

# Algorithm 1 updateHashTables(Pre-processing output $O$ , DeploymentGraph $G$ )

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1: IDSet  $sSet \leftarrow \emptyset$ ;
2: if  $O.flag = ENTER$  then
3:    $sSet \leftarrow OHT[O.objectID].IDSet$ ;
4:   if  $OHT[O.objectID].STATE = Active$  then
5:     for the single element  $c$  in  $sSet$  do
6:       Delete  $O.objectID$  from  $DHT[c]$ ;
7:   else if  $OHT[O.objectID].STATE = Deterministic$  then
8:     for the single element  $c$  in  $sSet$  do
9:       Delete  $O.objectID$  from  $CDHT[c]$ ;
10:  else
11:    for each element  $c$  in  $sSet$  do
12:      Delete  $O.objectID$  from  $CNHT[c]$ ;
13:    Add  $O.objectID$  to  $DHT[O.deviceID]$ ;
14:     $OHT[O.objectID] \leftarrow (Active, O.t, \{O.deviceID\})$ ;
15:  else
16:    Delete  $O.objectID$  from  $DHT[O.deviceID]$ ;
17:     $sSet \leftarrow G.\ell_E^{-1}(O.deviceID)$ ;
18:    if  $Devices(O.deviceID).TYPE = UP$  then
19:       $OHT[O.objectID] \leftarrow (Nondeterministic, O.t, sSet)$ ;
20:      for each element  $c$  in  $sSet$  do
21:        Add  $O.objectID$  to  $CNHT[c]$ ;
22:    else
23:       $OHT[O.objectID] \leftarrow (Deterministic, O.t, sSet)$ ;
24:      for the single element  $c$  in  $sSet$  do
25:        Add  $O.objectID$  to  $CDHT[c]$ ;
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