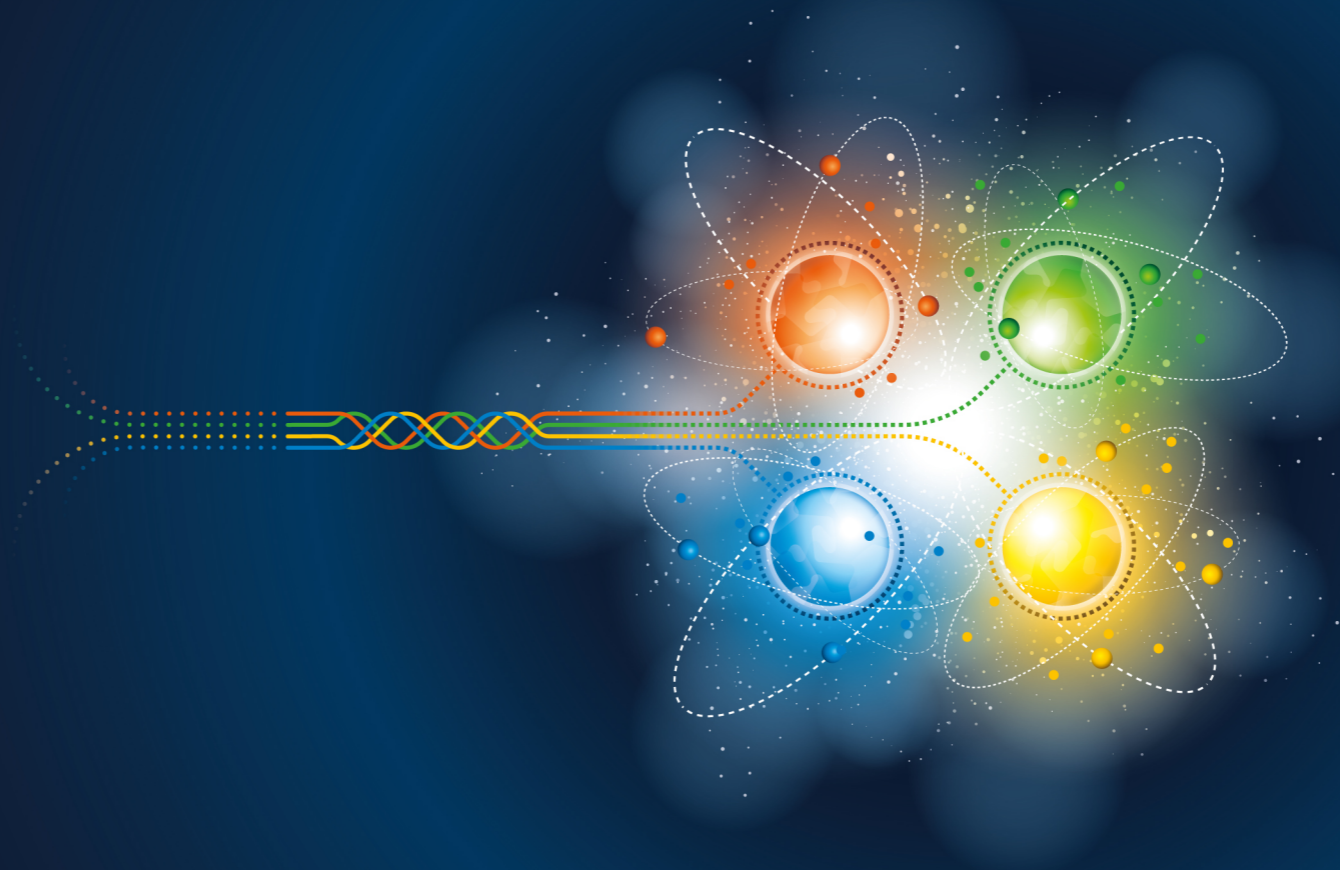


The responsible public cloud





Digital perseverance

We are entering a new era where every organization will become a digital organization, and every nation will become a digital nation. In this era digital technology will be the key input that powers the world's economic output.

We live in turbulent times full of promise and peril. The world now stands at the crossroads of momentous change: geopolitical, economic, social, and technological. This places us at an historic intersection where tremendous opportunity is matched by an equally great responsibility towards the world around us. While no organization or nation can ever be 100% resilient in the face of adversity, those who persevere on the road to digital transformation will be more resilient than those who do not.

One of the greatest measures of progress for the nearly eight billion humans living on the Earth today is economic growth, the kind of strong and sustained growth that will lift every person on the planet out of poverty, that will bring equitably distributed wealth to every nation and every group, while protecting our environment and fundamental human rights.

Ubiquitous digital technologies—the cloud, AI, big data, modern networks, the digitization of every experience and business process—will provide the keys to delivering that growth. At Microsoft we see our fundamental job as providing the platforms and tools—the digital factors of production—that allow others to grow and prosper. That is our ambition and the reason why, in the face of the many challenges of today's world, we choose the path of digital perseverance.





Our vision for a responsible public cloud



Brad Smith
President &
Vice-Chair



Judson Althoff
Executive Vice President &
Chief Commercial Officer

Today every organization must become a digital organization to grow and prosper. This is why nations around the world are focusing on the cloud, both for its potential to spur equitable economic growth and as a powerful, possibly unsettling force that requires close scrutiny. As a cloud provider with a leading global presence we know that we must continually earn the trust and confidence of those we serve.

We also know that investment is the key to achieving growth. We are investing in technologies in every area, from hybrid work and resilient supply chains to AI and 5G, from the Internet of Things and digital twins to the metaverse. Our unvarying goal is to help organizations achieve their goals in the face of new and often unprecedented conditions.

The scale and breadth of capabilities of the cloud present responsibilities that we are committed to meet. This document presents our vision and our work across the four principles shown on the right that we believe should define the civic role of a public cloud like ours.

A responsible public cloud is one that strives to apply these four principles in its products, its culture, and its business practices. We firmly believe that such a cloud has much to offer the world. For that reason we are more optimistic than ever about the digital road ahead.

Our four principles:



1. The cloud must be an engine for inclusive economic prosperity. It should drive economic growth in every country where it operates.



2. The cloud must be worthy of trust. It must be secure and must respect both privacy and sovereignty.



3. The cloud must protect the fundamental rights of all people, especially those who have historically been excluded.



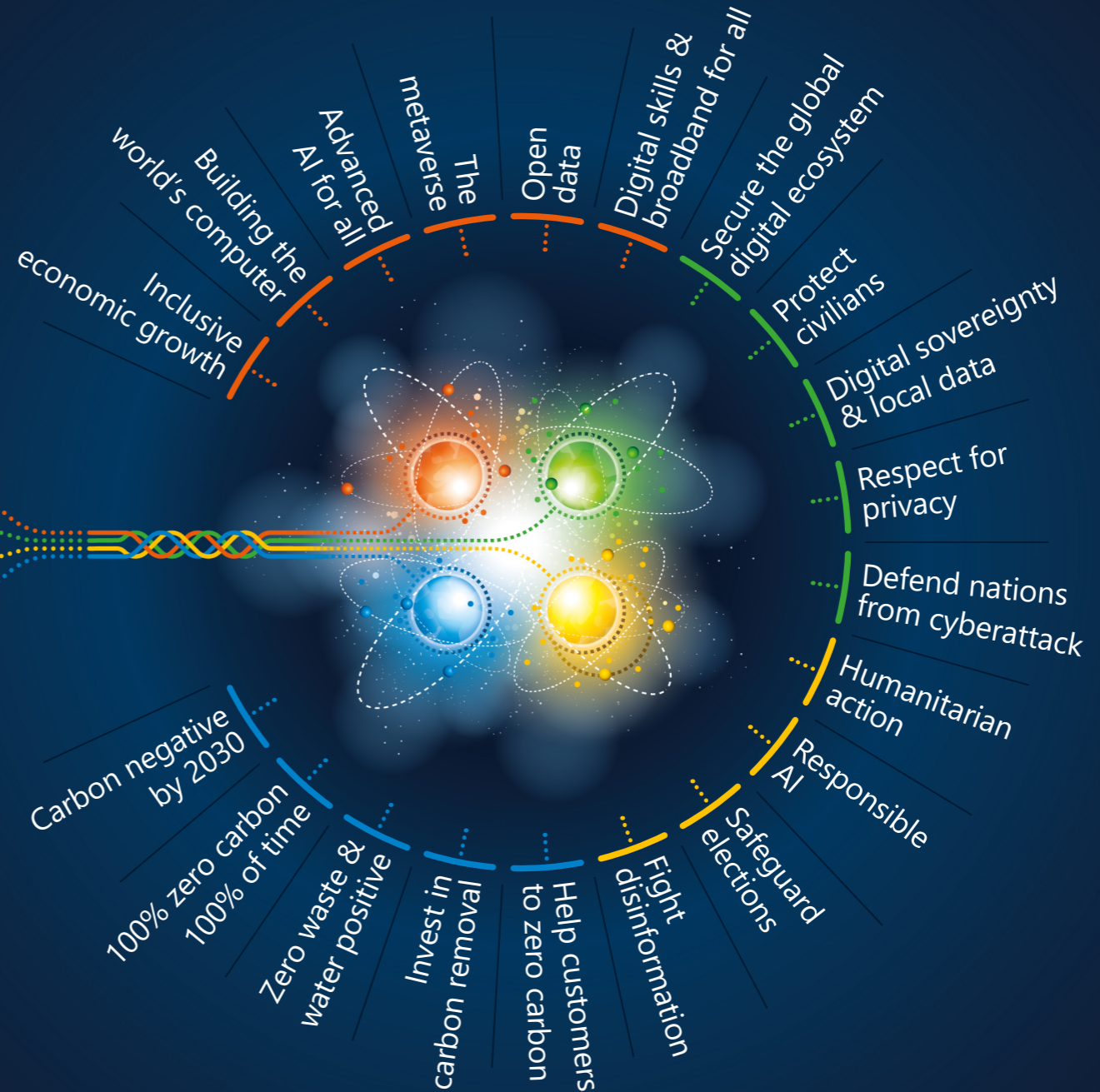
4. The cloud must be environmentally sustainable. It must help move the world to a net zero carbon economy by 2050.



The building blocks of the responsible public cloud

-  **Inclusive economic opportunity**
-  **Earning trust**
-  **Protecting fundamental rights**
-  **Building a sustainable future**

A responsible public cloud offers economic growth for every nation, community, organization, and person, uses its resources to defend the global digital ecosystem, respects privacy and sovereignty, protects democratic values and human rights, and contributes to a sustainable future.





Inclusive economic opportunity



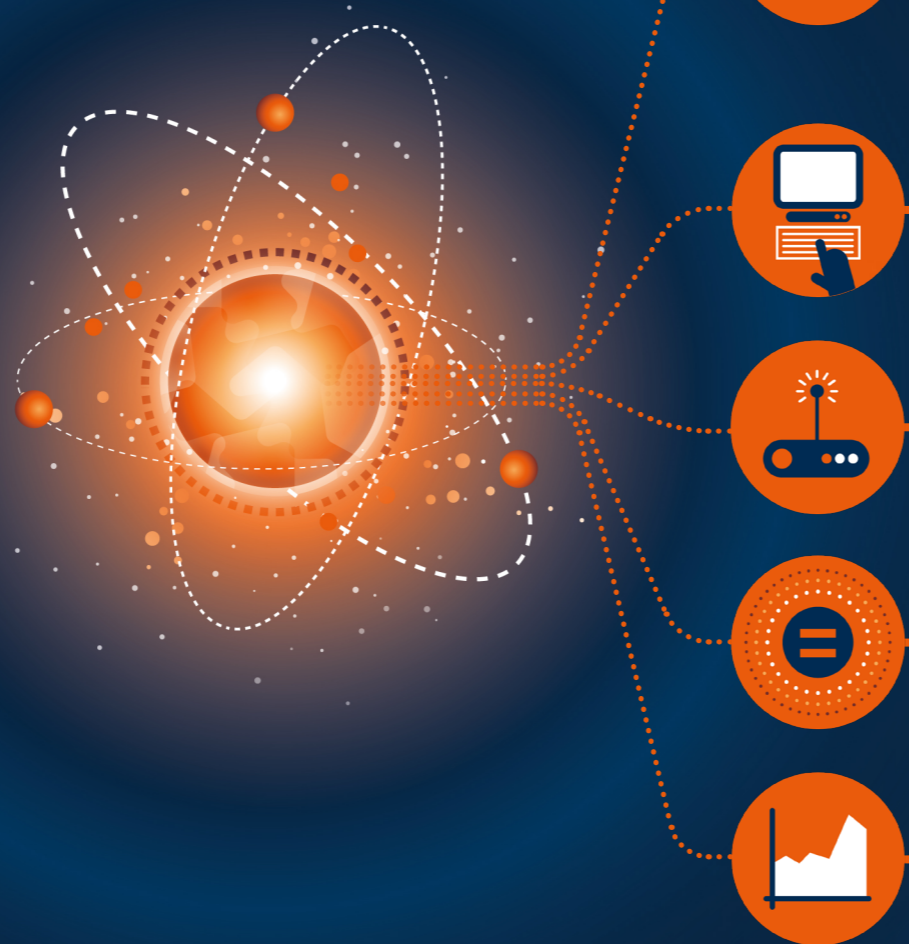


What we stand for

The cloud must be an engine for strong economic growth for everyone on the planet. Its benefits must reach every country, every community, every organization, every person—especially the groups who have been marginalized in the past.

