Druid.

Raemis

PCN and eNodeBGW

Resource Requirements and Sizing

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Version	Date	Description
1.0	19th Dec 2019	**Initial Version based on 4.4 Release Testing.**

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1 Introduction

Raemis is a portable source code that can run on multiple architectures. It has virtualisation and is scalable across a wide range of hardware platforms. Raemis has been deployed on ruggedised servers tailored for military and blue light, oil refineries and cargo vessels. In larger enterprise environments it is typically deployed on commercially off the shelf hardware, Dell and HP class of servers depending on the specific requirements. It is also widely deployed in virtualized environments like VMWare. Deployments with AWS and Azure (Including AES - Azure Edge Services) are also supported.

1.1 System Requirements

The server requirements in relation to cores, network interfaces and memory is dependent primarily on the throughput of user data and transcoding requirements for VoLTE to PBX integration. The following table provides a guide and Druid will work with our partners in identifying the hardware platform that best fits the solution. Flexibility is what the raemis technology offers here.

Assuming a processor based on Intel i9 capability and a solid state hard drive (SSD) then a basic rule of estimating scale is as follows.

Attached Users:
We estimate the control plane as follows, Provision a core for every 10,000 sessions, (This approximation is based on signaling timers, number of cells).

Data Throughput:
We estimate the user plane as follows, we allocate a core for every X Gbps of data throughput- this is a bit harder to judge as depending on the network card and the link between the VM and the physical network you can get some variance for the value of X.

On a VM sharing a port with a bridged adapter X could be as low as 800Mbps per core, on a well configured network port isolated for the VM this can be 3Gbps per core, on a bare metal server even higher. For this document we will work with a conservative sizing estimate of 2Gbps throughput per core.

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O&M and External Application Integration:
In addition to the processing requirements for control and user data we recommend that you reserve 2 cores for O&M and the HTTP API.[1]

Network cards and network ports are also dependent on the target requirements and Druid will recommend specific network cards when a hardware platform has been selected for the solution.

1.2 10,000 Attached Users

The following table illustrates some sample system requirements based on the recommendations above.

Max UE sessions	Number of Core	throughput	vRAM	Notes
10	1	128 Mb/s	4GB	Small system, typically an embedded solution for a portable configuration(Military Patrol, Blue Light etc) but this could be a small office deployment
1,000	>=4	2Gb/s	4GB	This is the basic hardware requirements for up to 1000 users.
1000 - 10,000	>=6	6Gb/s	8GB	To increase capacity add 1 core for every additional 2Gb/s throughput and 1 additional core for every additional 10, 000 users

[1] Not required for really small, embedded or standalone systems as detailed in Section 1.1

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Transcoding: To support VoLTE to PBX integration with transcoding of AMR to ALAW codecs then provision 1 core for every 40 concurrent transcoded calls.

1.2.1 20,000 Attached Users

20,000 Attached	>=10	10Gb/s	12GB	To increase capacity add 1 core for every additional 2Gb/s throughput and 1 additional core for every additional but tl 10, 000 users
20,000 Attached	>=26	40Gb/s	12GB	

Transcoding: To support VoLTE to PBX integration with transcoding of AMR to ALAW codecs then provision 1 core for every 40 concurrent transcoded calls.

1.3 Operating System Requirements

The recommended operating system is Cent 7 however raemis has been deployed on a number of linux based operating systems for embedded deployments. For general product release Cent 7 will be the supported operating system.

1.4 Hypervisors, Containers and Cloud Deployment

Raemis is very flexible in relation to container, vm, and cloud based deployments as long as the Cent 7 minimal install operating system is supported.

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1.5 Disk / Storage

Raemis is deployed on a wide range of hardware using both hard disk drives and solid-state drives. SSD is strongly recommended. Raemis only requires 100Mb of disk to run, the storage of CDRs, IPDRS, KPIs and events will also require storage but a standard SSD usually offers at least 256GB of storage will be sufficient even for sites of 100,000+ users.

1.6 Recommended Hardware

For bare metal deployment, Raemis can deployed on a wide range of off the shelf hardware. HP servers Gen 9 and Gen 10 are commonly used. As part of the engagement with Druid we will help identify a hardware platform that will meet more detailed processing and end user requirements.

1.7 Supported Architecture

Supported processor architecture is Intel based but ARM and MIPS support is possible for customised releases of Raemis.

1.8 Network Interfaces

Standard 1Gb or 10Gb network ports are required depending on the scale and network requirements of the Enterprise (segregated ports, vlans, separate RAN network etc). SRIOV support should be available in the 10Gbps cards.

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