The Software Alliance

BSA

2018 BSA GLOBAL CLOUD COMPUTING SCORECARD

Powering a Bright Future

galexia

CONTENTS

EXECUTIVE SUMMARY 1

BSA Cloud Policy Blueprint 3

KEY FINDINGS 5

CUTTING-EDGE TECHNOLOGIES: Cloud Computing Is the Catalyzer of the Benefits Created by Cutting-Edge Innovations 6

DIGITAL TRADE: Unleashing Social Benefits and Economic Growth through Modern Trade Rules 10

SCORECARD METHODOLOGY 11

USING THE SCORECARD 14

ABOUT BSA 24

ABOUT GALEXIA 24

EXECUTIVE SUMMARY

Five years is an extremely long time in today's technology-driven era, and the global cloud computing market has grown exponentially in the five innovation-filled years since BSA | The Software Alliance launched the initial Global Cloud Computing Scorecard.

Consider just a few changes: In 2013 when BSA released the first Scorecard, the demand for cloud computing came largely from start-ups and other small companies. In 2018, though, analysts predict that more than half of enterprises will have adopted cloud computing worldwide and that cloud applications, platforms, and services will continue to radically change the way enterprises compete for customers.[1] Governments, recognizing the cost-effective and far-reaching power of the technology, are increasingly adopting cloud-based tools as well. According to market experts, between 2012 and 2015 the demand for cloud computing accounted for 70 percent of related IT market growth — and it is expected to represent 60 percent of growth through 2020.[2]

In light of that growth — and changes in markets around the world — BSA opted to update the way it ranks countries' preparedness for the adoption and growth of digital services. The result of that re-examination is the 2018 BSA Global Cloud Computing Scorecard, the newest and most comprehensive version of the only report to regularly track change in the international policy landscape for cloud computing.

These new rankings put additional emphasis on the policy areas that matter most to cloud computing, such as privacy laws that protect data without unnecessarily restricting its movement across borders and cybersecurity regimes that promote the proper protection of consumer and business data without freezing into place outdated and unneeded regimes. In addition, questions to assess intellectual property protections have been extensively revised to focus on cloud-relevant issues, including new questions on trade secrets and patents.

Using the Scorecard, BSA has tracked the evolution of the legal and regulatory environment for cloud computing in 24 countries around the world. This year's results clearly demonstrate several important points. The new methodology reveals a similar overall pattern. The rankings fall into three general categories with a group of top-performing countries (e.g., the EU nations, Japan, the United States, Australia, Singapore, and Canada) being pursued by countries like Korea, Mexico, Malaysia, and South Africa. Bringing up the rear are a small group of nations that have failed to embrace the international approach: Russia, China, Indonesia, and Vietnam.

[1] Predictions 2018: Cloud Computing Accelerates Enterprise Transformation Everywhere, Forrester (Nov. 7, 2017), available at: https://www.forrester.com/report/Predictions+2018+Cloud+Computing+Accelerates+Enterprise+Transformation+Everywhere/-/E-RES139611.

[2] The Changing Faces of the Cloud: Technology Companies Are Adapting to Sell Cloud to the Growing Number of More-Mainstream Buyers, Bain & Company, Mark Brinda and Michael Heric (2017), available at: http://www.bain.com/Images/BAIN_BRIEF_The_Changing_Faces_of_the_Cloud.pdf.

Countries continue to update and refine their data protection regimes — most often in a way that ensures important cross-border data transfers.

Among the other key findings of the 2018 Scorecard:

Advanced privacy and security policies set leading countries apart from lagging markets

- Countries continue to update and refine their data protection regimes — most often in a way that ensures important cross-border data transfers. Canada again scored highest in the privacy category based on its comprehensive legal regime that avoids onerous registration requirements.
- Japan now has a new central regulator in place to accompany its recently adopted comprehensive privacy legislation, and those elements are complemented by effective enforcement provisions.
- Turkey adopted its new Law on Personal Data Protection in 2016 (in addition to signing the Convention on Cybercrime, which came into force in Turkey in 2015). These developments help to create a positive environment for building consumer trust in cloud services.
- Several countries, however, still have not adopted adequate privacy laws. Brazil and Thailand do not have comprehensive laws, and the laws in China, India, Indonesia, and Vietnam remain very limited.

Emerging markets continue to lag in the adoption of cloud-friendly policies, hindering their growth

- Indonesia continues to update and reform laws and regulations in the information technology (IT) sector, but the result has not been positive for cloud computing. Regulations impose significant barriers for cloud service providers, including requirements for providers to register their services with a central authority and rules that force some providers to establish local data centers and hire local staff.
- Russia's laws on both privacy and cybercrime do not follow recognized international standards. Russia requires data operators to store the personal data of Russian citizens on servers based in Russia. This data localization requirement has a significant negative impact on the digital economy.
- Vietnam falls short in several key policy categories, scoring just one point for security (with no national cybersecurity strategy in place) and just half a point in efforts to promote free trade.

Deviations from widely adopted regimes and international agreements hold back key markets

- Japan, which has finished atop the rankings in every previous version of the Scorecard, scores strongly in most policy categories but its scores slip sharply in Support for Industry-Led Standards and International Harmonization of Rules. It is the only leading market to not have a general law on e-commerce.
- The Budapest Convention on Cybercrime is the first international treaty that aimed to harmonize national laws, improve investigative techniques, and increase cooperation among nations in order to fight Internet and computer crime. The convention has been widely adopted or mirrored through national regimes. Only two countries have failed to follow their lead: China and Korea.
- Internationally accepted standards, certification, and testing help improve the security environment for cloud computing, but not every country recognizes such best practices as meeting local standards. The holdouts include countries that might be expected to have protectionist policies (e.g., China, Indonesia, Russia, and Vietnam), but they also include countries like Argentina, India, Mexico, and South Africa.

BSA CLOUD POLICY BLUEPRINT

The economic growth predicted to flow from cloud computing — and the resulting transformation of both businesses and national economies — is predicated on the proper policies being in place in each of the seven areas used in the BSA index:

- **Ensuring privacy:** The success of cloud computing depends on users' faith that their information will not be used or disclosed in unexpected ways. At the same time, to maximize the benefit of the cloud, providers must be free to move data through the cloud in the most efficient way.
- **Promoting security:** Users must be assured that cloud computing providers understand and properly manage the risks inherent in storing and running applications in the cloud. Cloud providers must be able to implement cutting-edge cybersecurity solutions without being required to use specific technologies.
- **Battling cybercrime:** In cyberspace, as in the real world, laws must provide meaningful deterrence and clear causes of action. Legal systems should provide an effective mechanism for law enforcement, and for cloud providers themselves, to combat unauthorized access to data stored in the cloud.
- **Protecting intellectual property:** In order to promote continued innovation and technological advancement, intellectual property laws should provide for clear protection and vigorous enforcement against misappropriation and infringement of the developments that underlie the cloud.
- **Ensuring data portability and the harmonization of international rules:** The smooth flow of data around the world — for example, between different cloud providers — requires efforts to promote openness and interoperability. Governments should work with industry to develop standards, while also working to minimize conflicting legal obligations on cloud providers.
- **Promoting free trade:** By their very nature, cloud technologies operate across national boundaries. The cloud's ability to promote economic growth depends on a global market that transcends barriers to free trade, including preferences for particular products or providers.
- **Establishing the necessary IT infrastructure:** Cloud computing requires robust, ubiquitous, and affordable broadband access. This can be achieved through policies that provide incentives for private sector investment in broadband infrastructure and laws that promote universal access to broadband.

The move to the cloud and capitalization on its benefits across the board is hardly inevitable, and an urgent task lies ahead for governments. In order to obtain the benefits of the cloud, policymakers must provide a legal and regulatory framework that will promote innovation, provide incentives to build the infrastructure to support it, and promote confidence that using the cloud will bring the anticipated benefits without sacrificing expectations of privacy, security, and safety.

The ability of countries and companies to leverage cloud computing for growth requires that they be able to access a powerful network; the new methodology puts increased emphasis on the IT Readiness, Broadband Deployment category.

Those few countries that have embraced localization policies pay a heavy price

- After years of concerns about restrictive policies in Russia, the effect of those policies are becoming more clear. This year, for the first time in the history of the Scorecard a country finished with a zero in one of the scoring categories. Russia's failure to embrace technology neutrality in government procurement and its cumbersome Internet filtering and censorship regulations act as a barrier to cloud computing.
- These policies are not without financial effects. Consider that in 2012 the research firm IDC found that Russia's cloud computing market had grown more than 417 percent to nearly $60 million and was projected to continue to grow by more than 50 percent in the years ahead.[3] By 2017, though, IDC was finding growth in the Russian cloud market of just 9.9 percent — far behind the global growth of 19 percent.[4]
- Vietnam also continues to impose severe censorship and restrictions on Internet content. That fact is further complicated by the country's failure to develop appropriate laws on government procurement and other trade barriers.

