

Cloud computing - statistics on the use by enterprises

Statistics Explained

*Data extracted in December 2018.
Planned article update: March 2021.*

Cloud computing for business yet to go mainstream in the EU

This article presents recent statistics on enterprises' use of cloud computing services in the [European Union \(EU\)](#). In principle, cloud computing involves two components, a cloud infrastructure and software applications. The first consists of the hardware resources required to support the cloud services being provided and typically includes server, storage and network components. The second component refers to software applications and computing power for running business applications, as provided via the internet by third parties.

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Use of cloud computing: highlights

- 26 % of EU enterprises used cloud computing in 2018, mostly for hosting their e-mail systems and storing files in electronic form.
- 55 % of those firms used advanced cloud services relating to financial and accounting software applications, customer relationship management or to the use of computing power to run business applications.
- In 2018, many more firms used public cloud servers (18 %) than private cloud servers (11 %), i.e. infrastructure for their exclusive use.
- Compared with 2014, the use of cloud computing increased particularly in large enterprises (+21 percentage points).

Cloud computing as a service model for meeting enterprises' ICT needs

Essentially, instead of building or expanding their own IT infrastructure (which would include hardware and involve developing and maintaining software applications and databases), enterprises can access computing resources hosted by third parties on the internet (the 'cloud').

In technological terms, cloud computing is a model for providing enterprises with ubiquitous, flexible, on demand access over the internet to a shared pool of configurable computing resources, including servers, databases, software applications, storage capacity and computing power.

Cloud computing can be seen as the technological evolution of server-based computing. The cloud/internet functions as an enormous networked server. Consequently, enterprises can use the services by accessing the internet using devices ranging from relatively low-cost desktop computers ('thin clients') to any number of various portable devices.

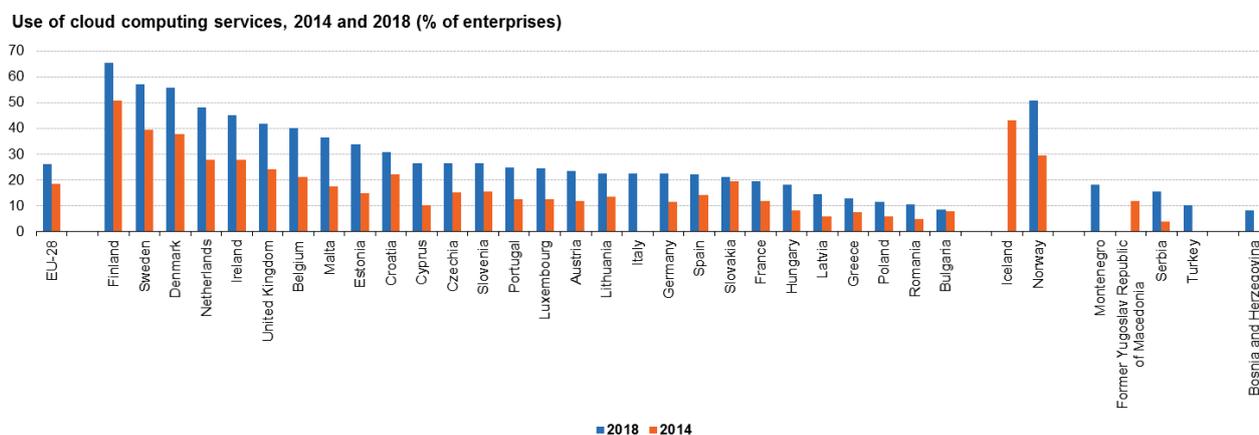
Cloud computing services should be delivered from service providers' servers and, for the purposes of the ICT usage and e-commerce in enterprises survey, have the following mandatory characteristics:

- *on-demand self-service* : users may request computing resources without human interaction with the service provider;
- *elasticity of provision* : capabilities may be easily scaled up or down, e.g. in response to changes in the number of users or required storage capacity, so that enterprises can meet demand peaks without having to invest in infrastructure that will otherwise remain idle or underutilised; and
- *payable services* (pay-per-user, pay-per-use or pre-paid).

