

Un protocollo di comunicazione

esempio tratto dal testo “Reactive Systems, Modelling, Specification and Verification”

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$\text{Spec} = \text{acc} . \text{del_to} . \text{Spec}$

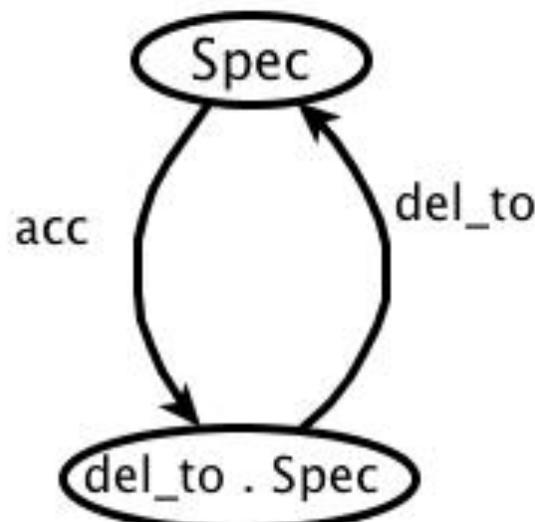
$\text{Impl} \stackrel{\text{def}}{=} (\text{Send} \mid \text{Med} \mid \text{Rec}) \setminus \{\text{send}, \text{trans}, \text{ack}, \text{error}\}$

Impl e Spec sono Bisimili (debolmente) ?

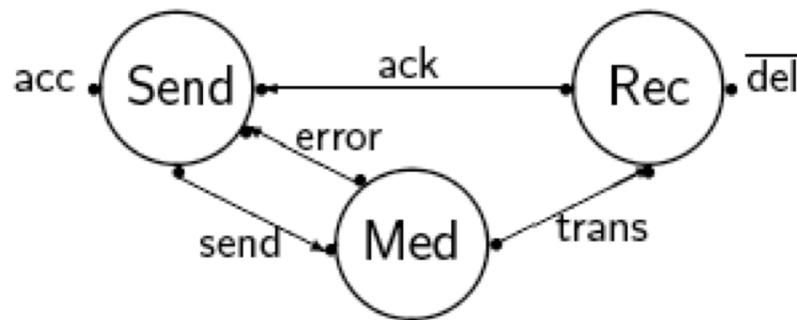
Costruire i due sistemi di transizioni e verificarlo.

Protocollo - specifica

Spec = acc . del_to . Spec



Case Study: Communication Protocol



$$\text{Send} \stackrel{\text{def}}{=} \text{acc.Sending}$$

$$\text{Sending} \stackrel{\text{def}}{=} \overline{\text{send}}.\text{Wait}$$

$$\text{Wait} \stackrel{\text{def}}{=} \text{ack.Send} + \text{error.Sending}$$

$$\text{Rec} \stackrel{\text{def}}{=} \text{trans.Del}$$

$$\text{Del} \stackrel{\text{def}}{=} \overline{\text{del}}.\text{Ack}$$

$$\text{Ack} \stackrel{\text{def}}{=} \overline{\text{ack}}.\text{Rec}$$

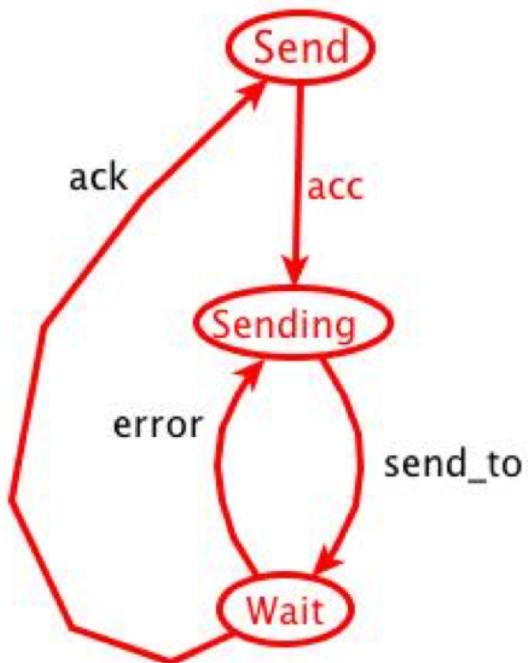
$$\text{Med} \stackrel{\text{def}}{=} \text{send.Med}'$$

$$\text{Med}' \stackrel{\text{def}}{=} \tau.\text{Err} + \overline{\text{trans}}.\text{Med}$$

