

COUNTRY: GERMANY

SCORE: 83.95 | RANK: 1/24

Germany provides strong protection for cloud services, through a combination of comprehensive cybercrime legislation as well as an up-to-date cybersecurity strategy. Germany also has modern electronic commerce and electronic signature laws.

Germany has comprehensive privacy legislation, but it includes onerous registration requirements that may act as a cost barrier for the use of cloud computing.

Germany has a strong commitment to international standards and interoperability.

In the area of intellectual property, Germany offers good protection but there are some areas in which improvement could be made including further trade secrets protection.

Germany is making good progress on extending broadband access to the population. Its current target is to ensure that all households have access to broadband with speeds of at least 50 Mbps by the end of 2018.

Although Germany's overall rank has improved since the last Scorecard — from third to first place — this stemmed largely from the rebalancing of the Scorecard methodology. The country's improved scores in the security section of the report also contributed to the increase.

# GERMANY	RESPONSE	EXPLANATORY TEXT
DATA PRIVACY (SCORE: 10.8/12.5 RANK: 3/24)		
1. Is a data protection law or regulation in place?	✓	The main legislation is the Federal Personal Data Protection Act 2001 (Bundesdatenschutzgesetz, BDSG). However, a number of additional Data Protection Acts apply at the state level in Germany. Some sector specific regulations such as the Telemedia Act (Telemediengesetz, TMG) and the Telecommunication Act (Telekommunikationsgesetz, TKG) might apply if services fall into the regulation scope. In April 2017, the German Parliament passed the new BDSG to implement the European General Data Protection Regulation (GDPR) in Germany. The new BDSG will enter into force on May 25, 2018.
2. What is the scope and coverage of the data protection law or regulation?	Comprehensive	Germany has comprehensive privacy laws for both the public and private sector.
3. Is a data protection authority in place?	✓	In Germany, 16 privacy authorities for the private sector exist at the state level — each with a commissioner responsible for one state. A Federal Commissioner has a role in relation to government agencies.
4. What is the nature of the data protection authority?	Sole commissioner	The 16 data protection authorities are listed at <www.bundesdatenschutz.de>. Each is a sole commissioner.
5. Is the data protection authority enforcing the data protection law or regulation in an effective and transparent manner?	✓	Enforcement of the data protection law in Germany can sometimes be complex, as there are numerous commissioners, and issues of jurisdiction and consistency may arise. Overall, there is an active enforcement culture, and a wide range of sanctions and fines are available.
6. Is the data protection law or regulation compatible with globally recognized frameworks that facilitate international data transfers?	EU framework	The Federal Personal Data Protection Act 2001 implements the EU Data Protection Directive in German law.
7. Are data controllers free from registration requirements?	ⓘ	Registration requirements are in place for most data processing. However, in practice exemptions apply where the organization has appointed a registered data protection officer, a requirement for all organizations that employ 10 or more persons in the automated processing of personal data.

# GERMANY	RESPONSE	EXPLANATORY TEXT
8. Are there cross-border data transfer requirements in place?	Detailed requirements	<p>German law follows the usual European practice of allowing all cross-border data transfers within the EU and to countries deemed to have adequate protection by the EU, and then restricting other transfers to certain specific exceptions.</p> <p>As of May 2017, the exceptions include transfers to:</p> <ul style="list-style-type: none"> • The United States made by companies participating in the EU-US Privacy Shield <www.privacyshield.gov>; • Any country based on contractual provisions, e.g., by standard contractual clauses (Model Clauses), approved by the European Commission, or internal rules (Binding Corporate Rules) applicable to data exporters and data importers.
9. Are cross-border data transfers free from arbitrary, unjustifiable, or disproportionate restrictions, such as national or sector-specific data or server localization requirements?	✓	<p>German law recognizes a large number of circumstances in which transfers can be allowed, including reliance on binding corporate rules and standard contractual clauses.</p> <p>In practice, German Data Protection Authorities are some of the most active regulators in enforcing cross-border data transfer requirements.</p> <p>There are no general data localization requirements in place in Germany.</p>
10. Is there a personal data breach notification law or regulation?	📌	<p>Germany has two overlapping data breach notification requirements. Both have significant limitations.</p> <p>Organizations must notify the data protection authority and data subjects if a breach occurs that threatens serious harm to the data subjects' rights or legitimate interests (Section 42a of the Federal Personal Data Protection Act 2001). However, this rule applies only for certain limited categories of data, including data subject to professional secrecy, data relating to criminal or administrative offenses, and bank or credit card accounts data.</p> <p>For some telecommunications and online data, if there is a serious threat to the interests of concerned individuals, data controllers must inform regulatory authorities and the concerned individuals (Telecommunications Act, 2004).</p>
11. Are personal data breach notification requirements transparent, risk-based, and not overly prescriptive?	📌	<p>Germany's data breach notification laws are not comprehensive; however, the requirements will cover most typical breaches that affect consumers (e.g., credit card details).</p> <p>Some organizations may be caught by two overlapping schemes, and this could be avoided if Germany adopted a single, uniform data breach notification requirement.</p>
12. Is an independent private right of action available for breaches of data privacy?	✓	<p>The German Constitution provides "personality rights," which are broadly equivalent to privacy rights. These rights were upheld by the European Court of Human Rights in the high-profile case Von Hannover v. Germany [2004] ECHR 294 <www.bailii.org/eu/cases/ECHR/2004/294.html>.</p>
SECURITY (SCORE: 10.8/12.5 RANK: 2/24)		
1. Is there a national cybersecurity strategy in place?	✓	<p>The Cyber Security Strategy for Germany <bmi.bund.de/cybersicherheitsstrategie> released in November 2016 contains strategic objectives and specific measures to improve cybersecurity.</p>
2. Is the national cybersecurity strategy current, comprehensive, and inclusive?	✓	<p>The Cyber Security Strategy for Germany (November 2016) is a comprehensive revamp of the original 2011 Strategy and contains provision for regular review and revision. Key new elements include expansion of cooperation between the government and private sector and the creation of "mobile teams" for on-site support.</p> <p>It is based around 10 strategic areas:</p> <ol style="list-style-type: none"> (1) Protection of critical information infrastructures; (2) Secure IT systems in Germany; (3) Strengthening IT security in the public administration; (4) National Cyber Response Centre; (5) National Cyber Security Council; (6) Effective crime control also in cyberspace; (7) Effective coordinated action to ensure cybersecurity in Europe and worldwide; (8) Use of reliable and trustworthy information technology; (9) Personnel development in federal authorities; and (10) Tools to respond to cyberattacks. <p><bmi.bund.de/cybersicherheitsstrategie></p>

