draft-ietf-6tisch-6top-sf0-01

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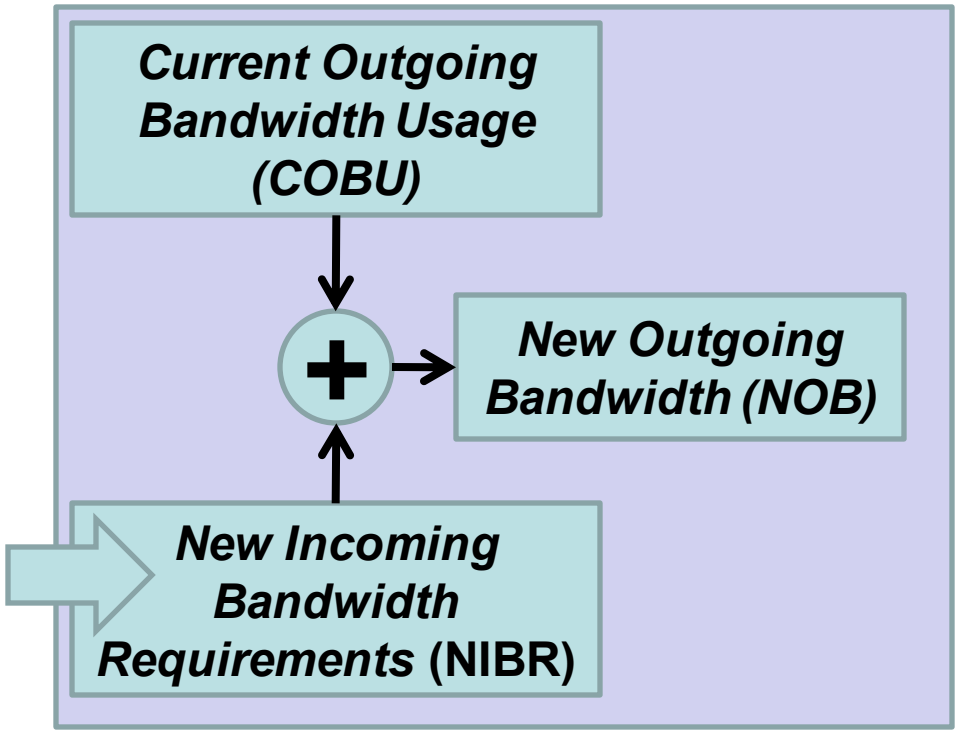
Status

