# Spectrum Communications

## Leading Solution Provider

## To

## Network Operators and Service Providers

www.spectrummea.com

# 4G and 5G Core Solution

# *HawkSpid4G/5G - Carrier*

# HawkSpid *4G/5G - Carrier*

## EPC and 5GC Solution:

- Enables operators to Implement Triple-mode mobile Core  Solution.
    - Supporting cloud-native 4G EPC, 5G NSA and 5G SA 3GPP network arcitecture modes.
    - 5G core enables 5G use cases such as enhance Mobile Broadand (eMBB) , Ultra Reliable Low Latency Communication (URLLC), while
    - Enabling co-existance with EPC and provide 4G ad 5G NSA services at the same time.

### 4G Core Network

Mobility management Entity (MME)

Home Subscriber Service (HSS)

Serving Gateway CP (SGW-C)

Serving Gateway UP (SGW-U)

Policy Based & Charging Function (PCRF)

Central User Data Repository (CUDR)

### 5G Core Network Function

Access & Mobility Function (AMF)

Session Management Function (SMF)

User Plane Function/Packet Gateway (UPG)

Network Relation Function (NRF)

Authentication Server Function (AUSF)

Unified Data Management (UDM)

Policy Control Function (PCF)

# Network Topology
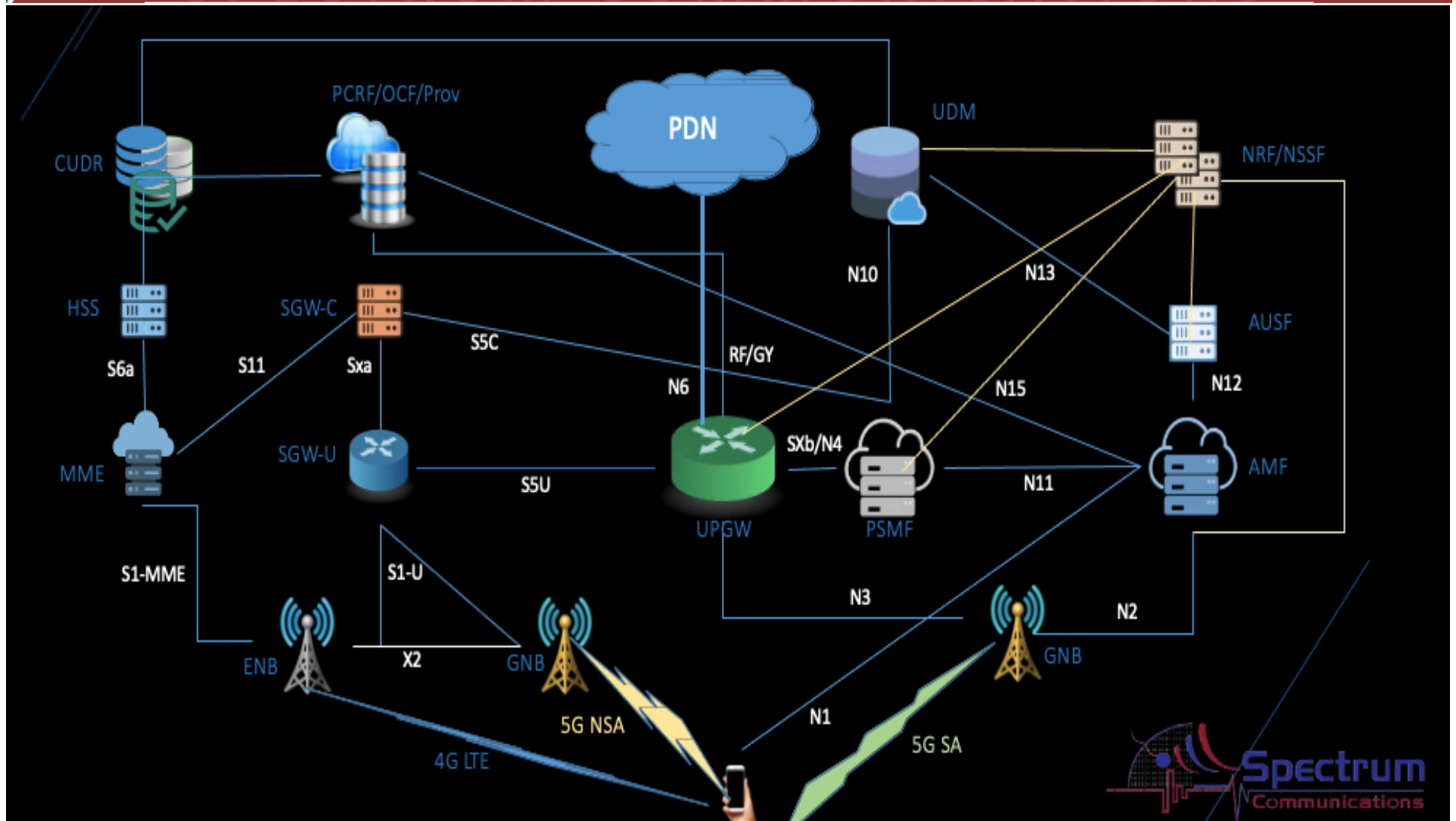
# EPC- MME Features

## Support EMM Cases

- Attach

- Detach

- S1 Release

- Service Request

- Periodic TAU

- Handover with and without TAU

- Cell Reselection with and without TAU

## Support ESM Procedures

- UE Bearer Context Management

- UE Default and Dedicated Bearer Management

- S11 Session Management

- S10 Context Management

- APN Resolution

- PDN Management and S/PGW Selection

- Charging and OAM UE-Purge

# EPC-HSS Features

## HSS-Front End

- S6a Diameter Signaling
  - Authentication & Securty Management
  - Location Management
- Diameter Provisioning
- Data Access Control
- RAT Restriction
- Subscriber Closed Group
- Dynamic Service Activation
- Dynamic PDN Allocation
- Regional Service Support

## HSS-EPS Procedures

- EPS Location Management
- EPS Reset support in ESM
- EPS Subscriber Data Handling
- Handling of Service Profile
