GreenIPv6
What's IPv6's Carbon Footprint?

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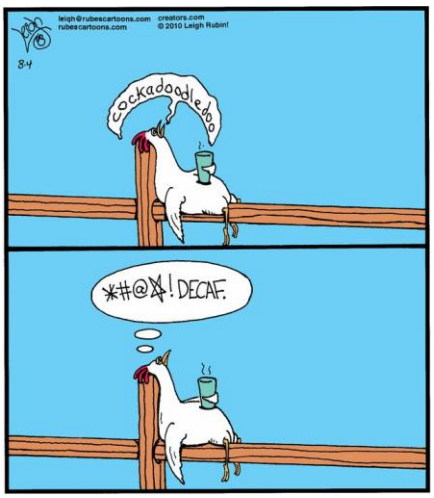
IPv6 Forum Australia

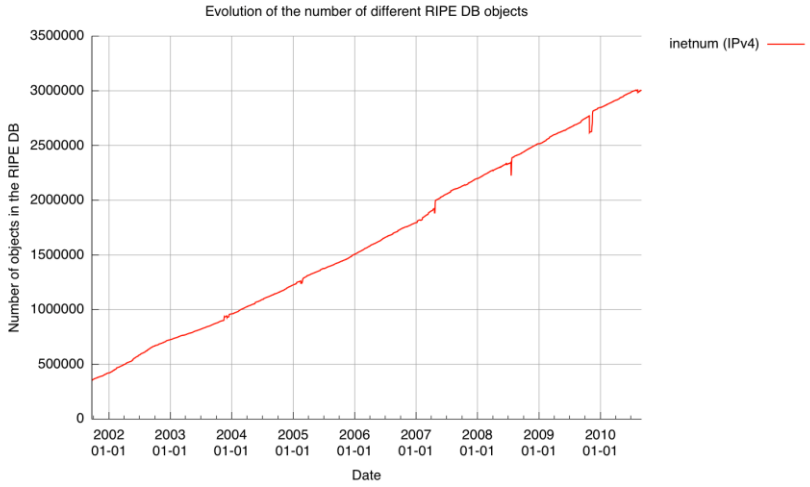
- SIG of ISOC-AU
- Affiliated with the IPv6 Forum worldwide
- Part of the Asia Pacific IPv6 Task Force



Cartoon used with permission, Leigh Rubens.

RIPE NCC IPv6 Growth Graphs

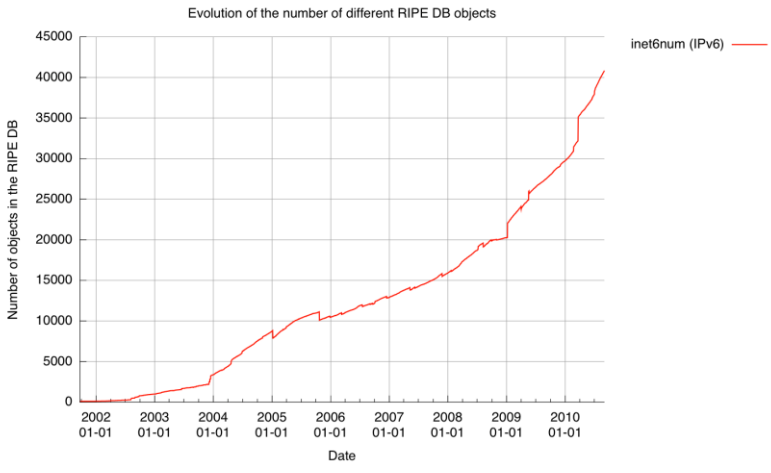
IPv4



https://labs.ripe.net/Members/kistel/interesting-graph-nine-years-of-ripe-db-objects

RIPE NCC IPv6 Growth Graphs

IPv6



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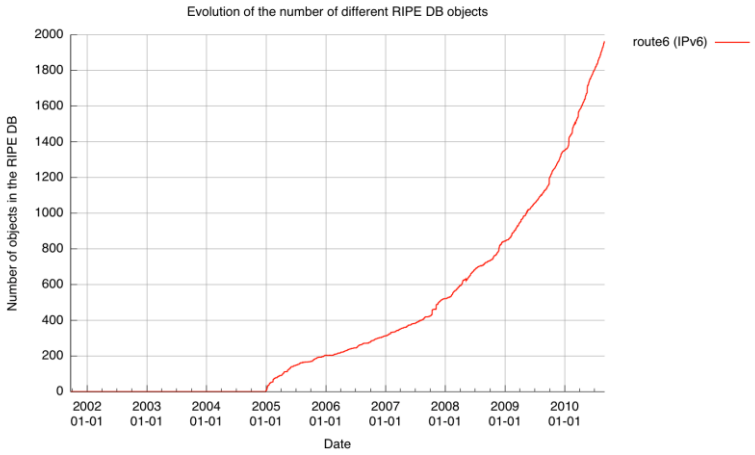
RIPE NCC IPv6 Growth Graphs

IPv6



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IPv6 a major catalyst for billions of dollars worth of deals?

