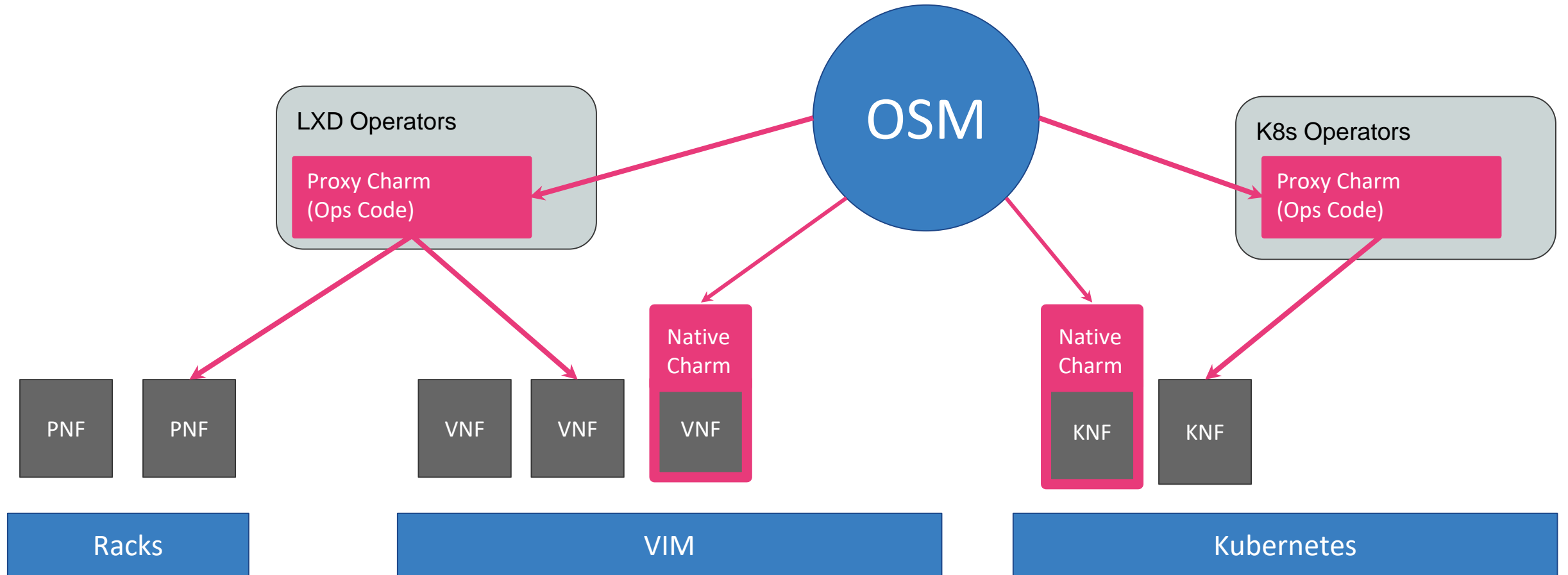
Your mission? Deploy and manage an entire end to end cellular data network complete with:

- Magma Orc8r and AGW software (the EPC)
- Software radio and cell phone
- Firewall/router to manage internet egress
- Web cache to reduce backhaul expenses

Cellular Data Path



Reality is messy and mixed



Charms are packages of scripts to drive apps

Lifecycle scripts

- install
- config
- update
- remove
- scale

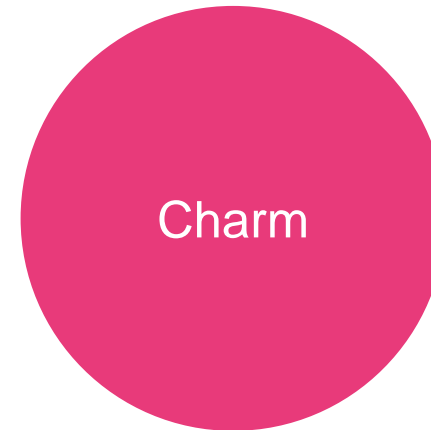
Integration scripts

- relate-mysql
- relate-ldap
- relate-proxy
- relate-...

