

## A ICT Infrastructure

This chapter examines trends in the available **telecommunication and internet infrastructure** measured mainly by number of telephone and broadband subscriptions. Data used in this chapter is collected from the telecommunication or internet service providers (supply side) and should be distinguished from data based on ICT users' surveys (demand side).

**Reference period:** end of the year unless otherwise stated.

The information in this section applies to services provided at the retail level only, **from services to end users**.

### Definitions:

- **Fixed telephone subscription** refers to individuals or legal entity connected to the public switched telephone network (PSTN) including usage of IP telephone (VoIP technology). Number of fixed telephone subscriptions is measured as a number of active **fixed telephone lines (PSTN lines) and VoIP fixed line subscriptions (VoIP lines)**.
- **Mobile telephone subscription** refers to individual or legal entity connected to a public mobile telephone service that provides access to the PSTN using cellular technology and offering voice communication. Number of mobile telephone subscriptions is measured as a number of **SIM cards**. Both **post-paid** and active **prepaid** SIM cards that have been used during the last three months are included. *Note: As one person may use more than one active SIM card, the number of mobile phones can exceed the number of individuals in total.*
- **The telephone traffic** originated in fixed or mobile telephone networks is measured by means of the number of actually called minutes (real minutes of calling) during the reference year, not the invoiced ones.
- **Broadband internet subscription** includes both **fixed (wired and wireless)** and **mobile access** to the internet with nominal speed 256 or more Kbit/s, in one or both directions. It includes both residential subscriptions and subscriptions for organizations.
- **Fixed wired broadband** includes one of these "wired" technologies: DSL (Digital Subscriber Line); Cable modem (CaTV) and Fiber (FTTx).
- **Fixed wireless access (FWA)** is the terrestrial internet connection by means of a radio system including non-licensed frequency (**Wi-Fi**). It is characteristic by placing of the end point device on a fixed location (house, apartment) - the so-called WLL (Wireless Local Loop). *It is included only if this service is used as the transport mechanism of the internet service provider (ISP).*
- **Mobile broadband** is internet access on third generation technologies (3G) and higher (4G/LTE). Mobile broadband subscriptions refers to:
  - **Standard mobile subscription** via SIM cards are typical voice subscriptions which also provide access to the internet but are not purchased separately. It covers only actual subscribers - users must have accessed the internet in the last three months.
  - **Dedicated data subscription** offered separately from voice services, either as an **add-on data package** to voice service **via SIM cards** or a **stand-alone service** using USB data **cards/modems/keys** integrated usually into portable computers or tablets.
- **Domain (internet domain/domain name)** is a unique identifier of a computer or computer network connected to the internet. The domain is registered by the registration authority (Top Level Domain).

Statistical information from the **Czech Telecommunication Office** (<http://www.ctu.eu>) has been used as main data source for the Czech Rep. Data for **registered domains** has been obtained from [www.nic.cz](http://www.nic.cz). International comparison data has been taken from **ITU, OECD and Eurostat database**.

**For further information on ICT infrastructure see:**

[https://www.czso.cz/csu/czso/telekomunikacni\\_a\\_internetova\\_infrastruktura](https://www.czso.cz/csu/czso/telekomunikacni_a_internetova_infrastruktura)

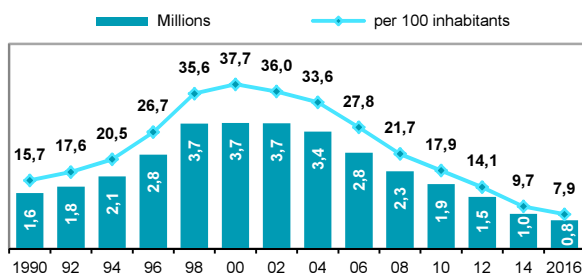
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**Tab. A1 Fixed telephone network in the Czech Republic**

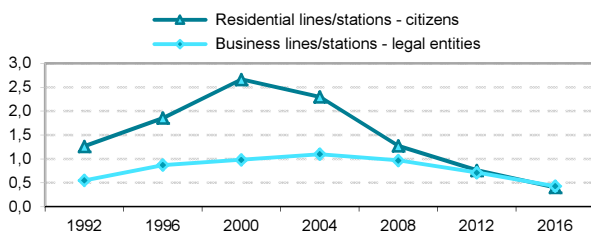
	Thous.		
	2014	2015	2016
<b>Fixed-telephone voice subscriptions, total</b>	<b>1 875</b>	<b>1 893</b>	<b>1 749</b>
<b>Voice subscriptions to PSTN lines</b>	<b>1 022</b>	<b>993</b>	<b>832</b>
Residential lines/stations	589	522	403
Business lines/stations	433	471	429
<b>VoIP technology subscriptions</b>	<b>853</b>	<b>900</b>	<b>917</b>
Individuals (citizens) as subscribers	344	307	299
Legal entities (e.g. enterprises) as subscribers	509	593	619

PSTN lines - Public Switched Telephone Network (formerly called main telephone stations); VoIP - Voice over Internet Protocol

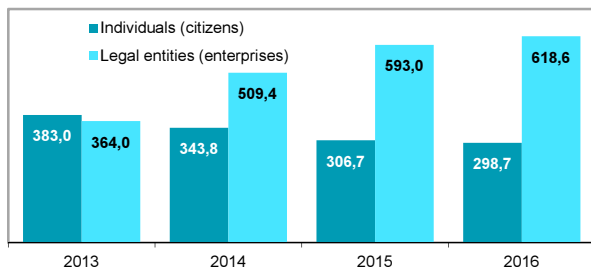
**Figure A1 Fixed-telephone voice subscriptions to PSTN lines**