Increased emphasis on IT Readiness and Broadband Deployment leads to interesting results

- The ability of countries and companies to leverage cloud computing for growth requires that they be able to access a powerful network; the new methodology puts increased emphasis on the IT Readiness and Broadband Deployment category. Although almost all countries continue to work to improve broadband penetration, the success of those efforts remains very inconsistent.
- Singapore, Japan, and Korea score highest in the category — boosted by the successful efforts to boost their national broadband plans.
- Certain countries' high IT Readiness scores may be masking weaknesses in other areas of cloud policy. For example, when infrastructure scores are removed, Japan ranking plummets from No. 2 to No. 10. Likewise, Korea scores nearly 20 points for IT Readiness and rounds out the top tier of countries in the rankings. But it finishes much closer to middle-tier countries like Mexico and South Africa in an examination of the countries' pure policy rankings.

[3] Oleg Kouzbit, *Report: Russian Cloud Market to Top $460 Million by 2015* (September 25, 2012), available at: http://www.ewdn.com/2012/09/25/report-russian-cloud-market-to-top-460-million-by-2016/.

[4] IDC, *Russia Cloud Services Market 2016–2020 Forecast and 2015 Vendor Shares*, (September 2016), available at: https://www.idc.com/getdoc.jsp?containerId=CEMA40565616; Forbes, *Roundup of Cloud Computing Forecasts, 2017*, (April 29, 2017), available at: https://www.forbes.com/sites/louiscolumbus/2017/04/29/roundup-of-cloud-computing-forecasts-2017/#144a9d7f31e8.

KEY FINDINGS

Five short years ago, cloud computing was a new tool — a next-generation technology that promised to help companies and countries unlock greater productivity and expanded economic growth. It was with that perspective that BSA | The Software Alliance launched the Global Cloud Computing Scorecard — a resource to help policymakers shape the proper legal and regulatory environment to encourage the growth of the cloud in their markets.

Fast forward to today and cloud computing is a widely adopted technology that powers global businesses and helps governments better connect with their citizens on a daily basis. Based on that evolution BSA | The Software Alliance believed that 2018 presented an opportunity to step back and reassess the Scorecard — the only report to regularly track change in the relevant international policy landscape. With companies and governments increasingly moving their key IT processes to the cloud, the mix of important policy considerations has become increasingly clear:

- Privacy laws must ensure the proper protection for users' data without restricting the ability of companies and users to move data across borders to maximize its value.
- Security laws must help shape an environment where cloud computing providers can implement cutting-edge cybersecurity solutions without being handcuffed by requirements to use specific technologies. Users also must be able to trust that cloud computing providers understand and properly manage the risks inherent in storing and running applications in the cloud.
- When it comes to delivering the cloud, countries must invest in the appropriate infrastructure. Cloud users must have access to robust, ubiquitous, and affordable broadband, which requires policies that provide incentives for private sector investment in broadband infrastructure and laws that promote universal access to broadband.

Some basic fundamentals have not changed. IT remains integral to every nation's economic growth. Cloud computing adds to the importance of IT by increasing access to technology that drives economic growth at the global, national, and local levels.

Cloud computing democratizes the use of advanced technologies. It allows anyone — a start-up, an individual consumer, a government, or a small business — to access technology previously available only to large organizations. These services in return have opened the door to unprecedented connectivity, productivity, and competitiveness.

Countries that offer a policy environment in which cloud-computing services can flourish gain in productivity and economic growth. The countries with the most favorable policies are those in which the free movement of data, privacy, intellectual property protections, robust deterrence, and enforcement of cybercrime are all important priorities. Many countries also recognize that coordination of national cloud computing policies with those of other nations will facilitate benefits for all countries participating in the global economy.

ISSUE BRIEF

CUTTING-EDGE TECHNOLOGIES: Cloud Computing Is the Catalyzer of the Benefits Created by Cutting-Edge Innovations

One of the many benefits of cloud computing is that it catalyzes the positive effect of cutting-edge technologies, generating societal benefits and economic growth. Policies that create an environment conducive to cloud computing will produce significant, positive results as these new technologies evolve.

Examples of cutting-edge technologies enabled by cloud computing include:

- Cloud computing allows a tremendous amount of data, collected from multiple locations, to be stored and analyzed in a cost-effective way. This enables data analytics to be performed on a large scale.
- Artificial intelligence uses vast amounts of data to "train" algorithms to solve complex problems and achieve certain goals. Cloud computing allows this data to be collected and analyzed efficiently.
- There are multiple uses for blockchain technology from financial transactions to manufacturing, and many new uses are constantly emerging. Cloud computing allows participants in blockchain transactions to remotely record information in decentralized ledgers and subsequently access them.

The cloud not only enables cutting-edge technologies to function, but it facilitates access to these technologies. Governments, businesses, and even individuals can take advantage of data analytics, artificial intelligence, blockchain solutions, or other technologies developed by third parties who offer cloud-based solutions. This is done in a very cost-effective way, with minimum upfront investment by the user. Thus, the benefits of these technologies become exponentially larger through the use of cloud computing.

These cutting-edge technologies, enabled or substantially improved by the use of cloud computing are creating benefits in nearly every industry sector. The automotive industry is one of many examples. In the automotive industry, companies leverage the cloud to increase productivity. They use data analytics to improve accuracy in demand forecasting and adjust production plans. Proactive maintenance powered by artificial intelligence-enabled tools reduces unscheduled downtime of machinery. The need for costly repairs and recalls can also be substantially reduced by the use of blockchain technology to more efficiently track faulty components.

The benefits of innovations powered by cloud computing and enabled by emerging technologies are not only available to large corporations. Small- and medium-sized enterprises can — and in many cases already are — leveraging these technologies. For instance, family-owned restaurants can use data analytics software to better predict demand, which allows them to adjust supply orders and staff schedules accordingly; local firms can grow their business by leveraging software that uses artificial intelligence to make recommendations on which sales leads to prioritize; and accounting firms can improve the efficiency of their business by using blockchain technology to streamline compliance with regulatory requirements.

Emerging technologies have the potential to improve our lives even further. But this can only be achieved if cloud computing can continue to be leveraged. It is, therefore, crucial that countries continue to strive to create an environment that favors the continued development and deployment of cloud computing so that these technologies continue to promote societal benefits and economic growth.

But countries inhibiting, or failing to support, the use of cloud computing will not keep pace with those embracing the tool.

The Scorecard has for five years ranked the IT infrastructure and policy environment — or cloud computing readiness — of 24 countries that account for 80 percent of the world's IT markets. Each country is graded on its strengths and weaknesses in seven key policy areas. The 2018 BSA Global Cloud Computing Scorecard, though, focuses new attention on the policy areas that matter most to cloud computing.

The 2018 Scorecard shows continuing improvements in the policy environment for cloud computing in key global economies since the 2016 version of the Scorecard.

These new rankings put additional emphasis on the policy areas that matter most to cloud computing, things like privacy laws that protect data without unnecessarily restricting its movement across borders and cybersecurity regimes that promote the proper protection of consumer and business data without freezing into place outdated and unneeded regimes. In addition, questions to assess intellectual property protections have been extensively revised to focus on cloud-relevant issues, including new questions on trade secrets and patents.

Data Privacy

Cloud users need to trust that their data, which may be stored anywhere in the world, will not be used or disclosed by a cloud provider in unauthorized ways. Countries can provide these assurances with appropriate privacy laws. But it is a delicate balance — unnecessarily burdensome restrictions will hinder the important advantages of cloud computing that users want and need.

This section of the Scorecard examines how countries are managing these competing interests. Overall, the concern for privacy has produced many positive results across jurisdictions, including significant law reform and a greater public awareness of data privacy issues.

Most countries in the Scorecard have data protection frameworks in place and have established independent privacy commissioners. Many of the data protection laws are now being updated to meet new international standards — such as the European Union General Data Protection Regulation (GDPR) and the APEC Cross Border Privacy scheme (CBPRs).

The 2018 Scorecard shows continuing improvements in the policy environment for cloud computing in key global economies.

Unfortunately, privacy laws are still absent or insufficient in several countries. Brazil and Thailand have no comprehensive laws in place, while laws in China, India, Indonesia, and Vietnam remain very limited.

A small number of countries have adopted or proposed prescriptive data localization regimes that would require cloud providers to restrict the free flow of data or build costly — and unnecessary — servers in order to provide services in a specific market.

