**1 UL interface**

**图示

描述已自动生成**

**1.1 UL TX signal configuration**

|  |  |  |  |
| --- | --- | --- | --- |
| gi\_nrPhySimUlTx\_s |  |  |  |
| **Paramter** | **Type** | **Significance** | **Comment** |
| numSlot | integer | Number of slots in each repeat |  |
| numRepeat | integer | Number of repeats for slot-level configurations in this case.  Value starts from 1. |  |
| snrStart | float | Start SNR used in 'Noise applying'. The unit is dB. |  |
| snrEnd | float | End SNR used in 'Noise applying'. The unit is dB. |  |
| snrStep | float | SNR interval used in 'Noise applying'. The unit is dB. |  |
| interferenceEnable | integer | Control for interference adding. Only in enable status, 'simUlInfTemplateS' is used.  0: Interference disable  1: Interference enable |  |
| cirStart | float | Start CIR used in 'Interference applying'. The unit is dB. |  |
| cirEnd | float | End CIR used in 'Interference applying'. The unit is dB. |  |
| cirStep | float | CIR step used in 'Interference applying'. The unit is dB. |  |
| puschThroughputSNR | float | PUSCH SNR to achieve fraction of maximum throughput in 38.104  255: Invalide value |  |
| pucchACKmissedSNR | float | PUCCH SNR to achieve probability of not detecting an ACK when an ACK was sent in 38.104  255: Invalide value |  |
| pucchNack2AckSNR | float | PUCCH SNR to achieve probability that an ACK bit is falsely detected when an NACK bit was sent on the particular bit position in 38.104  255: Invalide value |  |
| pucchUciSNR | float | PUCCH SNR to achieve probability of incorrectly decoding the UCI information when the UCI information is sent in 38.104  255: Invalide value |  |
| pucchDtx2AckThres | float | The probability that ACK is detected when nothing was sent  255: Invalide value |  |
| simUlTemplateS | gi\_nrPhySimUlTemplate\_s | Template option |  |
|  |  |  |  |

**1.1.1 UL template configuration**

|  |  |  |  |
| --- | --- | --- | --- |
| gi\_nrPhySimUlTemplate\_s |  |  |  |
| **Paramter** | **Type** | **Significance** | **Comment** |
| systemTemplate | string | Several templates of gi\_nrPhySimSys\_s  Value：  'Disable'  'SYS-10MHz-1TX-1RX'  'SYS-10MHz-2TX-2RX'  'SYS-10MHz-4TX-4RX'  'SYS-100MHz-1TX-1RX'  'SYS-100MHz-2TX-2RX'  'SYS-100MHz-4TX-4RX'  etc. |  |
| frcTemplate | string | Several templates of gi\_nrPhySimUl\_s  Value：  'Disable'  'G-FR1-A3-11-TypeA-1Port'  'G-FR1-A3-11-TypeB-1Port'  'G-FR1-A3-14-TypeA-1Port'  'G-FR1-A3-14-TypeB-1Port'  etc. | 注意’G-FR1-A3-11'这样的配置中包含了layer信息。 |
| channelTemplate | string | Several templates of gi\_nrPhySimUlChan\_s  Value：  'Disable'  'AWGN'  'TDLA30-10-Low'  'TDLB100-400-Low'  'TDLC300-100-Low'  etc. | 'AWGN'意味过信道阶段没有任何操作，因为’AWGN‘意味着只加高斯白噪声。  但它的确也是一种信道，所以在这里显示地标识了这样一个名称。 |
|  |  |  |  |

**1.2 Channle configuration**

|  |  |  |  |
| --- | --- | --- | --- |
| gi\_nrPhySimUlChan\_s |  |  |  |
| **Paramter** | **Type** | **Significance** | **Comment** |
| tdlDelay | string | 'AWGN'  'TDL-A'  'TDL-B'  'TDL-C'  'TDL-D'  'TDL-E'  'TDLA30'  'TDLB100'  'TDLC300'  'TDLC60' |  |
| delaySpread | float | Desired root mean square (RMS) delay spread in seconds.  It makes sense when tdlDelay is set to 'TDL-A', 'TDL-B', 'TDL-C', 'TDL-D', 'TDL-E'. |  |
| maxDopplerShift | float | Maximum Doppler shift in Hz. |  |
| mimoCorrelation | string | 'Low'  'High'  'Medium'  'Medium-A'  'UplinkMedium' |  |
| polarization | string | 'Co-Polar'  'Cross-Polar' |  |
| TO | float | Time delay in transmission. The unit is second. |  |
| FO | float | Frequency offset in transmission. The unit is Hz. |  |
| powerGain | float | Power adding to basic SNR, making different UE has different SNR. The unit is dB. |  |
|  |  |  |  |

**1.3 System configuration**

|  |  |  |  |
| --- | --- | --- | --- |
| gi\_nrPhySimSys\_s |  |  |  |
| **Paramter** | **Type** | **Significance** | **Comment** |
| dlBandwidth | integer | Carrier bandwidth for DL in MHz [3GPPTS 38.104, sec 5.3.2] Values: 5, 10, 15, 20, 25, 30, 40,50, 60, 70, 80,90,100,200,400 | 变量名称命名为FAPI中的原始名称，可能会不符合驼峰原则。 |
| dlFrequency | integer | Absolute frequency of DL point A in KHz [3GPP TS 38.104, sec5.2 and 3GPP TS 38.211, sec 4.4.4.2]  FR1: 410000 -> 7125000  FR2: 24250000 -> 52600000 | FR1:450MHz-7125MHz  FR2:24250MHz-52600MHz  described in table 5.1-1 in 38.104 |
| numTxAnt | integer | Number of Tx antennas Value: 1, 2, 4, 8 |  |
| uplinkBandwidth | integer | Carrier bandwidth for UL in MHz. [3GPPTS 38.104, sec 5.3.2] Values: 5, 10, 15, 20, 25, 30, 40,50, 60, 70, 80,90,100,200,400 |  |
| uplinkFrequency | integer | Absolute frequency of UL point A in KHz [3GPP TS 38.104, sec 5.2 and 3GPP TS 38.211, sec 4.4.4.2]  FR1: 410000 -> 7125000  FR2: 24250000 -> 52600000 |  |
| numRxAnt | integer | Number of Rx antennas Value: 1, 2, 4 |  |
| downlinkTxDirectCurrentLocation | integer | The downlink Tx Direct Current location for the carrier [3GPP TS 38.211, sec 4.4.2]  Value: 0->3299 | 此参数暂不关注 |
| uplinkTxDirectCurrentLocation | integer | The uplink Tx Direct Current location for the carrier [3GPP TS 38.211, sec 4.4.2]  Value: 0->3299 | 此参数暂不关注 |
| frequencyShift7p5KHz | integer | Indicates presence of 7.5KHz frequency shift. Value: 0 = false 1 = true | 暂不支持shift7p5，此参数值默认设置为0。 |
| phyCellId | integer | Physical Cell ID*, N,cell,ID*[3GPP TS 38.211 [2], sec7.4.2.1] Value: 0 ->1007 |  |
| frameDuplexType | integer | Frame duplex type Value: 0 = FDD 1 = TDD |  |
|  |  |  |  |

**1.4 UL slot level configuration**

|  |  |  |  |
| --- | --- | --- | --- |
| gi\_nrPhySimUl\_s |  |  |  |
| **Paramter** | **Type** | **Significance** | **Comment** |
| SFN | integer | SFN Value: 0 -> 1023 |  |
| Slot | integer | Slot number in frame Value: 0 ->159 |  |
| nPDUs | integer | Number of PDUs that are included in this message. Value: 0 -> 65535 |  |
| nPDUsOfPrach | integer | Number of PRACH PDUs |  |
| nPDUsOfPusch | integer | Number of PUSCH PDUs |  |
| nPDUsOfPucch01 | integer | Number of Format 0/1 PUCCH PDUs |  |
| nPDUsOfPucch234 | integer | Number of Format 2/3/4 PUCCH PDUs |  |
| nPDUsOfSrs | integer | Number of SRS PDUs |  |
| simPduU[GI\_NR\_PHY\_SIM\_UL\_NUM\_PDU] | gi\_nrPhySimPdu\_U | Union of PDU configuration |  |
|  |  |  |  |

**1.4.1 UL PDU configuration**

|  |  |  |  |
| --- | --- | --- | --- |
| gi\_nrPhySimUlPdu\_u |  |  |  |
| **Paramter** | **Type** | **Significance** | **Comment** |
| pduType | integer | 0: PRACH PDU 1: PUSCH PDU 2: PUCCH PDU 3: SRS PDU |  |
| simPuschPduS | gi\_nrPhySimPuschPdu\_s | PUSCH PDU configuration |  |
| simPucchPduS | gi\_nrPhySimPucchPdu\_s | PUCCH PDU configuration | 联合的不同形式 |
|  |  |  |  |