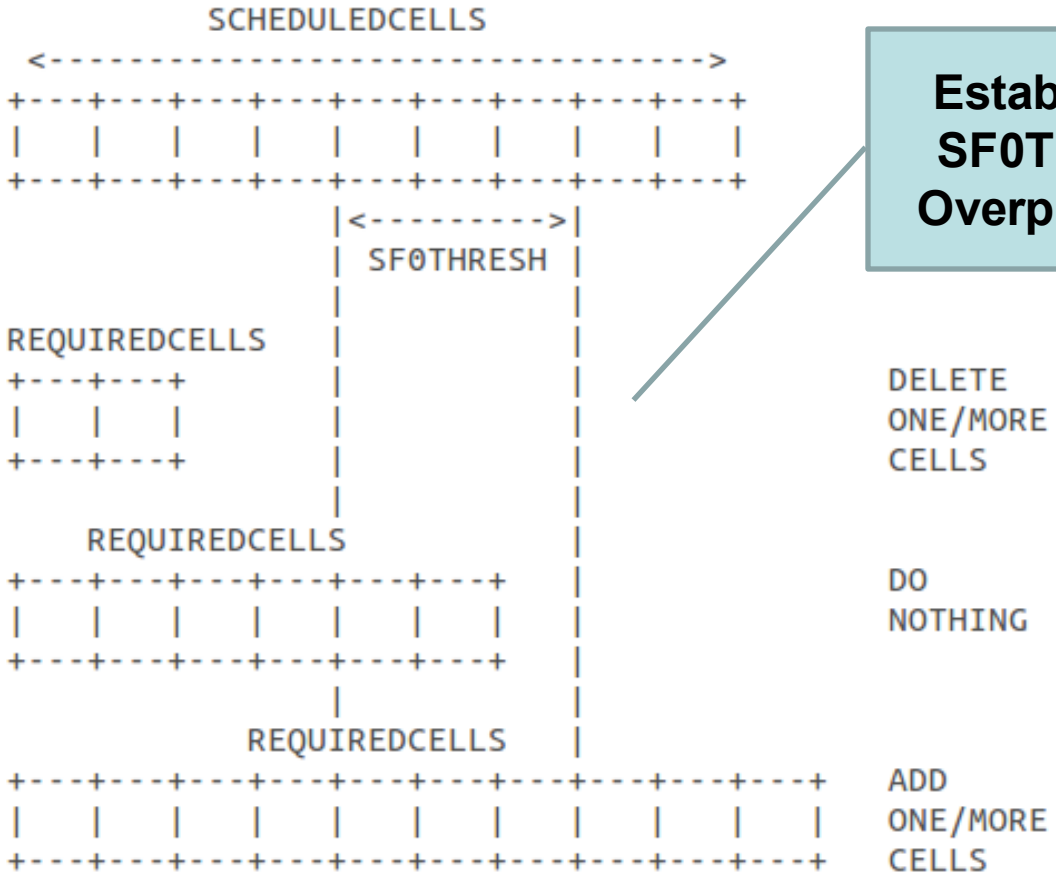
- Goal: **To describe the On-The-Fly scheduling function as the default SF for the 6tisch stack: Scheduling Function Zero (SF0)**
- Updated changes since IETF95: **Bandwidth Estimation Algorithm, Allocation Policy, Whitelist/Blacklist, Timeout, Behavior at Boot, Errors.**
- Next:
  - **Adapt to new changes on 6P.**
  - **ToDo questions at the end.**

Bandwidth Estimation Algorithm



- Selected the **alternative algorithm** from two presented at IETF95.

