

# Telco 2.0 for UC – an example of integration telecommunications service provider’s SDP with enterprise UC system

Dariusz Bogusz  
Siemens Enterprise  
Communications\*  
ul. Mińska 63A  
03-828 Warsaw, Poland  
Email:  
dariusz.bogusz@siemens-  
enterprise.com

Jarosław Legierski  
Orange Labs  
ul. Obrzeźna 7,  
02-691 Warsaw, Poland  
Email:  
jaroslaw.legierski@orange.com

Andrzej Podziewski<sup>1</sup>  
Kamil Litwiniuk<sup>2</sup>  
Warsaw University of Technology  
Faculty of Electronics and  
Information Technology  
ul. Nowowiejska 15/19  
00-665 Warsaw, Poland  
Email: a.podziewski@gmail.com<sup>1</sup>  
kamillitw@gmail.com<sup>2</sup>

**Abstract** — This paper presents practical integration of enterprise Unified Communications system with telecommunication service provider Service Delivery Platform. System implemented in Orange Labs, enables sending SMS and USSD messages geo-localizing of user mobile terminal directly from user interface of Unified Communications system. This article presents also statement regarding further investigations in the area of integration enterprise UC with telecommunication service provider SDP using Telco 2.0 model and restrictions in implementing this kind of applications.

## I. INTRODUCTION

Enterprise communication systems are some of the most promising area for implementing telecommunications service provider (TSP) services in Telco 2.0 model. Contemporary communications systems: PBX, IP PBX, and Unified Communications (UC), combine multimedia communication including: Voice, Instant Messaging, Video etc. The obvious direction is expansion above list by TSP provided media. Possible enhancements of enterprise UC by TSP include e.g. SMS, MMS or Unstructured Supplementary Service Data (USSD). It is noticeable that business communications systems implement interfaces integrating computer and telephony systems for years. Protocols supported by this model known as Computer Telephony Integration (CTI) include CSTA, TAPI, and JTAPI. Enterprise systems vendors have rich experience in integrating telecommunications and IT areas.

Integration of enterprise communication and mobile communication provider systems used to require detailed knowledge of specific protocols like SMPP (SMS), MM7 (MMS) or MAP (USSD). Availability of TSP open Service Delivery Platforms [3], enabled access Intelligent Network services via more developer friendly interfaces like CORBA (OSA/Parlay) or Web Services [4] e.g. ParlayX [7] and oneAPI [11] standards.

Dynamic expansion of social networking services in Internet brings some observations. Service providers have noticed correlation between growth rate of a social net-

work and number of available Application Programming Interfaces (API). The fastest growth has been achieved by portals enabling developers with rich API functionalities (Facebook, LinkedIn, LastFM), and portals without such an open API, have often shrunk (N-K) [2]. As a result from above dependency TSP’s started process of opening their networks to external developers and expose their Service Delivery Platforms in the Internet. This two sided business model, in which both TSP and independent developer share benefits from telecommunication application or service is known as Telecommunication 2.0 [9] or Telco 2.0.

## II. SIEMENS’ UNIFIED COMMUNICATIONS - OPENScape UC

### A. OpenScape solution

Siemens Enterprise Communications OpenScape UC Application is part of OpenScape Suite, communication environment for enterprises. From architectural point of view OpenScape Suite consists of many applications, described in Fig. 1. The most important are:

- OpenScape Voice – application implementing IP protocol based voice services for subscribers and Private Branch Exchange’s (PBX).
- OpenScape Video – system enabling video communication between terminals and multiparty video conferences.
- OpenScape Messaging – implementing integrated offline messaging services, i.e. combination of email, SMS, fax mail and voice mail in one Unified Messaging system.
- OpenScape UC Application – set of applications supporting group work and collaboration. User services include: One Number Service (ONS), advanced voice and multimedia multiparty conferencing, presence management, contextual conferencing with document sharing, aggregation of many communication forms in one busi-

ness client like MS Outlook, Lotus Notes or Google Apps.

- OpenScope Mobility – implementing mobile user concept, by safe, wireless access to enterprise knowledge resources and enterprise Fixed Mobile Convergence (FMC). Features are implemented using dedicated application on the Smartphone.

