



Case Study with Lessons Learned Slovakia RCS Interconnection

Slovak Telekom (Deutsche Telekom) launched RCS in June 2014 followed by Orange Slovensko with a unilateral launch in March 2015. Following these launches the two Operators commercially interconnected in December 2016. There has been given a grace period to close all outstanding minor issues prior to opening networks for commercial activities with other partners. Research by GSMA Intelligence shows that Slovak Telekom and Orange Slovensko together held nearly 71% market share in Slovakia as of Q3 2016.

In Summer 2015, to facilitate interoperable interconnected launches in Europe, the GSMA offered to support the RCS Interconnection testing between Slovak Telekom and Orange Slovensko. This was considered as a good opportunity to take advantage of the external expertise and quality assessment of RCS services and, ultimately, save Operator resources. This offer was welcomed by both the DT and Orange Groups and as a result the Project Plan was developed by GSMA and subsequently accepted by the Local Operators. GSMA took the responsibility for Project Management activities and provided resources to run testing with traces analysis.

Key lessons learned

- *Before the start of the Project each Operator needs to identify risks related to Infrastructure Roadmap changes and Release update policy. All changes to the network architecture shall be considered as Project Change Requests and approved by all participants.*
- *RCS Interconnect is a highly complicated technical project which requires strong management and intensive collaboration between all the participants involved at all stages.*
- *RCS itself is developing fast in standards, clients and network implementations therefore long projects (over 9 months) will have an increased probability of failing. Consider running interconnect testing on Production environment from the beginning.*
- *Customers will not immediately discover the service and there will be some extra time needed to fix final issues. Agree downgrade of issues and a plan to resolve after launch in order to maintain the launch date and the budget.*

RCS launches

- Orange Slovensko launched RCS in March 2015
- Slovak Telekom (Deutsche Telekom) launched RCS in June 2014

Interconnected launch

- Interconnection discussion started in September 2015, and was technically ready in November 2016
- Operators' RCS services were commercially interconnected in December 2016 (grace period)

Project details

The key objective of the Project was the commercial launch of the RCS interconnect between Slovak Telekom and Orange Slovensko with the following deliverables:

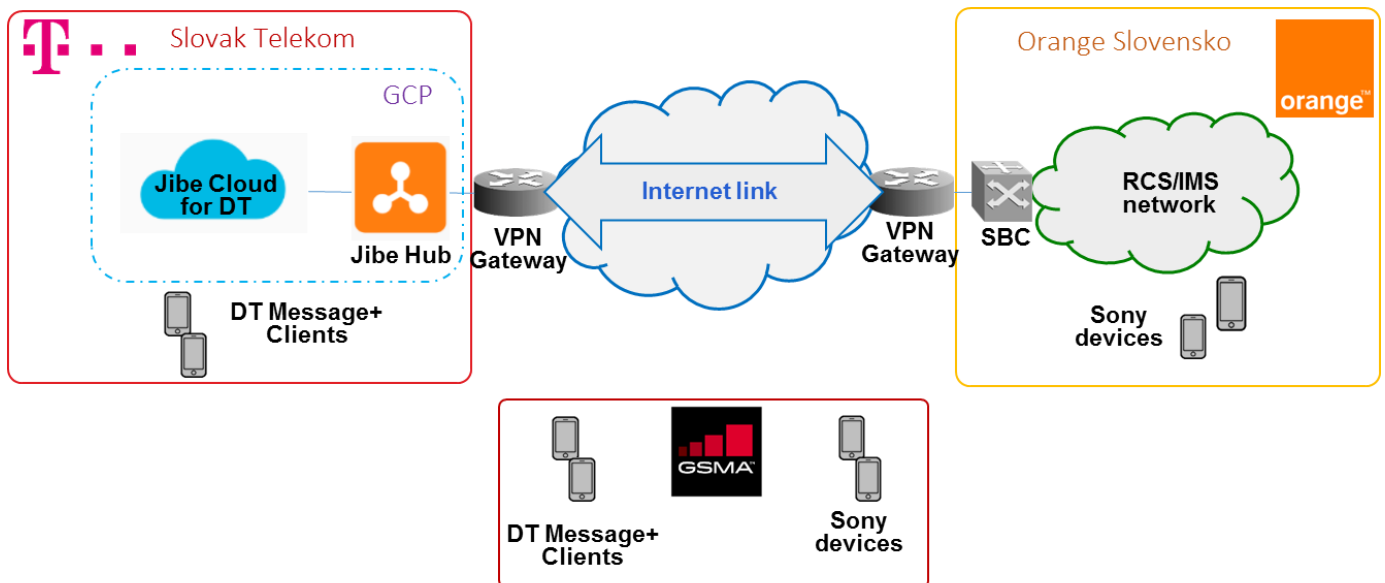
- *RCS Interconnect between Slovak Telekom and Orange Slovensko tested and accepted on pre-production environment.*
- *RCS Interconnect between Slovak Telekom and Orange Slovensko tested and accepted on production environment.*
- *Lessons Learned for the RCS Interconnect Testing for Slovakia project.*
- *Slovak Telekom and Orange Slovensko networks Full accreditation to joyn Blackbird.*

