IEEE P802.11  
Wireless LANs

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| --- | --- | --- | --- | --- |
| Liaison from 3GPP RAN2 re: RoHC utilization for Ethernet header compression | | | | |
| Date: 2019-03-19 | | | | |
| Author(s): | | | | |
| Name | Affiliation | Address | Phone | email |
| Dorothy Stanley | Hewlett Packard Enterprise | 3333 Scott Blvd. Santa Clara, CA 95054 | +1 630 363 1389 | [dstanley@ieee.org](mailto:dstanley@ieee.org) |
|  |  |  |  |  |

Abstract

This document contains a liaison statement received from 3GPP RAN/RAN2 on the topic of RoHC utilization for Ethernet header compression

The received liaison is embedded below and reproduced on the following pages.



3GPP TSG-RAN WG2 Meeting #105 R2-1902372

Athens, Greece, 25 Feb - 01 Mar 2019

**Title:** LS on RoHC utilization for Ethernet header compression

**Response to:** -

**Release:** Release 16

**Work Item:** FS\_NR\_IIOT

**Source:** 3GPP RAN WG2

**To:** IETF, IEEE 802

**Cc:** 3GPP TSG RAN

**Contact Person:**

#### Name: Dawid KOZIOL

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**Send any reply LS to: 3GPP Liaisons Coordinator,** [**mailto:3GPPLiaison@etsi.org**](mailto:3GPPLiaison@etsi.org)

**Attachments:** RP-182090

**1. Overall Description:**

3GPP RAN Work Groups are at the moment performing a study on RAN support for Industrial Internet of Things, objectives of which are described in RP-182090, as attached. One of the goals of the study is to analyse potential enhancements for more efficient Time Sensitive Networks (TSN) support over 5G/NR system and one of the studied features is Ethernet header compression:

|  |
| --- |
| * 1. Ethernet header compression (RAN2):      1. Analysis of the benefits and the scenario (e.g. what are the formats and size of Ethernet frame to be considered, are VLAN fields included, protocol termination etc.).      2. Definition of the requirements for a new header compression. |

RAN2 WG has discussed the above topic and the result has been captured in the Text Proposal intended for Technical Report of the 3GPP Study Item on NR Industrial IoT. Since RoHC is a well-established standard for header compression of VoIP packets in 3GPP, one of the considered options is to reuse it also for Ethernet header compression on NR air interface. The related description from the attached Text Proposal is copied below for convenience:

|  |
| --- |
| **ROHC-based solution**  Ethernet header compression may build on the ROHC-framework, which is currently used for IP-header compression and applied on PDCP layer. A ROHC profile specific to the Ethernet header would need to be defined, meaning that the existing ROHC framework and features would be reused and do not need to be developed. R2-1817913 analyses the benefits of this approach. For example, robustness of compression against packet losses and in-built handling for multiple flows. On the other hand, ROHC profiles are defined by IETF for TCP/UDP/RTP/IP protocols, and Ethernet is defined by IEEE. It is unclear how 3GPP can define a new ROHC profile and if/how IETF/IEEE adopts such new ROHC profile. In addition, ROHC profile identifiers may need registration with IANA [ref]. Such collaboration/liaison with other standard bodies may add uncertainties and could delay the work completion. |

As can be seen, 3GPP RAN WG2 is not certain about the procedural aspects of defining a new RoHC profile for Ethernet header. Therefore, 3GPP RAN WG2 would like to ask IETF and IEEE the following questions:

Q1: Does IETF or IEEE have any concerns with 3GPP defining new RoHC profile for Ethernet header compression?

Q2: Does IEEE have any concern with 3GPP specifying a new Ethernet header compression algorithm?

Q3: In case 3GPP is allowed to develop RoHC profile for Ethernet header compression, does it have to be registered with IANA. If yes, how long can such process take?

Q4: According to IETF, what are the actions needed of 3GPP to specify and maintain a ROHC profile?

3GPP RAN WG2 would like to clarify that it intends to specify the new profile for its own purposes mainly, as described above, but would have nothing against IETF, IEEE or any another party using the profile, once it is defined. 3GPP RAN WG2 is open to collaboration with IETF/IEEE on new profile definition, but would like to indicate that the target completion date of the related work is end of 3GPP Rel-16, which is planned for Q1 of 2020.

**2. Actions:**

**To IETF:**

**ACTION:** RAN2 respectfully asks IETF to reply to questions 1, 3 and 4 above and provide any other guidance they see fit, if any.

**To IEEE:**

**ACTION:** RAN2 respectfully asks IEEE to reply to question 1 and 2 above and provide any other guidance they see fit, if any.