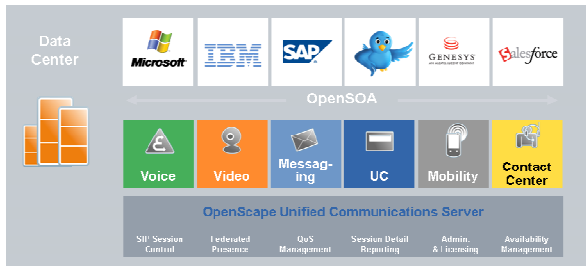


Fig 1. Siemens' OpenScope logical system architecture

### B. OpenScope UC

OpenScope UC Application is an Unified Communications class system [8], which provides user with the following services:

- CTI – control of a user phone from PC application,
- ONS – possibility of dynamic definition and management of preferred communication device for voice and video by the user. Regardless actual device, incoming or outgoing communication, user is presented to other parties by the same logical address,
- Presence – possibility to define and issue to authorized parties own user status (Office, Holidays, Meeting etc.) and managing incoming connections based on this status,
- IM - multiparty Instant Messaging,
- Conference – setting up dial in and dial out multiparty conferences for voice, video and web collaboration based on media server,
- Voicemail – voice mail function based on personal user voice portal,
- Contacts – contact list service private e.g. MS Outlook and global e.g. OpenScope system or MS Active Directory integrated,
- Mobile – support of mobile users access to UC services via Smartphone applications.

Fig. 2. presents physical architecture of system consisting of IP PBX OpenScope Voice unified communications system OpenScope UC.

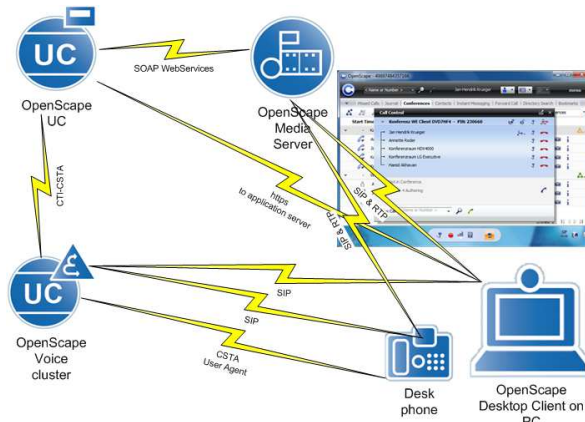


Fig 2. OpenScope UC system architecture

OpenScope Voice system monitors connected phones using CTI technology with CSTA protocol. OpenScope UC is application server for clients running on user PC's and mobile devices. Thank's to open API based on Service Oriented Architecture (SOA) [5], [6] and using open standards (SIP, XMPP,) OpenScope environment can be easily enhanced by new functions. Such functions can be advanced network services of TSP available via Telco 2.0 API.

### III. INTEGRATION BETWEEN UC SYSTEM AND TELCO 2.0 SDP

Architecture of prototype system integrating OpenScope UC Application with TSP Service Delivery Platform (SDP) built in Orange Labs is presented in Fig. 3.