**Figure A2 Type of voice subscribers to PSTN lines (mil.)**



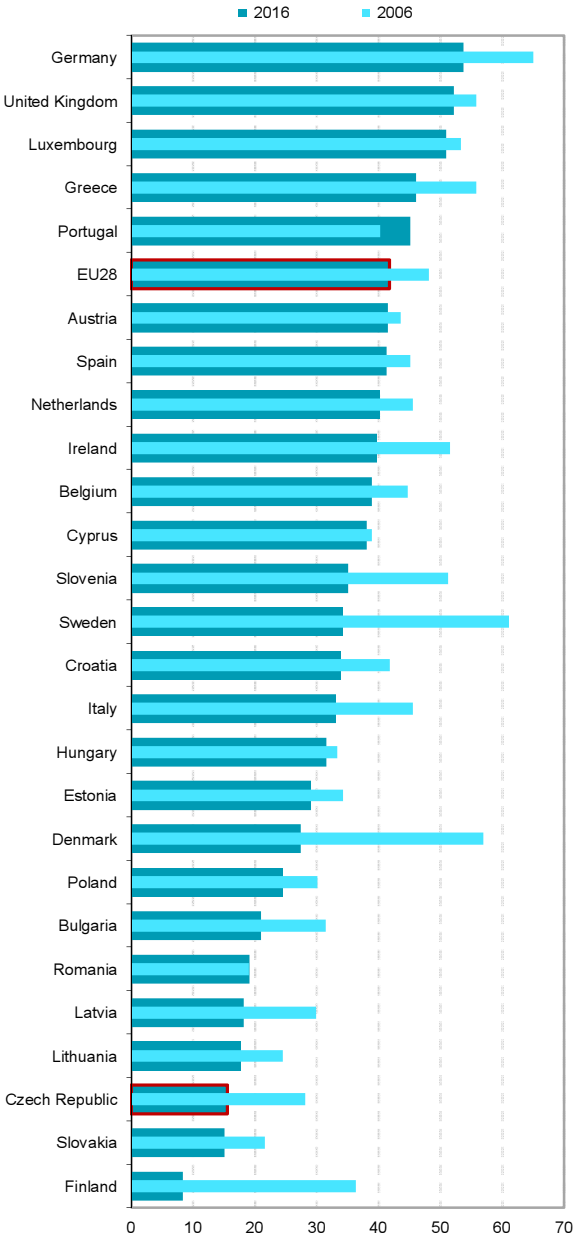
**Figure A3 Type of subscribers using VoIP (thous.)**



Source: Czech Telecommunication Office, 2018

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**Figure A4 Fixed-telephone voice subscriptions per 100 inhabitants in EU countries**



Source: International Telecommunication Union, 2018

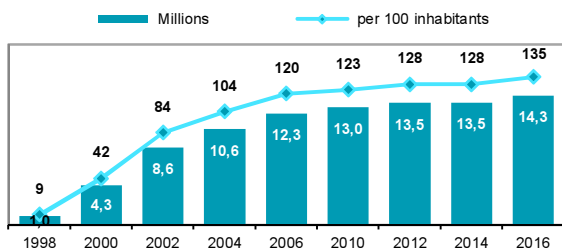
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Tab. A2 Mobile telephone network in the Czech Republic

	Thous.		
	2014	2015	2016
<b>Mobile telephone subscriptions*, total</b>	<b>13 518</b>	<b>14 017</b>	<b>14 299</b>
M2M mobile-network subscriptions	688	744	838
<b>By type of SIM cards</b>			
Pre-paid subscriptions (SIM cards)	5 055	4 893	4 821
Post-paid (tariff) subscriptions (SIM cards)	8 463	9 124	9 478
<b>By type of subscribers</b>			
Individuals (citizens) as subscribers		9 222	9 237
Legal entities (e.g. enterprises) as subscribers		4 795	5 062

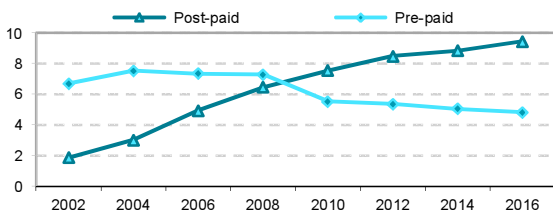
\* Measured by the number of SIM cards that have been used at least once in the last three months. The indicator applies to all mobile-cellular subscriptions that offer voice or data communications.

Figure A5 Mobile telephone subscriptions\*



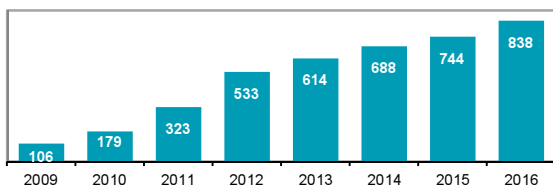
\* change in methodology since 2009

Figure A6 Mobile telephone subscriptions by type of used SIM cards\* (mil.)



\* after 2008, a change in the methodology for calculating the number of pre-paid SIM cards

Figure A7 M2M mobile-network subscriptions\*\* (thous.)

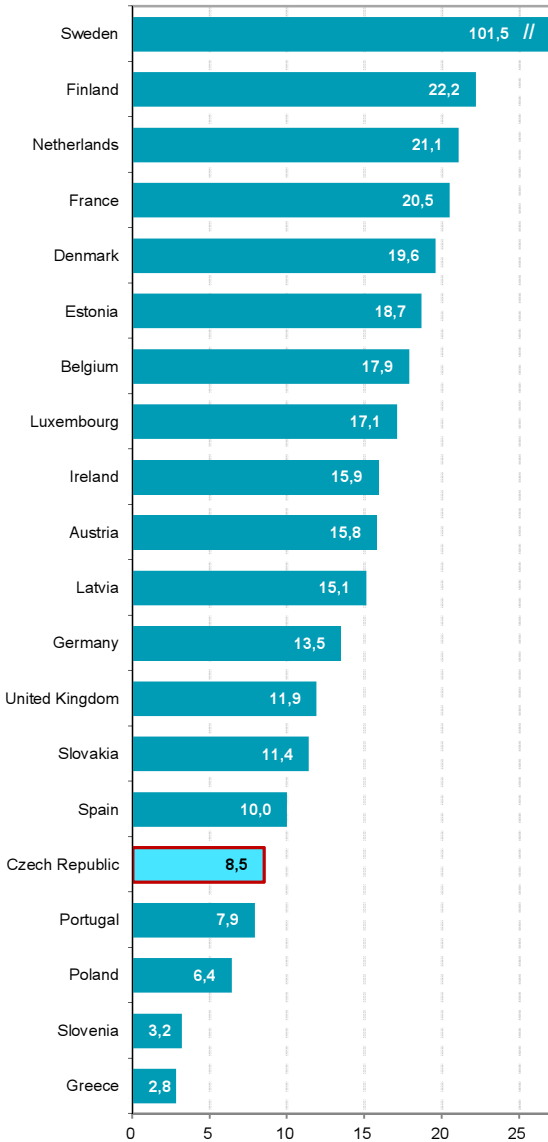


\*\* M2M (Machine-to-machine) SIM cards designed exclusively for wireless communication between machines, devices and IS without human intervention