In principle, the service providers may deliver ICT-related services from shared servers (public cloud) or from a cloud infrastructure provided for the exclusive use of a particular enterprise (private cloud).

Enterprises using cloud computing

As cloud computing services can be delivered only via the internet, enterprises must have internet access to be able to use them. In 2018, this applied to almost all EU enterprises (97 %) with 10 or more persons employed. Although the proportion of firms with internet access was at similar near saturation levels in most Member States, one in four (26 %) reported that they used cloud computing services (see Figure 1).



Note : Italy: Break in series. Iceland and The Former Yugoslav Republic of Macedonia: 2018 not available. Montenegro, Turkey and Bosnia and Herzegovina: 2014 not available.
Source: Eurostat (online data code: isoc_cicce_use)



Figure 1: Use of cloud computing services in enterprises, 2014 and 2018 (% of enterprises) - Source: Eurostat (isoc_cicce_use)

Significant differences can be observed across countries. In Finland, Sweden, Denmark, the Netherlands, Ireland, the United Kingdom and Belgium at least 40 % of enterprises used cloud computing. On the other hand, in Romania and Bulgaria only 10 % or fewer enterprises did so.

Use of cloud computing services in enterprises, 2018

	Use of cloud computing	E-mail	Storage of files	Office software	Hosting the enterprise's database(s)	Financial or accounting software applications	CRM software applications	Computing power for enterprise's own software
	% enterprises	% enterprises using the cloud						
EU-28	26	69	68	53	48	38	29	23
Belgium	40	71	71	59	55	41	40	33
Bulgaria	8	73	64	56	58	28	26	20
Czechia	26	77	64	56	36	33	21	17
Denmark	56	74	69	58	55	52	41	37
Germany	22	48	61	34	33	28	19	19
Estonia	34	68	48	43	26	64	19	9
Ireland	45	78	78	63	52	45	34	22
Greece	13	68	61	48	43	20	22	22
Spain	22	74	73	48	64	32	33	28
France	19	65	77	46	63	32	35	20
Croatia	31	82	65	54	47	44	17	24
Italy	23	82	60	47	46	34	25	13
Cyprus	27	82	66	60	32	31	27	19
Latvia	15	64	41	41	48	46	19	8
Lithuania	23	70	61	39	52	41	27	36
Luxembourg	25	66	73	57	53	29	29	24
Hungary	18	73	59	56	38	35	27	31
Malta	37	81	73	64	42	28	26	23
Netherlands	48	67	72	56	70	59	45	24
Austria	23	58	67	38	30	17	21	20
Poland	11	67	53	51	33	27	23	15
Portugal	25	82	63	52	40	33	26	31
Romania	10	77	60	52	50	50	0	31
Slovenia	26	71	57	57	37	33	20	25
Slovakia	21	83	60	60	39	44	26	25
Finland	65	79	69	65	53	56	37	18
Sweden	57	72	74	53	52	51	31	26
United Kingdom	42	72	77	73	49	45	32	28
Norway	51	78	77	61	65	60	40	32
Montenegro	18	65	50	44	50	41	13	26
Serbia	15
Turkey	10	81	73	64	58	65	38	49
Bosnia and Herzegovina	8	73	59	49	64	56	25	37

(.) not available

Source: Eurostat (online data code: isoc_cicce_use)

eurostat 

Table 1: Use of cloud computing services in enterprises, 2018 - Source: Eurostat (isoc_cicce_use)

Of the enterprises that reported using cloud computing, some 69 % relied on a cloud solution for their e-mail (see Table 1). Instead of setting up a server infrastructure for their e-mail system, which would have involved inter alia capital expenditure and maintenance costs, these firms opted for a cloud solution based on per-user operating costs.

