

# IPv6. Why should you care?



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## What the heck is IPv6?

Internet Protocol version 6 (IPv6) **is the most recent, current version** of the Internet Protocol (IP)...

...IPv6 was developed by the Internet Engineering Task Force (IETF) to deal with the long-anticipated problem of IPv4 address exhaustion, and was intended to **replace IPv4**.

Somewhere...in an IT shop near you...



# That means...



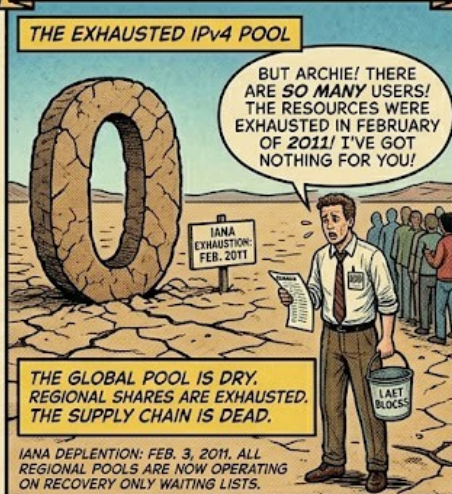
## PAGE 11: LEGACY'S END, FUTURE'S EDGE!

THE INTERNET ENGINEER Archie Adams and his intrepid team navigate the harsh realities of a changing digital landscape. Their subject: the inescapable evolution from the old IP to the new.

### POINT 1: LEGACY IP IS ON LIFE SUPPORT



### POINT 2: NO MORE RESOURCES EXIST



## POINT 3: IPv6 IS INEVITABLE

### THE IPv6 NEW FRONTIER



“So what. I have NAT and plenty of IPv4.”



- Network Address Port Translation (Masquerading) is the most common form of NAT.
- It takes one address and maps many addresses into it. NAT-T is one of the reasons IPv6 has taken so long to

“So what. I have NAT and plenty of IPv4.”

- Some institutions do have plenty of legacy IP
- Great! However, you are in a rapidly increasing minority
- The abundance of your IPv4 does not preclude you from deploying (and using) IPv6\*
- Large environments may also run out of RFC 1918 and RFC 6598 addressing

# Only IPv6 can handle the AI onslaught

- With so many agents on the network, can you imagine running it on private IPv4 addressing and NAT?
- For AI to succeed without friction, we would need:
  - Simplicity in the network (elimination of middleboxes)
  - Consistency for end-to-end automation (one addressing scheme)
  - Ability for hyper-connectivity (any-to-any)

# Only IPv6 can handle the AI onslaught

- With so many *devices* on the network, why would you want to deal with layers of NAT and layers of translation tables?
- Many engineers don't have experience with anything else.
- The grass *is* potentially greener.
- Remember - NAT  $\neq$  Firewall

# “So what. I have NAT and/or plenty of IPv4.”

**TECH TALES**

**PAGE 12: THE LAST STAND OF THE JUNIOR ENGINEER!**

**THE SKEPTICAL JUNIOR ENGINEER** (Let's call him "KID") challenges the inevitable march to IPv6 with his most powerful spell... the mighty 'NAT'!

**BUT KID, THE IANA POOL EXHAUSTED IN 2011! THE REGIONAL POOLS ARE GONE! THIS TIMER IS TICKING!**

**THE SHRINKING POOL**

**IPv4 EXHAUSTION TIMER**

Timers... details. My NAT is stronger.

**SO WHAT. I HAVE NAT AND PLENTY OF IPv4. I'LL BE LONG GONE BEFORE THAT EVER MATTERS!**

**THE JUNIOR'S DEFENSE: THE SKEPTICAL FAITH IN IPv4'S ENDLESS NAT ADDRESSES**

**NAT MAGIC**

ONLY IPv4 → **NAT** → PRIVATE ADDRESSES

**NAT-O-MATIC:** Turning one into many since 1994!

**CLASS C FOR DAYS!**

**CLASS C FOR DAYS! OLD COMPUTERS RULE!**

**OLD COMPUTERS RULE!**

(Exasperated sigh) Another 'plug-and-pray' convert... **SKEPTICAL** is an understatement!

