



IPv6 on Xbox One

12/7/2018

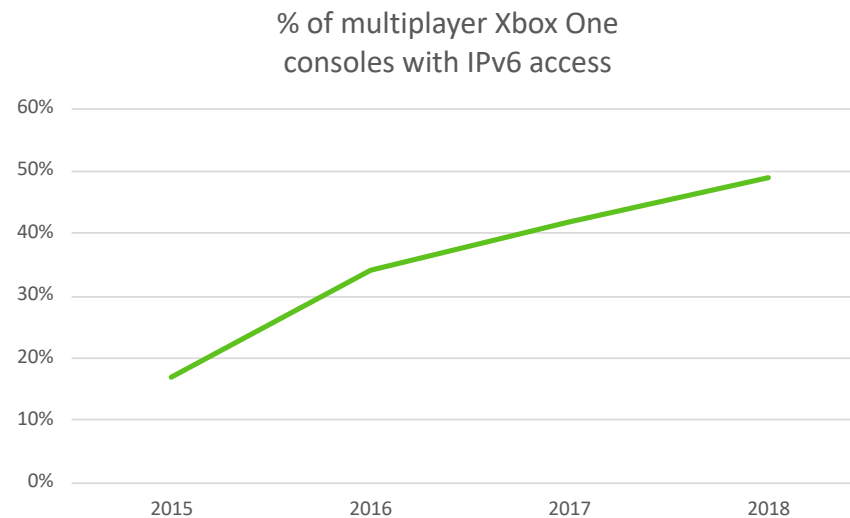
Overview

- Current state of IPv6 on Xbox One
- Health trends for IPv4 NAT traversal
- Mitigating IPv4 NAT traversal issues
- Challenges facing IPv6 multiplayer & chat

Current State of IPv6

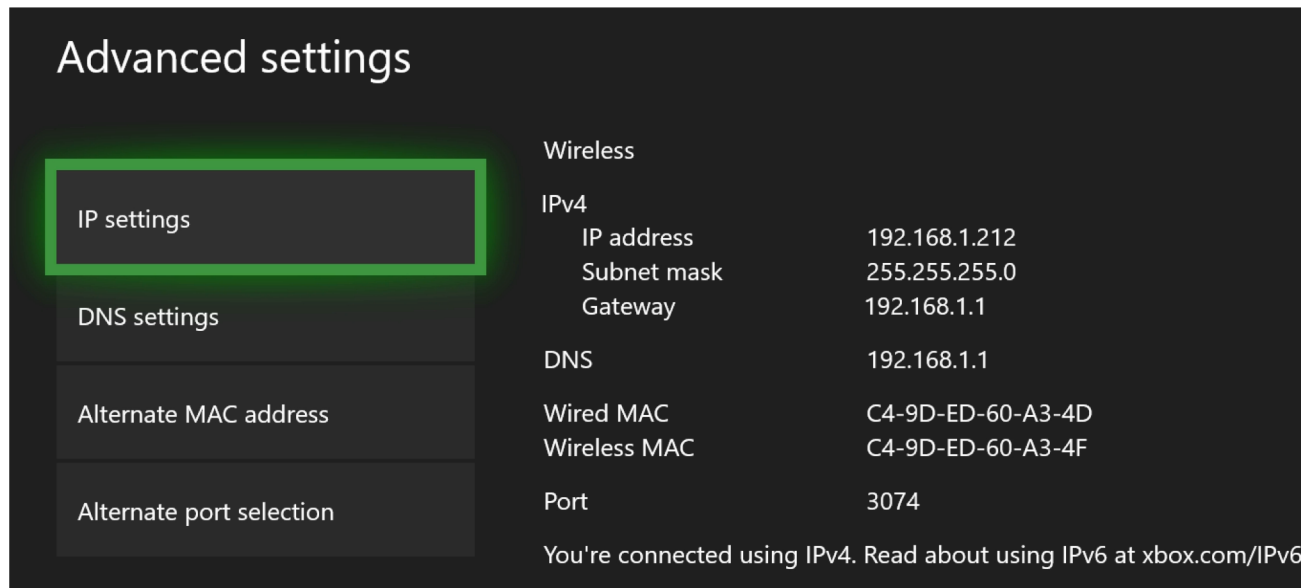
Current state of IPv6 on Xbox One

- IPv6 support for content downloads, services & apps since launch
- IPv6 support enabled for Party Chat and multiplayer over the last 2 years
- Continued IPv6 connectivity growth YoY



