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1  delete pseudocode
2  set CLEANUP and isSimpleDelete flags to false
3  while(true)
4  {
5      do primarySeekForDelete(deleteKey)
6      if node->secDoneFlag is set
7          help
8          continue from top of primary seek's while loop
9      if(!CLEANUP)
10     {
11         try CAS(node->lChild,<nlChildAddr,0,0>,<nlChildAddr,1,0>)
12         if CAS FAILED
13             help
14             continue from top of primary seek's while loop
15         if CAS SUCCEEDED
16             set CLEANUP to true and set storedNode = node
17     }
18     if(storedNode != node) //Someone removed the node for me. So DONE
19     set "deleteFlag" on node's rChild using BTS
20     if complex delete
21     {
22         while(true) //secondary seek
23         {
24             nRChild = node->rChild
25             if(nRChild != NULL)
26                 isSplCase = secondarySeekForDelete(nRChild)
27             else
28                 set isSimpleDelete flag to true
29                 break from while loop
30             if node key is unmarked
31             {
32                 try CAS(rnode->lChild,<NULL,0,0>,<nodeAddr,0,1>)
33                 if CAS failed
34                 {
35                     if promoteFlag is set
36                         if address does not match with node's address
37                             restart primary seek. assert(node->secFlag == DONE)
38                             break from while loop
39                     else
40                         if address != NULL //restart secondary seek
41                             continue from top of secondary seek's while loop
42                     else
43                         assert(rnode->lChild's deleteFlag is set)
44                         help operation at secondaryLastUnmarkedEdge
45                         if secondaryLastUnmarkedEdge does not exist, then help node->rChild
46                             //simplehelp(node,nrChild)
47                             continue from top of secondary seek's while loop
48                 }
49                 set promote flag on rnode->rChild using BTS
50                 promote key using a simple write. Node's key changes from <0,kN> to <1,kRN>
51             }
52             if(!isSplCase)
53             {
54                 try CAS(rpnodelChild,<rnode,0,0>,<rnodeRChild,0,0>) //remove secondary node
55                 if CAS FAILED, help operation at secondaryLastUnmarkedEdge

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55         if secondaryLastUnmarkedEdge doesn't exist, override CASinvariant and help
           node->rChild //simplehelp(node,nrChild)
56         continue from top of secondary seek's while loop
57         if CAS SUCCEEDED, set node->secDoneFlag to true
58     }
59     else
60     {
61         try CAS(nodeRChild,<rnode,1,0>,<rnodeRChild,1,0> //no problem if CAS fails
62         set node->secDoneFlag to true
63     }
64     oldNodeAddr = address of node
65     while(true)
66     {
67         create a fresh copy of node
68         newNodeKey as <0,kRN>
69         newNodeLChild as <node's lChildAddr,0,0>
70         newNodeRChild = <node's rChildAddr,0,0>
71         try CAS(pnode->lChild,<node,0,0>,<newNode,0,0>)
72         if CAS SUCCEEDED then DONE
73         if CAS FAILED
74             if address has changed
75                 then someone helped me install a fresh copy.so DONE
76             else
77                 CAS has failed coz the edge is marked.
78                 if lastUnmarkedEdge is not (pnode,node) then help
79                 do primarySeekForDelete(node->key) //restart primary seek with new key
80                 if the new key is not found then someone has installed a fresh copy. So done
81
82                 if key is found and newNodeAddr != oldNodeAddr then someone has installed a
                   fresh copy. So done
83     }
84 }
85 else //simple delete
86     set isSimpleDelete to true
87     if(isSimpleDelete)
88     {
89         try CAS(pnode->lChild,<node,0,0>,<node's l/r child,0,0>)
90         if CAS SUCCEEDED, then DONE
91         if CAS FAILED
92             if lastUnmarkedEdge is NOT (pnode,node) help
93     }
94 }
95 //simplehelp(node,node's rChild)
96 simplehelp(pnode,node)
97 assert(pnode's secDoneFlag not set)
98 set delete flag on node->rChild using BTS
99 if complex delete
100     if node->secDoneFlag is set
101         create a fresh copy of node
102         try CAS(pnode->rChild,<node,1,0>,<newNode,1,0>)
103     else //simple delete
104         try CAS(pnode->rchild,<node,1,0>,<node's lchild,1,0>)

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