Such a cloud is designed and operated as an open platform that brings digital transformation to every organization, whatever its size and sector of activity, whether it is a business, a government body, or a non-profit.

This is Microsoft's ambition and our highest commitment.



Aim for inclusive 5% world GDP growth

Strong and sustainable economic growth is the only way to lift the world's poor and marginalized out of poverty. We must have the courage to aim for 5% GDP growth. Technology will be critical to achieving that.

Make tech skills accessible to all

Inclusive economic growth starts with ensuring that everyone has access to the technology and skills needed to succeed in a digital economy.

Deliver universal broadband

Digital transformation cannot happen without Internet access, but billions in the world still lack affordable broadband.

Close the disability divide

More than one billion people live with disabilities, but there will be no limit to what they can achieve when technology matches their diversity of talents.

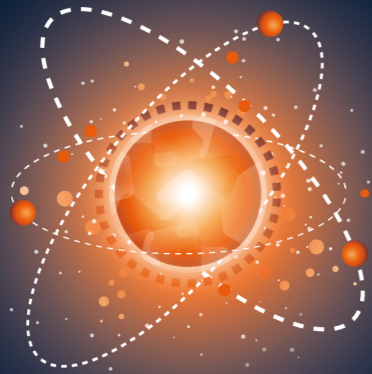
Open the world's data

Data is vital for growth, but access to data remains a daunting challenge. Let's work together to make the world's data as open as possible.



Key facts

The public cloud drives economic growth and digital transformation in every region of the world



Cloud could create USD 1 trillion per year in value for top 500 U.S. firms by 2030
(McKinsey)

Cloud use by EU SMBs growing 3 times as fast as GDP
(Eurostat)

Digital tech will add €2.2 trillion to EU GDP 2020 to 2030
(European Commission)

Cloud will contribute USD 90 to 130 billion to India's GDP from 2019 to 2023
(Boston Consulting Group)

Cloud will add USD 160 billion to Asia Pacific economy 2020 to 2024
(Deloitte)

AI could add USD 13 trillion to world economy by 2030
(McKinsey)

Over half of enterprise IT spending shifts to public cloud by 2025
(Gartner)

Digitalization of public services could add 5.7% to Latin America's GDP by 2030
(Inter-American Development Bank)

4th Industrial Revolution & digitization will transform Africa into a global powerhouse
(Brookings)

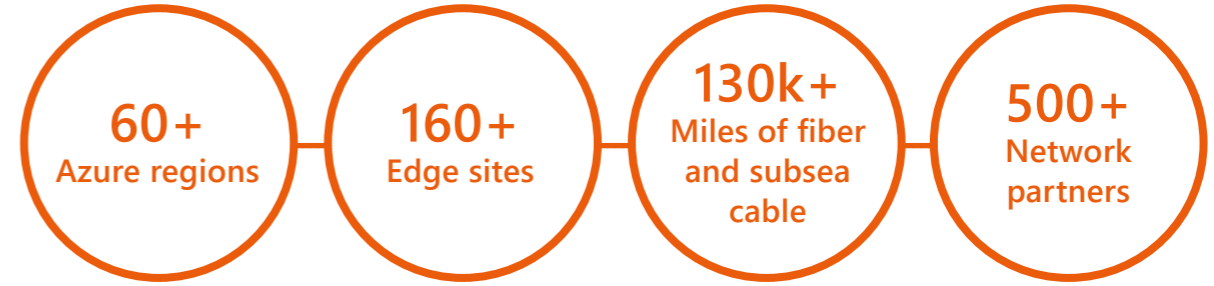
AI could contribute USD 320 billion to the Middle East economy by 2030
(PwC)

Microsoft's global partner ecosystem creates over USD 1 trillion in annual revenue for our 400,000 partners & their 17 million employees



The world's computer

We are building a cloud that respects digital sovereignty by combining global reach with local control



Microsoft cloud datacenters in operation or announced as of April 2022

Americas

- Brazil
- Canada
- Chile
- Mexico
- United States

Middle East & Africa

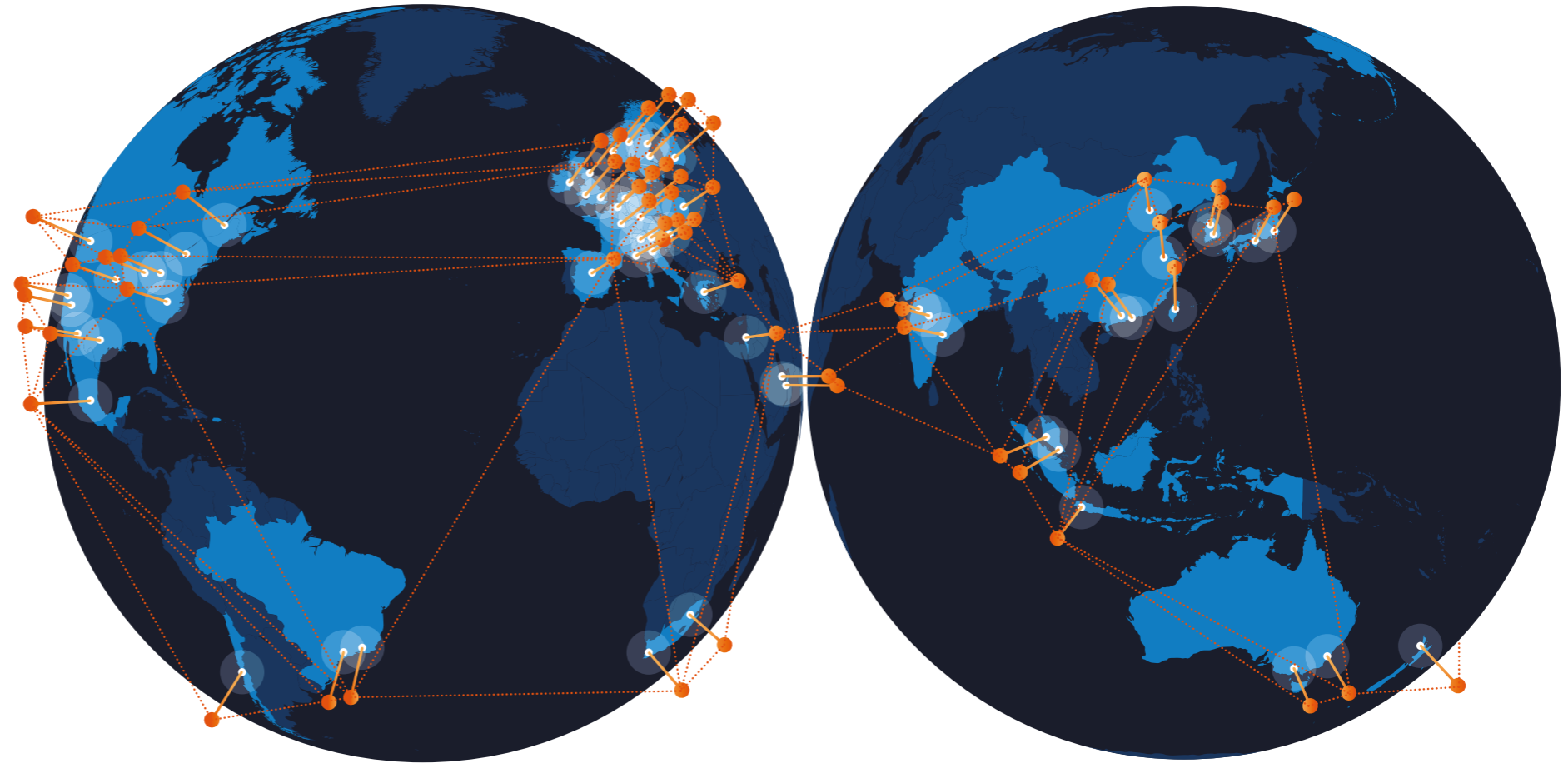
- Israel
- Qatar
- South Africa
- United Arab Emirates

Europe

- Austria
- Belgium
- Denmark
- Finland
- France
- Germany
- Greece
- Ireland
- Italy
- Netherlands
- Norway
- Poland
- Spain
- Sweden
- Switzerland
- United Kingdom

Asia-Pacific

- Australia
- China
- Hong Kong
- India
- Indonesia
- Japan
- Malaysia
- New Zealand
- Singapore
- South Korea
- Taiwan





Growth for all

Microsoft is striving to ensure that our cloud offers the benefits of growth to everyone on the planet

Tech skills for all

Our global skills initiative has helped over 40 million people learn new skills and pursue in-demand roles in the digital economy. We are committed to helping tens of millions more in the years to come. In 2021 we helped 250,000 companies make skills-based hires. We have just launched a cybersecurity skilling campaign in 24 countries with special emphasis on bringing women and historically excluded groups into the cybersecurity workforce.

Social entrepreneurship

Our Entrepreneurship for Positive Impact program offers qualified startups in 140 countries access to technology, education, customers, and grants for projects that use technology to meet important social or environmental challenges.

Closing the disability divide

We're expanding our work on accessibility with a new five-year commitment to spur the development of accessible technology, expand opportunities for people with disabilities, and build a more inclusive workplace.

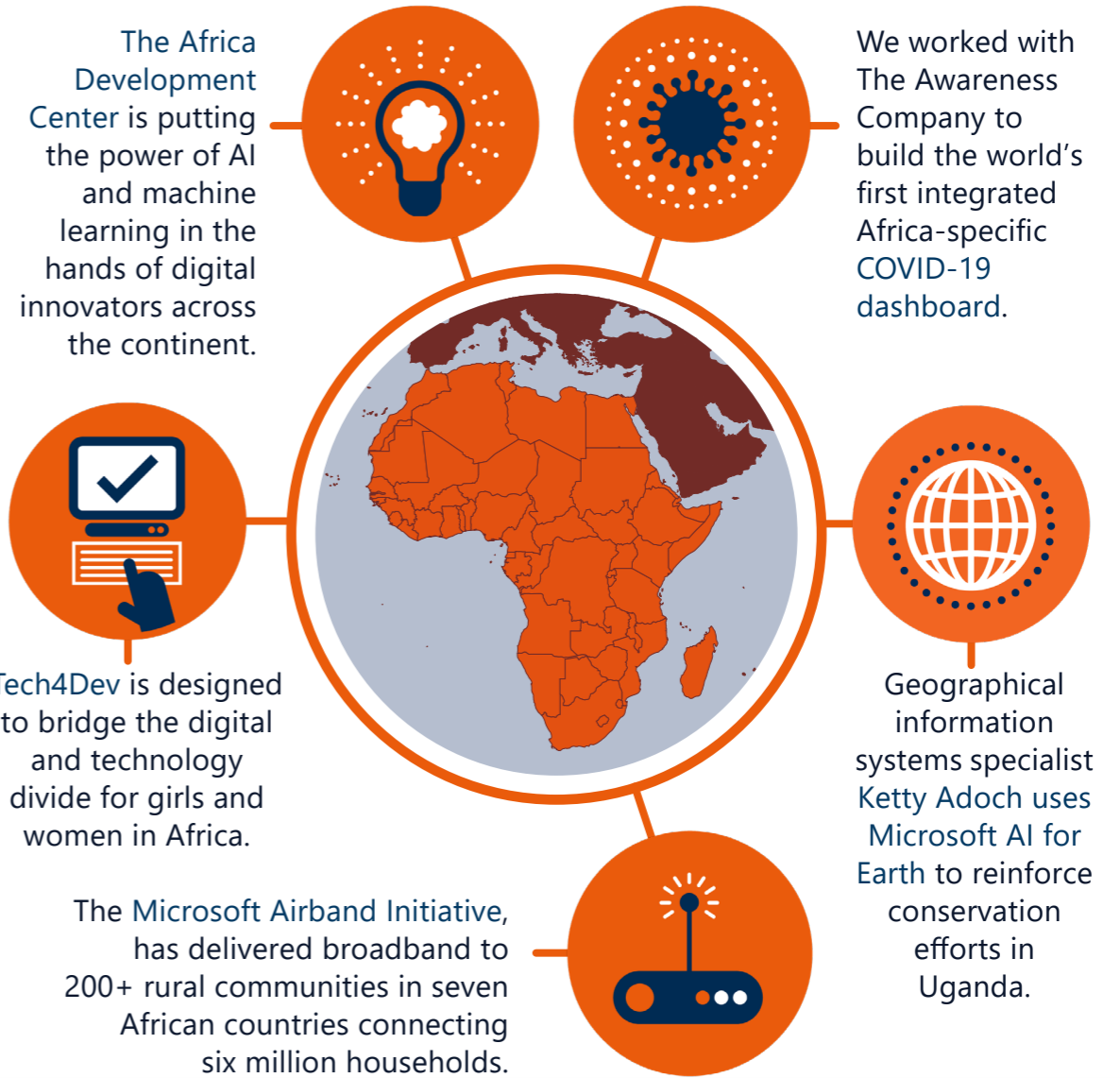
Closing the broadband gap

Since 2017, we've helped more than 33 million people in underserved communities get affordable broadband. We pledge to redouble our efforts.