“Action” scripts are OSM Primitives

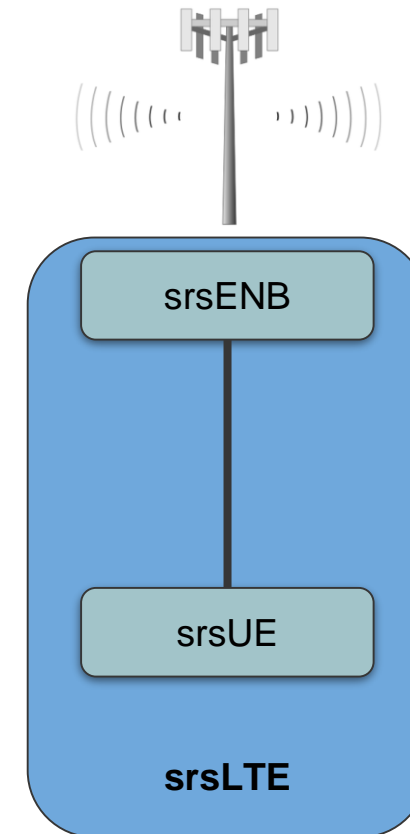
- “action: backup”
- “action: restore”
- “action: scan-viruses”
- “action: health-check”
- “action: add-repo”
- “action: ...”
- “action: ...”
- “action: ...”

These are your
operations
primitives.

