
READERSWRITERS SHARED RESOURCE

CADT ReadersWriters

OPERATIONS

ACTION BeforeRead:

ACTION AfterRead:

ACTION BeforeWrite:

ACTION AfterWrite:

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

CONCURRENCY: $(\text{Read}^+ \mid \text{Write})^*$

SEMANTICS

DOMAIN:

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

INVARIANT: $(\text{readers} > 0 \rightarrow \text{writers} = 0) \wedge$
 $(\text{writers} = 1 \rightarrow \text{readers} = 0) \wedge$
 $(\text{writers} = 0 \vee \text{writers} = 1)$

INITIAL: $\text{writers} = 0 \wedge \text{readers} = 0$

PRE: true

CPRE: $\text{self.writers} = 0$

BeforeRead

POST: $\text{self} = (1 + \text{self.readers}^{\text{in}}, \text{self.writers}^{\text{in}})$

PRE: true

CPRE: true

AfterRead

POST: $\text{self} = (-1 + \text{self.readers}^{\text{in}}, \text{self.writers}^{\text{in}})$

PRE: true

CPRE: $\text{self} = (0, 0)$

BeforeWrite

POST: $\text{self} = (0, 1)$

PRE: true

CPRE: true

AfterWrite

POST: $\text{self} = (0, 0)$