Making data as open as possible

In addition to developing cloud-based tools to enable data set sharing, we're working with nonprofits, universities, and governments to establish a broad range of open data collaborations that address key social and business challenges.

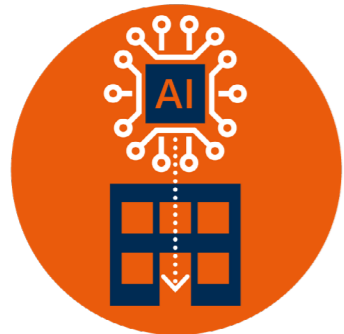
The cloud is bringing digital transformation to Africa





What the cloud can achieve

Here are some examples of how the Microsoft public cloud is making the world's most advanced technologies available to organizations of all sizes



An AI supercomputer for every SMB

AI that can understand the world and help humans perform complex tasks needs extraordinary compute power. The cloud makes this power affordable for all.



Smart cities & smart infrastructure with 5G

Computing at the edge of the cloud combined with low latency 5G networks will make smart cities and infrastructure a reality.



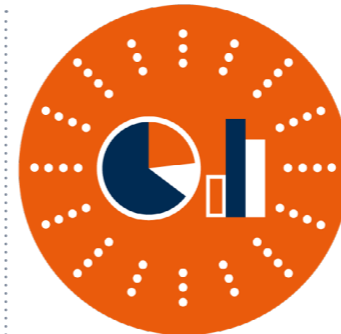
Internet of Things

The Internet of Things will embed billions of smart devices in the fabric of civilization, in its factories and infrastructures, and in our daily lives.



The metaverse

AI, augmented reality, and digital twins powered by the public cloud will bring the metaverse to the world's manufacturing and logistics industries.



The power of big & open data

By 2025 humanity's store of digital data will equal 100 copies of Wikipedia for everyone on Earth. Data is the lifeblood of digital transformation and should be as open as possible.



Collaboration and remote work

Remote work and collaboration for billions of users helped the world navigate the Covid pandemic with far less economic damage than would have occurred in previous epochs.



Low-code lets everyone create software

Low-code tools for software development aided by AI make it possible for non-programmers to create and customize applications of remarkable power.



Internet use is growing but access remains profoundly unequal

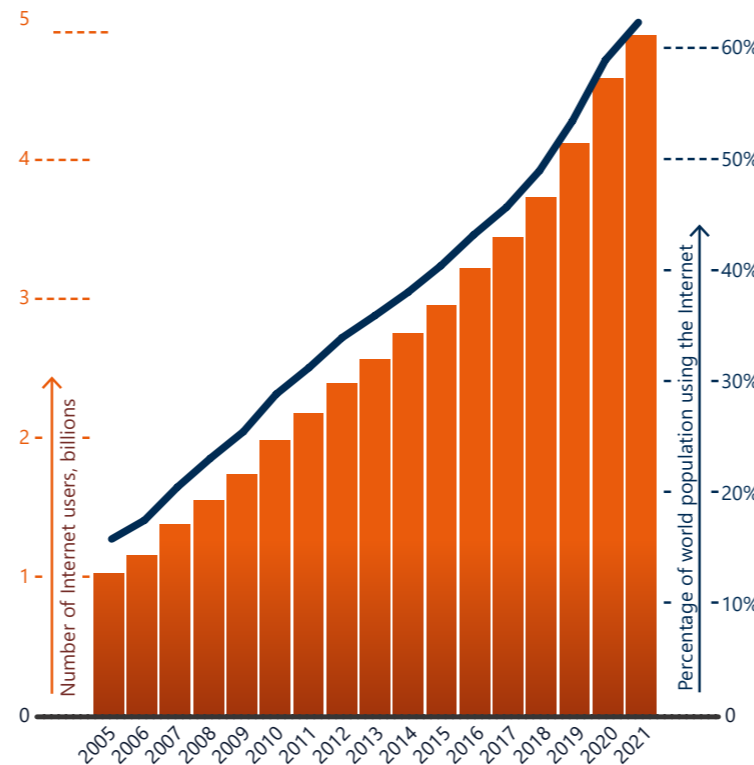
Much progress has been made, but Internet access remains profoundly unequal

As data from the UN's International Telecommunications Union (ITU) shows, the number of people using the Internet has soared in recent years, rising from one billion in 2005 to nearly five billion in 2021.

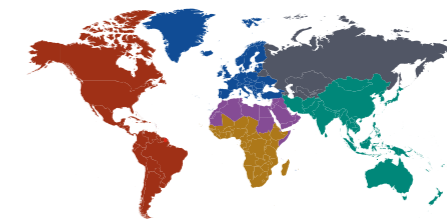
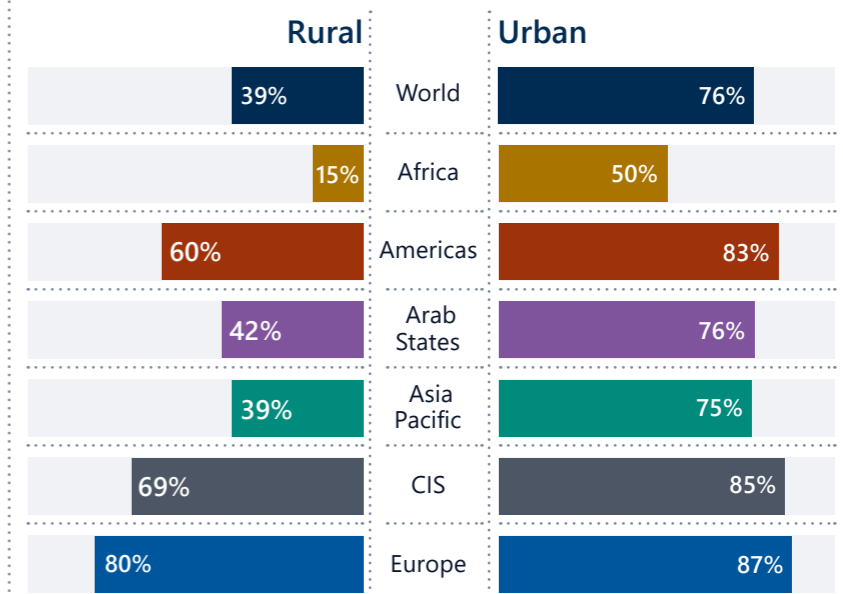
Internet uptake has even accelerated in the last two years, suggesting that the pandemic has increased the importance of technology in the daily lives of many. But the ITU also reports that 37% of the world's population, or 2.9 billion people, still remain offline and disconnected from the promise of the digital revolution. Of these, 96% live in developing countries. Some 390 million people are not even covered by a mobile broadband signal.

Disparities in Internet usage among the world's regions remain very large and concerning. The ITU reports that only 15% of rural Africans were using the Internet in 2020 compared to 80% of the rural population in Western Europe.

Individuals using the Internet



Percentage of individuals using the Internet by location, 2020





Our cloud at work

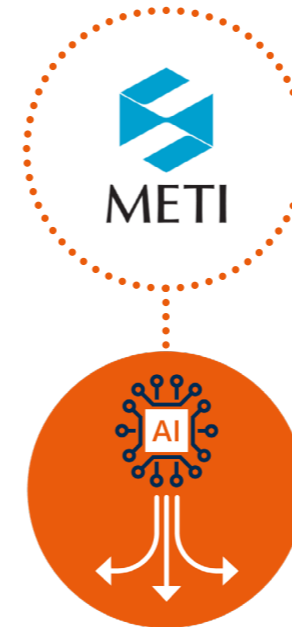
The responsible public cloud helps organizations use technology to solve strategic problems in new ways



AT&T is moving its 5G network to the cloud

AT&T is the world's largest telecommunications company and the largest provider of mobile telephone services in the United States. Like most of its peers around the world, it is currently undertaking a massive migration of its network to 5G. To increase its ability to deploy new applications quickly while reducing its costs, AT&T has decided to migrate key components of its core and edge 5G networks to Microsoft's cloud using the Azure for Operators offering.

In densely populated urban areas or on sprawling industrial campuses, enterprises want to deploy cloud-based applications that can respond to local conditions in near real-time. This is made possible by the marriage of highly scalable cloud services with 5G infrastructure to deliver low-latency edge computing. Today all over the world innovative enterprise customers are working with their 5G network providers to explore the many possibilities of powerful software applications deployed at the network's edge.



Digital transformation at Japan's METI

Japan's Ministry of Economy, Trade and Industry has long been known as one of the most influential government agencies of its kind in the world. Part of METI's mission is to pilot the digital transformation of Japanese industry, but it is also engaged in the digital transformation of its own processes.

To streamline its work and make itself more efficient, METI is building an online administrative procedure platform with Microsoft Power Platform. Creating new apps for each of thousands of procedures using traditional software development methods would be an impossible task, so METI's IT team decided to try a "low-code" approach, which puts AI-assisted software creation tools in the hands of users themselves. One early app developed by this method had over 500,000 small businesses register to use it within a few months of launch.



Policy measures to promote an inclusive economy

Policymakers and regulators can take many steps to ensure that the benefits of the cloud reach all members of society, including groups that have historically been excluded



Encourage open data

Non-private data should be as widely available as possible. Governments should publish public sector data for research and private sector innovation.



Focus on accessibility

Adopt globally accepted standards that encourage innovative accessible technology. Incorporate accessibility standards such as ETSI EN 301 549 into government procurement.



Help the developing world

Development finance agencies such as USAID, DFC, World Bank, and IFC should target funding for digital transformation and workforce development projects.



Pursue international consensus on digital trade and standards

Agreements on digital trade and on fairness and non-discrimination in standard settings will offer powerful stimulus to global economic growth.



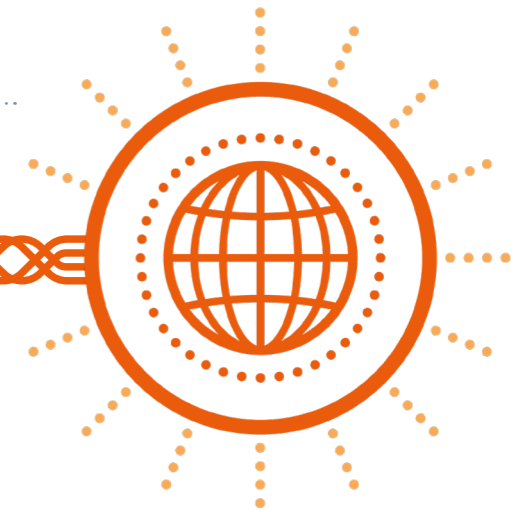
Bring affordable broadband Internet access to all

Close the broadband gap for underserved communities, especially rural populations in low and middle income countries. Close the Internet usage gap between men and women.



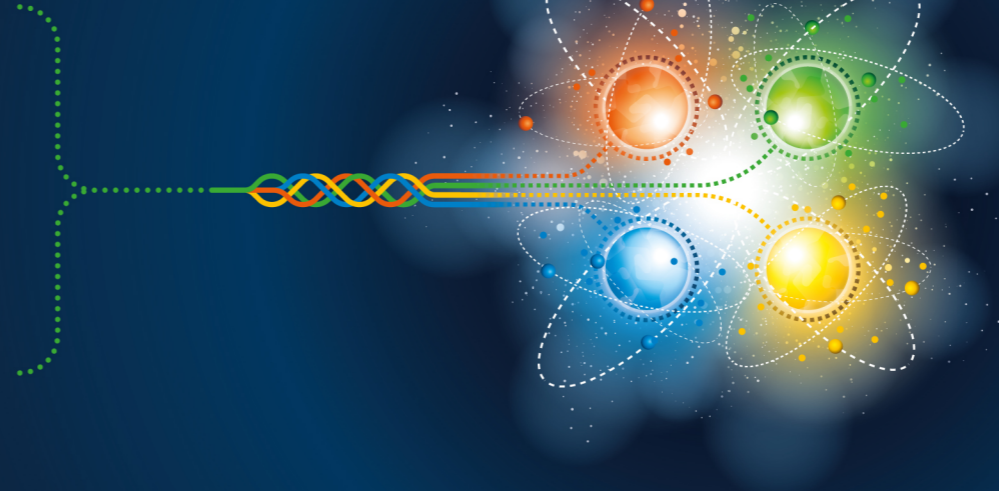
Make it easier for everyone to acquire tech skills

Help people gain tech skills by increasing funding for workforce training programs. Encourage employers to upskill employees and hire from non-traditional backgrounds. Help job seekers and employers identify in-demand skills by encouraging interoperable learning records.





