

draft-ietf-6tisch-6top-sf0-05

Diego Dujovne (Ed.)
Luigi Alfredo Grieco
Maria Rita Palattella
Nicola Accettura

Status

- Goal: Dynamic and Distributed Scheduling Function Zero for 6tisch
- News: Revision from comments
- Next: ?

Tickets

#Ticket 66, 67, 70, 71, 72, 74, 76, 78, 79, 80, 81, 84, 86, 87, 93, 94, 95: Typos, expressions, deleted text.

#Ticket 67: Transferred to sections from Intro:

- Cell Estimation Algorithm
- Allocation Policy

Tickets

#Ticket 68: Difference between allocated and used cells

- Allocated cell **reserves a resource**
 - Used cell is when the **resource is filled with a packet.**
-
- We count those used **during the last slotframe.**
 - SF0 **only allocates TX** cells to the neighbor.
 - There are **no shared cells** allocated by SF0.

Tickets

#Ticket 69: Definition of overprovision

Overprovisioning:

- Is the action and effect of **increasing a value representing an amount of resources**.
- In the case of SF0, overprovisioning is done as **a provision to reduce traffic variability effects on packet loss**, to the expense of **artificially allocating a number of cells**.

Tickets

#Ticket 75: Relocation

- It is defined on section **4.3.3 of the 6P draft**
- SF0 **only decides when** the relocation mechanism is activated.
- The replacement cells are **selected randomly** among the available ones.
- There are **no retransmissions** on SF0. If the allocation fails and the bad PDR condition prevails, retriggered on the next slotframe.

Tickets

#Ticket 77: Triggering events

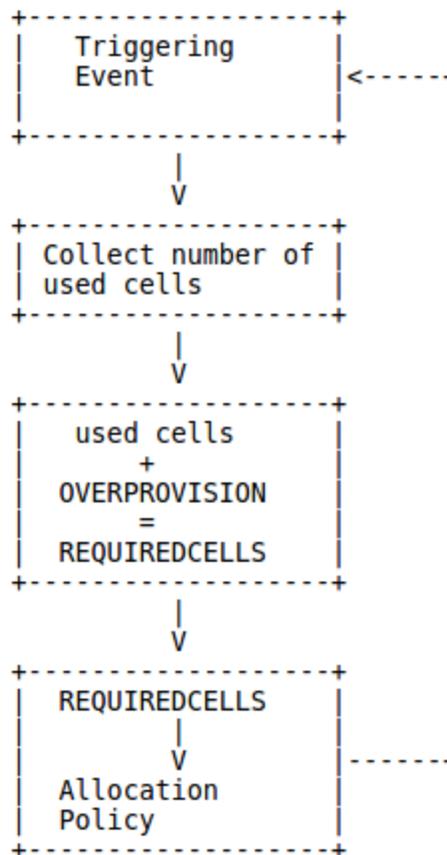
- There is only one triggering event left: When there is a **change in the number of used cells** towards any of the neighbours

#Ticket 82, 83: Cell Estimation Algorithm

- Collect the number of used cells **towards a particular neighbor during the last slotframe**

Tickets

#Ticket 85: Flow diagram for Cell Estimation Algorithm



Tickets

#Ticket 88: OVERPROVISION value

- It is implementation-specific
- A value of 0 (Zero):
 - **Case 1:** The number of **scheduled cells is equal to the number of used cells**: the algorithm cannot detect an increase in cell usage. Since there is no space for new packets to the neighbour, they are dropped at the queue.
 - **Case 2:** The number of **scheduled cells is higher than the number of used cells**: the algorithm detects an increase in cell usage. However, the number of used cells will tend to fill the scheduled cells and it will fall into Case 1.
- Conclusion: Zero means that the number of scheduled cells towards a neighbor **will not grow on top of the initial value**.

Tickets

#Ticket 89: OVERPROVISION relationship with SF0THRESH

- There is **no intended relationship**.
- They are independent on purpose to keep modularity.
- The Cell Estimation Algorithm decides **how many** cells to schedule
- The Allocation Policy decides **when** to schedule
- Along the history of SF0, we have changed the Cell Estimation Algorithm without changing the Allocation Policy. This results in complete separation between the two blocks

Tickets

#Ticket 90: CellList error handling

- SF0 **does not handle errors**. If a transaction does not succeed, it will be triggered on the next slotframe if the change in resources is still not satisfied.
- The cells on the CellList will be **randomly chosen**. Although we can add an advantage from the CellList response, we try to keep SF0 simple.

Tickets

#Ticket 91: 6P Timeout value

- SF0 has now a **per-transaction timeout value** which is implementation-specific.

#Ticket 92: PDR Definition

- Packet Delivery Rate (PDR) **is calculated per cell**, as the **percentage** of acknowledged packets, for the **last 10 packet transmission attempts**. There is no retransmission policy on SF0.

Tickets

#Ticket 96: Allocation Policy mechanism

- Initial Value of SCHEDULEDCELLS:
 - Node Behavior at Boot
 - “In order to define a known state after the node is restarted, a CLEAR command is issued to each of the neighbor nodes to enable a new allocation process and **at least a SF0THRESH number of cells MUST be allocated to each of the neighbours.**”
 - SF0THRESH value is implementation-specific
 - There is **no formula** to determine the number of cells to ADD or DELETE. The number of cells to ADD or DELETE is implementation-specific
 - SF0THRESH is supposed to be a **fixed value**. A variable SF0THRESH has not been considered for the draft to keep it simple.



SF0 / Questions

Questions?

Diego Dujovne

Diego.dujovne@mail.udp.cl

Universidad Diego Portales

Faculty of Engineering

School of Informatics and Telecommunications

Santiago, Chile