**3. Date of Next TSG-RAN WG2 Meetings:**

3GPP RAN2#105bis 08 - 12 Apr 2019 China

3GPP RAN2#106 13 - 17 May 2019 USA

**3GPP TSG RAN meeting #81 RP-182090**

**Gold Coast, Australia, September 10-13, 2018**

**Source: Nokia, Nokia Shanghai Bell**

**Title: Revised SID: Study on NR Industrial Internet of Things (IoT)**

**Document for: Approval**

**Agenda Item: 9.3.12**

3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](http://www.3gpp.org/About/WP.htm), article 39; and [3GPP TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm).  
Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

# Title: Study on NR Industrial Internet of Things (IoT)

## Acronym: FS\_NR\_IIOT

## Unique identifier: 800098

NOTE: For new WIs/SIs leave the Unique identifier empty but you may make a proposal for an Acronym.

If this is a RAN WID including Core and Perf. Part, then Title, Acronym and Unique identifier refer to the feature WI.

Please tick (X) the applicable box(es) in the table below:

Either:

|  |  |
| --- | --- |
| **This WID includes a Core part** |  |
| **This WID includes a Performance part** |  |

or:

|  |  |  |
| --- | --- | --- |
| **This WID includes a Testing part** | |  |
| **and it addresses the following 3GPP work area:** | **Radio Access** |  |
| **Core Network** |  |
| **Services** |  |

## 1 Impacts

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Affects:** | UICC apps | ME | AN | CN | Others (specify) |
| **Yes** |  | x | x |  |  |
| **No** | x |  |  |  | x |
| **Don’t know** |  |  |  | x |  |

## 2 Classification of the Work Item and linked work items

### 2.1 Primary classification

This work item is a …

|  |  |
| --- | --- |
|  | Feature |
|  | Building Block |
|  | *Work Task* |
| X | Study Item |

NOTE: Normally, Core/Perf./Testing parts in RAN WIDs are Building Blocks. Only if they are under an SA or CT umbrella, we define them as work tasks. If you are in doubt, please contact MCC.

### 2.2 Parent and child Work Items

|  |  |  |
| --- | --- | --- |
| Parent and child Work Items | | |
| Unique ID | Title | Nature of relationship |
|  |  |  |

NOTE: RAN agreed some time ago, that it describes the feature WI + Core/Perf. Part WI or Testing part WI in one WID. Therefore the table above should just include the feature WI Unique ID and title and Nature of relationship is “parent WID”.

### 2.3 Other related Work Items and dependencies

|  |  |  |
| --- | --- | --- |
| Other related Work Items (if any) | | |
| Unique ID | Title | Nature of relationship |
| 800028 | Study on 5GS Enhanced support of Vertical and LAN Services |  |
| 790008 | Study on enhancement of URLLC supporting in 5GC |  |
| 800095 | Study on physical layer enhancements for NR ultra-reliable and low latency case (URLLC) |  |

NOTE: Classical examples: List a preceding SI or a preceding WI (e.g. if you further enhance a topic). Also related or dependent WIs in other TSGs should be indicated.

**Dependency on non-3GPP (draft) specification**:

## 3 Justification

In Release 15 the basic support for URLLC was introduced with TTI structures for low latency as well as methods for improved reliability. Further use cases with tighter requirements have been identified as an important area for NR evolution.

The RAN level email discussion identified the follow key use new cases to be considered:

* Release 15 enabled use case improvements
  + Such as AR/VR (Entertainment industry)
* New Release 16 use cases with higher requirements
  + Factory automation
  + Transport Industry
  + Electrical Power Distribution

For these use cases improved areas have been identified for L2 and L3, including support of TSN (Time Sensitive Networking). TSG SA WG1 has been also addressing the requirements for enhanced URLLC work, as captured in TS 22.804.

## 4 Objective

### 4.1 Objective of SI

The objective of this study item is to investigate enhancements to URLLC (Ultra Reliable Low Latency Communications), considering both FR1 and FR2 as well as TDD and FDD, with the already existing solutions for NR as the baseline. The study is focusing on the following items:

1. L2/L3 enhancements:
   1. Data duplication and multi-connectivity enhancements, including (RAN2/RAN3):
      1. Resource efficient PDCP duplication e.g. coordination between the nodes for PDCP duplication activation and resource efficiency insurance, avoiding unnecessary duplicate transmissions etc.
      2. PDCP duplication with more than 2 copies leveraging (combination of) DC and CA, whereupon data transmission takes places from at most two nodes : assessment of the gains, and if beneficial, study the associated solutions.
      3. Potential impacts of higher layer multi-connectivity as studied by SA2.
   2. UL/DL intra-UE prioritization/multiplexing, i.e. prioritization (for example dropping, delaying or puncturing lower priority service) between different categories of traffic in the UE, including both data and control channels and considering (RAN2/RAN1):
      1. different latency and reliability requirements
      2. Different types of resource allocation for example grant-free and grant-based allocations

Note: RAN2 to start the work, RAN1 to take action based on RAN2 progress.