Earning trust

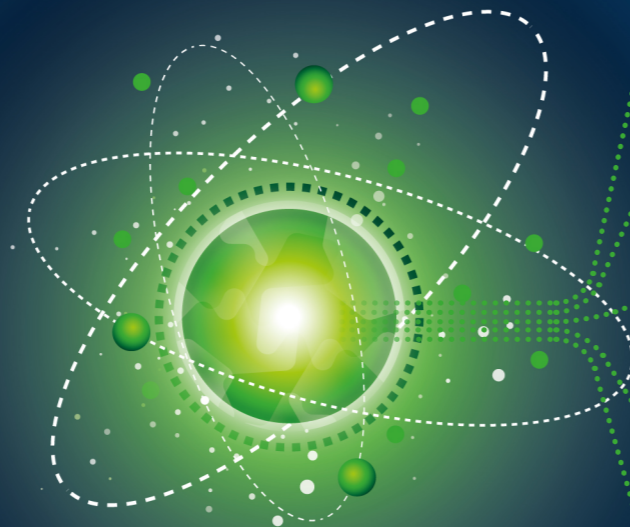




What we stand for

As a public cloud provider serving over a billion users in 140 countries, we recognize that it is our civic duty to deploy our technical resources and human expertise to defend the global digital ecosystem from attack.

Our responsibility also extends beyond technology to encompass respect for the privacy of individuals and the sovereignty of nations.



Defend the global digital ecosystem

The scale of our cloud puts us on the front lines of world cyber defense. We recognize that it is our duty to deploy our technical resources and human expertise to defend the digital ecosystem from attacks.



Be a good security partner for government

We work with the governments of democratic nations to detect and defend against cyberattacks by state-sponsored groups and criminal gangs.



Treat privacy as a fundamental right

Privacy is a fundamental right for all. We advocate around the world for strong privacy laws everywhere.



Respect digital sovereignty

Customers require confidence that foreign governments cannot gain access to their confidential or personal data in violation of the law.



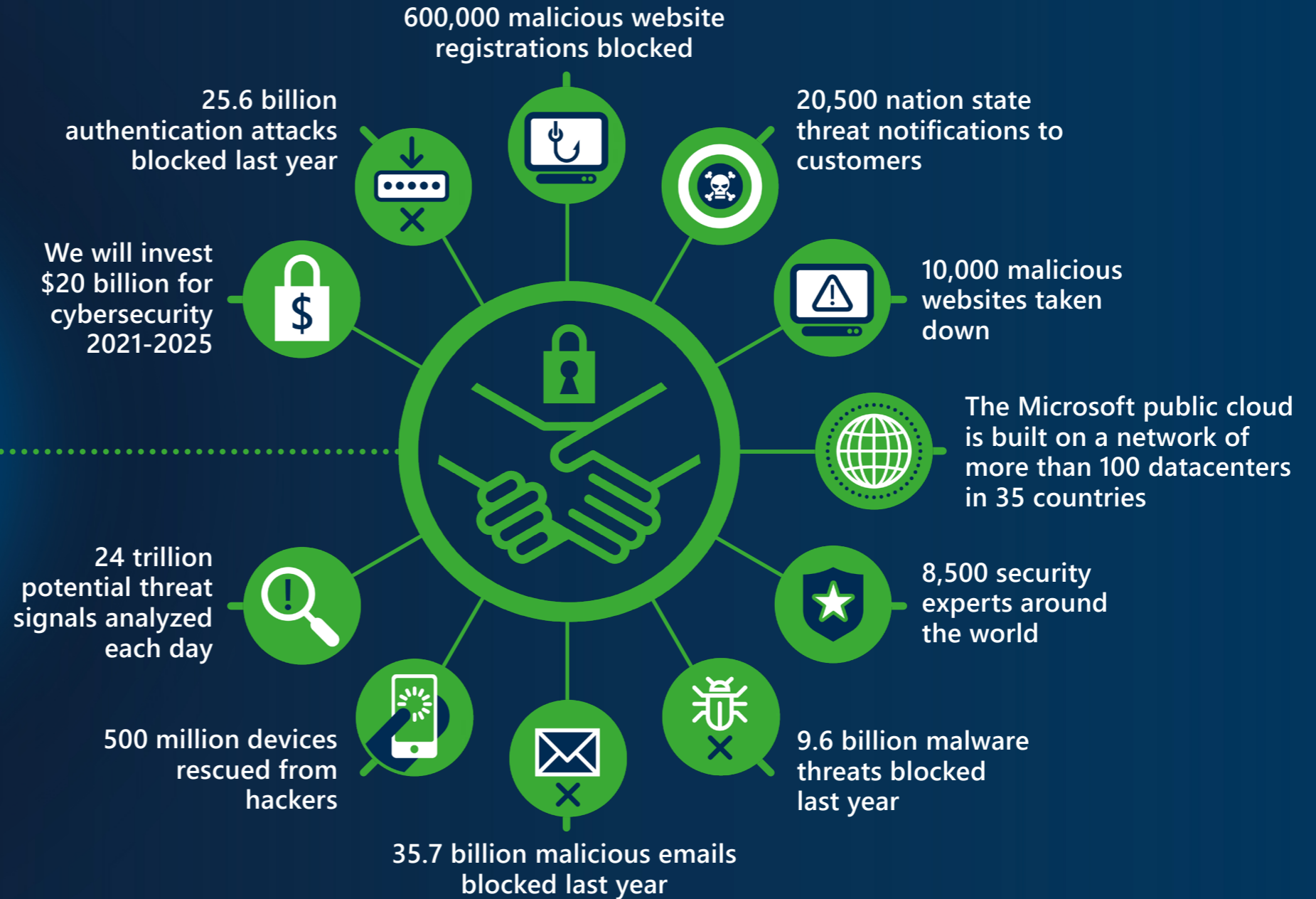
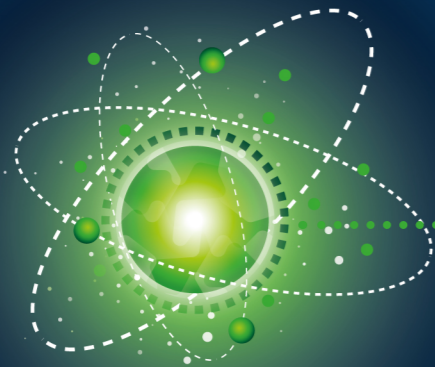
Deploy multi-stakeholder diplomacy to protect civilians

Cyberattacks on vital civilian facilities have become dangerously normalized. Nations must adopt binding rules to protect civilians in cyberspace. Digital peace requires a multi-stakeholder approach bringing governments, the tech industry, and civil society together.



Key facts

Our global cloud puts us on the front lines of the world's cyber defense





Respecting the rights of all

Privacy, security, enforceable international norms for cyberpeace, & multi-stakeholder partnerships are key values for us

We are committed to protecting the privacy of all

We design and build our products with privacy in mind from the ground up. We were early supporters of the European Union's General Data Protection Regulation (GDPR) and the first major tech company to extend GDPR's core rights from the EU to all our users worldwide.

Digital diplomacy in pursuit of digital peace

To address rising cyberattacks on civilians, in 2017 we initiated a call for a [Digital Geneva Convention](#) modeled on the original Geneva Conventions. Creating such a framework will be the work of many years. To this end we are engaging in a sustained effort with NGOs, experts in international law, the UN, and democratic governments to establish enforceable international norms that forbid cyberattacks on civilians. We actively participate in and support forums such as the [Paris Call for Trust and Security in Cyberspace](#) and the [Oxford Process](#) legal workshop on international cyber law.

We are building a cloud that respects digital sovereignty by combining global reach with local control

Every cloud customer should be able to choose the degree of data localization, encryption, network isolation, and legal control required for its mission and risk profile. While these choices will always involve trade-offs in cost and functionality, we are working to offer our customers a unique and unified technology suite that covers every significant step from our global hyperscale public cloud to fully isolated environments that can operate without external dependencies.

We are investing across a broad front to protect the global digital ecosystem

In addition to investing \$20 billion over five years to develop advanced new cybersecurity technologies, we have thousands of engineers, lawyers, digital forensics specialists, intelligence analysts, and policy experts working across our company and around the world to monitor, deter, and disrupt the most dangerous threat actors.

We aim to be the best cybersecurity partner for governments

We want governments to know that we accept our responsibility as a leader to do more, and we pledge to use our unparalleled resources in the interests of all. When major cyber emergencies occur, we immediately mobilize our experts to work with the targeted victims and the appropriate authorities to shut down the attacks.



Spotlight on Europe

Delivering on our privacy and digital sovereignty commitments to customers in the European Union

We are developing multiple product initiatives to reinforce our compliance with the privacy, data protection, and digital sovereignty requirements of EU regulators and customers. These include:

Enhanced data residency options

EU Data Boundary program

Cybersecurity protection

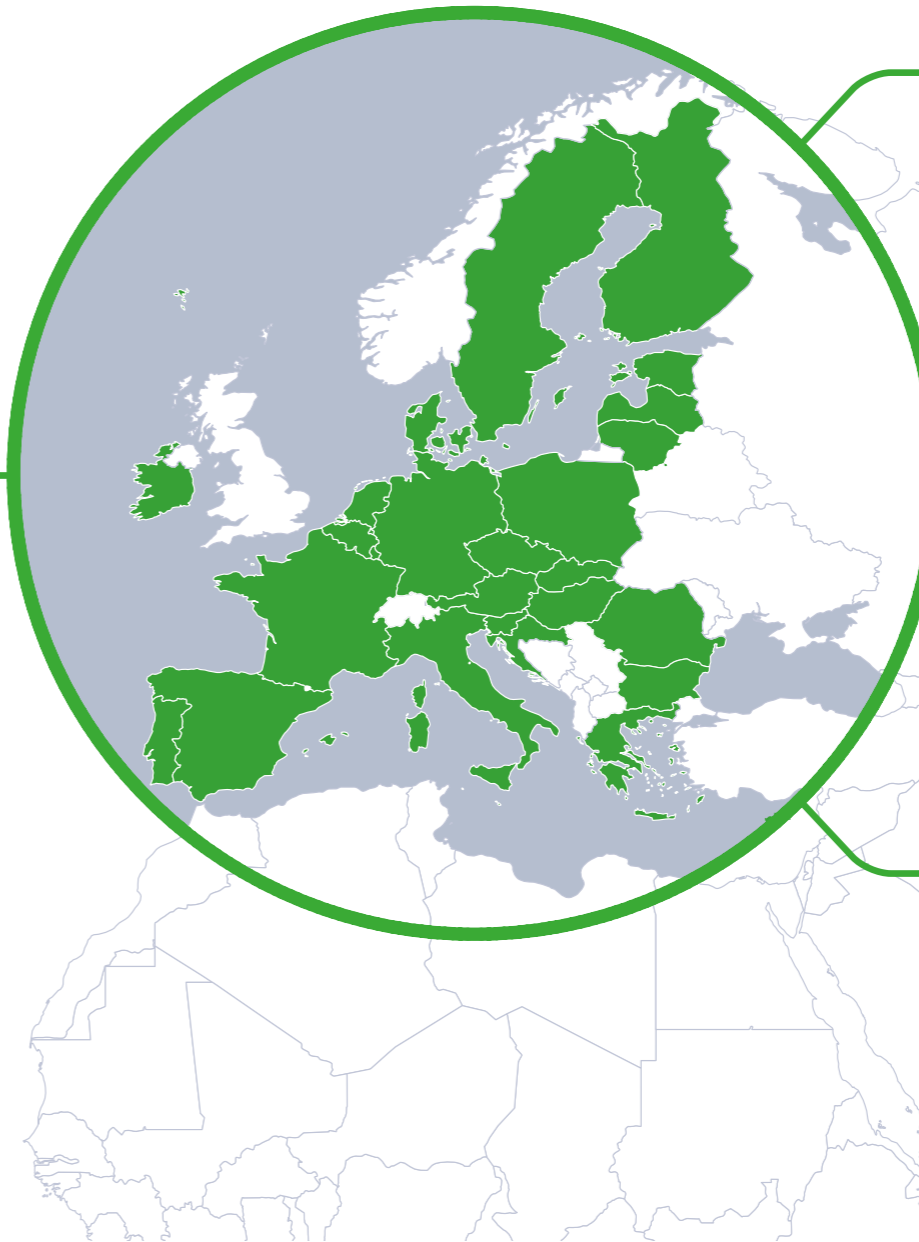
Founded on the unrivaled depth of our technical resources and human expertise, backed by the insight we gain from a global network that sees trillions of security signals per day

Our commitment to defending our customers' data rights by

- Challenging all government requests for public sector or enterprise customer data, where there is a lawful basis for doing so
- Promise to provide monetary compensation to customers' users if we disclose their data in response to a government request in violation of GDPR

