



Bureau
Telecommunicatie en Post
Secretariat Smart Nation Curaçao



Smart
Nation
Curaçao



The Journey Towards a Smart Nation – LACNIC On The Move [July 3rd, 2019]

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A Successful Smart Nation Strategy Includes ...



A strategic vision for the development of Curacao as a Smart Nation

“The government will develop and promote economic activities and investments in the downtown area based on the vision for Willemstad in the 21st century (“Smart City”); a city on the world heritage list of UNESCO but with a modern, futuristic, inclusive ecosystem for a vibrant entrepreneurial sector, access to state-of-the-art ICT technology and connectivity, hospitality and modern housing for tourists and locals (especially the younger generation), and a center for education, culture and recreation accessible to the whole population. This development must be the model of how to improve the quality of living in all the other neighborhoods of the island.”



A well balanced policy approach based on inclusiveness

- BTP international conference 2016: “Smart Nation Curacao – Objectives beyond 2020”
- The Council of Ministers of Curacao adopted an Innovation Policy on March 22th, 2017
- The Coalition Agreement officially supports the “Development of Curacao’s Potential” as one of its main objectives for the period of 2017 – 2021
- This should be realized throughout the development of Curacao as a Smart Nation
- The Smart Nation Platform is officialized by National Decree of February 6th, 2018 (No. 18/0289)
- The Platform consists of a Steering Committee, a Secretariat and an Advisory Board
- The Platform will support the National Development Plan of Curacao including the identified SDGs
- In June 2018, the Smart Nation Platform was officially launched by the Minister of Economic Development
- In October 2018, the Vision Paper Smart Nation Platform Curacao was introduced
- January 2019: Launch of the Smart Nation Curacao Facebook Group



Net Benefits of a Smart Nation

- More efficient transportation and traffic flows;
- Improved electronic communication services and better user experience;
- Improved efficiencies through on-line services offered by the Government;
- Improved management of public infrastructures, buildings and areas;
- Improved energy efficiency and renewable energy;
- Better management of public utilities and waste removal;
- Better access to education and at lower cost;
- Improved public safety and related emergency services;
- More effective health services; and
- Other worthwhile benefits

Improved outcomes in multiple Quality-of-Life dimensions



SOURCE: McKinsey Global Institute



ENABLING CONDITIONS FOR THE DEVELOPMENT OF A SMART NATION

- Stakeholder participation, collaboration and citizen engagement
- Sense of urgency to work towards stated goals and objectives
- The introduction and maintenance of long term knowledge and talent development programs
- The introduction of a coordinated investment program, aligning public sector and private sector investments
- The introduction of necessary policies and implementation of structural advocacy to sustain innovation in the main pillars of national development
- Real-life reference projects as success stories





Smart Nation Open Platform

"Innovation Integration Inclusiveness"

Steering Committee



Secretariat



Advisory Council

Ministers MEO, BPD, VVRP, JUSTICE

- Strategic Plan & Management
- Policies & project synchronization
- Creating & facilitating enabling conditions
- Creates investment opportunities



Bureau Telecommunicatie & Post

- Facilitate meetings & coordinate working groups
- Align public sector with private sector
- Support research & development
- Facilitates policy guidelines

Manages Interactive Website & Social Media

- Content
- Projects
- Inputs
- Collaboration
- Support
- Discussions



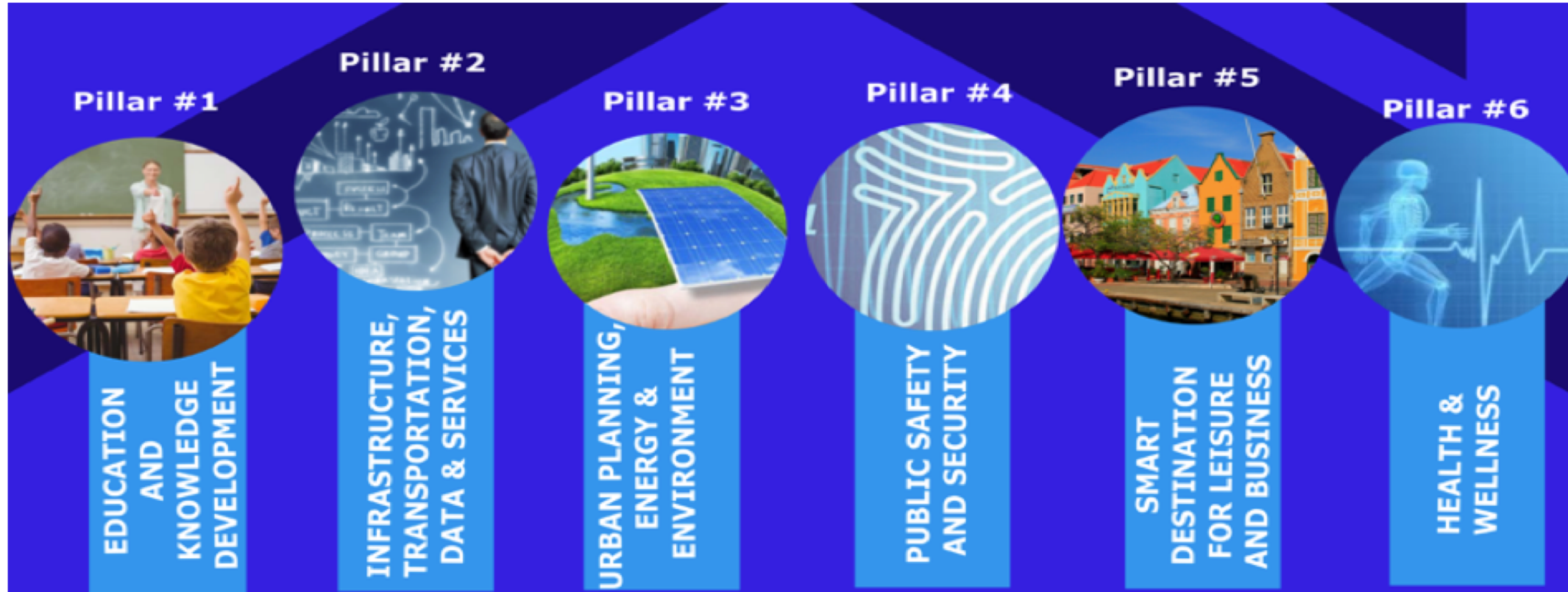
Platform Functionalities

Input ...

