Demonstrating 5G Core network automation by OSM
ULAK Communications
Gülsüm Atıcı & Naciye Akyıldız
ÇINAR 5G Core

- Cross-functional development teams from ULAK and partners are co-developing 5G Core network (Çınar) according to 3GPP standards, utilizing agile development methodology (Scrum) and using smart, continuous integration and continuous delivery pipeline.

- Source Management Repository & Release management: **Bitbucket**
- Static code check: **CppCheck**
- Test Automation Tools: **NodeJs, Npm, Mocha**
- Build Automation Tool: **GNU Make**
- Continuous Integration Tool: **Jenkins**
- Code Coverage Tool: **Gcovr**
ÇINAR 5G Core:

- Compliant to 3GPP standard which is generated from 3GPP 5G YAML
- Includes 10 VNFs (NRF, NSSF, NEF, AMF, SMF, UPF, UDM, UDR, AUSF, PCF)
- Service communication through the REST API's within server/client model

- ULAK VIM solution is used for development, test and deployment
- We are extending it to participate OSM events as VIM/NFVi /MEC provider
ÇINAR 5G Core

- Utilizes 4 separate networks
- Management network for connection to database and other tools
- Control network is used for communication between NF’s
- Public network is used for external access
- Data network is used for data transportation

- PaaS environment includes databases (MongoDB & Postgresql)
- Monitoring (Zabbix), log collection and analytics tools (EFK)
Collaborations

**MANO**
- Whitestack-WhiteNFV
- TATA Elxsi-TEOSM

**NFVI-VIM**
- Windriver
- Whitestack-Whitecloud
- Havelsan-Telco Cloud

**VNF Vendors**
- Ulak
- Spirent
ETSI Plugtest Experience

**Demo Setup**
- Ulak NS includes 9 VNFs
- Sprient Landslide is composed of 2NS’s: vTAS and vTS
- ULAK’s NRF and Landslide vTS were deployed on Windriver via Whitestack
- ULAK’s 5GC was deployed on Windriver VIM via Tata Elxsi
- Landslide vTAS NS was deployed on Havelsan VIM

**5G Use Case Demo: OSM Orchestrated 5G-related NS**

**NRF testing scenario:**
Ulak’s NRF functionality has been verified by the Landslide capabilities of AMF emulation for NF registration and SMF discovery to ULAK’s NRF

**5GC E2E testing scenario:**
Registration and PDU session establishment to ULAK’s 5GC has been successfully completed by Landslide’s 5G RAN emulation capability for Ulak VNF’s
ETSI Plugtest Experience
OSM Usage

- VNF configuration and recovery with day-2 actions
- 5G Core network orchestration
- Manuel scaling
- Performance monitoring and alarm creating by Zabbix integration
- Log collection and error reporting by integration with Elasticsearch - Fluentd - Kibana (EFK)
Plains and Comments

Plan
- Use OSM to create network slices within separate and shared NS’s
- Autoscale the VNF’s

Difficulties Experienced
- Configuration of scaled VNFs for a dynamic scenario
- Getting notifications from OSM in status changes
THANKS