Suite of sovereignty controls

- Encryption at rest and in transit
- Customer controlled encryption for most sensitive data
- Customer Lockbox
- Azure Confidential Computing
- Sovereignty controls ensured by in-country partners (in development)



Support for the Trans-Atlantic Data Privacy Framework

To provide further assurance to our customers, we will:

- Increase certainty for customers by seeking certification from the U.S. government
- Bolster the legitimacy of the redress process through participation in review of claims

Support for lasting diplomatic solutions

Longer term we continue to support diplomatic solutions to issues of cross-border government data access through U.S. CLOUD Act and the OECD Global Principles



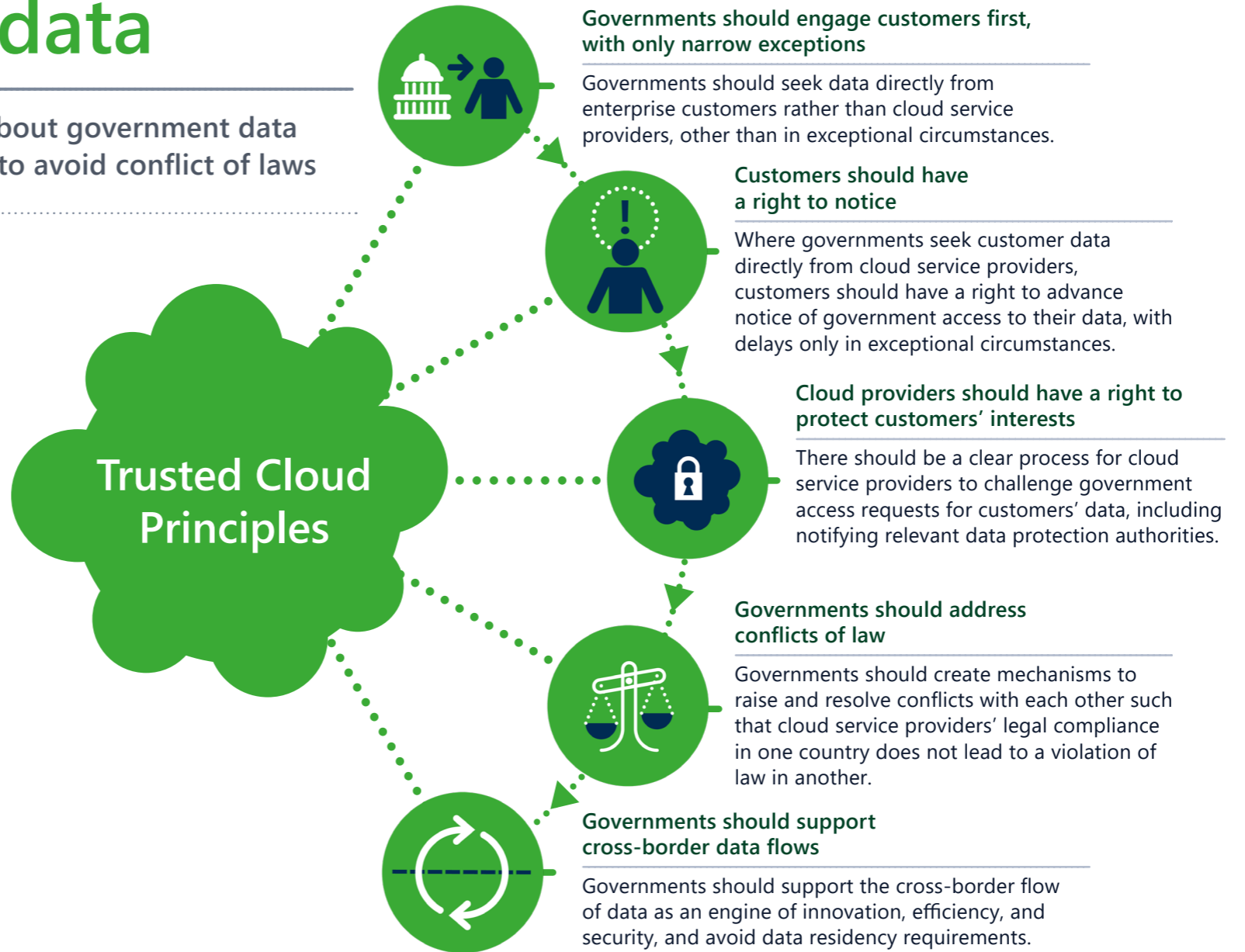
Shielding customer data

We defend customer privacy, practice transparency about government data requests, and advocate for international agreements to avoid conflict of laws

Microsoft’s unique insights into nation state actors and cybercrime activity often generate government requests for access to data relevant to these attacks. Governments may also seek customer data from us for investigations of terrorism, human trafficking, child exploitation, drug smuggling, and other crimes. When responding to these requests, we vigorously defend our customers’ privacy rights. We disclose customer data to governments only when we are clearly compelled to do so by law, and we systematically challenge requests that are unreasonable, invalid, or otherwise present a clear conflict of law.

As part of our commitment to full transparency about government data requests, every six months we publish detailed statistical reports about the requests we have received from U.S. and foreign law enforcement agencies and U.S. national security authorities.

We have also joined with other leading cloud companies from the U.S., Europe, and Australia to endorse a set of Trusted Cloud Principles that advocate for reform of the international rules governing cross-border government requests for data from cloud providers.





Tracking threats

We share our unique cybersecurity knowledge with the world

Microsoft identifies nation state threat actors by chemical element names. The map shows some of the most active threat actors tracked by Microsoft and their characteristic targets. For full details of our cyber defense activities see the latest Microsoft Digital Defense Report.

Key:

Country of origin	Activity group
Symbol	Commonly targeted industries
Industry references	

Turkey

Si
Sea Turtle
UNC1326

Silicon
Telecommunication companies in the Middle East and the Balkans

Iran

Cm
Houseblend
Tortoise Shell

Curium
US Military and defense contractors, IT services, Middle Eastern governments

Iran

P
Charming Kitten

Phosphorus
Diplomatic and nuclear policy communities, academics and journalists

Iran

Rb
Fox Kitten
Parasite

Rubidium
Israeli logistics companies, IT services, defense

China

Cr
ControlX

Chromium
Energy, communications, infrastructure, education, government agencies and services

China

Gd
APT40

Gadolinium
Maritime, healthcare, higher education, regional government organizations

China

Hf

Hafnium
Higher education, defense industrial base, think tanks, NGOs, law firms, medical research

China

Mn
APT5
Keyhole Panda

Manganese
Communications infrastructure, defense industrial base, software/technology

China

Ni
APT15
Vixen Panda

Nickel
Government agencies and services, diplomatic organizations

China

Zr
APT31

Zirconium
Government agencies and services, diplomatic organizations, economic organizations

Russia

Br
Energetic Bear

Bromine
Government, energy, civil aviation, defense industrial base

Russia

No
UNC2452

Nobelium
Government, diplomatic and defense entities, IT software and services, telecommunication, think tanks, NGOs, defense contractors

Russia

Sr
APT28
Fancy Bear

Strontium
Government, diplomatic and defense entities, think tanks, NGOs, higher education, defense contractors, IT software and services



North Korea

Ce
Kimsuky

Cerium
Think tanks, diplomatic officials, academics, defense and aerospace companies

North Korea

Os
Konni

Osmium
Diplomatic officials, think tanks

North Korea

Tl
Kimsuky
Velvet Chollima

Thallium
Think tanks, diplomatic officials, academics

North Korea

Zn
ControlX
Labyrinth Chollima

Zinc
Utilities, private companies, think tanks, security researchers



Defending Ukraine

We are fully engaged in the cyber defense of Ukraine and its people

One of our principal responsibilities as a global public cloud company is to help defend governments and countries from cyberattacks. The war in Ukraine is a hybrid war that combines kinetic military operations with cyberattacks that target services and institutions crucial for civilians. Microsoft is only a company, not a country or government. However, we have unique cybersecurity skills and resources to draw on, and we are using them to defend Ukraine and its people.

In April we published a [detailed report](#) describing the relentless and destructive Russian cyberattacks and the actions we are taking to counter them. We believe it is important to share this information so that policymakers and the public of all nations know what is happening, and so that the global cybersecurity community will be better armed to defend against such attacks.

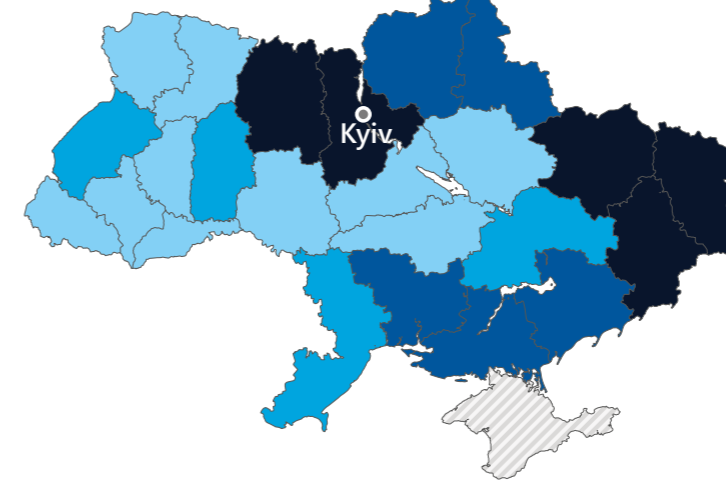
Throughout the war Microsoft security teams have worked closely with Ukrainian officials and cybersecurity staff to identify and remediate threat activity against Ukrainian networks. We have established secure lines of communication to respond rapidly to new incidents. Our actions include 24/7 sharing of threat intelligence and deployment of technical countermeasures to defeat malware. Throughout the war our cyber teams have also worked in close coordination with the European Union, European nations, the U.S. government, NATO, and the UN.

It's clear to all that digital technology will play a vital role in both war and peace. Like others, we call for the restoration of peace, respect for Ukraine's sovereignty and territorial integrity, and the protection of its people. We hope for a future where technology serves only to protect peoples and nations and to work for their benefit.

The hybrid war in Ukraine

Kinetic and cyber activity

High kinetic /high cyber High kinetic /low cyber Low kinetic /high cyber Low kinetic /low cyber



The principal Russian cyber threat actors that the Microsoft Threat Intelligence Center observed conducting cyberattacks against Ukrainian targets before the start of the war, with examples of their activities.



Unit 26165

Russia
Sr
APT28
Fancy Bear

Strontium
Data theft, phishing (military targets)

Unit 74455

Russia
Ir
Sandworm

Iridium
Destruction, Foxblade wiper; CaddyWiper, Industroyer2

Suspected GRU affiliation

Russia
DEV-0586

DEV-0586
Destruction WhisperGate wiper, data theft, influence operations

Russia
No
UNC2452/2652

Nobelium
Password spray, phishing (Ukrainian and NATO member diplomatic targets)

Unit 71330

Russia
Ac
Gamaredon

Actinium
Phishing, data theft

Russia
Br
Energetic Bear

Bromine
Data theft

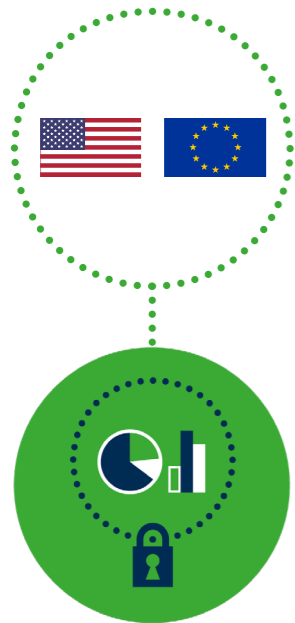
Russia
Kr
Turla

Krypton
Reconnaissance, phishing



Our cloud at work

The responsible public cloud helps organizations use technology to solve strategic problems in new ways



Microsoft implements the Trans-Atlantic Data Privacy and Security Framework

Microsoft is fully committed to implementing the new Trans-Atlantic Data Privacy and Security Framework agreement between the EU and the U.S. This framework aims to rebuild and strengthen the EU-U.S. data protection bridge by addressing concerns raised by the Court of Justice of the European Union in 2020. We will meet or exceed all of the framework's requirements. We will verify that U.S. government demands for data that we hold comply with it. When we believe they fall short we will use all lawful means to challenge them. We will also support the new redress process and participate in judicial review of individual claims of harm related to our public sector and commercial cloud services.

Through our Defending Your Data protections we will continue to challenge any government demand for personal data that we hold on behalf of our public sector and commercial customers. We will provide monetary compensation if such data is disclosed unlawfully in response to a government request.



An independent insurance agency in Tennessee uses the cloud to protect itself from global hackers

The first point of cyber vulnerability in any organization lies in the devices used by its staff— Windows PCs, Macs, iPhones, and Android devices, owned by the organization or by individual users. These days organized cybercrime gangs are besieging organizations of all sizes with ransomware and other malicious cyberattacks, not sparing small and medium businesses. Until now, gaining a unified view of security threats on every device in an organization and remediating those threats automatically has been something only large enterprises could afford.