**1.4.1.1 PUSCH configuration**

|  |  |  |  |
| --- | --- | --- | --- |
| gi\_nrPhySimPuschPdu\_s |  |  |  |
| **Paramter** | **Type** | **Significance** | **Comment** |
| pduBitmap | integer | Bit 0: puschData (Indicates data is expected on the PUSCH) Bit 1:puschUci (Indicates UCI is expected on the PUSCH) Bit 2: puschPtrs (Indicates PTRS included) Bit 3: dftsOfdm (Indicates DFT S-OFDM transmission) All other bits reserved | 变量名称命名为FAPI中的原始名称，可能会不符合驼峰原则。 |
| RNTI | integer | The RNTI used for identifying the UE when receiving the PDU Value: 1 -> 65535 |  |
| userIndex | integer | The index of user in one slot this pdu belongs to, differerent RNTI has different userIndex  Value: 0 start |  |
| pduOrder | integer | Order of PDU in all PDUs  Value: 0 start, 0xffff(65535) means inactive. |  |
| Handle | integer | An opaque handling returned in the Rx\_Data.indication and/or UCI.indication message |  |
| BWPSize | integer | RB size of BWP which PUSCH PDU located in  Value:  1->275  'bandwidth', set BWPsize according to bandwidth |  |
| BWPStart | integer | RB start of BWP which PUSCH PDU located in  Value: 0->274 |  |
| subcarrierSpacing | integer | subcarrierSpacing [3GPP TS 38.211, 4.2] Value:0->4 |  |
| cyclicPrefix | integer | Cyclic prefix type [3GPP TS 38.211, 4.2]  0: Normal; 1: Extended |  |
| targetCodeRate | float | Target coding rate [3GPP TS 38.214 [5], sec 6.1.4.1]. This is the number of information bits per 1024 coded bits expressed in 0.1 bit units |  |
| qamModOrder | integer | QAM modulation [3GPP TS 38.214 [5], sec 6.1.4.1] Value: 2,4,6,8 if transform precoding is disabled Value: 1,2,4,6,8 if transform precoding is enabled |  |
| payloadSize | integer | Playload size in bits | FAPI中没有这个参数，根据需要添加。 |
| mcsIndex | integer | MCS index [3GPP TS 38.214, sec 6.1.4.1], should match value sent in DCI Value : 0->31 | 不设置newData参数，用mcsIndex和mcsTable计算 |
| mcsTable | integer | MCS-Table-PUSCH [3GPP TS 38.214, sec 6.1.4.1] Value: 0: notqam256 [3GPP TS 38.214, table 5.1.3.1-1] 1: qam256 [3GPP TS 38.214, table 5.1.3.1-2] 2: qam64LowSE [3GPP TS 38.214, table 5.1.3.1-3] 3: notqam256-withTransformPrecoding [3GPP TS 38.214, table 6.1.4.1-1] 4: qam64LowSE-withTransformPrecoding [3GPP TS 38.214, table 6.1.4.1-2] | 不设置newData参数，用mcsIndex和mcsTable计算 |
| transformPrecoding | integer | Indicates if transform precoding is enabled or disabled [3GPP TS 38.214, sec 6.1.4.1] [3GPP TS 38.211, 6.3.1.4] Value: 0: enabled 1: disabled | 暂不支持transformPrecoding，此参数值默认设置为1。 |
| nIdPusch | integer | Parameter nID [3GPP TS 38.211, sec 6.3.1.1] Value: 0->1023 |  |
| nrOfLayers | integer | Number of layers [3GPP TS 38.211, sec 6.3.1.3] Value : 1->4 |  |
| nrOfPorts | integer | Number of ports [3GPP TS 38.211, sec 6.3.1.5] Value : 1, 2, 4 | FAPI中没有这个参数。接收机应该用不到，只有发送信号需要。 |
| transScheme | integer | Two transmission schemes are supported for PUSCH:  codebook based transmission and non-codebook based transmission. [3GPP TS 38.214, sec 6.1.1]  Value:  0: codebook 1: nonCodebook | FAPI中没有这个参数，接收机应该用不到，只有发送信号需要。  暂不支持nonCodebook，此参数值默认设置为0。 |
| TPMI | integer | Precoding matrix index[3GPP TS 38.211, sec 6.3.1.5]  Value: 0->27 | FAPI中没有这个参数。接收机应该用不到，只有发送信号需要。 |
| ulDmrsSymbPos | integer | DMRS symbol positions [3GPP TS 38.211, sec 6.4.1.1.3 and Tables 6.4.1.1.3-3 and 6.4.1.1.3-4] Bitmap occupying the 14 LSBs with: bit 0: first symbol and for each bit 0: no DMRS 1: DMRS |  |
| dmrsConfigType | integer | UL DMRS config type [3GPP TS 38.211, sec 6.4.1.1.3] 0: type 1 1: type 2 |  |
| puschDmrsScramblingId0 | integer | PUSCH DMRS Scrambling-ID [3GPP TS 38.211, sec 6.4.1.1.1.1], as provided by parameter NID, 0.  There maybe a situation puschDmrsScramblingId0 = puschDmrsScramblingId1 = cellID.  Value: 0->65535 | 设置NID, 0，NID, 1两个接口是因为[文本  描述已自动生成](http://192.168.0.6/zentao/file-read-443.png)计算需要。 |
| puschDmrsScramblingId1 | integer | PUSCH DMRS Scrambling-ID [3GPP TS 38.211, sec 6.4.1.1.1.1], as provided by parameter NID, 1.  There maybe a situation puschDmrsScramblingId0 = puschDmrsScramblingId1 = cellID.  Value: 0->65535 |  |
| puschDmrsIdentity | integer | PUSCH DMRS ID [3GPP TS 38.211, sec 6.4.1.1.1.2], as provided by parameter nID,RS.  Value: 0-> 65535 |  |
| nSCID | integer | DMRS sequence initialization [3GPP TS 38.211, sec 6.4.1.1.1.1], as provided byparameter nSCID. Value : 0->1 |  |
| lowPAPRdmrsNoDft | integer | DMRSuplink-r16 in [3GPP TS 38.211, sec 6.4.1.1.1.1] and [3GPP TS 38.331].  0：DMRSuplink-r16 in the DMRS-UplinkConfig IE is not provided  1：DMRSuplink-r16 in the DMRS-UplinkConfig IE is provided | FAPI中没有这个参数，根据需要添加。  [38.331]This field indicates whether low PAPR DMRS is used,  as specified in TS38.211 [16], clause 6.4.1.1.1.1. |
| numDmrsCdmGrpsNoData | integer | Number of DM-RS CDM groups without data [3GPP TS 38.212, sec 7.3.1.1] Value: 1->3 |  |
| dmrsPorts | integer | DMRS ports. [3GPP TS 38.212, 7.3.1.1.2] provides description between DCI 0-1 content and DMRS ports. Bitmap occupying the 12 LSBs with: bit 0: antenna port 1000 bit 11: antenna port 1011 and for each bit 0: DMRS port not used 1: DMRS port used |  |
| groupOrSequenceHopping | integer | PUSCH DMRS hopping mode [3GPP TS 38.211, sec 6.4.1.1.1.2]. It is only valid when the transform precoding for PUSCH is enabled. Value: 0, 1 or 2 • 0: neither, neither group or sequence hopping is enabled • 1: enable, enable group hopping and disable sequence hopping • 2: disable, disable group hopping and enable sequence hopping • other values are reserved. | 暂不支持transformPrecoding，此参数无效。 |
| groupNumber | integer | Group number for Low PAPR sequence generation. [3GPP TS 38.211, sec 5.2.2] For DFT-S-OFDM.  Value: 0->29 |  |
| sequenceNumber | integer | Base sequence number for Low PAPR sequence generation. [3GPP TS 38.211 [2], sec 5.2.2] For DFTS- OFDM.  Value: 0->1 |  |
| resourceAlloc | integer | Resource Allocation Type [3GPP TS 38.214, sec 6.1.2.2] 0: Type 0 1: Type 1 | 暂不支持type0，此值默认设置为1。 |
| rbBitmap[36] | integer | For resource allocation type 0. [3GPP TS 38.214, sec 6.1.2.2.1] [3GPP TS 38.212, 7.3.1.1.2] bitmap of RBs, 273 rounded up to multiple of 32.  This bitmap is in units of VRBs. LSB ofbyte 0 of the bitmap represents VRB0, per section 6.3.1.7 of 3GPP TS 38.211. | 暂不支持type0，此值默认设置为0。 |
| rbStart | integer | For resource allocation type 1. [3GPP TS 38.214, sec 6.1.2.2.2] The starting resource block corresponds to VRB0 for this PUSCH, per section 6.3.1.7 of 3GPP TS 38.211. Value: 0->274 |  |
| rbSize | integer | For resource allocation type 1. [3GPP TS 38.214, sec 6.1.2.2.2] The number of resource block within for this PUSCH. Value: 1->275 |  |
| intraSlotFrequencyH opping | integer | For resource allocation type 1. [3GPP TS 38.212, sec 7.3.1.1] [3GPP TS 38.214, sec 6.3]  Indicates if intra-slot frequency hopping is enabled  Value: 0: disabled 1: enabled | 暂不支持hopping，此值默认设置为0。 |
| puschSecondHopPRB | integer | Index of the first PRB after intra-slot frequency hopping, as indicated by the value of RBstart for i=1, per 3GPP TS 38.214, section 6.3 Valid: when IntraSlotFrequencyHopping Is true Value: 0->274 | 暂不支持hopping，此参数无效。 |
| startSymbolIndex | integer | Start symbol index of PUSCH mapping from the start of the slot, S. [3GPP TS 38.214, Table 6.1.2.1-1] Value: 0->13 |  |
| nrOfSymbols | integer | PUSCH duration in symbols, L [3GPP TS 38.214, Table 6.1.2.1-1] Value: 1->14 |  |
| rvIndex | integer | Redundancy version index [3GPP TS 38.214, sec 6.1.4] Value : 0->3 |  |
| harqProcessID | integer | HARQ process number [3GPP TS 38.212, sec 7.3.1.1] Value: 0 ->15 |  |
|  |  |  |  |

