

Mobile data communication Bill shock prevention and roaming regulation

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Abstract

The mobile data communication is growing fast including the mobile data international roaming. The usage of smart devices, the demand to be connected in online activities increases the usage of data from end user perspective. The users experience in data communication is evolving and changing. Especially in roaming data communications, the users are facing more and more often the phenomenon of bill shock. It is mainly due to the fact that the roaming prices are not well communicated to the end user. It is hard for the user to distinguish how the tariffs are composed either from the home network or from the host network provider. This article will analyze the situation with user experience and user behavior and how we can improve or prevent the bill shock experience in data usage especially in roaming in a combination of measures from regulatory perspective, network operators and users. The article is focused on international mobile roaming, the technical and regulatory measures to prevent bill shock experience by analyzing the roaming regulation in Europe Union, and in Western Balkans focused on Albanian case.

Keywords: roaming regulations, mobile data, RLAH, bill shock prevention.

Introduction

International mobile roaming is a service that allows mobile users to continue to use their mobile phone or other mobile device to make and receive voice calls and text messages, browse the internet, and send and receive emails, while visiting another country.

The market for roaming services really began in 1998 when mobile network operators (MNOs) started to charge supplementary tariffs for international voice calling. The first mobile roaming agreement was signed in 1992 between Vodafone UK and Telecom Finland (*Blackman C., Forge S. "Roaming, One year after implementation", November 2018*). At the beginning of international mobile roaming the most common services were voice calls, which is related with making and receiving calls to or from home country, visited country or a third country and SMS service, sending and receiving messages when you where abroad. Developments of technology in the mobile market, from one generation to another one, from 2G to 3G, 4G/LTE, to 5G networks, as well as the introduction, and increased usage of smart devices, mobile applications lead to high data traffic in mobile communications. Today the international mobile roaming is used not only for voice and SMS services, but for data communication in mobile broadband for sending and receiving emails, download images, music, films and software, applications etc.

Referring to Tefficient report, "Industry Analysis#32019", the data usage per SIM user

per month continues to grow fast. In Europe the highest consumption is in Finland, with 23.5 GB/month during the first half of 2019. The lowest data consumption in Europe is in Greece with 1GB/month in Germany, Belgium and Netherlands with 2 to 2.5G/month per user. The data consumption in Finland was increased from 5GB/month in 2016 to 23.5 GB/month in 2019. The figures published from AKEP (Raporti Vjetor AKEP, 2018), regulatory body for electronic communication gives that total mobile data traffic in Albania is increased 10 times during 2014-2018. The average consumption per user at the end of 2018 was 2.6GB/month.

In parallel of mobile data traffic growth, the mobile data in roaming is growing fast. Referring to BICS 2018, a leading international communications enabler, the 4G/LTE roaming traffic across its global network grew by over 95% in 2018 – almost double that of 2017. The increase of data traffic in international roaming faced with the bill shock experience from different users.

The bill shock experience mainly linked with high differences of domestic and international prices in roaming especially for data communications. Online applications and open access in mobile data roaming is also one of the reasons of bill shock experience. In addition the online applications activated from end users in the smart devices lead to increase data traffic, sometimes not under the awareness of end user. Referring to Telecom paper, on 2018, a German family was charged for mobile roaming of over EUR 12,000 during a cruise trip from northern Germany to Norway. The roaming charges arose after the family's 12-year-old son viewed a number of videos on his smartphone that was connected to a mobile network via a satellite-internet connection. In Canada during 2012-2013 the complaints against cell phone roaming charges jumped to 721 in the August 2012-to-July 2013 period, up from 211 in the comparable 12 months a year earlier (CBC, Canada, 2013). The bill shock experience is a problem faced in different countries, in Albania too. Data analyzed by operators over one year during 2016, shows that in average, they manage about 600 complaints per month. This figure is much higher compared to the complaints reported to regulatory body. 19-21% of total complaints are related with tariffs, billing for roaming.

This article is focused on international mobile roaming, the technical and regulatory measures to prevent bill shock experience by analyzing the roaming regulation in Europe Union, and in Western Balkans focused on Albanian case.