Cloud computing services may meet a wide range of other business ICT needs. Nearly seven out of ten enterprises (68 %) using the cloud used it for storing files in electronic form. Some 48 % used it to host their database, while 53 % reported using it for office software (e.g. word processors, spreadsheets, etc.).

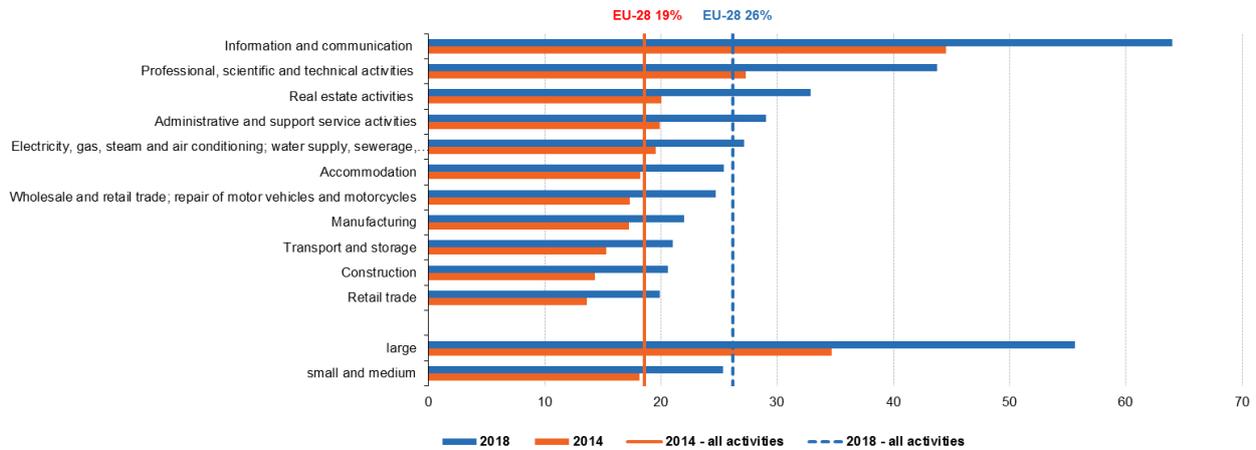
Most importantly, via the cloud, enterprises access relatively more advanced end customer software applications, e.g. for finances/accounting and managing information about their customers (customer relationship management – CRM) (38 % and 29 % respectively). In addition, 23 % reported using the (usually high-performance) cloud computing platforms for computing power in order to run their own business software applications.

Not surprisingly, the highest proportion of enterprises using cloud computing services (64 %) was in the information and communication sector, while in almost all other economic sectors the percentage ranged from 20 % to 33 % (see Figure 2). 'Professional, scientific and technical' firms came in between, with 44 % reporting that they used the cloud.

Compared with 2014, the increase in the use of cloud computing was highest in the information and communication sector (+19 percentage points), in the professional, scientific and technical sector (+16pp) followed

by the real estate sector (+13pp). The use of cloud computing increased particularly in large enterprises where more than one in two (56 %) used it in 2018, i.e. an increase of 21pp compared with 2014. The increase for small and medium-sized enterprises over this period was three times smaller (from 18 % to 25 %).

Use of cloud computing services, by economic activity and size, EU-28, 2014 and 2018 (% of enterprises)