- IMS Orgination/Termination session Support

# EPG - SGW

Session Management

Packet Forwarding Control Plane PFCP

GPRS Tunneling Protocol - User plane GTP-U

PDP Context Management

EPS Bearer Management

DPDK fast path

AMBR calculation

Path Failure and Recovery Procedure

QoS, Admission Control & Bearer Throttling

Dynamic and Static IP Assignment & Routing Behind MS Management

# 5G Core - AMF

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AMF Features

Support authentication function

User equipment identification function

5G-GUTI distribution function

NAS (N1 interface) signaling and its security

AS security context issuance function

Registration area management

Connection management function

Registration and deregistration

service request, storage , Modify, delete user mobility context and bearer context

AMF Interface Support

- N1, N2, N8, N12, N11, N15

  Service-oriented interface protocol supports

  NAS

  NGAP

# 5G Core - SMF

## SMF Functionality:

Supports PDU session establishment

PDU session modification

PDU session release

Activation or deactivation of UP connections

Service continuity (SSC)

Network element selection

UPF selection

PCF selection

UDM selection

Policy control request trigger

QoS Flow binding

Policy control request event reporting function

5GS and EPC policy integration control function

Reflection QoS function

Basic location management function

Interface support

- N1, N2, N4, N7, N10

Service-oriented interface protocol

NAS

PFCP/GTP-U

Nudm

# 5G Core - UPG

## UPG Functionality:

Support PDU session management function

Manage PDU session information

Support multiple SMF control UPF

Session level (APN-AMBR, TDF session UL and DL bit rate, or UL and PDN connection DL rate)

bearer level (GBR, MBR carried by GBR)

QoS Flow level (for 5GC), service data flow (SDF) or application, support upstream and downstream traffic classifiers and merge functions

## The interface supports

- N3, N4, N9, N6,S5,SGI

## Service-oriented interface protocol supports

GTP-U, PFCP.