# GERMANY	RESPONSE	EXPLANATORY TEXT
3. Are there laws or appropriate guidance containing general security requirements for cloud service providers?	✓	<p>The data protection legislation contains some limited security requirements. It states that organizations must implement technical and organizational measures to ensure the security of information. Measures must be “reasonable in relation to the desired level of protection.”</p> <p>In addition, the Act to Increase the Security of Information Technology Systems 2015 contains detailed security requirements that apply to critical infrastructure. The Act also expanded and extended the security requirements in some other laws (e.g., the telecommunications legislation).</p> <p>In April 2017, the German Parliament passed an act in the Implementation of the NIS-Directive. This act brings several amendments to the Act on the Federal Office for Information Security, including new data security and security breach notification obligations for cloud service providers. Compliance with these new obligations will be supervised by the German Federal Office for Information Security, which has the right to impose administrative orders and/or fines against cloud computing providers. The provisions will become binding on May 10, 2018</p>
4. Are laws or guidance on security requirements transparent, risk-based, and not overly prescriptive?	①	Germany is gradually developing more specific and detailed security requirements for organizations through expansion to key legislation and regulations. The requirements are generally transparent and risk-based.
5. Are there laws or appropriate guidance containing specific security audit requirements for cloud service providers that take account of international practice?	①	There are no general security audit requirements in Germany. However, security audit requirements do apply to critical infrastructure providers, as the Act to Increase the Security of Information Technology Systems 2015 introduced a minimum two-year audit requirement. For other organizations, regulators encourage voluntary compliance with national information security audit guidelines.
6. Are international security standards, certification, and testing recognized as meeting local requirements?	✓	<p>Germany is a Certificate Authorizing Member (the highest level) of the Common Criteria Recognition Agreement (CCRA) <www.commoncriteriaportal.org>, and certification requirements in Germany are common.</p> <p>Some German data protection legislation envisages the use of “data protection certificates” for certain products. Under these provisions, the Trusted Cloud Data Protection Profile <www.tcdp.de> has emerged as a new evaluation standard for data protection certification. The program is supported by the German Federal Ministry for Economic Affairs and Energy (BMWi) as part of their Competence Network Trusted Cloud (CNTC) <www.trusted-cloud.de>. The evaluation standard incorporates international standards, including ISO/IEC 27018, ISO/IEC 27017 and ISO/IEC 27002.</p>
CYBERCRIME (SCORE: 11.5/12.5 RANK: 5/24)		
1. Are cybercrime laws or regulations in place?	✓	The German Criminal Code contains comprehensive provisions on computer crime and cybercrime.
2. Are cybercrime laws or regulations consistent with the Budapest Convention on Cybercrime?	✓	Germany ratified the Council of Europe Convention on Cybercrime in 2009.
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?	①	<p>Certain government entities are authorized to request passwords and encryption keys under Section 113 of the Telecommunications Act. However, the inquiries may be used only to identify the person who generated a certain communication or connection at a certain point in time.</p> <p>In 2016 the French and German governments submitted a joint proposal to the European Commission calling for legislation to mandate secure encryption with backdoors for law enforcement access. The local ICT industry has responded with a joint letter opposing the proposal and raising both legal and technical hurdles to requirements for the industry to build vulnerabilities into their security products. It is possible that this issue can only be resolved at the European regional level, rather than in Germany itself, as any German proposals would be subject to oversight by the European court system (e.g., the European Court of Justice can be asked to rule on fundamental rights issues such as privacy and government surveillance).</p>
4. Are arrangements in place for the cross-border exchange of data for law enforcement purposes that are transparent and fair?	✓	<p>Germany is party to numerous Mutual Legal Assistance Treaties (MLATs) and other international agreements for sharing data for law enforcement cooperation, both directly and via European wide agreements.</p> <p>The agreements are up to date and follow international best practice.</p>