Operators and the GSMA agreed two sets of test cases for this Project based on the GSMA RCS IOT Test Cases Matrices:

- One set of basic tests cases to be run by the Operators for quick verification of their networks; and
- The extended test cases set for GSMA to verify interconnected services in depth with traces analysis.

In this Project Operators agreed to follow the usual approach of introducing telecommunication services where services are at first completely tested on a pre-production (test) environment, and once all issues are resolved the same testing is repeated on the production environment.

The actual interconnection between Orange Slovensko and Slovak Telekom was performed via the VPN technology as provided on the figure below. The Slovak Telekom network was implemented on the Google Cloud Platform (GCP) using Jibe Cloud and Jibe Hub of Deutsche Telekom Group's network. Every testing party was provided with the appropriate number of SIM cards for each Operator and corresponding User Equipment: DT Message+ Client and Sony Xperia Z5 devices. The GSMA performed most of the testing while in Romania and during the first stages visited Bratislava to collect initial traces onsite via Mobile Access.



* - GCP, Google Cloud Platform

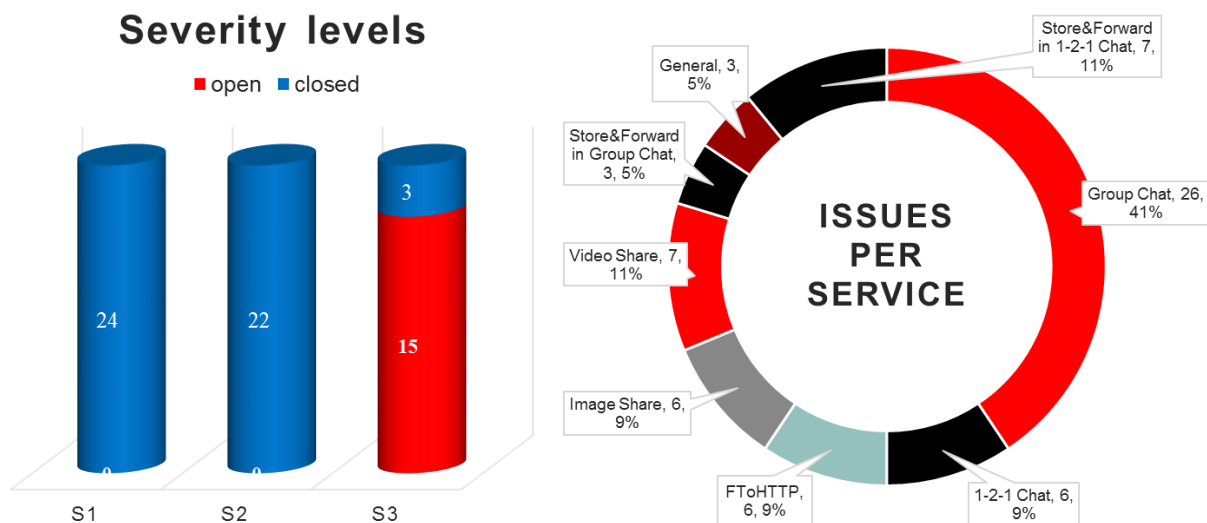
(Roaming + WiFi)

Group Operators shared their experience from other European markets in terms of quality and acceptance criteria for test results and these were approved by all for the Slovakia Project:

- *ALL agreed test cases have been executed*
- *ALL S1 (Critical) and S2 (Major) issues have been resolved*
- *S3 (Minor) & S4 (Warning) issues resolution plan agreed*

The official Kick-Off Workshop happened on the 18th September 2015 and participants pre-agreed the baseline interconnection launch date as 19th April 2016. Due to unexpected infrastructure changes and the amount of issues found the actual interconnected launch happened on 6th December 2016, 8 months later.

The diagrams illustrate that during the Project execution over 60 issues have been detected and there are still some minor S3 issues which are being resolved. More than 40% of all issues were related to the Group Chat services.



Lesson 1: Project preparation

- During analysis of IR.90 parameters issues with UX for FileTransfer and ImageShare (MaxSize) were identified.
- Parameters not covered by IR.90/RCC.07 (e.g. R-URI max length) introduced issues on NNI and brought delay in establishing SIP interconnection.
- In this project the first phase was to test on pre-production environment. Problems with the pre-production environment readiness caused a two week delay.
- Too much time was spent analysing issues on a reference client and learning how to use services on that client.

