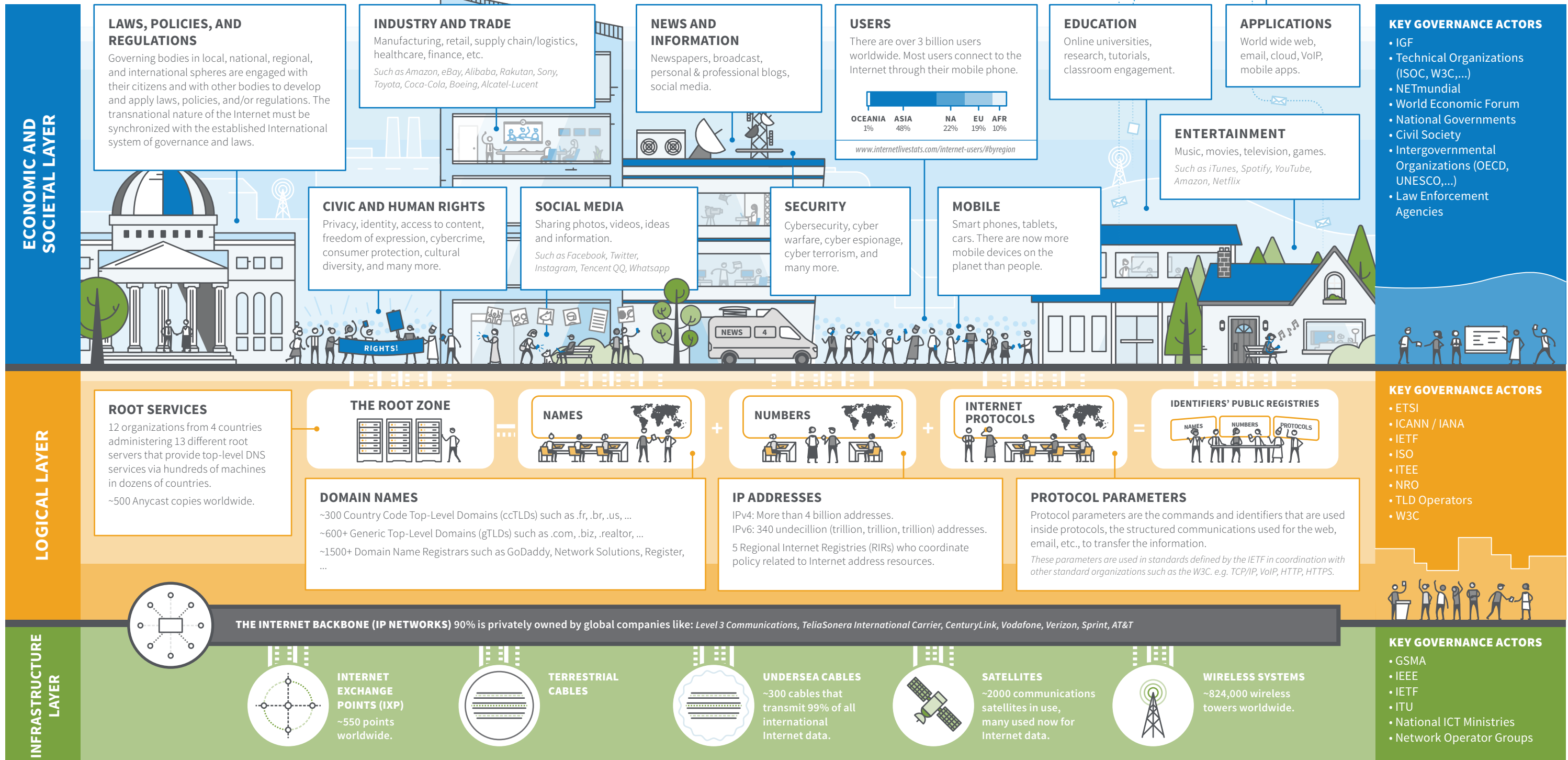# THE THREE LAYERS OF DIGITAL GOVERNANCE

No one person, government, organization, or company governs the digital infrastructure, economy, or society. Digital governance is achieved through the collaborations of Multistakeholder experts acting through polycentric communities, institutions, and platforms across national, regional, and global spheres. Digital Governance may be stratified into three layers to address