1. Time Sensitive Networking related enhancements:
   1. Accurate reference timing: Delivery & related process (e.g. SIB delivery or RRC delivery to UEs, Multiple Transmission points) (RAN2/RAN3/RAN1)
   2. Enhancements (e.g. for scheduling) to satisfy QoS for wireless Ethernet when using TSN traffic patterns as specified in TR 22.804 (RAN2/RAN1). Note: RAN2 to start the work, RAN1 to take action based on RAN2 progress.
   3. Ethernet header compression (RAN2):
      1. Analysis of the benefits and the scenario (e.g. what are the formats and size of Ethernet frame to be considered, are VLAN fields included, protocol termination etc.).
      2. Definition of the requirements for a new header compression.
   4. Performance evaluation of TSN requirements as captured in TR 22.804 clause 8.1 (RAN2/RAN1/RAN3)

NOTE: This task is related to TSN specific requirements, which are not evaluated as part of “Study on physical layer enhancements for NR ultra-reliable and low latency case”. It is not intended to discuss/agree additional simulation assumptions for this case.

Note: RAN2 to start the work, RAN1 to take action based on RAN2 progress

The expected Release 16 development in TSG SA side should be taken into account, especially related to the studies in TSG SA WG2.

Consideration for LTE applicability may be taken into account.

The following items have been identified to have relationship with Industrial IoT, but are covered in other study items and will not be studied as part of NR Industrial IoT SI:

* Multi-TRP transmission
* Mobility improvements for higher reliability
* Beam Management
* Enhanced Physical Layer NR URLLC

### 4.2 Objective of Performance part WI

NOTE: Leave empty if the WI proposal does not contain a RAN performance part.

### 4.3 RAN time budget request (not applicable to RAN5 WIs/SIs)

NOTE: For all RAN related WIs/SIs which are not led by RAN WG5 the WI/SI rapporteur has to fill out the attached Excel table to request time budgets for corresponding RAN WG meetings.  
The Excel table has to be filled out for all affected RAN WGs and up to the target date of the WI/SI.  
One time unit (TU) corresponds to ~ 2 hours in the meeting.  
If no TU is needed leave the field empty otherwise enter a number in the field.

For revisions of already approved WI/SI descriptions: Please remove the Excel table from the WID/SID’s zip file. The time budgets are already recorded. If you want to modify them, then this has to be done via the status report and not via a revised WID/SID.

If this WID is covering Core and Performance part, then please fill out one line for each of them in the attached Excel table.

**Additional comments to the time budget request in the attached Excel table:**

## 5 Expected Output and Time scale

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **New specifications** *{One line per specification. Create/delete lines as needed}* | | | | | |
| Type | Series | Title | For info  at TSG# | For approval at TSG# | Remarks |
| TR | 38.825 | Study on NR industrial Internet of Things (IoT) | *RAN#82* | *RAN#83* | TR editor: Nokia |

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Remarks for each spec.  
By default a new specs can only be new for one of both parts.

|  |  |  |  |
| --- | --- | --- | --- |
| **Impacted existing TS/TR** *{One line per specification. Create/delete lines as needed}* | | | |
| TS/TR No. | Description of change | Target completion plenary# | Remarks |
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NOTE: If this is a RAN WID including Core and Perf. Part, then all new Core part specs have to be listed first and then all new Perf. Part specs. Indicate “Core part” or “Perf. Part” under Remarks for each spec.  
If an existing spec is affected by both (Core part and Perf. Part), then it has to be listed twice with appropriate approval dates.

## 6 Work item Rapporteur(s)

Dawid Koziol (dawid.koziol@nokia.com)

Company: Nokia

## 7 Work item leadership

Primary responsible WG: RAN WG2

Secondary responsible WG: RAN WG1/RAN WG3

## 8 Aspects that involve other WGs

NOTE: For RAN WIDs: Section 8 applies only to WGs outside of TSG RAN because RAN WG aspects have to be covered in section 4.

## 9 Supporting Individual Members

|  |
| --- |
| Supporting IM name |
| Nokia |
| Nokia Shanghai Bell |
| Telecom Italia |
| Dish |
| KDDI |
| MTI |
| Sharp |
| Verizon |
| Deutsche Telekom |
| KT |
| Sierra Wireless |
| Sony |
| Docomo |
| Motorola Mobility |
| Xylinx |
| Ericsson |
| Sequans |
| Fujitsu |
| Xiaomi |
| Orange |
| III |
| Interdigital |
| Vivo |
| CATT |
| Huawei |
| Intel |
| CMCC |
| LG Electronics |
| Mediatek |
| Vodafone |
| Qualcomm |
| Fraunhofer HHI |
| U-blox |
| China Unicom |
| Lenovo |
| Panasonic |
| NEC |
| ZTE |

**References:**