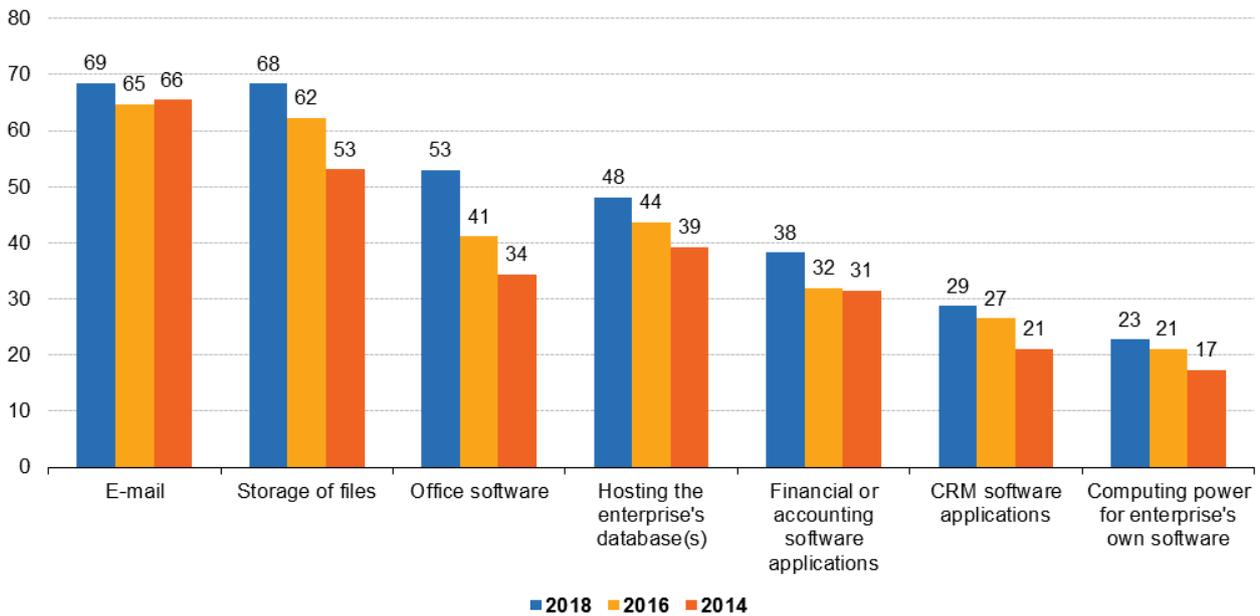
Source: Eurostat (online data code: isoc_cicce_use)



Figure 2: Use of cloud computing services, by economic activity and size, EU-28, 2014 and 2018 (% of enterprises) - Source: Eurostat (isoc_cicce_use)

Figure 3 shows the comparison to previous years in the use of cloud services by purpose. In 2018, the use of cloud for e-mail and storage of files is still predominant. The use of office software has recorded the highest growth (+19pp) since 2014 among all purposes. The more sophisticated purposes of cloud services (for financial and accounting software applications, CRM software applications and computing power) recorded smaller increases (+7pp, +8pp and +6pp respectively).

Use of cloud computing services in enterprises, by purpose, 2014, 2016 and 2018 (% of enterprises using the cloud)



Source: Eurostat (online data code: isoc_cicce_use)



Figure 3: Use of cloud computing services in enterprises, by purpose, 2014, 2016 and 2018 (% of enterprises using the cloud) - Source: Eurostat (isoc_cicce_use)

