Protocol 6.3. Tracking histories of mobile objects in cordon-structured networks.

Restrictions: $\mathcal{NB}$, where connectivity graph induced by sensor nodes V on transportation network is a subgraph of the communication graph G; sensor function $s : V \times T \to O \cup \{\varnothing\}$ where O is a set of unique mobile object identifiers; identifier function $id : V \to \mathbb{N}$

State Trans. Sys.: $(\{\text{IDLE}\}, \varnothing)$

Initialization: All nodes in state IDLE

Local data: Table $m = \langle oid : O, enter : T, exit : T, in : \mathbb{N}, out : \mathbb{N} \rangle$, initialized with zero records.

IDLE

When $\mathring{s}(now) \neq \varnothing$

let $o = \mathring{s}_c(now)$ #*o is mobile object id*

INSERT INTO m VALUES $(o, now, \text{NULL}, \mathring{id}, \text{NULL})$ #*Create new open record*

broadcast (`exit`, *o*, *now*, $\mathring{id}$)

Receiving (`exit`, o, t_x, i)

if SELECT *count*(∗) FROM m WHERE *exit* = NULL AND *oid* = o AND *in* = $\mathring{id} > 0$ **then**

let t_n := SELECT *enter* INTO t_n FROM m WHERE *exit* = NULL AND *oid* = o

UPDATE m SET *exit* = t_x, *out* = i WHERE *exit* = NULL AND *oid* = o #*Close record*

send (`entr`, o, t_n, t_x, $\mathring{id}$) to node with identifier i

Receiving (`entr`, o, t_n, t_x, i)

INSERT INTO m VALUES $(o, t_n, t_x, i, \mathring{id})$