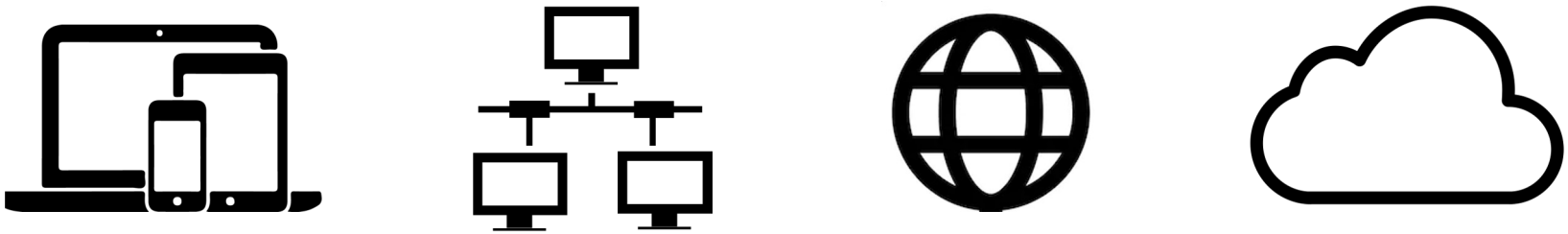
IPconomics:

Getting Comfortable with the Business Side of IPv6

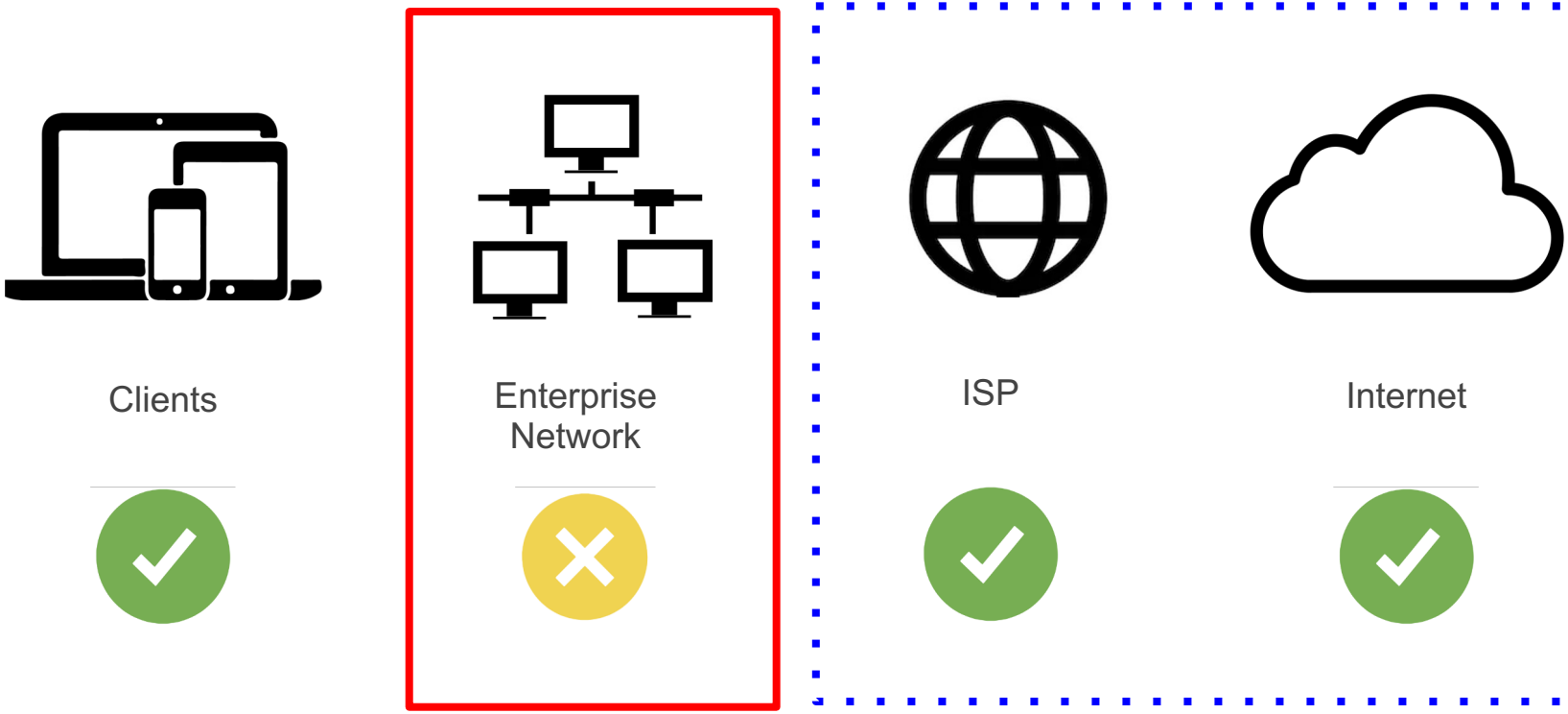
Disclaimer: The views and opinions expressed in this presentation are those of the speaker and do not necessarily reflect the views or positions of their employer.