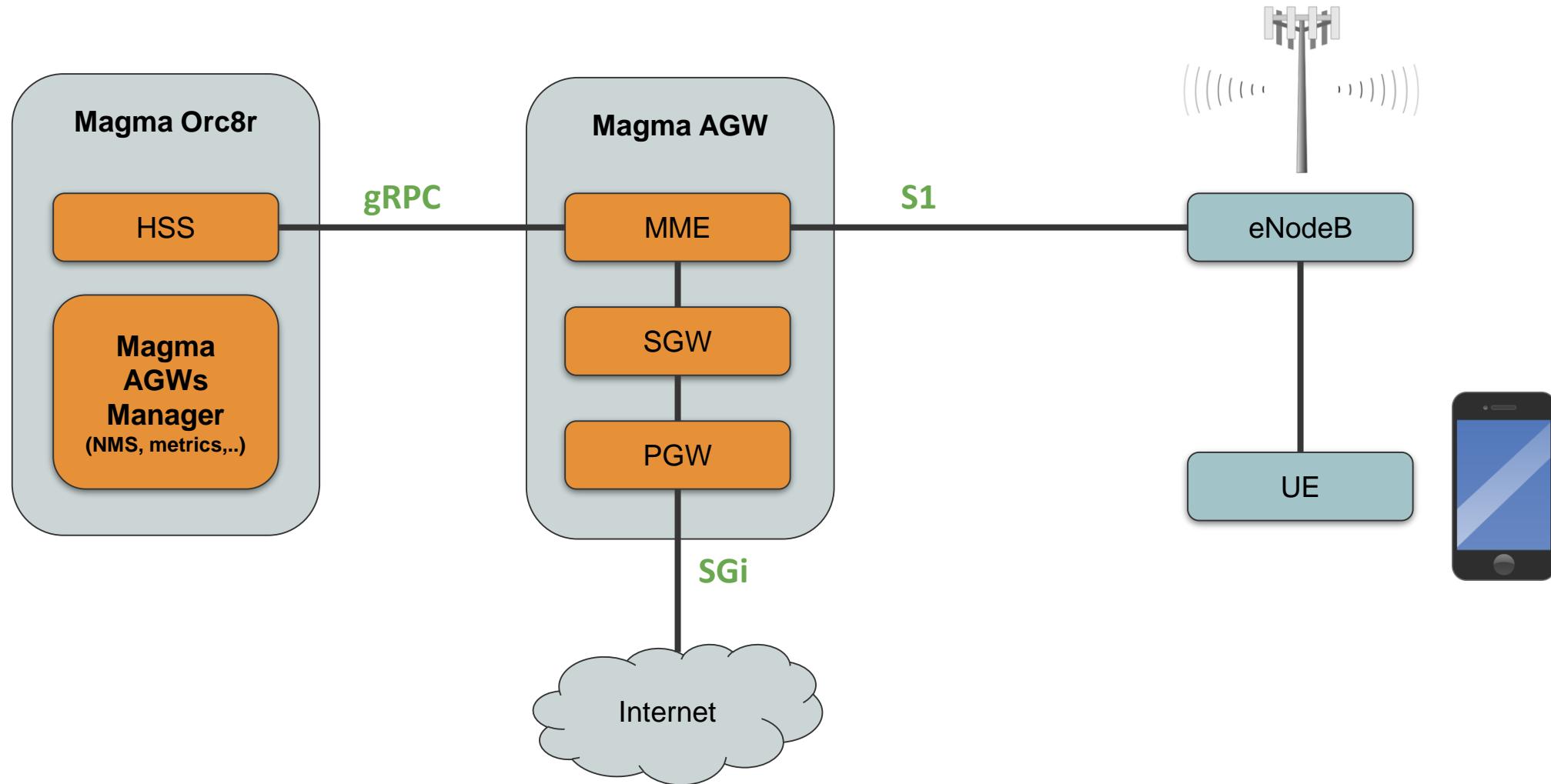


What are the eNodeB and UE?

- UE
 - User Equipment
 - Our “pretend” cell phone for the week
- Evolved Node B:
 - Connected to carrier network
 - Radio that communicates with phones (UE)
- Software driven by srsLTE
 - Free, open source LTE software
 - <https://github.com/srsLTE>
 - srsUE
 - srsENB



So what is an Evolved Packet Core? (EPC)



What is the Router?

- Network device to forward data packets between networks
- Uses tables to determine where packets go
- Already exists in our network
- Purpose built VyOS based appliance
 - Has no lifecycle
 - Cannot manage the firmware
- Only able to manage routing tables