**1.4.1.2 PUCCH configuration**

|  |  |  |  |
| --- | --- | --- | --- |
| gi\_nrPhySimPucchPdu\_s |  |  |  |
| **Paramter** | **Type** | **Significance** | **Comment** |
| RNTI | integer | The RNTI used for identifying the UE when receiving the PDU Value: 1 -> 65535 | 变量名称命名为FAPI中的原始名称，可能会不符合驼峰原则。 |
| userIndex | integer | The index of user in one slot this pdu belongs to, differerent RNTI has different userIndex  Value: 0 start |  |
| pduOrder | integer | Order of PDU in all PDUs  Value: 0 start, 0xffff(65535) means inactive. |  |
| Handle | integer | An opaque handling returned in the UCI.indication message |  |
| DTX | integer | 0 - Data is sent normally  1 - DTX, no data is actually sent |  |
| BWPSize | integer | Bandwidth part size [3GPP TS 38.213[4], sec12].  Number of contiguous PRBs allocated to the BWP  Value:  1->275  'bandwidth', set BWPsize according to bandwidth |  |
| BWPStart | integer | Bandwidth part start RB index from reference CRB [3GPP TS 38.213 [4], sec 12] Value: 0->274 |  |
| subcarrierSpacing | integer | subcarrierSpacing [3GPP TS 38.211 [2], sec 4.2] Value:0->4 |  |
| cyclicPrefix | integer | Cyclic prefix type [3GPP TS 38.211 [2], sec 4.2] 0: Normal; 1: Extended |  |
| FormatType | integer | PUCCH Format Type [3GPP TS 38.211 [2], sec 6.3.2.1] Value: 0->4 |  |
| pi2Bpsk | integer | When enabled, indicates that the UE uses pi/2 BPSK for UCI symbols instead of QPSK for PUCCH. [3GPP TS 38.213 [4], sec 9.2.5] Value: 0: disabled, 1: enabled |  |
| prbStartSr | integer | The starting PRB within the BWP for SR resource, or first PRB prior to hopping [3GPP TS 38.213 [4], sec 9.2.1].  Valid only for format 1 Value: 0->274 | Currently, two resources for format1 only have difference of PRB position.  Two resources different in total will support in further version. |
| prbStart | integer | The starting PRB within the BWP for this PUCCH, or first PRB prior to hopping [3GPP TS 38.213 [4], sec 9.2.1].  Valid for all formats Value: 0->274 |  |
| prbSize | integer | The number of PRBs within this PUCCH. Valid for all formats. Value: 1 -> 16 |  |
| StartSymbolIndex | integer | Start symbol index of PUCCH from the start of the slot, S. [3GPP TS 38.213 [4], sec 9.2.2]. Valid for all formats Value: 0->13 |  |
| NrOfSymbols | integer | PUCCH duration in symbols [3GPP TS 38.213 [4], sec 9.2.2] Values: 1 -2: Valid for formats 0,2 4->14: Valid for formats 1,3,4 |  |
| intraSlotFrequencyHopping | integer | Intra-slot Frequency hopping for a PUCCH resource [3GPP TS 38.211 [2], sec 6.3.2.2.1].  Valid for all formats  Value: 0: disabled 1: enabled | 暂不支持hopping，此值默认设置为0。 |
| secondHopPRB | integer | Index of the first PRB after frequency hopping. Valid for all formats. Value:0->274 | 暂不支持hopping，此参数无效。 |
| pucchGroupHopping | integer | Signaling of group and sequence hopping for PUCCH formats 0, 1, 3 and 4 [3GPP TS 38.211 [2], sec 6.3.2.2.1]. Value: 0: neither, neither group nor sequence hopping is enabled 1: enabled, enable group hopping and disable sequence hopping 2: disable, disable group hopping andenable sequence hopping |  |
| nIdPucchHopping | integer | The parameter nID used for sequence hopping. [3GPP TS 38.211 [2], sec 6.3.2.2.1] Valid for formats 0, 1, 3 and 4. Value: 0->1023 |  |
| InitialCyclicShift | integer | Initial cyclic shift (m0) used as part of frequency hopping. [3GPP TS 38.213 [4], sec 9.2.1 and 3GPP TS 38.211 [2], sec 6.3.2.2.2]. Valid for formats 0, 1, 3 and 4 Value: 0->11 | Format3, 4时，注意和PreDftOccIdx有关联。 |
| nIdPucchScrambling | integer | parameter nID in [3GPP TS 38.211 [2], sec 6.3.2.5.1 and 6.3.2.6.1] Valid for formats 2, 3 and 4. Value: 0->1023 |  |
| TimeDomainOccIdx | integer | An index of an orthogonal cover code [3GPP TS 38.211 [2], sec 6.3.2.4.1]. Valid for format 1. Value: 0->6 |  |
| FreqDomainOccIdx | integer | An index of an orthogonal cover code [3GPP TS 38.211 [2], sec 6.3.2.5.2]. Valid for format 2. Value: 0->3 |  |
| FreqDomainOccLen | integer | A length of an orthogonal cover code. [3GPP TS 38.211 [2], sec 6.3.2.5.2]. Valid for format 2. Value: 1, 2 or 4 |  |
| PreDftOccIdx | integer | An index of an orthogonal cover code. [3GPP TS 38.211 [2], sec 6.3.2.6.3]. Valid for format 4. Value: 0->3 |  |
| PreDftOccLen | integer | A length of an orthogonal cover code. [3GPP TS 38.211 [2], sec 6.3.2.6.3]. Valid for format 4. Value: 1, 2 or 4 |  |
| AddDmrsFlag | integer | Flag for additional DMRS. [3GPP TS 38.213 [4], sec 9.2.2]. Valid for formats 3 and 4. Value: 0 = disabled 1 = enabled |  |
| DmrsScramblingId | integer | Scrambling-ID-0 [3GPP TS 38.211 [2], sec 6.4.1.1.1] Valid for formats 2, Value: 0->65535 |  |
| SRFlag | integer | Indicates whether there is an SR opportunity in the UCI. Valid for format 0 and 1 Value: 0 = no SR 1 = SR opportunity |  |
| BitLenSr | integer | Bit length of SR payload.  Valid for format 2, 3, and 4  Value: 0 = no SR bits 1 -> 1706 |  |
| BitLenHarq | integer | Bit length of HARQ payload Valid for all formats. Value: 0 = no HARQ bits 0->2 = Valid for Formats 0 and 1 2 -> 1706 = Valid for Formats 2, 3 and 4 |  |
| csiPart1BitLength | integer | Bit length of CSI part 1 payload. Valid for formats 2, 3 and 4. Value: 0 = no CSI bits 1 -> 1706 |  |
| csiPart2BitLength | integer | Bit length of CSI part 2 payload. Valid for formats 3 and 4. Value: 0 = no CSI bits 1 -> 1706 |  |
| maxCodeRate | float | Max coding rate to determine how to feedback UCI on PUCCH for format 2, 3 or 4 [3GPP TS 38.213 [4], Table 9.2.5.2-1] Value Range: 0 -> 6: max code rate per Table 9.2.5.2-1 of 3GPP TS 28.213 [4] |  |
|  |  |  |  |

**1.5 System FAPI**

|  |  |  |  |
| --- | --- | --- | --- |
| gi\_nrPhyFapiCfgReq\_s |  |  |  |
| **Parameter** | **Significance** | **Comment** | **4byte-align mark** |
| uint8\_numTlvs | Number of TLV | Prefix 'uint16', or 'uint32', etc.. is used for bin file transformation. |  |
| uint8\_rsv[3] | Reserving field for 4 byte-align |  | Align |
| uint16\_dlBandwidth\_Tag | Tag of dlBandwidth  **Value: 0** |  |  |
| uint16\_dlBandwidth\_Length | Length of dlBandwidth in bytes  Value: 2 |  | Align |
| uint16\_dlBandwidth | Carrier bandwidth for DL in MHz [3GPPTS 38.104, sec 5.3.2] Values: 5, 10, 15, 20, 25, 30, 40,50, 60, 70, 80,90,100,200,400 |  |  |
| uint8\_dlBandwidth\_rsv[2] | Reserving field for 4 byte-align | 'Value' field is designed to have 4 bytes at most. | Align |
| uint16\_dlFrequency\_Tag | Tag of dlFrequency  **Value: 1** |  |  |
| uint16\_dlFrequency\_Length | Length of dlFrequency in bytes  Value: 4 |  | Align |
| uint32\_dlFrequency | Absolute frequency of DL point A in KHz [3GPP TS 38.104, sec5.2 and 3GPP TS 38.211, sec 4.4.4.2]  FR1: 410000 -> 7125000  FR2: 24250000 -> 52600000 |  | Align |
| uint16\_numTxAnt\_Tag | Tag of numTxAnt  **Value: 2** |  |  |
| uint16\_numTxAnt\_Length | Length of numTxAnt in bytes  Value: 2 |  | Align |
| uint16\_numTxAnt | Number of Tx antennas Value: 1, 2, 4 |  |  |
| uint8\_numTxAnt\_rsv[2] | Reserving field for 4 byte-align |  | Align |
| uint16\_uplinkBandwidth\_Tag | Tag of uplinkBandwidth  **Value: 3** |  |  |
| uint16\_uplinkBandwidth\_Length | Length of uplinkBandwidth in bytes  Value: 2 |  | Align |
| uint16\_uplinkBandwidth | Carrier bandwidth for UL in MHz. [3GPPTS 38.104, sec 5.3.2] Values: 5, 10, 15, 20, 25, 30, 40,50, 60, 70, 80,90,100,200,400 |  |  |
| uint8\_uplinkBandwidth\_rsv[2] | Reserving field for 4 byte-align |  | Align |
| uint16\_uplinkFrequency\_Tag | Tag of uplinkFrequency  **Value: 4** |  |  |
| uint16\_uplinkFrequency\_Length | Length of uplinkFrequency in bytes  Value: 4 |  | Align |
| uint32\_uplinkFrequency | Absolute frequency of UL point A in KHz [3GPP TS 38.104, sec 5.2 and 3GPP TS 38.211, sec 4.4.4.2]  FR1: 410000 -> 7125000  FR2: 24250000 -> 52600000 |  | Align |
| uint16\_numRxAnt\_Tag | Tag of numRxAnt  **Value: 5** |  |  |
| uint16\_numRxAnt\_Length | Length of numRxAnt in bytes  Value: 2 |  | Align |
| uint16\_numRxAnt | Number of Rx antennas Value: 1, 2, 4 |  |  |
| uint8\_numRxAnt\_rsv[2] | Reserving field for 4 byte-align |  | Align |
| uint16\_frequencyShift7p5KHz\_Tag | Tag of frequencyShift7p5KHz  **Value: 6** |  |  |
| uint16\_frequencyShift7p5KHz\_Length | Length of frequencyShift7p5KHz in bytes  Value: 1 |  | Align |
| uint8\_frequencyShift7p5KHz | Indicates presence of 7.5KHz frequency shift Value: 0 = false 1 = true |  |  |
| uint8\_frequencyShift7p5KHz\_rsv[3] | Reserving field for 4 byte-align |  | Align |
| uint16\_phyCellId\_Tag | Tag of phyCellId  **Value: 7** |  |  |
| uint16\_phyCellId\_Length | Length of phyCellId in bytes  Value: 2 |  | Align |
| uint16\_phyCellId | Physical Cell ID, N,cell,ID [3GPP TS 38.211 [2], sec7.4.2.1] Value: 0 ->1007 |  |  |
| uint8\_phyCellId\_rsv[2] | Reserving field for 4 byte-align |  | Align |
| uint16\_frameDuplexType\_Tag | Tag of frameDuplexType  **Value: 8** |  |  |
| uint16\_frameDuplexType\_Length | Length of frameDuplexType in bytes  Value: 2 |  | Align |
| uint16\_frameDuplexType | Frame duplex type Value: 0 = FDD 1 = TDD |  |  |
| uint8\_frameDuplexType\_rsv[2] | Reserving field for 4 byte-align |  | Align |
|  |  |  |  |

**1.6 UL slot level FAPI**

|  |  |  |  |
| --- | --- | --- | --- |
| gi\_nrPhyFapiUl\_s |  |  |  |
| **Parameter** | **Significance** | **Comment** | **4byte-align mark** |
| uint16\_SFN | SFN Value: 0 -> 1023 | Prefix 'uint16', or 'uint32', etc.. is used for bin file transformation. |  |
| uint16\_Slot | Slot number in frame Value: 0 ->159 |  | Align |
| uint16\_nPDUs | Number of PDUs that are included in this message. Value: 0 -> 65535 |  |  |
| uint16\_nPDUsOfPrach | Number of PRACH PDUs |  | Align |
| uint16\_nPDUsOfPusch | Number of PUSCH PDUs |  |  |
| uint16\_nPDUsOfPucch01 | Number of Format 0/1 PUCCH PDUs |  | Align |
| uint16\_nPDUsOfPucch234 | Number of Format 2/3/4 PUCCH PDUs |  |  |
| uint16\_nPDUsOfSrs | Number of SRS PDUs |  | Align |
| fapiUlPduU[GI\_NR\_PHY\_SIM\_UL\_NUM\_PDU] | gi\_nrPhyFapiUlPdu\_U, Union of PDU FAPI |  | Align |
|  |  |  |  |

