
READERSWRITERS SHARED RESOURCE

CADT readersriters

OPERATIONS

ACTION BeforeRead:

ACTION AfterRead:

ACTION BeforeWrite:

ACTION AfterWrite:

PROTOCOLS: *Read* : *BeforeRead*; *AfterRead*
Write : *BeforeWrite*; *AfterWrite*

CONCURRENCY: *Read**

SEMANTICS

DOMAIN:

STATE: $RW = (readers \mathbb{N} \times writers : \mathbb{N})$

INVARIANT: $(readers > 0 \rightarrow writers = 0) \wedge$
 $(writers = 1 \rightarrow readers = 0) \wedge$
 $(writers = 0 \vee writers = 1) \wedge readers \geq 0$

INITIAL: $writers = 0 \wedge readers = 0$

CPRE: $writers = 0$

BeforeRead

POST: $readers = 1 + readers^{\text{in}}$

PRE: $reader > 0$

CPRE: $true$

AfterRead

POST: $readers = readers^{\text{in}} - 1$

CPRE: $writers = 0 \wedge readers = 0$

BeforeWrite

POST: $writers = 1$

PRE: $writers = 1$

CPRE: $true$

AfterWrite

POST: $writers = 0$