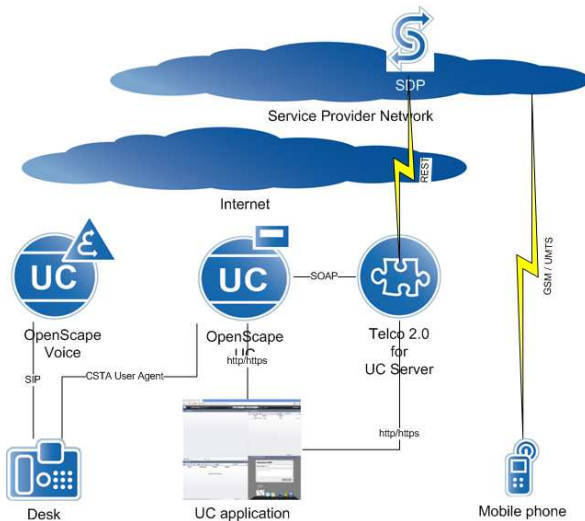


Fig 3. Integration of provider' SDP with Unified Communications system

System is dedicated for use in enterprises. Typical UC

user is equipped with VoIP office phone connected via SIP protocol with OpenScape Voice soft switch and www based UC client from PC. This OpenScape Web Client application, enables access to advanced Unified Communications system functions, like: Conferencing, Instant Messaging, phone management (CTI) etc. OpenScape Suite architecture has been expanded by application server named Telco 2.0 for UC. Tasks of this server are connecting and maintaining connection to provider platform SDP (using Web Services in REST standard – Representational State Transfer) on one interface, on the other interface proxying Telco 2.0 services to Unified Communications system users.

Server integrating enterprise Unified Communications environment with TSP Service Delivery Platform is based on J2EE. Application has been created in Java programming language using Eclipse Integrated Development Environment (IDE). Apache Tomcat server provides www container function and underlying database is implemented as MySQL.

User interface of Telco 2.0 for UC is based on www subpage, integrated in UC user portal – OpenScape Web Client. OpenScape Web Client is an application which enables users with: choice of preferred device for voice service (office phone, soft phone, mobile phone). Additionally it offers access to other services like:

- easy handling of voice phone connections via Click & Dial,
- logging incoming and outgoing connections in a personal journal,
- access to global directories via LDAP standard and integration of private contacts and directories with company contacts,
- creation and managing of conferences.

The above list of functions has been enhanced by TSP provided services:

- sending SMS messages
- sending USSD messages
- subscriber terminal location

OpenScape Web Client application interface implemented with telecommunication service provider functions is presented in Fig. 4:

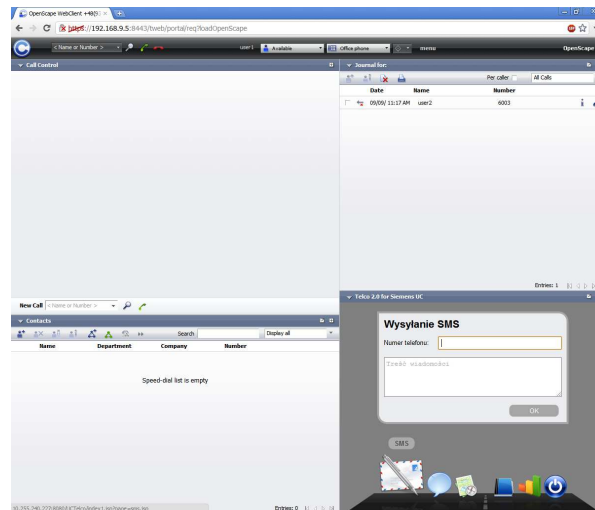


Fig 4. OpenScape Web Client with functionality provided by an provider' SDP

Application Telco 2.0 for UC can make use of UC server internal directory service. For this purpose Telco 2.0 server initiates Web Service (SOA) session to OpenScape UC server using SOAP protocol. Using this interface application can use list of users defined in enterprise UC system. Using received contact data, we can use TSP location service to find terminal location, send SMS or USSD message. Example record of electronic directory accessed this way is presented in Fig. 5. Fig. 6. presents terminal location function.