The complexity of international mobile roaming

International mobile roaming started at the early '90, when the mobile network operators applied additional prices for provision of services in roaming. International mobile roaming allows mobile users of one country to use their mobile phone or other mobile device in another country to make and receive voice calls, text messages, browse the internet. The roaming service is a complex and demanding process, either from the technical point of view or interconnections and regulatory aspects between network operators. The figure below describes the main components of international mobile roaming looking on commercial links.

Figure 1. Commercial links required for international mobile roaming

Source: GSMA International roaming Explained, 2013

In order to provide the roaming services for its own users, the home network operator needs to have a roaming agreement with the mobile network operator in the visited country associated with the relevant technical configurations. There are some actors/components in the process such as the international carrier/s, data management system for international roaming traffic, billing systems, the potential most favorite routes for connectivity etc. All these components have their impact in the composition of the roaming prices. There are two main parts of roaming prices, wholesale prices for the services between operators and retail prices linked with end user. The roaming prices is more complicated than usual mobile prices due to the fact that the retail price paid from the end user is linked also with tariffs applied from the visited mobile network operator besides the prices of home network operator and wholesale paid for interconnection.

Prices models in telecommunications

From the history of telecommunications the general approaches of prices are as follows:

Demand-based pricing: in this case the prices are decided according to what the customer is able to pay. This is mainly related with social reasons, used in monopoly environment where the incumbent operators operates as state owned company;

Cost-based pricing: in this case prices are linked with the service costs to supply. This approach mainly required by regulators (in a regulated environment).

Market-based pricing: the prices are decided in order to compete with other suppliers in the marketplace. This approach is mostly required by shareholders, market players (in a competitive market).

The prices of the roaming services usually are defined by the market players itself. Besides the common approaches as above, the competition and technology developments lead to a great number of tariff plans in mobile market including bundle packages, special packages for roaming, special regulation for routing in a favorite visited network etc. Due to the increased volume of international mobile roaming, the bill shock experiences of users, the regulation of roaming services is now practiced in European countries and recently in the Western Balkans. The necessity for regulation of roaming services is mostly related with a number of factors such as:

- Complexity of tariff data plans and difficulties to be understood from the end user;
- The lack of transparence of pricing;
- The lack of awareness of consumers on the pricing policie;
- The changes of tariff packages in visited countries;
- The difference of roaming regulation in EU and non EU countries;
- The complexity of relations between actors involved in the process;

All of these topics need to be better addressed from all parties:

- Regulatory bodies;
- Network/service providers;
- Users themselves through some tools which improve the user experience.

Regulatory framework regarding bill shock prevention

There are some regulations in place in order to avoid bill shock experience of users in Europe. The European Union Directive on Universal Service Obligation directive 2002/22/EC, amended by directive 2009/140/EC has an obligation for the network operators to send a warning message when the consumption of tariff package is consumed at 80% level or when it totally consumed. In addition the regulations adopted by European Commission regarding to roaming has specific provisions for the consumer protection in roaming such as transparency, nondiscrimination, implementation of net neutrality principle etc.

Similar regulations are part of new electronic communication code EECC 2018/1972/EU.

The regulatory framework for bill shock prevention was adopted in Albania by amending the electronic communication law on 2012. The network operators have the obligation to send a message to the end use when you have consumed 80% of the package, or when you finish the package. The specific notification when you are in roaming is also part of services provided by home network operator to its users in roaming. This good practice and regulation is implemented from mobile network operators. Considering the roaming services where the situation is more complex, the notifications between systems and networks in a visited country with home network operator might be not in real time, the notification for unusual traffic or potential bill shock might be delayed. In this case we raise a question is it enough the notification message or is it functioning well in roaming, which are other potential technical and regulatory tools? The answer for this question is the combination of measures.

The role of network providers in prevention of data roaming bill shock

Reduction of roaming prices and the ability to negotiate and achieve good wholesale prices, find the best routing for interconnection and hosting operators in the visiting country is an important part or the main role of the network operator. The roaming service is based on the roaming agreements between the home network operator and the hosting network operator, or visited network in other country. Clear provisions on communication, notification in short time, real time in case of unusual traffic, provisions of reducing of speed of Internet access should be part of regulations and agreements between operators. In addition, the service provider should have a clear picture of user profile. Some systems or tools like CRM, CEM etc are quite useful for those purposes.