infrastructure, economic, and societal issues with solutions. For a map of Digital Governance Issues and Solutions across all three layers, visit *https://map.netmundial.org*
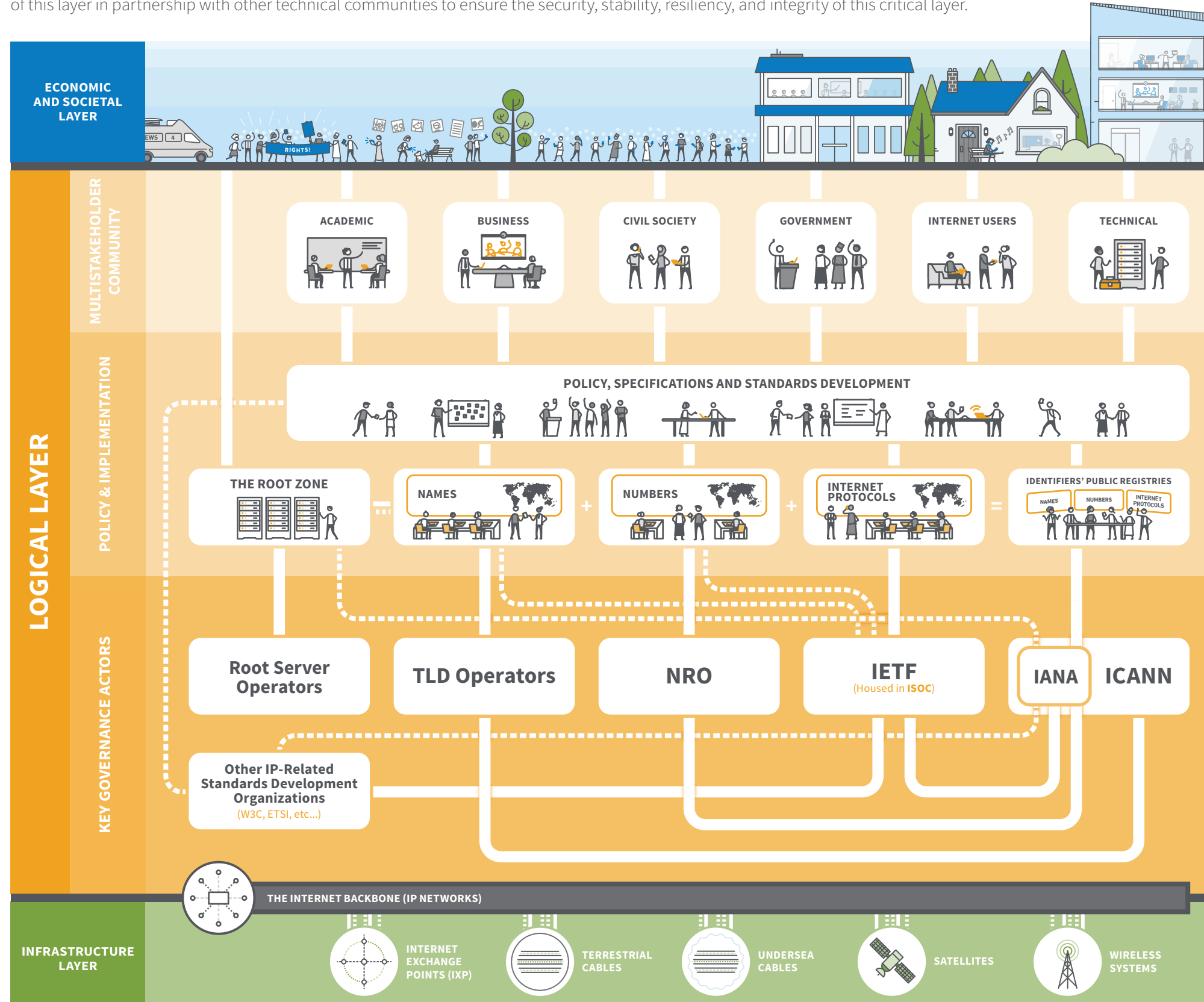
MULTISTAKEHOLDER COLLABORATIONS

Solutions to issues in each layer include policies, best practices, standards, and specifications developed by the collaborations of expert stakeholders from actors in business, government, academia, technical, and civil society.