# 5G Core - Security

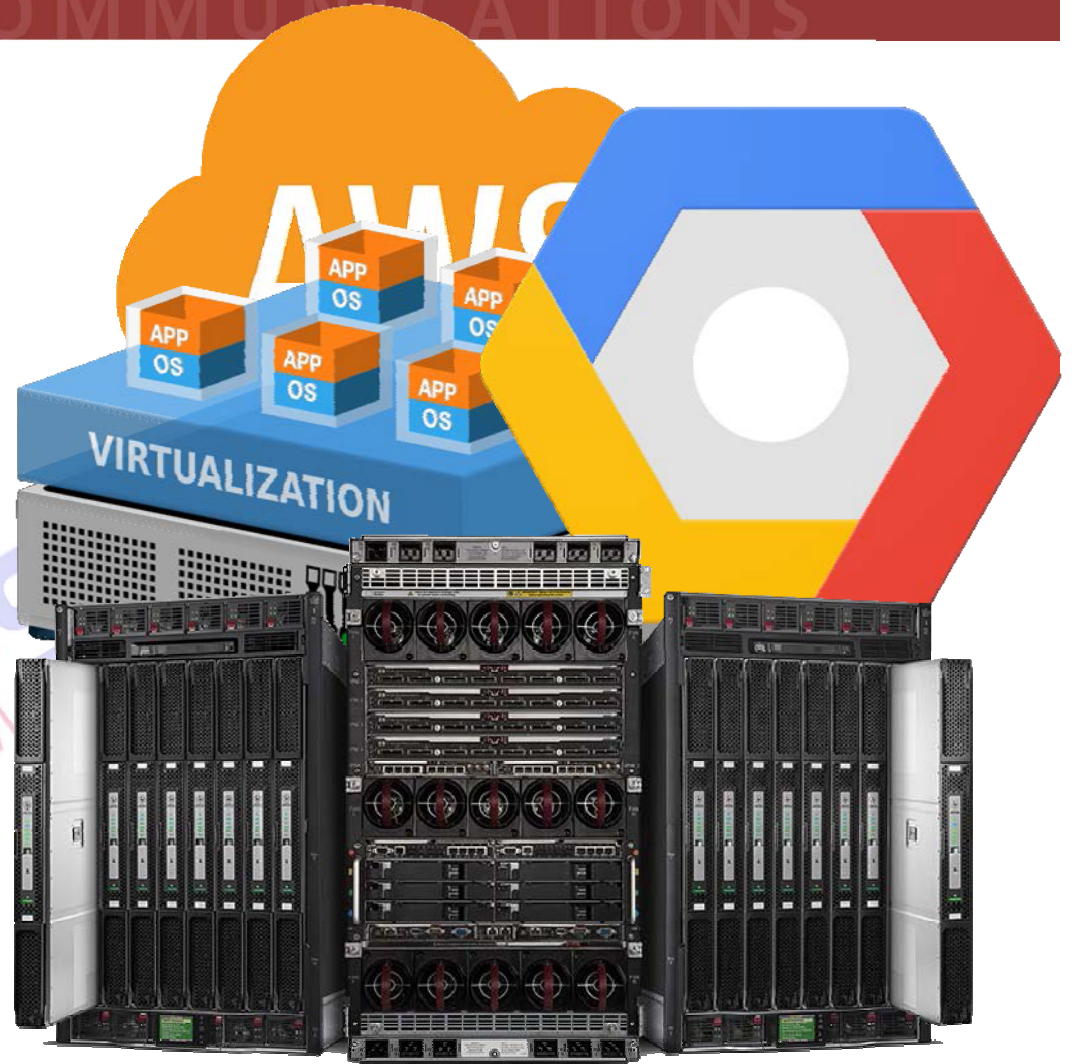SPECTRUM COMMUNICATIONS

## Security

Based on different security requirements and service features, Spectrum core network system is divided into different small security domains. Each security domain is independent and appoints security policy according to actual requirement, protect UE, billing system, OMC system and other systems from the DOS attacks from internet and other networks
