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| Annex7 |  |  |
| To:  Mr. Jean-Philippe Kermoal  Chairman STG |  |  |
|  | | Date: 28 August 2012 |
| Source: Project Team SE PT 24 | | |
| **Subject: SEAMCAT** | | |
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Dear Jean-Philippe,

During its last meeting (25-26 June 2012) SE24 considered the liaison statement from STG (M65\_02R0\_SE24) and since then SE24 discussed via correspondence the next steps. Below we tried to summarise the relevant items which were reviewed and confirmed at this SE24 meeting (27-28 August 2012).

**Spectrum sensing with LBT- Channel access techniques:**

* In your LS you suggested that SE24 should use the “cognitive feature” currently implemented in SEAMCAT in order to analyse LBT effects
* This is seen as appropriate, as long as the LBT is a simple “energy detector” which needs to detect the “victim link transmitter”; but the intension in SE24 was more to analyse on channel-access level the coexistence between different SRD techniques; we assume that this can not easily be assesses with generic SEAMCAT simulations, because the coexistence would be normally based on some harmonised channel access techniques (e.g. 802.11 at 2.4 GHz). The simulation of a dynamic LBT as it is used in 802.11 (CSMA/CD) is not only the issue of defining a power threshold; the timing, the retries, all this would needs to be specified. An input contribution to SE24 (M66\_10R0\_SE24) includes a Java- Simulation, that considers those techniques.
* It is not clear if it is appropriate to implement such detailed channel access techniques into SEAMCAT. Possibly as a plugin? This would be a totally new approach in SEAMCAT. Each interfering transmitter would needs to "measure" the received power of all other interfering transmitters, that would possibly require a new power vector.
* SE24 believes that such a possible new implementation may be an issue just in the long term.

**Duty Cycle in the None mode:**

* We understand from your suggestions that one solution in the None mode is to consider the duty cycle as a cumulative power distribution of the interfering transmitter;
* The new solution you mentioned in your LS was to introduce a new input field for the DC in the “None” mode; we appreciate this new approach, but we think the consideration of the Duty Cycle in the Tx power definition is sufficient.

**Duty Cycle in the Uniform density mode:**

* Within SE24 concerns and questions were raised on the practical relevance and correctness of the Duty Cycle consideration in the uniform density mode.
* The correlation between User density, Duty cycle, Active transmitters and simulation radius in the uniform density mode is possibly causing confusion. Especially the prediction of the number of active transmitters (e.g. which no of active transmitters for uniform density 100, and Duty Cycle 1%, see Table below).



Table : Example Calculation of Simulation radius in the uniform density mode (embedded as excel-file)

* In document M66\_03 a comparison between the none and uniform density mode is provided, where the simulation radius was fixed and the number of active devices was reduced according to the formula Rsimu^2=active/(pi\*act\*DC\*dens)). Under this assumption the uniform density mode, the none mode and a manual analysis shows the same results.
* SE24 believes that SEAMCAT provides accurate results, as long as the user sets the input parameter correctly; but more guidance may be provided in the SEAMCAT handbook by STG on the uniform density mode.

**Consideration of time pattern:**

* SE24 also discussed the consideration of specific time pattern of the victim and interfering system (frame length, etc) in SEAMCAT and we received certain correction factors proposals for SEAMCAT in order to reflect this effects.
* For example (source M66\_03R0\_SE24): The adjustment factor could be used in Seamcat on the probability of transmitting. Suppose TINT is the interferer packet length and TVICT is the victim packet length, Where *DCINT* is the interferer duty cycle, and *R* is the rush hour factor. Then it has been proposed within SE24 that the following factor might be applied as the probability of the transmitting interferer:  ; this should be further examined and validated.
* For the time being we believe that such an approach should be considered on a case by case basis when doing particular studies. Further consideration is required within SE24 in order to validate such a correction before being in a position to propose to STG any generic implementation of such an adjustment factor in SEAMCAT.

SE 24 would appreciate to receive guidance from STG on the points raised above.

Kind regards

Ralf Kallenborn

Chairman SE 24

