



CHARISMA NEWS



#7 – August 2017

Editorial

Dear Reader,

This is the seventh issue of CHARISMA News, the newsletter of the Horizon 2020 5G-PPP Project CHARISMA: Converged Heterogeneous Advanced 5G Cloud-RAN Architecture for Intelligent and Secure Media Access.

This edition focuses on the latest CHARISMA results and the dissemination activities that have taken place in the past few months.

I hope you will find the contents of this newsletter interesting. Your comments and suggestions are, as always, appreciated.

Dr. Theodoros Rokkas (INCITES CONSULTING, trokkas at incites.eu), Editor

Project results & activities

CHARISMA CMO

Deliverable D3.4 “Intelligence-driven v-security, including content caching and traffic handling” is now available on the CHARISMA website.

This deliverable comprises the extended report on the activities of WP3, conducted within the three on-going tasks during the second year of the project. The developments within these tasks have produced the CHARISMA Control, Management and Orchestration (CMO) platform software. In line with the objectives of the work

package WP3, the D3.4 report describes the design and implementation of the individual CMO components, as well as the software produced to cover the requirements identified for the delivery of intelligence-driven and virtualised security, in addition to content caching and traffic handling.

Initially in D3.4 the overall architecture of the CHARISMA CMO is presented, followed by the individual components of the CMO, providing details on their architecture and internal organization, functionality, and interfacing: either the internal interfacing between the modules comprising the component; or the external interfacing, describing the interaction with other components of the CMO. The components of the CMO detailed in this deliverable have either been developed from scratch within the CHARISMA project, or have been inherited from other projects but extended to serve the CHARISMA objectives. These components include: the Service Policy Manager, the NFV Orchestrator, Service Monitoring and Analytics, the Open Access Manager, and the CHARISMA GUI. In this report, we also describe the internal functions of the VNFs developed within CHARISMA for providing virtualized security and caching. These VNFs include: virtualized Firewall (vFW), Intrusion Detection System, Caching and Cache Controller.

Finally, the interactions between the CMO components in order to achieve network slicing, and delivering intelligence-driven virtualized security, content caching and traffic handling are described. For more information you can consult the D3.4 deliverable that is available at the [CHARISMA web site](#).

CHARISMA Demonstrators

Deliverable D4.2 “Demonstrators infrastructure setup and validation” is also now available on the CHARISMA website.

This deliverable provides a view of the CHARISMA project demonstrator setups, the infrastructure employed for each demo use case, and how each device is integrated into their respective infrastructure. In addition, it provides a plan for the validation of the technologies in each of the demonstrators, and their performance evaluation in the designed 5G use cases.

The three CHARISMA demonstrators and field trials are located in:

- Ljubljana at the premises of Telekom Slovenije, in Slovenia;
- Centelles (near Barcelona in Spain) at the premises of APFutura;
- in the laboratories of Demokritos (NCSR) in Athens, Greece.

The deliverable presents a detailed view of the infrastructure deployed in each field trial, and the software used in each of the demonstrations. Each demonstrator works to showcase one or more of the key 5G features of the CHARISMA project, these being: Security, Low-Latency, and Open-Access. In addition, the field trial demonstrators have been created so that each

showcase demonstrates within a single environment context the multiple hardware and software solutions that have been specially designed and developed within CHARISMA.

The objectives of each demo are as follows:

- In NCSR: Development of an end-to-end secure, multi-tenancy, converged 5G network, via slicing of virtualized compute, storage and network resources to different service providers. Network intelligence (such as security and caching functions) is distributed out towards end-users over a hierarchical architecture, featuring optimized and secure cross-slice communications.
- In Telekom Slovenije: Demonstration of all three of the key CHARISMA objectives: Multi-tenancy, Low Latency, and Security. In particular, these three features are showcased by complementing the existing network with additional virtual network slices to provide an overall 5G network functionality. These slices can be used to serve users such as Network Operators, or to supporting Virtual Network Operators (VNOs) with their different requirements, e.g. energy aggregators, and mobile VNOs (MVNOs), etc.
- In APFutura: In this field trial, two 5G demonstrators are being showcased, based upon: Low Latency, and the Transportation Sector (Bus) Use Case.
 - Low Latency demonstrator: The goal of this demo is to demonstrate two of the

key objectives of CHARISMA: low latency and open access, in a 5G networking context. This scenario simulates a robot that moves packages inside a warehouse that is managed remotely by a Controller located in the Converged Aggregation Level 3 (CAL3) node. Latency has an impact on how rapidly the control orders for safe operation of the robot arrive from the controller, so as to provide accurate and precise movement inside the warehouse.