Source: Czech Telecommunication Office, 2018

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Figure A8 M2M mobile-network subscriptions per 100 inhabitants in EU countries



\* M2M (Machine-to-machine) - SIM cards designed exclusively for wireless communication between machines, devices and IS without human intervention

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Tab. A3 Fixed telephone traffic in the Czech Republic

	Million minutes		
	2014	2015	2016
<b>Total voice calls in fixed network*</b>	<b>2 047</b>	<b>1 687</b>	<b>1 489</b>
<b>Domestic voice calls, total</b>	<b>1 740</b>	<b>1 421</b>	<b>1 373</b>
Fixed-to-fixed telephone traffic	1 260	1 006	858
Fixed-to-mobile telephone traffic	480	415	515
<b>International voice calls</b>	<b>153</b>	<b>110</b>	<b>116</b>
<i>Other voice calls</i>	155	156	112
<b>By type of subscribers</b>			
Calls from individuals as subscribers	.	11 550	11 566
Calls from legal entities as subscribers	.	9 084	9 413

\* includes all outgoing voice traffic from public fixed telephone network

Figure A9 Total fixed telephone traffic (mil. minutes)

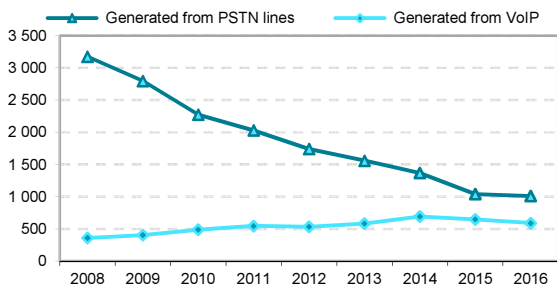


Figure A10 Domestic fixed telephone traffic (mil. minutes)

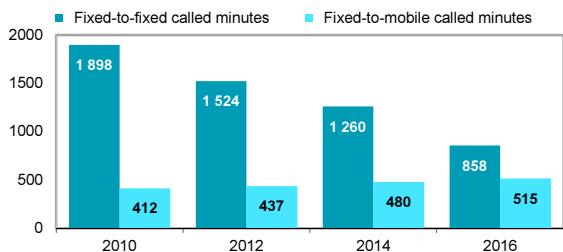
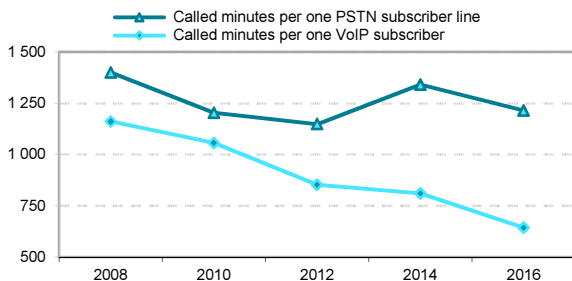


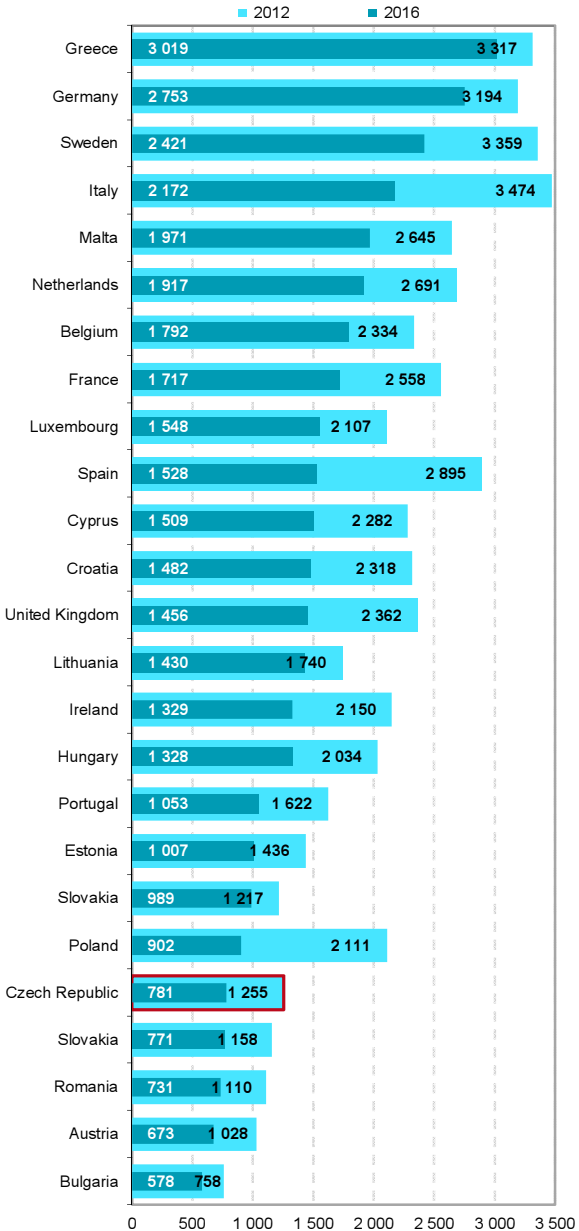
Figure A11 Domestic fixed telephone traffic per one voice subscriber



Source: Czech Telecommunication Office, 2018

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Figure A12 Domestic fixed telephone traffic in EU countries (outgoing called minutes per one subscription)