IPv6 growth

- Continued IPv6 rollouts by ISPs
- However, IPv6 is still disabled by default on many popular retail routers
- Guiding customers to enabling IPv6 via Xbox One UI



IPv4 NAT Health Trends

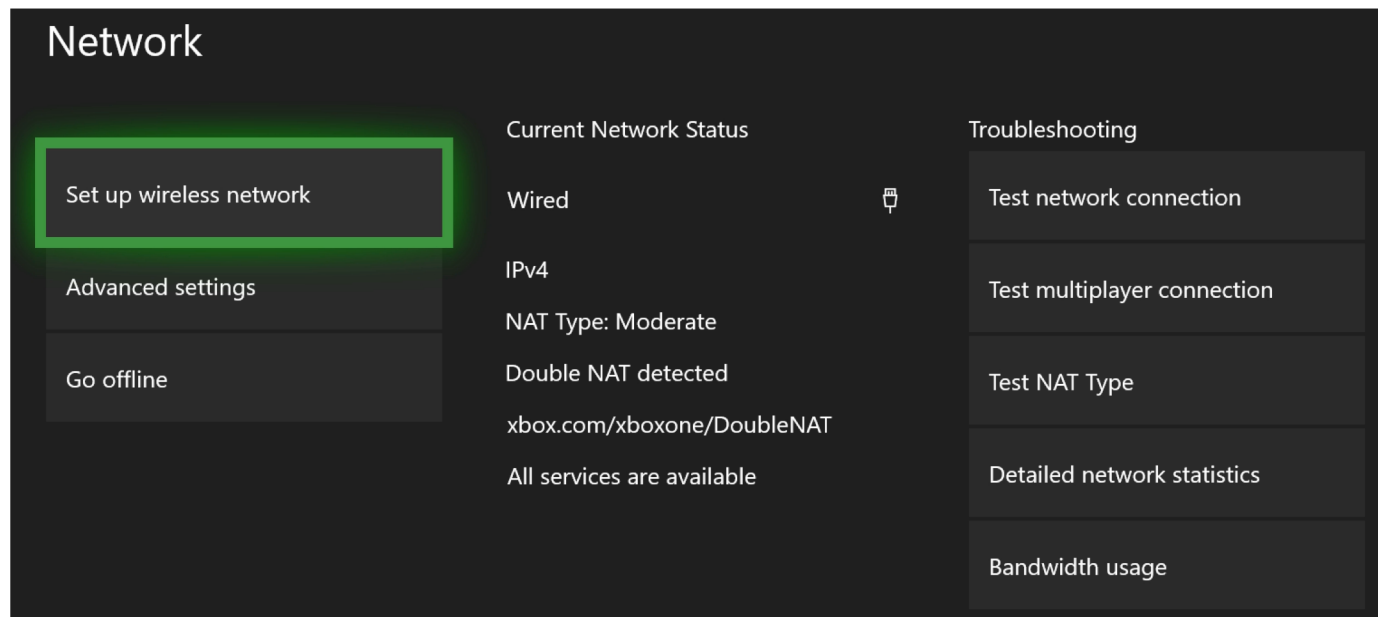
Multiplayer gaming and chat via IPv4 P2P

- Party Chat and several popular online games use P2P network topology
- NAT configuration is attempted via UPnP to facilitate P2P IPv4 NAT traversal
- Connection failures due to incompatible NAT types is a frustrating customer experience