ECONOMIC AND SOCIETAL LAYER

LAWS, POLICIES, AND REGULATIONS

Governing bodies in local, national, regional, and international spheres are engaged with their citizens and with other bodies to develop and apply laws, policies, and/or regulations. The transnational nature of the Internet must be synchronized with the established International system of governance and laws.

INDUSTRY AND TRADE

Manufacturing, retail, supply chain/logistics, healthcare, finance, etc.

Such as Amazon, eBay, Alibaba, Rakuten, Sony, Toyota, Coca-Cola, Boeing, Alcatel-Lucent

NEWS AND INFORMATION

Newspapers, broadcast, personal & professional blogs, social media.

USERS

There are over 3 billion users worldwide. Most users connect to the Internet through their mobile phone.

OCEANIA	ASIA	NA	EU	AFR
1%	48%	22%	19%	10%

www.internetlivestats.com/internet-users/#byregion

EDUCATION

Online universities, research, tutorials, classroom engagement.

APPLICATIONS

World wide web, email, cloud, VoIP, mobile apps.

ENTERTAINMENT

Music, movies, television, games.

Such as iTunes, Spotify, YouTube, Amazon, Netflix

CIVIC AND HUMAN RIGHTS

Privacy, identity, access to content, freedom of expression, cybercrime, consumer protection, cultural diversity, and many more.

SOCIAL MEDIA

Sharing photos, videos, ideas and information.

Such as Facebook, Twitter, Instagram, Tencent QQ, Whatsapp

SECURITY

Cybersecurity, cyber warfare, cyber espionage, cyber terrorism, and many more.

MOBILE

Smart phones, tablets, cars. There are now more mobile devices on the planet than people.

RIGHTS!

NEWS 4

KEY GOVERNANCE ACTORS
- IGF
- Technical Organizations (ISOC, W3C,...)
- NETmundial
- World Economic Forum
- National Governments
- Civil Society
- Intergovernmental Organizations (OECD, UNESCO,...)
- Law Enforcement Agencies

LOGICAL LAYER

ROOT SERVICES

12 organizations from 4 countries administering 13 different root servers that provide top-level DNS services via hundreds of machines in dozens of countries.
~500 Anycast copies worldwide.

THE ROOT ZONE

NAMES + **NUMBERS** + **INTERNET PROTOCOLS** = **IDENTIFIERS' PUBLIC REGISTRIES**

NAMES   NUMBERS   PROTOCOLS

DOMAIN NAMES

~300 Country Code Top-Level Domains (ccTLDs) such as .fr, .br, .us, ...
~600+ Generic Top-Level Domains (gTLDs) such as .com, .biz, .realtor, ...
~1500+ Domain Name Registrars such as GoDaddy, Network Solutions, Register, ...

IP ADDRESSES

IPv4: More than 4 billion addresses.
IPv6: 340 undecillion (trillion, trillion, trillion) addresses.
5 Regional Internet Registries (RIRs) who coordinate policy related to Internet address resources.

PROTOCOL PARAMETERS

Protocol parameters are the commands and identifiers that are used inside protocols, the structured communications used for the web, email, etc., to transfer the information.

These parameters are used in standards defined by the IETF in coordination with other standard organizations such as the W3C. e.g. TCP/IP, VoIP, HTTP, HTTPS.

KEY GOVERNANCE ACTORS
- ETSI
- ICANN / IANA
- IETF
- ISO
- ITEE
- NRO
- TLD Operators
- W3C

INFRASTRUCTURE LAYER

THE INTERNET BACKBONE (IP NETWORKS) 90% is privately owned by global companies like: *Level 3 Communications, TeliaSonera International Carrier, CenturyLink, Vodafone, Verizon, Sprint, AT&T*

INTERNET EXCHANGE POINTS (IXP)
~550 points worldwide.

TERRESTRIAL CABLES

UNDERSEA CABLES
~300 cables that transmit 99% of all international Internet data.

SATELLITES
~2000 communications satellites in use, many used now for Internet data.

WIRELESS SYSTEMS
~824,000 wireless towers worldwide.

KEY GOVERNANCE ACTORS
- GSMA
- IEEE
- IETF
- ITU
- National ICT Ministries
- Network Operator Groups

THE LOGICAL LAYER OF DIGITAL GOVERNANCE

Layered on top of the Physical Infrastructure's thousands of networks and satellites, the Internet's Logical Infrastructure is what delivers One Internet for the world through Unique Identifiers (Names, Numbers, and Protocol Parameters). ICANN coordinates the administration of this layer in partnership with other technical communities to ensure the security, stability, resiliency, and integrity of this critical layer.