Source: International Telecommunication Union, 2018

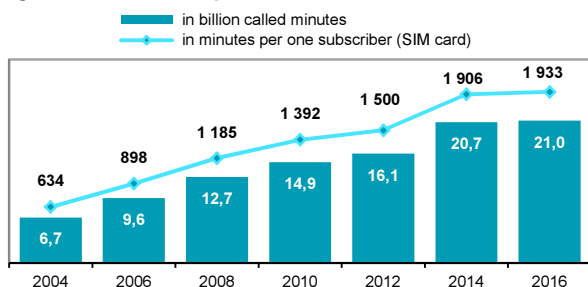
## A ICT infrastructure

**Tab. A4 Mobile telephone traffic in the Czech Republic**

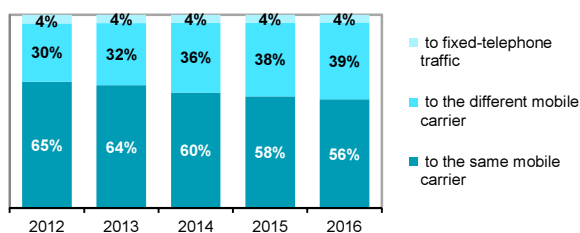
	Million minutes		
	2014	2015	2016
<b>Total voice calls in mobile network*</b>	<b>20 731</b>	<b>20 634</b>	<b>20 979</b>
<b>Domestic voice calls, total</b>	<b>20 197</b>	<b>20 176</b>	<b>20 672</b>
Mobile-to-mobile telephone traffic (to the same mobile carrier)	12 082	11 660	11 544
Mobile-to-mobile telephone traffic (to the different mobile carrier)	7 273	7 694	8 141
Mobile-to-fixed telephone traffic	842	822	826
<b>International voice calls</b>	<b>534</b>	<b>459</b>	<b>307</b>
<b>By type of subscribers</b>			
Calls from individuals as subscribers	.	11 550	11 566
Calls from legal entities as subscribers	.	9 084	9 413

\* includes all outgoing voice traffic from mobile telephone network

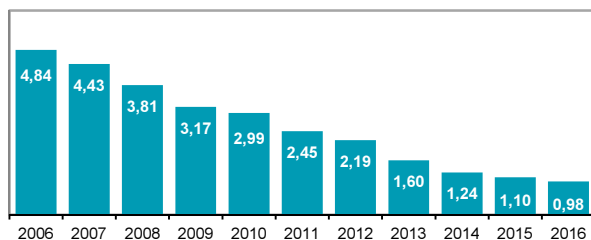
**Figure A13 Mobile telephone traffic**



**Figure A14 Domestic outgoing calls from mobile network**



**Figure A15 The average retail price for one outgoing called minute in the mobile network in CZK**

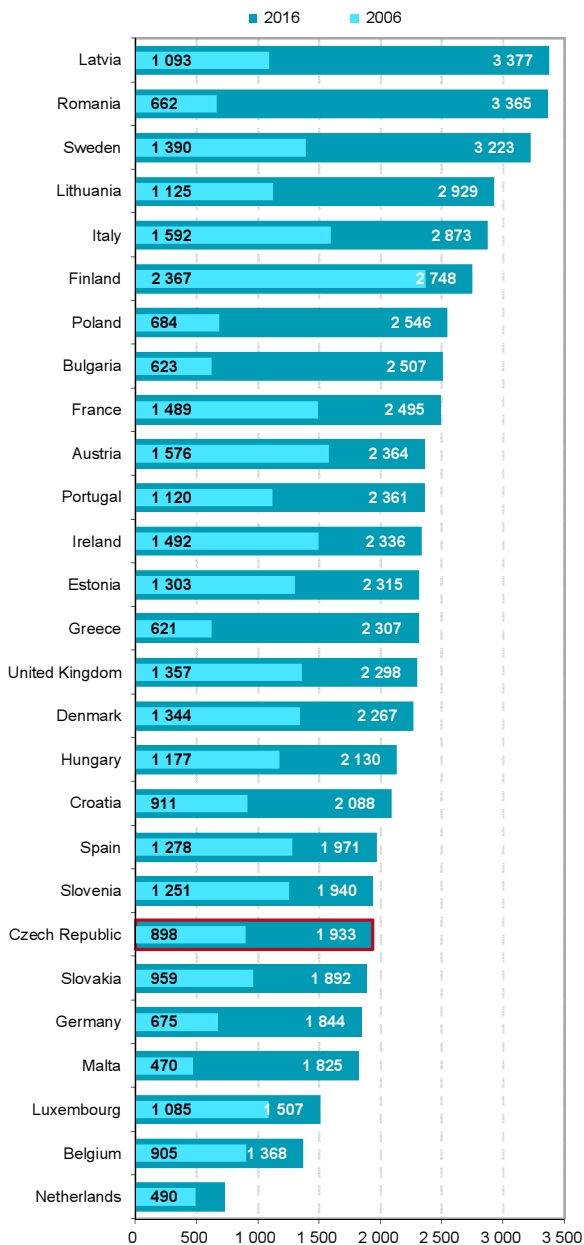


Source: Czech Telecommunication Office, 2018



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Figure A16 Domestic mobile telephone traffic in EU countries (outgoing called minutes per one subscription)



Source: International Telecommunication Union, 2018

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Tab. A5 Fixed broadband penetration in the Czech Republic

	Thous.		
	2014	2015	2016
<b>Fixed broadband subscriptions (lines), total</b>	<b>2 943</b>	<b>2 963</b>	<b>3 058</b>
<b>By technology</b>			
Fixed wireless access (FWA) using WiFi*	1 060	1 004	1 068
xDSL, total	953	941	904
ADSL	554	457	350
VSDL	398	485	554
Cable modem	527	541	563
Fibre (FTTH/B)	404	476	523
<b>By type of subscribers</b>			
Individuals (citizens) as subscribers	.	2 505	2 572
Legal entities (e.g. enterprises) as subscribers	.	459	486

The number of subscriptions to the fixed broadband network is measured on the basis of the number of access points where subscriptions are provided with the service for one of below mentioned technologies employed for the internet access. In majority of cases the number corresponds to the number of agreements concluded for the services providing in the retail segment. Fixed broadband comprises DSL, cable modem, fibre (FTTH/B) and terrestrial fixed wireless technologies.

\* Fixed wireless access (FWA) is the terrestrial internet connection by means of a radio system including non-licensed frequency (Wi-Fi). It is characteristic by placing of the end point device on a fixed location (house, apartment). Sometimes this alternative is also called Wireless Local Loop (WLL).