Enterprises' dependence on cloud computing

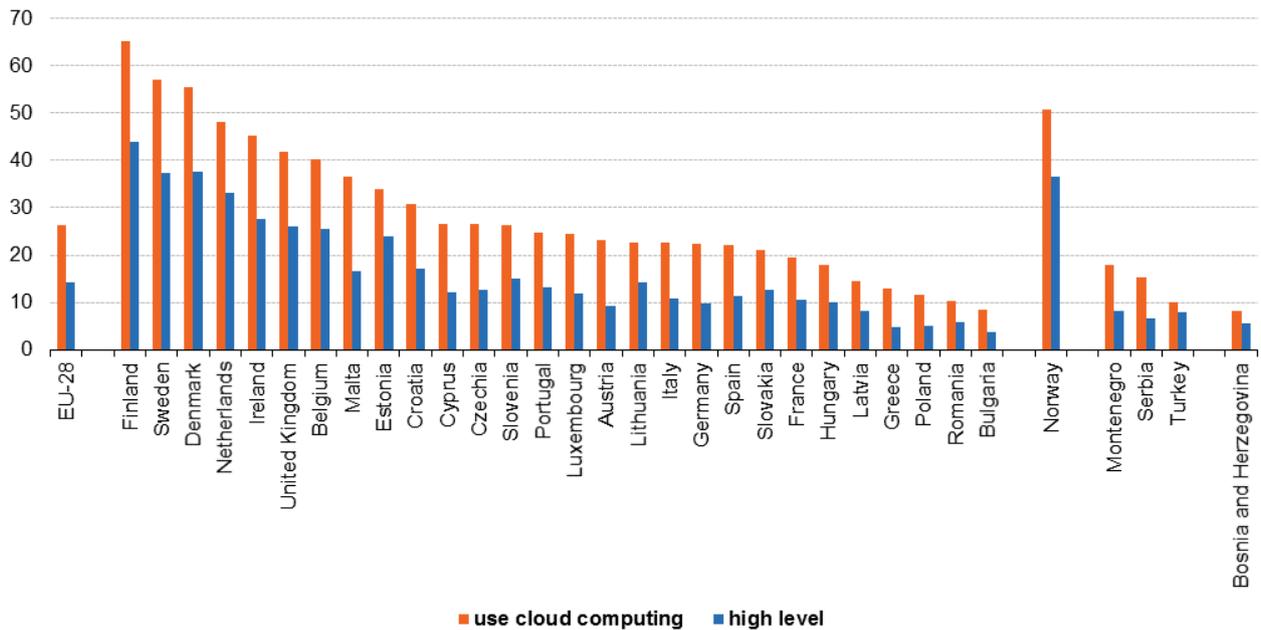
As regards dependence on cloud computing services, enterprises can be classified according to three levels (lower-medium, upper-medium and high) by combining the reported use of services as shown in the following table:

Use of cloud computing services	Medium		High
	Lower-medium	Upper-medium	
(a) e-mail	Yes/No	Yes/No	Yes/No
(b) Office software	Yes/No	Yes/No	Yes/No
(c) Storage of files	Yes/No	Yes/No	Yes/No
(d) Hosting the enterprise's database(s)	No	Yes	Yes/No
(e) Financial or accounting software applications	No	No	Yes/No
(f) Customer Relationship Management software application	No	No	Yes/No
(g) Computing power for enterprise's own software	No	No	Yes/No

For this classification, all possible individual responses (in **bold**) are necessary conditions. For example, enterprises classified in the 'lower-medium' level will have reported using at least one of the services in (a), (b) or (c), but **none** of the others. Those classified in the 'upper-medium' level will, in addition, have reported using the cloud for (d), but **none** of the relatively advanced services in (e), (f) and (g). Enterprises classified in the 'high' level will have responded in the affirmative for at least one of the services in (e), (f) or (g).

26 % of EU enterprises reported using the cloud and a relatively high proportion (14 % of the total) reported using at least one of the advanced services ((e), (f) or (g)) and were hence classified as highly dependent (see Figure 4).

Use of cloud computing services and high level dependence on the cloud, 2018 (% of enterprises)



Note : Iceland and The Former Yugoslav Republic of Macedonia: 2018 not available.