**IT'S NOT ABOUT JUST ADDRESSES! IT'S ABOUT CONNECTIVITY! IPv6 IS INEVITABLE!**

**CURRENT IPv6 DEPLOYMENT**

**IPv4 BLOCK**

**KID'S LAST STAND:** His 'NAT' is his shield, but the future moves fast... Will he adapt, or fade with the old IP?

**IN THIS INSTALLMENT: THE CLASH OF FAITHS! THE OLD WORLD JUNIOR FIGHTS THE FUTURE'S ENGINEER! CAN 'NAT' TRULY HOLD BACK THE TIDE? OR IS ADOPTION THE ONLY LIFE?**

OCT. 1971

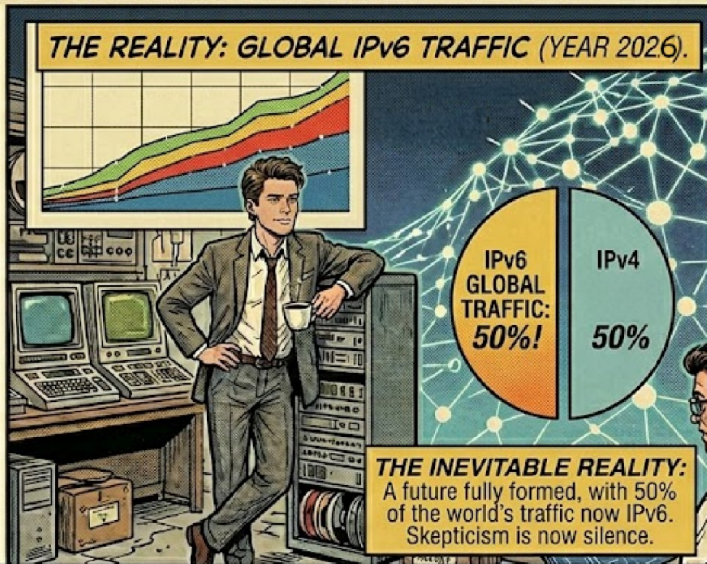
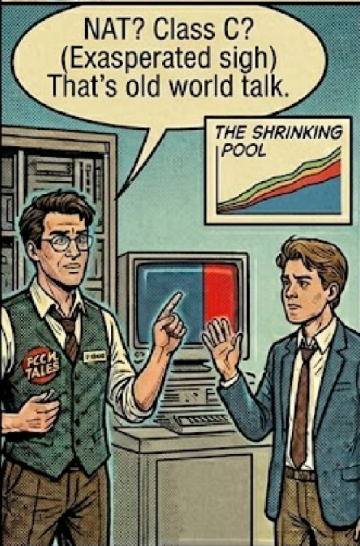
OCT. 1971 35 CENTS

“But I don’t wanna!”

**TECH TALES**

**PAGE 12: THE LAST STAND OF THE JUNIOR ENGINEER!**

HIS FAITH CRUMBLES as the FUTURE’S ENGINEER speaks **TRUTH!**The **FINAL PAGE!** The **DEBATE** is **OVER**, and the **NUMBERS** are **INCONTESTABLE!**



(Exasperated sigh)  
**SKEPTICAL** is one thing, but **DELUSIONAL** is another. 50% is not a trend, and it is not a fringe technology. IPv6 is the future we live in.

