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| Project | **IEEE 802.16 Broadband Wireless Access Working Group <**<http://ieee802.org/16>**>** |
| Title | ***Comments on*** ***IEEE 802.16-12-0483-00***  |
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| Re: | Metrology Study Group’s *Call for Contributions: IEEE* *Project P802.16.3:* *Mobile Broadband Network Performance Measurements* (IEEE 802.16-12-0492-01-Smet) for IEEE 802.16’s Session #81 of 17-20 September 2012 |
| Abstract | This document proposes comments on IEEE 802.16-12-0483-00. |
| Purpose | This contribution requests that the Metrology Study Group review the attached proposal and, on that basis, prepare a revision of IEEE 802.16-12-0483-00. |
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*Comments on IEEE 802.16-12-0483-00*

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# Abstract

This document proposes comments on IEEE 802.16-12-0483-00.

# Background

On 30 August 2012, the IEEE-SA Standards Board approved Project Authorization Request (PAR) [P802.16.3](http://doc.wirelessman.org/16-12-0489) for the development of a new standalone standard on Mobile Broadband Network Performance Measurements. The IEEE 802.16 Working Group is assigned to develop the standardization project. The Metrology Study Group issued a *Call for* *Contributions: IEEE Project P802.16.3: Mobile Broadband Network Performance Measurements* ([IEEE 802.16-12-0492](http://doc.wirelessman.org/16-12-0492)) for IEEE 802.16’s Session #81 of 17-20 September 2012.

The Call for Contributions requested comments regarding working document [IEEE 802.16-12-0483](http://doc.wirelessman.org/16-12-0483) (“[Draft] Applications and Requirements for Mobile Broadband Network Performance Measurements”).

# Proposal

This contribution requests that the Metrology Study Group review the attached proposal and, on that basis, prepare a revision of IEEE 802.16-12-0483-00.

# Proposed Requirements

1. The standard shall specify procedures for characterizing and assessing the performance of deployed mobile broadband networks from a user perspective.
2. The standard shall specify metrics broadly applicable to all IP-based mobile broadband networks.
3. The standard should reference metrics specified by IETF (particularly from the IP Performance Metrics (IPPM) Working Group) whenever feasible.
4. The standard shall specify test procedures.
5. The standard shall specify procedures for a measurement server to collect information from a disparate set of user devices on the network.
6. The standard shall specify communication and data exchange protocols and data formats allowing a network-based server to coordinate and manage test operation and data collection.
7. The standard shall be implementable in software.
8. The standard should be compatible with implementation by any IP-based server in conjunction with any IP-based user device.
9. The standard should consider how to minimize (consistent with an overall optimized solution) the cost burden on the user device due to the extent that data transfer may be subject to a fee from the carrier, may interfere with other active user device processes, and may drain the user device power.
10. The standard shall specify procedures for measuring including uplink throughput rate, downlink throughput rate, latency, and jitter.
11. The standard shall specify procedures for quantifying packet loss and timeouts.
12. The standard shall specify procedures for collecting and transmitting various types of metadata, to include carrier network, network type, cell ID, user device make/model, network policy information, and radio resource control parameters, if available.
13. The standard shall specify procedures for collecting and transmitting user device location and location accuracy associated with measurement events.
14. The standard shall specify procedures for reducing user device location accuracy for privacy protection.
15. The standard shall specify procedures to ensure that Personally Identifiable Information (PII) is treated sensitively and protected from unauthorized disclosure.
16. The standard shall specify procedures to manage and respond to user consent authorization with regard to PII.
17. The standard shall specify anonymization procedures.
18. The standard shall provide for control of the tradeoff between cost and performance, so that cost-driven users can reduce the number of measurements and the thoroughness of measurements to obtain lower-cost operation, albeit with less complete information. The standard should recommend means of estimating and reporting the statistical validity of a set of measurement data.
19. The standard shall specify procedures based on active probing.
20. The standard should specify procedures based on passive measurements.
21. The standard shall support the needs of the public and research communities for collection of openly accessible anonymized data.

# Mobile-Specific Considerations

The standard shall take into consideration the specific circumstances relevant to mobility and the resultant implications on measurements. In the mobile case:

* measurements will typically be related to a specific user device, rather to a router on a LAN
* a single user device can typically operate with multiple disparate network technologies
* a single user device may connect with multiple operators
* a user device experience widely varying signal and network conditions
* due to variability, far larger statistical samples may be required to draw generalized conclusions
* significantly more metadata (including, for example, location information) is required to characterize the scenario of a specific sample
* it may be necessary to trigger testing based on a set of environmental circumstances, such as location, rather than relying upon scenarios such as LAN quiescence as a trigger
* active testing may be relatively more constrained due to practical issues, including data plan limits and battery consumption

underlying software on many mobile devices is relatively closed, and underlying network data is often relatively difficult to access

# References

1. [IEEE 802.16-12-0489](http://doc.wirelessman.org/16-12-0489), “Approved PAR P802.16.3, with Five Criteria (Mobile Broadband Network Performance Measurements)”
2. [IEEE 802.16-12-0454](http://doc.wirelessman.org/16-12-0454), “Proposed Applications and Requirements for Mobile Broadband Network Performance Measurements,” Roger B. Marks, David Choffnes, Z. Morley Mao, Matt Welsh, July, 2012
3. “Profiling resource usage for mobile applications: a cross-layer approach,” Feng Qian, Zhaoguang Wang, Alexandre Gerber, Zhuoqing Mao, Subhabrata Sen, and Oliver Spatscheck. 2011. In *Proceedings of the 9th international conference on Mobile systems, applications, and services (MobiSys '11)*