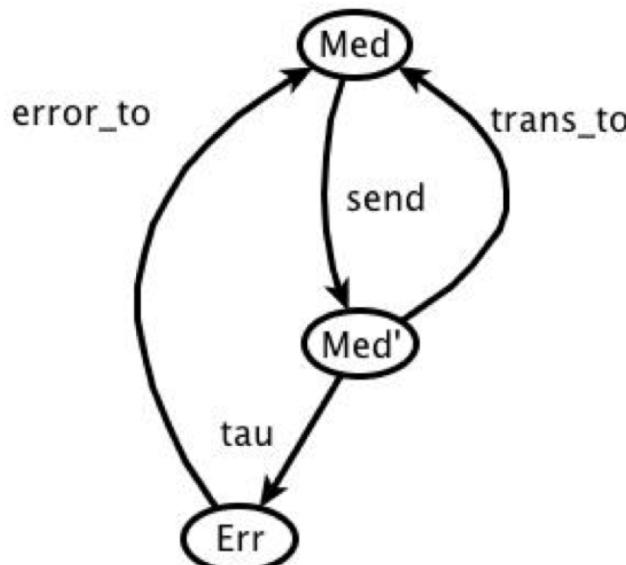
$$\text{Err} \stackrel{\text{def}}{=} \overline{\text{error}}.\text{Med}$$

$$\text{Impl} \stackrel{\text{def}}{=} (\text{Send} \mid \text{Med} \mid \text{Rec}) \setminus \{\text{send}, \text{trans}, \text{ack}, \text{error}\}$$

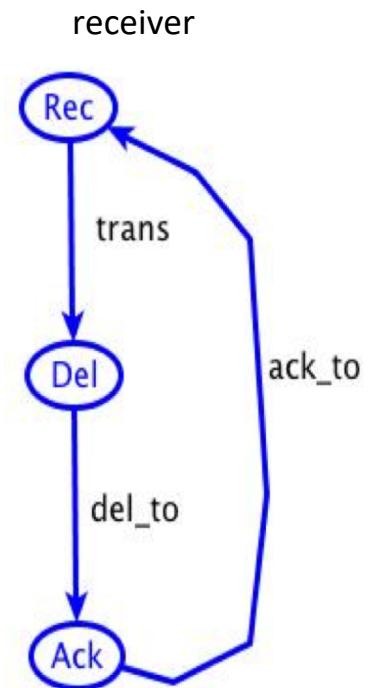
protocollo di comunicazione: implementazione – i componenti



$\text{Send} \stackrel{\text{def}}{=} \text{acc}.\text{Sending}$
 $\text{Sending} \stackrel{\text{def}}{=} \overline{\text{send}}.\text{Wait}$
 $\text{Wait} \stackrel{\text{def}}{=} \text{ack}.\text{Send} + \text{error}.\text{Sending}$