Now Microsoft's Defender for Business brings this capability to small and medium businesses like the Martin & Zerfoss agency in Nashville, Tennessee. Doing the work of a dedicated Security Ops team, Defender for Business looks at all the cloud-connected devices a modern small business has, builds a unified picture of suspicious events and behaviors, and shuts down threats automatically.



Policy measures to promote a trusted cloud

Enforceable international norms will protect civilian infrastructures from cyber attacks by state actors. Consistent and practical global cybersecurity standards are also essential



Protect healthcare providers

There must be an unambiguous international expectation that healthcare institutions are off-limits to state-sponsored cyberattacks.



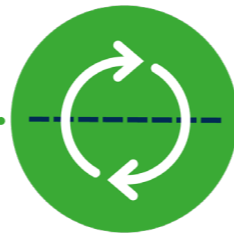
Cybersecurity regulations should be risk-based & consistent

Regulations should reflect actual risks, be interoperable across borders, and leave room for new solutions in response to threats.



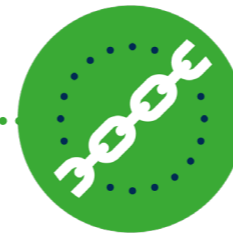
Accountability and deterrence for nations

Strong and enforceable international norms are needed to deter reckless behavior against civilians by state-sponsored actors.



Reciprocal norms for cross-border government access to data

Law enforcement access to data should meet legitimate expectations of privacy and avoid conflicts of law between nations.



Secure the ICT supply chain

State-sponsored cyberattacks against the ICT supply chain, in particular the software update process, must be prohibited.



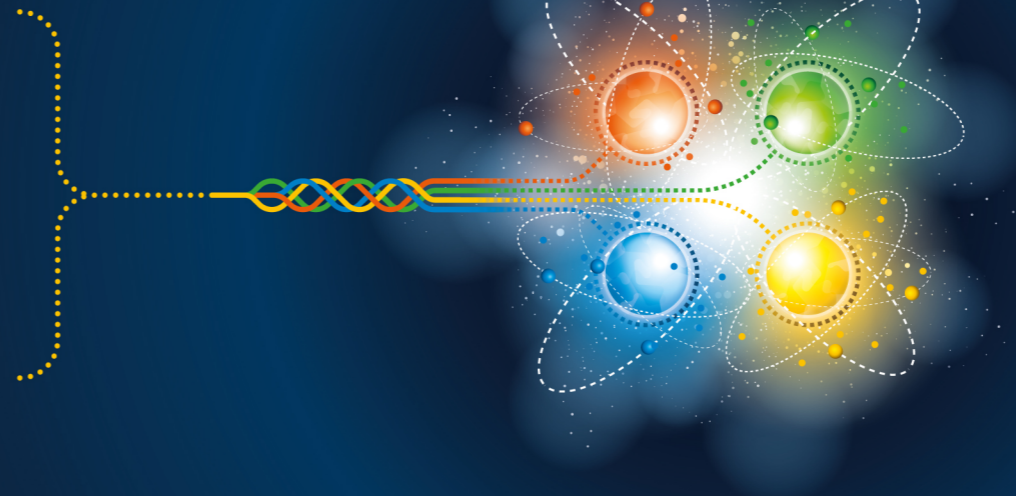
Multi-stakeholder cooperation for cybersecurity

Cooperation between democratic nations and the tech industry is essential to securing critical civilian infrastructures and shaping effective policies.





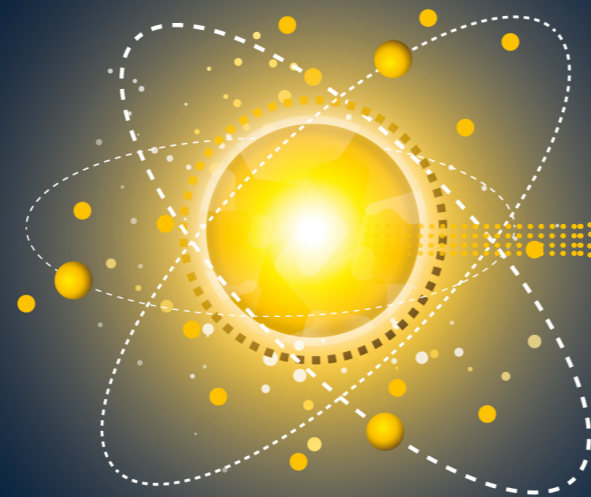
Protecting fundamental rights





What we stand for

The conduct and offerings of a cloud provider must always support democratic values and fundamental human rights.



Protect elections & democratic institutions

The cloud should offer dedicated software tools that protect the institutions of democracy.



Combat disinformation

State-sponsored disinformation threatens democracy and public health. The cloud should offer tools to identify the sources of disinformation and prevent its spread.



Ensure technology causes no harm

AI may create risk by behaving in ways that human users don't expect. It may also be used in ways that violate ethical, legal, or safety norms. Our strong governance procedures ensure we develop AI responsibly and we decline business that violates our principles.



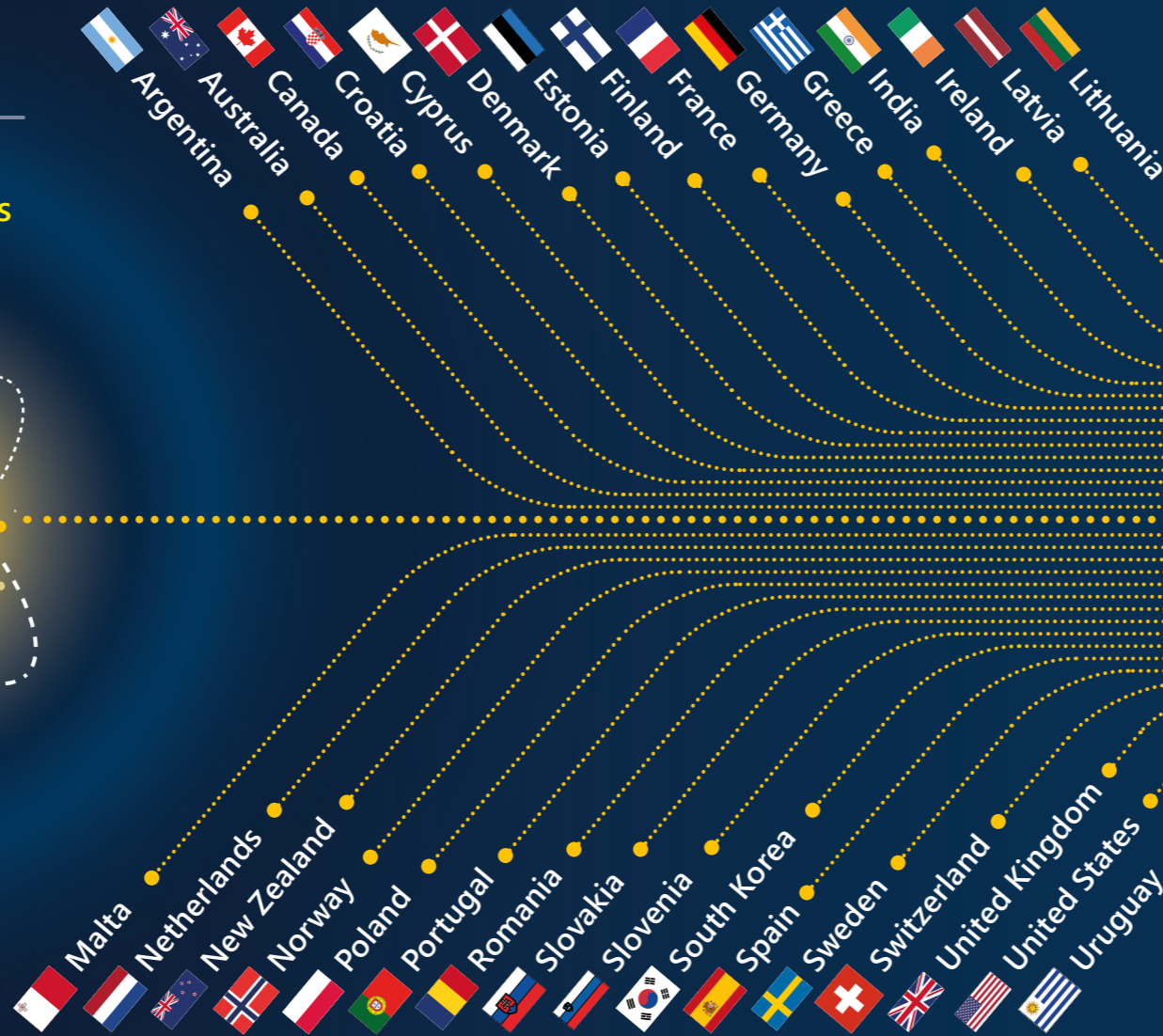
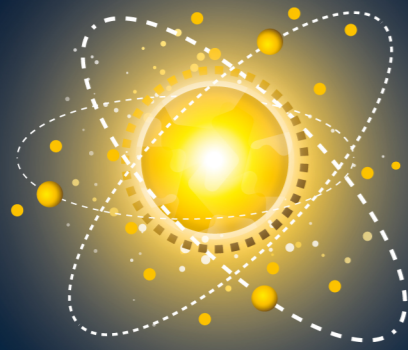
Leverage technology for humanitarian action

A cloud provider must deploy its technology and resources generously to alleviate the suffering of people overwhelmed by disasters or injustice.



Key facts

Microsoft's Democracy Forward Program protects elections & human rights in 31 countries





Protecting democracy

Democracy is vulnerable to cyberattack— we are deploying our technologies to protect it

AccountGuard uses enterprise technology to defend democracy

To protect political parties and campaigns that use our cloud from state-sponsored cyberattacks, Microsoft's AccountGuard program offers these organizations enterprise cybersecurity features at no cost combined with unique threat monitoring and notification services.

AccountGuard now protects 31 democracies

We offer AccountGuard to human rights organizations, newsrooms, and healthcare organizations in 31 democracies.

Our open source ElectionGuard software verifies election results

ElectionGuard is open source software designed by Microsoft Research to make elections more secure and end-to-end verifiable.

Algorithms to combat disinformation

To fight disinformation we are developing technology for certifying the origin, authenticity, and history of online media. We are working with the Coalition for Content Provenance and Authenticity to develop open standards for content provenance and authentication.

AI for Humanitarian Action

We work with crisis-affected communities and humanitarian organizations to bring relief to those in need. We have committed \$40 million over five years to support disaster response, aid to refugees and displaced persons, human rights, and the needs of women and children.

Documenting international crimes in Ukraine

Microsoft is providing Ukraine's government, the International Criminal Court, and the Clooney Foundation for Justice with technology to document and preserve evidence of international crimes in Ukraine.

We are building a corporate culture that develops AI responsibly

We're building responsible AI with strong governance procedures. Our AI principles guide how we design, develop, and sell our products. Our Office of Responsible AI ensures that our actions and business processes align to these principles.

Color matters in Computer Vision Facial recognition algorithms by Microsoft, IBM and Face++ were more likely to misidentify the gender of black women than white men:



Gender was misidentified in up to 1 percent of lighter-skinned males in a set of 385 photos.



Gender was misidentified in up to 7 percent of lighter-skinned females in a set of 296 photos.



Gender was misidentified in up to 12 percent of darker-skinned males in a set of 318 photos.

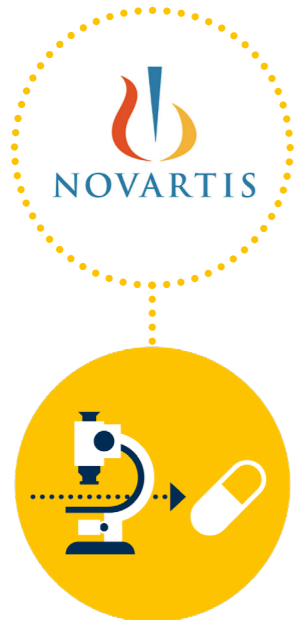


Gender was misidentified in 35 percent of darker-skinned females in a set of 271 photos.



Our cloud at work

The responsible public cloud helps organizations use technology to solve strategic problems in new ways



Novartis designs new drugs with AI

In partnership with Microsoft Research, Novartis is applying AI to search through huge sets of unstructured data for ideas about new drugs. The researchers use Microsoft's AI tools to comb through thousands of past drug development experiments whose findings are buried in PDFs, Excel tables, and written descriptions of the properties of previously explored molecules. The search results can suggest molecules with desirable characteristics for possible new drugs. These candidates can then be fast-tracked for additional testing and, if proven safe and effective, potentially be developed and brought to market.

The scientists can also test molecules that have never been made before to see if they could lead to new medicines for diseases that have no treatments today. Eventually, they hope to use computer models to predict promising molecular structures or reveal which experiments might be most useful. This AI-bolstered process could cut out years of traditional trial-and-error drug development experimentation. This is how the AI revolution is beginning to unfold.



