

*Internet Protocol
version 6:
What it is and why it
matters*

*Opportunities for Consumer
Electronics' Internet Innovators*

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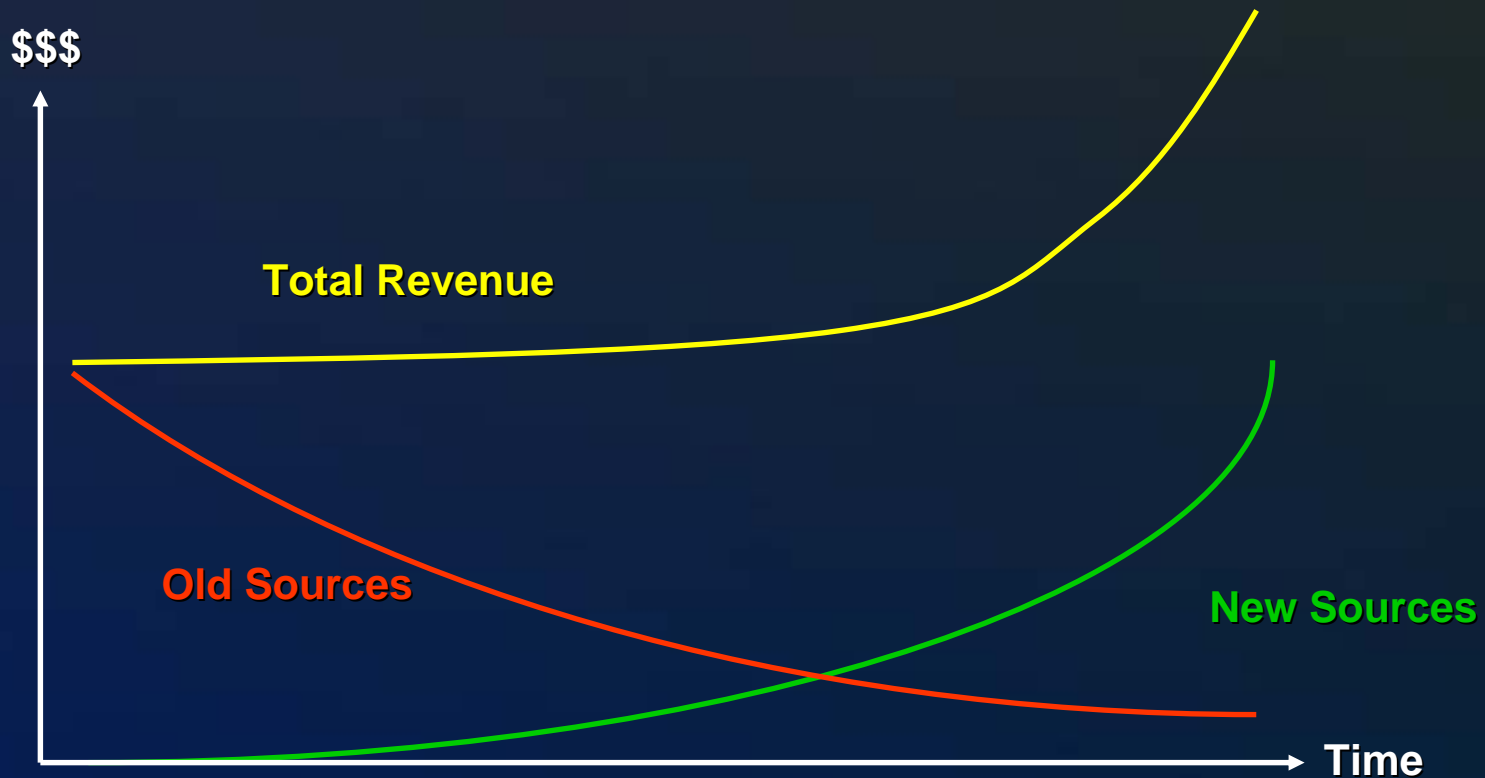
Conference Chairman, IPv6 Summits in North America

Founder, The 4G Society

Opening Thought

- **The primary reason to deploy IPv6 is to improve customer communication experiences while also improving civilization for all humanity.**

Service Provider Revenues



Cambrian Explosion

Adaptive Radiation/Chaos/
Pseudo-Random Search
Evolution

Multicellularity
Discovered

Complex Environmental Interaction

Bacteria ☺

Insects

Invertebrates

Selection/Emergence/
Phase Space Collapse/
MEST Collapse

Development

Vertebrates

570 mya. 35 body plans emerged immediately after. *No* new body plans since!
Only new brain plans, built *on top* of the body plans (homeobox gene duplication).