The Secretariat helps to achieve goals and objectives of the Platform and related working groups



The 6 main pillars for a comprehensive Smart Nation development

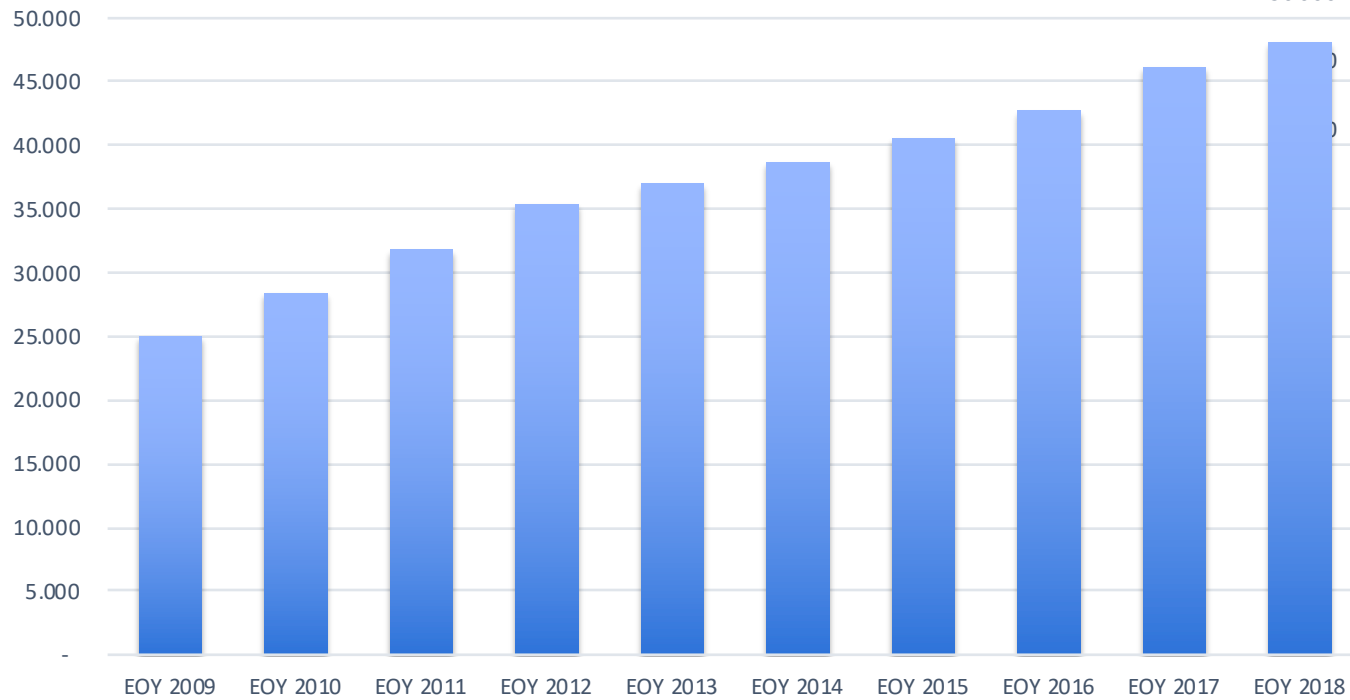


Stakeholders - Smart Nation Curacao Platform

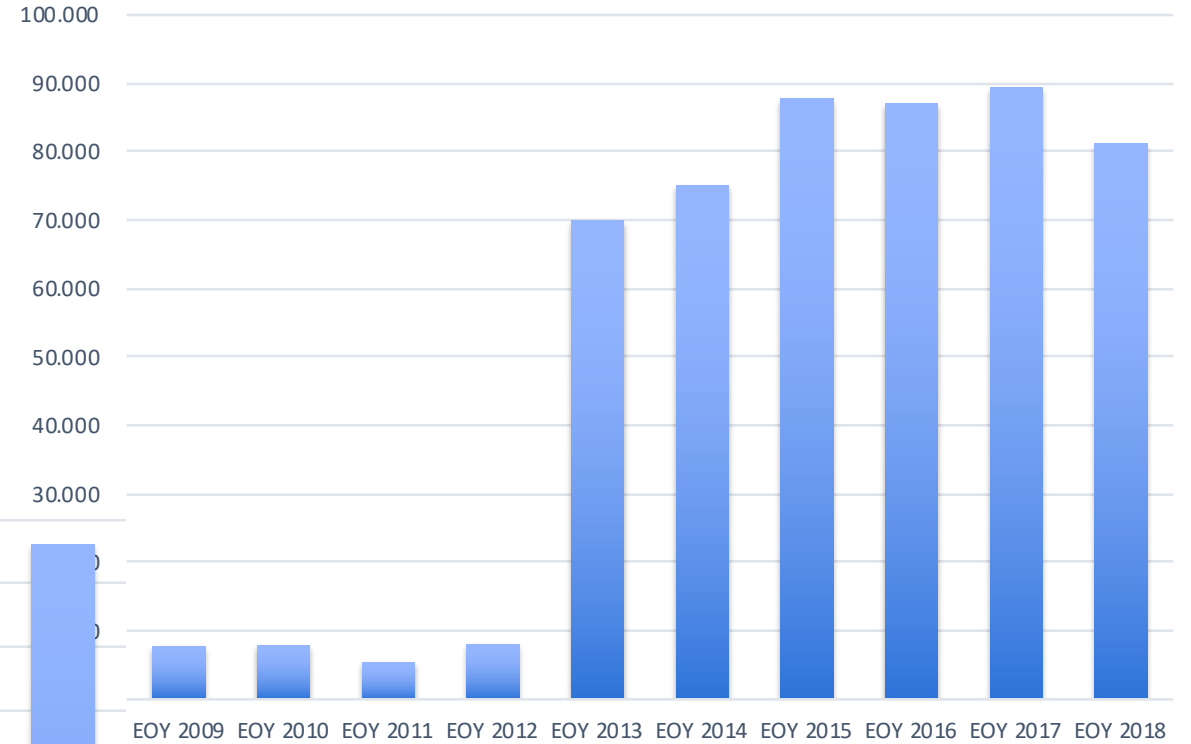
- Ministers & Gov. Departments
- Regulators
- Academia
- Technology Institutions
- Public Utilities
- Renewable energy sector
- Public Transportation
- Health Care sector
- Law Enforcement
- Disaster Management Team
- Airport & Harbor
- Financial Institutions (FinTechs)
- Investment Institutions
- Blockchain community
- Law Firms
- Telcos & ISPs
- ICT-companies
- Tourism Agencies
- Agriculture sector
- Entrepreneurs & Start-ups
- Other industries
- **Citizens ... !!!**