The role of roaming user

The tariff plans are more complex today. The tariff plans based on bundles include voice traffic, SMS, data traffic. Each user need to choose the best option offered for its demand based on its experience, the normal daily traffic and budget. The high prices in the international roaming associated with "silent roamers". Silent roamers are those users that switch off the phone when they travel outside the country or at least "switch off" the data roaming service. This is a restriction of service access managed by the user. Using of applications to manage your user profile will be helpful in order to avoid the bill shock. The end user may use the free application provided online in order to manage closely the usage of data plans and to avoid bill

shock. This application help end user to know better the situation, daily or hourly in some specific cases and also to decide based on knowledge and well informed what to do. The application will help the user also to create its usage profile and help him to choose the appropriate data plan.

Wi-Fi connection to avoid bill shock in roaming

The Wi-Fi connectivity is highly used in Europe from the local users and also from visitors the roamer users. Mobile roaming users in order to avoid roaming prices use Wi-Fi connection where it is available. Wi-Fi connection in an unsecured network may expose the end user data.

Based on a survey of speedtest.net, the Europeans are connected to Wi-Fi most of the time as it is given in the table below.

Country	Local users	Visitors /roamers
Albania	61.9%	59.8%
Bosnia Herzegovina	71.9%	66%
North Macedonia	65.3%	52.9%
Montenegro	63.5%	65.2%
Serbia	68.6%	61.2%
Greece	73.5%	52.2%
Italy	64.1%	48.9%

Table 1. The time spent on Wi-Fi connectivity for Q3-Q4 2018

Source: Roaming in Europe 2019, data from speedtest.net

Regulatory measures for roaming services

The sections below analyze the regulation of roaming in European Union and in Western Balkans focused in Albanian case.

Roaming regulation in European Union

The roaming regulation in EU started on 2007 and was completed on 2017 by implementation of Roaming Like at Home (RLAH). Roaming regulation adopted by European Commission was associated with a number of detailed guidelines of Body of Regulatory for Electronic communications of EU such as BoR (16)34 BEREC Guidelines on Regulation (EU) No. 531/2012), BoR (14) 209, International Roaming, Analysis of the impacts of Roam Like at Home (RLAH) etc. The prices for voice calls, text messages (sms) and data traffic was reduced in several steps as below:

Service Year	Voice calls (1 minute)	SMS sent	Data MB
2007	0.49€	0.28€	6€
2012	0.29€	0.09€	0.7€
2015	0.19€	0.06€	0.2€
2016	Domestic price + max. 0.05€	Domestic price + max. 0.02€	Domestic price + max. 0.05€
2017	Domestic price	Domestic price	Domestic price

Table 2. Roaming regulation in EU

Source: Roaming factsheet, Digital Single Market EU;

The impact of roaming regulation and especially implementation of the Roaming Like at Home has reduced the number of silent roamers in EU. Based on Eurobarometer (2018) the silent roamers were reduced by 9% during 2018 after RLAH in June 2017. Nevertheless, the analysis shows that silent roamers are not disappeared. Overall 53% of travelers restricted their mobile use in some way. The most common actions were to switch off data roaming on their phone (27%). Meanwhile, 20% of them activated a special data roaming plan and 12% of them switched off the phone (no use at all). Implementation of Roaming Like at Home was associated with a significant increase of data traffic in roaming with 12 times from 33.9 million GB in June 2017 to 190,28 million GB in June 2018 (Blackman C., Forge S. "Roaming, One year after implementation", November 2018). On the other hand the reduction of roaming prices in internal market of EU, was associated with higher roaming prices for non EU countries as a compensation mechanism used from mobile operators. Looking in the ten year process we see that the roaming regulation in EU is based on a glide path model, as it is given in the figure below. The first phase starts with some price reduction and a maximum cap is set for both wholesale and retail. The next phase continues with further price reduction. The final steps are the introduction of Roaming like at Home+ and, from June 2017, to Roaming Like at Home. Roaming like at home means that the user within internal market will be charged with domestic prices.