Canada and Mexico score highest in the privacy section, offering comprehensive privacy regimes without onerous registration requirements. Countries with no laws (Brazil and Thailand) and countries with prescriptive data localization requirements (such as Russia and Indonesia) score poorly in this section.

Security

Users of cloud computing and other digital services need to be certain that cloud service providers can manage the security risks of storing their data and running their applications on cloud systems. Large-scale national and international cybersecurity attacks are now common.

This section examines how countries manage and regulate cybersecurity, security certification, and security testing.

This year's Scorecard indicates that many countries have implemented national cybersecurity strategies. Many of these national strategies promote a joint public-private approach to the management of cybersecurity. Overall, this is a positive development, although Argentina, Mexico, and Vietnam are yet to develop and implement strategies.

Overall, the Scorecard finds that most countries are rising to the challenge of protecting data from cyberattack and physical security breaches.

Most cloud computing applications are designed to meet internationally recognized security standards, and this approach is supported by most countries in the Scorecard. This means that a product tested in one country can be recognized in other countries. However, the Scorecard reveals that some overly prescriptive security requirements that duplicate accepted international standards and impose onerous local requirements have been introduced. For example, China, India, and Korea have all introduced some local security testing requirements.

The United Kingdom, Germany, France, Australia, the United States, and Japan score highest in the security section. Mexico, Argentina, and Vietnam record the lowest scores — mainly due to delay in implementing national cybersecurity strategies.

Cybercrime

The huge quantities of data that companies and governments store in their computer networks have long attracted the attention of bad actors. In order to protect data holders and deter cyber criminals, governments must use legislative, investigative, and enforcement tools.

This section examines cybercrime laws, as well as rules relating to investigation and enforcement.

Overall, the Scorecard finds that most countries are rising to the challenge of creating legal regimes to protect data from cyberattack and physical security breaches. Most countries studied have legislation to combat the unauthorized access of data stored in the cloud. Most also have implemented cybercrime laws, many of which are compatible with the Convention on Cybercrime. Italy, Japan, Poland, and Spain all score very highly in this section of the Scorecard.

Unfortunately, a few key jurisdictions still have gaps and inconsistencies in their cybercrime laws. China and Vietnam score poorly in this section of the Scorecard.

The Scorecard also asks whether local laws and policies on access to data by law enforcement authorities avoid technology specific mandates (e.g., requirements for specific tools that allow access to encrypted data). These mandates may act as a barrier to the supply of security products and services. There was a wide divergence on this issue and on other issues related to the investigation and prosecution of cybercrime.

Intellectual Property Rights

As with the creators of other highly innovative and fast-evolving products, providers of cloud computing services rely on a combination of patents, copyrights, trade secrets, and other forms of intellectual property protection. To encourage investment in cloud research and development, intellectual property laws must provide clear protections and effective enforcement of misappropriation and infringement. Online intermediaries should be offered incentives to operate responsibly and should enjoy safe harbor from copyright liability when they do so.

This section examines the intellectual property protections in place in the countries studied, as well as their approaches to implementation and enforcement. The Intellectual Property criteria for this year's Scorecard was extensively revised to focus on issues that are most relevant to cloud computing, including new questions on trade secrets and patents.

The United Kingdom, Singapore, and the United States all score very highly in the Intellectual Property section, reflecting their combination of modern laws and effective enforcement. Unfortunately, many countries struggled to achieve good results in this section, with Vietnam, Malaysia, Turkey, and India recording the lowest scores. However, numerous proposed and draft laws and regulations exist across the countries in the study, and this may be a section where we see strong improvements in the coming years.

Support for Industry-Led Standards and International Harmonization of Rules

Users need data portability and seamless interoperable applications if they are to make full use of cloud-computing services and the digital economy. IT industry organizations are developing international standards that will ensure optimal portability. Government support for these voluntary, industry-

led efforts is highly important. Countries must also promote global harmonization of e-commerce rules, tariffs, and relevant trade rules.

This section examines the extent to which governments have encouraged industry-led processes and promoted harmonization of e-commerce rules.

The Scorecard reveals that some countries have moved away from accepting international standards and international certifications, most notably China, India, Indonesia, Korea, and Russia.

Although tariffs and trade barriers for online software and applications continue to be rare, they continue to hinder new technology products used to access cloud services in a few countries. Argentina, Brazil, and Russia all score poorly in this section.

Promoting Free Trade

Cloud services operate across national boundaries, and their success depends on access to regional and global markets. Restrictive policies that create actual or potential trade barriers will inhibit or slow the evolution of cloud computing.

This section examines government procurement regimes and the existence or absence of barriers to free trade, including each country's requirements and preferences for particular products. The section also examines whether countries support international efforts to standardize and liberalize trade and procurement policies, allow cloud providers to operate free from tariffs and other trade barriers, and avoid laws or policies that impose data localization requirements.

The Scorecard indicates that a number of countries still provide preferential treatment for domestic suppliers in government procurement or have introduced other barriers to international trade. Indeed, this section of the Scorecard reveals the widest divergence between countries. A small group of countries scored close to the maximum points — Canada, Germany, the United States, Poland, and Japan — while a number of countries score no points or almost no points, including China, India, Vietnam, and Russia.

Despite major infrastructure improvements underway in a number of countries, broadband penetration remains very inconsistent.

IT Readiness and Broadband Deployment

Digital economies and cloud computing require extensive, affordable broadband access, which in turn requires incentives for private sector investment in infrastructure and laws and policies that support universal access.

This section of the Scorecard examines and compares the infrastructure available in each country to support the digital economy and cloud computing. It is based on detailed comparative statistics on a range of important IT indicators, including the presence of a national broadband plan, a country's International Connectivity Score and International Internet Bandwidth. In addition, the Scorecard includes statistics on the number of subscribers for key services, such as mobile broadband subscriptions.

Despite major infrastructure improvements underway in a number of countries, broadband penetration remains very inconsistent. As a result, some countries continue to have low infrastructure scores. Countries that do not yet have sufficient infrastructure continue to be at risk of missing the economic benefits of the digital economy and cloud computing.

Singapore, Japan, and Korea achieve the highest results in this section of the report. As IT Readiness and Broadband Deployment is worth 25 percent of the overall score in this year's Scorecard, this strong result helps to lift the overall rankings for these countries. For example, Japan jumps from 10th in the Scorecard rankings to 2nd once the infrastructure scores are included. Most of the other countries in the Scorecard receive a similar ranking whether or not infrastructure scores are included.

The poorest performers in this section of the Scorecard are Vietnam, Indonesia, and India.

ISSUE BRIEF

DIGITAL TRADE: Unleashing Social Benefits and Economic Growth through Modern Trade Rules

Data-driven innovation enabled by cloud computing powers the global economy, and its role will be even more prominent in the future. Business of all sizes and from across industry sectors increasingly use data by utilizing software and cloud computing services to increase productivity, create jobs, and improve lives. Governments around the globe also use data-driven innovations to better serve their citizens and grow their economies. Modern trade rules are needed to ensure these benefits continue.

Technology has evolved tremendously in the years since most trade agreements were negotiated. The software industry has evolved from floppy disks and desktop computing to cloud-based solutions and smart devices. Innovation continues to move at a tremendous speed with the adoption of new technologies, including large-scale data analytics, artificial intelligence, and block chain.

International trade rules, however, have not kept up with these changes. For example, trade agreements currently in force lack enforceable obligations ensuring that governments will not prevent data from moving from one place to another, which is essential to the data economy. The Trans-Pacific Partnership (TPP) agreement is the first multilateral trade agreement to create a legal framework enabling the unrestricted movement of data across borders. Even without continued United States participation in TPP, the other 11 governments have made clear their intention to apply these strong data flow obligations when the agreement takes effect.

In addition, forward-looking governments are incorporating digital trade provisions in other multilateral and bilateral trade pacts they are pursuing. These agreements should include rules ensuring movement of data across borders, prohibiting data localization and forced technology transfer, promoting intellectual property protection, supporting cybersecurity, among others. For example, the United States, Canada, and Mexico are currently discussing modernizing the North American Free Trade Agreement along these lines.

In Europe, however, advocates of including digital trade provisions in the European Union's free trade agreements (FTAs) have confronted strong resistance, and this has led to a climate of uncertainty about the EU's commitment to free international data flows. A recent European Commission proposal to include in its FTAs a prohibition of data localization measures, for example, also contains a broad and unconstrained exemptions for privacy measures. As a result, the prospective EU trade rule against localization could actually be counterproductive to the objective of free data flows.

It is important that modern trade agreements include clear, binding, and forward-looking provisions on digital trade. This will allow data-driven innovation powered by cloud computing to continue improving lives and creating economic growth.