This is a PNF

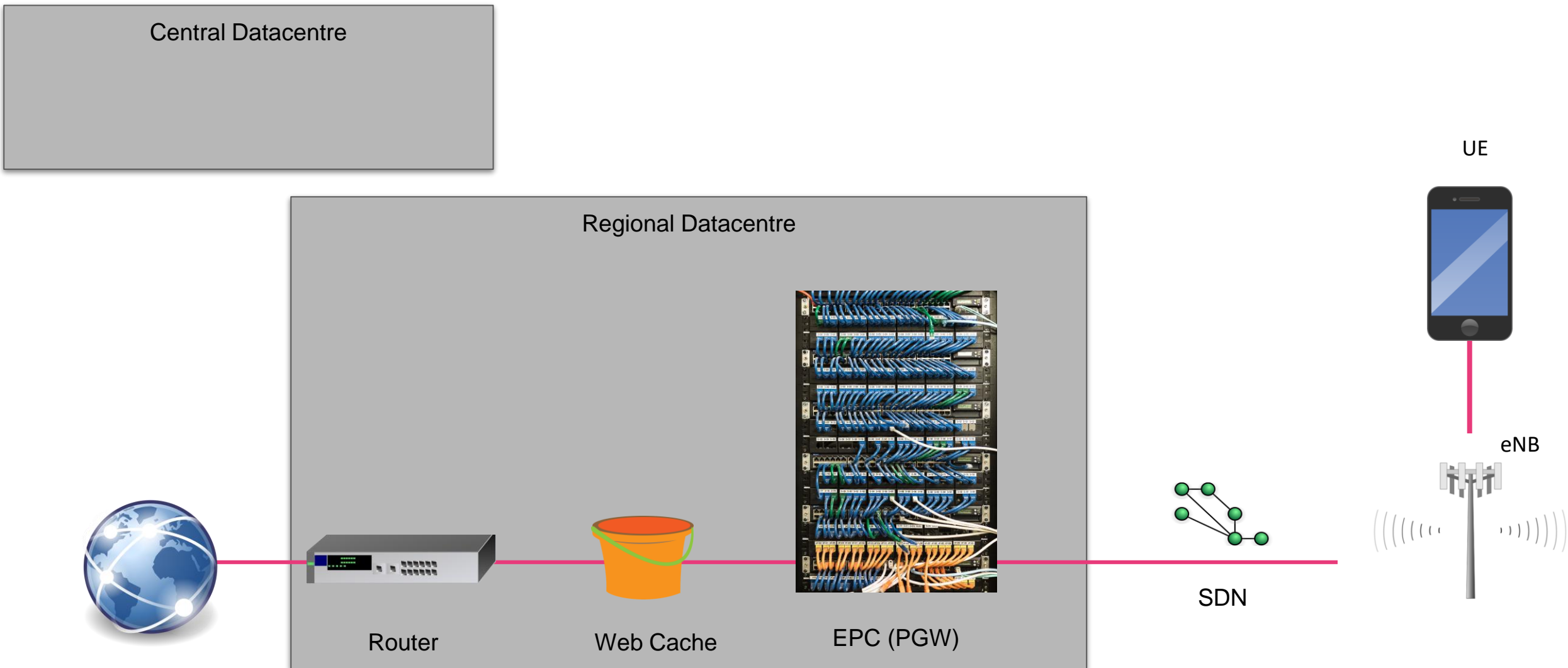


What is the Web Cache?

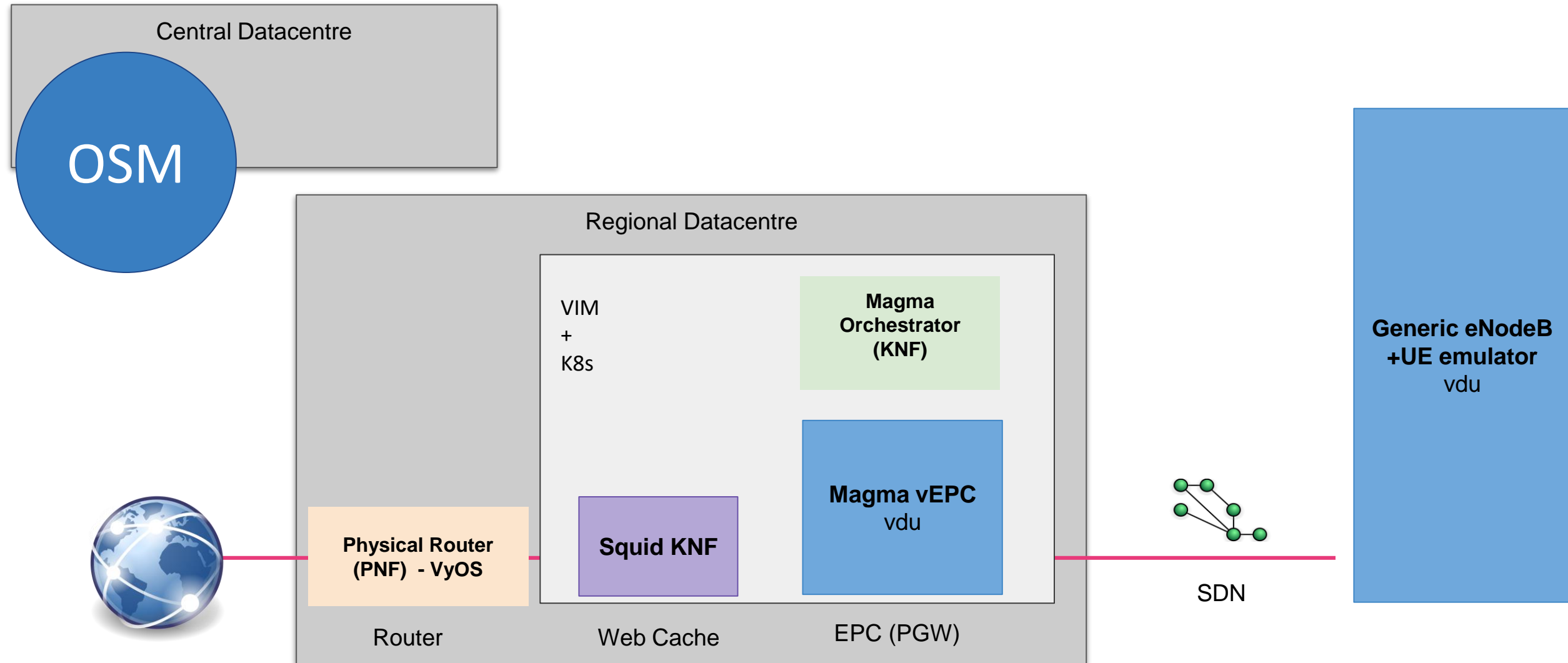
- Technology that stores (caches) content
 - Stores copies of content passing through
 - First request gets content from source
 - Subsequent requests replay content from local storage
- Powered by Squid
 - <http://www.squid-cache.org/>
- Has allow/deny rules for what origins will be served