Statistics supporting smart nation infrastructure and development

Fixed Broadband subscriptions



Mobile Broadband subscription



Smart Nation Infrastructure

- Fixed Internet Penetration 81.5% of Households (BTP)
- Internet Usage 68% (CBS - 2017)
- Computer Usage 69% (CBS - 2017)
- Entry level broadband 8 Mbps
- Average Download Speed 22 Mbps
- Broadband subscriptions
 - 33% > 2 Mbps - 10 Mbps
 - 31% > 10 Mbps - 30 Mbps
 - 36% > 30 Mbps
- Target 2025 50% of households > 100 Mbps

Smart Nation Infrastructure

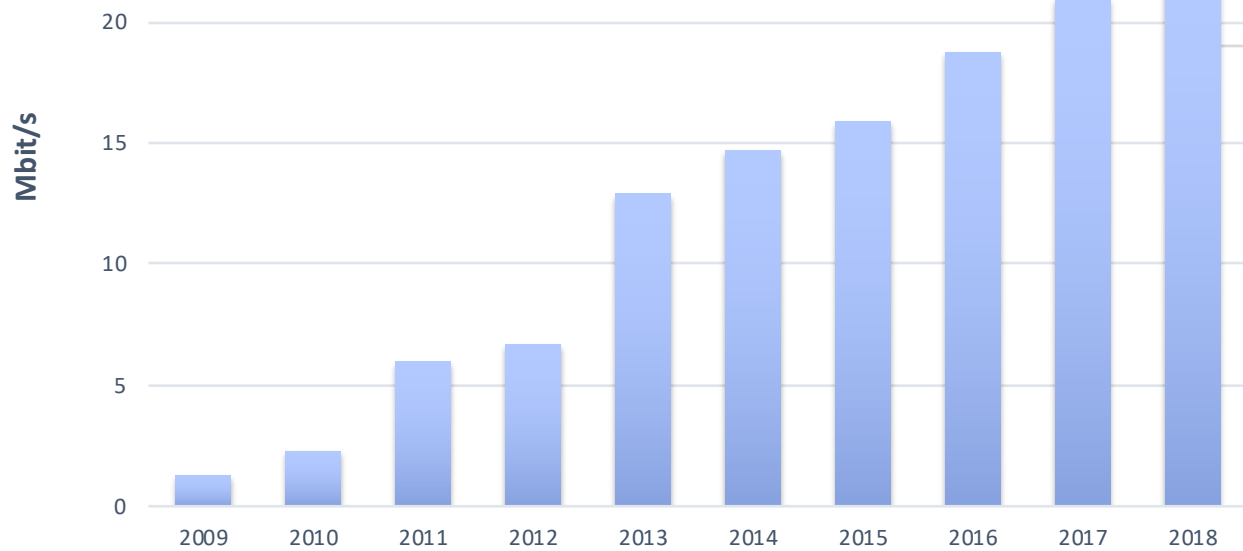
- New draft policy on electronic communication networks vs. services
- Based on single/shared passive fiber-optic infrastructure
- Two major telecom providers for fixed and mobile services
- Households covered by fiber: 25%
- Population covered with 4G-LTE service: 90%
- Going from 4G LTE -to- 5G
- Wi-Fi in City Center - Willemstad
- 7 International subsea cable systems
- AMS-IX Caribbean (incl. Content Delivery Networks)
- Multiple tier 3 & tier 4 Data Centers
- Scalability of Networks and Services ... !!!