SCORECARD METHODOLOGY

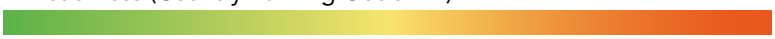
The BSA Global Cloud Computing Scorecard examines the legal and regulatory framework of 24 countries around the world, identifying 72 questions that are relevant to determining readiness for cloud computing. The questions are categorized under the aforementioned policy categories, and are generally framed so as to be answerable by "yes" or "no." The answers are also color coded:

- Indicates a positive assessment, which is generally considered to be an encouraging step toward the establishment of a favorable legal and regulatory environment for cloud computing.
- Indicates a negative assessment and the presence of a potential barrier to the establishment of a favorable legal and regulatory environment for cloud computing.
- Indicates that the assessment is positive in part, although some gaps or inconsistencies may exist that require further remedial work.
- Indicates a fact-finding question on relevant issues.

The Scorecard aims to provide a platform for discussion between policymakers and providers of cloud offerings, with a view toward developing an internationally harmonized regime of laws and regulations relevant to cloud computing. It is a tool that can help policymakers conduct a constructive self-evaluation, and determine the next steps that need to be taken to help advance the growth of global cloud computing.

Responses for the infrastructure portion of the Scorecard are color coded based on the scale below. That is, the "highest" answer to a particular question (e.g., the largest population or highest number of Internet users) is indicated in bright green, and the color for other responses graduates down to the lowest response in red.

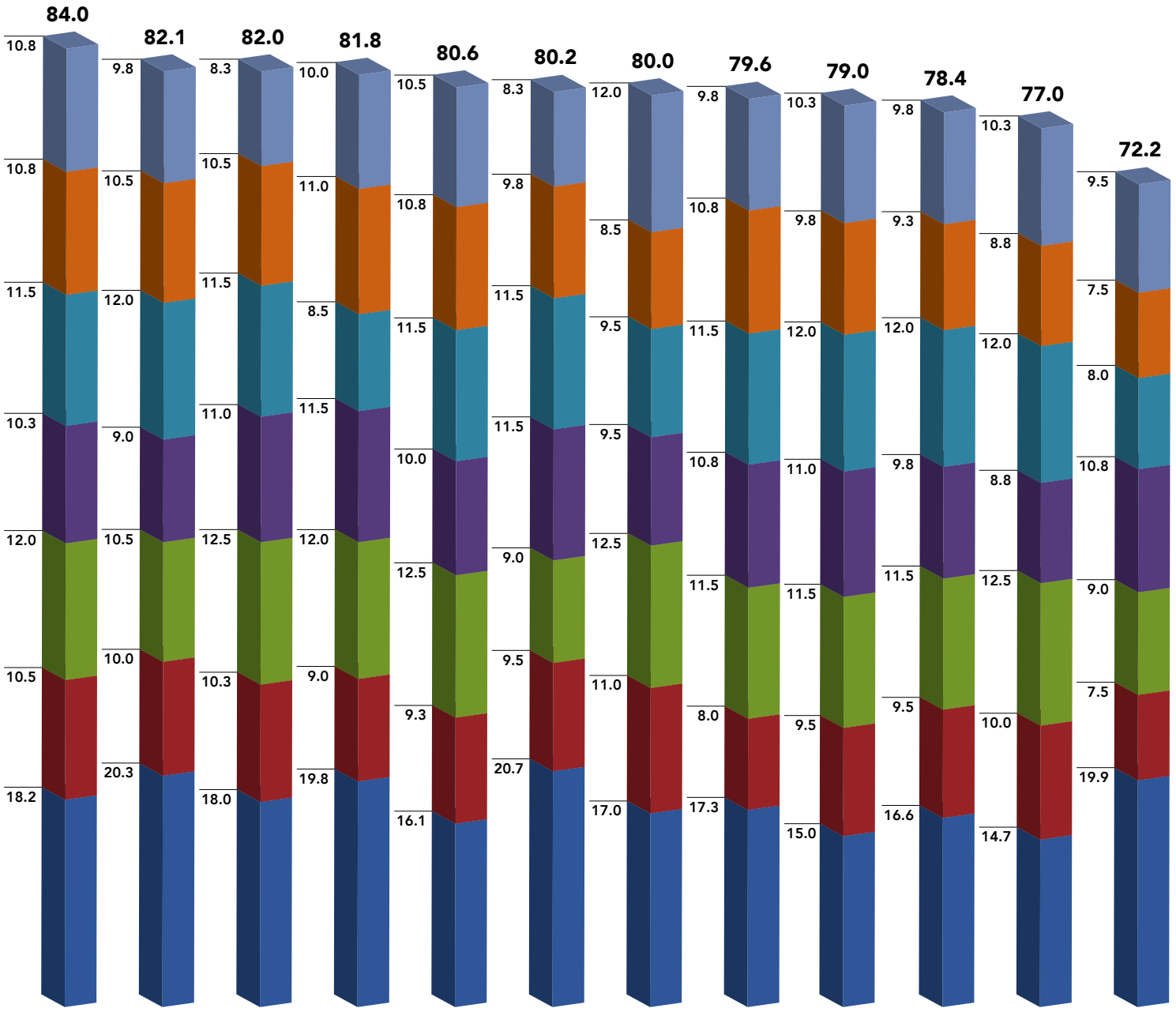
IT Readiness (Country Ranking Out of 24)



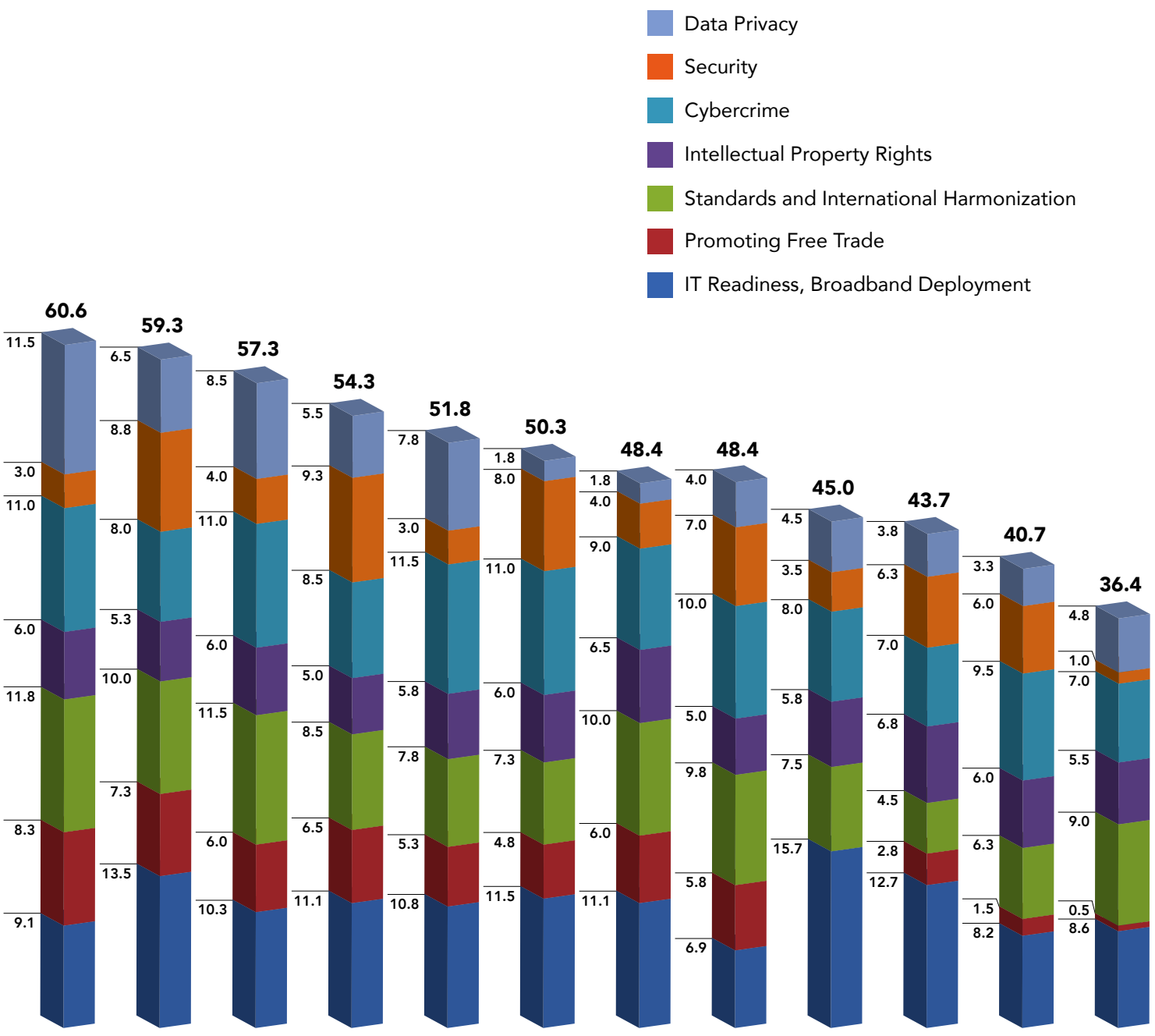
Highest Lowest

2018 BSA Global Cloud Computing Scorecard

By focusing new attention on the policy areas that matter most to cloud computing, the 2018 Scorecard shows continuing improvements in the policy environment for cloud computing in key global economies.