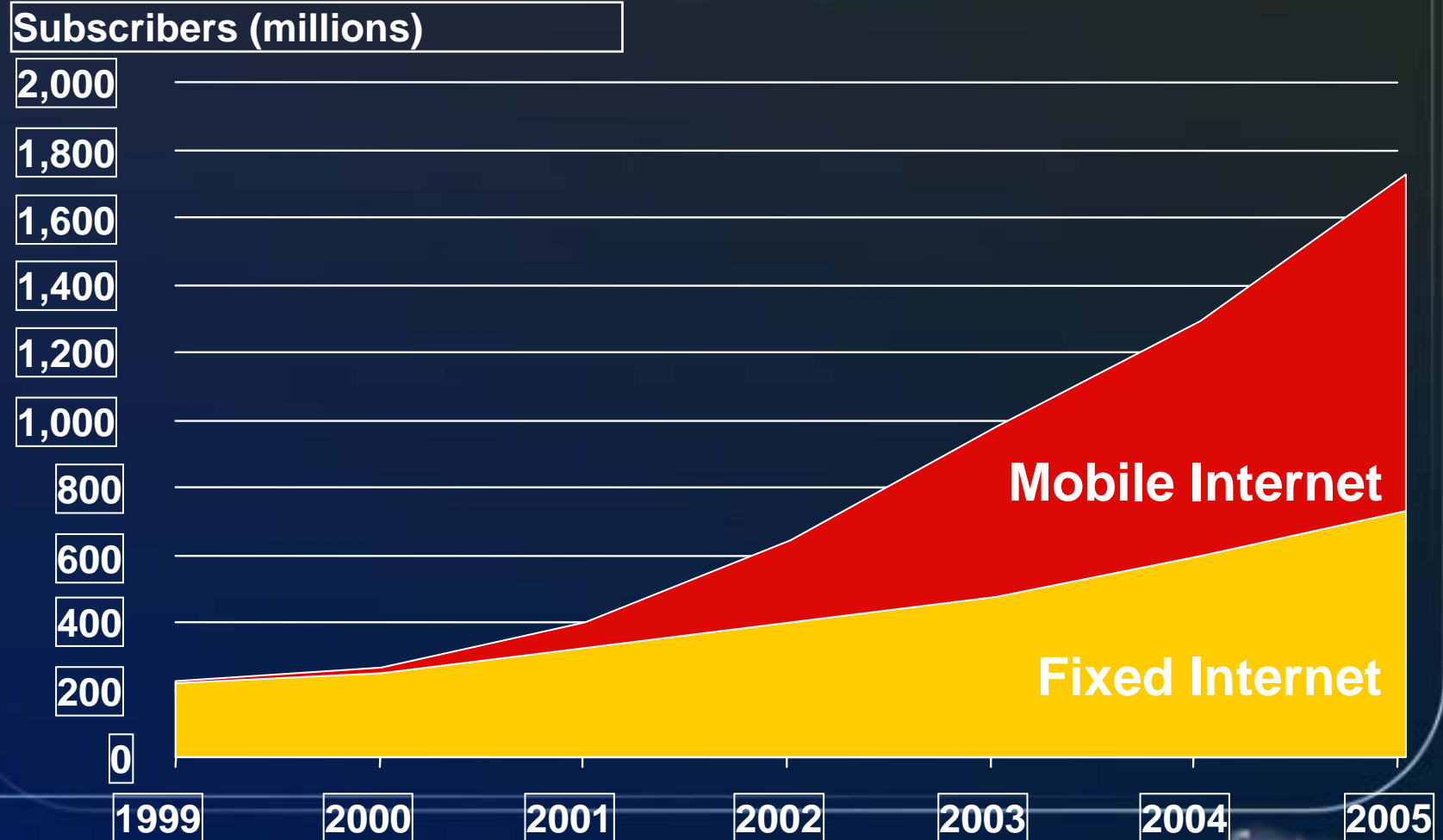
Body/brain plans: “eukaryotic multicell. evolutionary *developmental* substrates.”



