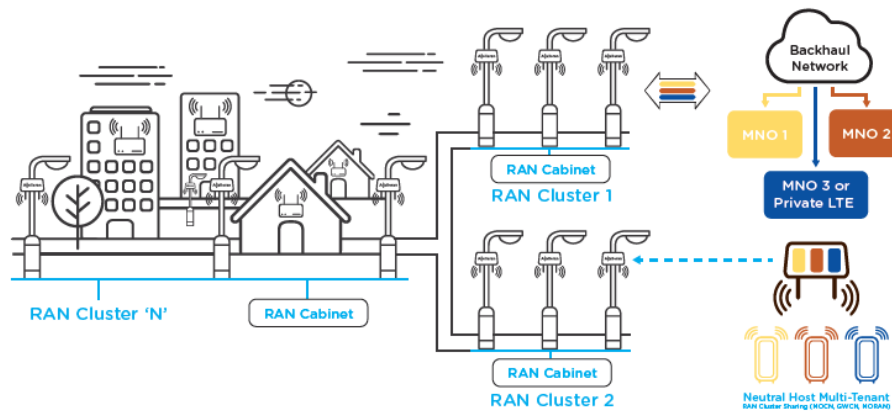# 5GCity enables Smart Cities with 5G Neutral Host vRAN Architectures based on Accelleran dRAX™

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The **5GCity** project deploys a **5G Neutral Host Platform** on which multiple tenants, both Public and Private, can easily enable 5G Smart City applications.

5GCity project enables a distributed cloud and radio platform for 5G neutral hosts and runs pilots in Barcelona (ES), Bristol (UK) and Lucca (IT). Some real exploitation derivatives based on 5GCity have also been shown in other cities such as the 'smart lamppost' offering demonstrated by partners **Ubiwhere and Accelleran in Guimarães** (PT).

The new urban deployments will share 5G network infrastructure with municipalities playing the '**neutral hosts**' role with small cells installed in urban furniture (e.g. in lampposts) and providing cloud and edge enabled '**5G network slices**' for '**multi-tenant**' operators.

These operators can be existing public MNOs (Mobile Network Operators) needing to extend and improve connectivity in the urban areas and new **private network** operators with access to dedicated resources, to enable new 5G vertical markets and business models, benefiting both municipalities and citizens alike.

By bringing **virtualized cloud-enabled** computing to the radio **edge**, the benefits of this new architecture are being demonstrated by the 5GCity pilot use-cases of the media industries, connected car industry and city services like video processing for unauthorized waste dumping prevention.

As part of the 5GCity consortium, Accelleran has proudly provided and integrated its neutral host enabled **dRAX™** vRAN (virtualized Radio Access Network) platform and small cells in different bands.

The Accelleran dRAX™ 5G disaggregated O-RAN aligned vRAN platform

At the centre of the 5GCity RAN platform sits the Accelleran dRAX™ Intelligent Control Plane vRAN solution controlling the cluster of urban small cells.
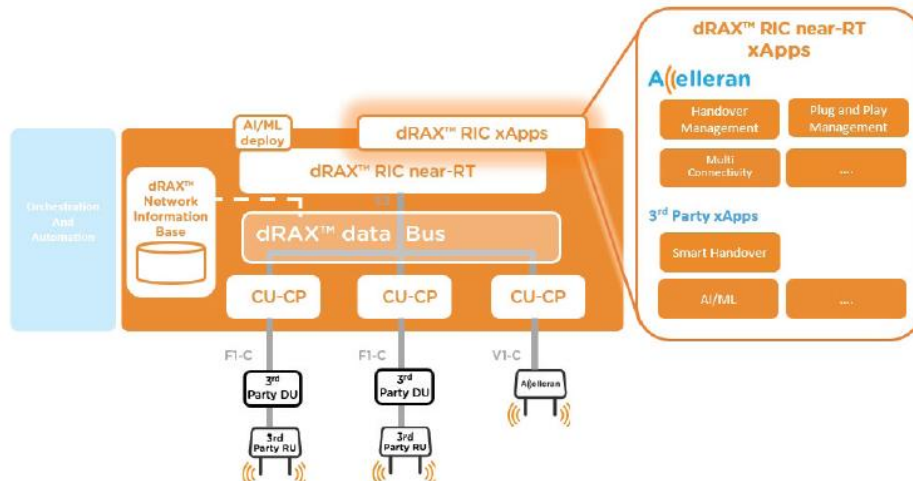

dRAX™ Key Features are:

- O-RAN Aligned vRAN
  The Accelleran dRAX™ vRAN platform delivers a true multi-vendor, disaggregated and open virtualized RAN Intelligent Control Plane, aligned with the O-RAN Alliance. Implementing CUPS, the user and control planes are fully decoupled. Support for 3rd party RUs, DUs & e/gNB encourage an open disaggregated eco-system to bring innovative 4G/5G products to commercial market at price points never seen before in the industry.
- Cloud-Native NFV/SDN vRAN
  The lightweight dRAX™ components are cloud-native VNFs, available as containers (Docker for Kubernetes) and VMs (Openstack). Functional deployment at the RU, edge or cloud can be decided by orchestration at run-time.
- Open Orchestration & Data APIs
  dRAX™ is open. Orchestration supports the industry preferred NFV/SDN framework APIs above and the NIB (Network Information Base) data APIs support industry standards and best practices (NFV/SDN, O-RAN, OAM, 3GPP, Netconf/Yang, …).
- 4G today, roadmap to 5G SA
  dRAX™ is field-proven today for 4G LTE M2M and IoT roll-outs. A committed roadmap, in development today, towards 5G NSA (r15) and aligned with the O-RAN Alliance architecture evolution is just a software update away. 5G SA (r16) will follow shortly afterwards then r17.

- Extensible RIC xApps
  Extending the dRAX™ RIC via xApps and accessing the control plane NIB 'big data' is ongoing through our by partners and 3rd parties, bringing added-value and enabling vRAN innovation.
- Mission Critical Quality
  The dRAX™ RIC and control plane are mission-critical grade software developed to Accelleran's exacting software standards and methodologies.

The Accelleran dRAX™ in 5GCity architecture

Accelleran dRAX™ can run virtualized either at the Edge computing resources deployed for example in city street cabinets or at the Data Center computing resources in order to support different service level requirements associated with different use cases, such as the need to provide low latency and processing at the edge.
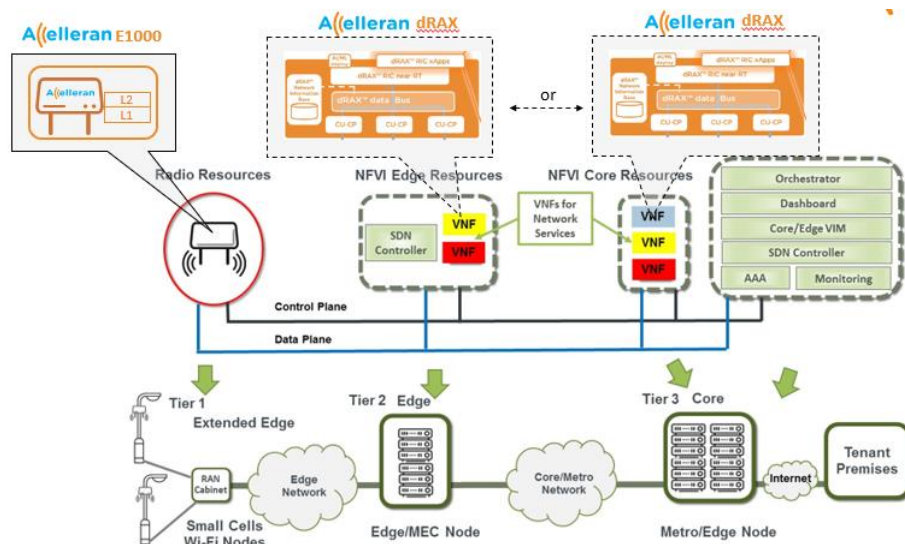
The following figure shows the pilot deployment in Barcelona 22@ district enabling a dense urban small cell network deployed on the lamposts.

The use of carrier-grade small, light and easy to install outdoor small cells capable of providing service to different operators show how Smart Cities could enable the densification and flexibility needed to provide enough 4G and 5G network capacity at the lowest TCO possible.

For further information about Accelleran RAN/vRAN 4G and 5G solutions contact visit www.accelleran.com.

5GCity Consortium