**1.6.1 UL PDU FAPI**

|  |  |  |  |
| --- | --- | --- | --- |
| gi\_nrPhyFapiUlPdu\_U |  |  |  |
| **Paramter** | **Significance** | **Comment** | **4byte-align mark** |
| uint16\_pduType | 0: PRACH PDU 1: PUSCH PDU 2: PUCCH PDU 3: SRS PDU | Prefix 'uint16', or 'uint32', etc.. is used for bin file transformation. |  |
| uint16\_pduSize | Size of the PDU control information (in bytes). This length value includes the 4 bytes required for the PDU type and PDU size parameters.  Value: 0 -> 65535 |  | Align |
| fapiPuschPduS | gi\_nrPhyFapiPuschPdu\_s, PUSCH PDU FAPI. |  | Align |
| fapiPucchPduS | gi\_nrPhyFapiPucchPdu\_s, PUCCH PDU FAPI. | 联合的不同形式 | Align |
|  |  |  |  |

**1.6.1.1 PUSCH FAPI**

|  |  |  |  |
| --- | --- | --- | --- |
| gi\_nrPhyFapiPuschPdu\_s |  |  |  |
| **Paramter** | **Significance** | **Comment** | **4byte-align mark** |
| uint16\_pduBitmap | Bit 0: puschData (Indicates data is expected on the PUSCH) Bit 1:puschUci (Indicates UCI is expected on the PUSCH) Bit 2: puschPtrs (Indicates PTRS included) Bit 3: dftsOfdm (Indicates DFT S-OFDM transmission) All other bits reserved | Prefix 'uint16', or 'uint32', etc.. is used for bin file transformation. |  |
| uint16\_RNTI | The RNTI used for identifying the UE when receiving the PDU Value: 1 -> 65535 |  | Align |
| uint16\_userId | The index in all users this pdu belongs to, differerent RNTI has different userId(for HARQ combine)  Value: 0 start |  |  |
| uint16\_pduOrder | Order of PDU in all PDUs  Value: 0 start, 0xffff(65535) means inactive. |  | Align |
| uint32\_Handle | An opaque handling returned in the Rx\_Data.indication and/or UCI.indication message |  | Align |
| uint16\_BWPSize | RB size of BWP which PUSCH PDU located in  Value: 1->275 |  |  |
| uint16\_BWPStart | RB start of BWP which PUSCH PDU located in  Value: 0->274 |  | Align |
| uint8\_subcarrierSpacing | subcarrierSpacing [3GPP TS 38.211, 4.2] Value:0->4 |  |  |
| uint8\_cyclicPrefix | Cyclic prefix type [3GPP TS 38.211, 4.2]  0: Normal; 1: Extended |  |  |
| uint16\_targetCodeRate | Target coding rate [3GPP TS 38.214 [5], sec 6.1.4.1]. This is the number of information bits per 1024 coded bits expressed in 0.1 bit units |  | Align |
| uint32\_payloadSize | Playload size in bits. | Put here for 4-byte align | Align |
| uint8\_qamModOrder | QAM modulation [3GPP TS 38.214 [5], sec 6.1.4.1] Value: 2,4,6,8 if transform precoding is disabled Value: 1,2,4,6,8 if transform precoding is enabled |  |  |
| uint8\_mcsIndex | MCS index [3GPP TS 38.214, sec 6.1.4.1], should match value sent in DCI Value : 0->31 |  |  |
| uint8\_mcsTable | MCS-Table-PUSCH [3GPP TS 38.214, sec 6.1.4.1] Value: 0: notqam256 [3GPP TS 38.214, table 5.1.3.1-1] 1: qam256 [3GPP TS 38.214, table 5.1.3.1-2] 2: qam64LowSE [3GPP TS 38.214, table 5.1.3.1-3] 3: notqam256-withTransformPrecoding [3GPP TS 38.214, table 6.1.4.1-1] 4: qam64LowSE-withTransformPrecoding [3GPP TS 38.214, table 6.1.4.1-2] |  |  |
| uint8\_transformPrecoding | Indicates if transform precoding is enabled or disabled [3GPP TS 38.214, sec 6.1.4.1] [3GPP TS 38.211, 6.3.1.4] Value: 0: enabled 1: disabled |  | Align |
| uint16\_nIdPusch | parameter nID [3GPP TS 38.211, sec 6.3.1.1] Value: 0->1023 |  |  |
| uint8\_nrOfLayers | Number of layers [3GPP TS 38.211, sec 6.3.1.3] Value : 1->4 |  |  |
| uint8\_dmrsConfigType | UL DMRS config type [3GPP TS 38.211, sec 6.4.1.1.3] 0: type 1 1: type 2 | Put here for 4-byte align | Align |
| uint16\_ulDmrsSymbPos | DMRS symbol positions [3GPP TS 38.211, sec 6.4.1.1.3 and Tables 6.4.1.1.3-3 and 6.4.1.1.3-4] Bitmap occupying the 14 LSBs with: bit 0: first symbol and for each bit 0: no DMRS 1: DMRS |  |  |
| uint16\_puschDmrsScramblingId0 | PUSCH DMRS Scrambling-ID [3GPP TS 38.211, sec 6.4.1.1.1.1], as provided by parameter *NID,0*.  There maybe a situation puschDmrsScramblingId0 = puschDmrsScramblingId1 = cellID.  Value: 0->65535 |  | Align |
| uint16\_puschDmrsScramblingId1 | PUSCH DMRS Scrambling-ID [3GPP TS 38.211, sec 6.4.1.1.1.1], as provided by parameter *NID,1*.  There maybe a situation puschDmrsScramblingId0 = puschDmrsScramblingId1 = cellID.  Value: 0->65535 |  |  |
| uint16\_puschDmrsIdentity | PUSCH DMRS ID [3GPP TS 38.211, sec 6.4.1.1.1.2], as provided by parameter nID,RS.  Value: 0-> 65535 |  | Align |
| uint8\_nSCID | DMRS sequence initialization [3GPP TS 38.211, sec 6.4.1.1.1.1], as provided byparameter *nSCID.* Value : 0->1 |  |  |
| uint8\_lowPAPRdmrsNoDft | *DMRSuplink-r16* in [3GPP TS 38.211, sec 6.4.1.1.1.1] and [3GPP TS 38.331].  0：DMRSuplink-r16 in the DMRS-UplinkConfig IE is not provided  1：DMRSuplink-r16 in the DMRS-UplinkConfig IE is provided |  |  |
| uint8\_numDmrsCdmGrpsNoData | Number of DM-RS CDM groups without data [3GPP TS 38.212, sec 7.3.1.1] Value: 1->3 |  |  |
| uint8\_intraSlotFrequencyHopping | For resource allocation type 1. [3GPP TS 38.212, sec 7.3.1.1] [3GPP TS 38.214, sec 6.3]  Indicates if intra-slot frequency hopping is enabled  Value: 0: disabled 1: enabled | Put here for 4-byte align | Align |
| uint16\_dmrsPorts | DMRS ports. [3GPP TS 38.212, 7.3.1.1.2] provides description between DCI 0-1 content and DMRS ports. Bitmap occupying the 12 LSBs with: bit 0: antenna port 1000 bit 11: antenna port 1011 and for each bit 0: DMRS port not used 1: DMRS port used |  |  |
| uint16\_puschSecondHopPRB | Index of the first PRB after intra-slot frequency hopping, as indicated by the value of RBstart for i=1, per 3GPP TS 38.214, section 6.3 Valid: when IntraSlotFrequencyHopping Is true Value: 0->274 | Put here for 4-byte align | Align |
| uint8\_groupOrSequenceHopping | PUSCH DMRS hopping mode [3GPP TS 38.211, sec 6.4.1.1.1.2]. It is only valid when the transform precoding for PUSCH is enabled. Value: 0, 1 or 2 • 0: neither, neither group or sequence hopping is enabled • 1: enable, enable group hopping and disable sequence hopping • 2: disable, disable group hopping and enable sequence hopping • other values are reserved. |  |  |
| uint8\_groupNumber | Group number for Low PAPR sequence generation. [3GPP TS 38.211, sec 5.2.2] For DFT-S-OFDM.  Value: 0->29 |  |  |
| uint8\_sequenceNumber | Base sequence number for Low PAPR sequence generation. [3GPP TS 38.211 [2], sec 5.2.2] For DFTS- OFDM.  Value: 0->1 |  |  |
| uint8\_resourceAlloc | Resource Allocation Type [3GPP TS 38.214, sec 6.1.2.2] 0: Type 0 1: Type 1 |  | Align |
| uint8\_rbBitmap[36] | For resource allocation type 0. [3GPP TS 38.214, sec 6.1.2.2.1] [3GPP TS 38.212, 7.3.1.1.2] bitmap of RBs, 273 rounded up to multiple of 32.  This bitmap is in units of VRBs. LSB ofbyte 0 of the bitmap represents VRB0, per section 6.3.1.7 of 3GPP TS 38.211. |  | Align |
| uint16\_rbStart | For resource allocation type 1. [3GPP TS 38.214, sec 6.1.2.2.2] The starting resource block corresponds to VRB0 for this PUSCH, per section 6.3.1.7 of 3GPP TS 38.211. Value: 0->274 |  |  |
| uint16\_rbSize | For resource allocation type 1. [3GPP TS 38.214, sec 6.1.2.2.2] The number of resource block within for this PUSCH. Value: 1->275 |  | Align |
| uint8\_startSymbolIndex | Start symbol index of PUSCH mapping from the start of the slot, S. [3GPP TS 38.214, Table 6.1.2.1-1] Value: 0->13 |  |  |
| uint8\_nrOfSymbols | PUSCH duration in symbols, L [3GPP TS 38.214, Table 6.1.2.1-1] Value: 1->14 |  |  |
| uint8\_rvIndex | Redundancy version index [3GPP TS 38.214, sec 6.1.4] Value : 0->3 |  |  |
| uint8\_harqProcessID | HARQ process number [3GPP TS 38.212, sec 7.3.1.1] Value: 0 ->15 |  | Align |
|  |  |  |  |