Microsoft's advanced R & D discovery

- Dan Rosen, former Dir of Adv R & D for Microsoft: “The most valuable thing we’ve learned is that in the future everything that costs over \$25 except food will be connected to the Internet.”
- IP + a pico radio could compliment, then embrace and extend, then replace, bar codes and RFID tags.
- Gillette: just ordered 500,000 RFID tags. Razorblade sweeping.

The Mobile High Performance Internet The Next Boom, and the Next 4 Relationships



Source: Ericsson

The New Powers of Ten

<u>Time</u>	<u>Platform(s)</u>	<u>Network Operations Model</u>	
1960-1980	Mainframe/ IBM era	10:1 people/machine ratio	<p><i>Old network management systems were single vendor solutions optimized for cost in rigid five-year preplanned networks.</i></p>
1970-1990	Minicomputer/ DEC era	1:1 people/machine ratio	
1980-	Workstation/ PC era	1:10 people/machine ratio	
1990-	Enterprise networks/ Cisco era	1:100? people/machine ratio	<p><i>New network operations systems must be designed for <u>adaptability and change</u> (new equipment, multiple vendors, new service offerings/provisioning).</i></p>
2000-	Broadband packet networks ?	1:1000? people/machine ratio	

IPv6 is needed for billions of addresses

■ IPv6

■ features

- ✓ 3.4×10^{38} unique addresses available
- ✓ Stateless autoconfiguration
- ✓ Security: authentication and encryption
- ✓ Mobility management

Three Big Leaps for IPv6

- 1.** The Global Grid Forum began adoption of IPv6 in June 2003 during the San Diego Summit benefiting from IPv6 peer-2-peer and end to end security
- 2.** US Dept. of Defense has mandated IPv6 in its procurement as of Oct 2003 to create the Net-centric vision which will culminate into the 4G vision
- 3.** DOD orchestrated the Moonv6 coast-2-coast testbed comparing it to the first moon landing exercise.

The Information Foundation

- Just as foundation of building (brick vs. structural steel) determines how high it can go, the information foundation (structure of networks) determines how high civilization can reach.
- Jim Bound: “IPv6 is infrastructure!”
- Latif Ladid: IPv4 is straining to support just one application like the World Wide Web. IPv6 could support at least ten applications the size of the WWW.
- Like putting round peg in round hole: how do we drop entire industries into the expanding IPv6, creating commercial explosions?

The Seven Wonders of the Ancient World

- **The Pyramids of Giza**
- **The Hanging Gardens of Babylon**
- **The Colossus of Rhodes**
- **The Lighthouse of Alexandria**
- **The Mausoleum of Halicarnassus**
- **The Temple of Artemis at Ephesus**
- **The Temple of Zeus at Olympiad**

The Colossus of Rhodes

The Statue of Liberty

We Don't Want to Wait For 2000 Years!



APPLICATIONS the size of WWW

- **Atlas application, supports the world**
- **Voice (\$500 billion annually)**
- **Radio (add personalization, location)**
- **Television (Every show ever made)**
- **Medical Monitoring**
- **Simulations**
- **High resolution Location Based Services, including security**

