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Technical Specification Group Radio Access Networks; (2022-04)
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NG-RAN;
Technical Specification
NG layer 1
(Release 17)



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Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

- x the first digit:
 - 1 presented to TSG for information;
 - 2 presented to TSG for approval;
 - 3 or greater indicates TSG approved document under change control.
- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the document.

1 Scope

The present document specifies the standards allowed to implement layer 1 on the NG interface.

The specification of transmission delay requirements and O&M requirements are not in the scope of the present document.

In the following, 'layer 1' and 'physical layer' are assumed to be synonymous.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

3 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in 3GPP TR 21.905 [1].

4 Introduction

The main functions of layer 1 are summarized in the following:

- Interface to physical medium;
- Frame delineation;
- Line clock extraction capability;
- Layer 1 alarms extraction and generation;
- Transmission quality control.

5 Layer 1 specifications

The support of any suitable layer 1 technique - like point-to-point or point-to-multipoint techniques - shall not be prevented.

6 Interface to management plane

The description of the interface towards the management plane is out of scope of this document, but at least the following O&M functions should be foreseen:

- Performance monitoring functions;
- Alarm status reporting functions;
- Synchronisation source management.

Annex A (informative): Change history

| Change history | | | | | | | |
|----------------|-----------------|-----------|----|-----|-----|--|-------------|
| Date | Meeting | TDoc | CR | Rev | Cat | Subject/Comment | New version |
| 2017-04 | R3#95b | R3-171214 | - | - | - | TS skeleton | 0.0.0 |
| 2017-04 | R3#95b | R3-171309 | - | - | - | Update of the new template and Editor's note | 0.0.1 |
| 2017-05 | R3#96 | R3-171861 | - | - | - | Update of title page and change history | 0.0.2 |
| 2017-05 | R3#96 | R3-171970 | - | - | - | Adding the contents of introduction | 0.1.0 |
| 2017-11 | R3#98 | R3-174662 | - | - | - | Adding the contents of layer 1 specifications, Interface to management plane and abbreviations | 0.2.0 |
| 2018-01 | R3#NR AH1801 | R3-180510 | - | - | - | Updating the title of specification and removing the NG-RAN in Abbreviations section | 0.3.0 |
| 2018-06 | RAN#80 | RP-180986 | - | - | - | Version submitted to RAN for approval | 1.0.0 |
| 2018-06 | RAN#80 | | | | | Specification approved at TSG-RAN and placed under change control | 15.0.0 |
| 2020-07 | SA#88-e | - | - | - | - | Update to Rel-16 version (MCC) | 16.0.0 |
| 2022-03 | SA#95-e | | | | | Promotion to Release 17 without technical change | 17.0.0 |