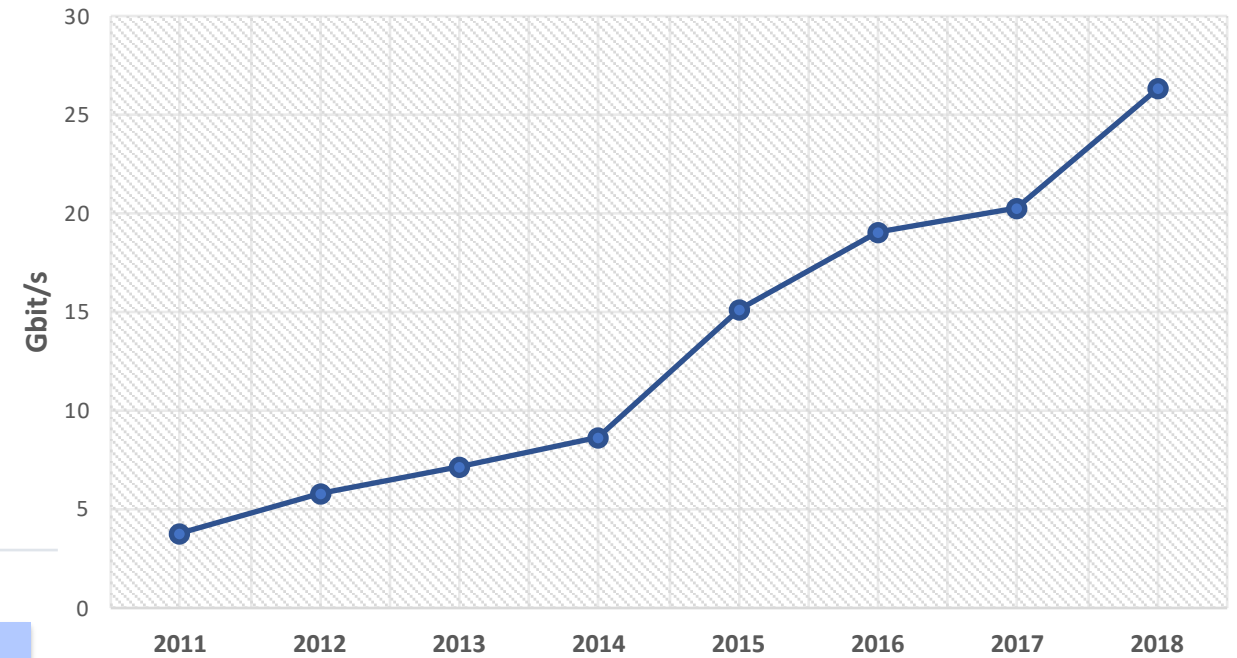
Smart Nation Infrastructure [Statistics]

25

Average download speeds



Used international internet bandwidth (Gbit/s)



TOTAL YEARLY



Regional Benchmarking



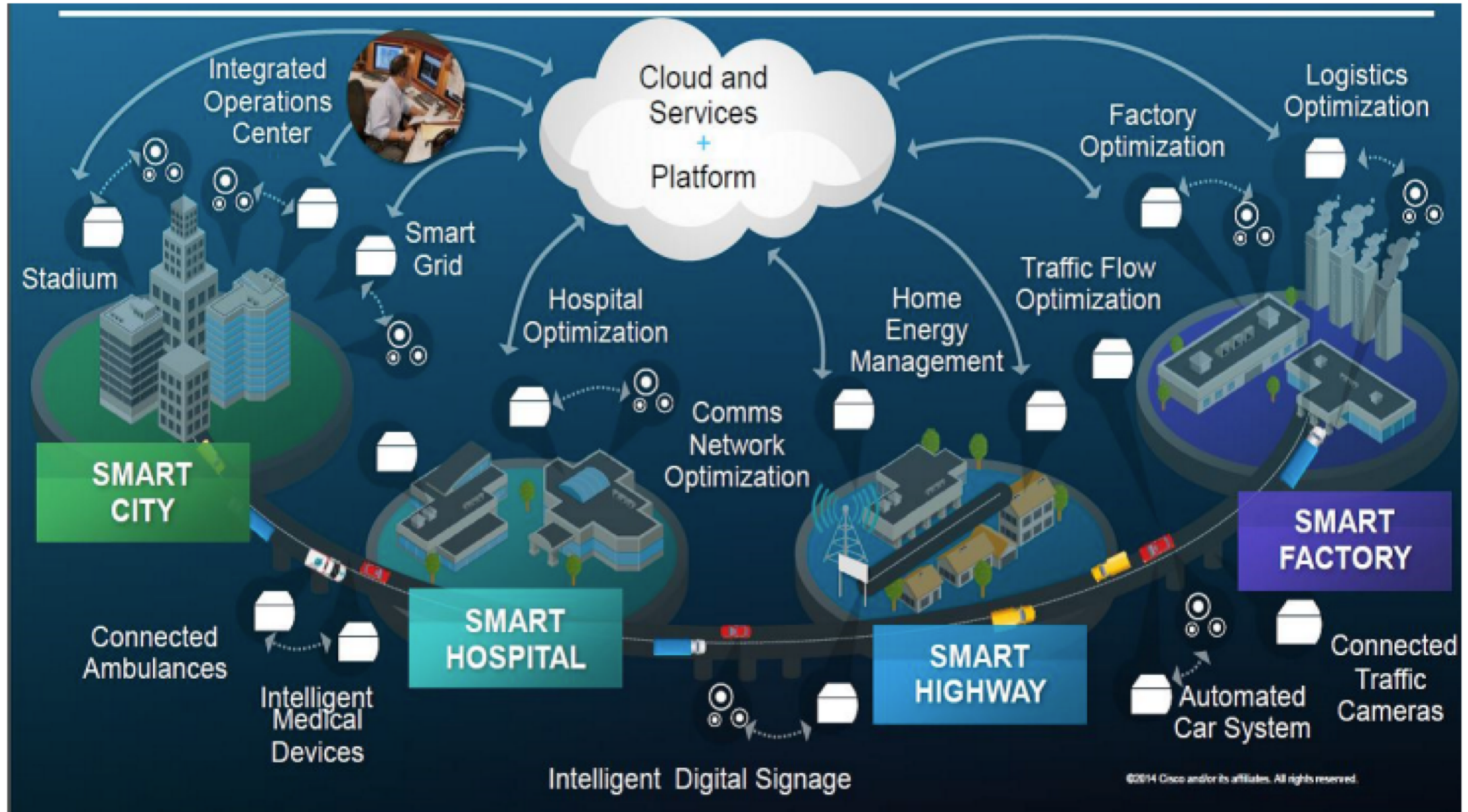
Rank	Economy	Fixed Broadband subscriptions per 100 inhabitants
1	Barbados	31,27
2	Curaçao	30,84
3	Uruguay	27,48
4	Trinidad and Tobago	23,87
5	St. Vincent & Grenadines	22,30
6	Bahamas	21,97
7	Grenada	20,62
8	Puerto Rico	18,02
9	Argentina	17,78
10	Saint Lucia	17,77
11	Chile	16,94
12	Costa Rica	15,17
13	Brazil	13,70
14	Mexico	13,26
15	Colombia	12,88
16	Suriname	12,64
17	Panama	10,88
18	Ecuador	10,13
		8,34
		8,27
	la	8,16
	an Rep,	7,30
		7,18
	lor	6,94
	r	4,08
	ia	3,38
		3,25
	s	2,51
		0,29
		0,27