		Xbox B		
Xbox A	NAT Type	Open	Moderate	Strict
	Open	✓	✓	✓
	Moderate	✓	✓	✗
	Strict	✓	✗	✗

Increasing challenges for P2P IPv4 NAT traversal

- IPv4 address exhaustion is leading to expansion of CGNAT deployments
- Double NAT scenarios are increasingly common & often lead to issues with P2P multiplayer gaming/chat
- Xbox One UI updated to inform customers of Double NAT presence

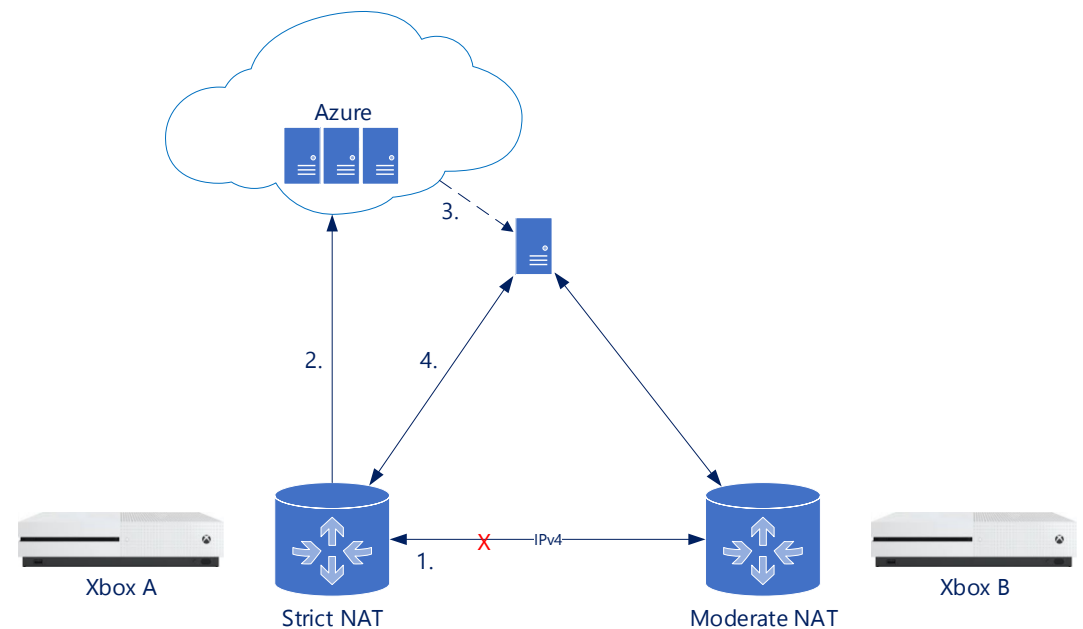


Bypassing Incompatible IPv4 NATs

Network relay functionality

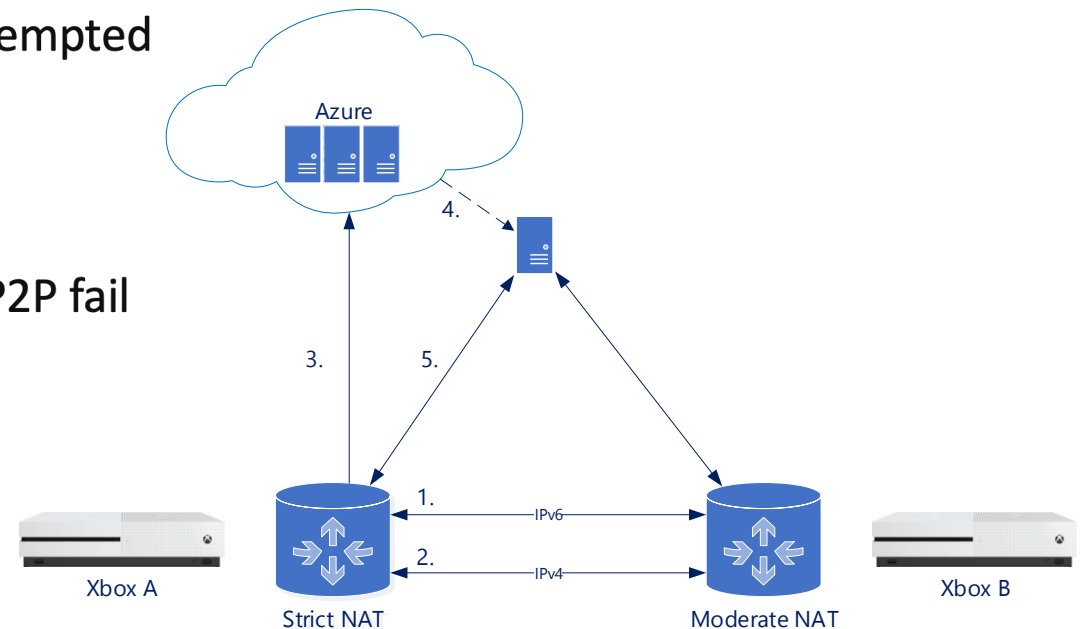
Party Chat feature added Azure network relay support to mitigate IPv4 NAT traversal issues. Games built on Xbox Integrated Multiplayer (XIM) also have relay support.

1. P2P IPv4 connectivity is attempted first