Memory Lane

The End-to-End Utopia



The Reality Today (high-level)



What did we learn?

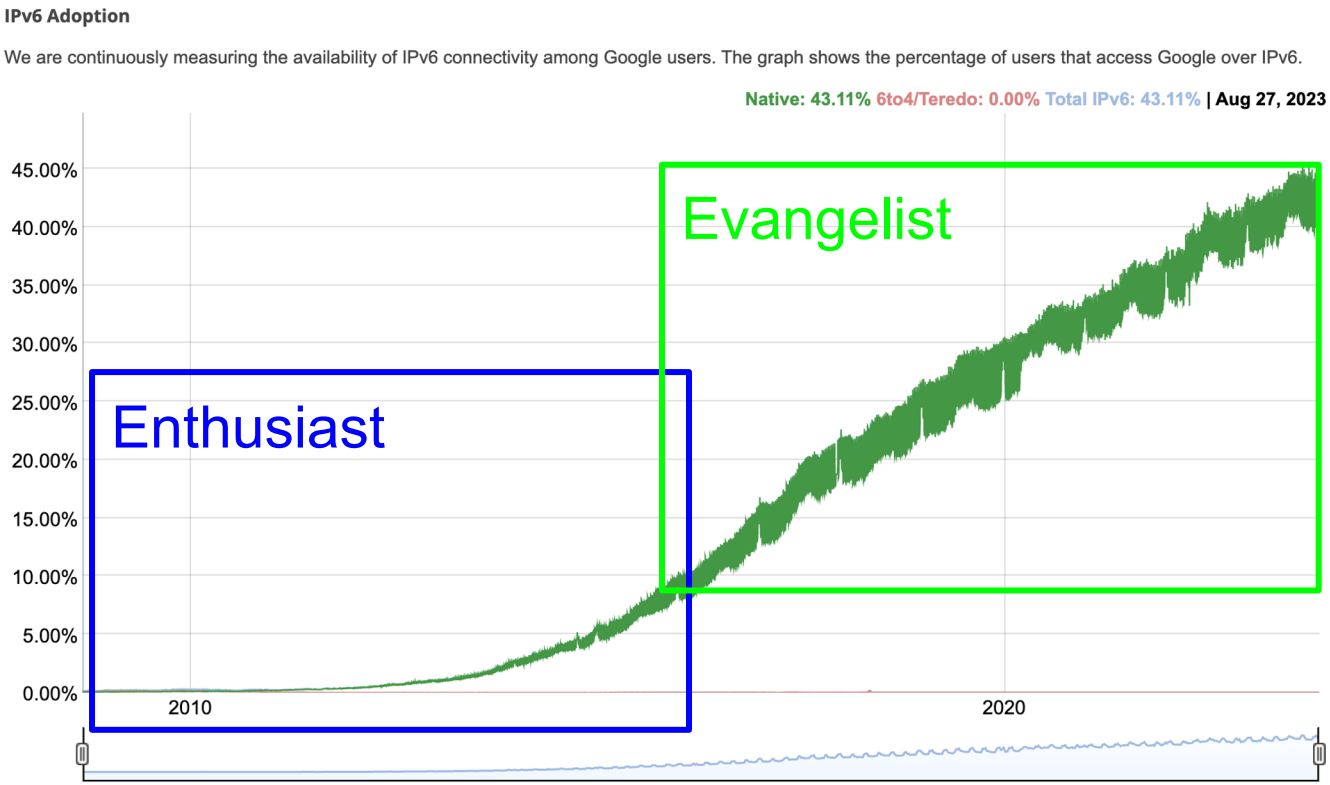
Scale

&

Automation

A Learning Journey

Learning Evolution



Source: https://www.google.com/intl/en/ipv6/statistics.html

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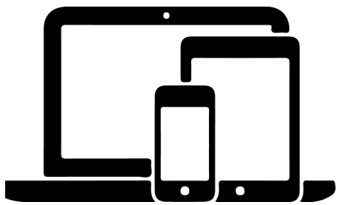
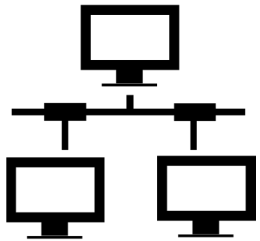
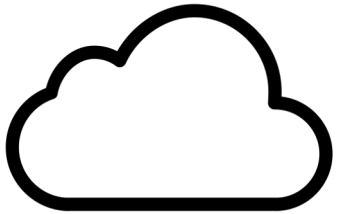


Clients



Enterprise Network

ISP



Internet

Supporting The Enterprise Transition

Business Outcomes