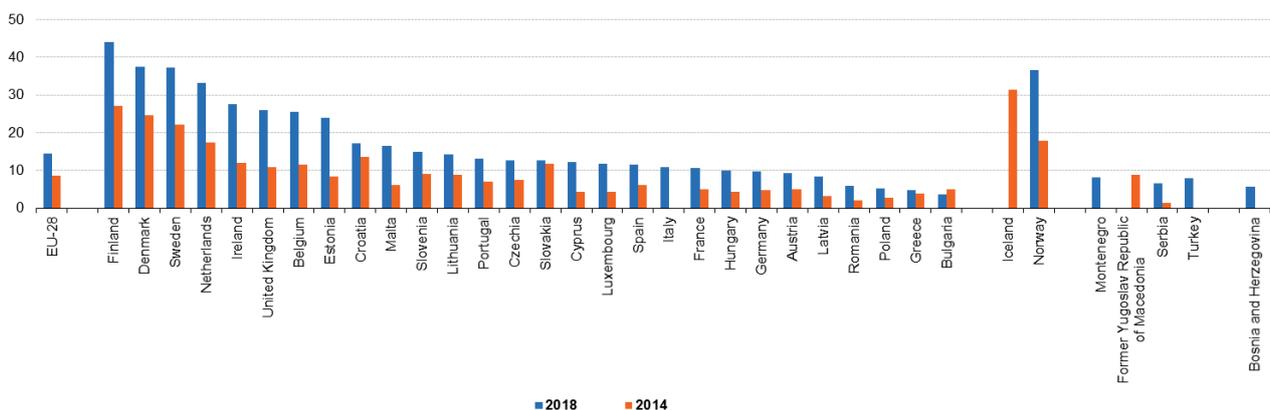
Source: Eurostat (online data code: isoc_cicce_use)



Figure 4: Use of cloud computing services and high level of dependence on the cloud, 2018 (% of enterprises) - Source: Eurostat (isoc_cicce_use)

Compared with 2014, the increase in the high level dependence on cloud computing was highest in Finland, the Netherlands, Ireland and Estonia (see Figure 5).

High level dependence on cloud computing services, 2014 and 2018 (% of enterprises)



Note: Italy: Break in series. Iceland and The Former Yugoslav Republic of Macedonia: 2018 not available. Montenegro, Turkey and Bosnia and Herzegovina: 2014 not available.

Source: Eurostat (online data code: isoc_cicce_use)



Figure 5: High level dependence on cloud computing services, 2014 and 2018 (% of enterprises) - Source: Eurostat (isoc_cicce_use)

In 2018, among enterprises that used cloud computing services, 55 % were 'highly dependent', while 41 % used none of the advanced services and were classified in the 'upper-medium' level (see Figure 6). At the two extremes, the majority of enterprises in the manufacturing sector (51 %) belonged to the upper-medium dependence group, while the majority in information and communication (71 %) reported using advanced services and hence belonged to the high dependence group.

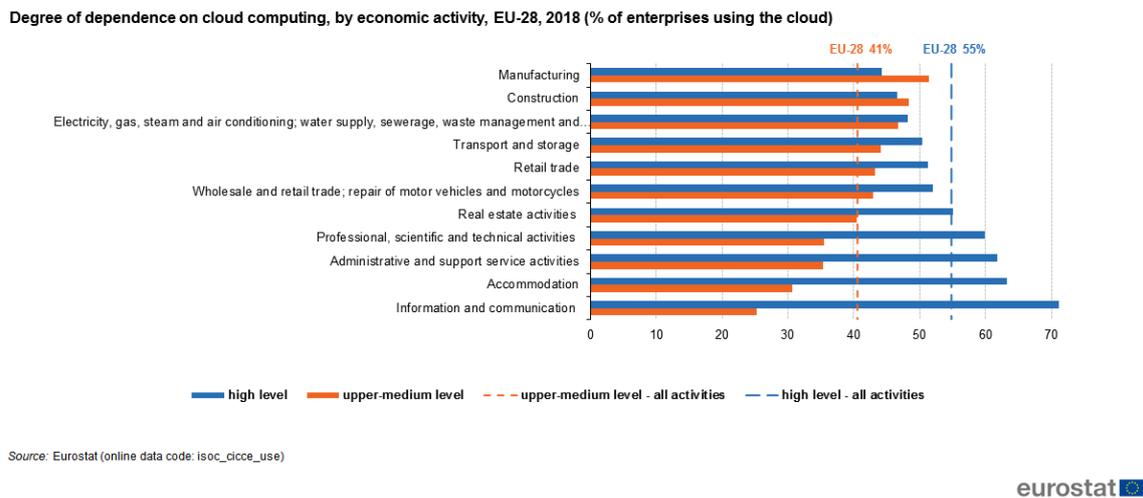


Figure 6: Degree of dependence on cloud computing, by economic activity, EU-28, 2018 (% of enterprises using the cloud) - Source: Eurostat (isoc_cicce_use)