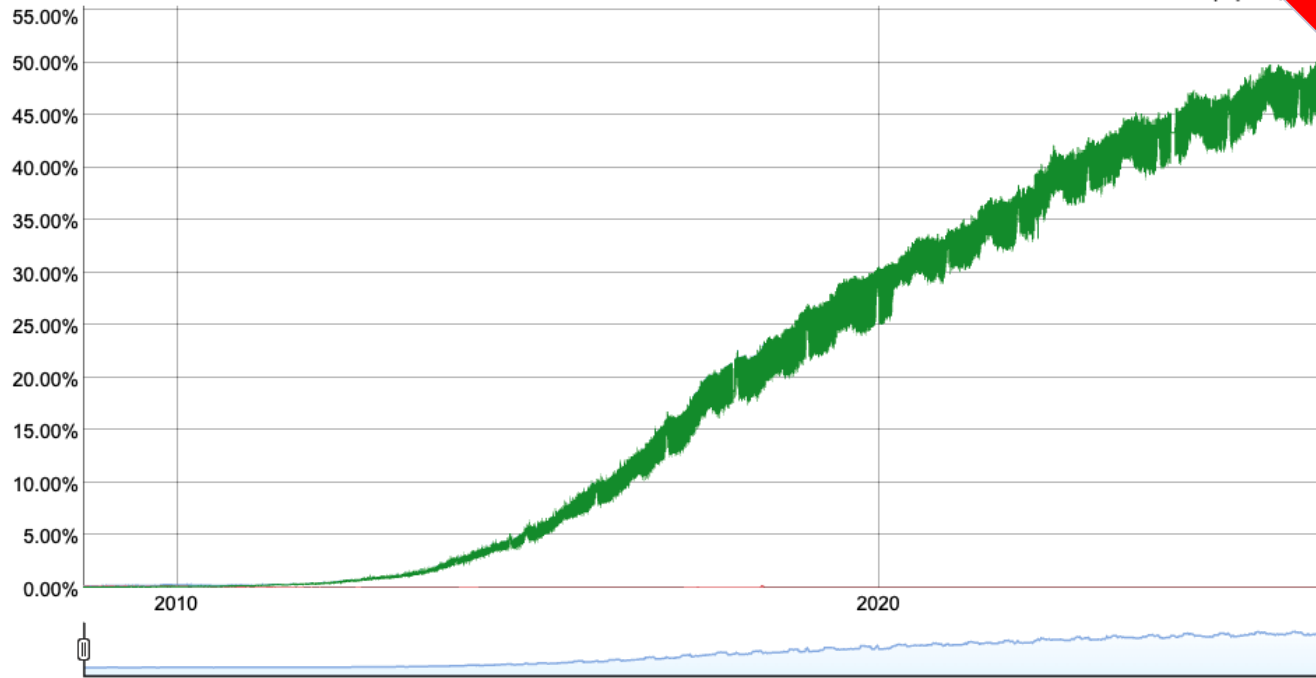
**IN THIS FINAL INSTALLMENT: The LAST WORD is Factual!The DEBATE is OVER!The FUTURE won't be POSTPONED or PREVENTED...It has ARRIVED!**

# “But I don’t wanna!”

## IPv6 Adoption

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

Native: 46.49% 6to4/Teredo: 0.00% Total IPv6: 46.49% | Apr 30



“But I don’t wanna!”

## IPv6 Deployment

~~Geology~~ is the study  
of pressure and time.  
That’s all it takes, really.

Pressure and time.



# Don't worry, you've been using it for years



(FOGM TALES) PAGE 13: THE LAST ADOPTION STAND!

HIS CONCERNS DISSIPATE as the ENGINEER reveals the **TRUTH!**  
**THE ARGUMENT ISN'T ABOUT ADOPTION...IT'S ABOUT REALITY!**

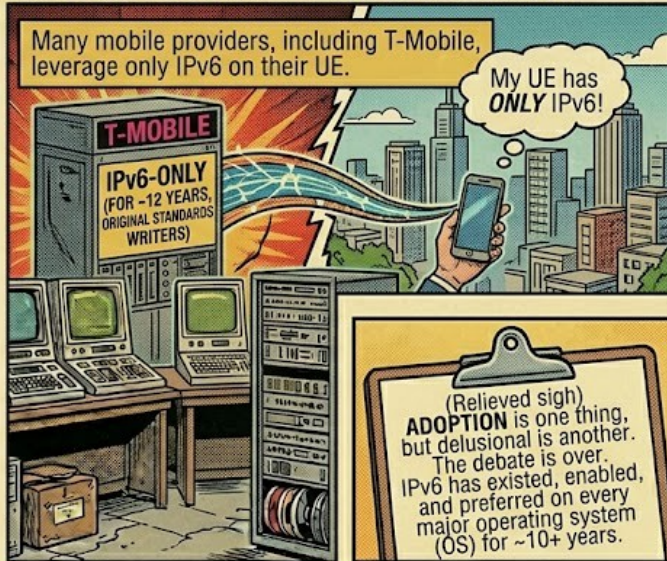
DON'T WORRY, YOU'VE BEEN USING IT FOR YEARS. SKEPTICAL IS ONE THING, BUT ADMITTING REALITY IS AN UNDERRATED VIRTUE. **SKEPTICISM IS DEAD, ADOPTION IS LIFE.**

IPv6 ISN'T NEW... IT'S **ALREADY** IN YOUR POCKET.

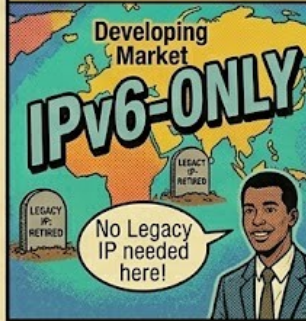


Many mobile providers, including T-Mobile, leverage only IPv6 on their UE.

My UE has **ONLY** IPv6!



Many developing markets have no legacy IP and operate as IPv6-only.



(Relieved sigh)  
**ADOPTION** is one thing, but delusional is another. The debate is over. IPv6 has existed, enabled, and preferred on every major operating system (OS) for ~10+ years.