Cell Allocation Policy



Establish a high SF0THRESH for Overprovisioning

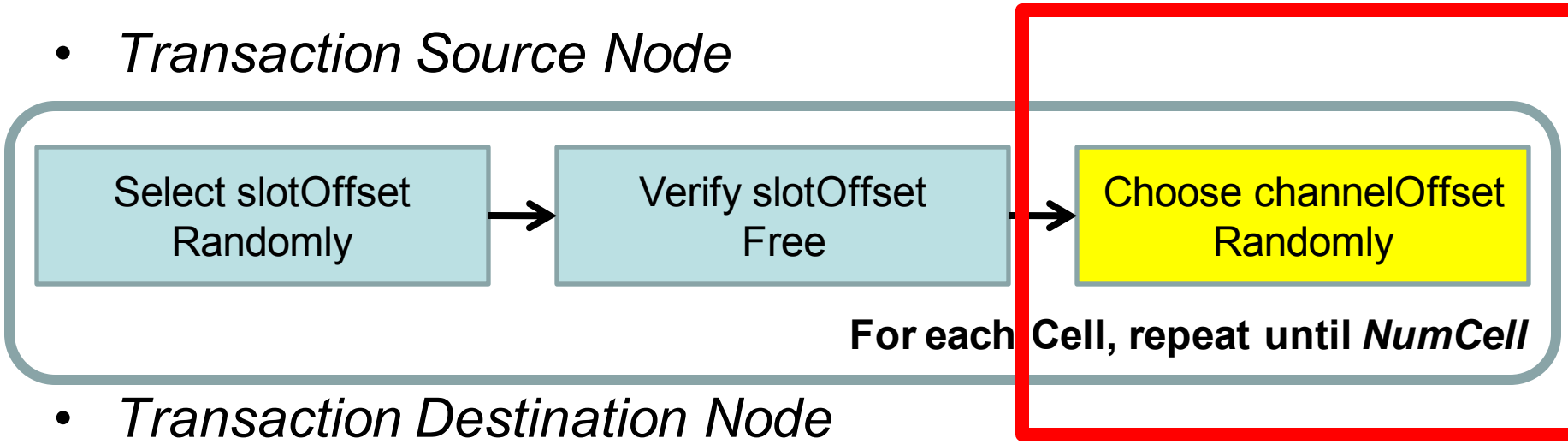
Figure 1: The SF0 Allocation Policy

BEA / Allocation Policy

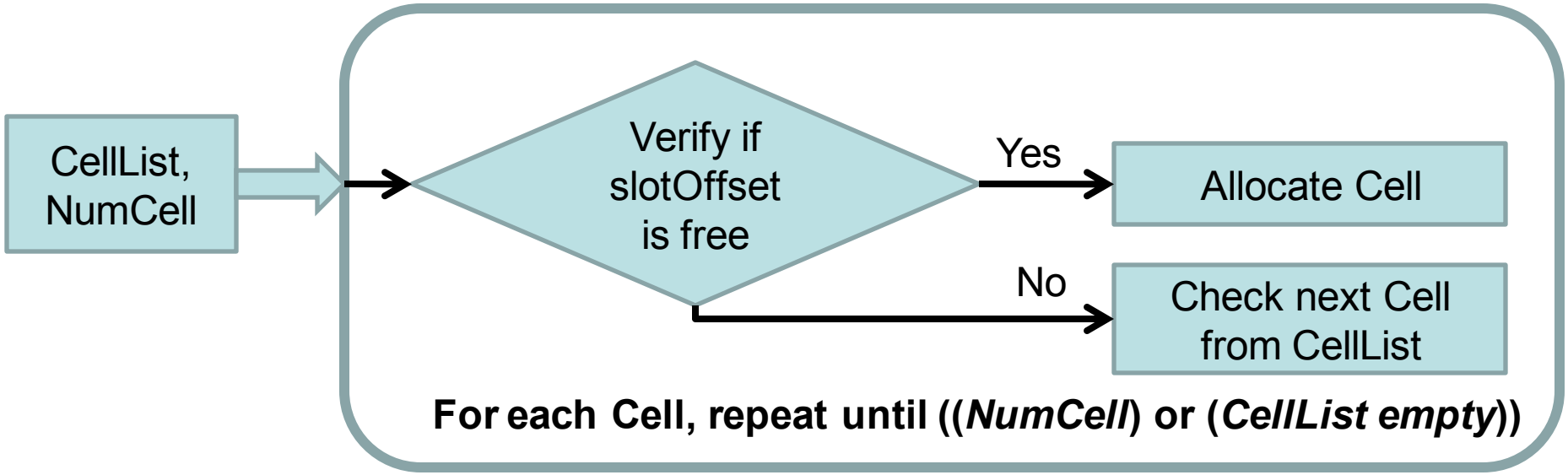
- The **Estimated Bandwidth** is converted to **Required Cells** for the Allocation Policy (according to each of the cells' PDR)
- A relocation request is treated as **new incoming bandwidth**

