



Akraino

Use Case Proposal

Edge Media Processing



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Action: Community member uses template to capture use case and use case characteristics and submits to TSC

| What | Definition |
|---------------|--|
| Edge Use Case | Description of the business outcome. Defines workload characteristics, design constraints, cost ranges, etc... |

| What | Definition |
|-------------------------------|---|
| Edge Use Case Characteristics | HW/SW components, deployment configurations, etc. required to support Use Case(s) Testable, implementation-agnostic manner |

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Action: TSC reviews and approves use case



Action: Blueprint is developed and maintained within the Akraino Community (CI)

| What | Definition |
|-----------|---|
| Blueprint | <ul style="list-style-type: none"> Edge cloud stack to meet the use case need Implementation-specific declarative configuration file(s) ready to be consumed by that implementation's deployment and LCM tool(s) and resulting in a stack that passes the design's tests. |

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Action: Akraino community tests blueprint in labs. Results published under the blueprint

| What | Definition |
|------------|--|
| Validation | <ul style="list-style-type: none"> Tested without VNF/Edge Apps – prove it works Tested with VNF/Edge Apps – Prove ETE works |

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Action: User perform additional validation of VNFs and applications on top of the Blueprint



Action: TSC Approves Release



Action: Blueprint available for production deployments

Akraio Use Cases and Use Case Specifications

Akraio Use Cases Templates

› Business driven

| <i>Use Case Characteristics</i> | <i>Network Cloud Use Case Examples</i> |
|---------------------------------|---|
| Business Need | Network based edge cloud that can be deployed at provider data center and telco offices |
| User Experience | Single Pane of Glass control - Administrative and User Based GUIs Zero touch provisioning to reduce ops cost |
| Cost Of Solution | Less 800K a POD [46 servers deployment] – Cruzor POD configuration |
| Scale | Minimum 10 – Maximum 1000 Locations |
| Applications | Any type of Edge Virtual Network Functions |
| Power restrictions | Less than 50K watts |