Scaling web services at Britain's NHS

Britain's National Health Service is the largest non-military public sector organization in the world, treating over one million patients in a typical 36 hour period. When the Covid pandemic erupted in 2020 the NHS quickly realized that it needed to update its system architecture in order to scale reliably with surging patient demand. Within days of the first news reports about Covid's spread, traffic to the agency's frontline 111 Online service that directs patients to the care they need suddenly surged to 25 times its previous peak load.

To address its urgent need for greatly increased scalability of this critical web service, the NHS adopted a Microsoft Azure cloud service called AlwaysOn that let it spread user demand more intelligently across available resources. The result was a completely re-engineered system with significantly improved performance, reliability, and security, as well as far superior operability.



Policy measures to promote fundamental rights

Agreements among democratic governments can do much to make the world's shared digital ecosystem safer and more secure for everyone



Protect elections

Agreements among democratic nations and the technology industry can protect against attacks on elections and support trusted journalism.



Implement the Christchurch Call

Governments and the tech industry should come together to implement the Christchurch Call to prevent the use of social media to organize and promote terrorism and violent extremism.



Embrace the Trusted Cloud Principles

Governments should adopt the Trusted Cloud Principles as a basis for international rules governing cross-border government access to data.



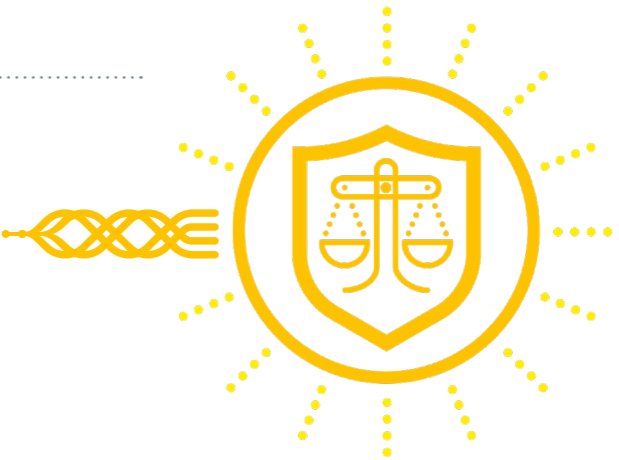
Promote responsible AI

Nations and the tech industry should agree to norms and export policies governing the responsible use of AI and other sensitive technologies.



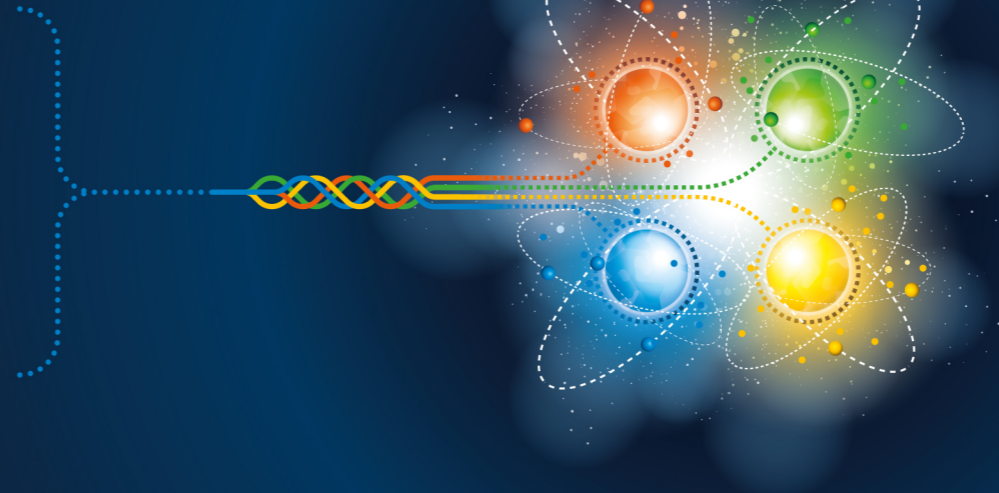
Content moderation should protect rights and interests

Regulation of online speech should have clear scope and not incentivize platforms to over-censor content to avoid liability. Rules should avoid "one-size-fits-all" obligations and focus on the relative risk of harm, especially when human rights or privacy are at stake.





Building a sustainable future

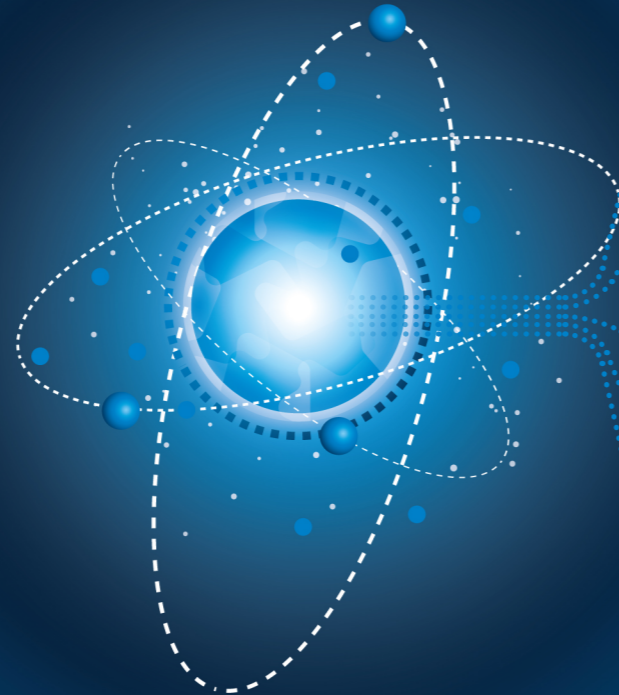




What we stand for

Climate change is the defining issue of our time. Addressing the crisis will require collective action and technical innovation on a vast scale over many years. At Microsoft we are committed to ambitious goals for improving our climate footprint and we have detailed plans for achieving them.

For Microsoft to do well, we need the world to do well, and that means we must make it our business to help solve the problems of the planet and its citizens.



Carbon negative by 2030

We will become carbon negative by 2030 by reducing emissions and removing CO₂ from the air. We will match 100% of our electricity with zero carbon energy 100% of the time. By 2050 we will remove all carbon we have emitted since our founding in 1975.



Water positive & zero waste

We will become water positive and zero waste in our direct operations by 2030. We will also provide at least 1.5 million people with access to clean water and sanitization services by 2030.



Protecting ecosystems with data

We combine the power of big data, machine learning, and the cloud to help scientists monitor, model, and manage the planet's natural resources.



Helping customers reach their own climate goals

We are building a suite of cloud-based tools to help customers reduce their own climate footprints and measure their progress.



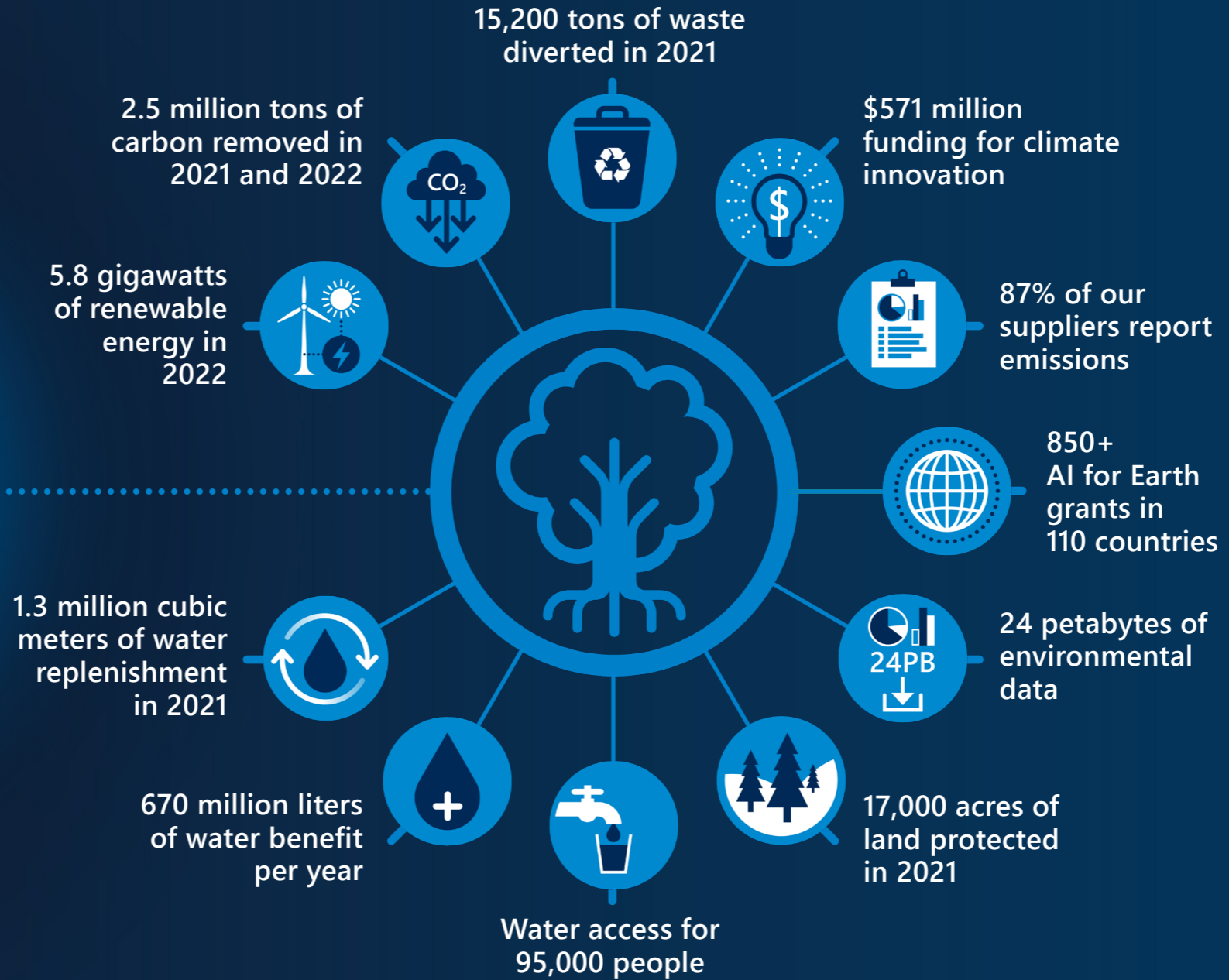
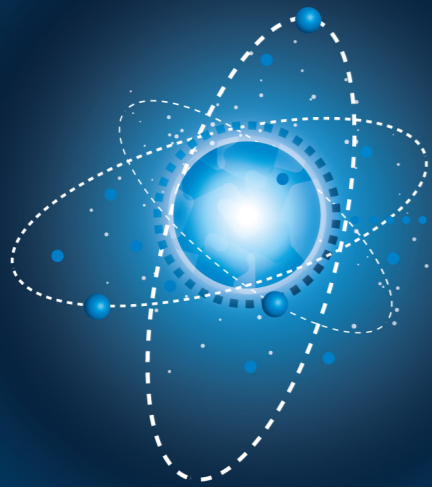
Reporting our progress transparently

Transparency means reporting on everything, including setbacks. We are committed to measuring our emissions accurately and reporting transparently on our progress.



Key facts

We are building a sustainable future by taking climate action today





Working toward sustainability

Our many initiatives to reach our carbon negative goal by 2030 are extensively documented in our annual **Microsoft Environmental Sustainability Report**

We are reducing our scope 1 and 2 emissions

Last year we reduced our scope 1 (direct emissions from operations) and 2 (indirect emissions from electricity consumption) by 58,654 metric tons of carbon dioxide equivalent (mtCO₂). We will reduce scope 1 and 2 emissions to near zero by 2025.

We are striving to reduce our scope 3 emissions

Our scope 3 emissions, which come from our supply chain and device use by our customers, account for 98% of our total emissions. Last year these emissions increased by 23%, driven by our significant

global datacenter expansions and growth in Xbox during the pandemic. Despite this temporary setback, we remain fully committed to reducing our scope 3 emissions by 50% by 2030.

To accomplish this we are engaging in in-depth discussions with our suppliers to understand and limit their emissions, while designing carbon out of our buildings and undertaking a fundamental rethink of the design of our devices.

We are moving to 100% renewable energy 100% of the time

By 2025, our datacenters and facilities will use 100% renewable

energy on an annual basis. We have set a new goal for 2030 to have 100 percent of Microsoft's energy supply from zero carbon resources 100 percent of the time. Our newest datacenters are already operating 100% carbon-free.