# GERMANY	RESPONSE	EXPLANATORY TEXT
INTELLECTUAL PROPERTY RIGHTS (SCORE: 10.3/12.5 RANK: 7/24)		
1. Are copyright laws or regulations in place that are consistent with international standards to protect cloud service providers?	✓	The Urhebergesetz (Copyright Act) has been updated several times, and incorporates international standards. Copyright "safe harbor" protection for intermediaries such as cloud service providers is provided in European Union member countries by Article 14 of the E-commerce Directive. According to this article, an Internet intermediary cannot be held liable unless actual knowledge of infringement or awareness of facts or circumstances from which infringement is apparent exists. However, there are proposals in Europe to weaken these protections; see the Proposal for a Directive of the European Parliament and of the Council on copyright in the Digital Single Market — COM (2016) 593 at <ec.europa.eu/newsroom/dae/document.cfm?doc_id=17200>.
2. Are copyright laws or regulations effectively enforced and implemented?	✓	Germany has strong copyright laws in place and an active enforcement regime, complemented by an efficient court system. An effective intellectual property "safe harbor" has been implemented for cloud service providers.
3. Is there clear legal protection against misappropriation of trade secrets?	📌	Trade Secrets law in Europe is influenced by the Trade Secrets Directive, which was adopted on May 26, 2016, by the European Commission and must be implemented by all Member States by the end of 2018 <ec.europa.eu/growth/industry/intellectual-property/trade-secrets_en>. Until the Directive is fully implemented, plaintiffs can rely on Section 17 of the German Act on Unfair Competition (UWG). This act concentrates on the protection of trade secrets disclosed to employees, but Section 17 is a very broad provision. It covers the unlawful disclosure of trade secrets, general industrial espionage, and unlawful exploitation of trade secrets.
4. Is the law or regulation on trade secrets effectively enforced?	📌	Germany has very limited trade secrets laws in place and cases are rare. It is expected that enforcement will improve significantly once Germany implements the EU Trade Secrets Directive, due to be implemented by the end of 2018.
5. Is there clear legal protection against the circumvention of Technological Protection Measures?	✓	German law contains slightly complex provisions related to technological protection measures, in that German copyright law differs depending on the medium. However, the overall effect is that the development and distribution of circumvention devices is prohibited.
6. Are laws or regulations on the circumvention of Technological Protection Measures effectively enforced?	✓	Germany is the venue for one of the world's highest-profile cases (known as the Nintendo case) on the circumvention of technological protection measures. Nintendo sued a distributor of adapters for playback of illegally copied games on the Nintendo DS console. The adapters bypassed the protective measures implemented by Nintendo. After a complex legal process, including a referral to one point to the European Court of Justice, the case was finally resolved by the Munich Higher Regional Court in favor of Nintendo. This case is indicative of growing enforcement activity in this field, including injunctions and large fines.
7. Are there clear legal protections in place for software-implemented inventions?	📌	Some computer-related inventions have been patented by the German Patent and Trademarks Office <www.dpma.de> on the grounds that they are technical inventions with a clear technical step, and the software is incidental to the invention.
8. Are laws or regulations on the protection of software-implemented inventions effectively implemented?	📌	German court decisions usually reject patents for software-related inventions. The two most common grounds for rejection are that the invention is actually a stand-alone computer program (which cannot be patented) or lack of a specific technical inventive step (because German law ignores purely non-technical features).
STANDARDS AND INTERNATIONAL HARMONIZATION (SCORE: 12/12.5 RANK: 5/24)		
1. Is there a regulatory body responsible for standards development for the country?	✓	The German Institute for Standardization (Deutsches Institut für Normung, DIN) <www.din.de> is contracted by the German government to manage standards development, certification, and accreditation.
2. Are international standards favored over domestic standards?	✓	Germany favors and implements EU standards and international standards in the ICT sector.
3. Does the government participate in international standards setting process?	✓	The German Institute for Standardization (Deutsches Institut für Normung, DIN) <www.din.de> represents Germany on the International Standards Organization (ISO), and Germany is an active participant in the international standards process. Germany is a participant in the top-level ICT standards committee (JTC-1) <www.iso.org/isoiec-jtc-1.html>.
4. Are e-commerce laws or regulations in place?	✓	The Act on Framework Conditions for Electronic Commerce was passed in 2001.