Process modernization and simplification

Cost reduction

New line of business

New offering

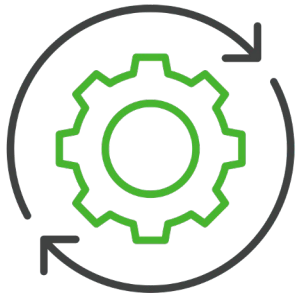
Mandates & Compliance

Staying in business

How does IPv6 adoption meet business outcomes?

Simplicity And Efficiency from the Protocol

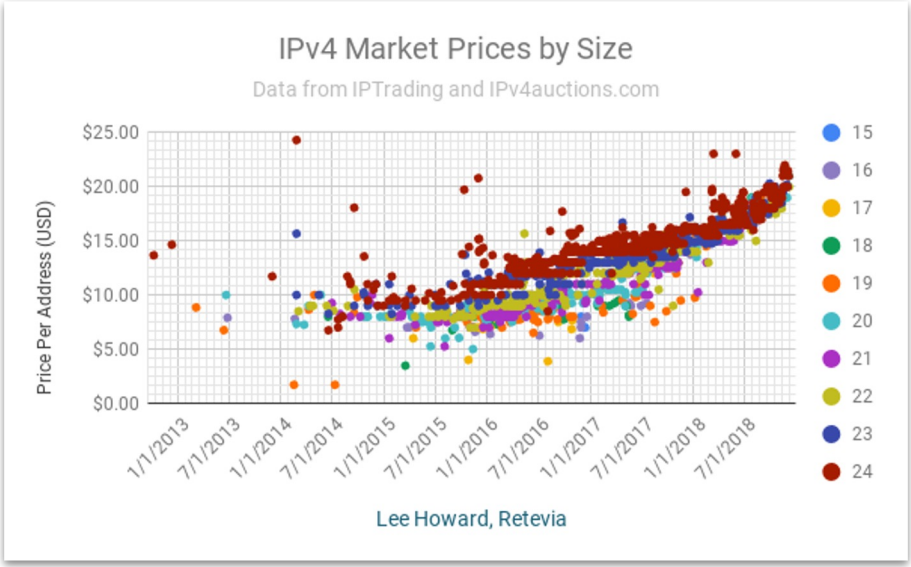
- Less moving parts
  - No NAT, or better application of NAT
  - No DHCP (mostly)
  - SLAAC improvements to deliver more (e.g., DNS)



- Improved summarization
  - Less memory on router => longer life of existing infrastructure

