3GPP TSG-RAN WG2 #118-e R2-22xxxxx

Online Meeting, May 9th – May 20th, 2022

Agenda Item: 6.21.2

Source: Ericsson

Title: [AT118-e][628][POS] NMEA GGA string for HA-GNSS reporting

 (Ericsson)

Document for: Discussion, Decision

# Introduction

This email discussion addresses the following contribution about a correction to add information corresponding to the NMEA GGA string to HA-GNSS reporting.

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| [R2-2206329](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_118-e/Inbox/R2-2206329.zip) (revision of R2-2205845) | Remaining details for high-precision GNSS reporting | ESA, Ericsson, Deutsche Telecom, T-Mobile USA, Swift Navigation, Hexagon, MediaTek Inc., u-blox |

* [AT118-e][628][TEI17] NMEA GGA string for HA-GNSS reporting (Ericsson)

      Scope: Discuss the contribution in R2-2205845 and determine if a CR is agreeable.

      Intended outcome: Agreed CR (without CB if possible)

      Deadline:  Tuesday 2022-05-17 1800 UTC

The email discussion is in two phases, where the first phase ends ***Friday 2022-05-13 1800 UTC.***

#  Contact Information

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# Discussion

The 3GPP-based high precision GNSS has been leveraged by the RTCM work when introducing support for OSR in Rel 15. RTCM distribution is based on NTRIP signalling, where NMEA GGA strings are used to provide device feedback with position estimate and quality and positioning details (no of satellites used, dilution of precision, quality indicator for position fix and age of assistance data). In 3GPP, location information feedback in terms of position estimates and quality is handled by the LPP *CommonIEsProvideLocationInformation* IE, with the possibility to add specific information per positioning method. For GNSS, this is handled via the *GNSS-LocationInformation* IE which optionally for capable devices could be hosting the positioning details. The contribution [1] [R2-2206329](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_118-e/Inbox/R2-2206329.zip) suggests that the remaining positioning information from the NMEA GGA string is added to the *GNSS-LocationInformation* IE.

Question 1: The contribution [1] is signed and co-signed by ESA, Ericsson, Deutsche Telecom, T-Mobile USA, Swift Navigation, Hexagon, MediaTek Inc., u-blox. In addition to these companies, do you support the addition of the remaining positioning information from the NMEA GGA string (no of satellites used, dilution of precision, quality indicator for position fix and age of assistance data) to the LPP *GNSS-LocationInformation* IE?

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| Company | Yes/No | Comments |
| Intel | Yes |  |
| Huawei, HiSilicon | Yes |  |
| ESA | Yes |  |
| Apple | Yes |  |
| Qualcomm | No | This is a late and unmotivated proposal with unclear benefits. It is completely unclear what a server is supposed to do with this information and why this is "missing information". Most implementations support NMEA and/or the 3GPP AT commands for testing, verification, etc. anyhow, but LPP is a positioning protocol. In particular, the proposed "fix quality indicator" in *GNSS-LocationInformation* includes the following:* 0 = Invalid, no position available.

There is LPP error handling defined, and in the case of "no fix" is available no *GNSS-LocationInformation* can be provided. However, with the proposal it seems the target device would now be required to report a *GNSS-LocationInformation* even in the case "no position available" (to include the HA-GNSS-Metrics-r17). It is unclear what *GNSS-LocationInformation* should be provided if no position is available, and which benefit this provides. * 1 = Autonomous GPS fix, no correction data used.
* 2 = DGPS fix, using a local DGPS base station or correction service such as WAAS or EGNOS.
* 3 = PPS fix
* 4 = RTK fix
* 5 = RTK Float
* 6 = Estimated fix (dead reckoning).

This seems to propose that a UE is allowed to select the positioning method and/or mode autonomously. E.g., if UE-based GNSS is requested, the UE is allowed to use "Autonomous GPS fix" (e.g., NMEA string supports GPS only).It seems the proposal is even that a UE can select a non-3GPP defined positioning method (like WAAS/EGNOS correction services or "dead reckoning"). This needs to be clarified in e.g., Stage 2 as well, and should then not be restricted to this set of non-3GPP methods only.* 7 = Manual input mode.
* 8 = Simulation mode.

It seems the contribution [1] proposes that a UE/user can enter a location estimate manually or via some undefined simulation mode. This seems to have serious impacts on e.g., regulatory services. ageThis field specifies the age of the used assistance data for HA GNSS, scale factor 0.1 seconds.This is also completely unclear and seems to introduce new UE requirements. It is unclear how a UE should determine the age of the used assistance data, and which assistance data are meant. I.e., individual assistance data may have a wide range of "age" (e.g., *GNSS-ReferenceLocation* or *GNSS-IonosphericModel* may be "very old" compared to the proposed scale factor of 0.1 seconds). A UE seems now be required to time stamp received assistance data with 0.1 seconds granularity. The benefit of all this is completely unclear (the network is providing the assistance data to the UE and should know its age). ***nrofUsedSatellites******hdopi******pdopi***Similar to the above, the purpose of this information reporting is unclear. A UE reports a location estimate according to the requested QoS. If a location server would like to know more information of the position calculation function (e.g., for debugging purposes, comparing different UE implementations, etc.), it can use UE-assisted mode. But LPP is a positioning protocol, not a testing/debugging protocol. |
| CATT | Not clear | What’s the reference file if the IE *HA-GNSS-Metrics* is introduced? Usually we review the reference file and make the decision how to capture the data. Not sure how 3gpp captures the data defined by National Marine Electronics Association (NMEA). Proposal 2 Add GNSS-LocationInformation attributes based on NMEA-GGA attributes number of detected/used satellites, satellite geometry in terms of dilution of precision, and positioning engine location estimate classification  |
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Question 2: Any technical comments to the text proposal to TR 37.355 in R2-2206329?

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| Company | Comments |
| Intel | Editorial issues:nrofUsedSatellites-r17 should be nrOfUsedSatellites-r17***ha-GNSS-MetricsReq***This field, if present, indicates that any location estimate provided by the target device should be reported with GNSS positioning metrics---- full stop is missing. ***ha-gnss-MetricsSupport***This field specifies that high accuracy GNSS positioning metrics are supported by the target device ---- full stop is missing.  |
| Huawei, HiSilicon | Since this is a TEI17 CR, there should be a tag for it attached to the title of the CR according to previous agreement in RANP.  |
| Apple | Some editorials:1. The acronym “HA” is used, e.g. in “This field specifies the age of the used assistance data for HA GNSS, scale factor 1 seconds”. Is the acronym defined somewhere?
2. Suggest adding “high accuracy” (or “HA”) to “This field, if present, indicates that any location estimate provided by the target device should be reported with GNSS positioning metrics”.
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| CATT | Being short of reference file. |
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# Conclusion

# References

[1] [R2-2206329](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_118-e/Inbox/R2-2206329.zip) Remaining details for high-precision GNSS reporting, ESA, Ericsson, Deutsche Telecom, T-Mobile USA, Swift Navigation, Hexagon, MediaTek Inc., u-blox