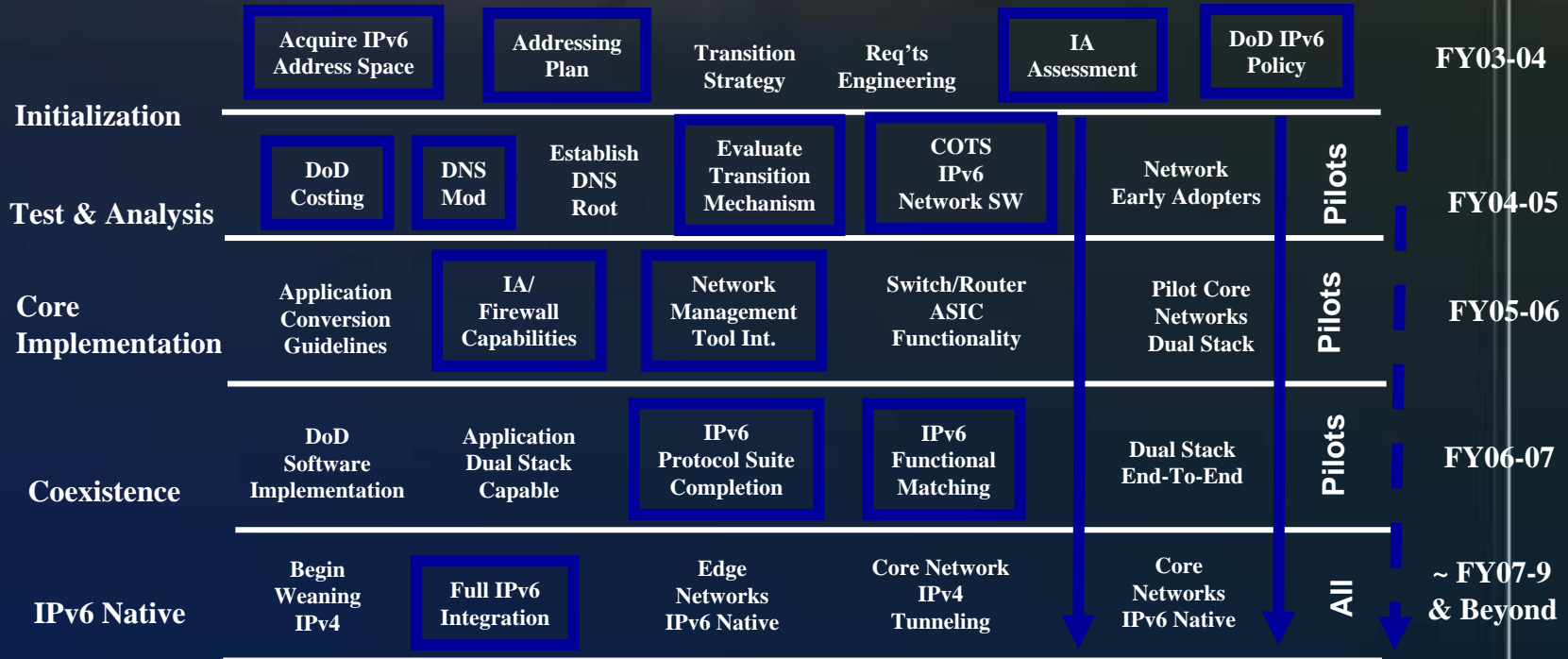
Powers of IPv6

- Power of Numbering
- Power of Sequencing
- Power of Ranking
- Power of Naming
- Power of Leading
- Power of Granularity
- Power of Bounding
- Power of Finer Address (from “c/o General Delivery to street to 5 digit zip to 9 digit zip to 128 digit zip)
- Power of Slapping on Labels and Instructions
- Power of Containerized Cargo
- Power of Tight Targeting
- Power of Better Modeling and Simulation

DoD IPv6

At a first level:

Transition Concept

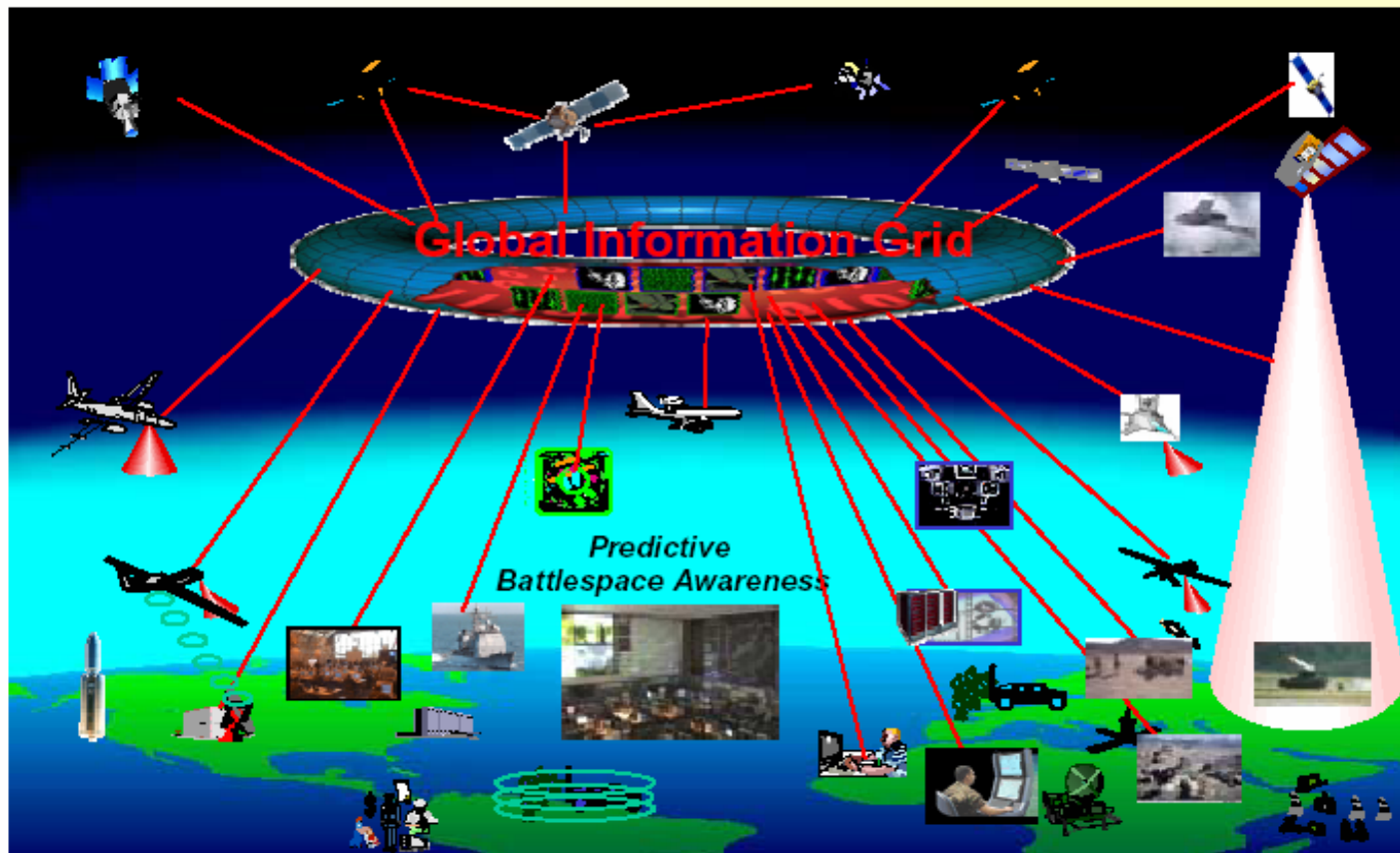


Need to define next level of details and integrate in IA needs, low bandwidth environment, QOS, mobility, convergence

US DOD Net-Centricity is Basis for 4G

Is There An End State?