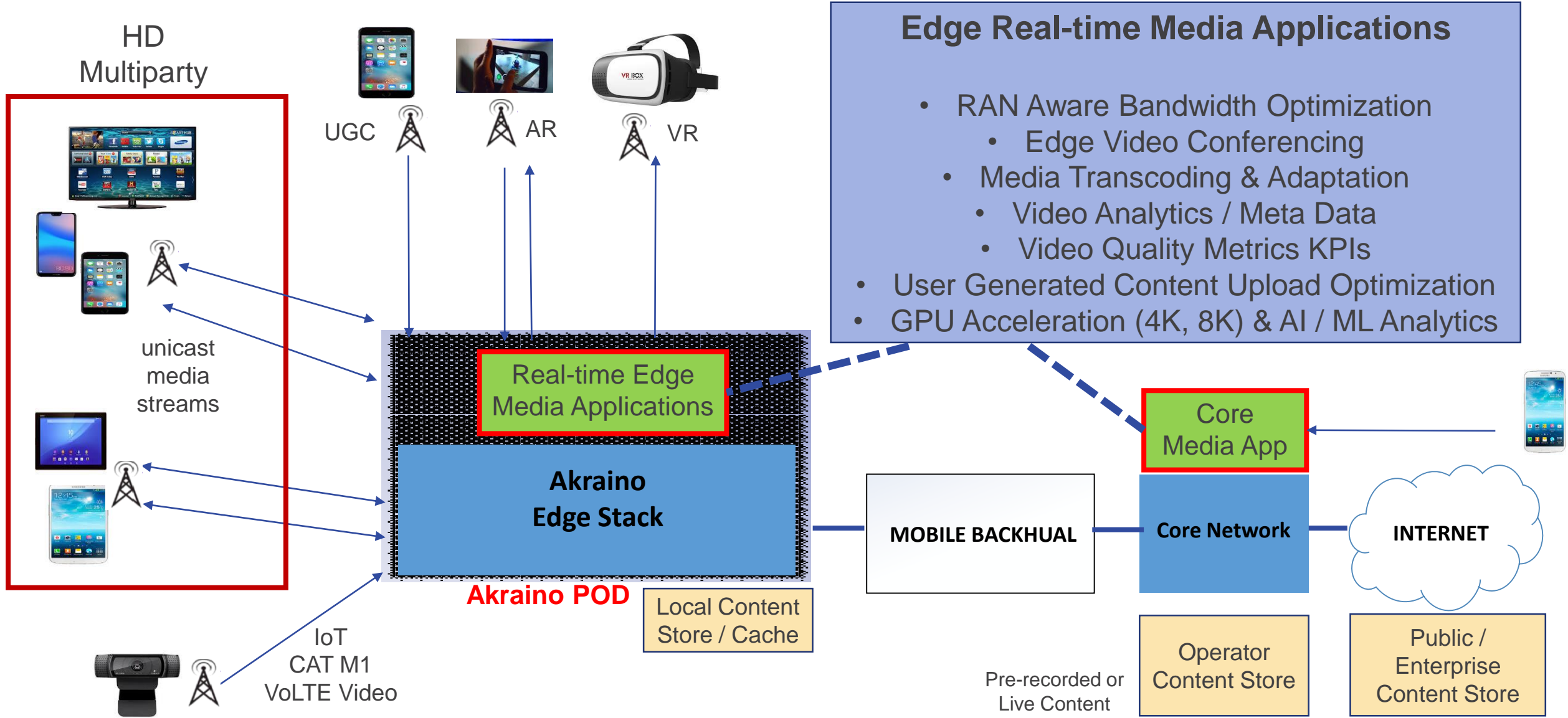
Sample templates – not a final version

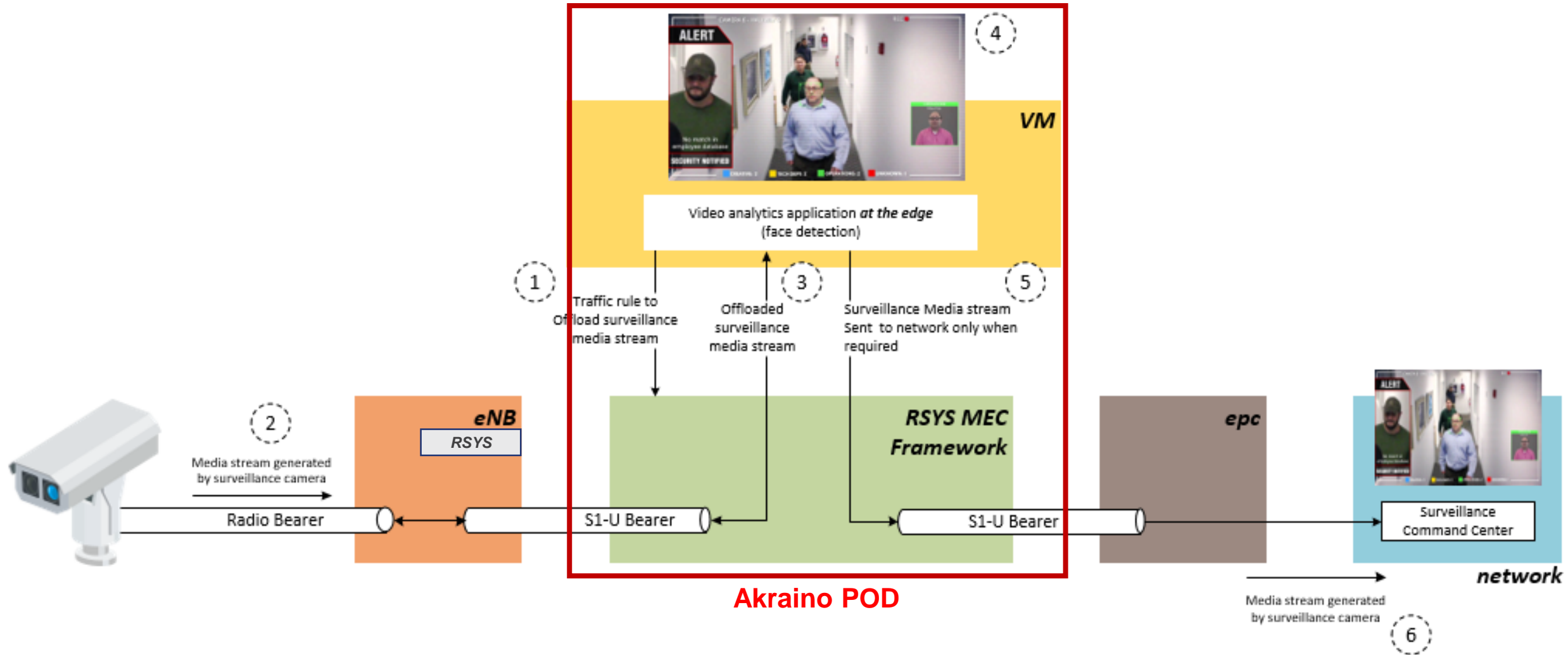
Akraio Use Case Specifications

Specifications (HW/SW components, deployment configurations, etc.) designed support Use Case(s) and described in a testable, implementation-agnostic manner

