**[101-e--NR-5G\_V2X\_NRSL-SYNC-01]**

**Email discussion/approval regarding PSBCH content/TDD configuration indication**

* **Issue 1: Indication of TDD configuration**
* **Issue 2: SL-TDD-Config determination**
* **Issue 4: PSBCH contents and payload size (WAs confirmation)**

**By 5/29, with potential TP till 6/4 – Teng (CATT)**

**FL Draft TP 6/6**

------------------------------------------------------ Start of Draft TP of 38.213--------------------------------------------------

**16.1 Synchronization procedures**

For transmission of an S-SS/PSBCH block, a UE assumes the following information is transmitted by means of the PSBCH payload:

* *sl-TDD-Config* – 12 bits as defined in [12, TS 38.331].
* *inCoverage* – 1 bit as defined in [12, TS 38.331].
* *directFrameNumber* – 10 bits as defined in [12, TS 38.331].
* *slotIndex* – 7 bits as defined in [12, TS 38.331].
* *reservedBits* – 2 bits as defined in [12, TS 38.331].

A bit sequence $a\_{0}, a\_{1}, a\_{2}, a\_{3}, …, a\_{11}$ indicated by *sl-TDD-Config* provides the slot format over a number of slots:

* A number of patterns indicated by *TDD-UL-DL-ConfigCommon* as described in Subclause 11.1 by $a\_{0}$

 - If a *pattern1* is provided, $\_{}$

 - If a *pattern1* and a *pattern2* are provided, $a\_{0}=1$

- A period or two periods indicated by *dl-UL-TransmissionPeriodicity* by $a\_{1}, a\_{2}, a\_{3},a\_{4}$

 - $j=\sum\_{i=1}^{4}a\_{i}∙2^{4-i}$ denotes an index in Table 16.1-1 if $a\_{0}=0$ or Table 16.1-2 if $a\_{0}=1$

- The number $\_{}^{}$ of slots including uplink symbols by $a\_{5}, a\_{6}, a\_{7}, a\_{8}, a\_{9}, a\_{10}, a\_{11}$

 - if $a\_{0}=0$, $\_{}^{}\_{}\left⌊\frac{\_{}}{}\right⌋$,

 - if $a\_{0}=$$1$, $u\_{slots}^{SL}=$$\left⌊\frac{\_{}\left⌊\frac{\_{}}{}\right⌋}{}\right⌋\left⌈\frac{^{}}{}\right⌉\left⌊\frac{\_{}\left⌊\frac{\_{}}{}\right⌋}{}\right⌋$

 where

 - $w$ is the granularity of slots indication, and $w=$$\left⌈\left({\left(^{}\right)\left(\_{}^{}\right)}/{^{}}\right)^{{}/{}}\right⌉$,

 - $u\_{slots}$, $u\_{sym}$, $u\_{slots,2}$, $u\_{sym,2}$, $P$ msec and $P\_{2}$ msec are described in Subclause 11.1,

 - $μ=$$0, 1, 2, 3$ as defined in [4, TS 38.211].

- $\_{}\_{}\_{}\_{}\_{}\_{}\_{}$ equal the binary representation of $u\_{slots}^{SL}$ according to $\sum\_{i=5}^{11}a\_{i}∙2^{11-i}$.

 Table 16.1-1: Slot configuration period when one pattern is indicated

|  |  |
| --- | --- |
| Index$$j$$ | Slot configuration period of *pattern1*$P$ (msec) |
| 0 | 0.5 |
| 1 | 0.625 |
| 2 | 1 |
| 3 | 1.25 |
| 4 | 2 |
| 5 | 2.5 |
| 6 | 4 |
| 7 | 5 |
| 8 | 10 |
| 9 – 15 | Reserved |

Table 16.1-2: Slot configuration period when two patterns are indicated

|  |  |  |
| --- | --- | --- |
| Index$$j$$ | Slot configuration period of *pattern1*$P$ (msec) | Slot configuration period of *pattern2*$\_{}$ (msec) |
| 0 | 0.5 | 0.5 |
| 1 | 0.625 | 0.625 |
| 2 | 1 | 1 |
| 3 | 0.5 | 2 |
| 4 | 1.25 | 1.25 |
| 5 | 2 | 0.5 |
| 6 | 1 | 3 |
| 7 | 2 | 2 |
| 8 | 3 | 1 |
| 9 | 1 | 4 |
| 10 | 2 | 3 |
| 11 | 2.5 | 2.5 |
| 12 | 3 | 2 |
| 13 | 4 | 1 |
| 14 | 5 | 5 |
| 15 | 10 | 10 |

------------------------------------------------ < Unchanged parts are omitted > --------------------------------------------

----------------------------------------------------- End of Draft TP of 38.213 ------------------------------------------------

|  |  |
| --- | --- |
| **Company** | **Views** |
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**Agreements**