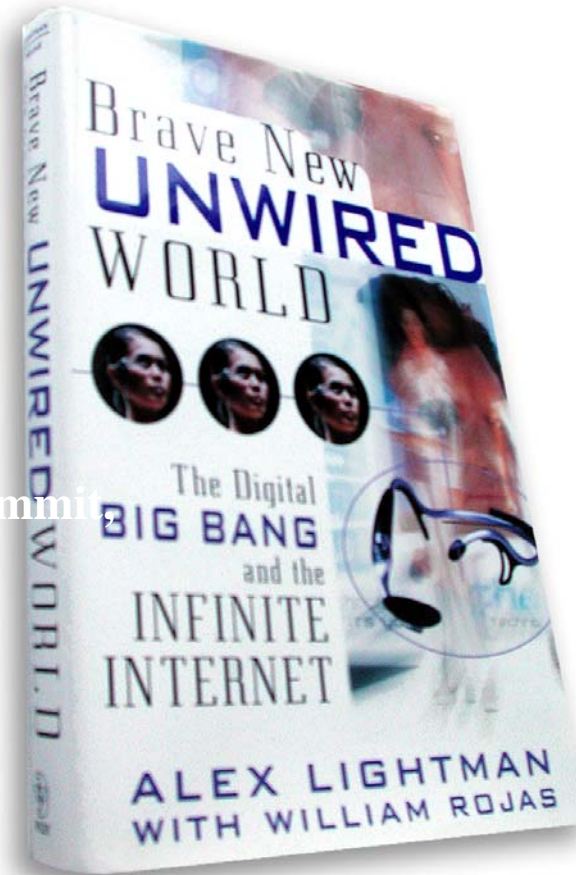
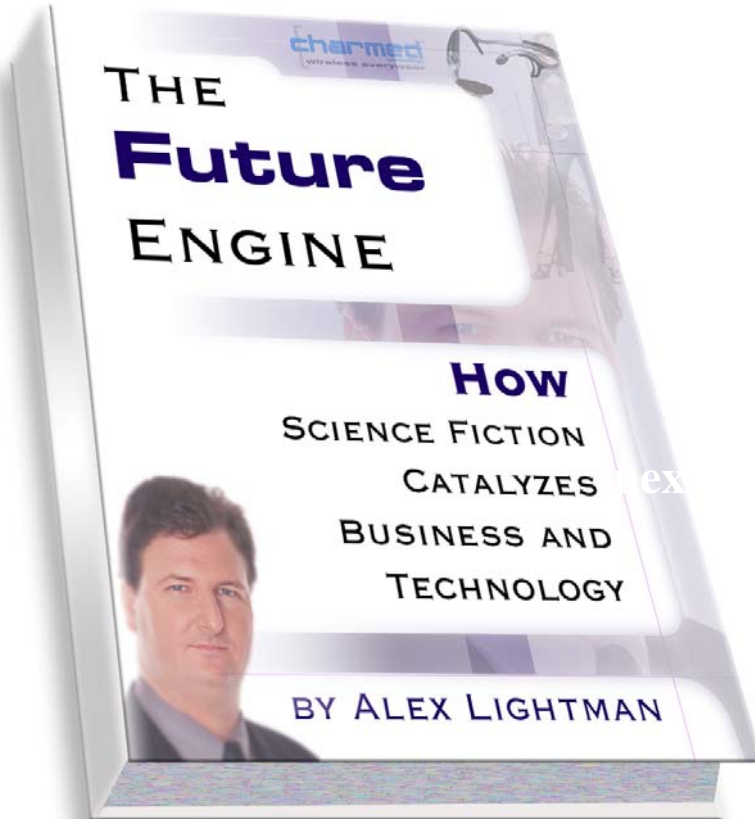
A Net-Centric DoD
NII/CIO



It's a journey, not a destination



Power to the Edge ~~~~~



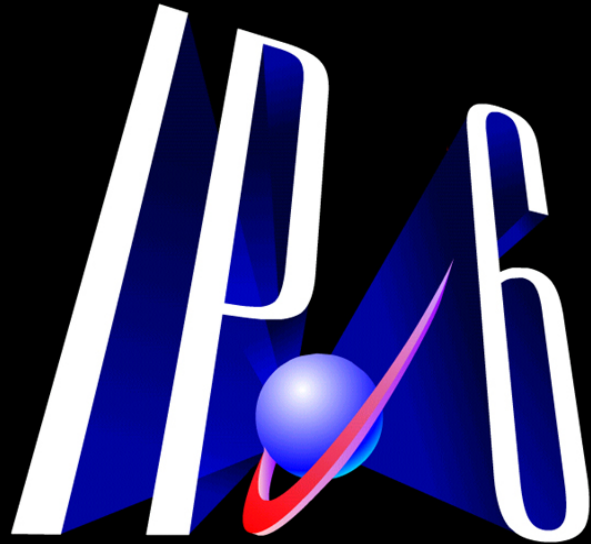
Books come with 24 hour tech support, lunch, and a friendship

Closing Thought

- **The future is here.**
- **It's just not evenly distributed.**
- **William Gibson.**

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UNITED STATES



GLOBAL SUMMIT

Thank you!

Please stay in touch.

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You are invited to attend the next IPv6 Summit in
Santa Monica, CA at the Loews Resort Hotel

www.usipv6.com