- **Bus Use Case:** The goal of this demo is to demonstrate the service availability and reliability that can be achieved using MoBcache devices in a 5G network. The demo simulates users inside a moving bus that request a video from a content server outside the operator's network. Other users requesting the same video will experience a reduced waiting time, because the request is being serviced from the caching device. The Control, Management and Orchestration (CMO) allows the caching to be isolated for each of the Virtual Network Operators.

For each of the demos a leaflet describing the overall concept, architecture and specific details has been created and made available to the visitors.

For more information the deliverable D4.2 can be consulted and is available at the [CHARISMA web site](http://www.charisma5g.eu).



Figure 1: CHARISMA booth at EuCNC 2017

Dissemination Activities

EuCNC 2017

CHARISMA had a strong presence at EuCNC 2017 that took place from 12th to 15th of June in Oulu, Finland. In the CHARISMA booth the following demos were presented to visitors:

- **100G OFDM-PON demo:** This demonstrated the 100G real-time OFDM-PON that is being built within CHARISMA. The OLT and the ONU nodes were shown and their main characteristics were shown in a live demonstration.
- **Low latency demo:** The M2M use case showed the impact of the E2E-delay on M2M or CAR-2-CAR communications. The E2E-delay has a high impact on the system stability if it is included in the servo loop between sensor and actor. The demo simulated a scenario where a sensor and actor are placed on a moving vehicle (CAL0) and data processing is undertaken in the cloud (at CAL3).
- **CHARISMA Control, Management, and Orchestration (CMO) Platform Demo:**

The main highlights of this demo included:

- E2E Slice Creation for multiple-tenants;
- Rapid On-boarding of network services;
- Dynamic provisioning of network services in the assigned slice of the tenant;
- Security policy configuration per tenant;
- CHARISMA Caching solution (optional).

Workshop at EuCNC 2017

CHARISMA in collaboration with other 5G-PPP Phase 1 projects SESAME, COHERENT, VirtuWind, NORMA, 5GEx, SPEED-5G, SELFNET and mmMAGIC helped organise a workshop in “Business Models and Techno-Economic Analysis for 5G Networks” at the EuCNC 2017 conference in Oulu, Finland.

The workshop focused on the business and techno-economic aspects of future 5G networks. It was divided into three sessions with a total of twelve presentations from several H2020 research projects, such as CHARISMA, SESAME, mmMagic, VirtuWind, COHERENT, FUTEBOL, 5G NORMA, SPEED-5G, 5GEX, and TWEETHER.

The CHARISMA presentation was focused on the reference business model created for 5G networking.



Figure 2: CHARISMA workshop at EuCNC 2017

Summer School

CHARISMA and SESAME also co-organized a Summer School called “A Roadmap to 5G Development & Implementation” at Oulu, Finland on 12/06/2017. The event took place at the University of Oulu and had a full day of presentations covering a large range of topics around 5G such as: IoT opportunities and challenges in 5G, use cases for future connected and autonomous vehicles, 5G spectrum sharing, and techno-economic modeling.

Second International Workshop on Security in NFV-SDN

CHARISMA helped organize the 2nd International Workshop on Security in NFV-SDN (SNS-2017), held during the 3rd IEEE Conference on Network Softwarization (IEEE NetSoft 2017). The workshop was co-organized by the CHARISMA, 5G-ENSURE, and SHIELD projects, and the University of Derby.

About CHARISMA

The CHARISMA project is funded by the European Commission (Horizon 2020 program) within the 5G Public-Private Partnership (5G-PPP) initiative under the grant agreement No: 671704.