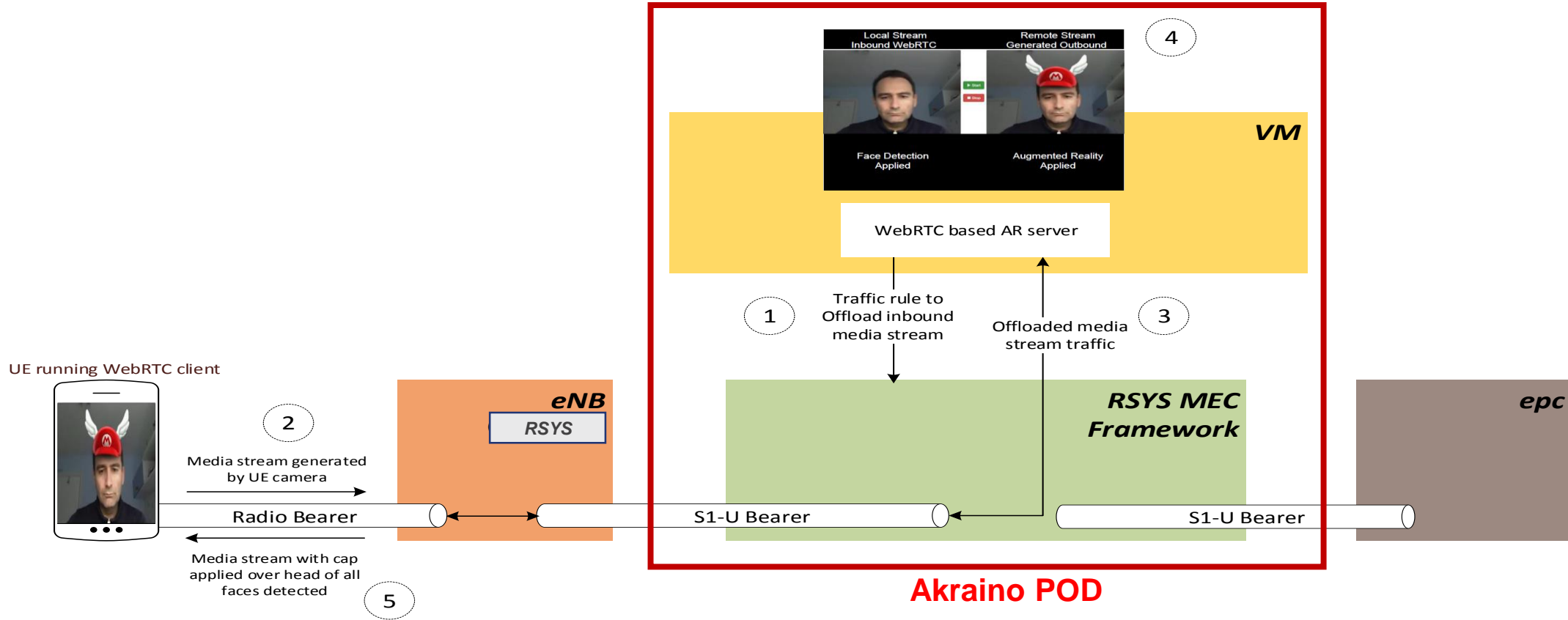
| <i>Use Case Specifications</i> | <i>vEPC service on Network Cloud Specification Examples</i> |
|-------------------------------------|---|
| Workload | vEPC or any Edge VNFs |
| Infrastructure orchestration | OpenStack/ONAP |
| UCP tool | Airship |
| Workload Characteristics | VMs and Containers |
| Under cloud | K8 & Docker |
| SDN | SR-IOV & OVS-DPDK |
| OS | Linux (Ubuntu) |
| Hardware | X86 based G10 and above servers. |

