

Greenfield Telecom Networks - an update

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The Greenfield Telecom Networks group is an incubator for ideas to re-think and simplify network infrastructure, make it accessible for fast innovation cycles and prepare the infrastructure architectures for the next generation of networks. As a common theme, all activities in the Greenfield Telecom Networks group are open solutions based on modern technologies used in web-scale infrastructures. The currently active projects in the project group are:

- **Application Aware Networking:** The future networks will need to provide more capabilities to actively broker between application demand for bandwidth and physical realities of networks with the goal to provide best possible user experiences based on available connectivity and bandwidth. As starting point the team chose to focus on topology and capacity state exchange between content providing and content transporting infrastructures. The basis for these activities is the work done by the ALTO project group in IETF to provide actual implementations to measure and iterate over topology detection and traffic flow optimization implementations developed by the group. This track addresses especially ISP, CDN and content providers but also provides opportunities for network equipment solution providers.
- **Distributed Infrastructure Management Framework:** Disaggregation of management systems and network functions is an important step to enable an efficient management of heterogeneous infrastructures. The infrastructure management track in the Greenfield Telecom Networks group is picking up work around IETF and OpenConfig YANG models and distribution mechanisms for generic configuration management across network components, server systems and applications leveraging the work done in the sysrepo project.
- **Application Enablement:** A key objective of this group is to create a suite of Open APIs that will enable rapid application creation on top of Access, Core and Management components in a Mobile Operator Network. Based on the WSO2 API management platform we deployed in the TIP Community Lab@Facebook we are jointly developing new use-cases, application facing APIs and integration modules into carrier infrastructure systems using native interfaces. This initiative is actively driven by the extensive experience of Dialog Axiata from running its own IT transformation projects referred to as MIFE Internal and the expertise of WSO2.Telco that delivers the Open Source software powering this initiative together with the Telestax team providing some core telecom infrastructure protocol implementations. The MIFE project at Axiata has exposed more than 1,500 APIs.
- **Application Lifecycle Management:** We're actively seeking a lead for this group, which will focus on developing an open framework for distributing applications and managing release processes with automated tooling, canarying new releases and rolling out based on analysis of statistical counters and KPIs across different releases to identify regressions and control rollouts based on the measured data automatically.

Members of the Greenfield group can find more details on the working groups and their meeting schedule in the wiki of the Greenfield project group: <http://redmine.telecominfraproject.com/projects/greenfield-telecom-networks/wiki>

Application Enablement working group deep dive

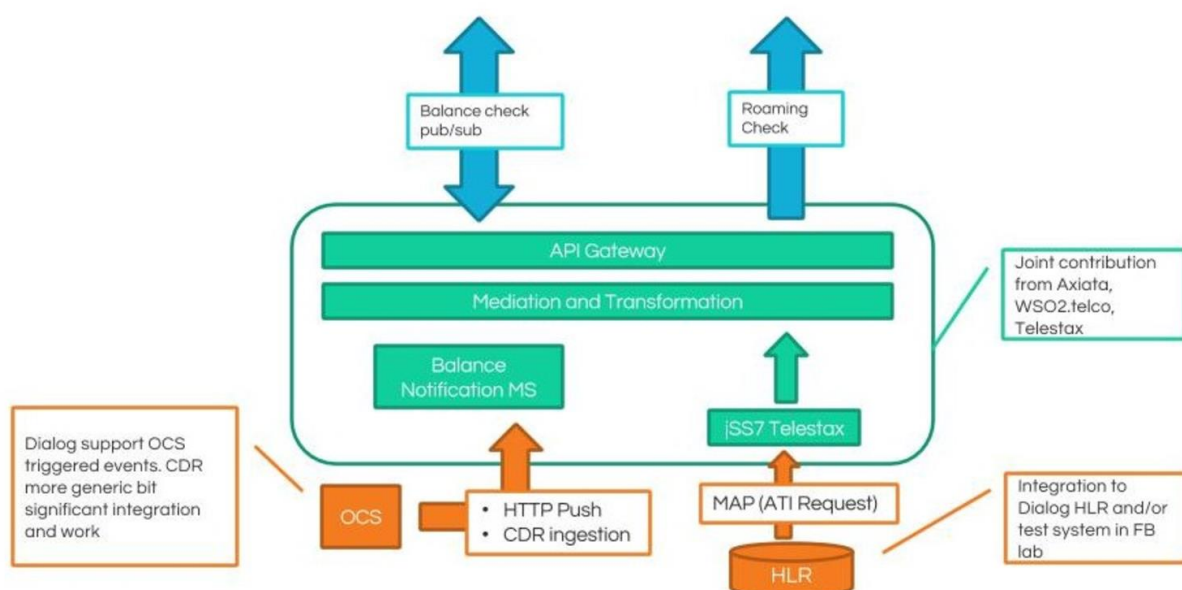
Venura Mendis, CEO of WSO2.Telco and lead of the application enablement working group has shared the following exciting details on the work of the team over the past months since the activities were started within the Greenfield Telecom Networks project group:

The Application Enablement working group was initiated within the Greenfield project group of the Telecom Infra Project (TIP) in a collaborative effort after active discussions during the TIP Summit in November. Our key objective is to create a suite of Open APIs that will enable rapid application creation on top of Access, Core and Management components in a Mobile Operator Network.

This initiative is driven by the extensive experience of Dialog Axiata in running its own IT transformation projects referred to as MIFE Internal and the expertise of WSO2.Telco that delivers the Open Source software powering this initiative. The MIFE project has resulted in over 1500 APIs being exposed. The Application Enablement group seeks to share learnings of projects such as this and also make software and tools developed available for the wider TIP community. Through such open collaboration with a wider forum, we are able to develop an easily replicable reference model that will accelerate innovation in other MNOs.

We have deployed the WSO2.Telco Internal Gateway and associated microservices framework along with connectors from the Telestax team in the TIP Community Lab@Facebook. This in turn is integrated with live Dialog HLR and OCS elements. The eventual goal is to build testbed versions of these network elements that are being actively developed by Telestax. We will publish other APIs and develop a set of southbound connectors that will expose complex network protocols that are as easy to use the REST APIs.

The below diagram illustrates key elements of these solutions. While we are currently connecting to Dialog HLR and OCS elements via VPN, a live deployment such as this would be deployed on-premise for the MNO. The WSO2.Telco Gateway provides security layer enabling applications and services to be developed ensuring integrity of underlying core IT and network elements.



The team integrated multiple components and networks in the TIP Community Lab@Facebook:

- WSO2.Telco Internal Gateway - Single interface for API Discovery, Governance and Security
- jSS7 Connector - This is a simple web app developed using Telestax jSS7. It converts MAP protocol to a REST API
- Microservices Framework - Providing wrapper layer for existing APIs and providing framework for rapidly mashing together API and building business logic.
- OCS & HLR Elements - These are production elements in Dialog network that have been integrated to TIP testbed.

For MWC we are will be presenting a variety of use cases that use Roaming Verification and Balance-up Notifications (Asynchronous event on top up of a pre-paid account) APIs. These are described in more details below.

Arimac Digital, (<https://arimaclanka.com/>) has developed a game called 'bounce' that illustrates the use of these APIs. With a low pre-paid balance players are able to play the game within a limited environment. Unlockable objects, graphics and 'life revival power-up' will be available on top-up of mobile accounts. The implementation of the API within the game enables mobile service providers to increase their revenue by allowing the users to 'pay without spending'. Topping-up allows the users to enable new features in the game, keeping their money within their accounts.

Juvo, a San Francisco based fintech company and TIP member that partners with mobile operators around the world to establish financial identities for creditworthy, yet excluded individuals, is demonstrating a voice IVR lending application that integrates the Balance Check and Balance Up APIs. The implementation shows how service providers can use Juvo's data science driven Identity Scoring to dramatically reduce churn and and increase revenue. In real time, Identity Scoring establishes individual lending criteria, enabling users to seamlessly request a balance increase in order to purchase services or premium content on the provider's network for immediate use. (<http://juvo.com>)

Software developed so far is available at our public GIT [repository](#).

Please contact venura@wso2telco.com for further information.