# GERMANY	RESPONSE	EXPLANATORY TEXT
5. What international instruments are the e-commerce laws or regulations based on?	UNCITRAL Model Law on E-Commerce	The Act on Framework Conditions for Electronic Commerce 2001 implements the EU E-Commerce Directive into German law. The EU Directive is largely based on the UNCITRAL Model Law on E-Commerce.
6. Is there a law or regulation that gives electronic signatures clear legal weight?	✓	The Digital Signature Act 2001 sets out the rules for using electronic signatures that will receive the same legal status as handwritten signatures. The act is complemented by the Ordinance on Electronic Signatures 2001, which sets out the rules for establishing certification authorities and minimum technical requirements for digital signatures.
7. Are cloud service providers free from mandatory filtering or censoring?	✓	Plans to introduce mandatory Internet filtering (aimed principally at online child pornography) were abandoned in 2011. Many organizations in Germany also comply with the European Commission Code of Conduct on Countering Illegal Hate Speech Online, 2016. This code requires the rapid removal of extremist content from online platforms < ec.europa.eu/justice/fundamental-rights/files/hate_speech_code_of_conduct_en.pdf >. Germany has strict censorship laws in place relating to specific online content, principally Holocaust denial and related content. These laws are regularly enforced by the state courts.
PROMOTING FREE TRADE (SCORE: 10.5/12.5)		RANK: 2/24
1. Is a national strategy or platform in place to promote the development of cloud services and products?	①	German government policy and strategy provides limited support for cloud computing. The Digital Strategy 2025 promotes cloud computing to a limited extent, with a focus on service providers that offer "trusted cloud offerings based on certified secure solutions," < www.de.digital/DIGITAL/Redaktion/EN/Publikation/digital-strategy-2025.html >.
2. Are there any laws or policies in place that implement technology neutrality in government?	✓	The German Regulation on the Award of Public Contracts (updated in 2009) promotes a technology-neutral approach to all procurement, subject to some limited exceptions.
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?	✓	There are no mandatory product requirements or preferences in place in Germany.
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?	✓	There are no laws in Germany that discriminate based on the nationality of vendors. Germany is a member of the updated World Trade Organization (WTO) plurilateral Agreement on Government Procurement (all European Union members are covered by the EU membership since April 2014).
5. Has the country signed and implemented international agreements that ensure the procurement of cloud services is free from discrimination?	①	Germany is a full member of the WTO plurilateral Agreement on Government Procurement < www.wto.org/english/tratop_e/gproc_e/gp_gpa_e.htm >.
6. Are services delivered by cloud providers free from tariffs and other trade barriers?	✓	There are no relevant tariffs or other barriers in Germany.
7. Are cloud computing services able to operate free from laws or policies that impose data localization requirements?	①	Germany does not have general data localization requirements in place, but some very specific requirements are contained in sectoral laws. For example, Section 113b of the German Telecommunications Act requires providers of publicly available telecommunication services to store traffic data (metadata) in Germany for a certain time. These provisions came into force in July 2017.

# GERMANY	RESPONSE	EXPLANATORY TEXT
IT READINESS, BROADBAND DEPLOYMENT (SCORE: 18.2/25 RANK: 5/24)		
1. Is there a National Broadband Plan?	<p>By 2018:</p> <ul style="list-style-type: none"> All households to have speeds of at least 50 Mbps <p>By 2025:</p> <ul style="list-style-type: none"> A gigabit national FttH optical fiber network enabling multiple Gbps upload and download speeds 	<p>Germany's broadband strategy is set out in Germany's Digital Agenda 2014–2017, which continues to apply until 2018. In 2016 the Federal Ministry for Economic Affairs and Energy (BMWi) launched an updated broadband strategy as part of its Digital Strategy 2025, <www.de.digital/DIGITAL/Redaktion/EN/Publikation/digital-strategy-2025.html>.</p> <p>The updated strategy set the goal of a gigabit optical fiber network enabled by a FttH expansion supporting broadband speeds of "several gigabits per second" for both download and upload speeds.</p> <p>Note: The European Commission has set goals under the Digital Agenda for Europe initiative <ec.europa.eu/digital-agenda/en/broadband-strategy-policy> for European Union-wide broadband coverage with speeds above 30 Mbps by 2020 and for 50% of EU households being subscribed to a broadband service with speeds above 100 Mbps by 2020. In September 2016, the European Commission adopted a strategy on Connectivity for a European Gigabit Society <ec.europa.eu/digital-single-market/en/connectivity-european-gigabit-society> that proposes by 2025 100% of EU households have 100 Mbps speeds and by 2025 gigabit connectivity for schools, transport hubs, providers of public services, and digitally intensive enterprises.</p>
2. Is the National Broadband Plan being effectively implemented?	✔	<p>The Digital Strategy 2025 <www.de.digital/DIGITAL/Redaktion/EN/Publikation/digital-strategy-2025.html> offered a frank assessment of broadband in Germany: "Germany's Internet is not fast.</p> <ul style="list-style-type: none"> Currently, 96% of households have access to LTE networks with at least 2 Mbps, however only 6% have access to 16 Mbps. The average data signalling rate in Germany in the second quarter of 2015 was around 10.7 Mbps, with peak rates ranging at 46.8 Mbps. Only about 15% of Internet access points used in Germany achieved data signalling rates exceeding 15 Mbps. Only 7% of households have access to optical fibre cable, and only a little over 1% of broadband customers use this type of connection Adequate offers for commercial customers, in particular affordable gigabit connections for small- and medium-sized businesses, are often not even available. Only large companies can afford their own optical fibre connection. Other countries are significantly ahead of us in this regard." <p>The Digital Strategy 2025 mandates a range of national and regional funding and implementation measures to achieve a nationwide gigabit optical fibre network by 2025 and requires investment of €100 billion. The expectation in the strategy is that market competition would deliver gigabit network speed in metropolitan areas and an initial investment fund of €10 billion will support development in rural areas.</p> <p>In March 2017 the government announced Netzallianz Digitales Deutschland, a government and private consortium, to roll out the €100 billion network over a 7-year period.</p> <p>The Federal Bureau for Broadband (BBB) <www.breitbandbuero.de> oversees the expansion of Germany's broadband networks. The BBB is part of the Federal Ministry of Transport and Digital Infrastructure <www.bmvi.de>.</p> <p>Germany provides consumers with real-time measurement tools and updated results on a broadband map <breitbandmessung.de>.</p> <p>Additional information about the national broadband strategies and progress is available for each EU member country at the European Commission Digital Single Market portal <ec.europa.eu/digital-single-market/country-information-germany>.</p>