	Germany	Japan	United States	United Kingdom	Australia	Singapore	Canada	France	Italy	Spain	Poland	Korea
Change in Rank	+2	-1	-1	+5	+1	+1	-3	-3	-1	+1	-1	none


Data Privacy
Security
Cybercrime
Intellectual Property Rights
Standards and International Harmonization
Promoting Free Trade
IT Readiness, Broadband Deployment
60.6
11.5
3.0
11.0
6.0
11.8
8.3
9.1
59.3
6.5
8.8
8.0
5.3
10.0
7.3
13.5
57.3
8.5
4.0
11.0
6.0
11.5
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51.8
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11.5
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7.8
5.3
10.8
50.3
1.8
8.0
11.0
6.0
7.3
4.8
11.5
48.4
1.8
4.0
9.0
6.5
10.0
6.0
11.1
48.4
4.0
7.0
10.0
5.0
9.8
5.8
6.9
45.0
4.5
3.5
8.0
5.8
7.5
15.7
43.7
3.8
6.3
7.0
6.8
4.5
2.8
12.7
40.7
3.3
6.0
9.5
6.0
6.3
1.5
8.2
36.4
4.8
1.0
7.0
5.5
9.0
0.5
8.6
Mexico
Malaysia
South Africa
Turkey
Argentina
Brazil
Thailand
India
Russia
China
Indonesia
Vietnam
+2
-1
-1
+3
-1
+4
+2
-2
-4
+1
-3
none

USING THE SCORECARD

The Scorecard is derived from the 24 individual country reports, which are available online at www.bsa.org/cloudscorecard. Using these results, a weighted score has been allocated to a selection of key questions. A number of basic fact-finding questions are excluded from the scoring system. Each group of questions is weighted to reflect its importance to cloud computing. Each individual question is also weighted to reflect its importance within each group. The weights are shown in the following table:

# THEME / QUESTIONS	Weight	Value (out of 100)
DATA PRIVACY	**12.5%**	**12.5**
1. Is a data protection law or regulation in place?	30%	3.75
5. Is the data protection authority enforcing the data protection law or regulation in an effective and transparent manner?	20%	2.5
6. Is the data protection law or regulation compatible with globally recognized frameworks that facilitate international data transfers?	10%	1.25
7. Are data controllers free from registration requirements?	10%	1.25
9. Are cross-border data transfers free from arbitrary, unjustifiable, or disproportionate restrictions, such as national or sector-specific data or server localization requirements?	10%	1.25
10. Is there a personal data breach notification law or regulation?	10%	1.25
11. Are personal data breach notification requirements transparent, risk-based, and not overly prescriptive?	10%	1.25
SECURITY	**12.5%**	**12.5**
1. Is there a national cybersecurity strategy in place?	20%	2.5
2. Is the national cybersecurity strategy current, comprehensive, and inclusive?	20%	2.5
3. Are there laws or appropriate guidance containing general security requirements for cloud service providers?	10%	1.25
4. Are laws or guidance on security requirements transparent, risk-based, and not overly prescriptive?	20%	2.5
5. Are there laws or appropriate guidance containing specific security audit requirements for cloud service providers that take account of international practice?	10%	1.25
6. Are international security standards, certification, and testing recognized as meeting local requirements?	20%	2.5
CYBERCRIME	**12.5%**	**12.5**
1. Are cybercrime laws or regulations in place?	40%	5
2. Are cybercrime laws or regulations consistent with the Budapest Convention on Cybercrime?	20%	2.5
3. Do local laws and policies on law enforcement access to data avoid technology-specific mandates or other barriers to the supply of security products and services?	20%	2.5
4. Are arrangements in place for the cross-border exchange of data for law enforcement purposes that are transparent and fair?	20%	2.5
INTELLECTUAL PROPERTY RIGHTS	**12.5%**	**12.5**
1. Are copyright laws or regulations in place that are consistent with international standards to protect cloud service providers?	20%	2.5
2. Are copyright laws or regulations effectively enforced and implemented?	20%	2.5
3. Is there clear legal protection against misappropriation of trade secrets?	10%	1.25
4. Is the law or regulation on trade secrets effectively enforced?	10%	1.25
5. Is there clear legal protection against the circumvention of Technological Protection Measures?	10%	1.25
6. Are laws or regulations on the circumvention of Technological Protection Measures effectively enforced?	10%	1.25
7. Are there clear legal protections in place for software-implemented inventions?	10%	1.25
8. Are laws or regulations on the protection of software-implemented inventions effectively implemented?	10%	1.25

# THEME / QUESTIONS	Weight	Value (out of 100)
STANDARDS AND INTERNATIONAL HARMONIZATION	**12.5%**	**12.5**
1. Is there a regulatory body responsible for standards development for the country?	10%	1.25
2. Are international standards favored over domestic standards?	20%	2.5
3. Does the government participate in international standards setting process?	10%	1.25
4. Are e-commerce laws or regulations in place?	30%	3.75
6. Is there a law or regulation that gives electronic signatures clear legal weight?	10%	1.25
7. Are cloud service providers free from mandatory filtering or censoring?	20%	2.5
PROMOTING FREE TRADE	**12.5%**	**5**
1. Is a national strategy or platform in place to promote the development of cloud services and products?	20%	2.5
2. Are there any laws or policies in place that implement technology neutrality in government?	10%	1.25
3. Are cloud computing services able to operate free from laws or policies that either mandate or give preference to the use of certain products services, standards, or technologies?	20%	2.5
4. Are cloud computing services able to operate free from laws, procurement policies, or licensing rules that discriminate based on the nationality of the vendor, developer, or service provider?	20%	2.5
5. Has the country signed and implemented international agreements that ensure the procurement of cloud services is free from discrimination?	10%	1.25
6. Are services delivered by cloud providers free from tariffs and other trade barriers?	10%	1.25
7. Are cloud computing services able to operate free from laws or policies that impose data localization requirements?	10%	1.25
IT READINESS, BROADBAND DEPLOYMENT	**25%**	**25**
1. Is there a National Broadband Plan?	10%	2.5
2. Is the National Broadband Plan being effectively implemented?	10%	2.5
4.7. Personal Computers (% of households) (2015) – *Average for all countries in this scorecard: 63%*	5%	1.25
5.1. ITU ICT Development Index (IDI) (2016) (score is out of 10 and covers 175 countries) – *Average for all countries in this scorecard: 6.58*	20%	5
5.2. World Economic Forum Networked Readiness Index (NRI) (2016) (score is out of 7 and covers 139 countries) – *Average for all countries in this scorecard: 4.77*	20%	5
6.2. Internet Users (% of population) (2015) – *Average for all countries in this scorecard: 67%*	5%	1.25
6.3. International Internet Bandwidth (total gigabits per second (Gbps) per country) (2015) – *Total for all countries in this scorecard: 117,736 Gbps*	5%	1.25
6.4. International Internet Bandwidth (bits per second (bps) per Internet user) (2015) – *Average for all countries in this scorecard: 97,747 bps*	5%	1.25
7.5. Average Broadband Data Connection Speed (total megabits per second (Mbps) per country) (Q1 2017) – *Average for all countries in this scorecard: 12 Mbps* – *Average peak for all countries in this scorecard: 70 Mbps*	5%	1.25
8.3. Proportion of Fiber-to-the-home/building (FttX) Internet Subscriptions (% of fixed broadband subscriptions) (2015) – *Average for all countries in this scorecard: 23%*	5%	1.25
9.3. Active Mobile Broadband Subscriptions (% of population) (2015) – *Average for all countries in this scorecard: 77%*	5%	1.25
9.4. Average Mobile Data Connection Speed (total megabits per second (Mbps) per country) (Q1 2017) – *Average for all countries in this scorecard: 11 Mbps*	5%	1.25