Types of cloud computing: public and private cloud

Service providers can deliver cloud computing services with all the above characteristics in two main ways: via public cloud servers (18 % of enterprises) or private cloud servers (11 % of enterprises). The latter, by definition, involve a single-tenant environment where the hardware, storage and network are set aside for a single enterprise. Consequently, the infrastructure guarantees high levels of security, as the service provider's other clients cannot access the same resources. Some 11 % of SMEs and 31 % of large enterprises reported using private cloud (see Figure 7).

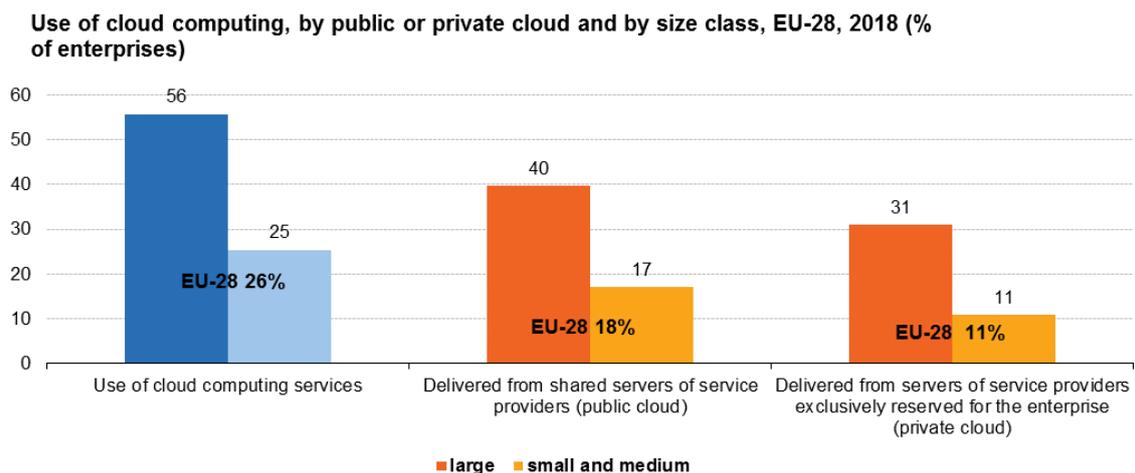


Figure 7: Use of cloud computing, by public or private cloud and by size class, EU-28, 2018 (% of enterprises) - Source: Eurostat (isoc_cicce_use)

In contrast, public cloud infrastructures are provided for shared use by multiple clients. Essentially, they tend to be highly standardised, with limited customisation options, e.g. an e-mail server can provide many firms with the necessary cloud infrastructure to manage their e-mail systems. Public cloud computing is reportedly used by 40 % of large enterprises and 17 % of SMEs in the EU.

Source data for tables and graphs

- [Tables and graphs for Cloud computing](#)

Data sources

The data in this article are based on the results of the 2014, 2016 and 2018 surveys on ICT usage and e-commerce in enterprises. The statistics were obtained from enterprise surveys conducted by national statistical authorities. The statistical observation unit is the enterprise, as defined in Regulation (EEC) No 696/93. The survey covered enterprises with at least 10 persons employed.

The economic activities referred to are defined in the EU's [NACE](#) classification, Revision 2. The sectors covered are manufacturing, electricity, gas and steam, water supply, construction, wholesale and retail trades, repair of motor vehicles and motorcycles, transportation and storage, accommodation and food service activities, information and communication, real estate, professional, scientific and technical activities, administrative and support activities, and the repair of computers and communication equipment. Enterprises are broken down by size, into small (10-49 persons employed), medium (50-249) and large (250 or more).