Figure A17 Fixed broadband internet subscriptions

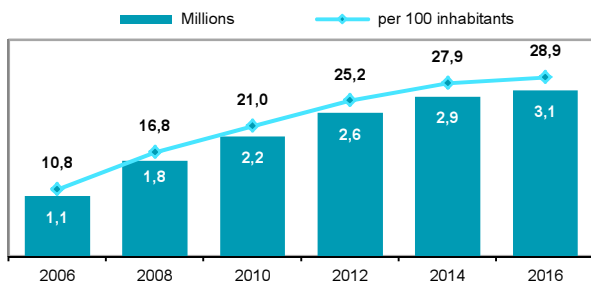
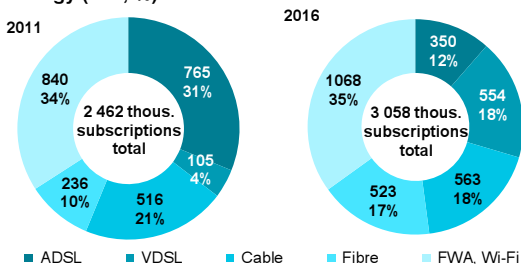
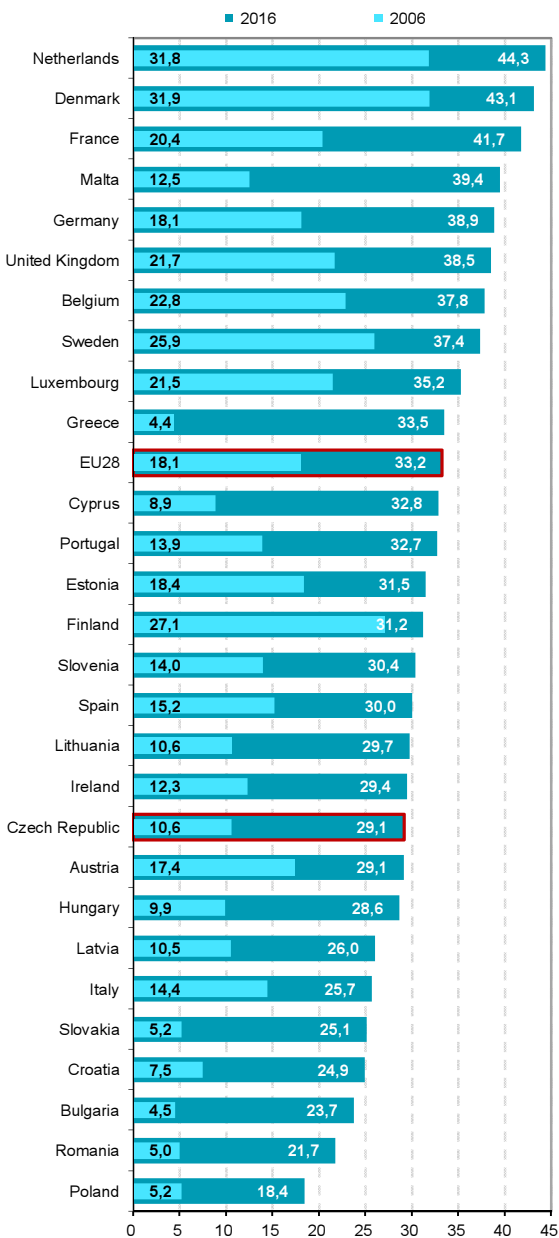


Figure A18 Fixed broadband internet subscriptions by technology (mil.; %)



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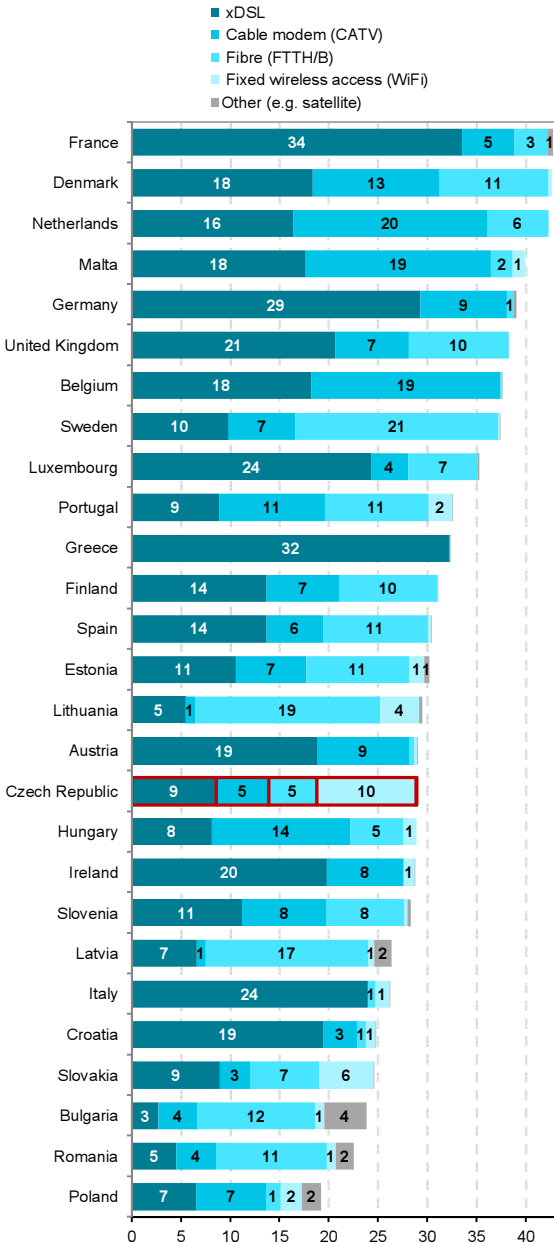
Figure A19 Fixed broadband subscriptions per 100 inhabitants in EU countries