- "If we look at the transition from IPv4 to IPv6, we're seeing an explosion of billions of devices and they all need to be secured." (Dave DeWalt McAfee CEO after Intel announcement of US$7.7B purchase)
- Baltimore Gas and Electricity (BGE) signed a contract for the provision of IPv6 based smart readers to equip their 1.2 million customers using a 'secure, end-to-end IPv6 platform'

Source: Yves Poppe, CircleID

IPv6 a major catalyst for billions of dollars worth of deals?

- Cisco and Itron sign a strategic agreement to 'develop a standards-based, highly secure technology for full IPv6 implementation of field area communications to support smart metering, intelligent distribution automation and interfaces to the customer premise '.
- One day later, September 2nd, Cisco announces the purchase of Archrock,

Source: Yves Poppe, CircleID

Victorian Government EV Trial

- The Electric Vehicle Trial will run for five years
- Help Victoria to better understand the process, timelines and barriers for transitioning to ev technologies.
- The trial is seeking 180 households to take an ev for three months each.

Green Cars?

Smarter Energy

- 'Smart grids' use sensors, meters, digital controls and analytic tools to automate, monitor and control the two-way flow of energy across operations—from power plant to plug. (IBM)

Overview of the smart grid maturity model

- Level 1—Exploring: The utility is beginning to explore the journey toward a smart grid, and may have a vision but not a clear strategy. At this point, experimentation and evaluation of technologies and building of business cases are key.
- Level 2—Investing: The utility is investing in and implementing at least one of the essential functional areas of smart grid. For some, the priority is advanced metering infrastructure (AMI). Others may start with demand-side management (DSM) or deployment of a distributed intelligent sensor network for enhanced grid reliability and outage recovery.
- **Level 3—Integrating: The components of smart grid begin to be integrated with one another, providing operational linkages between two or more functional areas.**
- Level 4—Optimizing: Transformation and optimization of systems enterprise-wide occurs, taking advantage of integrated control across and between utility functions.
- Level 5—Innovating: The enterprise is positioned so when new business, operational, environmental and societal opportunities present themselves, the capability exists to take full advantage of them.

Source: IBM

$A100 million Smart Grid, Smart City Project

- Project being undertaken by a consortium led by EnergyAustralia.
- provide distributed generation, smart metering, and demand-management solutions at five sites in Sydney and the Hunter region of NSW.
- Other members of the consortium are GE Energy Australia, AGL, Sydney Water, Hunter Water, and Newcastle City Council.

The NGN Forum™ Launches Smart Energy Forum™

- Focus on IP services used to power the smart grid, home grids and alternative energy sources such as wind and solar.
- The NGN Forum activities going forward:
  - Next Generation Communications, and
  - NGN Energy Applications
- Affiliated with the IPv6 Green Protocol Working Group

www.NGNforum.org or www.SmartEnergyforum.org.

Smart Energy Forum™ (SEF)

- the US smart grid industry is valued at about $21.4 billion. (2014: exceed $42.8 billion).
- world market is expected to grow at a faster rate, surging from $69.3 billion to $171.4 billion by 2014. [Smart Grid News]
- Utilities traditionally develop their own networks and communications systems, now teleco's have apps, technology OSS, BSS, Security…IMS based and mandating IPv6

IP Multimedia Subsystems - IMS

- accelerate the interoperability of NGN, IMS and Smart Energy services
- to enable enterprise and residential consumers to benefit fully from the delivery of all-IP M-playTM/rich multimedia, mobility, M2M, cloud computing, and fixed services
- over wireline, cable, GSM, UMTS, Wi-Fi, 4G (WiMAX / LTE), power line/smart meters and fibre broadband networks.

Ongoing IPv6 Based Initiatives

- Latif Ladid discussed “The Internet of Things”
- Last year, the poster child for Smart / Green IPv6 was the 2008 Beijing Olympics
  - Smart Lighting
  - Smart Power
- Hiroshi Eskai will discuss:
  - the Green University of Tokyo Project
- Let’s look at the International Cooperation House - Geneva

Smart IPv6 Buildings

- key objectives
  - reduce the building energy consumption and CO2 emissions
  - integrated and smarter building management.

http://www.smartipv6building.org

IPv6 as Part of Mix

- **Architecture**
  - Materials & insulation
  - Windows & glass technology
  - Green concrete
  - Wood
  - Insulation
- **Energy**
  - Solar cells
  - Heat-pumps
  - Green heating system
  - Smart IPv6 building & automation
  - Green lighting system
- **Transportation**
  - Soft mobility
  - Public transport
  - Telepresence
- **Biodiversity**
  - Biodiversity
  - Green roof
  - Rainwater collection
- **Environmental & CO_2 footprint evaluation**