Internet Opex

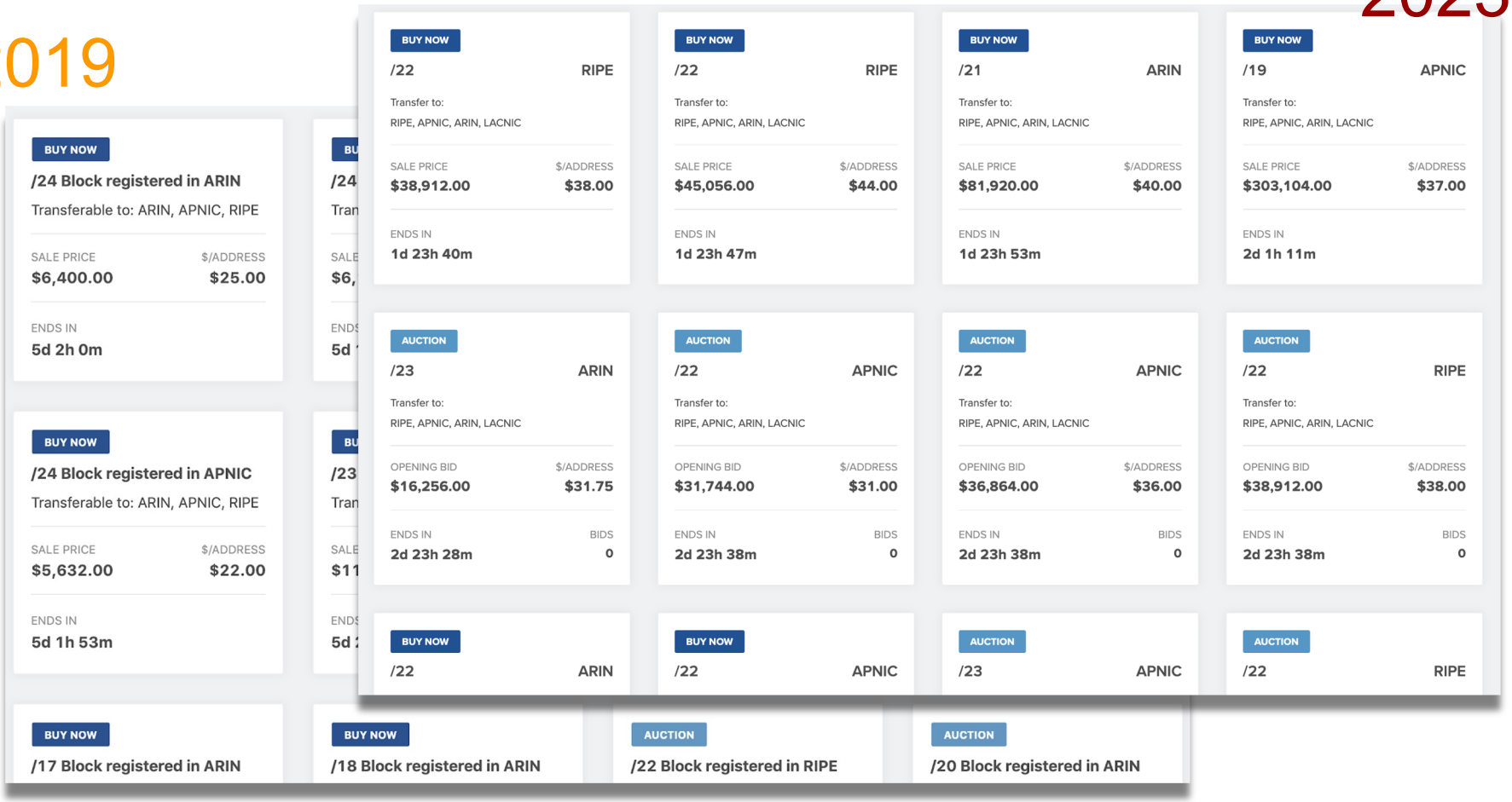
- Average cost
  - Retevia projections (https://www.retevia.net/address-pricing-2019-and-beyond/)



IPv4 “Marketplace” on the Rise

2019

2023



IPv4 Total Cost of Ownership (TCO)

Maintaining IPv4 operations:

- Big NAT/CGN boxes
  - More complexity in setup and troubleshooting (time = money)
- “Tainted” IPv4
- Providers charging extra for IPv4 and NAT
  - GCP
  - AWS

Image source: https://www.noction.com/blog/cost-network-downtime

Lines of Business

Experiences

5G

Smart buildings

AI/ML

Location Services

Internet of things

Smart sensors

Industry 4.0

Virtual reality

Cloud computing

Smart cities

Smart manufacturing

Big data

Mandates & Compliance

Compliance - Country Mandates

Example countries:

- China- China sets goal of running single-stack IPv6 network by 2030, orders upgrade blitz
  - New update May 2023 https://www.networkcomputing.com/networking/ipv6-adoption-china-steps-deployment-pedal
- USA Federal Government - https://www.whitehouse.gov/wp-content/uploads/2020/11/M-21-07.pdf
- India- India is promoting a new internet protocol
- Germany- DE_German Govt IPv6 Plan
- Mexico - Mandate similar to US delayed by 1 year

Government Objectives

Economic Empowerment

Enable entire populations to participate in the digital economy

Innovation Potential

Designing with abundant resources

Modernization

Develop egov options to serve communities

IPv6 adoption is the catalyst to achieving their goals

Case Study:
The Cisco Meraki Platform

Product Development - Building a Business Case

What are we solving for?