BSA Global Cloud Computing Country Checklist

✔ Yes ✖ No ◑ Partial

# QUESTION	Argentina	Australia	Brazil	Canada	China	France	Germany	India	Indonesia	Italy	Japan	Korea	Malaysia	Mexico	Poland	Russia	Singapore	South Africa	Spain	Thailand	Turkey	United Kingdom	United States	Vietnam
DATA PRIVACY																								
1. Is a data protection law or regulation in place?	✔	✔	Draft	✔	◑	✔	✔	◑	◑	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	Draft	✔	✔	◑	◑
2. What is the scope and coverage of the data protection law or regulation?	Comprehensive	Comprehensive	Not applicable	Comprehensive	Sectoral	Comprehensive	Comprehensive	Sectoral	Comprehensive	Comprehensive	Comprehensive	Comprehensive	Sectoral	Comprehensive	Comprehensive	Comprehensive	Sectoral	Comprehensive	Comprehensive	Not applicable	Comprehensive	Comprehensive	Sectoral	Sectoral
3. Is a data protection authority in place?	✔	✔	✖	✔	✖	✔	✔	◑	✖	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✖	✔	✔	✔	✖
4. What is the nature of the data protection authority?	Sole commissioner	Sole commissioner	Not applicable	Sole commissioner	Not applicable	Collegial body	Sole commissioner	Other government official	Not applicable	Collegial body	Collegial body	Other government official	Other government official	Collegial body	Sole commissioner	Other government official	Sole commissioner	Collegial body	Sole commissioner	Not applicable	Collegial body	Sole commissioner	Other government official	Not applicable
5. Is the data protection authority enforcing the data protection law or regulation in an effective and transparent manner?	✔	✔	Not applicable	✔	Not applicable	✔	✔	◑	Not applicable	✔	◑	✔	◑	✔	✔	◑	✔	◑	✔	Not applicable	◑	✔	✔	Not applicable
6. Is the data protection law or regulation compatible with globally recognized frameworks that facilitate international data transfers?	EU framework	APEC framework & EU framework	Not applicable	APEC framework & EU framework	Not applicable	EU framework	EU framework	Not applicable	Not applicable	EU framework	APEC framework & EU framework	APEC framework & EU framework	APEC framework & EU framework	APEC framework & EU framework	EU framework	APEC framework & EU framework	APEC framework & EU framework	EU framework	EU framework	Not applicable	EU framework	EU framework	APEC framework	Not applicable
7. Are data controllers free from registration requirements?	✖	✔	✔	✔	✖	✖	◑	✔	✖	◑	✔	✖	✖	✔	◑	✖	✔	◑	✖	✔	✖	✖	✔	✔
8. Are there cross-border data transfer requirements in place?	Detailed requirements	Detailed requirements	No requirements	Detailed requirements	Detailed requirements	Detailed requirements	Detailed requirements	Brief requirements	Brief requirements	Detailed requirements	Detailed requirements	Detailed requirements	Detailed requirements	Detailed requirements	Detailed requirements	Detailed requirements	Detailed requirements	Detailed requirements	Detailed requirements	No requirements	Detailed requirements	Detailed requirements	No requirements	Brief requirements
9. Are cross-border data transfers free from arbitrary, unjustifiable, or disproportionate restrictions, such as national or sector-specific data or server localization requirements?	◑	✔	◑	◑	✖	◑	✔	◑	✖	◑	✔	◑	✔	✔	✔	✖	✔	✔	◑	◑	✔	✔	✔	✖
10. Is there a personal data breach notification law or regulation?	✖	✔	Draft	✔	◑	◑	◑	✖	◑	◑	◑	✔	✖	✔	◑	✖	✖	✔	◑	✖	✖	◑	✔	◑
11. Are personal data breach notification requirements transparent, risk-based, and not overly prescriptive?	Not applicable	✔	Not applicable	✔	◑	◑	◑	Not applicable	◑	◑	◑	◑	Not applicable	✔	◑	Not applicable	Not applicable	✔	◑	Not applicable	Not applicable	◑	◑	◑
12. Is an independent private right of action available for breaches of data privacy?	✔	✖	✔	✔	✔	✔	✔	✔	◑	✔	✔	✔	✖	✔	✔	✔	✖	✔	✔	✔	✔	✔	✔	✔
SECURITY																								
1. Is there a national cybersecurity strategy in place?	Draft	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	◑	✖	✔	◑	✔	✔	✔	✔	✔	✔	✔	✖
2. Is the national cybersecurity strategy current, comprehensive, and inclusive?	Not applicable	✔	◑	✖	✔	✔	✔	✔	◑	✔	✔	◑	◑	✖	✔	◑	✔	◑	✔	✔	✔	✔	✔	✖
3. Are there laws or appropriate guidance containing general security requirements for cloud service providers?	◑	✔	◑	◑	✔	✔	✔	✔	✔	◑	◑	◑	✔	✔	✔	✔	✔	✖	◑	✖	◑	✔	◑	✔
4. Are laws or guidance on security requirements transparent, risk-based, and not overly prescriptive?	◑	✔	◑	✔	✖	◑	◑	◑	✖	◑	✔	◑	◑	✔	◑	✖	✔	✖	◑	✖	◑	✔	◑	✖
5. Are there laws or appropriate guidance containing specific security audit requirements for cloud service providers that take account of international practice?	◑	◑	◑	◑	◑	◑	◑	◑	✔	◑	◑	◑	◑	✖	◑	✖	◑	✖	✖	✖	✖	✔	◑	✖
6. Are international security standards, certification, and testing recognized as meeting local requirements?	✖	✔	◑	✔	✖	✔	✔	✖	✖	✔	✔	◑	✔	✖	◑	✖	◑	✖	✔	✖	✔	✔	✔	✖
CYBERCRIME																								
1. Are cybercrime laws or regulations in place?	✔	✔	✔	◑	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
2. Are cybercrime laws or regulations consistent with the Budapest Convention on Cybercrime?	✔	✔	✔	✔	✖	✔	✔	✔	✔	✔	✔	✖	◑	✔	✔	◑	✔	✔	✔	✔	✔	✔	✔	◑
3. Do local laws and policies on law enforcement access to data avoid technology-specific mandates or other barriers to the supply of security products and services?	✔	◑	◑	◑	◑	◑	◑	✔	✔	✔	✔	◑	✖	✔	✔	✖	◑	◑	✔	✖	✖	✖	✔	✖
4. Are arrangements in place for the cross-border exchange of data for law enforcement purposes that are transparent and fair?	✔	✔	✔	✔	✔	✔	✔	✔	◑	✔	✔	✔	✔	✔	✔	◑	✔	✔	✔	✔	✔	✔	✔	✔
INTELLECTUAL PROPERTY RIGHTS																								
1. Are copyright laws or regulations in place that are consistent with international standards to protect cloud service providers?	◑	◑	◑	✔	✔	✔	✔	◑	◑	✔	✔	✔	◑	◑	✔	◑	✔	◑	✔	◑	◑	✔	✔	◑
2. Are copyright laws or regulations effectively enforced and implemented?	✖	◑	◑	✔	◑	✔	✔	◑	✖	✔	✔	◑	◑	✖	◑	✖	✔	◑	◑	◑	✖	✔	✔	◑
3. Is there clear legal protection against misappropriation of trade secrets?	✔	✔	✔	◑	✔	◑	◑	✖	✔	◑	◑	✔	✖	✔	✔	✔	✔	◑	✔	✔	◑	◑	✔	◑
4. Is the law or regulation on trade secrets effectively enforced?	✖	✔	◑	✖	◑	◑	◑	✖	◑	◑	◑	✔	✖	✔	✔	◑	◑	◑	◑	◑	◑	◑	✔	✖
5. Is there clear legal protection against the circumvention of Technological Protection Measures?	✔	✔	✖	✔	◑	◑	✔	✔	◑	✔	◑	✔	✔	◑	◑	◑	✔	◑	◑	◑	✖	✔	✔	✔
6. Are laws or regulations on the circumvention of Technological Protection Measures effectively enforced?	✖	✔	✖	✔	✖	◑	✔	◑	◑	✔	◑	✔	✔	✖	◑	✖	✔	✖	◑	✖	✔	✔	◑	✖
7. Are there clear legal protections in place for software-implemented inventions?	✔	✔	✔	✔	◑	✔	◑	✖	◑	✔	◑	✔	✖	✔	◑	◑	✔	◑	✔	◑	✔	✔	✔	✔
8. Are laws or regulations on the protection of software-implemented inventions effectively implemented?	◑	✔	◑	✔	◑	✔	◑	✖	◑	✔	◑	✔	✖	◑	✖	◑	◑	✖	✔	✖	◑	✔	◑	◑
STANDARDS AND INTERNATIONAL HARMONIZATION																								
1. Is there a regulatory body responsible for standards development for the country?	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
2. Are international standards favored over domestic standards?	◑	✔	◑	✔	◑	✔	✔	◑	✖	✔	✔	◑	◑	◑	✔	◑	◑	✔	✔	✔	✔	✔	✔	◑
3. Does the government participate in international standards setting process?	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
4. Are e-commerce laws or regulations in place?	✖	✔	✖	✔	Draft	✔	✔	✔	✔	✔	◑	✔	✔	✔	✔	◑	✔	✔	✔	✔	◑	✔	✔	✔
5. What international instruments are the e-commerce laws or regulations based on?	Not applicable	UN Convention on E-Contracting	Not applicable	UNCITRAL Model Law on E-Commerce	UN Convention on E-Contracting	UNCITRAL Model Law on E-Commerce	UNCITRAL Model Law on E-Commerce	UNCITRAL Model Law on E-Commerce	UN Convention on E-Contracting	UNCITRAL Model Law on E-Commerce	Not applicable	UN Convention on E-Contracting	UN Convention on E-Contracting	UNCITRAL Model Law on E-Commerce	UNCITRAL Model Law on E-Commerce	UN Convention on E-Contracting	UN Convention on E-Contracting	UNCITRAL Model Law on E-Commerce	UNCITRAL Model Law on E-Commerce	UNCITRAL Model Law on E-Commerce	UNCITRAL Model Law on E-Commerce	Other	UNCITRAL Model Law on E-Commerce	Other	UNCITRAL Model Law on E-Commerce
6. Is there a law or regulation that gives electronic signatures clear legal weight?	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
7. Are cloud service providers free from mandatory filtering or censoring?	✔	✔	✔	✔	✖	◑	✔	◑	✖	◑	✔	✖	✖	✔	✔	✖	✖	◑	◑	✖	✖	✔	✔	✖
PROMOTING FREE TRADE																								
1. Is a national strategy or platform in place to promote the development of cloud services and products?	✖	✔	◑	✔	✔	✖	◑	✔	✖	◑	◑	✔	✖	✔	◑	✖	◑	✖	✖	✔	✔	✔	◑	✖
2. Are there any laws or policies in place that implement technology neutrality in government?	✖	◑	✖	✔	✖	◑	✔	◑	◑	◑	◑	✖	◑	✔	◑	✖	◑	◑	✔	✖	✖	◑	✔	✖
3. Are cloud computing services able to operate free from laws or policies that either mandate or give preference to the use of certain products services, standards, or technologies?	✔	✔	✔	✔	✖	◑	✔	✖	✖	◑	✔	✖	✔	✔	✔	✖	✔	◑	✔	✔	✖	✔	✔	✖
4. Are cloud computing services able to operate free from laws, procurement policies, or licensing rules that discriminate based on the nationality of the vendor, developer, or service provider?	◑	◑	✖	✔	✖	✔	✔	◑	✖	✔	✔	✔	◑	✖	✔	✖	◑	◑	✔	✖	✖	✔	✔	✖
5. Has the country signed and implemented international agreements that ensure the procurement of cloud services is free from discrimination?	✖	✖	✖	◑	✖	◑	◑	✖	✖	◑	◑	◑	✖	✖	◑	✖	◑	✖	◑	✖	✖	◑	◑	◑
6. Are services delivered by cloud providers free from tariffs and other trade barriers?	✖	✔	✖	✔	◑	✔	✔	◑	◑	✔	✔	✔	✔	✔	✔	✖	✔	✔	✔	◑	✔	✔	✔	✖
7. Are cloud computing services able to operate free from laws or policies that impose data localization requirements?	✔	◑	✔	◑	✖	✔	✔	◑	✖	✔	✔	✔	✔	✔	✔	✖	✔	✔	✔	✔	◑	✔	✔	✖