**1.6.1.2 PUCCH FAPI**

|  |  |  |  |
| --- | --- | --- | --- |
| gi\_nrPhyFapiPucchPdu\_s |  |  |  |
| **Paramter** | **Significance** | **Comment** | **4byte-align mark** |
| uint16\_RNTI | The RNTI used for identifying the UE when receiving the PDU Value: 1 -> 65535 | Prefix 'uint16', or 'uint32', etc.. is used for bin file transformation. |  |
| uint8\_rsv[2] | Reserving field for 4 byte-align |  | Align |
| uint16\_userId | The index in all users this pdu belongs to, differerent RNTI has different userId  Value: 0 start |  |  |
| uint16\_pduOrder | Order of PDU in all PDUs  Value: 0 start, 0xffff(65535) means inactive. |  | Align |
| uint32\_Handle | An opaque handling returned in the UCI.indication message |  | Align |
| uint16\_BWPSize | Bandwidth part size [3GPP TS 38.213[4], sec12].  Number of contiguous PRBs allocated to the BWP  Value: 1->275 |  |  |
| uint16\_BWPStart | Bandwidth part start RB index from reference CRB [3GPP TS 38.213 [4], sec 12] Value: 0->274 |  | Align |
| uint8\_subcarrierSpacing | subcarrierSpacing [3GPP TS 38.211 [2], sec 4.2] Value:0->4 |  |  |
| uint8\_cyclicPrefix | Cyclic prefix type [3GPP TS 38.211 [2], sec 4.2] 0: Normal; 1: Extended |  |  |
| uint8\_FormatType | PUCCH Format Type [3GPP TS 38.211 [2], sec 6.3.2.1] Value: 0->4 |  |  |
| uint8\_pi2Bpsk | When enabled, indicates that the UE uses pi/2 BPSK for UCI symbols instead of QPSK for PUCCH. [3GPP TS 38.213 [4], sec 9.2.5] Value: 0: disabled, 1: enabled |  | Align |
| uint16\_prbStartSr | The starting PRB within the BWP for SR resource, or first PRB prior to hopping [3GPP TS 38.213 [4], sec 9.2.1].  Valid only for format 1 Value: 0->274 | Currently, two resources for format1 only have difference of PRB position.  Two resources different in total will support in further version. |  |
| uint16\_prbStart | The starting PRB within the BWP for this PUCCH, or first PRB prior to hopping [3GPP TS 38.213 [4], sec 9.2.1].  Valid for all formats Value: 0->274 |  | Align |
| uint16\_prbSize | The number of PRBs within this PUCCH. Valid for all formats. Value: 1 -> 16 |  |  |
| uint8\_StartSymbolIndex | Start symbol index of PUCCH from the start of the slot, S. [3GPP TS 38.213 [4], sec 9.2.2]. Valid for all formats Value: 0->13 |  |  |
| uint8\_NrOfSymbols | PUCCH duration in symbols [3GPP TS 38.213 [4], sec 9.2.2] Values: 1 -2: Valid for formats 0,2 4->14: Valid for formats 1,3,4 |  | Align |
| uint8\_intraSlotFrequencyHopping | Intra-slot Frequency hopping for a PUCCH resource [3GPP TS 38.211 [2], sec 6.3.2.2.1].  Valid for all formats  Value: 0: disabled 1: enabled |  |  |
| uint8\_pucchGroupHopping | Signaling of group and sequence hopping for PUCCH formats 0, 1, 3 and 4 [3GPP TS 38.211 [2], sec 6.3.2.2.1]. Value: 0: neither, neither group nor sequence hopping is enabled 1: enabled, enable group hopping and disable sequence hopping 2: disable, disable group hopping andenable sequence hopping | Put here for 4-byte align |  |
| uint16\_secondHopPRB | Index of the first PRB after frequency hopping. Valid for all formats. Value:0->274 |  | Align |
| uint16\_nIdPucchHopping | The parameter nID used for sequence hopping. [3GPP TS 38.211 [2], sec 6.3.2.2.1] Valid for formats 0, 1, 3 and 4. Value: 0->1023 |  |  |
| uint16\_InitialCyclicShift | Initial cyclic shift (m0) used as part of frequency hopping. [3GPP TS 38.213 [4], sec 9.2.1 and 3GPP TS 38.211 [2], sec 6.3.2.2.2]. Valid for formats 0, 1, 3 and 4 Value: 0->11 |  | Align |
| uint16\_nIdPucchScrambling | parameter nID in [3GPP TS 38.211 [2], sec 6.3.2.5.1 and 6.3.2.6.1] Valid for formats 2, 3 and 4. Value: 0->1023 |  |  |
| uint8\_TimeDomainOccIdx | An index of an orthogonal cover code [3GPP TS 38.211 [2], sec 6.3.2.4.1]. Valid for format 1. Value: 0->6 |  |  |
| uint8\_FreqDomainOccIdx | An index of an orthogonal cover code [3GPP TS 38.211 [2], sec 6.3.2.5.2]. Valid for format 2. Value: 0->3 |  | Align |
| uint8\_FreqDomainOccLen | A length of an orthogonal cover code. [3GPP TS 38.211 [2], sec 6.3.2.5.2]. Valid for format 2. Value: 1, 2 or 4 |  |  |
| uint8\_PreDftOccIdx | An index of an orthogonal cover code. [3GPP TS 38.211 [2], sec 6.3.2.6.3]. Valid for format 4. Value: 0->3 |  |  |
| uint8\_PreDftOccLen | A length of an orthogonal cover code. [3GPP TS 38.211 [2], sec 6.3.2.6.3]. Valid for format 4. Value: 1, 2 or 4 |  |  |
| uint8\_AddDmrsFlag | Flag for additional DMRS. [3GPP TS 38.213 [4], sec 9.2.2]. Valid for formats 3 and 4. Value: 0 = disabled 1 = enabled |  | Align |
| uint8\_DmrsScramblingId | Scrambling-ID-0 [3GPP TS 38.211 [2], sec 6.4.1.1.1] Valid for formats 2, Value: 0->65535 |  |  |
| uint8\_SRFlag | Indicates whether there is an SR opportunity in the UCI. Valid for format 0 and 1 Value: 0 = no SR 1 = SR opportunity |  |  |
| uint16\_BitLenSr | Bit length of SR payload.  Valid for format 2, 3, and 4  Value: 0 = no SR bits 1 -> 1706 |  | Align |
| uint16\_BitLenHarq | Bit length of HARQ payload Valid for all formats. Value: 0 = no HARQ bits 0->2 = Valid for Formats 0 and 1 2 -> 1706 = Valid for Formats 2, 3 and 4 |  |  |
| uint16\_csiPart1BitLength | Bit length of CSI part 1 payload. Valid for formats 2, 3 and 4. Value: 0 = no CSI bits 1 -> 1706 |  | Align |
| uint16\_csiPart2BitLength | Bit length of CSI part 2 payload. Valid for formats 3 and 4. Value: 0 = no CSI bits 1 -> 1706 |  |  |
| uint16\_maxCodeRate | Max coding rate to determine how to feedback UCI on PUCCH for format 2, 3 or 4 [3GPP TS 38.213 [4], Table 9.2.5.2-1] Value Range: 0 -> 6: max code rate per Table 9.2.5.2-1 of 3GPP TS 28.213 [4] | Change from uint8 to uint16 for 4-byte align | Align |
| uint16\_csiPart1Num | Number of CSI part1 report |  |  |
| uint16\_csiPart2Num | Number of CSI part2 report |  | Align |
| fapiPucchRiInfoS[GI\_NR\_PHY\_SIM\_UL\_CSI\_NUM\_REPORT] | gi\_nrPhyFapiPucchRiInfo\_s, active number is uint8\_csiPart1Num |  | Align |
| fapiPucchPmiInfoS[GI\_NR\_PHY\_SIM\_UL\_CSI\_NUM\_REPORT] | gi\_nrPhyFapiPucchPmiInfo\_s, active number is uint8\_csiPart1Num or uint8\_csiPart2Num |  | Align |
|  |  |  |  |

**1.6.1.2.1 gi\_nrPhyFapiPucchRiInfo\_s**

|  |  |  |  |
| --- | --- | --- | --- |
| gi\_nrPhyFapiPucchRiInfo\_s |  |  |  |
| **Paramter** | **Significance** | **Comment** | **4byte-align mark** |
| uint16\_bitOffsetRiField | Bit offset for RI in one CSI1 report | Prefix 'uint16', or 'uint32', etc.. is used for bin file transformation. |  |
| uint16\_bitLenRiField | Bit length for RI |  | Align |
| uint16\_bitLenTotal | Total bit length for one CSI1 report |  |  |
| uint8\_rsv[2] | Reserving field for 4 byte-align |  | Align |
|  |  |  |  |

**1.6.1.2.2 gi\_nrPhyFapiPucchPmiInfo\_s**

|  |  |  |  |
| --- | --- | --- | --- |
| gi\_nrPhyFapiPucchPmiInfo\_s |  |  |  |
| **Paramter** | **Significance** | **Comment** | **4byte-align mark** |
| uint16\_bitOffsetPmiField | Bit offset for region of X1 and X2 in one CSI1 or CSI2 report | Prefix 'uint16', or 'uint32', etc.. is used for bin file transformation. |  |
| uint8\_rsv[2] | Reserving field for 4 byte-align |  | Align |
| uint16\_bitLenPmiX1Field[8] | Length of X1 based on Rank 0 - 7 |  | Align |
| uint16\_bitLenPmiX2Field[8] | Length of X2 based on Rank 0 - 7 |  | Align |
| uint16\_bitLenTotal | Total bit length for one CSI1 or CSI2 report |  |  |
| uint8\_rsv[2] | Reserving field for 4 byte-align |  | Align |
|  |  |  |  |

**1.7 UL indication**

**1.7.1 Rx Data indication**

|  |  |  |  |
| --- | --- | --- | --- |
| gi\_nrPhyIndRxData\_s |  |  |  |
| **Paramter** | **Significance** | **Comment** | **4byte-align mark** |
| uint16\_SFN | SFN Value: 0 -> 1023 | Prefix 'uint16', or 'uint32', etc.. is used for bin file transformation. |  |
| uint16\_Slot | Slot Value: 0 ->159 |  | Align |
| uint16\_nPDUs | Number of PDUs included in this message |  |  |
| uint8\_rsv[2] | Reserving field for 4 byte-align |  | Align |
| indRxDataPduS[GI\_NR\_PHY\_SIM\_UL\_PUSCH\_NUM\_PDU] | gi\_nrPhyIndRxDataPdu\_s, struct of PDU Rx Data Indication. |  | Align |
|  |  |  |  |