# GERMANY	RESPONSE	EXPLANATORY TEXT
3. Are there laws or policies that regulate "net neutrality"?	Extensive regulation	<p>Germany is subject to wider European Union legislation on net neutrality. Regulation (EU) 2015/2120 of the European Parliament and of the Council was adopted in November 2015, laying down measures concerning open Internet access <eur-lex.europa.eu/legal-content/EN/NOT/?uri=CELEX:32015R2120>. Article 3.3 of the regulation requires providers to treat all data equally, irrespective of content or the applications or services used to deliver it. However, it also states that this does not prevent providers from implementing "reasonable traffic management measures." The law is complemented by implementation guidelines for Net Neutrality issued by the Body of European Regulators for Electronic Communications (BEREC) <berec.europa.eu>.</p> <p>Although Germany is often seen as a critic of net neutrality, in practice they have abided by the European regulation. For example, in December 2014, German Chancellor Angela Merkel made public remarks in support of the concept of an Internet fast lane that would guarantee speeds for "special services" <blogs.wsj.com/digits/2014/12/10/germany-emerges-as-net-neutrality-antagonist>. However, no formal proposals for such a "fast lane" were pursued.</p>
4. Base Indicators		
4.1. Population (millions) (2015) • Total for all countries in this scorecard: 4,700 million	83	<p>In 2015, the population of Germany decreased by -0.1%.</p> <p>[International Telecommunication Union (ITU), World Telecommunication/ ICT Indicators Database (Dec. 2016) <www.itu.int/en/ITU-D/Statistics/Pages/publications/wtid.aspx>]</p>
4.2. Urban Population (%) (2015) • Average for all countries in this scorecard: 73%	75%	<p>In 2015, the urban population of Germany increased by 0.3%.</p> <p>[World Bank, Data Catalog, Indicators, Urban Population (Jan. 2017) <data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS>]</p>
4.3. Number of Households (millions) (2015) • Total for all countries in this scorecard: 1,249 million	39	<p>In 2015, the number of households in Germany decreased by -0.1%.</p> <p>[International Telecommunication Union (ITU), World Telecommunication/ ICT Indicators Database (Dec. 2016) <www.itu.int/en/ITU-D/Statistics/Pages/publications/wtid.aspx>]</p>
4.4. Population Density (people per square km) (2015) • Average for all countries in this scorecard: 471	234	<p>In 2015, the population density of Germany increased by 0.5%.</p> <p>[World Bank, Data Catalog, Indicators, Population Density (Jan. 2017) <data.worldbank.org/indicator/EN.POP.DNST>]</p>
4.5. Per Capita GDP (US\$ 2015) • Average for all countries in this scorecard: US\$ 22,649	\$41,313	<p>In 2015, the per capita GDP for Germany increased by 1.7% to US\$ 41,313. This was above the five-year compound annual growth rate (CAGR) from 2010–2015 of -0.2%.</p> <p>This ranks Germany 6th for value of per capita GDP and 15th for growth (CAGR) for this indicator in this scorecard.</p> <p>[World Bank, Data Catalog, Indicators: GDP Per Capita, Current US\$ (Jan. 2017) <data.worldbank.org/indicator/NY.GDP.PCAP.CD> and GDP Growth, Annual % (Jan. 2017) <data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG>]</p>
4.6. ICT Service Exports (billions of US\$) (2015) • Total for all countries in this scorecard: US\$ 978 billion	\$104	<p>In 2015, the value of ICT service exports for Germany decreased by 8.6% to US\$ 104.45 billion. This was below the five-year compound annual growth rate (CAGR) from 2010–2015 of 4.7%.</p> <p>This ranks Germany 4th for value of ICT service exports and 15th for growth (CAGR) for this indicator in this scorecard.</p> <p>[World Bank, Data Catalog, Indicators: ICT Service Exports US\$ (Jan. 2017) <data.worldbank.org/indicator/BX.GSR.CCIS.CD>]</p>
4.7. Personal Computers (% of households) (2015) • Average for all countries in this scorecard: 63%	91%	<p>In 2015, 91% of households in Germany had personal computers. This is an increase of 0.4% since 2014 and ranks Germany 9th out of 236 countries surveyed. The growth from 2014 is below the five-year compound annual growth rate (CAGR) from 2010 to 2015 of 1.2%.</p> <p>This ranks Germany 1st for the number of personal computers (as a % of households) and 19th for growth (CAGR) for this indicator in this scorecard.</p> <p>[International Telecommunication Union (ITU), World Telecommunication/ ICT Indicators Database (Dec. 2016) <www.itu.int/en/ITU-D/Statistics/Pages/publications/wtid.aspx>]</p>

