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|  | Federal Communications Commission  Washington, D.C. 20554 |

Nov. 27, 2019

**VIA ECFS ELECTRONIC DELIVERY**

Ms. Marlene H. Dortch, Secretary

Federal Communications Commission  
445 12th Street SW  
Washington, DC 20554  
  
Re: Measuring Broadband America Program (Fixed Collaborative), GN Docket No. 12-264  
  
Dear Ms. Dortch,  
  
On September 19, 2019 Commission staff met with representatives of broadband providers, public interest groups, and other organizations for the fixed-line Measuring Broadband America (MBA) Collaborative meeting in the FCC premises to discuss ongoing plans pertaining to the MBA program.[[1]](#footnote-1)

Rajender Razdan, Senior Electronics Engineer, EMCD/OET welcomed all the Collaborative members and, following customary practice, introduced Ms. Anastasia (Stacie) Djordjevic, Government Project Manager for North America, SamKnows to present the agenda for the meeting.[[2]](#footnote-2)

The first item on the agenda was a presentation on a new MARS[[3]](#footnote-3) (MBA Assisted Research Studies) project proposal from Professor Nick Feamster (of the University of Chicago), together with the associated research team at Princeton University.[[4]](#footnote-4) Ms. Padma Krishnaswamy, Senior Electronics Engineer, EMCD/OET gave a brief overview of the MARS component of the MBA program and introduced Prof. Nick Feamster. The introduction recalled that Professor Feamster had worked with the MBA program previously, while conducting a research project utilizing the MBA platform to develop heuristics for distinguishing whether Internet traffic slowdowns experienced by the consumer were due to congested in-home Wifi or alternatively, congestion in the ISP network providing the household with Internet access. This research is described in a publication entitled Home or Access (HoA)[[5]](#footnote-5).

Professor Feamster’s most recent MARS proposal is to use the MBA platform for a rigorous academic study of the performance impacts of various privacy-focused DNS techniques such as DNS over HTTP (DoH), and DNS over TLS (DoT), relative to longstanding DNS. The subject is of significant topical interest to various sections of the Internet industry and user communities. A study of the related phenomena at the scale and technical diversity offered by the fixed MBA platform is seen as a valuable piece of the technical “due diligence” on DoH and is keenly desired by Internet-focused academic, standards, operator and user constituencies.[[6]](#footnote-6)

Prof. Feamster provided a brief summary of the work performed upto September 19th, 2019 to evaluate DoH and DoT response times[[7]](#footnote-7). He acknowledged the MBA program was, as of September through October 2019, in the midst of the routine data collection phase for the 10th annual fixed MBA report, and that commencing research experiments on the MBA platform would, at the very least, have to wait until after this process was completed. He welcomed feedback from the MBA collaborative community on the proposed study, including suggestions on metrics, besides those already detailed in his team’s publications on the subject.

Prof. Feamster then introduced Austin Hounsel, a PhD student from Princeton and the principal researcher on this project. Austin went on to present a more detailed overview of the work done by the team as of that point[[8]](#footnote-8). He explained the growing interest in the industry for the use of DoH (RFC 8484) and DoT (RFC 7858) as possible means to increase privacy for DNS queries, from their point of origin; and mentioned that the main aim of the Princeton study was to compare the various alternatives in this space with respect to query response and page load times. In their earlier work the Princeton team originated queries to access the top 1,000 websites on the Tranco list. Some takeaways from the study were that DoT and DoH performance varied depending upon the recursive resolver platform (Google, Cloudflare or Quad 9) used, and DoH outperformed Do53 (normal DNS) for the slowest queries. There was no clear winner in terms of DoH or DoT response times. Of particular interest were results obtained indicating that webpage loading times using DoH and DoT were only slightly slower than Do53 except when using Google resolvers (where DoH was the order of a few seconds slower than Do53 for page load times). Mr. Hounsel accompanied these observations with the caveat that at the time these tests were run, Google’s DoH implementation was not production ready. He mused that it might be interesting to rerun these tests now that Google’s DoH is fully implemented. In general, Mr. Hounsel welcomed the opportunity to use the MBA platform to scale up the number of networks, resolvers and vantage points from which to test metrics of interest.

A question was asked as to whether the lower performance of unencrypted DNS (i.e., Do53) over DoH for the slowest queries could be due to a timeout. In response, Austin explained that the DNS response time was taken only for successful responses and did not include failed responses. There was also a suggestion that it might be useful to track network distances, e.g. the number of hops needed to resolve the DNS address. Prof. Feamster and Mr. Austin thanked the MBA collaborative for their interest and helpful comments. Ms. Krishnaswamy stated that the FCC MBA team were willing to create an MBA focus group to facilitate participant input towards this study. Those interested were asked to contact her at [padma.krishnaswamy@fcc.gov](file:///C:\Users\Rajender.Razdan\AppData\Local\Microsoft\Windows\INetCache\Content.Outlook\W4WYQZ08\padma.krishnaswamy@fcc.gov).

Mr. Razdan reintroduced Ms. Djordjevic to complete the rest of the agenda. Ms. Djordjevic pointed out that the recruitment period had come to a close and that 1,616 new actively reporting volunteers had joined as a result of the active recruitment efforts of the ISPs and SamKnows. She also was happy to report that there seemed to have been no ill effect of Hurricane Dorian on whitebox or server performance within the MBA infrastructure. She also noted that the MBA program was well into its pre-validation phase and she thanked everyone for providing their pre-validation information to SamKnows. She explained that, for thoroughness, there may be special cases where SamKnows might re-check the tier subscription numbers of some panelists with the ISPs. Post validations will be sent out before November 4. If any of the ISPs have any questions regarding the process they were encouraged to contact her at [stacie@samknows.com](mailto:stacie@samknows.com).

Mr. Razdan concluded the meeting by thanking all the attendees for their participation and reminding everyone on the bridge to send in email notifications of their presence at this meeting.

Sincerely,  
  
/s/ Rajender Razdan  
  
Rajender Razdan, Electronics Engineer,  
Electromagnetic Compatibility Division/OET  
Federal Communications Commission

1. A list of attendees is attached to this filing in GN Docket No. 12-264. [↑](#footnote-ref-1)
2. SamKnows presentation is attached to this filing in GN Docket No. 12-264. [↑](#footnote-ref-2)
3. <https://www.fcc.gov/general/mba-assisted-research-studies> [↑](#footnote-ref-3)
4. The referenced work was initiated while Prof. Feamster was a Professor of Computer Science at Princeton University. Although continuing to advise project research team, as of May 2019 he accepted a position at the University of Chicago, as the Neubauer Professor of Computer Science /Director for Center of Data and Computing [↑](#footnote-ref-4)
5. <http://www1.icsi.berkeley.edu/~srikanth/docs/hoa-pam2016.pdf> [↑](#footnote-ref-5)
6. <https://www.fcc.gov/files/csric6wg3finalreport030819pdf> [↑](#footnote-ref-6)
7. .<https://arxiv.org/abs/1907.08089> [↑](#footnote-ref-7)
8. “Understanding How DNS, DoT, and DoH Affect End-User Experience at Scale”, MARS Research Experiments presentation by Austin Hounsel et. al. is attached to this filing in GN Docket No. 12-264. [↑](#footnote-ref-8)