In 2018, 158 000 of the 1.6 million enterprises in the EU-28 were surveyed. Of the 1.6 million enterprises, approximately 83 % were small enterprises (10-49 persons employed), 14 % medium (50-249) and 3 % large (250 or more). The data extracted for this article may differ from those in the Eurostat database where the latter have since been updated.

Context

The [Digital Single Market](#) for Europe is a major priority of the European Commission. The strategy is built on three pillars: (1) better access for consumers and businesses to digital goods and services across Europe; (2) creating the right conditions and a level playing field for digital networks and innovative services to flourish; (3) maximising the growth potential of the digital economy.

The [wider EU policy](#) interest is in enabling and facilitating the faster adoption of cloud computing across all sectors of the economy; this can cut ICT costs and, when combined with new digital business practices, boost productivity, growth and jobs.

Cloud computing is one of the strategic digital technologies considered important enablers for productivity and better services. Enterprises use cloud computing to optimise resource utilisation and build business models and market strategies that will enable them to grow, innovate and become more competitive. Growth remains a condition for businesses' survival and innovation remains necessary for competitiveness. In fact, the European Commission in the wider context of modernisation of the EU industry, develops [policies](#) that help speed up the broad commercialisation of innovation.

Other articles

- [Internet advertising of businesses - statistics on usage of ads](#)
- [E-business integration](#)
- [E-commerce statistics](#)

- [ICT security in enterprises](#)
- [Social media - statistics on the use by enterprises](#)
- [ICT specialists - statistics on hard-to-fill vacancies in enterprises](#)
- [Digital economy and society statistics - enterprises](#)

Tables

- [Digital economy and society](#)

Database

- [Digital economy and society](#)

Dedicated section

- [Digital economy and society](#)

Methodology

- [ICT usage and e-commerce in enterprises \(ESMS metadata file — isoc_e_esms\)](#)

Legislation

- [Regulation \(EC\) No 808/2004 of 21 April 2004 concerning Community statistics on the information society](#)
- [Regulation \(EC\) No 960/2008 of 30 September 2008 implementing Regulation \(EC\) No 808/2004 concerning Community statistics on the information society](#)
- [Regulation \(EC\) No 1023/2009 of 29 October 2009 implementing Regulation \(EC\) No 808/2004 concerning Community statistics on the information society](#)
- [Regulation \(EU\) No 821/2010 of 17 September 2010 implementing Regulation \(EC\) No 808/2004 concerning Community statistics on the information society](#)
- [Regulation \(EU\) No 937/2011 of 21 September 2011 implementing Regulation \(EC\) No 808/2004 concerning Community statistics on the information society](#)
- [Regulation \(EU\) No 1083/2012 of 19 November 2012 implementing Regulation \(EC\) No 808/2004 concerning Community statistics on the information society](#)
- [Regulation \(EU\) No 859/2013 of 5 September 2013 implementing Regulation \(EC\) No 808/2004 concerning Community statistics on the information society](#)
- [Regulation \(EU\) No 1196/2014 of 30 October 2014 implementing Regulation \(EC\) No 808/2004 concerning Community statistics on the information society](#)
- [Regulation \(EU\) 2015/2003 of 10 November 2015 implementing Regulation \(EC\) No 808/2004 concerning Community statistics on the information society](#)
- [Regulation \(EU\) 2016/2015 of 17 November 2016 implementing Regulation \(EC\) No 808/2004 concerning Community statistics on the information society](#)
- [Regulation \(EU\) 2017/1515 of 31 August 2017 implementing Regulation \(EC\) No 808/2004 concerning Community statistics on the information society](#)
- [Regulation \(EC\) No 696/1993 of 15 March 1993 on the statistical units for the observation and analysis of the production system in the Community](#)

External links

- [Digital Single Market](#)
- [Innovation Policies](#)
- [Innovating Innovation- European Political Strategy Centre Newsletter - November 2016](#)