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1  |----- MODULE JupiterInterface -----|
   | This module declares the parameters and defines the operators that describe the interface of a |
   | family of Jupiter specs. |
6  | EXTENDS Integers, SequenceUtils, OT |
7  |-----|
8  | CONSTANTS
9      Client,      the set of client replicas
10     Server,      the (unique) server replica
11     Char,        the set of characters allowed to be inserted
12     InitState    the initial state of each replica

14 | ASSUME We assume that all inserted elements are unique.
15      $\wedge \text{Range}(\text{InitState}) \cap \text{Char} = \{\}$  due to the uniqueness requirement
16 |-----|
17 | VARIABLES
18     state,      state[r]: state (the list content) of replica  $r \in \text{Replica}$ 
19     cincoming,  cincoming[c]: incoming channel at the client  $c \in \text{Client}$ 
20     sincoming,  incoming channel at the Server
21     chins       a set of chars allowed to insert; this is for model checking

23 | intVars  $\triangleq \langle \text{state}, \text{cincoming}, \text{sincoming}, \text{chins} \rangle$ 
24 |-----|
25 | Comm(Msg)  $\triangleq$  INSTANCE CSComm

27 | Replica  $\triangleq \text{Client} \cup \{\text{Server}\}$ 

29 | List  $\triangleq \text{Seq}(\text{Char} \cup \text{Range}(\text{InitState}))$  all possible lists
30 | MaxLen  $\triangleq \text{Cardinality}(\text{Char}) + \text{Len}(\text{InitState})$  the max length of lists in any state

32 | ClientNum  $\triangleq \text{Cardinality}(\text{Client})$ 
33 | Priority  $\triangleq \text{CHOOSE } f \in [\text{Client} \rightarrow 1 \dots \text{ClientNum}] : \text{Injective}(f)$ 
34 |-----|
35 | TypeOKInt  $\triangleq$ 
36      $\wedge \text{state} \in [\text{Replica} \rightarrow \text{List}]$ 
37      $\wedge \text{chins} \subseteq \text{Char}$ 

39 | InitInt  $\triangleq$ 
40      $\wedge \text{state} = [r \in \text{Replica} \mapsto \text{InitState}]$ 
41      $\wedge \text{chins} = \text{Char}$ 
42 |-----|
   | The set of all operations. Note: The positions are indexed from 1. |
46 | Rd  $\triangleq [\text{type} : \{\text{"Rd"}\}]$ 
47 | Del  $\triangleq [\text{type} : \{\text{"Del"}\}, \text{pos} : 1 \dots \text{MaxLen}]$ 
48 | Ins  $\triangleq [\text{type} : \{\text{"Ins"}\}, \text{pos} : 1 \dots (\text{MaxLen} + 1), \text{ch} : \text{Char}, \text{pr} : 1 \dots \text{ClientNum}]$  pr: priority

50 | Op  $\triangleq \text{Ins} \cup \text{Del}$  Now we don't consider Rd operations
51 |-----|

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* Modification History
* Last modified *Wed Dec 12 20:20:43 CST 2018* by *hengxin*
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