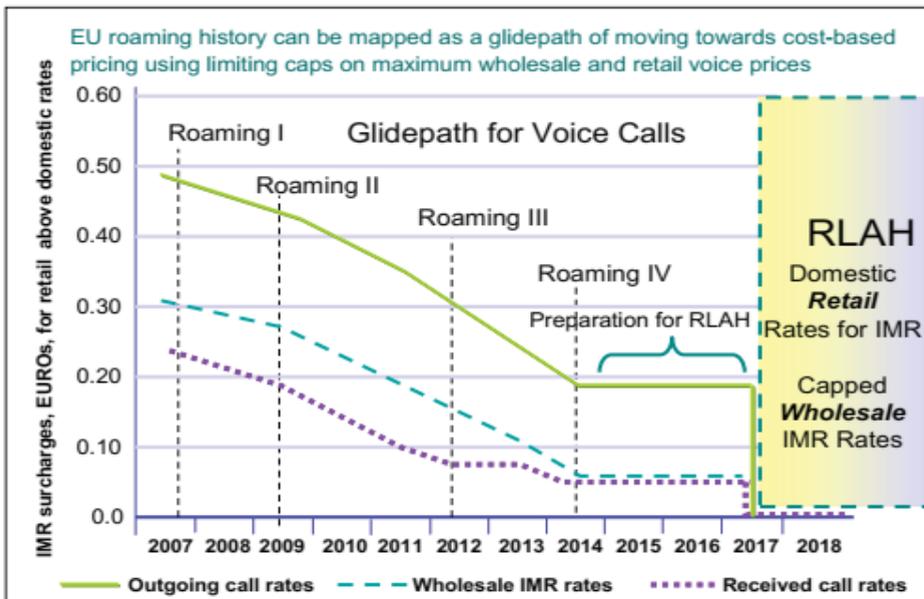


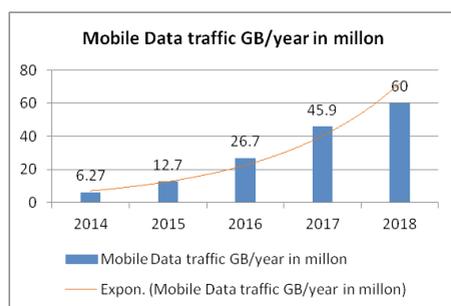
Figure 2: Glide-path of roaming regulation in EU

Source: "Roaming one year after implementation", Blackman C., Forge S., November 2018

Roaming regulation in Western Balkans

On 4 April 2019, the Western Balkans, Albania, Kosovo, Montenegro, North Macedonia, Bosnia and Herzegovina and Serbia, signed the Regional Roaming Agreement to reduce the roaming prices starting from 1st of July 2019 towards Roaming Like at Home (RLAH), or free roaming area on 1st of July 2021. The roaming regulation in Western Balkans based on EU model, is part of the Multiannual Action Plan for Regional Economic Area (MAP-REA) endorsed during the Trieste Summit held on 12th of July 2017. The roaming regulation in Western Balkan includes the first phase with Roaming Like and Home + and is based on EU regulation with domestic prices plus a surcharge. In addition the roaming regulation in Western Balkans includes the regulation of international mobile rates. The second phase of roaming regulation is introduction of Roaming like at home, which means the same tariffs like in your home when you travel in the region. In order to implement the agreement necessary amendments of legislation were approved in each country, including the regulatory decisions to impose the reduction of roaming prices started from 1st of July 2019.

The roaming regulation the Albanian case



The telecommunication market in Albania is fully liberalized and the competition is high especially in the mobile market. There are three mobile operators and all of them are provided data communication based on LTE, 3G and 4G. The competition and liberalization lead to lower prices and a number of alternatives for end users. The mobile data communication is growing fast in Albania as it is given in the figure below.

Figure 3. Mobile data traffic in Albania

The mobile number portability is in place since 2010, and the end user has the possibility to change the provider to benefit from lower prices and quality of services between operators. There are a great number of tariff packages in the market. The tariff packages are composed in a combination with voice, sms and data. Some packages in specific destinations mainly in Europe are provided also for roaming. On 1st July 2019 the reduction of prices for Western Balkan countries began. The regulation of roaming prices includes the maximum cap allowed to apply over the domestic prices for outgoing and receiving call, for SMS and for data communication.

Based on the document published from Regional Cooperation Council, the reduction of roaming prices in Albania for the Western Balkans destination is for voice calls from 87% to 97%, for SMS service from 86% to 95% and for data communication 93% to 99%. Similar figures are given for the reduction of roaming prices from other regional countries.