# GERMANY	RESPONSE	EXPLANATORY TEXT
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	8.31	Germany's ITU ICT Development Index (IDI) for 2016 is 8.31 (out of 10), resulting in a rank of 12th (out of 175 economies). The 2016 IDI for Germany increased by 2.2%, and the IDI ranking improved by 1 from a rank of 13th since 2015. This ranks Germany 4th in the ITU ICT Development Index and 20th for growth (CAGR) for this indicator in this scorecard. [International Telecommunication Union (ITU), Measuring the Information Society (Dec. 2016) < www.itu.int/net4/ITU-D/idi/2016 >]
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	5.55	Germany has a Networked Readiness Index (NRI) score of 5.55 (out of 7), resulting in a rank of 15th (out of 139 economies) and a rank of 13th (out of 32) in the High income: OECD grouping of economies. The 2016 NRI for Germany increased by 0.9% and declined by 2 places from a rank of 13th since 2015. This ranks Germany 7th in the ITU ICT Development Index and 18th for growth (CAGR) for this indicator in this scorecard. [World Economic Forum, Global Information Technology Report (2016) < reports.weforum.org/global-information-technology-report-2016 >]
6. Internet Users and International Bandwidth		
6.1. Internet Users (millions) (2015) Total for all countries in this scorecard: 2,330 million	72	[International Telecommunication Union (ITU), World Telecommunication/ ICT Indicators Database (Dec. 2016) < www.itu.int/en/ITU-D/Statistics/Pages/publications/wtid.aspx >]
6.2. Internet Users (% of population) (2015) • Average for all countries in this scorecard: 67%	88%	In 2015, 88% of the population in Germany used the Internet, resulting in a ranking of 24th out of 236 countries surveyed by the ITU. This is an increase of 1.6% since 2014 and is above the five-year compound annual growth rate (CAGR) from 2010–2015 of 1.3%. This ranks Germany 5th in the proportion of the population using the Internet and 23rd for growth (CAGR) for this indicator in this scorecard. [International Telecommunication Union (ITU), World Telecommunication/ ICT Indicators Database (Dec. 2016) < www.itu.int/en/ITU-D/Statistics/Pages/publications/wtid.aspx >] Note: There may be some variations as to how countries calculate this. Some countries base this upon all or part of the population — such as between 16 and 72 years of age.
6.3. International Internet Bandwidth (total gigabits per second (Gbps) per country) (2015) • Total for all countries in this scorecard: 117,736 Gbps	8,500	Germany has increased its international Internet bandwidth by 15% since 2014 to 8,500 Gbps and is ranked 4 out of 236 countries surveyed by the ITU. The growth from 2014 is above the five-year compound annual growth rate (CAGR) from 2009–2014 of 11.2%. This ranks Germany 3rd for total international Internet bandwidth and 22nd for growth (CAGR) for this indicator in this scorecard. [International Telecommunication Union (ITU), World Telecommunication/ ICT Indicators Database (Dec. 2016) < www.itu.int/en/ITU-D/Statistics/Pages/publications/wtid.aspx >]
6.4. International Internet Bandwidth (bits per second (bps) per Internet user) (2015) • Average for all countries in this scorecard: 97,747 bps	117,540	The international Internet bandwidth (per Internet user) of Germany has increased by 13% since 2014. The growth from 2014 is above the five-year compound annual growth rate (CAGR) from 2010–2015 of 9.9%. This ranks Germany 6th for international Internet bandwidth per user and 19th for growth (CAGR) for this indicator in this scorecard. [International Telecommunication Union (ITU), World Telecommunication/ ICT Indicators Database (Dec. 2016) < www.itu.int/en/ITU-D/Statistics/Pages/publications/wtid.aspx >]
7. Fixed Broadband		
7.1. Fixed Broadband Subscriptions (millions) (2015) • Total for all countries in this scorecard: 697 million	31	Germany has increased the number of fixed broadband subscribers by 4% since 2014 to 30.71 million, and is ranked 4th out of 236 countries surveyed by the ITU. The growth from 2014 is close to the five-year compound annual growth rate (CAGR) from 2010–2015 of 3.3%. This ranks Germany 4th for the number of fixed broadband subscriptions and 20th for growth (CAGR) for this indicator in this scorecard. [International Telecommunication Union (ITU), World Telecommunication/ ICT Indicators Database (Dec. 2016) < www.itu.int/en/ITU-D/Statistics/Pages/publications/wtid.aspx >]