Rank	Economy	% of GNI	Fixed broadband monthly subscription charge in USD	Speed in Mbit/s	GNI p.c., USD, 2017 (or latest available)
1	Bahamas, The	1,23	29,99	1,00	29.170
2	Trinidad and Tobago	1,58	20,20	3,00	15.350
3	Costa Rica	1,88	17,27	1,00	11.040
4	Panama	1,96	21,35	4,00	13.100
5	Curaçao	1,98	32,37	8,00	19.594
6	Puerto Rico	2,09	33,44	1,00	19.200
7	Brazil	2,41	17,20	0,50	8.580
8	Mexico	2,57	18,44	10,00	8.610

Smart Cities Services

TRANSPORT	 PUBLIC TRANSPORT	 TRAFFIC MANAGEMENT	 PARKING	ENVIRONMENT	 AIR QUALITY	 WEATHER SENSING	 FLOOD CONTROL
SAFETY	 STREET LIGHTING	 CROWD CONTROL	 CCTV	UTILITIES	 SMART METERING	 WASTE MANAGEMENT	 SEWERAGE
HEALTHCARE	 DISEASE CONTROL	 EMERGENCY RESPONSE	 PATIENT AUTHENTICATION	GOVERNMENT	 CITIZEN ENGAGEMENT	 MUNICIPAL SERVICES	 INFRASTRUCTURE MONITORING
ENTERTAINMENT AND TOURISM	 EVENT MANAGEMENT	 RECREATION FACILITIES	 SHOPPING MALLS	COMMERCE	 DELIVERY LOGISTICS	 RETAIL	 ADVERTISING

Why Smart Cities need IPv6





SMART CITY USE CASES



SMART
PARKING



WEATHER
SENSORS



DIGITAL
SIGNAGE



ACOUSTIC
SENSORS



WATER & GAS
METERING



TRAFFIC
LIGHTS &
CONTROLS



ELECTRIC
VEHICLE
CHARGING



SOLAR
INVERTERS



SECURITY AND
SURVEILLANCE



WASTE
MANAGEMENT

The Internet of Things (IoT) and Smart Cities

- A Smart City is defined as:
 - *“A city connecting physical infrastructures, **ICT-infrastructures**, social infrastructures and business infrastructures **to leverage the collective intelligence of the city**” (IET).*
 - *“An innovative city that uses **information and communication technologies** and other means to **improve quality of life**, efficiency of urban operation and services, and competitiveness, **while ensuring that it meets the needs of present and future generations** with respect to economic, social and environmental aspects” (ITU)*
- IoT (*“The Internet of Everything”*) may be defined as:
 - *“**Objects having identities and virtual personalities** in smart spaces using intelligent interfaces **to connect and communicate** within social, medical, environmental and users context”.*

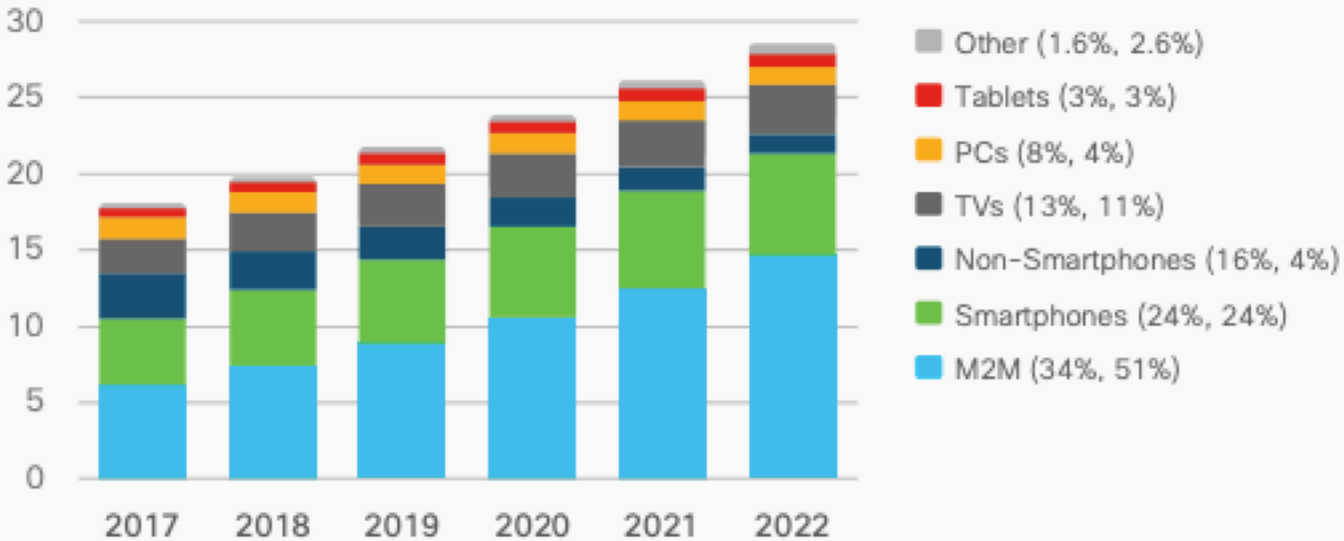
IoT Opportunities, Challenges & Threats

- The future of leveraging IoT for smaller/developing economies is promising
- McKinsey: the IoT market may generate up to 10 Trillion by 2025, which represents 11% of the global economy
- IoTs are opening opportunities to achieve development goals by providing new data sources that lead to the analysis, understanding and actions to be taken on existing and future issues
- IP-based networks are a key component in the IoT as it is the only technology to offer ubiquitous, cost-effective connectivity
- IoT will not happen on a large scale without IPv6 and it is the new business driver for IPv6
- IPv6 is the driving protocol for IoT, Smart GRID, and for Smart Cities
- IPv6 over Low Power Wireless Personal Area Networks (6LoWPAN)
- Promoting IPv4 now is irresponsible as NAT insecurity could harm Smart Cities
- Security & Data Protection is critical: cyber vulnerabilities remain the main challenge for IoT and Smart Cities