Whitelist

- *Transaction Source Node*



- *Transaction Destination Node*

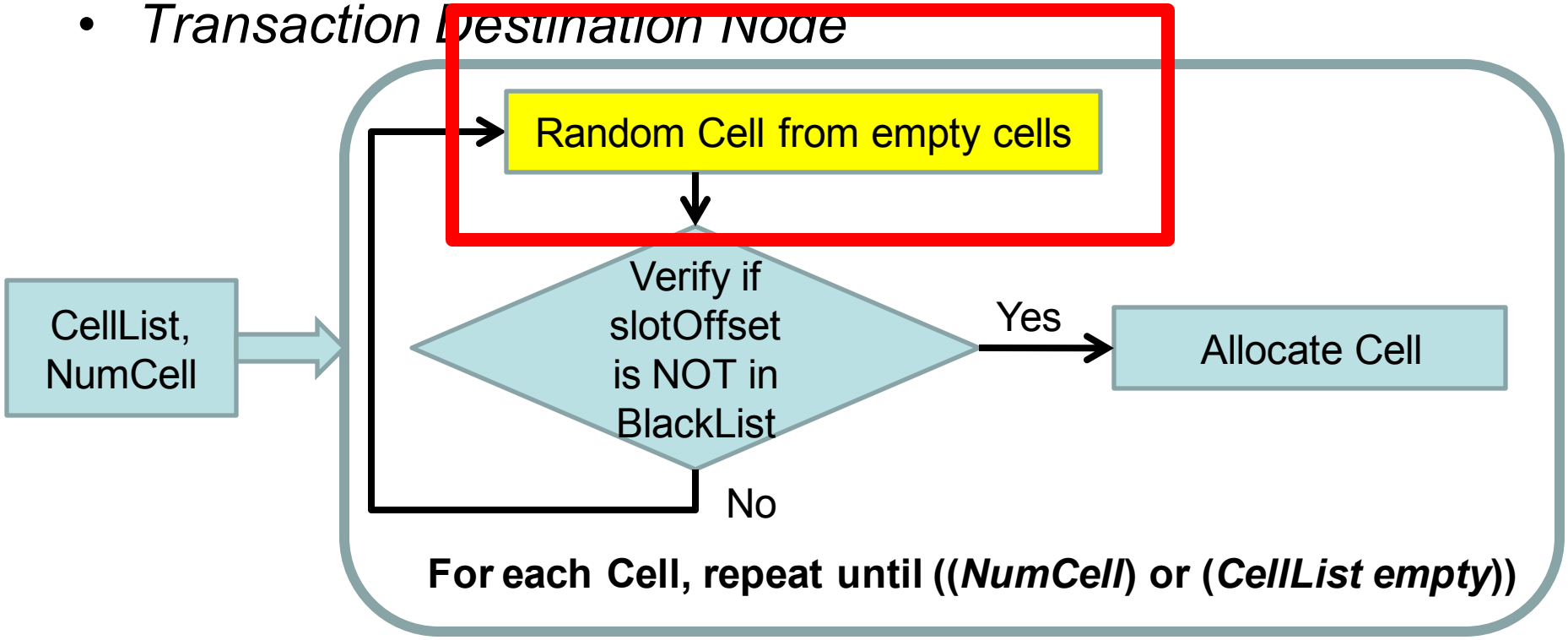


Blacklist

- *Transaction Source Node*

List of currently Scheduled Cells

- *Transaction Destination Node*



Timeout value

5. 6P Timeout Value

The general timeout equals the equivalent time of the number of slots until the next scheduled cell.

- Steady-state timeout: No news until **next scheduled cell** (time difference between timeslots)

Node behaviour at boot

7. 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 neighbour nodes to enable a new allocation process. The 6P Initial Timeout Value provided by SF0 allows the maximum number of TSCH link-layer retries. Given the TSCH parameters for the backoff mechanism, macMinBE and macMaxBE, and the length in seconds of the minimal Slotframe, SM, the timeout value is computed as: timeout = (2^(macMaxBE+1)-2^macMinBE) * SM

- **Initial timeout** to apply during the bootstrap process. (When do we consider bootstrap finished?)

Errors

```
   RC_VER_ERR:  The node MUST NOT retry immediately.  The node MAY add
      the neighbor node on a blacklist.  The node MAY retry to contact
      this neighbor later.
   RC_SFID_ERR:  The node MUST NOT retry immediately.  The node MAY add
      the neighbor node on a blacklist.  The node MAY retry to contact
      this neighbor later.
   RC_BUSY:  Wait for a timeout and restart the scheduling process.
   RC_RESET:  Abort 6P Transaction
   RC_ERR:  Abort 6P Transaction.  The node MAY retry to contact this
      neighbor later.
```

- RC_BUSY supports **concurrent transactions.**
- Proposal from Qin Wang: use one bit from metadata to differentiate between ***"no processing resources"*** from ***"ongoing concurrent transaction"***

ToDo / Schedule Generations

- Modify according to the new **Schedule Generations** from 6P.
- Change the **behavior at boot** to take advantage of this feature and recover from a node crash or disconnection?

ToDo / Relocation

- Cell relocation: is 20% of difference below the **average PDR** is a reasonable number to trigger relocation?
- Which is the **right monitoring period** for the relocation process?

ToDo / Cell deletion

- Do we add to the scope of the draft the deletion of cells after a **timeout from a neighbour**? (house cleaning)
- What to do when cell stock is **depleted**?

Questions?