# GERMANY	RESPONSE	EXPLANATORY TEXT
7.2. Fixed Broadband Subscriptions (% of households) (2015) • Average for all countries in this scorecard: 63%	79%	[International Telecommunication Union (ITU), World Telecommunication/ ICT Indicators Database (Dec. 2016) < www.itu.int/en/ITU-D/Statistics/Pages/publications/wtid.aspx >] Note: This may be skewed by business usage in some countries.
7.3. Fixed Broadband Subscriptions (% of population) (2015) • Average for all countries in this scorecard: 21%	37%	Germany has increased its fixed broadband subscriptions (as a % of the population) by 4% since 2014, which is above the five-year compound annual growth rate (CAGR) from 2010–2015 of 3.4%. This ranks Germany 17th out of 236 countries surveyed by the ITU. This ranks Germany 4th for the number of fixed broadband subscriptions (as a % of the population) and 16th for growth (CAGR) for this indicator in this scorecard. [International Telecommunication Union (ITU), World Telecommunication/ ICT Indicators Database (Dec. 2016) < www.itu.int/en/ITU-D/Statistics/Pages/publications/wtid.aspx >] The Organisation for Economic Co-operation and Development (OECD) figures below present a breakdown of the type of fixed broadband connections in Germany as of June 2016. In the OECD, Germany was ranked 11th (out of 35) for fixed broadband subscribers as a percentage of population [OECD Broadband Subscribers (Feb. 2017) < www.oecd.org/sti/broadband >] • DSL: 29.2% • Cable: 8.5% (Note: In Germany, cable includes HFC lines) • Fiber/LAN: 0.6% (Note: In Germany, fiber includes fiber lines provided by cable operators) • Satellite: 0% • Fixed wireless: 0% Total: 38.5% (31.4 million subscriptions), which is above the OECD average for June 2016 of 29.8%. Germany has increased the number of DSL connections (which is against the trend of other OECD countries) as well as increasing cable and fiber connections. The fixed broadband growth for the June 2015–2016 period was 2.98% (ranked 19 out of 35 for growth), below the OECD average growth of 3.42%. In Germany, fiber makes up 1.6% of fixed broadband subscriptions (ranked 30 out of 35), significantly below the OECD average of 20.1%. Note: In Germany fiber connections are provided by some cable operators as HFC FTTC lines. The growth in fiber subscriptions for the June 2015–2016 period was 32% (ranking Germany 12 out of 35 for growth) and above the OECD average of 15.94%. Note: From July 2015 OECD adjusted its definitions of fixed and mobile broadband by transferring the categories Satellite and Fixed Wireless from Mobile to Fixed Broadband. Note: Fiber subscriptions data includes FttH, FttP, and FttB, and excludes FTTC. Note: There may be minor variations in the ITU and OECD subscriber totals due to definition or timing differences.
7.4. Fixed Broadband Subscriptions (% of Internet users) (2015) • Average for all countries in this scorecard: 29%	42%	[International Telecommunication Union (ITU), World Telecommunication/ ICT Indicators Database (Dec. 2016) < www.itu.int/en/ITU-D/Statistics/Pages/publications/wtid.aspx >]
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	15	In Germany the Q1 2017 average broadband data connection speed was 15.3 Mbps and is ranked 29th out of 239 countries measured by Akamai. This ranks Germany 9th for average broadband data connection speed in this scorecard. Additional connection metrics for Q1 2017 in Germany include: • Average peak broadband connection speed: 65.56 Mbps (ranked 50th globally and 12th in this scorecard) • Above 4 Mbps: 90% (ranked 41st globally and 8th in this scorecard) • Above 10 Mbps: 53% (ranked 38th globally and 9th in this scorecard) • Above 15 Mbps: 34% (ranked 30th globally and 9th in this scorecard) • Above 25 Mbps: 14% (ranked 25th globally and 8th in this scorecard) [Akamai, The State of the Internet (1st Quarter, 2017) < www.akamai.com/us/en/about/our-thinking/state-of-the-internet-report/ >]