10% CAGR
2017-2022

Billions of
Devices



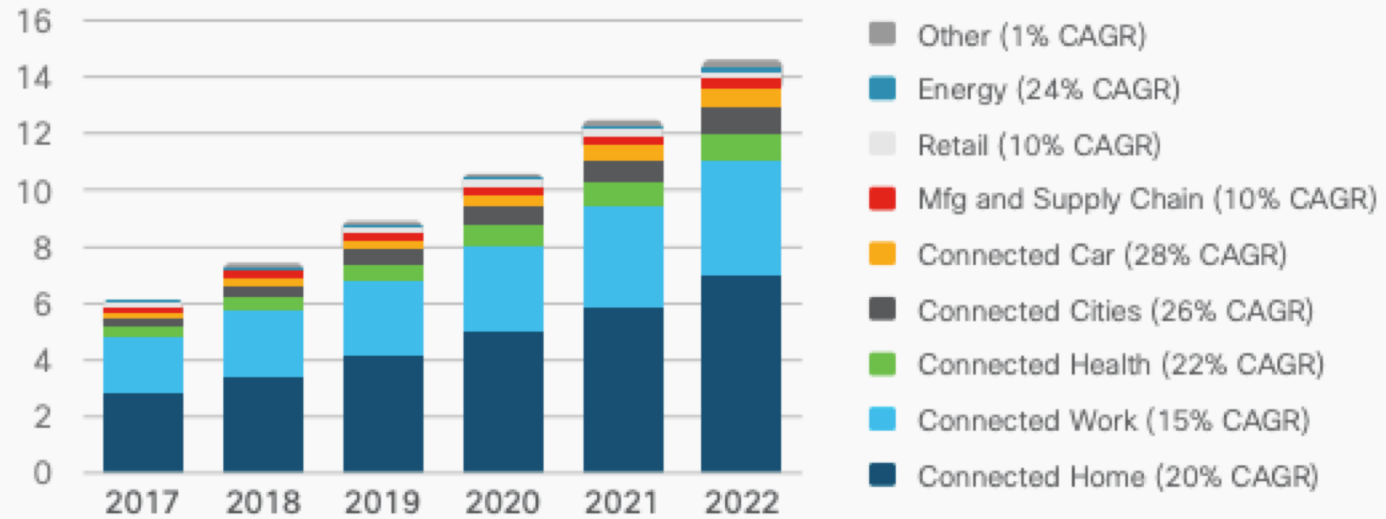
* Figures (n) refer to 2017, 2022 device share