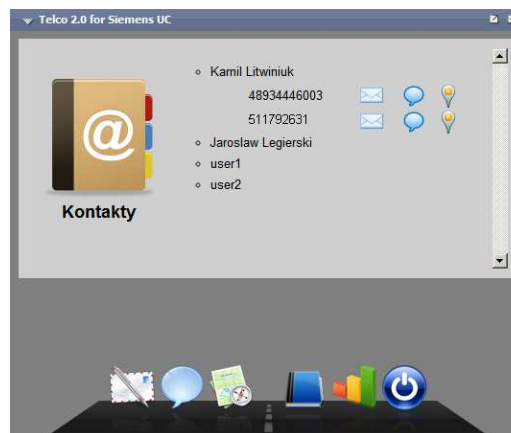


Fig 5. Telco 2. For UC user frontend – contacts window

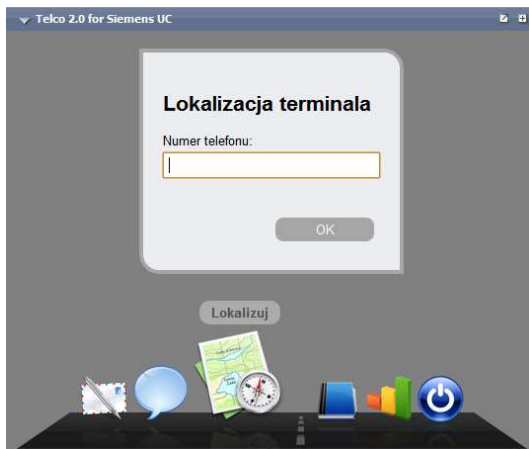


Fig 6. Telco 2. For UC user frontend – terminal location

The presented system is managed using dedicated www portal presented in the Fig. 7. Using this portal the IT Administrator is able to: manage users, give privileges to access particular services (SMS, USSD, and location), manage access to API of enterprise OpenScape UC and TSP Service Delivery Platform (manage user names and passwords).



Fig 7. Telco 2. For UC - system management

## VI. CONCLUSION

System presented in this paper is a non commercial (demo) application, integrating telecommunication service provider service delivery platform and enterprise Unified Communications system, using Telco 2.0 API's exposed in Internet. This integration is an example of enhancing enterprise Unified Communications by mobile telecommunication service provider functionalities. Such kind of integration not easy to implement and sometimes impossible without API provided by telecommunication service provider in internet [10].

During process of building a prototype and testing the system there was a need to estimate possible traffic and load of SDP platform. Unfortunately simple calculation of

number of requests per second, which have to be served by API exposing platform is not possible. Detailed performance models of enterprise UC systems which could be base for calculation of integration scalability (UC – Telco 2.0) are very simplified [12]. We have also not found full data of existing large implementations of enterprise Unified Communications systems. Such statistical data could help to find out correlations between VoIP, and other traffic forms present in UC system (IM, Presence, ONS, CTI, video) and their relations in time domain. This could create base for estimating API traffic towards telecommunication provider SDP and define performance requirements of this platform. Described issues will be further investigated.

Application has been developed as part of Orange Labs Telco 2.0 University program (<http://www.tu.rd.tp.pl>).

\*) Siemens Enterprise Communications Sp. z o.o. is a Trademark Licensee of Siemens AG

## REFERENCES

- [1] D. Bogusz, P. Korbel, J. Legierski, Integracja systemów Unified Communications z platformami usługowymi operatorów, KSTiT 2011 conferencing materials, Przegląd Telekomunikacyjny 8-9/2011
- [2] S. Czubkowska, Co się stanie z Naszą Klasą, Dziennik Gazeta Prawna nr 218 10-13 listopada 2011
- [3] M. Grzegorzewski, Otwarte Platformy Usługowe, Przegląd Telekomunikacyjny, 1/2009
- [4] E. Newcomer, Understanding Web Services: XML, WSDL, SOAP, and UDDI, Independent Technology Guides, 2003
- [5] OpenScape UC Application SOAP SDK Programming Guide, Siemens Enterprise Communications 2010
- [6] OpenScape UC Application Web Client SDK Programming Guide, Siemens Enterprise Communications 2010
- [7] Open Service Access (OSA); Parlay X web services, 3GPP Technical Specification TS 29.199-01 ÷ TS 29.199-22
- [8] Siemens to Reveal New LifeWorks Vision and Showcase Advanced IP-Based Applications and Services, SUPERCOMM 2003
- [9] M. Średniawa, Telekomunikacja – wersja 2.0, conferencing materials „INTERNET – Wrocław 2004”
- [10] M. Średniawa, J. Legierski, Telco 2.0 jako element integracji telekomunikacyjnych sieci prywatnych i publicznych, KSTiT 2011 conferencing materials, Przegląd Telekomunikacyjny 8-9/2011
- [11] Internet resources <http://oneapi.gsma.com/>
- [12] Internet resources <http://technet.microsoft.com/en-us/library/gg398811.aspx>