2. If P2P fails, a request is made for a relay server
3. Relay server is allocated
4. Consoles connect via the relay in Azure



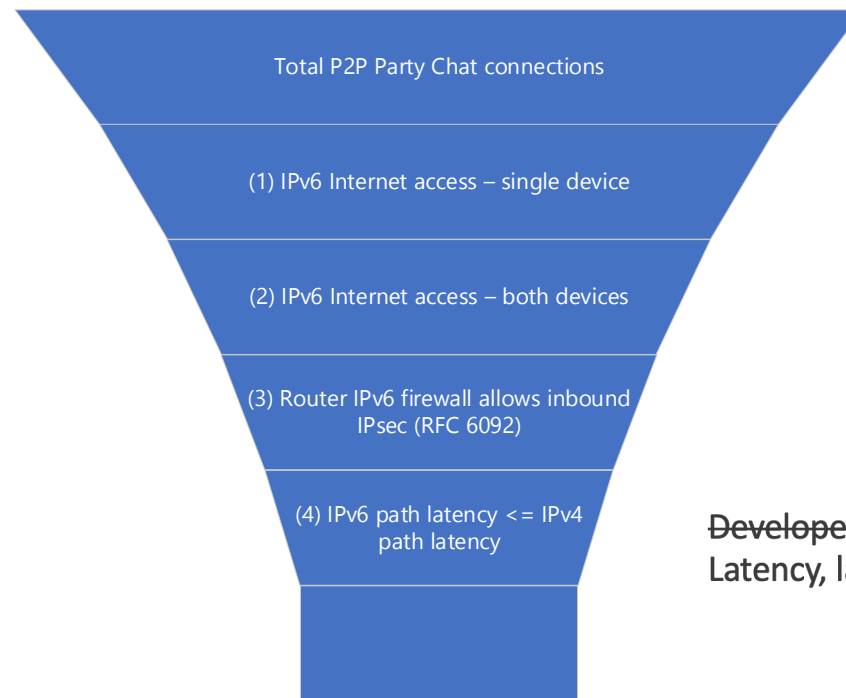
P2P multiplayer and chat via IPv6

- IPv6 support enabled for Party Chat and multiplayer*
- IPsec used for network security
- Routers with IPv6 firewalls need to follow RFC 6092: Don't filter IPv6 IKE or ESP
- Both IPv4 and IPv6 P2P connections are attempted
- IPv6 connection attempt starts first
- Whichever path connects first is used
- Relay fallback occurs if both IPv4 and IPv6 P2P fail



IPv6 Multiplayer and Chat Challenges

Filtering effect of P2P IPv6 requirements



~~Developers, developers, developers~~
Latency, latency, latency