↑ Blueprint Components ↓

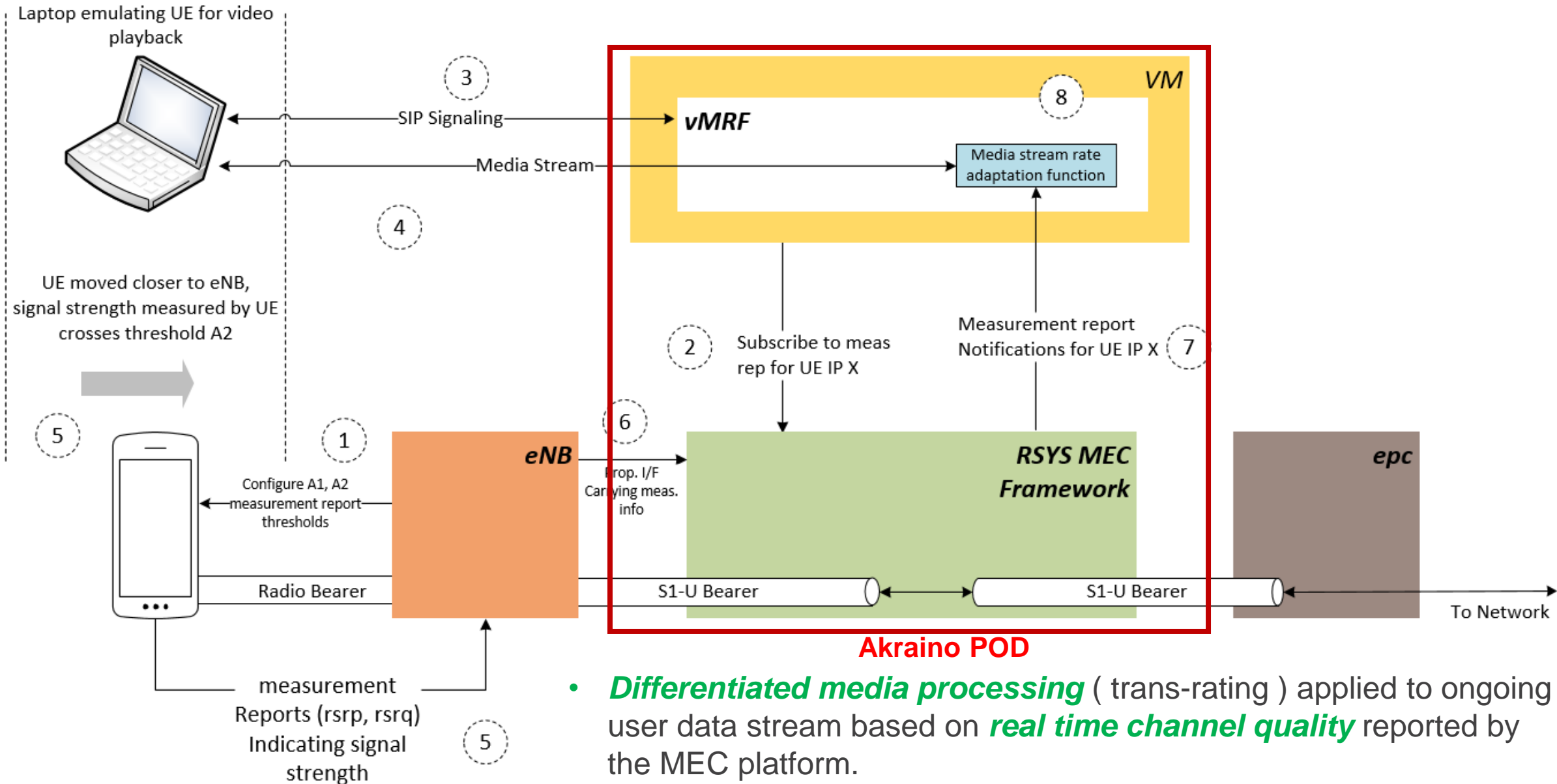




- Breakout @ edge - **Backhaul savings** since surveillance footage is always on
- **Real time traffic steering** capability when intrusion detected (face detection) @ back to the core.



Backhaul savings and URLLC



- **Differentiated media processing** (trans-rating) applied to ongoing user data stream based on **real time channel quality** reported by the MEC platform.

Business Drivers

| <i>Use Case Characteristics</i> | Network Cloud & Real Time | Edge media applications for real time media |
|---------------------------------|---|---|
| Business Need | Enabling new applications requiring distributed edge deployments. Low Latency & Bandwidth Optimized Real Time Media Processing and Edge Media AI Analytics. | Network based edge cloud that can be deployed at provider data center and telco offices |
| User Experience | HD and UHD real-time media content, contextual media processing, low latency | Single Pane of Glass control - Administrative and User Based GUIs Zero touch provisioning to reduce ops cost |
| Cost Of Solution | Low Cost with Virtualization and Open HW | Range from small footprint SW solution to large scale deployments with HW acceleration for advanced high density AI based media processing |
| Scale | Highly Scalable | Fully virtualized with low footprint (<4 compute servers) to high density for supporting large scale user services (100s of sites with optionally HW accelerated compute nodes) |
| Applications | Within the real time edge media processing and analytics (audio / video) domain | Real time HD video processing / transcoding Augmented and Virtual Reality (BW optimized) IoT initiated audio and video stream processing / recording Media Analytics (AI and ML based), speech & video |
| Power restrictions | TBD | TBD |