Agreements:

For indication of TDD configuration, the pattern(s) indication (X) and periodicity indication (Y) follows the two tables below:

Table 1. Periodicity indication Y with single TDD pattern (X=0)

|  |  |  |
| --- | --- | --- |
| Periodicity indication Y | P (ms) | Single pattern |
|
| 0 | 0.5 | 0.5 |
| 1 | 0.625 | 0.625 |
| 2 | 1 | 1 |
| 3 | 1.25 | 1.25 |
| 4 | 2 | 2 |
| 5 | 2.5 | 2.5 |
| 6 | 4 | 4 |
| 7 | 5 | 5 |
| 8 | 10 | 10 |
| 9-15 | Reserved |

Table 2. Periodicity indication Y with two TDD patterns (X=1)

|  |  |  |
| --- | --- | --- |
| Periodicity indication Y | P+P2 (ms) | Two patterns |
| P | P2 |
| 0 | 1 | 0.5 | 0.5 |
| 1 | 1.25 | 0.625 | 0.625 |
| 2 | 2 | 1 | 1 |
| 3 | 2.5 | 0.5 | 2 |
| 4 | 2.5 | 1.25 | 1.25 |
| 5 | 2.5 | 2 | 0.5 |
| 6 | 4 | 1 | 3 |
| 7 | 4 | 2 | 2 |
| 8 | 4 | 3 | 1 |
| 9 | 5 | 1 | 4 |
| 10 | 5 | 2 | 3 |
| 11 | 5 | 2.5 | 2.5 |
| 12 | 5 | 3 | 2 |
| 13 | 5 | 4 | 1 |
| 14 | 10 | 5 | 5 |
| 15 | 20 | 10 | 10 |

Agreements:

* Confirm the working assumptions in RAN1#99 for the PSBCH contents for NR SL Rel-16, and reserve bits are 2.

Agreements:

* When transmitting PSBCH, UE derives the values of X/Y/Z; from RRC configuration of TDD-UL-DL-ConfigCommon and maps them to the “indication of TDD configuration” field of PSBCH.

Agreements:

* If at least Y-th, (Y+1)-th, ....., (Y+X-1)-th symbols in a slot semi-statically for UL as indicated in TDD-UL-DL-ConfigCommon, where
	+ - X is sl-LengthSymbols
		- Y is sl-StartSymbol

this slot can be indicated by PSBCH.

NOTE: X and Y in this proposal are different from the X/Y/Z in PSBCH.

Agreements:

For indication of the UL slots by Z,

* If single pattern is configured, Z bits indicate the UL slot number in the pattern is n.
* If two patterns are configured, Z bits indicate the state index derived by the UL slots,

$$n=\left⌊\frac{n\_{2}}{w}\right⌋\*\left⌈\frac{P\*2^{μ}+1}{w}\right⌉+\left⌊\frac{n\_{1}}{w}\right⌋$$

Where

* *n*1 is the number of UL slots in the first pattern,
* $n\_{2}$*n*2 is the number of UL slots in the second pattern,
* $P$*P* is the periodicity in units of ms of the first pattern,
* w is the granularity of resource indication,
* $μ$μ is (working assumption)
* ~~Alt 1:~~ 0/1/2/3 corresponds to the 15/30/60/120 kHz SCS for SL respectively.
* ~~Alt 2: 2 corresponds to 60 kHz SCS for FR1, and 3 corresponds to 120kHz for FR2.~~

Agreeemnts:

For indication of the granularity of UL resources,

* If single pattern is configured, the granularity of the number of UL resources indicated by SL-TDD-Config is 1 slot.
* If two patterns are configured, the granularity of the number of UL resources indicated by SL-TDD-Config follows the table below (as a working assumption)

|  |  |  |  |
| --- | --- | --- | --- |
| Periodicity indication Y | P+P2 (ms) | Two patterns | Granularity in slots with different SCS |
| P | P2 | 15kHz | 30 kHz | 60 kHz | 120 kHz |
| 0 | 1 | 0.5 | 0.5 | 1 |
| 1 | 1.25 | 0.625 | 0.625 |
| 2 | 2 | 1 | 1 |
| 3 | 2.5 | 0.5 | 2 |
| 4 | 2.5 | 1.25 | 1.25 |
| 5 | 2.5 | 2 | 0.5 |
| 6 | 4 | 1 | 3 | 1 | 2 |
| 7 | 4 | 2 | 2 |
| 8 | 4 | 3 | 1 |
| 9 | 5 | 1 | 4 |
| 10 | 5 | 2 | 3 |
| 11 | 5 | 2.5 | 2.5 |
| 12 | 5 | 3 | 2 |
| 13 | 5 | 4 | 1 |
| 14 | 10 | 5 | 5 | 1 | 2 | 4 |
| 15 | 20 | 10 | 10 | 1 | 2 | 4 | 8 |