BSA Global Cloud Computing Country Checklist *(continued)*

✔ Yes ✖ No ◑ Partial

# QUESTION	Argentina	Australia	Brazil	Canada	China	France	Germany	India	Indonesia	Italy	Japan	Korea	Malaysia	Mexico	Poland	Russia	Singapore	South Africa	Spain	Thailand	Turkey	United Kingdom	United States	Vietnam
IT READINESS, BROADBAND DEPLOYMENT																								
1. Is there a National Broadband Plan?	• The 2010 Argentina Conectada plan promoted digital inclusion, but did not include specific national targets. No national broadband strategy is in place.	• By 2020: - The National Broadband Network (NBN) is forecast to provide 8 million connections at speeds of 25-50 Mbps	• By 2019: - National average broadband speed of 25 Mbps	• By 2021: - Universal broadband of 50/10 Mbps and unlimited data to 90% of premises • By 2026-2031: - Coverage to remaining 10% of premises	• By 2020: - Fixed broadband penetration rate of 70% - Mobile broadband penetration rate of 85% - 1 Gbps for households in developed cities - 50 Mbps in cities and - 12 Mbps for rural areas	• By 2022: - All households and businesses to have connections of at least 30 Mbps	• By 2018: - All households to have speeds of at least 50 Mbps • By 2025: - A gigabit national FttH optical fiber network enabling multiple Gbps upload and download speeds	• By 2016–2017: - Fiber network to reach 250,000 local government areas.	• By 2019: - 71% of households in urban areas to have 20 Mbps - 49% of households in rural areas to have 10 Mbps	• By 2020: - 85% of the population to have speeds of 100 Mbps - 100% of the population to have speeds of 30 Mbps	• Japan's successive broadband plans have delivered comprehensive fiber (FttH) deployment. The Smart Japan ICT Strategy and Japan Revitalization Strategy now focus on developing knowledge economy.	• Successive information master plans have resulted in ubiquitous high-speed broadband with extensive FttH/B infrastructure. A number of ICT strategies now focus on developing the ICT ecosystem.	• By 2020: - 100% of households in capital cities and high-impact growth areas to have access to speeds of 100 Mbps - 50% of households in suburban and rural areas to have access to speeds of 20 Mbps	• There is no specific national broadband plan. No speed or connectivity targets have been published.	• By 2020: - Universal access to at least 30 Mbps - 50% of premises to have access to 100 Mbps	• By 2018: - 80% of Russian households to have at least 100 Mbps	• Singapore's successive broadband plans have delivered comprehensive fiber (FttH) deployment and the goal is nationwide ultra-high-speed broadband access of 1 Gbps to all physical addresses • By 2019–2021, Heterogenous Network (HetNet) for convergence of Mobile and WiFi • After 2021, convergence of fixed and mobile broadband	• By 2016: - 50% of population with access to speeds of 5 Mbps • By 2020: - 90% of population with access to speeds of 5 Mbps - 50% to speeds of 100 Mbps • By 2030: - 100% of population with access to speeds of 10 Mbps - 80% to speeds of 100 Mbps	• By 2020: - 100% of population to have access to speeds of at least 30 Mbps • By 2025: - 50% of households at 100 Mbps	• By 2020: - Extend broadband coverage to 95% • By 2020: - Provide broadband Internet access of at least 100 Mbps in economically important provinces	• By 2018: - Proportion of Internet users increases to 70% - Number of fiber Internet subscribers increases to 4 million - Number of LTE subscribers increases to 10 million - Proportion market share of alternative DSL operators increases to 25% - GDP per capita rate of broadband access costs lowered to 1%	• By 2018: - Provide superfast broadband (at least 24 Mbps) to 95% of the UK	• By 2020: - At least 100 million homes to have affordable access to download speeds of 100 Mbps and upload speeds of 50 Mbps - Every household to have access to download speeds of 4 Mbps and upload speeds of 1 Mbps	• By 2020: - Fixed-line broadband to reach 40% of households - 95% of residential areas with 3G/4G coverage at speeds of 4 Mbps for urban and 2 Mbps for rural - 60% of Internet subscribers have at least 25 Mbps - 100% of public access points to offer broadband, with half delivering 50 Mbps
2. Is the National Broadband Plan being effectively implemented?	◑	◑	◑	✔	◑	✔	✔	✖	✖	✔	✔	✔	◑	Not available	✔	✔	✔	✖	✔	◑	✖	✔	◑	Not available
3. Are there laws or policies that regulate "net neutrality"1?	Extensive regulation	No regulation	Extensive regulation	Extensive regulation	No regulation	Extensive regulation	Extensive regulation	Regulation under consideration	No regulation	Extensive regulation	Limited regulation	Limited regulation	No regulation	Extensive regulation	Extensive regulation	No regulation	Limited regulation	Regulation under consideration	Extensive regulation	No regulation	Limited regulation	Extensive regulation	Limited regulation	No regulation
4. Base Indicators																								
4.1. Population (millions) (2015) – *Total for all countries in this scorecard: 4,700 million*	42	24	204	36	1,402	65	83	1,282	256	61	127	50	31	125	38	142	6	53	47	67	77	64	325	93
4.2. Urban Population (%) (2015) – *Average for all countries in this scorecard: 73%*	92%	89%	86%	82%	56%	80%	75%	33%	54%	69%	93%	82%	75%	79%	61%	74%	100%	65%	80%	50%	73%	83%	82%	34%
4.3. Number of Households (millions) (2015) – *Total for all countries in this scorecard: 1,249 million*	12	9	60	14	393	27	39	259	63	24	47	19	6	28	14	52	1	13	16	20	17	27	123	19
4.4. Population Density (people per square km) (2015) – *Average for all countries in this scorecard: 471*	16	3	25	4	146	122	234	441	142	207	348	519	92	65	124	9	7,829	45	93	133	102	269	35	296
4.5. Per Capita GDP (US$ 2015) – *Average for all countries in this scorecard: US$ 22,649*	$13,432	$56,311	$8,539	$43,249	$8,028	$36,206	$41,313	$1,598	$3,346	$29,958	$32,477	$27,222	$9,768	$9,005	$12,555	$9,093	$52,889	$5,724	$25,832	$5,815	$9,126	$43,876	$56,116	$2,111
4.6. ICT Service Exports (billions of US$) (2015) – *Total for all countries in this scorecard: US$ 978 billion*	$6	$9	$19	$32	$83	$98	$104	$105	$6	$30	$37	$23	$8	$0.2	$14	$17	$39	$3	$32	$9	$0.5	$132	$171	–