Source: Cisco VNI Global IP Traffic Forecast, 2017-2022

Global devices and connections growth

19% CAGR
2017-2022

Billions of
M2M
Connections

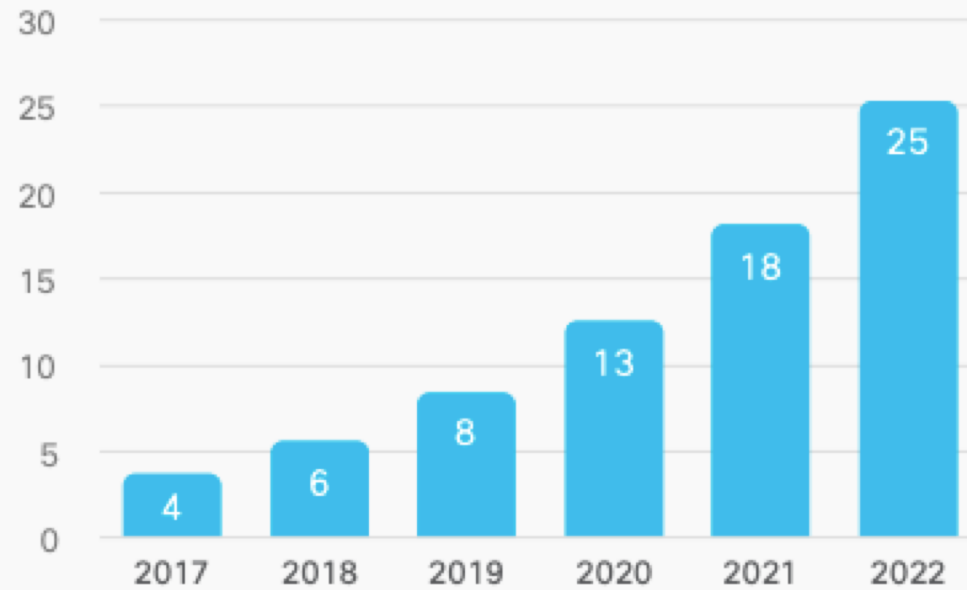


Source: Cisco VNI Global IP Traffic Forecast, 2017-2022

Global M2M connection growth by industries

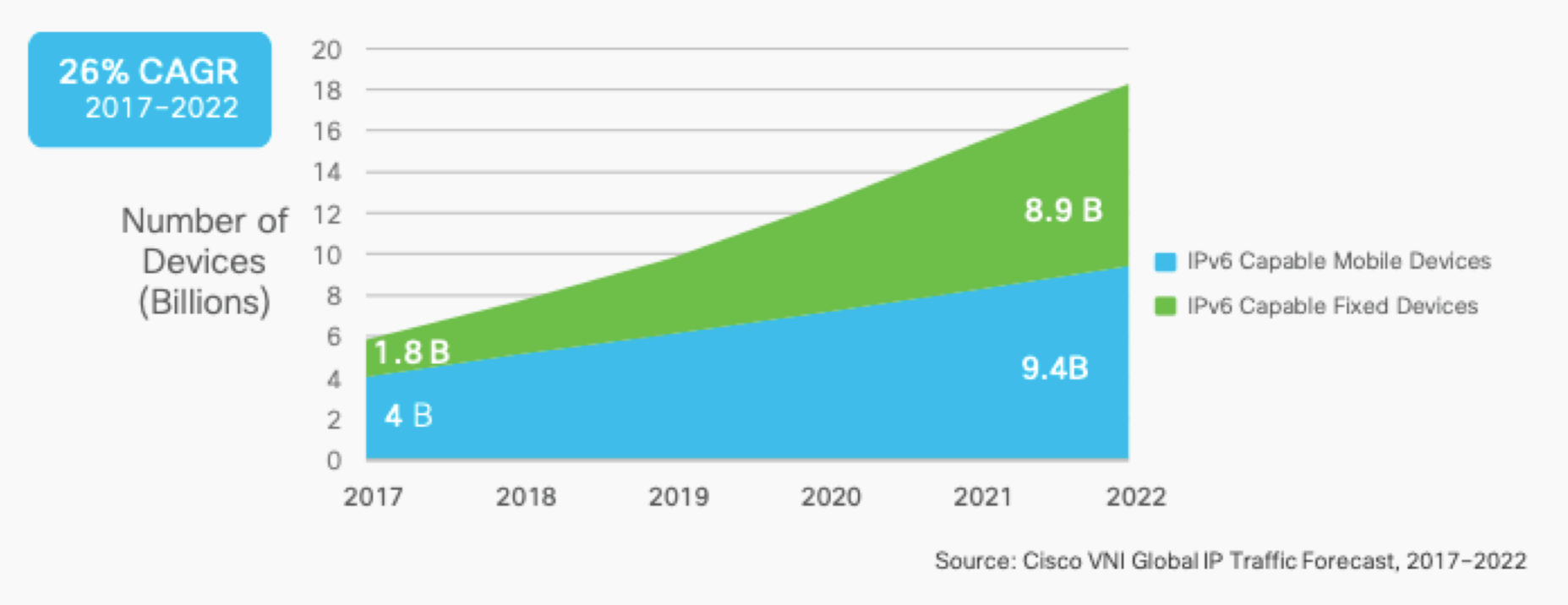
47% CAGR
2017-2022

Exabytes
per month



Source: Cisco VNI Global IP Traffic Forecast, 2017-2022

Global M2M traffic growth



Global IPv6-capable devices & connections forecast

The New Internet – IPv6

- We need ultra low latency / high broadband networks who can do the job from anywhere to any other point in the world
- Vint Cerf – Father of the Internet: *“The Internet needs to keep evolving and there are things that should happen beyond IPv6, but to overcome the present address space exhaustion, we need to implement IPv6 essentially everywhere”*
- Designed to replace the old Internet protocol (IPv4) addressing space providing millions and millions of IP-addresses
- Beneficial for large scale IoT implementation while supporting the development of Smart Cities ecosystems
- The only technical alternative for universal broadband access and innovative industry applications as it's impossible to sustain economic growth with IPv4
- The IPv4-based Internet will not stop working, but it will stop growing, while the IPv6-based Internet is designed for the Next Generation of Networks

Benefits of IPv6 vs IPv4

- Greatly expanded address space (32/128 bits)
- Always-on capabilities; Innovative Internet applications compared to IPv4
- Provides more functionalities & end-to-end communication capabilities
- Expanded autoconfiguration mechanisms
- Extensions for authentication and privacy
- Improved built in security by design (IPsec protocol)
- Enhanced wireless/mobile applications (LoRa, Sigfox, Zigbee, LTE, 5G, ...)
- Improved performance and Quality of Service
- Better control of your data in general
- Extensible, flexible, easy and relatively cheap to implement





IoT supporting innovation in Curacao

- Aqualectra AMI & Smart Lighting
 - Tracking devices (fleet tracking, heavy equipment, security services, etc.)
 - Logistics / management & monitoring
 - Law Enforcement Camera Surveillance Systems
 - Connected vehicles & Drones
 - Industrial sensor networks
 - Meteorological Department Sensors
 - M2M applications – mobile operators
 - e-SIM applications
 - Point of Sales (POS)
 - Point of Care Testing (POCT)
 - Other personalized e-Health applications
 - Connected (SMART) Homes
 - New projects, applications and other interests ...
[Digital Twin]
[Climate change, (waste)water management, ...]
- 

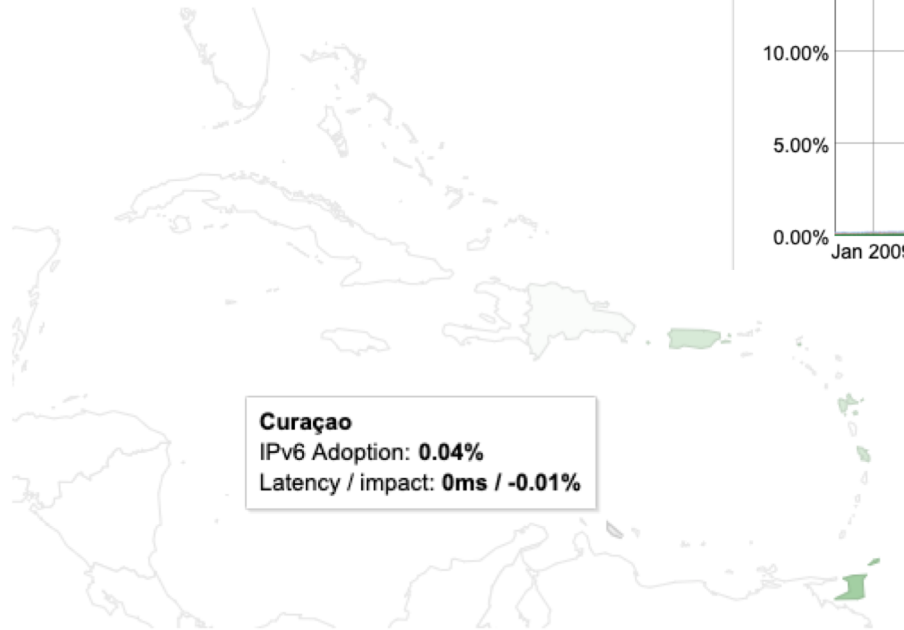
Blockchain & The New Future of the Internet