# GERMANY	RESPONSE	EXPLANATORY TEXT
8. Fiber-to-the-home/building (FttX)		
8.1. Fiber-to-the-home/building (FttX) Internet Subscriptions (millions) (2015) <ul style="list-style-type: none"> Total for all countries in this scorecard: 258 million 	0.4	Germany has increased the number of FttX subscribers by 30% since 2014 to 0.449 million, and is ranked 33rd out of 236 countries surveyed by the ITU. This ranks Germany 17th for the number of FttX subscriptions and 12th for growth (from 2014) for this indicator in this scorecard. [International Telecommunication Union (ITU), World Telecommunication/ ICT Indicators Database (Dec. 2016) < www.itu.int/en/ITU-D/Statistics/Pages/publications/wtid.aspx >]
8.2. Proportion of Fiber-to-the-home/building (FttX) Internet Subscriptions (% of households) (2015) <ul style="list-style-type: none"> Average for all countries in this scorecard: 18% 	1.2%	Germany has increased the proportion of FttX subscribers to households by 30% (since 2014) to 1.15%. This ranks Germany 19th for the proportion of FttX subscriptions to households and 12th for growth (from 2014) for this indicator in this scorecard. [International Telecommunication Union (ITU), World Telecommunication/ ICT Indicators Database (Dec. 2016) < www.itu.int/en/ITU-D/Statistics/Pages/publications/wtid.aspx >] Note: This may be skewed by business usage in some countries.
8.3. Proportion of Fiber-to-the-home/building (FttX) Internet Subscriptions (% of fixed broadband subscriptions) (2015) <ul style="list-style-type: none"> Average for all countries in this scorecard: 23% 	1.5%	Germany has increased the proportion of FttX subscribers to fixed broadband subscribers by 30% (since 2014) to 1.46%. This ranks Germany 20th for the proportion of FttX subscriptions to fixed broadband subscriptions and 12th for growth (from 2014) for this indicator in this scorecard. [International Telecommunication Union (ITU), World Telecommunication/ ICT Indicators Database (Dec. 2016) < www.itu.int/en/ITU-D/Statistics/Pages/publications/wtid.aspx >]
9. Mobile Broadband		
9.1. Mobile Cellular Subscriptions (millions) (2015) <ul style="list-style-type: none"> Total for all countries in this scorecard: 4,823 million 	96	In 2015, Germany decreased the number of mobile cellular subscriptions by -3.2% since 2014, which is below the five-year compound annual growth rate (CAGR) from 2010–2015 of 1.7%. Germany is ranked 15th out of 236 countries surveyed by the ITU. The number of subscriptions account for 117% of the population. This ranks Germany 11th for the number of mobile cellular subscriptions and 19th for growth (CAGR) for this indicator in this scorecard. [International Telecommunication Union (ITU), World Telecommunication/ ICT Indicators Database (Dec. 2016) < www.itu.int/en/ITU-D/Statistics/Pages/publications/wtid.aspx >] Note: This figure may be inflated due to multiple subscriptions per head of population, but excludes dedicated mobile broadband devices (such as 3G data cards, tablets, etc.).
9.2. Number of Active Mobile Broadband Subscriptions (millions) (2015) <ul style="list-style-type: none"> Total for all countries in this scorecard: 2,506 million 	58	In 2015, Germany has increased the number of active mobile broadband subscriptions by 11%, which is below the five-year compound annual growth rate (CAGR) from 2010–2015 of 22.5%. Germany is ranked 10th out of 236 countries surveyed by the ITU. This ranks Germany 10th for the number of active mobile broadband subscriptions and 12th for growth (CAGR) for this indicator in this scorecard. [International Telecommunication Union (ITU), World Telecommunication/ ICT Indicators Database (Dec. 2016) < www.itu.int/en/ITU-D/Statistics/Pages/publications/wtid.aspx >]

# GERMANY	RESPONSE	EXPLANATORY TEXT
<p>9.3. Active Mobile Broadband Subscriptions (% of population) (2015)</p> <ul style="list-style-type: none"> Average for all countries in this scorecard: 77% 	71%	<p>Germany has increased the number of active mobile broadband subscriptions (as a % of the population) by 11% since 2014, which is below the five-year compound annual growth rate (CAGR) from 2010–2015 of 22.6%. Germany is ranked 48th out of 236 countries surveyed by the ITU.</p> <p>This ranks Germany 15th for the number of active mobile broadband subscriptions (as a % of the population) and 12th for growth (CAGR) for this indicator in this scorecard.</p> <p>[International Telecommunication Union (ITU), World Telecommunication/ ICT Indicators Database (Dec. 2016) <www.itu.int/en/ITU-D/Statistics/Pages/publications/wtid.aspx>]</p> <p>Note: This refers to the sum of standard mobile broadband and dedicated mobile broadband subscriptions to the public Internet. It covers actual subscribers, not potential subscribers, even though the latter may have broadband enabled-handsets.</p> <p>The Organisation for Economic Co-operation and Development (OECD) figures below present a breakdown of the type of mobile broadband connections in Germany as of June 2016.</p> <p>In the OECD, Germany was ranked 24th (out of 35) for mobile wireless broadband subscribers as a percentage of population [OECD Broadband Subscribers (Feb. 2017) <www.oecd.org/sti/broadband>]:</p> <ul style="list-style-type: none"> Standard mobile broadband subscriptions: 37.6% Dedicated mobile data subscriptions: 36.2% <p>Total: 73.8% (60.2 million subscriptions), which is below the OECD average for June 2016 of 95.1%.</p> <p>Mobile broadband growth in Germany for the June 2015–2016 period was 10.95% (ranked 15 out of 35 for growth), just above the OECD average growth of 10.7%.</p> <p>Note: From July 2015 OECD adjusted its definitions of fixed and mobile broadband by transferring the categories Satellite and Fixed Wireless from Mobile to Fixed Broadband.</p> <p>Note: The OECD wireless broadband figure includes both data and voice subscriptions (referred to as Standard Mobile Broadband) and data-only subscriptions (referred to as Dedicated Mobile Data).</p> <p>Note: The OECD figures include mobile data subscriptions, which are not as consistently reported in the ITU indicators.</p>
<p>9.4. Average Mobile Data Connection Speed (total megabits per second (Mbps) per country) (Q1 2017)</p> <ul style="list-style-type: none"> Average for all countries in this scorecard: 11 Mbps 	24	<p>In Germany the Q1 2017 average mobile data connection speed was 24.1 Mbps and is ranked 3rd out of 70 countries measured by Akamai.</p> <p>This ranks Germany 2nd for average mobile data connection speed in this scorecard.</p> <p>[Akamai, The State of the Internet (1st Quarter, 2017) <www.akamai.com/us/en/about/our-thinking/state-of-the-internet-report/>]</p>