Source: European Commission, 2018

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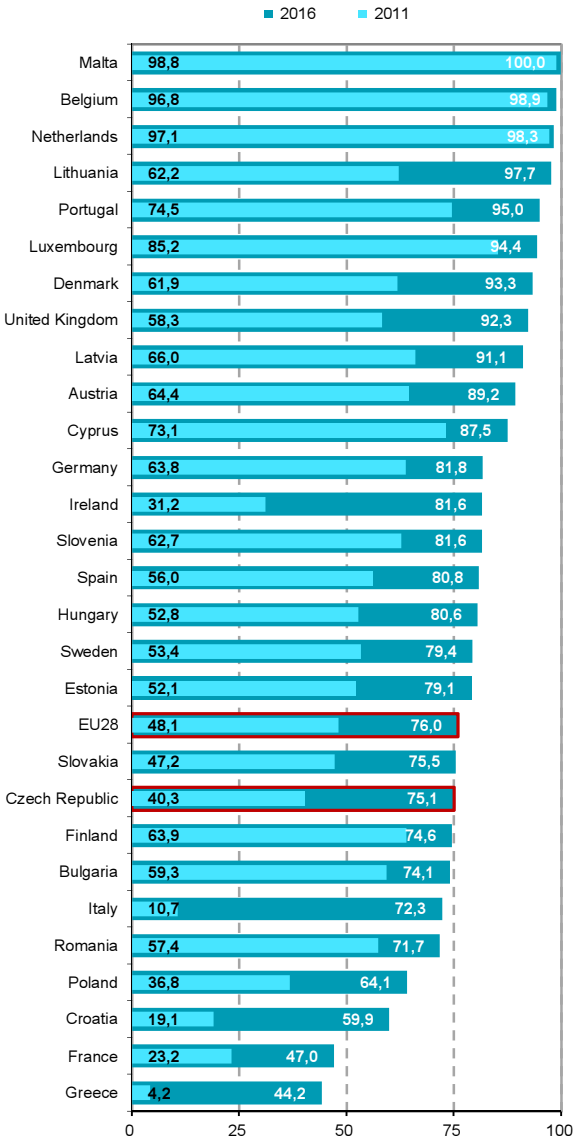
Figure A20 Fixed broadband subscriptions per 100 inhabitants in EU countries by technology; 2016



Source: International Telecommunication Union, 2018

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Figure A21 Percentage of households in EU countries living in areas served by Next Generation Access (NGA) networks\*



\* Next Generation Access includes the following technologies: FTTH, FTTB, Cable Docsis 3.0, VDSL and other superfast broadband (at least 30 Mbps download)

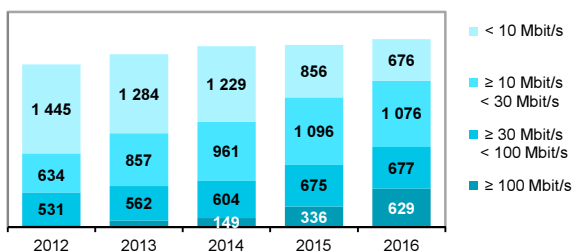
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**Tab. A6 Fixed broadband advertised maximum download speed in the Czech Republic**

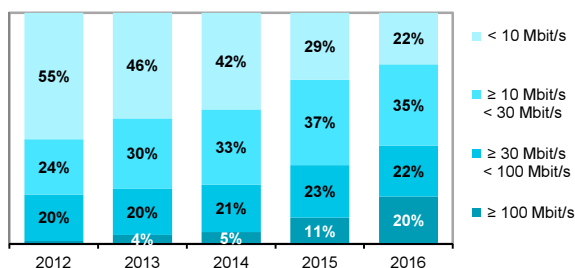
	Thousands of subscriptions		
	2014	2015	2016
<b>Subscriptions, total</b>	<b>2 943</b>	<b>2 963</b>	<b>3 058</b>
< 10 Mbit/s	1 229	856	676
≥ 10 Mbit/s < 30 Mbit/s	961	1 096	1 076
≥ 30 Mbit/s < 100 Mbit/s	604	675	677
≥ 100 Mbit/s	149	336	629

**Figure A22 Fixed broadband internet by speed**

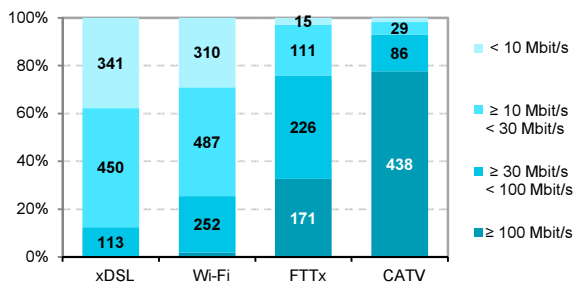
a) Subscriptions with advertised maximum download speed (thous.)



b) Subscriptions with advertised maximum download speed (%)



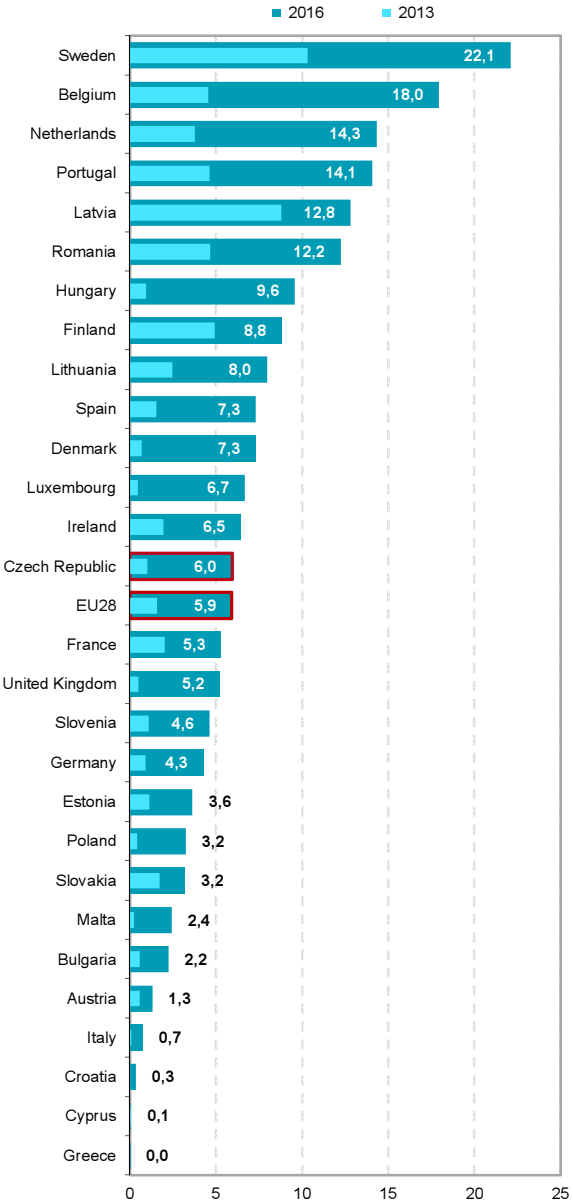
**Figure A23 Technology used for fixed broadband internet connection by speed (thous. of subscriptions; %); 2016**