**1.7.1.1 Rx Data PDU Indication**

|  |  |  |  |
| --- | --- | --- | --- |
| gi\_nrPhyIndRxDataPdu\_s |  |  |  |
| **Paramter** | **Significance** | **Comment** | **4byte-align mark** |
| uint32\_Handle | The handle passed to the PHY in an UL\_TTI.request PUSCH PDU | Prefix 'uint16', or 'uint32', etc.. is used for bin file transformation. | Align |
| uint16\_RNTI | The RNTI passed to the PHY in an UL\_TTI.request PUSCH PDU Value: 1 → 65535 |  |  |
| uint8\_HarqID | HARQ process ID Value: 0->15 |  |  |
| uint8\_ulCQI | SNR Value: 0-255, representing -64dB to 63dB, with 0.5dB step size. 0xff should be set if this field is invalid. |  | Align |
| uint16\_TA | Timing advance measured for the UE [3GPP TS 38.213[4], Section 4.2]  NTA\_new = NTA\_old + (TA − 31) ⋅ 16 ⋅ 64⁄2μ  Value: 0 → 63  0xffff should be set if this field is invalid |  |  |
| uint16\_RSSI | -64dB to 64dB with a step size of 0.1dB Value: 0-1280 0xffff should be set if this field is invalid |  | Align |
| uint32\_pduLen | Length of PDU in bytes  A length of 0 indicates a CRC or decoding error. |  | Align |
| uint8\_PDU[GI\_NR\_PHY\_SIM\_PUSCH\_TB\_SIZE] | Contents of PDU | mcsIndex = 27, mcsTable = 1, targetCodeRate = 948/1024,  qamModOrder = 8, payloadSize = **1,277,992**, nrOfLayers = 4, rbSize = 273,  ulDmrsSymbPos = 2052(2, 11), startSymbolIndex = 0, nrOfSymbols = 14  1,277,992/8 = **159,749**  GI\_NR\_PHY\_SIM\_PUSCH\_TB\_SIZE  = **160,000**  Bit order in byte is little endian. | Align |
|  |  |  |  |

**1.7.2 CRC indication**

|  |  |  |  |
| --- | --- | --- | --- |
| gi\_nrPhyIndCrc\_s |  |  |  |
| **Paramter** | **Significance** | **Comment** | **4byte-align mark** |
| uint16\_SFN | SFN Value: 0 -> 1023 | Prefix 'uint16', or 'uint32', etc.. is used for bin file transformation. |  |
| uint16\_Slot | Slot Value: 0 ->159 |  | Align |
| uint16\_nCRCs | Number of CRCs (PDUs) with status indication included in this message. |  |  |
| uint8\_rsv[2] | Reserving field for 4 byte-align |  | Align |
| indCrcPduS[GI\_NR\_PHY\_SIM\_UL\_PUSCH\_NUM\_PDU] | gi\_nrPhyIndCrcPdu\_s, struct of PDU CRC Indication. |  | Align |
|  |  |  |  |

**1.7.2.1 CRC PDU Indication**

|  |  |  |  |
| --- | --- | --- | --- |
| gi\_nrPhyIndCrcPdu\_s |  |  |  |
| **Paramter** | **Significance** | **Comment** | **4byte-align mark** |
| uint32\_Handle | The handle passed to the PHY in an UL\_TTI.request PUSCH PDU | Prefix 'uint16', or 'uint32', etc.. is used for bin file transformation. | Align |
| uint16\_RNTI | The RNTI passed to the PHY in an UL\_TTI.request PUSCH PDU Value: 1 → 65535 |  |  |
| uint8\_HarqID | HARQ process ID Value: 0->15 |  |  |
| uint8\_tbCrc | Indicates CRC result on TB data Value: 0 = pass 1 = fail |  | Align |
| uint16\_numCb | The number of CBs in the TB Value: 0->65535 |  |  |
| uint8\_rsv[2] | Reserving field for 4 byte-align |  | Align |
| uint8\_cbCrc[GI\_NR\_PHY\_SIM\_PUSCH\_NUM\_CB] | Each bit indicates CRC result on CB data Value: 0 = pass 1 = fail | mcsIndex = 27, mcsTable = 1, targetCodeRate = 948/1024,  qamModOrder = 8, payloadSize = **1,277,992**, nrOfLayers = 4, rbSize = 273,  ulDmrsSymbPos = 2052(2, 11), startSymbolIndex = 0, nrOfSymbols = 14  ceil((1,277,992 + 24)/(8448 - 24)) = **152**  GI\_NR\_PHY\_SIM\_PUSCH\_NUM\_CB = **152** | Align |
|  |  |  |  |

**1.7.3 PUCCH UCI indication**

|  |  |  |  |
| --- | --- | --- | --- |
| gi\_nrPhyIndPucchUci\_s |  |  |  |
| **Paramter** | **Significance** | **Comment** | **4byte-align mark** |
| uint16\_SFN | SFN Value: 0 -> 1023 | Prefix 'uint16', or 'uint32', etc.. is used for bin file transformation. |  |
| uint16\_Slot | Slot Value: 0 ->159 |  | Align |
| uint16\_NumUCIs | Number of UCIs included in this message. |  |  |
| uint8\_rsv[2] | Reserving field for 4 byte-align |  | Align |
| indPucchUciPdu[GI\_NR\_PHY\_SIM\_UL\_NUM\_PDU] | gi\_nrPhyIndPucchUciPdu\_s, struct of PDU PUCCH UCI Indication. |  | Align |
|  |  |  |  |

**1.7.3.1 PUCCH UCI PDU Indication**

|  |  |  |  |
| --- | --- | --- | --- |
| gi\_nrPhyIndPucchUciPdu\_s |  |  |  |
| **Paramter** | **Significance** | **Comment** | **4byte-align mark** |
| uint32\_Handle | The handle passed to the PHY in an UL\_TTI.request PUCCH PDU | Prefix 'uint16', or 'uint32', etc.. is used for bin file transformation. | Align |
| uint16\_RNTI | The RNTI passed to the PHY in an UL\_TTI.request PUCCH PDU Value: 1 → 65535 |  |  |
| uint8\_PucchFormat | PUCCH format Value: 0 -> 1 0: PUCCH Format0 1: PUCCH Format1 2: PUCCH Format2 3: PUCCH Format3 4: PUCCH Format4 |  |  |
| uint8\_ulCQI | SNR Value: 0-255, representing -64dB to 63dB, with 0.5dB step size. 0xff should be set if this field is invalid. |  | Align |
| uint16\_TA | Timing advance measured for the UE [3GPP TS 38.213[4], Section 4.2]  NTA\_new = NTA\_old + (TA − 31) ⋅ 16 ⋅ 64⁄2^μ  Value: 0 → 63 0xffff should be set if this field is invalid |  |  |
| uint16\_RSSI | -64dB to 64dB with a step size of 0.1dB Value: 0-1280 0xffff should be set if this field is invalid |  | Align |
| uin8\_dtxFlag | Indicates whether ACK/NACK info is valid  0: Valid;  1: Invalid, DTX |  |  |
| uint8\_ackSrCsi1CrcFlag | CRC of ACK + SR + CSI part1  0: Passed  1: Failed |  |  |
| uin16\_SrBitLen | Length of SR payload in bits Value: 1 -> 8 |  | Align |
| uint8\_SrPayload | Contents of SR |  |  |
| uint8\_csi2CrcFlag | CRC of CSI part2  0: Passed  1: Failed |  |  |
| uin16\_HarqBitLen | Length of HARQ payload in bits Value: 1 -> 1706 |  | Align |
| uint8\_HarqPayload[GI\_NR\_PHY\_SIM\_PUCCH\_NUM\_ACK\_BYTE] | Contents of HARQ |  | Align |
| uin16\_CsiPart1BitLen | Length of CSI payload in bits Value: 1 ->1706 |  |  |
| uin16\_CsiPart2BitLen | Length of CSI payload in bits Value: 1 ->1706 |  | Align |
| uint8\_CsiPart1Payload[GI\_NR\_PHY\_SIM\_PUCCH\_NUM\_CSI\_BYTE] | Contents of CSI part1 |  | Align |
| uint8\_CsiPart2Payload[GI\_NR\_PHY\_SIM\_PUCCH\_NUM\_CSI\_BYTE] | Contents of CSI part2 |  | Align |
|  |  |  |  |

**2 DL interface**

图示

描述已自动生成

**2.1 DL TX signal configuration**

|  |  |  |  |
| --- | --- | --- | --- |
| gi\_nrPhySimDlTx\_s |  |  |  |
| **Paramter** | **Type** | **Significance** | **Comment** |
| numSlot | integer | Number of slots in each repeat |  |
| numRepeat | integer | Number of repeats for slot-level configurations in this case.  Value starts from 1. |  |
| simDlTemplateS | gi\_nrPhySimDlTemplate\_s | Template option |  |
|  |  |  |  |

**2.1.1 DL template configuration**

|  |  |  |  |
| --- | --- | --- | --- |
| gi\_nrPhySimDlTemplate\_s |  |  |  |
| **Paramter** | **Type** | **Significance** | **Comment** |
| systemTemplate | string | Several templates of gi\_nrPhySimSys\_s  Value：  'Disable'  'SYS-10MHz-1TX-1RX'  'SYS-10MHz-2TX-2RX'  'SYS-10MHz-4TX-4RX'  'SYS-100MHz-1TX-1RX'  'SYS-100MHz-2TX-2RX'  'SYS-100MHz-4TX-4RX'  etc. |  |
|  |  |  |  |

**2.2 DL slot level configuration**

|  |  |  |  |
| --- | --- | --- | --- |
| gi\_nrPhySimDl\_s |  |  |  |
| **Paramter** | **Type** | **Significance** | **Comment** |
| SFN | integer | SFN Value: 0 -> 1023 |  |
| Slot | integer | Slot number in frame Value: 0 ->159 |  |
| nPDUs | integer | Number of PDUs that are included in this message. Value: 0 -> 65535 |  |
| nPDUsOfPdcch | integer | Number of PDCCH PDUs |  |
| nPDUsOfPdsch | integer | Number of PDSCH PDUs |  |
| nPDUsOfCsiRs | integer | Number of CSI-RS PDUs |  |
| nPDUsOfSsb | integer | Number of SSB PDUs |  |
| simDlPduS[GI\_NR\_PHY\_SIM\_DL\_NUM\_PDU] | gi\_nrPhySimDlPdu\_s | PDU configuration |  |
|  |  |  |  |

**2.2.1 DL PDU configuration**

|  |  |  |  |
| --- | --- | --- | --- |
| gi\_nrPhySimDlPdu\_s |  |  |  |
| **Paramter** | **Type** | **Significance** | **Comment** |
| pduType | integer | 0: PDCCH PDU 1: PDSCH PDU 2: CSI-RS PDU 3: SSB PDU |  |
| simPdcchPduS | gi\_nrPhySimPdcchPdu\_s | PDCCH PDU configuration |  |
| simPdschPduS | gi\_nrPhySimPdschPdu\_s | PDSCH PDU configuration | 联合的不同形式 |
| simCsiRsPduS | gi\_nrPhySimCsiRsPdu\_s | CSI-RS PDU configuration | 联合的不同形式 |
| simSsbPduS | gi\_nrPhySimSsbPdu\_s | SSB PDU configuration | 联合的不同形式 |
|  |  |  |  |