| Use Case Attributes | Description |
|-------------------------------|--|
| Type | New Submission |
| Industry Sector | Telco Carrier Networks and Enterprise |
| Business driver | Vast amounts of mobile/wireline data (predominantly video) is expected to continue to grow, particularly with 5G and IoT. Low latency, backhaul bandwidth restrictions and cost, and real time edge media analytics require media processing at network edges versus transporting all media to network core.. Without the ability to process real time media at the network edges a number of new advanced applications would not be possible or economically viable. |
| Business use cases | <ol style="list-style-type: none"> 1. Edge deployments at enterprises, entertainment venues, factory automation plants, public facilities where real time media processing required 2. Edge media applications include multi-party conferencing, gaming, surveillance, IoT generated content, AR and VR applications 3. Edge media applications requiring low latency and to overcome backhaul BW availability and costs being prohibitive 4. Real time media analytics with AI and ML based applications for high value and media monetization applications |
| Business Cost - Initial Build | Initial build requires a low footprint POD with minimal fabric and management switch, 4+ compute nodes with optional GPU acceleration, local storage node(s), PSUs, rack, typically under \$100K with SW. |
| Business Cost - Operational | <ol style="list-style-type: none"> 1. Low operation cost, with support for remote FCAPS management, and ONAP based resource and service orchestration 2. Typical 16U height OCP rack with similar power consumption |
| Operational need | <ol style="list-style-type: none"> 1. Edge Media solution shall support POD level consolidated management (OSAM) and service level orchestration and LCM via ONAP. 2. Zero touch provisioning, upgrades, fault and performance management KPI, and auto-scaling and auto-healing capabilities. |
| Security need | <p>POD platform SW and application level security vulnerability scanning and automated patching capabilities required</p> <p>Media security and user access authentication capabilities required</p> |
| Regulations | Depending on type of Edge Media application GDPR or other regulatory requirements may be applicable. NEBS may be required depending on deployment location and carrier network requirement. |
| Other restrictions | Depending on deployment location, a single half-height rack to multiple full-height racks at Edge DC or Edge CO locations may drive power and cooling requirements |
| Additional details | Edge Media solution shall enable support for high density media processing via GPU or FPGA acceleration for advanced high density AI and ML applications and shall scale from single site to 100s in regional deployments to 1000s globally. |

| Use Case Attributes | Description |
|--|---|
| Type | New Submission |
| Blueprint Family | Network Cloud Family |
| Use Case | Real Time Edge Media |
| Blueprint proposed | <ol style="list-style-type: none"> Unicycle POD (4-6 servers, single 16U rack config) Tricycle POD (16U or 42U rack configs, multi-rack) Cruiser POD (Multirack Core Network Configurations, with spine leaf fabric and ToR switch) |
| Initial POD Cost (capex) | Estimates (TBD) <ol style="list-style-type: none"> Unicycle POD (< 100K) Tricycle POD (< 200K) Cruiser POD (< 300K) |
| Scale | <ol style="list-style-type: none"> Unicycle POD – 1 rack with < 6 servers Tricycle POD – Multiple racks, each with < 24 servers Cruiser POD – Multiple racks, each with < 96 servers |
| Applications | Edge Virtual Function Applications (reference) <ol style="list-style-type: none"> Edge deployments at enterprises, entertainment venues, factory automation plants, public facilities where real time media processing required Edge media applications include multi-party conferencing, gaming, surveillance, IoT generated content, AR and VR applications Edge media applications requiring low latency and to overcome backhaul BW availability and costs being prohibitive Real time media analytics with AI and ML based applications for high value and media monetization applications |
| Power Restrictions | TBD |
| Preferred Infrastructure Orchestration | OS – CentOS or similar Linux, KVM Under Cloud – Airship OpenStack – VM Orchestration Docker + K8S - Container Orchestration VNF Orchestration - ONAP |
| Additional details | Edge Media solution shall enable support for high density media processing via GPU or FPGA acceleration for advanced high density AI and ML applications. |

A nighttime panoramic view of the Shanghai skyline, featuring the Bund and the Huangpu River. The city is illuminated with various lights, and several glowing white arcs of light sweep across the sky, creating a sense of motion and connectivity. The Radisys logo is prominently displayed in the center.

Radisys

Thank You