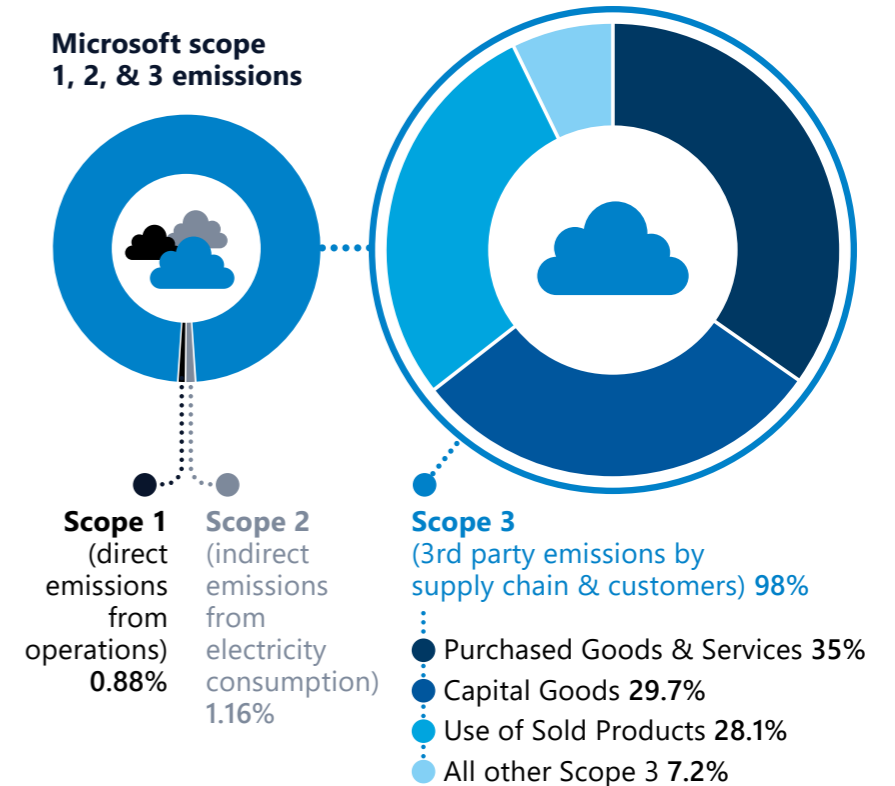
We are greening our campuses and datacenters

We are taking many steps to reduce the emissions of our campuses and datacenters, including certifying them to LEED Gold or Platinum, managing server usage more efficiently, installing on-site renewables, and eliminating diesel-powered backup generators.

The Microsoft Cloud for Sustainability helps our customers reach their climate goals

The Microsoft Cloud for Sustainability offers comprehensive, integrated, and automated sustainability management for organizations at any stage of the sustainability journey. With this tool companies can more effectively record, report, and reduce emissions on a path to net zero.

Microsoft scope 1, 2, & 3 emissions





Investing in carbon removal

Lessons and future priorities from our pioneering investments in carbon removal

In the last two years we have contracted for removal of 2.5 million metric tons of CO₂ from the Earth's atmosphere. These purchases are among the largest ever made by a corporation. Here we summarize the lessons learned from this experience and our future priorities. For more details please see the September 2021 article in Nature by Joppa et al.

Lesson 1: More carbon removal capacity is needed

The world will need from 2 to 10 gigatonnes of annual carbon removal capacity to reach global net zero by 2050. The amount currently on offer is only a small fraction of that. In a recent request for proposal, Microsoft

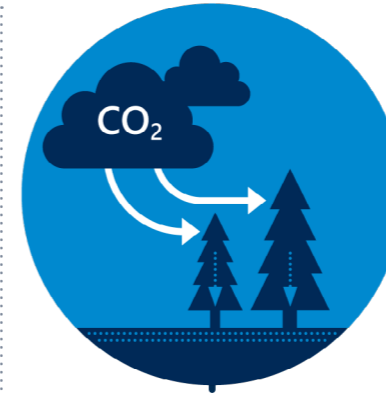
received 189 proposals offering 154 megatonnes of CO₂ but only 55 MtCO₂ were available immediately, and a mere 2 MtCO₂ met our criteria for high-quality CO₂ removal.

Lesson 2: Standards and clear definitions for carbon removal are needed

Today there are no standard definitions for carbon removal. Such ambiguity is a barrier to investment. Many proposals we received confused carbon removal with the more modest goal of merely avoiding new emissions and lacked the technical data needed to ensure reliability. We need a standard way to measure, report, and verify carbon removed.

Lesson 3: The difference between short-term and long-term carbon storage

CO₂ removed from the atmosphere must be stored. The two main options are (1) nature-based, which means sequestering carbon in trees and soil, and (2) geological, which means storing it in rocks and minerals. These methods differ in cost and length of time that they keep carbon from returning to the atmosphere. Nature-based storage is relatively cheap, around \$16 per metric ton, but usually returns carbon to the atmosphere within a century. Geological storage is currently very expensive, on average \$141 per metric ton, but retains the carbon for 1,000 years or more.

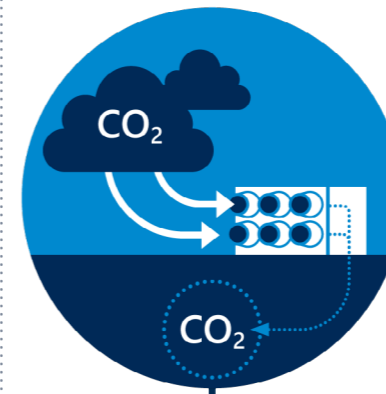


Short term carbon removal

Sequestering carbon in trees and soil

Cost per metric ton: **\$16**

Expected storage period:
100 years



Long term carbon removal

Geological storage in rocks and minerals

Cost per metric ton: **\$141**

Expected storage period:
1,000 years

How to make progress in carbon removal

The global goal of net zero is easy to understand, but the question of how to pursue it in an individual organization can be difficult. Global capacity to remove carbon is likely to remain limited for the foreseeable future. We need to invest more in long-lasting technological approaches and geological storage systems.

We also need more accurate, more automated, and more consistent ways of measuring and accounting for carbon, especially from supply and value chains, the so-called scope 3 which for many companies such as Microsoft account for the vast majority of emissions. Finally, we need better economic incentives to promote the most effective forms of CO₂ removal. Governments, researchers, and companies need to develop a robust carbon-removal market that can meet demand for global net zero.



Water, waste, and ecosystems

Creating a sustainable environment requires more than reducing carbon. We set ourselves ambitious goals for water, waste, and ecosystems

Becoming water positive

To meet our goal of becoming water positive by 2030, we are pursuing new approaches to water collection, treatment, reuse, and reduction at our campuses and datacenters. We are exploring ways to cool our datacenters with less water or even without water at all. We have just opened our first net zero water campus in California.

Taking responsibility for our land footprint

Microsoft directly operates on 11,000 acres of land around the world, and we recognize that our land footprint has an impact. We will permanently protect more land than we use by 2025.

We are taking a circular approach to waste

To reach our zero waste objective by 2030, we are reducing, reusing, and diverting waste in our campuses and datacenters, and adopting a circular approach to materials management. Our goal is to divert 90% of operational solid waste from landfills and incinerators across our datacenters and campuses.

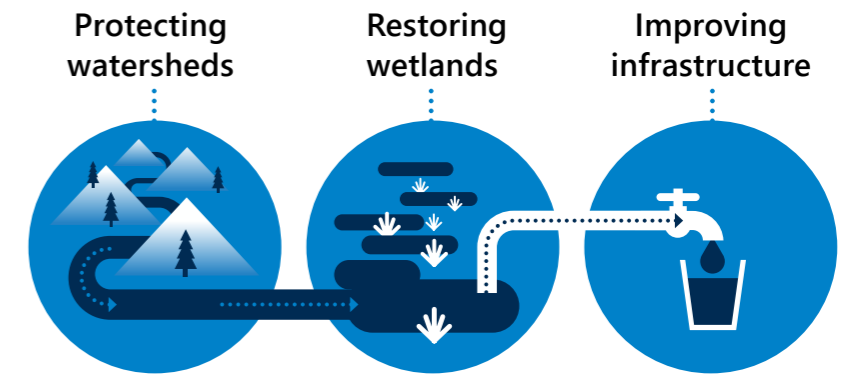
We responsibly source materials for our operations, products, and packaging, reducing the total quantity needed wherever possible. By 2025 we expect that 90% of our servers and cloud hardware components will be remarketed or reused after recycling.

We are building a Planetary Computer

The Planetary Computer is a powerful cloud platform that combines dozens of petabytes of global environmental data with a flexible scientific environment to help users answer global questions about this data. Using open source and open standards, it provides intuitive tools for developers to create applications that put those answers in the hands of conservation stakeholders. Developers are using the power of the Planetary Computer to create applications ranging from conservation planning and forest risk assessment to land cover and classification.

We are replenishing water and helping communities gain access to water

By 2030 we will replenish more water than we consume, focusing on water-stressed regions. We will achieve this goal by investing in water projects that protect watersheds, restore wetlands, and improve infrastructure.



We are also committed to providing access to safe drinking water and improved sanitation solutions for 1.5 million people in areas where we operate in Mexico, India, and Indonesia:





Our cloud at work

The responsible public cloud helps organizations use technology to solve strategic problems in new ways



Renewable energy producer Uniper manages its data in the cloud

Uniper is the third-largest producer of CO₂-free energy in Europe and operates in 40 countries around the world. Each of these countries has its own data protection and data residency requirements, and in many cases national regulations prevent certain types of operational data from leaving the country. This makes for a very complex global data estate that Uniper must manage. Historically the firm has been obliged to build separate cloud-based or on-premises data silos in each country, relying on a mix of local partners using a mix of tools.

To cope with this very heterogeneous and dispersed data estate, Uniper has adopted Microsoft's Azure Arc cloud service to provide a consistent management tool spanning multiple cloud and on-premises environments around the world. As a result, the firm has gained a single, unified view of its data estate, providing visibility and manageability it never had before.



Mexico's Grupo Bimbo is using the cloud to speed its path to net zero

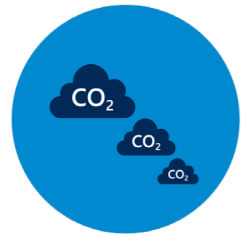
Grupo Bimbo is one of the largest bakeries in the world with 196 bakery plants and a presence in 33 countries. It has also committed itself to becoming a sustainable company by moving to 100% renewable energy by 2025 and net zero carbon emissions by 2050.

To gain greater visibility into the environmental impact of not only its own operations but also that of its supply chain, the company has become one of the first users of the Microsoft Cloud for Sustainability, an extensible cloud service that helps organizations record, report, and reduce their environmental impact by automating carbon accounting and generating actionable intelligence.



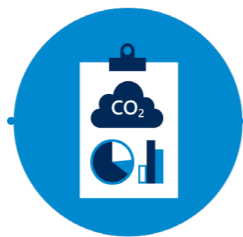
Policy measures to achieve sustainability

A strong and forward-looking policy framework is essential if the world is to make progress toward a sustainable future



Establish plans

Establish net zero aligned national contribution commitments and implementation plans.



Set standards

Set standards and reporting requirements for carbon and other environment impacts.



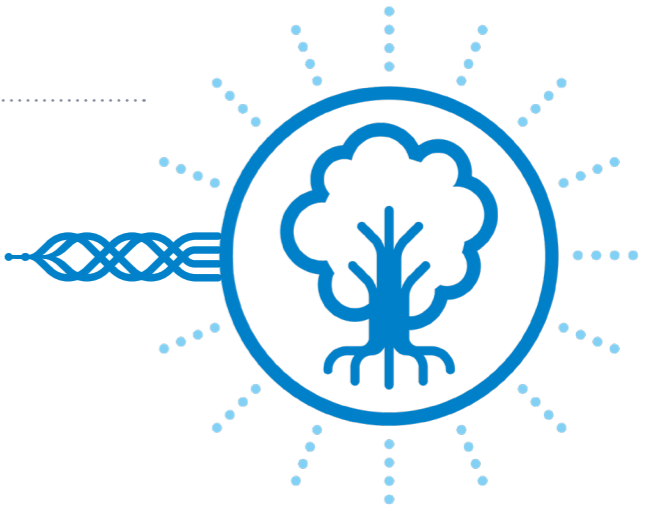
Promote market mechanisms

Market and pricing mechanisms will support innovation and incentivize people to make better carbon decisions. Removing regulatory barriers will help carbon-reduction technologies mature and scale more quickly.



Empower consumers to make better choices

Through transparent and universal standards for information about the carbon content of goods and services.





How we see our purpose

One of the most pressing needs in the world today is to realize economic growth. That growth must be environmentally sustainable, socially just, equitably distributed, and humane in every sense. The responsible public cloud promises to be the greatest technological enabler of the sustainable and humane economic growth that the nations and people of the world require.

Microsoft recognizes that its paramount duty as a private provider of a public cloud is to deliver on this promise. Our cloud is an interconnected global ensemble of hyperscale datacenters that offers the extraordinary potential of modern computing, particularly AI and big data, to every nation, every organization, and ultimately every individual on the planet.

Our ambition is to build a public cloud that is secure and respectful of both individual privacy and national sovereignty. Our entire corporate culture is based on the understanding that as the operators of this cloud we can only thrive when the world thrives.