**2.2.1.1 PDCCH configuration**

|  |  |  |  |
| --- | --- | --- | --- |
| gi\_nrPhySimPdcchPdu\_s |  |  |  |
| **Paramter** | **Type** | **Significance** | **Comment** |
| pduOrder | integer | Order of PDU in all PDUs  Value: 0 start, 0xffff(65535) means inactive. | 变量名称命名为FAPI中的原始名称，可能会不符合驼峰原则。 |
| CoresetBWPSize | integer | Bandwidth part size [3GPP TS 38.213 [4], sec12]. Number of contiguous PRBs allocated to the BWP Value: 1->275 |  |
| CoresetBWPStart | integer | Bandwidth part start RB index from reference CRB [3GPP TS 38.213 [4], sec 12] Value: 0->274 |  |
| SubcarrierSpacing | integer | subcarrierSpacing [3GPP TS 38.211 [2], sec 4.2] Value:0->4 |  |
| CyclicPrefix | integer | Cyclic prefix type [3GPP TS TS 38.211 [2], sec 4.2]  0: Normal; 1: Extended |  |
| StartSymbolIndex | integer | Starting OFDM symbol for the CORESET Value: 0->13 |  |
| DurationSymbols | integer | Contiguous time duration of the CORESET in number of symbols.  Corresponds to L1 parameter  [3GPP TS 38.211 [2], sec 7.3.2.2]  Value: 1,2,3 |  |
| FreqDomainResource | integer | Frequency domain resources. This is a bitmap defining non-overlapping groups of 6 PRBs in ascending order. [3GPP TS 38.213 [4], section 10.1]. Also, corresponds to L1 parameter  [3GPP TS 38.211 [2], sec 7.3.2.2]  Bitmap of uint8 array. 45 bits.  The first (left-most / most significant) bit corresponds to the first RB group in the BWP, and so on.  Bits corresponding to a group of RBs not fully contained in the bandwidth part within which the CORESET is configured are set to zero (see TS 38.211 [16], clause 7.3.2.2). |  |
| nIdPdcch | integer | Parameter nID used for PDCCH Data scrambling & DMRS generation in [3GPP TS 38.211 [2], sec 7.3.2.3, , sec 7.4.1.3]. Value: 0->65535 |  |
| CceRegMappingType | integer | CORESET-CCE-to-REG-mapping-type [3GPP TS 38.211[2], sec 7.3.2.2] 0: non-interleaved 1: interleaved |  |
| RegBundleSize | integer | The number of REGs in a bundle. Must be 6 for cceRegMappingType = nonInterleaved.  For cceRegMappingType = interleaved, must belong to {2,6} if duration = 1,2 and must belong to {3,6} if duration = 3.  Corresponds to parameter L. [3GPP TS 38.211 [2], sec 7.3.2.2]  Value: 2,3,6 |  |
| InterleaverSize | integer | The interleaver size. For interleaved mapping belongs to {2,3,6} and for non-interleaved mapping is NA. Corresponds to parameter R. [3GPP TS 38.211 [2], sec 7.3.2.2] Value: 2,3,6 |  |
| CoreSetType | integer | [3GPP TS 38.211 [2], sec 7.3.2.2 and sec 7.4.1.3.2] 0: CORESET is configured by the PBCH or SIB1(subcarrier 0 of the CORESET) 1: otherwise (subcarrier 0 of CRB0 for DMRS mapping) |  |
| ShiftIndex | integer | [3GPP TS 38.211 [2], sec 7.3.2.2] Not applicable for non-interleaved mapping.  Value:  0 - 274 if higher-layer parameter shiftIndex if provided,  otherwize, phyCellId |  |
| precoderGranularity | integer | Granularity of precoding [3GPP TS 38.211 [2], sec 7.3.2.2] 0: sameAsRegBundle 1: allContiguousRBs |  |
| numDlDci | integer | Number of DCIs in this CORESET. Value: 0->MaxDciPerSlot |  |
| simDlDci[GI\_NR\_PHY\_SIM\_DL\_NUM\_DCI\_CORESET] | gi\_nrPhySimDlDci\_s | Information for each DCI |  |
|  |  |  |  |

**2.2.1.1.1 DCI configuration**

|  |  |  |  |
| --- | --- | --- | --- |
| gi\_nrPhySimDlDci\_s |  |  |  |
| **Paramter** | **Type** | **Significance** | **Comment** |
| RNTI | integer | The RNTI used for identifying the UE when receiving the PDU Value: 1 -> 65535. | 变量名称命名为FAPI中的原始名称，可能会不符合驼峰原则。 |
| userIndex | integer | The index of user in one slot this pdu belongs to, differerent RNTI has different userIndex  Value: 0 start |  |
| nRntiPdcchData | integer | Parameter nRNTI used for PDCCH data scrambling, in [3GPP TS 38.211 [2], sec 7.3.2.3]   is given by the C-RNTI for a PDCCH in a UE-specific search space if the higher-layer parameter pdcch-DMRS-ScramblingID is configured, and   otherwise.  Value: 0 -> 65535 |  |
| CceIndex | integer | CCE start Index used to send the DCI Value: 0->135 |  |
| AggregationLevel | integer | Aggregation level used [3GPP TS 38.211 [2], sec 7.3.2.1] Value: 1, 2, 4, 8, 16 |  |
| powerControlOffsetSSProfileNR | integer | PDCCH power value used for all PDCCH Formats. This is ratio of PDCCH and PDCCH DMRS EPRE to SSB/PBCH block EPRE 3GPP TS 38.214 [5]  Value range:  0->16:  -8 … 8 representing -8 to 8 dB in 1dB steps |  |
| PayloadSizeBits | integer | The total DCI length (in bits) including padding bits [3GPP TS 38.212 [3], sec 7.3.1] Range 0 -> 140 |  |
|  |  |  |  |

**2.2.1.2 PDSCH configuration**

|  |  |  |  |
| --- | --- | --- | --- |
| gi\_nrPhySimPdschPdu\_s |  |  |  |
| **Paramter** | **Type** | **Significance** | **Comment** |
| RNTI | integer | The RNTI used for identifying the UE when receiving the PDU | 变量名称命名为FAPI中的原始名称，可能会不符合驼峰原则。 |
| userIndex | integer | The index of user in one slot this pdu belongs to, differerent RNTI has different userIndex  Value: 0 start |  |
| pduOrder | integer | Order of PDU in all PDUs  Value: 0 start, 0xffff(65535) means inactive. |  |
| BWPSize | integer | Number of contiguous PRBs allocated to the BWP |  |
| BWPStart | integer | Bandwidth part start RB index from reference CRB[3GPP TS 38.213 [4], sec 12] |  |
| SubcarrierSpacing | integer | subcarrierSpacing [3GPP TS 38.211 [2], sec 4.2] Value:0->4 |  |
| CyclicPrefix | integer | Cyclic prefix type [3GPP TS 38.211 [2], sec 4.2] 0: Normal; 1: Extended |  |
| NrOfCodewords | integer | Number of code words for this RNTI (UE) Value: 1 -> 2 |  |
| simPdschCwS[GI\_NR\_PHY\_SIM\_PDSCH\_NUM\_CW] | gi\_nrPhySimPdschCW\_s | Information for each codeword |  |
| nIdPdsch | integer | Parameter nID from [3GPP TS 38.211 [2], sec 7.3.1.1] Value: 0->1023 |  |
| nrOfLayers | integer | Number of layers [3GPP TS 38.211 [2], sec 7.3.1.3] Value : 1->8 |  |
| transmissionScheme | integer | PDSCH transmission schemes [3GPP TS 38.214 [5], sec 5.1.1] 0: Up to 8 transmission layers |  |
| refPoint | integer | Reference point for PDSCH DMRS "k" - used for tone mapping [3GPP TS 38.211 [2], sec 7.4.1.1.2]  Resource block bundles [3GPP TS 38.211 [2], sec 7.3.1.6]  Value: 0 -> 1  If 0, the 0 reference point for PDSCH DMRS is at Point A [3GPP TS 38.211 [2], sec 4.4.4.2]. If 1, PDCCH is associated with CORESET 0 and Type0-PDCCH common search space and is addressed to SI-RNTI，  the DMRS reference point is for PDSCH DM-RS is subcarrier 0 of the lowest numbered resource block bandwidth part which given by the field BWPStart(CORSET0 start). |  |
| dlDmrsSymbPos | integer | DMRS symbol positions [3GPP TS 38.211 [2], sec 7.4.1.1.2 and Tables 7.4.1.1.2-3 and 7.4.1.1.2-4] Bitmap occupying the 14 LSBs with: bit 0: first symbol and for each bit  0: no DMRS  1: DMRS |  |
| dmrsConfigType | integer | DL DMRS config type [3GPP TS 38.211 [2], sec 7.4.1.1.2] 0: type 1 1: type 2 |  |
| pdschDmrsScramblingId0 | integer | PDSCH DMRS Scrambling-ID [3GPP TS 38.211, sec 7.4.1.1.1.1], as provided by parameter NID, 0.  There maybe a situation pdschDmrsScramblingId0 = pdschDmrsScramblingId1 = cellID.  Value: 0->65535 |  |
| pdschDmrsScramblingId1 | integer | PDSCH DMRS Scrambling-ID [3GPP TS 38.211, sec 7.4.1.1.1.1], as provided by parameter NID, 1.  There maybe a situation pdschDmrsScramblingId0 = pdschDmrsScramblingId1 = cellID.  Value: 0->65535 |  |
| lowPaprDmrs | integer | DMRSdownlink-r16 in [3GPP TS 38.211, sec 7.4.1.1.1.1] and [3GPP TS 38.331].  0：DMRSdownlink-r16 in the DMRS-DownlinkConfig IE is not provided  1：DMRSdownlink-r16 in the DMRS-DownlinkConfig IE is provide |  |
| nSCID | integer | DMRS sequence initialization [3GPP TS 38.211 [2], sec 7.4.1.1.2] ], as provided by parameter nSCID. For example, in reference [12], this value is associated with DM-RS scrambling ID given by dlDmrsScramblingId Value : 0->1 |  |
| numDmrsCdmGrpsNoData | integer | Number of DM-RS CDM groups without data [3GPP TS 38.212 [3], sec 7.3.1.2.2] [3GPP TS 38.214 [5], Table 4.1-1]  it determines the ratio of PDSCH EPRE to DM-RS EPRE.  Value: 1->3 |  |
| dmrsPorts | integer | DMRS ports. [3GPP TS 38.212 [3], 7.3.1.2.2]  provides description between DCI 1-1 content and DMRS ports.  Bitmap occupying the 12 LSBs with: bit 0: antenna port 1000 bit 11: antenna port 1011 and for each bit 0: DMRS port not used 1: DMRS port used |  |
| resourceAlloc | integer | Resource Allocation Type [3GPP TS 38.214 [5], sec 5.1.2.2] 0: Type 0 1: Type 1 | 暂不支持type0，此值默认设置为1。 |
| rbBitmap | integer |  | 暂不支持type0，此值默认设置为0。 |
| rbStart | integer | For resource allocation type 1. [3GPP TS 38.214 [5], sec 5.1.2.2.2] The starting resource block corresponding to VRB 0 for this PDSCH, per section 7.3.1.6 of 3GPP TS 38.211 [2]. Value: 0->274 |  |
| rbSize | integer | For resource allocation type 1. [3GPP TS 38.214 [5], sec 5.1.2.2.2] The number of resource blocks within for this PDSCH. Value: 1->275 |  |
| VRBtoPRBMapping | integer | VRB-to-PRB-mapping [3GPP TS 38.211 [2], sec 7.3.1.6] 0: non-interleaved 1: interleaved with RB size 2 2: Interleaved with RB size 4 | 暂不支持interleaved，此值默认设置为0。 |
| StartSymbolIndex | integer | Start symbol index of PDSCH mapping from the start of the slot, S. [3GPP TS 38.214 [5], Table 5.1.2.1-1] Value: 0->13 |  |
| NrOfSymbols | integer | PDSCH duration in symbols, L [3GPP TS 38.214 [5], Table 5.1.2.1-1] Value: 1->14 |  |
| powerControlOffsetProfileNR | integer | Ratio of PDSCH EPRE to NZP CSI-RSEPRE [3GPP TS 38.214 [5], sec 5.2.2.3.1] Values: 0->23: representing -8 to 15 dB in 1dB steps |  |
| powerControlOffsetSSProfileNR | integer | Ratio of NZP CSI-RS EPRE to SSB/PBCH block EPRE to [3GPP TS 38.214 [5], sec 5.2.2.3.1] Values: 0: -3dB, 1: 0dB, 2: 3dB, 3: 6dB |  |
|  |  |  |  |