Lessons learned

- *Ensure quality of the network (pre-production and production) and client implementations on UNI prior to start of NNI testing. This could be achieved by running through GSMA accreditation or GCF certification procedures. Be ready to decline issues not related to NNI which is the key focus of interconnect projects.*
- *UX parameters difference should be discussed and agreed by Marketing departments of each Operator. Any parameter not covered in IR.90 or detected issue due to difference in IR.90 should be reported to GSMA in order to investigate and prepare appropriate CR to the Specification (if needed).*

Lesson 2: Project execution

- Project delayed due to migration of current live services to new Data centres.
- Vendor came with the late proposal to change NNI configuration to multiple session border elements instead of one. It brought additional effort to analyse the consequences and extra time to validate new architecture.
- Basic testing in Production environment revealed many new issues.
- Before moving to Production testing it was observed that Operators are running slightly difference basic verification test sets in asynchronous mode which caused delay in issues detection and analysis.
- Projects for RCS interconnection follow a typical approach, where initially there is testing of the complete test set on the pre-production environment and once this is completed, subsequent testing of the same complete test set on the production environment. GSMA statistics show that such projects last more than 9 months, and during that period OEMs usually perform a firmware upgrade which could bring changes in the behaviour/syntax of devices under test. In addition, network elements like device management could be also updated. Consequently all benefits of pre-production testing could be easily declined by a regular OEM firmware upgrade or other upgrade of a network element.
- ***LIMITATION:*** *Some Operators still have ways of working with network elements vendors (suppliers) not adopted by many and frequent software changes, consequently it requires more time to resolve issues.*

Lessons learned

- Before the start of the Project each Operator to identify risks related to Infrastructure Roadmap changes and the Release update policy. Sharing information between Operators in a transparent way where possible to identify risks early in the project.
- All changes to the network architecture shall be considered as Project's Change Requests and approved by all participants. By default consider staying with the initially agreed scope and a grace period for the change.
- Ensure the Project Plan contains at least 3 testing cycles for each test environment and between these there should be at least 2 weeks for regression and issues resolution.
- Basic/Integration testing in production should be performed in parallel by Operators, and aligned on planning and progress in more collaborative mode with daily meetings. All issues to be registered and followed in an online tool available for all (e.g. JIRA)
- Consider running interconnect testing on Production environment from day 1. To minimize potential impact on live IMS services.
- Use only commercially launched clients/devices on both ends of the interconnect.
- Ensure that deployed evolution for interconnection will not impact live IMS services by running a minimum set of test cases in pre-production.
- Pre-production environment to be used for validation of fixes to issues discovered during production testing, if there is a identified risk of regression for live services (not exclusively RCS).
- To verify impact of fixes to other functionalities consider running full set of test cases in a testing cycle after each patch. Ensure execution of each testing cycle within maximum 1 week.
- NOTE: Other alternatives depending on negotiated ways of working with the vendor will be to apply processes which are designed to react to, and resolve issues quickly on the E2E architecture – shorter delivery cycles from vendors.

Lesson 3: Finalising the project

- Local Operators were not ready to start acceptance testing immediately after completion of main testing by GSMA and Group Operators. It took additional time to ensure readiness of the SIMs and clients/devices
- Local Testing reveals more new issues and consequently not accepted moving the launch date

Lessons learned:

- Ensure a Project Plan has additional task for Local Operators to prepare for Acceptance Testing. Request confirmation from Local Operators for start of Acceptance Testing at least two weeks before the actual start date in the Project plan especially in the case of project timeline change due to issues. Consider this as a risk affecting project timeline.
- Agree downgrade S1/S2 issues and a plan to resolve after launch in order to maintain the launch date and the budget. Customers will not immediately discover the service and there would be some extra time to fix final issues.

Conclusion

At completion of this Case Study, Slovak Telekom and Orange Slovensko were progressing through Phase 2 of the Project which is targeting a more robust technical interconnect scheme and development of service profiles from Blackbird to Crane Priority Release. It was the intention of Slovak Telekom to enhance the RCS service offer to their customers without breaking the interconnection with Orange Slovensko and GSMA will continue to support Phase 2.

As illustrated in this case study and previous GSMA case studies for Germany, France and South Korea each All-IP Interconnect is unique, and continues to be a highly complicated and technical project that requires strong management with intensive collaboration between all the participants involved at all stages. There are several All-IP interconnects live already and Operators planning to start similar projects are invited to review industry learnings and tools provided by GSMA to avoid similar issues, including the [Network 2020 ALL-IP Business Guide](#).