**IN THIS FINAL INSTALLMENT: The LAST WORD is Factual! The DEBATE is OVER! The FUTURE won't be POSTPONED or PREVENTED...It has ARRIVED!**

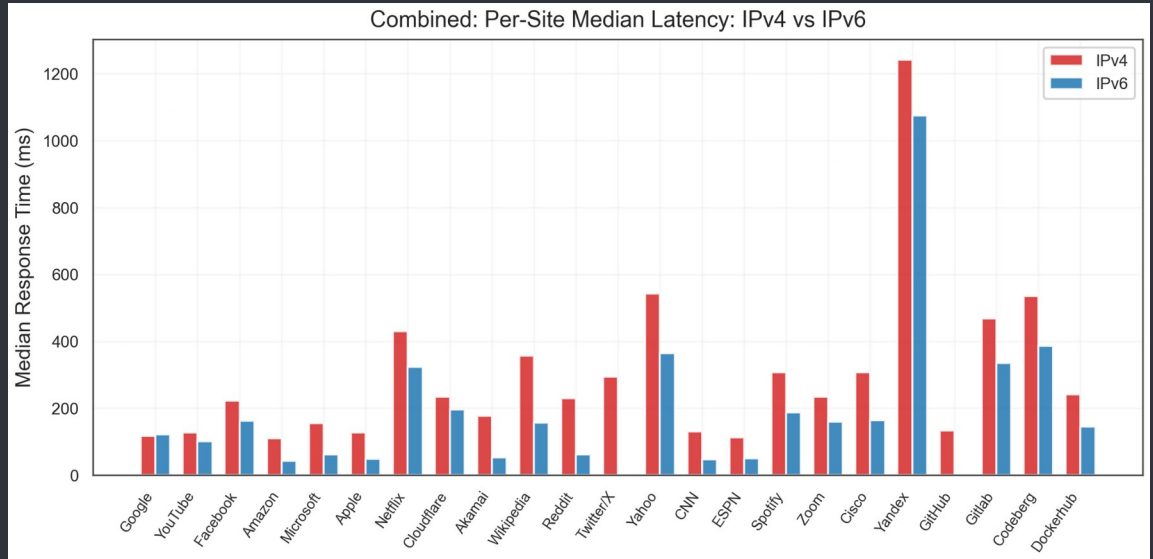
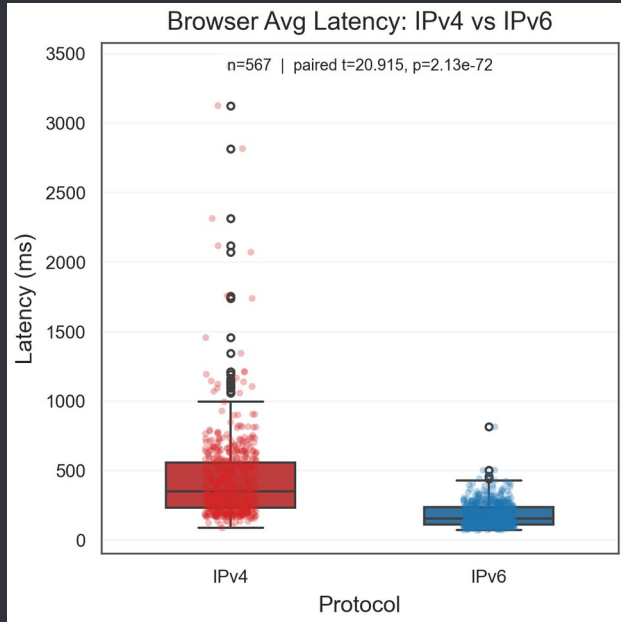
# Don't worry, you've been using it for years



“Don’t care. I’ll just wait. There is no advantage.”



# Data does point to an advantage



Run your own tests  
at  
<https://www.ipv6.ar>

# Don't fear the reaper (of legacy IP)

- Tools to aid in legacy software are now in every major platform\* (Client Address Translator: CLAT)