ECONOMIC AND SOCIETAL LAYER

LOGICAL LAYER

MULTISTAKEHOLDER COMMUNITY

ACADEMIC   BUSINESS   CIVIL SOCIETY   GOVERNMENT   INTERNET USERS   TECHNICAL

POLICY & IMPLEMENTATION

POLICY, SPECIFICATIONS AND STANDARDS DEVELOPMENT

THE ROOT ZONE

NAMES   +   NUMBERS   +   INTERNET PROTOCOLS   =   IDENTIFIERS' PUBLIC REGISTRIES (NAMES, NUMBERS, INTERNET PROTOCOLS)

KEY GOVERNANCE ACTORS

Root Server Operators | TLD Operators | NRO | IETF (Housed in **ISOC**) | IANA   ICANN

Other IP-Related Standards Development Organizations (W3C, ETSI, etc...)

THE INTERNET BACKBONE (IP NETWORKS)

INFRASTRUCTURE LAYER

INTERNET EXCHANGE POINTS (IXP)   TERRESTRIAL CABLES   UNDERSEA CABLES   SATELLITES   WIRELESS SYSTEMS

TECHNICAL OPERATIONS

The technical operating community is made up of multiple independent actors bound by common principles and mutual commitments that ensure the security and stability of the Internet Infrastructure. Each actor's community develops policies and standards in an open, inclusive, and consensus-based approach.

KEY GOVERNANCE ACTORS

ICANN *Internet Corporation for Assigned Names and Numbers*
Helps coordinate the Internet's systems of unique identifiers including domain names and IP addresses, as well as manages the IETF's protocol parameter registries.
www.icann.org

IANA, the Internet Assigned Numbers Authority, is a set of functions housed and operated within ICANN. It acts as the top-level allocator for blocks of IP addresses and AS numbers, proposes creation of and changes to DNS top-level domains, and manages lists of unique identifiers used in Internet protocols.
www.iana.org

IETF *Internet Engineering Task Force*
Develops and promotes a wide range of Internet standards dealing in particular with standards of the Internet protocol suite. Their technical documents influence the way people design, use, and manage the Internet. The IETF operates under the Internet Society (ISOC) with architectural oversight provided by the Internet Architecture Board (IAB).
www.ietf.org

ISO *International Organization for Standardization*
Standardizes, among many other things, the official names and postal codes of countries, dependent territories, special areas of geographic significance.
www.iso.org

NRO *Number Resource Organization*
A coordinating body for the five Regional Internet Registries (RIRs). The RIRs manage the distribution of IP addresses and Autonomous System Numbers in their regions of the world.
www.nro.net

AFRINIC   www.afrinic.net   LACNIC   www.lacnic.net
APNIC   www.apnic.net   RIPE NCC   www.ripe.net
ARIN   www.arin.net

TLD Operators *Top Level Domain Operators*
Organizations which have been assigned the management of Top-Level Domains such as: Generic TLDs (.com, .edu, .info, .name etc ...), Country Code TLDs (.fr, .us, .gh, .cn etc...) and non-ASCII alphabet TLDs (in language such as Chinese, Korean, Arabic, Russian, French etc...) —among others.

Root Server Operators
12 independent organisations operate the 13 authoritative name servers (A through M) that serve the Domain Name System (DNS) root zone. The name servers are a network of hundreds of physical servers located in many countries around the world.
www.root-servers.org

W3C
The World Wide Web Consortium (W3C) is an international community where Member organizations, a full-time staff, and the public work together to develop Web standards. W3C's mission is to lead the Web to its full potential.
www.w3.org

MULTISTAKEHOLDER COMMUNITY

Academic
• Institutions of higher learning
• Academic thought leaders
• Professors & students

Business
• Private-sector companies from across industries
• Industry and trade associations

Civil Society
• International organizations
• Non-governmental organizations
• Non-profit organizations
• Think Tanks

Government
• National governments
• Distinct economies recognized in international fora
• Multinational governmental and treaty organizations
• Intergovernmental organizations
• Public authorities (with a direct interest in global Internet Governance)

Internet Users
• Private citizens interested in regional or global Internet Governance

Technical
• Internet engineers
• Computer engineers
• Software developers
• Network operators