Source: Czech Telecommunication Office, 2018

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Figure A24 Fixed broadband subscriptions with advertised maximum download speed 100 Mbit/s and more per 100 inhabitants in EU countries



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Tab. A7 Mobile broadband penetration in the Czech Republic

	2014	2015	2016
<b>Mobile broadband subscriptions, total*</b>	<b>7 165</b>	<b>7 759</b>	<b>8 530</b>
Standard mobile subscription	1 832	2 068	1 908
<b>Dedicated mobile subscription</b>	<b>5 333</b>	<b>5 850</b>	<b>6 622</b>
As a part of voice services - mobile phone	4 442	5 032	5 646
Independently of voice services - laptops, tables	891	818	976

Thous.

\*Wireless mobile broadband subscriptions are mobile subscriptions that advertise data speeds of 256 kbit/s or greater. The subscription must allow access to the internet via HTTP and must have been used to make a data connection via Internet Protocol (IP) in the previous three months.

Figure A25 Mobile broadband subscriptions (thous.)

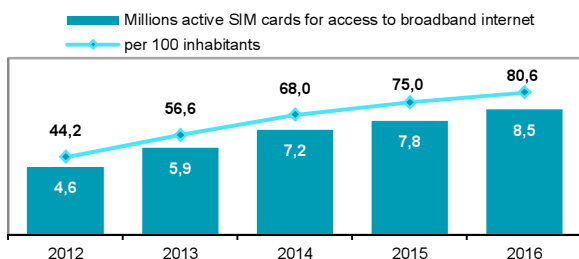


Figure A26 Dedicated mobile data subscription (thous.)

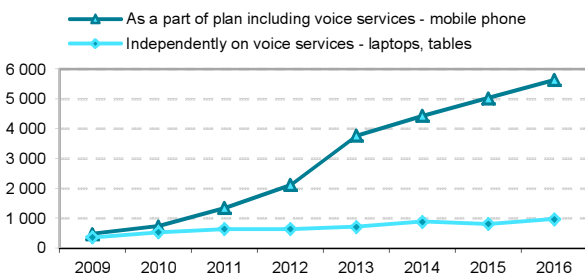
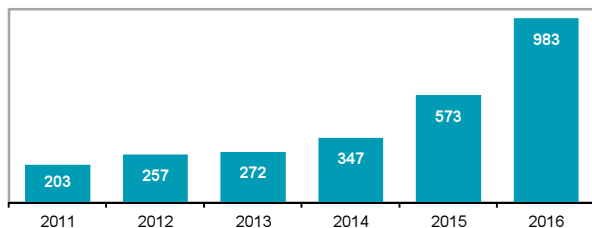


Figure A27 Average mobile data consumption per one active SIM card used for data services (in MB)