\*Imminent in windows 11, installable in Linux  
native in Android, MacOS, iOS



# Don't fear the reaper (of legacy IP)

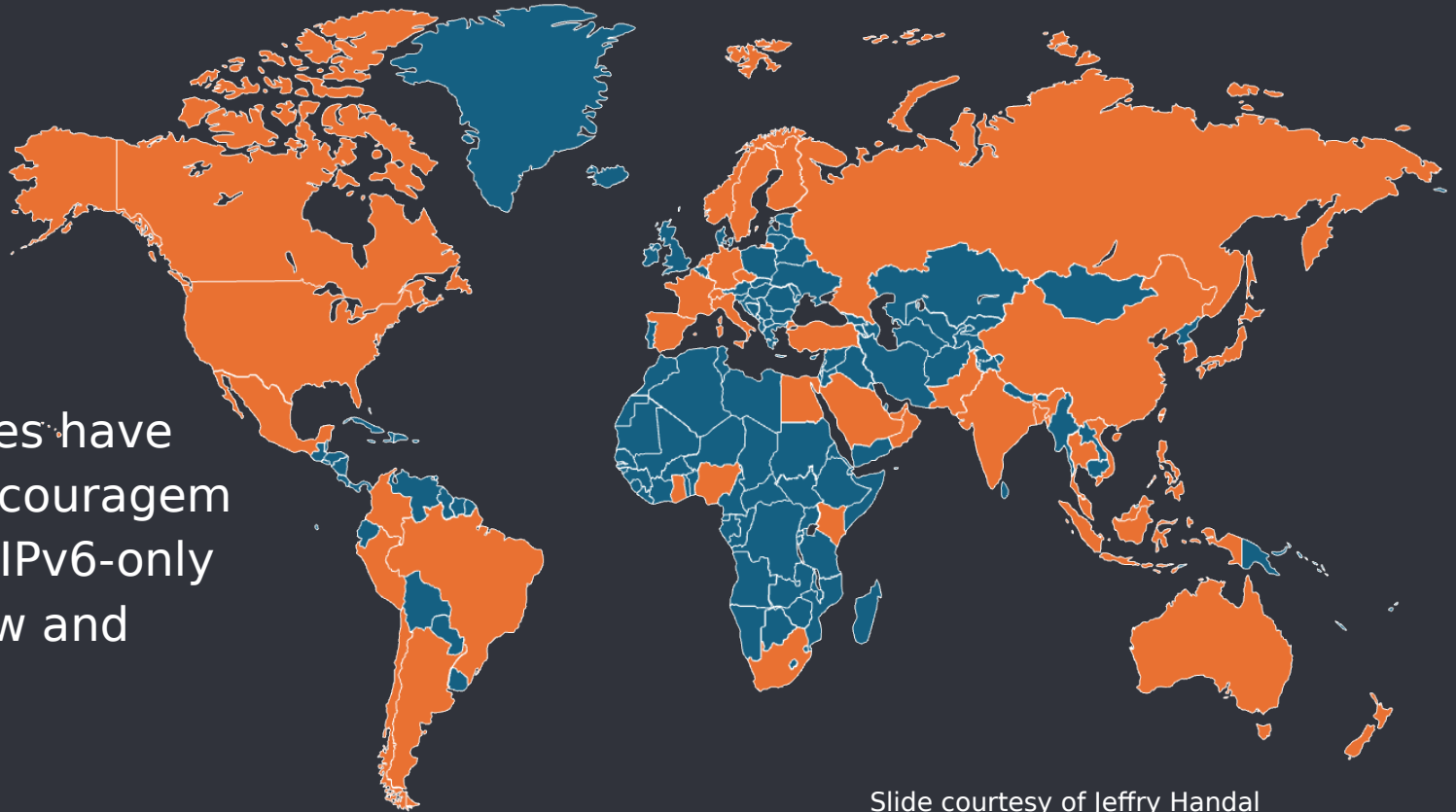
- Many, many resources to aid in learning and deploying IPv6
- Both protocols can exist together!
- Transition mechanisms are very well supported and very robust



## It is doable

- The content is already there
- Many organizations are well on their way
- Many resources exist
- Start small, move methodically

# It *is* worth your time



50+ countries have  
mandate/encouragem  
ent for IPv6/IPv6-only  
between now and  
2030+.

# Hit the ground running

- **AI Agents are coming—and they will suffocate in a RFC1918 world**
  - The world needs a borderless, end-to-end v6-only architecture
  - The alternative is a 'Shadow Network' of overlays and translators that obfuscate problems and increase operational complexity.
- **Dual-stack is a *Schrödinger* trap, not a destination**
  - It doubles your complexity and masks broken connectivity
- **Complacency is the biggest bottleneck**
  - Software and vendors gaps get fixed when we force transition
- **Don't just support v6 quietly — prioritize it**

# Shameless promotion

Further reading:

<https://www.ipv6textbook.com>

<https://www.ipv6.army>

<https://stats.ipv6.army>

Questions?