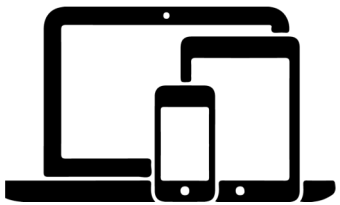
Is there a market for the solution?

Will this development unlock areas of innovation? patents?

Does the solution benefit the majority of customers?

Is this a market access problem?

The Enterprise Transition Opportunity



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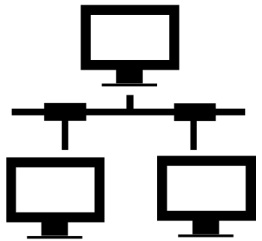

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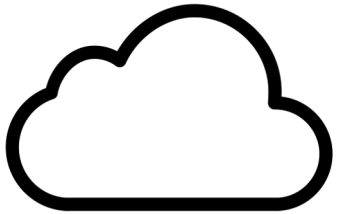


Internet

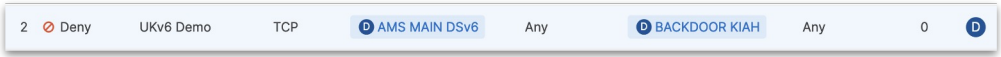
Business Outcome

Automating the transition to IPv6/IPv6-only for the enterprise

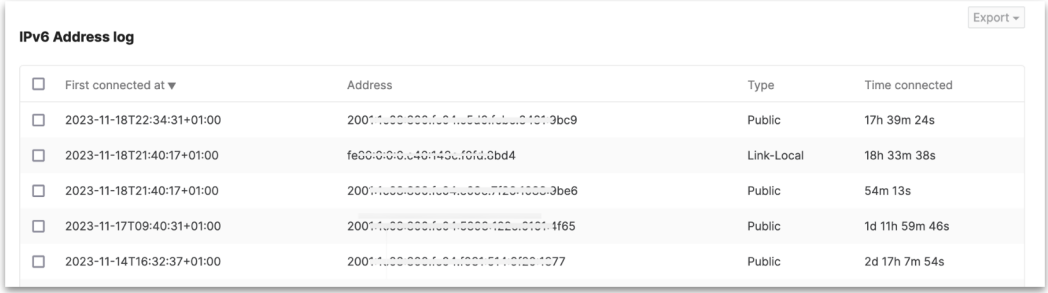
Example Design Principles

Always on design

Simplified operations

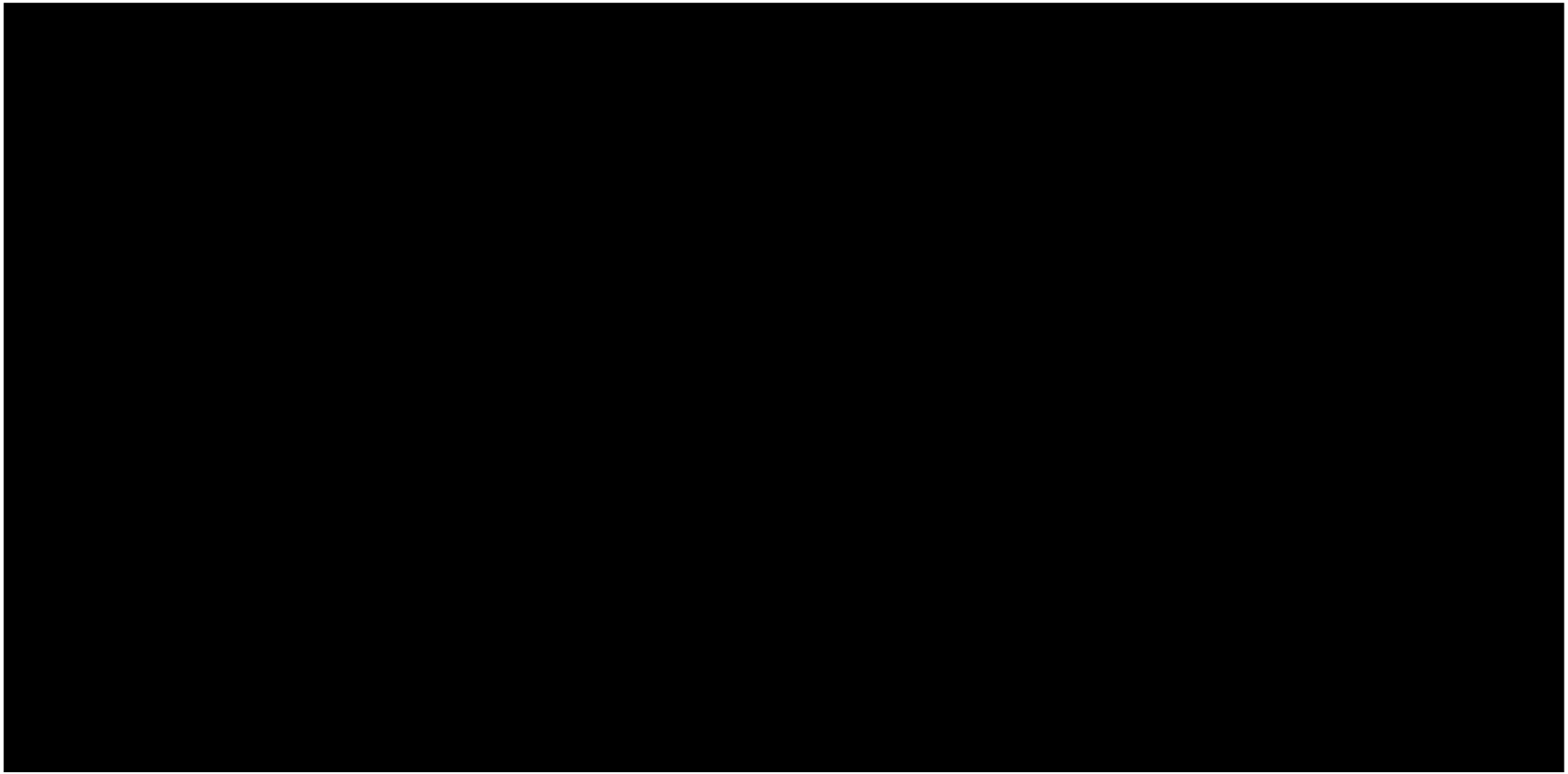


Effortless audits



Steadily marching towards IPv6-only operations

Merakiv6 Demo



Call to Action

ITOps with IPv6

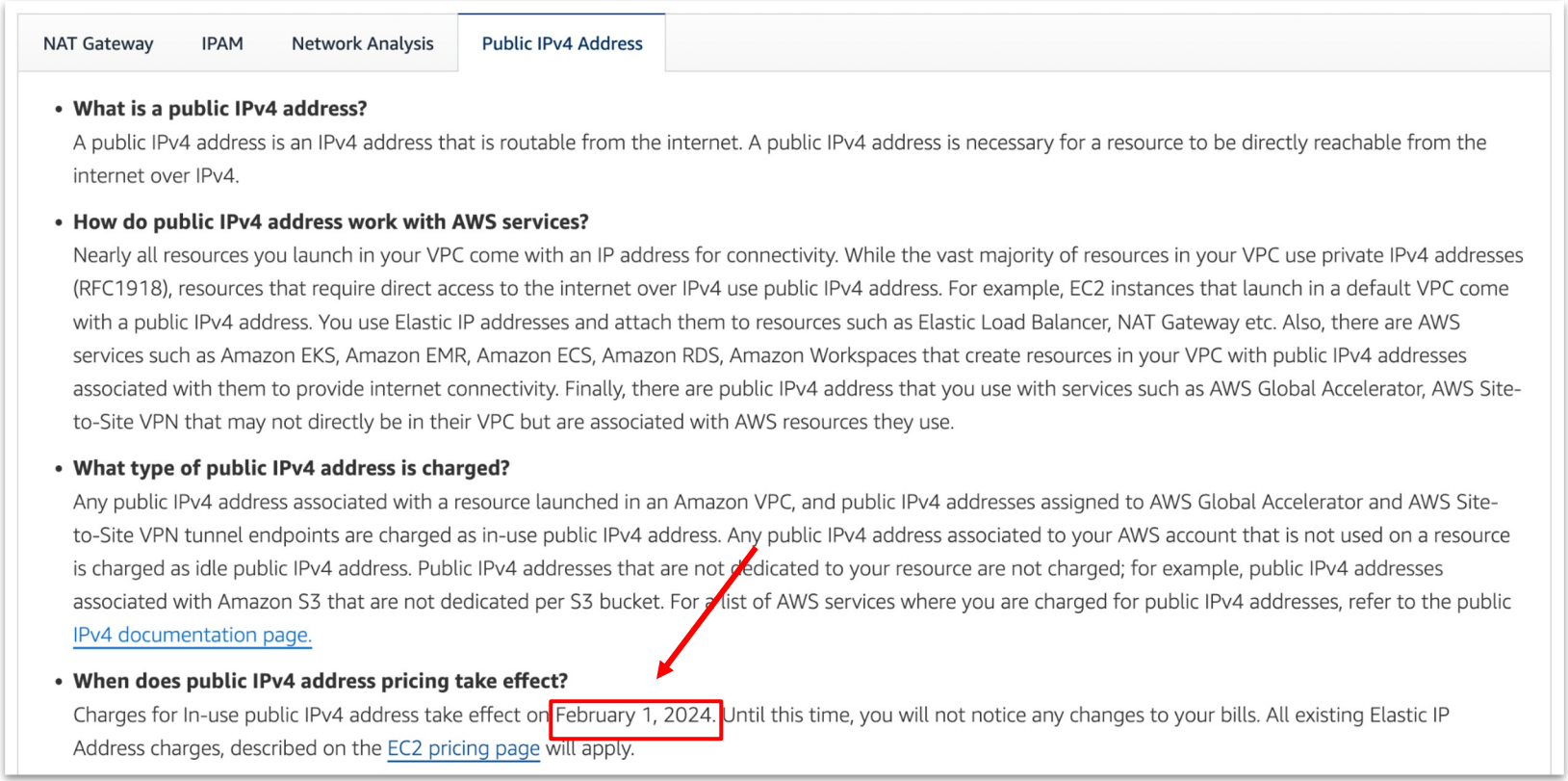
Business Ally

Understand the business and what makes it tick

Transition IT Operations

IPv6-as-an enabler to solve business problems explicitly

Take Action Soon