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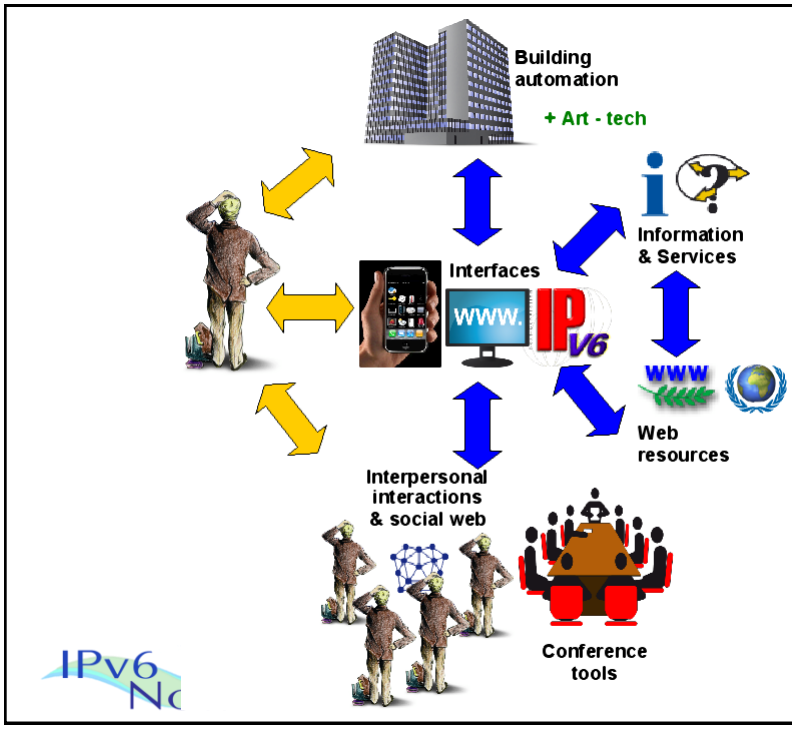

Smart IPv6 Buildings

- IPv6 can bring several advantages for smart buildings.
  - Increase the granularity of building control and monitoring, by addressing each and every sensor, device and actuator with its own IP address.
  - Ease the deployment of automated devices, with the self-configuration of the IP addresses.
  - Improve security of the connectivity to the devices, in particular for remote control.

http://www.smartipv6building.org

Universal Device Gateway

- The Universal Device Gateway uses IPv6 to integrate and to interconnect heterogeneous subsystems using different communication protocols and standards into a shared semantic framework.
- enables heterogeneous devices such as mobile phones, RFID tags, ZigBee sensors, KNX actuators and DLNA screens to interact with each other.

www.devicegateway.com

IPv6 Building Environment

Source: KNX Association

Smart IPv6 Buildings

- **Building automation**
  - To reduce energy consumption by at least 25%.
  - To ease the deployment and integration of building automation systems.
  - To manage access control and to improve security.
  - innovative tools for meeting and conference rooms.
  - To develop innovative interfaces within the building (virtual assistant, etc.).
  - To enable individual environment customization by the users (temperature, light, music, etc.).

http://www.smartipv6building.org

Smart IPv6 Buildings

- **Information & services**
  - To display real time information on the state of the world: key figures (population, surface of forest, etc.), satellite images, global temperature, etc.
  - To provide innovative services, including contextualized services.
  - To enable building infrastructure booking (meeting rooms, etc.).
  - To ease resource identification and orientation
  - To test innovative semantic and multilingual services.

http://www.smartipv6building.org

Smart IPv6 Buildings

- **Human beings**
  - To provide telepresence solutions
  - To facilitate the networking among tennants/users.
  - To develop a global networks with new forms of decentralized cooperation and collective intelligence.
  - To test on-line collaborative tools.
  - To organise social activities, family and spouse support.

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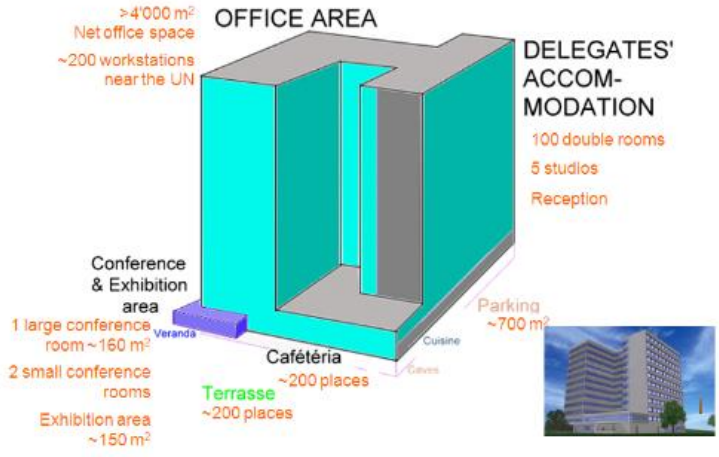
International Cooperation House - Geneva



Smart IPv6 Buildings

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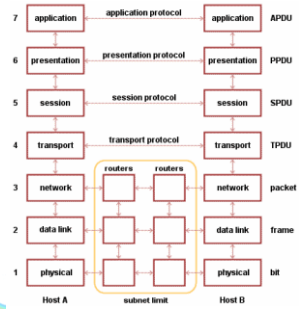
…only one of many IPv6 based green initiatives reducing IPv6's carbon footprint!

Tradition to Maintain

1. Exponential graphs ✓
2. OSI 7 Layer Model ✓



Questions?

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