**2.2.1.2.1 Codeword configuration**

|  |  |  |  |
| --- | --- | --- | --- |
| gi\_nrPhySimPdschCW\_s |  |  |  |
| **Paramter** | **Type** | **Significance** | **Comment** |
| targetCodeRate | integer | Target coding rate [3GPP TS 38.212 [3], sec 5.4.2.1 and 3GPP TS 38.214 [5], sec 5.1.3.1].  This is the number of information bits per 1024 coded bits expressed in 0.1 bit units | 变量名称命名为FAPI中的原始名称，可能会不符合驼峰原则。 |
| qamModOrder | integer | QAM modulation [3GPP TS 38.212 [3], sec 5.4.2.1 and 3GPP TS 38.214 [5], sec 5.1.3.1] Value: 2,4,6,8 |  |
| mcsIndex | integer | MCS index [3GPP TS 38.214 [5], sec 5.1.3.1], should match value sent in DCI Value : 0->31 |  |
| mcsTable | integer | MCS-Table-PDSCH [3GPP TS 38.214 [5], sec 5.1.3.1] 0: notqam256 1: qam256 2: qam64LowSE |  |
| rvIndex | integer | Redundancy version index [3GPP TS 38.212 [3], Table 5.4.2.1-2 and 3GPP TS 38.214 [5], Table 5.1.2.1-2],  should match value sent in DCI Value : 0->3 |  |
| harqProcessID | integer | HARQ process number [3GPP TS 38.212, sec 7.3.1.2] Value: 0 ->15 |  |
| TBSize | integer | Transport block size (in bytes) [3GPP TS 38.214 [5], sec 5.1.3.2] |  |
|  |  |  |  |

**2.2.1.3 CSI-RS configuration**

|  |  |  |  |
| --- | --- | --- | --- |
| gi\_nrPhySimCsiRsPdu\_s |  |  |  |
| **Paramter** | **Type** | **Significance** | **Comment** |
| pduOrder | integer | Order of PDU in all PDUs  Value: 0 start, 0xffff(65535) means inactive. | 变量名称命名为FAPI中的原始名称，可能会不符合驼峰原则。 |
| BWPSize | integer | Number of contiguous PRBs allocated to the BWP |  |
| BWPStart | integer | Bandwidth part start RB index from reference CRB[3GPP TS 38.213 [4], sec 12] |  |
| SubcarrierSpacing | integer | subcarrierSpacing [3GPP TS 38.211 [2], sec 4.2] Value:0->4 |  |
| CyclicPrefix | integer | Cyclic prefix type [3GPP TS 38.211 [2], sec 4.2] 0: Normal; 1: Extended |  |
| StartRB | integer | PRB where this CSI resource starts related to common resource block #0 (CRB#0).  Only multiples of 4 are allowed.  [3GPP TS 38.331 [6], sec 6.3.2 parameter CSIFrequencyOccupation]  Value: 0 ->274 |  |
| NrOfRBs | integer | Number of PRBs across which this CSI resource spans.  Only multiples of 4 are allowed.  The smallest configurable number is the minimum of 24 and the width of the associated BWP.  If the configured value is larger than the width of the corresponding BWP, the UE shall assume that the actual CSI-RS bandwidth is equal to the width of the BWP.  [3GPP TS 38.331 [6], sec 6.3.2 parameter CSI-FrequencyOccupation]  Value: 24 -> 276 |  |
| CSIType | integer | CSI Type [3GPP TS 38.211 [2], sec 7.4.1.5] Value: 0:CSI-RS NZP 1:CSI-RS ZP |  |
| Row | integer | Row entry into the CSI Resource location table. [3GPP TS 38.211 [2], sec 7.4.1.5.3 and table 7.4.1.5.3-1] Value: 1-18 |  |
| FreqDomain | integer | Bitmap defining the frequencyDomainAllocation  [3GPP TS 38.211 [2], sec 7.4.1.5.3] [3GPP TS 38.331 [6] CSIResource Mapping]  Value: Up to the 12 LSBs, actual size is determined by the Row parameter |  |
| SymbL0 | integer | The time domain location l0 and firstOFDMSymbolInTimeDomain [3GPP TS 38.211 [2], sec 7.4.1.5.3] Value: 0->13 |  |
| SymbL1 | integer | The time domain location l1 and firstOFDMSymbolInTimeDomain2 [3GPP TS 38.211 [2], sec 7.4.1.5.3] Value: 2->12 |  |
| FreqDensity | integer | The density field, p and comb offset (for dot5).  [3GPP TS 38.211 [2], sec 7.4.1.5.3 and table 7.4.1.5.3-1]  Value: 0: dot5 (even RB), 1: dot5 (odd RB), 2: one, 3: three |  |
| ScrambId | integer | ScramblingID of the CSI-RS [3GPP TS 38.214 [5], sec 5.2.2.3.1] Value: 0->1023 |  |
| powerControlOffsetSSProfileNR | integer | Ratio of NZP CSI-RS EPRE to SSB/PBCH block EPRE [3GPP TS 38.214 [5], sec 5.2.2.3.1] Values: 0: -3dB, 1: 0dB, 2: 3dB, 3: 6dB |  |
| Periodicity | integer | The periodicity (in slots) of CSI-RS transmission:  0 - 4 slots  1 - 5 slots  2 - 8 slots  3 - 10 slots  4 - 16 slots  5 - 20 slots  6 - 32 slots  7 - 40 slots  8 - 64 slots  9 - 80 slots  10 - 160 slots  11 - 320 slots  12 - 640 slots |  |
| SlotOffset | integer | The slot offset (in slots) allocated to CSI-RS transmission in each CSI-RS transmission period. |  |
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**2.2.1.4 SSB configuration**

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| --- | --- | --- | --- |
| gi\_nrPhySimSsbPdu\_s |  |  |  |
| **Paramter** | **Type** | **Significance** | **Comment** |
| pduOrder | integer | Order of PDU in all PDUs  Value: 0 start, 0xffff(65535) means inactive. | 变量名称命名为FAPI中的原始名称，可能会不符合驼峰原则。 |
| SubcarrierSpacing | integer | subcarrierSpacing [3GPP TS 38.211 [2], sec 4.2] Value:0->4 |  |
| betaPssProfileNR | integer | PSS EPRE to SSS EPRE in a SS/PBCH block [3GPP TS 38.213 [4], sec 4.1] Values: 0 = 0dB 1 = 3dB |  |
| ssbBlockIndex | integer | The first symbol indexes for candidate SS/PBCH blocks [3GPP TS 38.211 [2], section 7.3.3.1].  Value: 0->Lmax - 1 |  |
| ssbSubcarrierOffset | integer | kSSB (3GPP TS 38.211 [2], section 7.4.3.1)  Value:  for SS/PBCH block type A, 0 - 23;  for SS/PBCH block type B, 0 - 11 |  |
| SubcarrierSpacingCommon | integer | Subcarrier spacing for kSSB when FCarrierRx is no less than 24.25e9Hz and no bigger than 52.6e9 (in FR2)  0: 60kHz  1: 120kHz | FAPI中没有这个参数，根据需要添加。  暂不支持FR2，此参数无效。 |
| SsbOffsetPointA | integer | Offset of lowest subcarrier of lowest resource block used for SS/PBCH block.  Given in PRB [3GPP TS 38.211 [2], section 4.4.4.2]  Value: 0->2199 |  |
| lMax | integer | Lmax, the number of candidate SS/PBCH blocks in a half frame according to Clause 4.1 of [5, TS38.213]  Case A: 4, 8, 10(shared spectrum)  Case B: 4, 8  Case C: 4, 8, 20(shared spectrum)  Case D: 64  Case E: 64 |  |
| CaseFor30Khz | integer | SS/PBCH block candidates configuration options for 30 kHz numerology  0: Case B  1: Case C | 根据FAPI参数修改。 |
| Periodicity | integer | SS/PBCH block transmission period:  0 - 5 ms  1 - 10 ms  2 - 20 ms  3 - 40 ms  4 - 80 ms  5 - 160 ms | FAPI中没有这个参数，根据需要添加。 |
| TimeOffset | integer | SS/PBCH block transmission offset in each transmission period, in terms of half frame | FAPI中没有这个参数，根据需要添加。 |
|  |  |  |  |