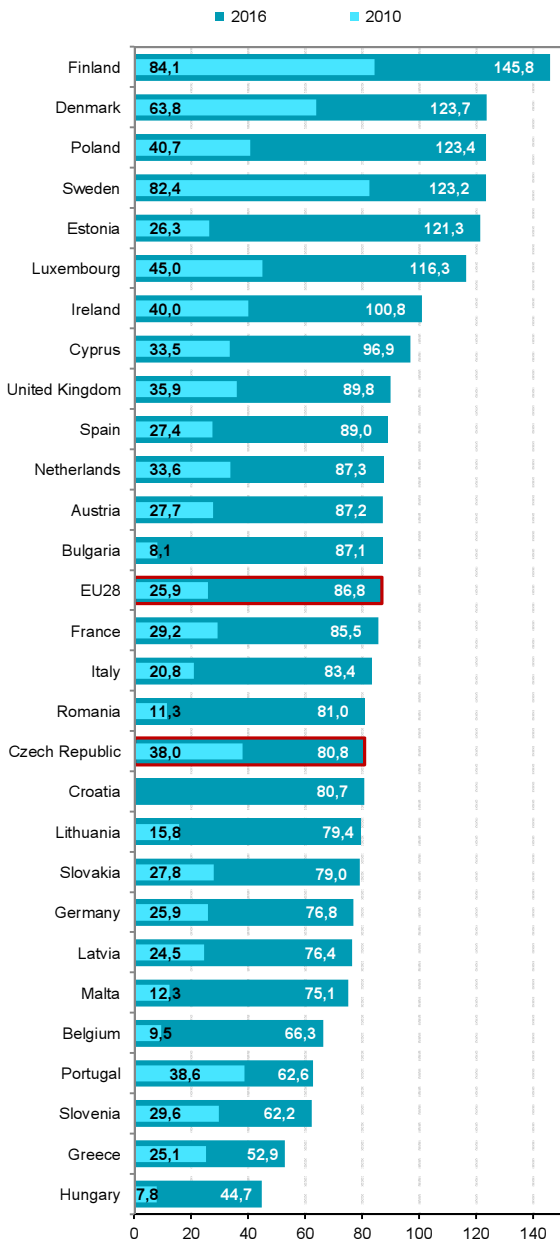


Source: Czech Telecommunication Office, 2018



## A ICT infrastructure

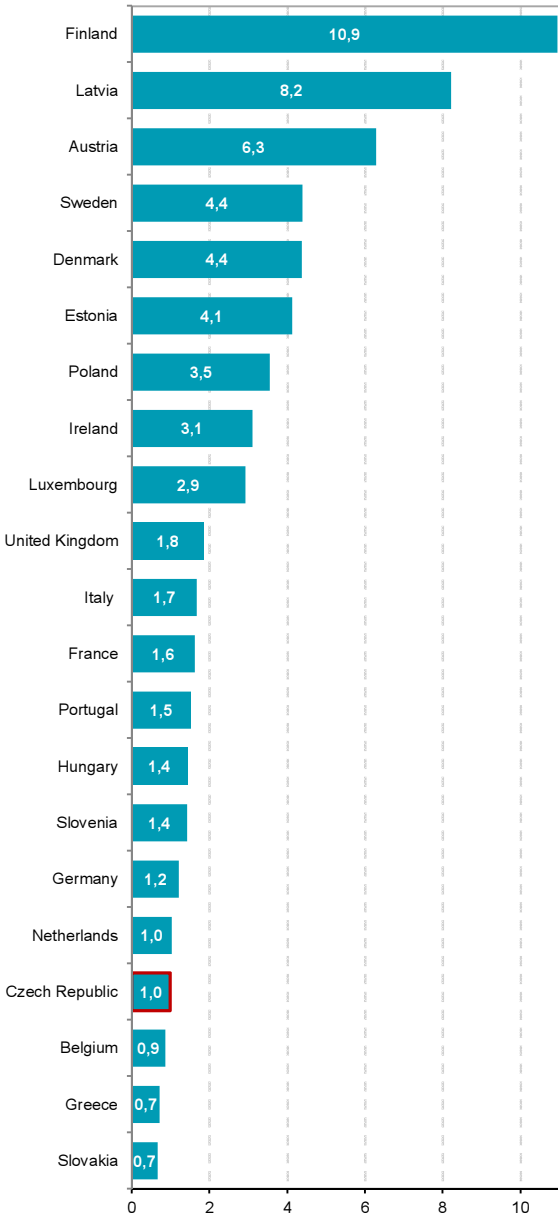
Figure A28 Mobile broadband subscriptions per 100 inhabitants in EU countries



Source: European Commission, 2018

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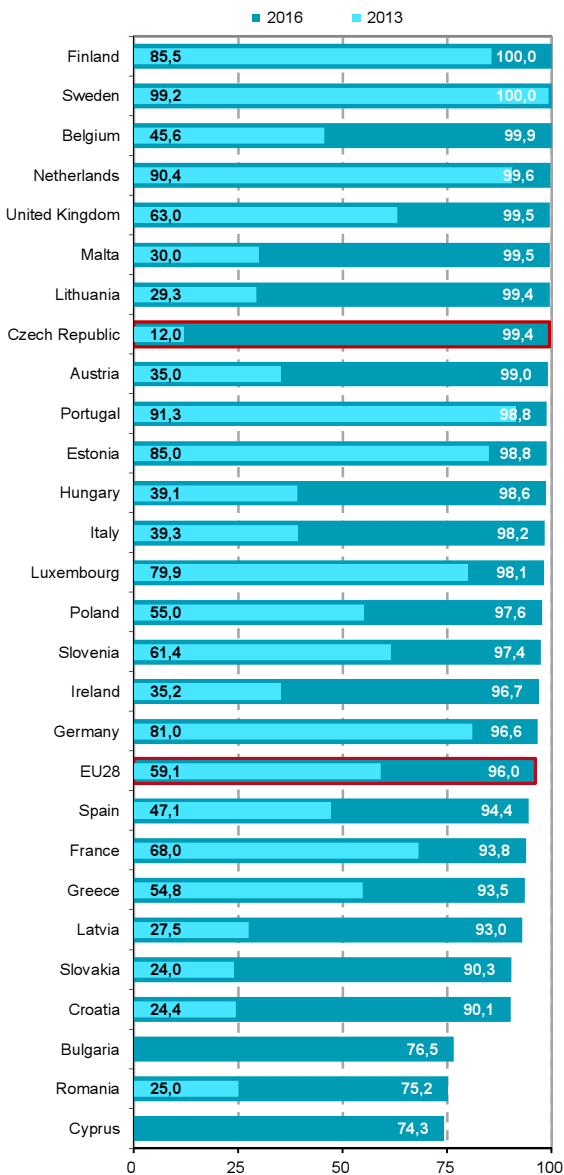
Figure A29 Average mobile data usage in GB per mobile broadband subscription in EU countries; 2016



Source: OECD, 2018

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Figure A30 Percentage of households in EU countries living in areas covered by LTE networks\*



\* LTE (Long Term Evolution) - high-speed wireless communication standard for mobile devices

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Tab. A8 Top-level domains in (.cz) zone

	2015	2016	2017
<b>Total</b>	<b>1 230</b>	<b>1 281</b>	<b>1 306</b>
DNSSEC signed	477	664	683
<b>By IP protocol</b>			
IPv4 domains	895	891	895
IPv4+IPv6; IPv6 domains	314	369	389

Thous.

**DNSSEC** is a security extension of common Domain Name System. See: [http://en.wikipedia.org/wiki/Domain\\_Name\\_System\\_Security\\_Extensions](http://en.wikipedia.org/wiki/Domain_Name_System_Security_Extensions)

**Internet protocol version 4 (IPv4)** and **Internet protocol version 6 (IPv6)**:  
<http://en.wikipedia.org/wiki/IPv4> and <http://en.wikipedia.org/wiki/IPv6>

Figure A31 Top-level domains in (.cz) zone

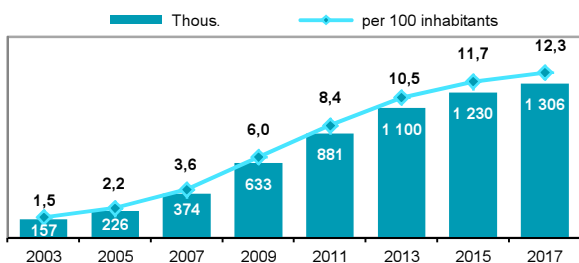


Figure A32 Top-level (.cz) domain registration and cancellation (thousand)

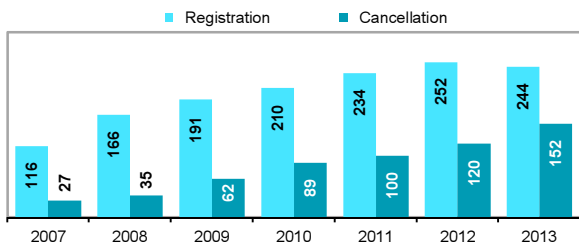


Figure A33 Top-level (.cz) domain by IP protocol



Source: CZ.NIC, 2018