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1  |----- MODULE Jupiter -----|
   | Specification of the interface of a family of Jupiter protocols, which adopt the C/S architecture.
7  | EXTENDS Integers, Sequences, FiniteSets, AdditionalFunctionOperators
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9  | CONSTANTS
10 |   Client,      the set of client replicas
11 |   Server,      the (unique) server replica
12 |   Char,       set of characters allowed
13 |   InitState   the initial state of each replica
14 |
15 | Replica  $\triangleq$  Client  $\cup$  {Server}
16 |
17 | List  $\triangleq$  Seq(Char  $\cup$  Range(InitState))  all possible lists/strings
18 | MaxLen  $\triangleq$  Cardinality(Char) + Len(InitState)  the max length of lists in any states;
19 |   We assume that all inserted elements are unique.
20 |
21 | ClientNum  $\triangleq$  Cardinality(Client)
22 | Priority  $\triangleq$  CHOOSE  $f \in [Client \rightarrow 1 \dots ClientNum] : Injective(f)$ 
23 |-----|
24 | ASSUME
25 |    $\wedge Range(InitState) \cap Char = \{\}$ 
26 |    $\wedge Priority \in [Client \rightarrow 1 \dots ClientNum]$ 
27 |-----|
   | The set of all operations. Note: The positions are indexed from 1.
32 | Rd  $\triangleq$  [type : { "Rd" }]
33 | Del  $\triangleq$  [type : { "Del" }, pos : 1 .. MaxLen]
34 | Ins  $\triangleq$  [type : { "Ins" }, pos : 1 .. (MaxLen + 1), ch : Char, pr : 1 .. ClientNum]  pr: priority
35 |
36 | Op  $\triangleq$  Ins  $\cup$  Del  Now we don't consider Rd operations.
37 |-----|
38 | VARIABLES
39 |   state,      state[r]: state (the list content) of replica  $r \in Replica$ 
   |   For communication between the Server and the Clients:
43 |   cincoming,  cincoming[c]: incoming channel at the client  $c \in Client$ 
44 |   sincoming   sincoming: incoming channel at the Server
45 |-----|
   | * Modification History
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