NAT Gateway | IPAM | Network Analysis | Public IPv4 Address

- **What is a public IPv4 address?**
  A public IPv4 address is an IPv4 address that is routable from the internet. A public IPv4 address is necessary for a resource to be directly reachable from the internet over IPv4.
- **How do public IPv4 address work with AWS services?**
  Nearly all resources you launch in your VPC come with an IP address for connectivity. While the vast majority of resources in your VPC use private IPv4 addresses (RFC1918), resources that require direct access to the internet over IPv4 use public IPv4 address. For example, EC2 instances that launch in a default VPC come with a public IPv4 address. You use Elastic IP addresses and attach them to resources such as Elastic Load Balancer, NAT Gateway etc. Also, there are AWS services such as Amazon EKS, Amazon EMR, Amazon ECS, Amazon RDS, Amazon Workspaces that create resources in your VPC with public IPv4 addresses associated with them to provide internet connectivity. Finally, there are public IPv4 address that you use with services such as AWS Global Accelerator, AWS Site-to-Site VPN that may not directly be in their VPC but are associated with AWS resources they use.
- **What type of public IPv4 address is charged?**
  Any public IPv4 address associated with a resource launched in an Amazon VPC, and public IPv4 addresses assigned to AWS Global Accelerator and AWS Site-to-Site VPN tunnel endpoints are charged as in-use public IPv4 address. Any public IPv4 address associated to your AWS account that is not used on a resource is charged as idle public IPv4 address. Public IPv4 addresses that are not dedicated to your resource are not charged; for example, public IPv4 addresses associated with Amazon S3 that are not dedicated per S3 bucket. For a list of AWS services where you are charged for public IPv4 addresses, refer to the public IPv4 documentation page.
- **When does public IPv4 address pricing take effect?**
  Charges for In-use public IPv4 address take effect on February 1, 2024. Until this time, you will not notice any changes to your bills. All existing Elastic IP Address charges, described on the EC2 pricing page will apply.

Thank you!