- Blockchain introduces a whole new dimension on how we will connect, communicate and share information in the future
- The buzz word is “**decentralized web**”. Blockchain is one of these technologies and it will change the way we use the Internet
- Blockchain is a new architecture, that revolutionizes the Internet and replaces the common centralized client-server design
- Decentralized web service, replacing http, peer-to-peer protocol to make the web faster, safer, and more open
- End-to-end connection and security is critical, so IPv6 will bring great advantages for blockchain systems
- Blockchain might be used for all different purposes, decentralized, hard to hack, hard to manipulate. Companies are starting to create clouds in the Internet with blockchain.
- Financial institutions, governments, law firms, electrical companies, the music industry and many others are starting to use blockchain
- “Blockchain for VoIP” – Distributed/decentralized ENUM implementation

Google IPv6 adoption

IPv6 Adoption **Per-Country IPv6 adoption**

Per-Country IPv6 adoption



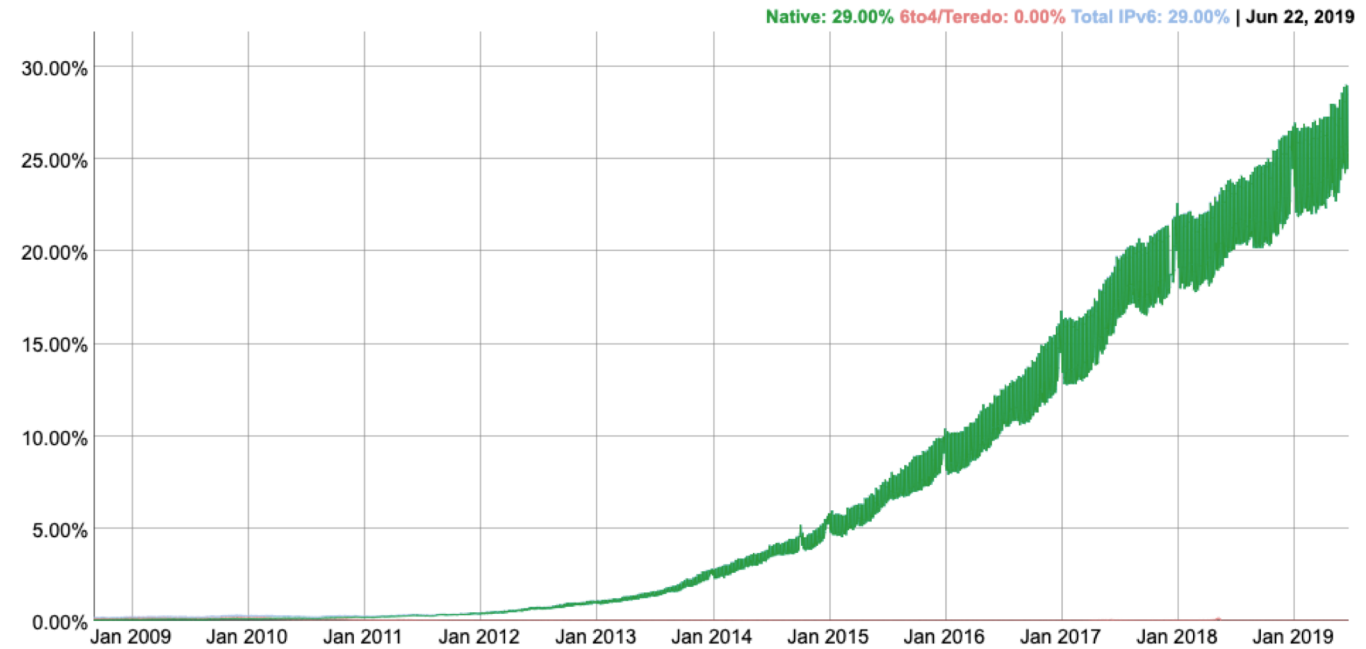
[World](#) | [Africa](#) | [Asia](#) | [Europe](#) | [Oceania](#) | [North America](#) | [Central America](#) | [Caribbean](#) | [South America](#)

The chart above shows the availability of IPv6 connectivity around the world.

IPv6 Adoption **Per-Country IPv6 adoption**

IPv6 Adoption

We are continuously measuring the availability of IPv6 connectivity among Google users. The graph shows the percentage of users that access Google over IPv6.



*Country data ranked by % of IPv6 connections from that country.

▼ RANK	IPV6%	COUNTRY
121	0%	Curacao



A COLLABORATIVE & INTER-DISCIPLINARY APPROACH



Join our community

<https://www.facebook.com/groups/smartnationcuracao/>



share your story.

The screenshot shows the Facebook interface for the 'Smart Nation Curacao' group. At the top, the group name and profile picture (a stylized logo with a circuit board) are visible. The left sidebar contains navigation options: About, Discussion, Chats, Members, Events, Videos, Photos, and Moderate Group. Below this is a search bar and a list of shortcuts to other groups. The main content area features a post from 'OWAC System by Omega Engineer' dated June 29 at 12:03 PM. The post text describes a visit by Studio Acht Caribbean Architects BV to consider the integration of OWAC into their future projects. It includes several hashtags: #owac, #omega, #curacao, #ocean, #water, #cooling, #caribbean, #economy, #development, #sustainability, #smart, #environment, #green, #blue, #reduction, #saving, and #energycosts. Below the text is a photo of a group of men in a technical setting, gathered around a large piece of equipment. The right sidebar contains information about the group, including the number of members (223), a list of suggested members with 'Invite Member' buttons, and a description of the group as a social media platform. At the bottom, there is a 'CREATE NEW GROUPS' section with a 'Create Group' button.

BOX#

OWAC System by Omega Engineer



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THANK YOU!



