draft-mcfadden-consolidation-taxonomy-03

A Taxonomy of Internet Consolidation
Much Excellent Discussion on Consolidation

• And, the impact by/on the IETF
  • See the 2019 IAB Workshop
  • ISOC White Paper from 2019
  • Full Issue of the Cyber Policy Journal, 2020
  • "Internet Centralization: What Can Standards Do?“
  • Much peer-reviewed academic work (too numerous to mention specifics)
  • On the Effects of Internet Consolidation
• And, much more . . .
Is There a Definition of Consolidation?

• Yes. In fact, several – from our own community.

• Arrko:
  • "the process of increasing control over internet infrastructure and services by a small set of organizations."

• Nottingham:
  • “the state of affairs where a single entity or a small group of them can observe, capture, control, or extract rent from the operation or use of an Internet function exclusively."

• ISOC:
  • “growing forces of concentration, vertical and horizontal integration, and shrinking opportunities for market entry and competition”
Why a Taxonomy?

- Because people are talking about consolidation . . .
  - . . . But, often, are talking about different things
- It’s evidence that that consolidation is not just real, but it has effects in different ways
- And, consolidation is viewed from different perspectives by different stakeholders
A Taxonomy and the IRTF (IETF)

• Others have discussed the relationship between standards and consolidation
  • That’s not the topic here, but that conversation continues . . .
• Instead, this is intended as research into the kinds of consolidation that other researchers, protocol designers and others identify
• The rechartered DINRG seems a perfect place to do this work
Taxonomy

• The current draft breaks consolidation into four main categories
  • Economic consolidation
  • Traffic and Infrastructure consolidation
  • Architectural consolidation
  • Service and Application consolidation

• A few words about each category . . .
Economic Consolidation on the Internet

• Many authors and researchers point to the dominance of a small number of market players
• The ISOC 2019 White Paper is notable for its particular emphasis on this category
  • “...a handful of actors play a significant role in our increasingly-connected societies. In this context it’s important to consider what the implications of those trends are. . .”
• Other authors suggest that economies of scale are the primary cause of consolidation (this is a very common theme)
• This economic reality is the source of some gloom in certain quarters (for instance, is regulation even possible?)
Traffic and Infrastructure Consolidation

• Others note how traffic flows and infrastructure provision has changed (and, identify that as separate from economics)
• In certain markets, access is dominated by a small group
• Services like CDNs and other modern infrastructure has high costs of provision and thus, a limited number of players
• In the mobile space, dominant, incumbent operators had first mover advantage (and dominate many markets) because of the infrastructure that was in place
Architectural Consolidation

• The end-to-end principle is a historic footnote
• The rise of intermediaries
  • Intermediaries dictated by protocol design
    • We’ve always had http proxies, but consider . . .
    • Privacy Pass, OHAI, and other protocols that depend on intermediaries to provide solutions to use cases
    • Some protocols require a small number of intermediaries for the protocol to work successfully
• An older argument was – “consolidation is not an issue for the IETF”
  • Protocol design in the last five years has demonstrably changed that
Service and Application Consolidation

• One-stop shops
  • Few run their own SMTP/IMAP/POP3 server anymore
  • Google alone holds 90% of the global search market, over 60% of web browsers, the number 1 (by far) mobile operating system (Android), the top user-generated video platform (YouTube), and has more than 1.5 billion active users of its email service (Gmail).
  • Tencent owns WeChat, China’s biggest social media platform, with more than 1 billion monthly active users. Tencent’s stable of platforms, including QQ, WeChat, and various Tencent branded social media and content offerings, demand almost 4 times as much user attention as any other service.

• The size of these dominant companies (and, those like them) is due to network effects and their presence beyond simply the application layer
Goal of this Draft

• Many viewpoints on consolidation
• Organize our thinking and discussion be having some clarity on what we are talking about
• Contribute to further research by providing a framework for thinking about consolidation (in its many forms)
• Looking for:
  • Comments on whether the taxonomy is granular enough?
  • Are there things missing?
  • Are there things that would be useful to see in a subsequent draft?
Questions?
Comments?