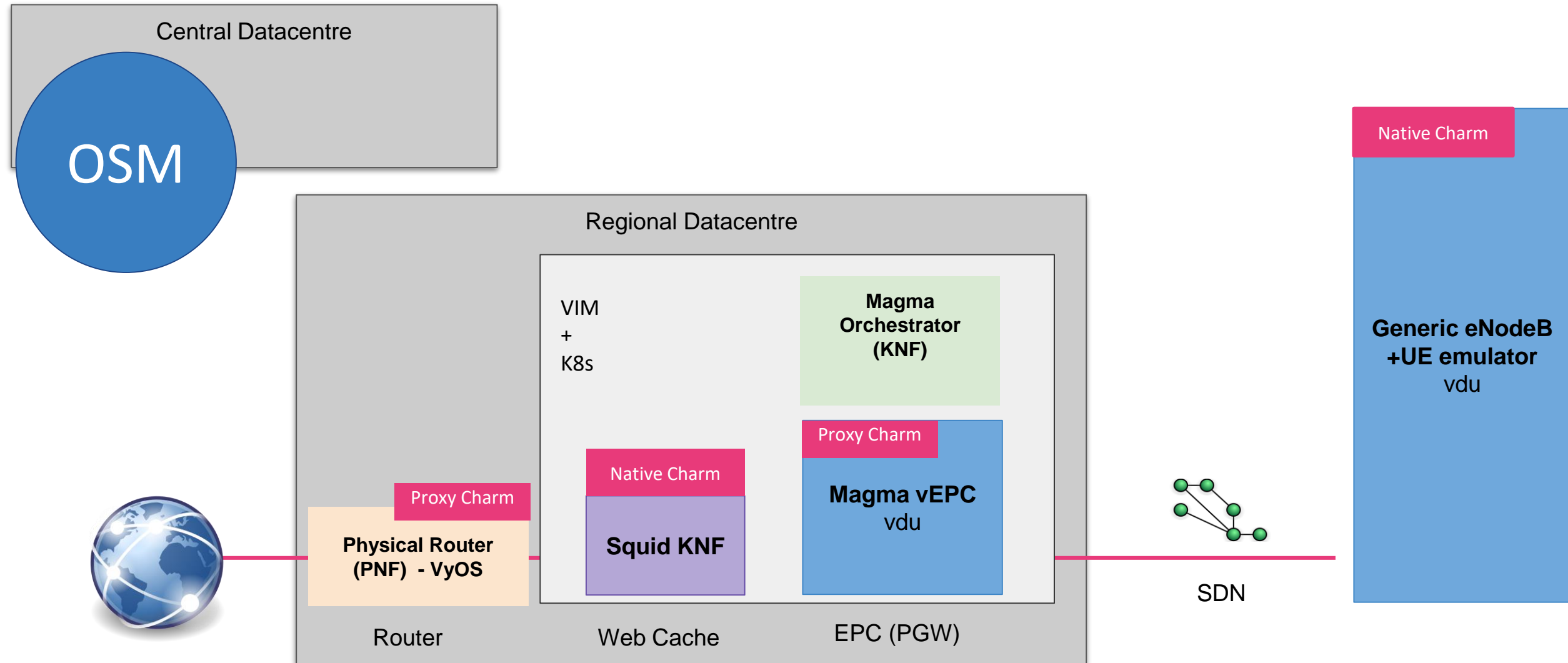
Cellular Data Path



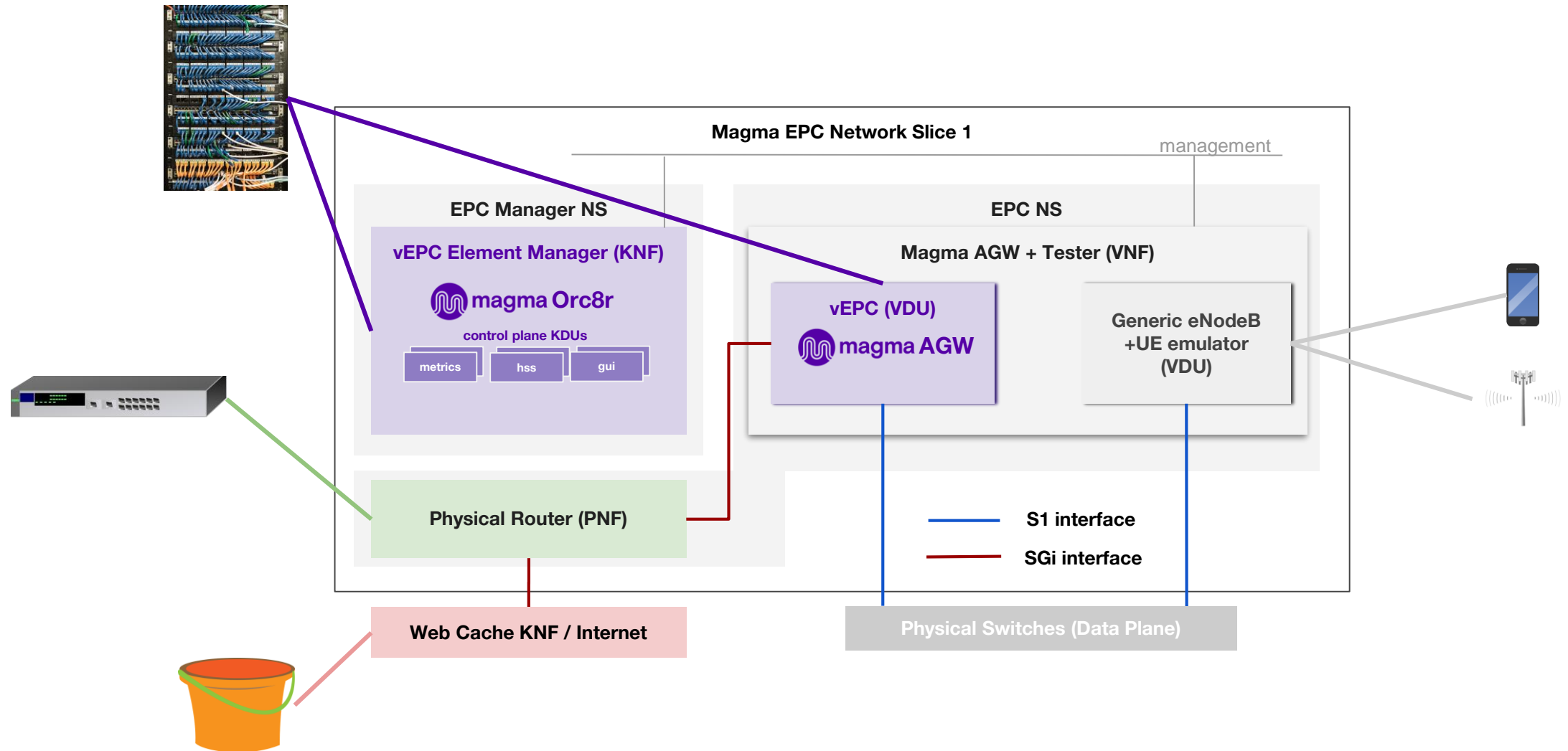
Cellular Data Path



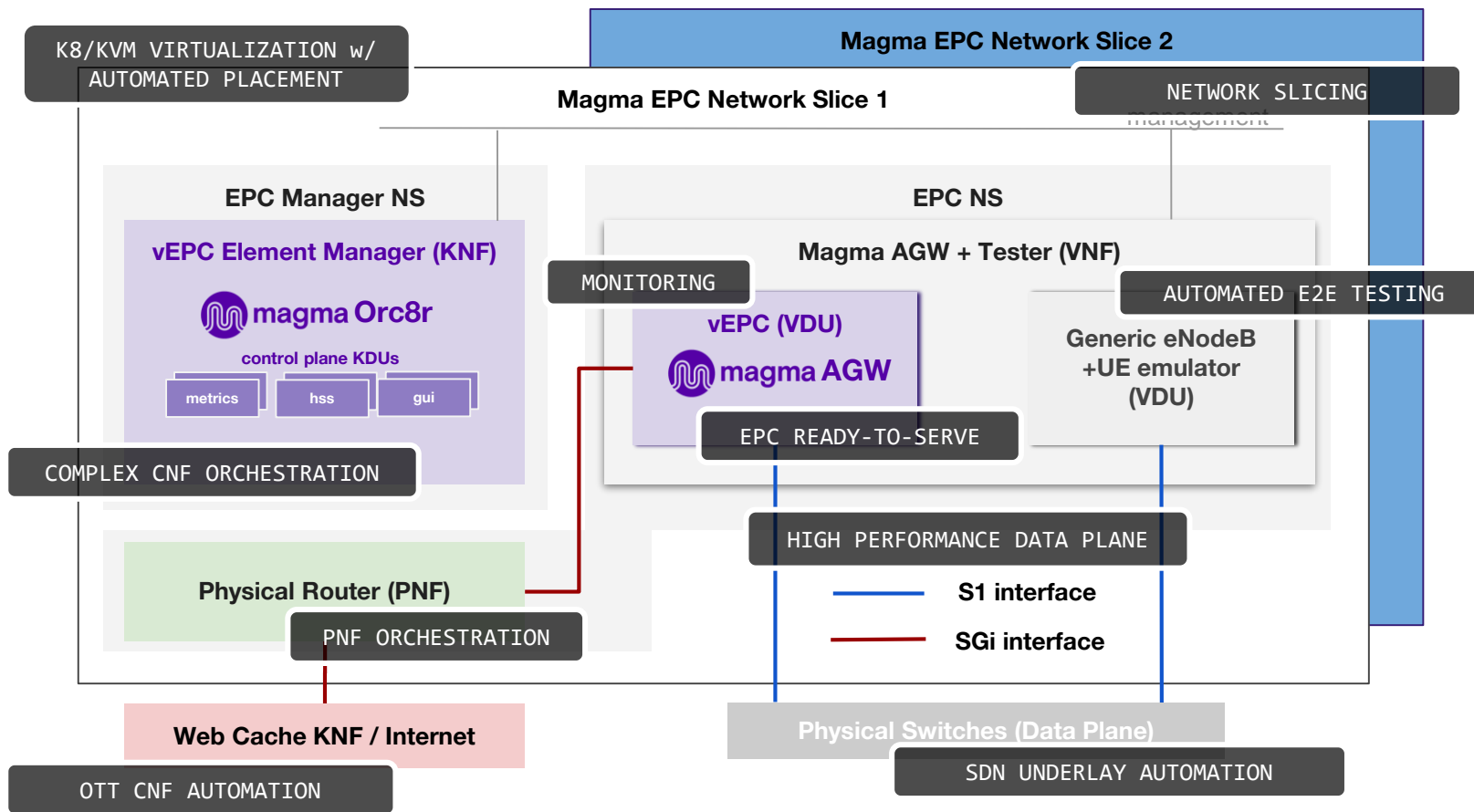
Cellular Data Path



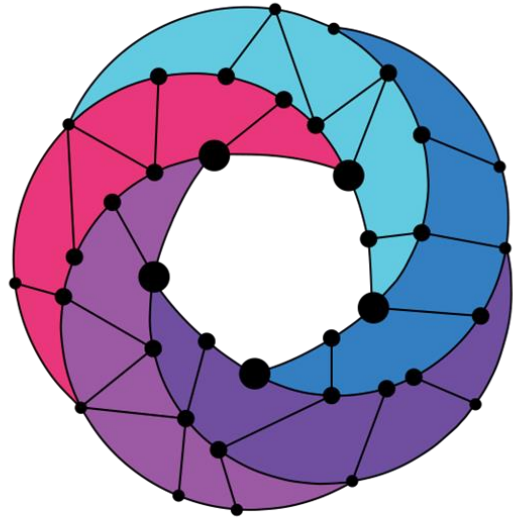
The Big Picture



Operational EPC in minutes!



- Docker and VM-based virtualization lifecycle management
- Complex KNF deployment in minutes
- Physical Network Function automation
- VNF Monitoring
- Automatic Horizontal Scaling
- High performance techniques activation
- Underlay network automation
- Network Function Day-0, Day-1 and Day-2 operations
- Network Slicing with shared services



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