The reduction of roaming prices helps the free movement of citizens and also improves the business environment in the region. The visitors for tourism or business are the

most beneficiaries from the roaming prices reduction.

Based on INSTAT figures the foreign citizens entering in Albania came mainly from: Kosovo (35 %), North Macedonia (11 %), Greece (9 %), Montenegro (6 %) and Italy (7 %) as it is given in the table below.

Year	2016	2017	2018
Foreign visitors	4735511	5117700	5926803
From Europe	4485405	4686695	5331614
Kosova	2157013	1745973	2088503
North Macedonia	566761	671570	680780
Montenegro	324968	380988	357071
Greece	410876	489172	552638
Italy	265970	363344	436103

Table 3. The foreign visitors in Albania from the region; Source: INSTAT

The number of foreign visitors from Kosovo, North Macedonia, Greece, Montenegro, Italy are composes 77-83% of foreign visitors from Europe and 69-78.67% of total foreign visitors.

The number of Albanians visiting other countries for tourism is also increased year by year. In the period 2014-2018, 24.1 million Albanians have traveled abroad. The favorite destinations of Albanian residents for abroad holidays during 2017 and 2018 are as below:

Country	The % of favorite destinations of Albanians	
	During 2017	During 2018
Greece	28%	40%
Italy	20%	17%
Kosovo	16%	13%
North Macedonia	13%	10%
Montenegro	6%	3%
Germany	3%	3%

Table 3. The favorite destinations for Albanians; Source: INSTAT

The INSTAT data above, shows that the main destinations for Albanians are in the region including the EU countries like Italy, Greece, Germany. If we consider the figures of mobile roaming traffic during 2017, between Albania and other countries part of the agreement shows that the roaming voice traffic from the region composes 10,8% of total roaming traffic for voice calls. SMS roaming traffic in the region composes 15.9% of total sms roaming traffic while data traffic of the region is 43% of total data roaming. The main contribution came from Kosovo with 98.6% of data traffic in roaming from the region.

The table below gives the traffic in roaming from the foreign visitors in Albania from the Western Balkans and in total as well as the traffic of Albanians when visiting the countries in Western Balkan and the total roaming traffic during 2017.

	Traffic from visitors from WB6			Traffic of Albanians in the WB6		
	Voice calls (in+outbound) minutes	SMS (inbound +outbound)	Data traffic (GB)	Voice calls (in+outbound) minutes	SMS (in +out-bound)	Data traffic (GB)
B& H	50898	121356	54	55870	52950	269
Kosovo	1317715	9480037	80184	1004486	2904074	2550
Montene-gro	260030	571310	285	816839	997343	4181
Serbia	143662	567058	173	188225	156288	1042
North Macedo-nia	354499	1232158	593	689790	1414173	2483
Total WB6	2126805	11971919	81289	2755210	5524828	10524
Total world	19605331	74936704	188614	31522249	21536383	106322

Table 4. The international mobile roaming traffic for Albania with Western Balkans
 Source: AKEP, Regulation of roaming in Western Balkan

Regarding the traffic of Albanians when visiting other countries, 36.4% of voice traffic is with Kosovo which is 3.1% of total traffic of roaming. Similar weight is for data traffic and SMS. AKEP data shows that roaming traffic of Western Balkan including Greece, Italy and Germany composes the 90% of total volume of roaming traffic. This figure shows a close relation between the statistics of tourism in Albania and roaming traffic. A high interest for Albanians is to have lower prices with other EU countries where the most favorite destinations in holidays as given above.

Conclusions and recommendations

The international mobile roaming is a complex process. The growth of mobile data traffic in roaming was associated with bill shock user experience. Addressing of the bill shock needs a combination of measures from all parties such as regulatory bodies, network/service providers and users themselves through some tools which improve the user experience. Regarding to regulatory measures, the regulation of roaming based on EU for roaming like at home model is a successful story with good impact for users, promoting free movement of citizens, cross border services and improve business environment. Regulation of roaming in Western Balkans started on July 2019 and is in early phase towards implementation of RLAH on July 2021. Further steps to reduce the roaming prices with EU countries are needed in order to increase the benefit for the citizens and business in the Europe.

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