

# DHCP Option Concatenation

A 20-year tale of lessons in practicality

Tommy Jensen, Microsoft

Milan Justel, Microsoft

# What 3396 says

- RFC 3396 defines how DHCP options are to be concatenated when there are multiple instances of them
- The idea is to support option data being larger than the length limit of a single option instance
- It defines “concatenation-requiring” and “non-concatenation-requiring” as option categories

# What 3396 *\*also\** says

"However, an implementation which supports any concatenation-requiring option **MUST** be capable of concatenating received options for both concatenation-requiring *and non-concatenation-requiring options.*" (emphasis added)

- For lists? It might make sense...
- For single items with fixed length? Usually a bad idea...
- For arbitrary length options? Who knows!

# What we really do in practice

- To our knowledge, major DHCP implementations only concatenate a small set of option types that clearly define themselves as concatenation-requiring
- This is defensive against misbehaving, but not \*technically\* out of spec, implementations that issue misconfigured duplicates
  - Unintentional multiple options is more common than intended splitting

# Proposed draft

- draft-tojens-dhcp-option-concat-considerations ([link](#))
- Codifies implementor options as MAYs for handling DHCP option concatenation in the real world with the benefit of hindsight
- In a nutshell:
  - Servers/relays SHOULD NOT split non-concatenation-requiring options
  - Clients MAY choose defensive options (listed in spec) to illustrate trade-offs when faced with multiple instances of non-concatenation-requiring

# Most recent changes

- Added more verbiage to explain that non-sensical deployment are unfortunately within spec as written today
- Clarified that this draft is “not intended to invent new DHCP mechanisms; rather, it clarifies with the benefit of hindsight how DHCP behaves in practice and what implementors need to account for.”

# Seeking WG Adoption

- We strongly believe updating 3396 would benefit implementors who lack historical knowledge and will read the RFCs
- Also, we are still defining new DHCP option definitions (most recently at the end of 2023)
- All feedback welcome!