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1  |----- MODULE JupiterH -----|
   | Jupiter with a history variable (i.e., list) collecting all list states across the system. |
5  | EXTENDS JupiterInterface |
6  |-----|
7  | CONSTANTS |
8      TypeOK,
9      Init, Next,
10     Do(-), Rev(-), SRev,
11     Msg,
12     Vars
13 |-----|
14 | VARIABLES list |
15 | varsH  $\triangleq$   $\langle \textit{Vars}, \textit{list} \rangle$  |
16 |-----|
17 | TypeOKH  $\triangleq$  |
18 |      $\wedge \textit{TypeOK}$  |
19 |      $\wedge (\textit{list} \subseteq \textit{List})$  |
20 |-----|
21 | InitH  $\triangleq$  |
22 |      $\wedge \textit{Init}$  |
23 |      $\wedge \textit{list} = \{\textit{InitState}\}$  |
24 |-----|
25 | DoH(c)  $\triangleq$  |
26 |      $\wedge \textit{Do}(c)$  |
27 |      $\wedge \textit{list}' = \textit{list} \cup \{\textit{state}'[c]\}$  |
28 |-----|
29 | RevH(c)  $\triangleq$  |
30 |      $\wedge \textit{Rev}(c)$  |
31 |      $\wedge \textit{list}' = \textit{list} \cup \{\textit{state}'[c]\}$  |
32 |-----|
33 | SRevH  $\triangleq$  |
34 |      $\wedge \textit{SRev}$  |
35 |      $\wedge \textit{list}' = \textit{list} \cup \{\textit{state}'[\textit{Server}]\}$  |
36 |-----|
37 | NextH  $\triangleq$  |
38 |      $\vee \exists c \in \textit{Client} : \textit{DoH}(c) \vee \textit{RevH}(c)$  |
39 |      $\vee \textit{SRevH}$  |
40 |-----|
41 | FairnessH  $\triangleq$  |
42 |      $\text{WF}_{\textit{varsH}}(\textit{SRevH} \vee \exists c \in \textit{Client} : \textit{RevH}(c))$  |
43 |-----|
44 | SpecH  $\triangleq$  InitH  $\wedge$   $\Box[\textit{NextH}]_{\textit{varsH}}$   $\wedge$  FairnessH |
45 |-----|
46 | WLSpec  $\triangleq$  The weak list specification |
47 |     Comm(Msg)! EmptyChannel |
48 |      $\Rightarrow \forall l1, l2 \in \textit{list} :$  |

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49           $\wedge \textit{Injective}(l1)$ 
50           $\wedge \textit{Injective}(l2)$ 
51           $\wedge \textit{Compatible}(l1, l2)$ 

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53 THEOREM  $\textit{Spec}H \Rightarrow \textit{WLSpec}$ 

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54 |-----|
   \| * Modification History
   \| * Last modified Tue Jan 01 10:08:34 CST 2019 by hengxin
   \| * Created Tue Jan 01 09:56:25 CST 2019 by hengxin

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