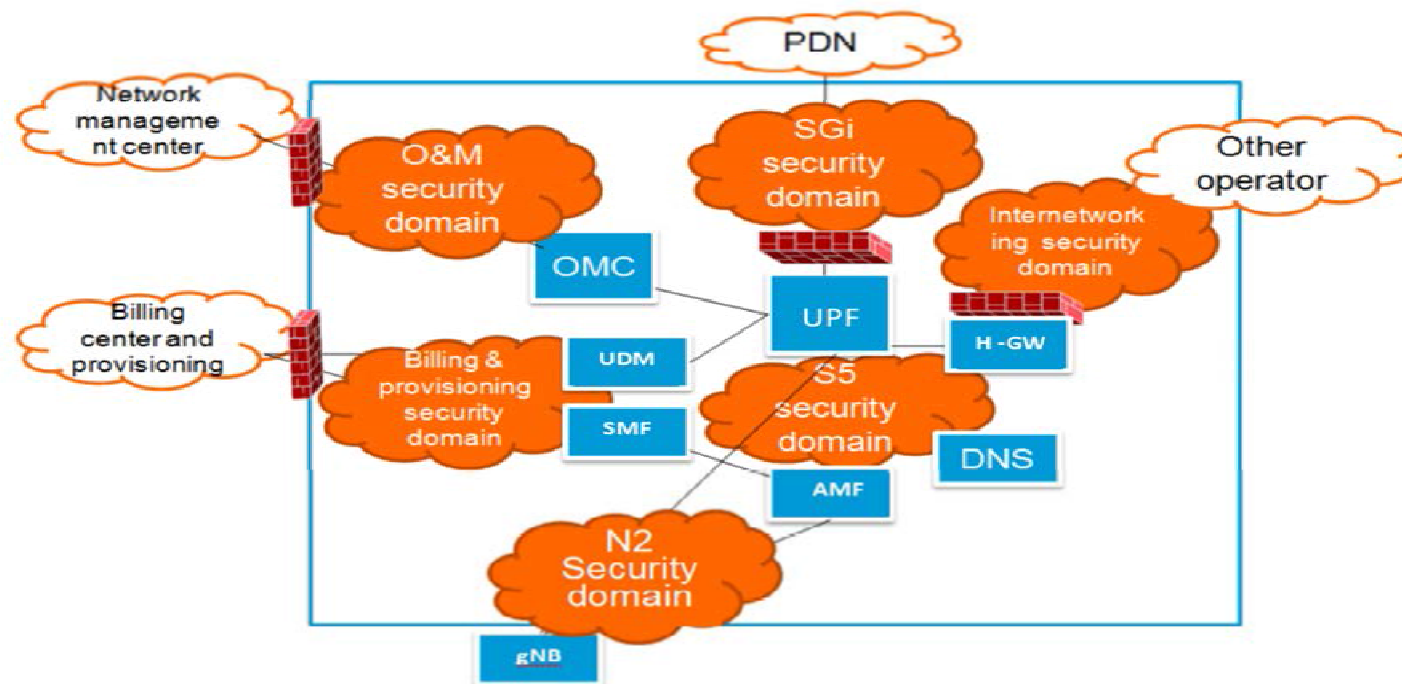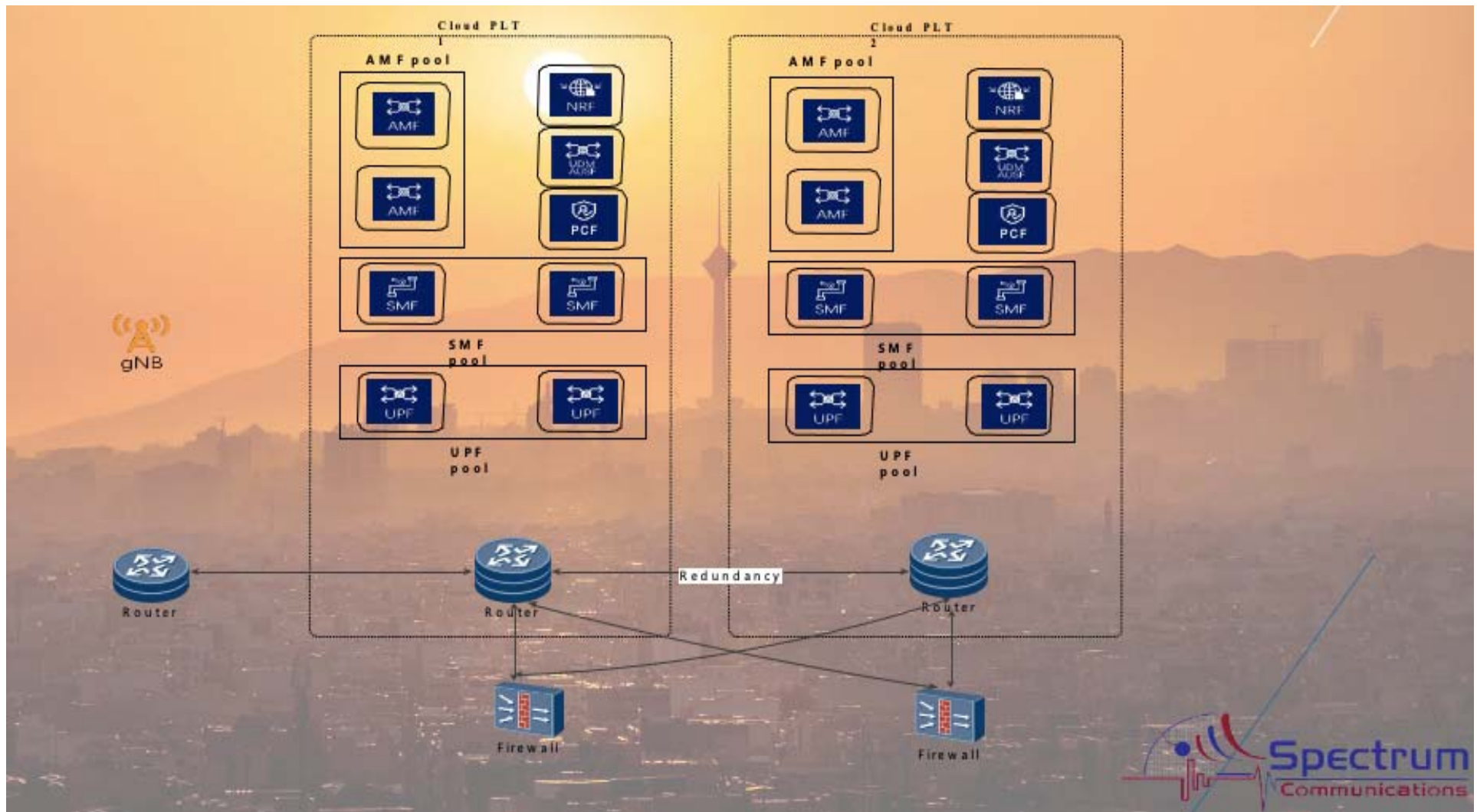
# 5G Core - Infra

Spectrum 5G Core is agonistic to hardware - as a Cloud-native microservice based platform it can be easily deployed on various range of infrastructure such as VM, Cloud platforms such as AWS, Google Cloud, or in Bare- metal.

It is easy to scale and can be easily Managed and supports industry standard API.

# 5G Core - Redundancy

# Implementation Support

- Local Support  if requested

- Remote Support 24 x 7 ( Different SLA can be offered)

- Emergency Work Around

- Customisation of any Engineering work if required

- Integration with various vendors and MNO

# Spectrum-Zi-EPC & Zi-5G

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## Thank You,

## Reach us out

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