4.7. Personal Computers (% of households) (2015) – *Average for all countries in this scorecard: 63%*	65%	83%	54%	85%	50%	82%	91%	14%	19%	73%	80%	77%	68%	45%	78%	73%	87%	20%	76%	30%	56%	90%	87%	22%
5. IT and Network Readiness Indicators																								
5.1. ITU ICT Development Index (IDI) (2016) (score is out of 10 and covers 175 countries) – *Average for all countries in this scorecard: 6.58*	6.52	8.19	5.99	7.62	5.19	8.11	8.31	2.69	3.86	7.11	8.37	8.84	6.22	4.87	6.65	6.95	7.95	5.03	7.62	5.18	5.69	8.57	8.17	4.29
5.2. World Economic Forum Networked Readiness Index (NRI) (2016) (score is out of 7 and covers 139 countries) – *Average for all countries in this scorecard: 4.77*	3.79	5.49	4.01	5.56	4.24	5.34	5.55	3.75	4.01	4.43	5.65	5.57	4.91	3.99	4.50	4.54	6.04	4.16	4.77	4.20	4.39	5.72	5.82	3.93
6. Internet Users and International Bandwidth																								
6.1. Internet Users (millions) (2015) – *Total for all countries in this scorecard: 2,330 million*	29	20	120	32	705	55	72	333	56	40	115	45	22	72	26	100	5	28	37	26	41	59	242	49
6.2. Internet Users (% of population) (2015) – *Average for all countries in this scorecard: 67%*	69%	85%	59%	88%	50%	85%	88%	26%	22%	66%	91%	90%	71%	57%	68%	70%	82%	52%	79%	39%	54%	92%	74%	53%
6.3. International Internet Bandwidth (total gigabits per second (Gbps) per country) (2015) – *Total for all countries in this scorecard: 117,736 Gbps*	1,350	1,650	5,250	4,300	4,604	7,153	8,500	1,909	370	3,100	7,411	2,091	743	1,500	2,250	2,800	3,400	4,100	3,900	1,720	2,433	22,000	24,000	1,200
6.4. International Internet Bandwidth (bits per second (bps) per Internet user) (2015) – *Average for all countries in this scorecard: 97,747 bps*	46,145	81,564	43,634	135,496	6,530	129,973	117,540	5,725	6,584	77,322	64,180	46,894	34,119	20,855	86,573	28,113	737,006	147,630	105,006	64,907	59,034	374,554	99,147	24,374
7. Fixed Broadband																								
7.1. Fixed Broadband Subscriptions (millions) (2015) – *Total for all countries in this scorecard: 697 million*	7	7	25	13	277	27	31	17	3	15	39	20	3	15	7	27	1	1	14	6	10	25	101	8
7.2. Fixed Broadband Subscriptions (% of households) (2015) – *Average for all countries in this scorecard: 63%*	59%	75%	42%	96%	71%	100%	79%	7%	4%	63%	83%	104%	48%	53%	53%	52%	118%	11%	84%	32%	54%	92%	82%	41%
7.3. Fixed Broadband Subscriptions (% of population) (2015) – *Average for all countries in this scorecard: 21%*	16%	29%	12%	36%	20%	41%	37%	1%	1%	24%	31%	40%	10%	12%	19%	19%	26%	3%	29%	9%	12%	39%	31%	8%
7.4. Fixed Broadband Subscriptions (% of Internet users) (2015) – *Average for all countries in this scorecard: 29%*	23%	34%	21%	41%	39%	49%	42%	5%	5%	37%	34%	45%	14%	20%	28%	27%	32%	5%	36%	24%	23%	42%	42%	15%
7.5. Average Broadband Data Connection Speed (total megabits per second (Mbps) per country) (Q1 2017) – *Average for all countries in this scorecard: 12 Mbps* – *Average peak for all countries in this scorecard: 70 Mbps*	6	11	7	16	8	11	15	6	7	9	20	29	9	8	13	12	20	7	15	16	8	17	19	10
8. Fiber-to-the-home/building (FttX)																								
8.1. Fiber-to-the-home/building (FttX) Internet Subscriptions (millions) (2015) – *Total for all countries in this scorecard: 258 million*	0.1	0.6	1.3	0.7	166.4	1.4	0.4	0.2	–	0.4	27.9	14.3	1.0	1.5	0.4	18.4	1.0	0.02	3.2	0.9	1.7	5.4	11.1	–
8.2. Proportion of Fiber-to-the-home/building (FttX) Internet Subscriptions (% of households) (2015) – *Average for all countries in this scorecard: 18%*	1%	7%	2%	5%	42%	5%	1%	0.1%	–	2%	59%	74%	16%	5%	3%	36%	79%	0.2%	20%	4%	10%	20%	9%	–
8.3. Proportion of Fiber-to-the-home/building (FttX) Internet Subscriptions (% of fixed broadband subscriptions) (2015) – *Average for all countries in this scorecard: 23%*	2%	9%	5%	5%	60%	5%	1%	1%	–	3%	72%	71%	33%	10%	5%	68%	67%	1%	23%	14%	18%	22%	11%	–
9. Mobile Broadband																								
9.1. Mobile Cellular Subscriptions (millions) (2015) – *Total for all countries in this scorecard: 4,823 million*	62	32	258	30	1292	67	96	1001	338	87	160	59	44	108	55	227	8	88	51	103	74	79	382	122
9.2. Number of Active Mobile Broadband Subscriptions (millions) (2015) – *Total for all countries in this scorecard: 2,506 million*	33	27	180	22	778	49	58	120	108	50	162	55	28	64	22	101	8	36	39	60	39	56	376	36
9.3. Active Mobile Broadband Subscriptions (% of population) (2015) – *Average for all countries in this scorecard: 77%*	78%	113%	89%	61%	56%	75%	71%	9%	42%	82%	128%	110%	91%	51%	57%	71%	143%	67%	83%	89%	51%	88%	115%	39%
9.4. Average Mobile Data Connection Speed (total megabits per second (Mbps) per country) (Q1 2017) – *Average for all countries in this scorecard: 11 Mbps*	5	16	5	10	9	17	24	5	13	12	16	12	4	8	10	10	9	7	14	9	10	26	11	5

IT Readiness (Country Ranking Out of 24)

Highest — Lowest

ABOUT BSA

BSA | The Software Alliance (www.bsa.org) is the leading advocate for the global software industry before governments and in the international marketplace. Its members are among the world's most innovative companies, creating software solutions that spark the economy and improve modern life.

With headquarters in Washington, DC, and operations in more than 60 countries, BSA pioneers compliance programs that promote legal software use and advocates for public policies that foster technology innovation and drive growth in the digital economy.

ABOUT GALEXIA

Galexia (www.galexia.com) is at the forefront of international research and advice in the areas of privacy, identity, cybersecurity and cloud — with a particular focus on global and cross-border legal and regulatory issues. The firm advises national governments, regional and global organizations (ASEAN and the United Nations), and the private sector (particularly ICT, health and financial services). The firm has expertise in the policy complexities that arise for countries and business addressing cross-border issues. Galexia publishes world-leading research publications, including the regular Cloud Scorecards, Cybersecurity Dashboards and reports on identity management, authentication, privacy and cyberlaws. The firm has specialist expertise in data governance, particularly the development and implementation of identity and authentication management systems, Privacy Impact Assessments and Cybersecurity strategies.

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