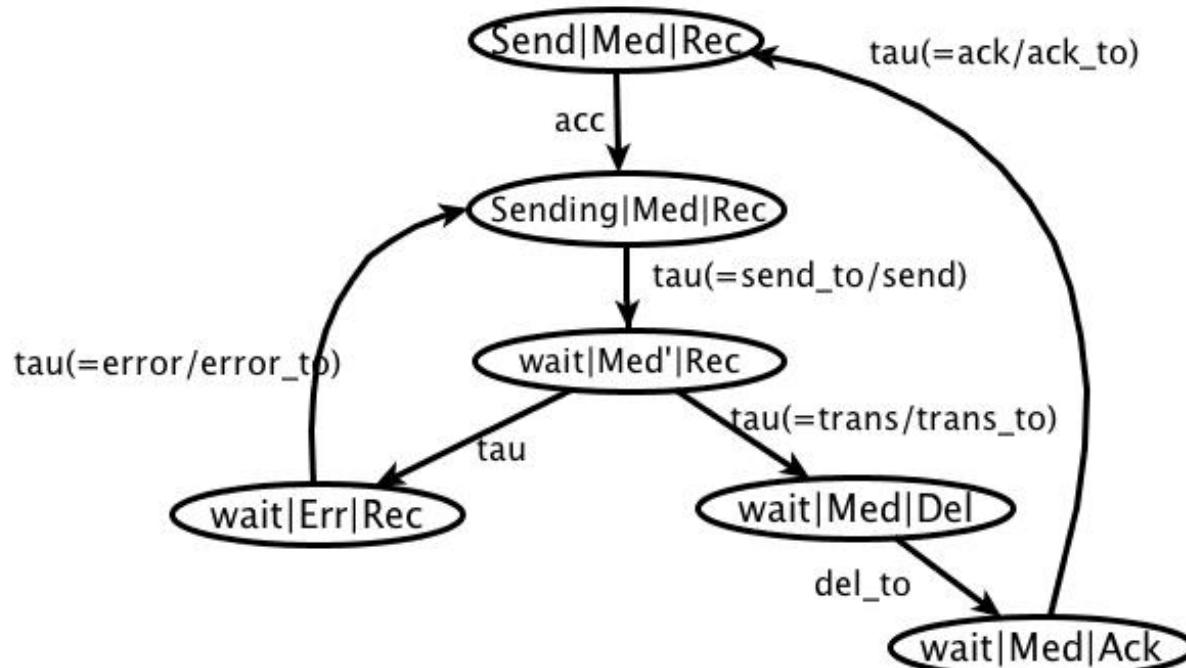
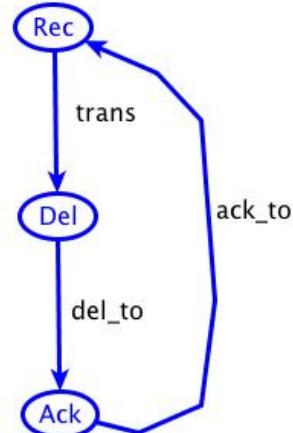
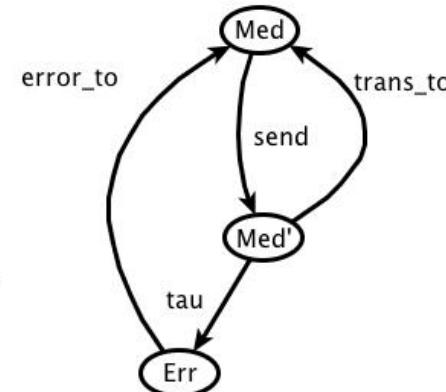
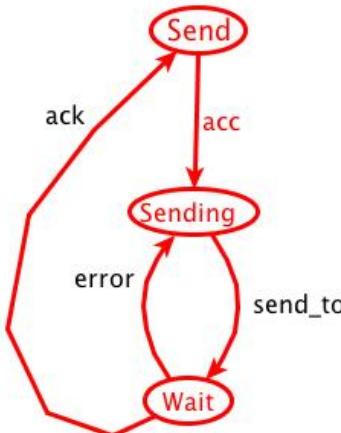
$\text{Med} \stackrel{\text{def}}{=} \text{send}.\text{Med}'$
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 $\text{Err} \stackrel{\text{def}}{=} \overline{\text{error}}.\text{Med}$



$\text{Rec} \stackrel{\text{def}}{=} \text{trans}.\text{Del}$
 $\text{Del} \stackrel{\text{def}}{=} \overline{\text{del}}.\text{Ack}$
 $\text{Ack} \stackrel{\text{def}}{=} \overline{\text{ack}}.\text{Rec}$

Protocollo : implementazione

$\text{Impl} \stackrel{\text{def}}{=} (\text{Send} \mid \text{Med} \mid \text{Rec}) \setminus \{\text{send}, \text{trans}, \text{ack}, \text{error}\}$



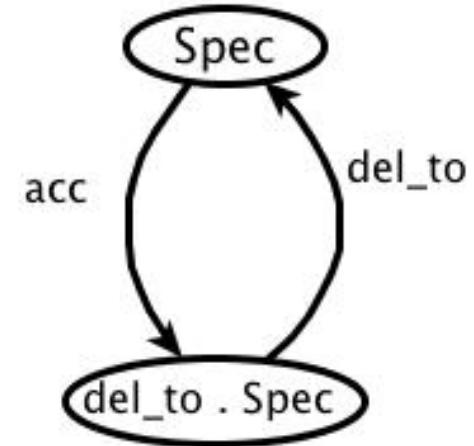
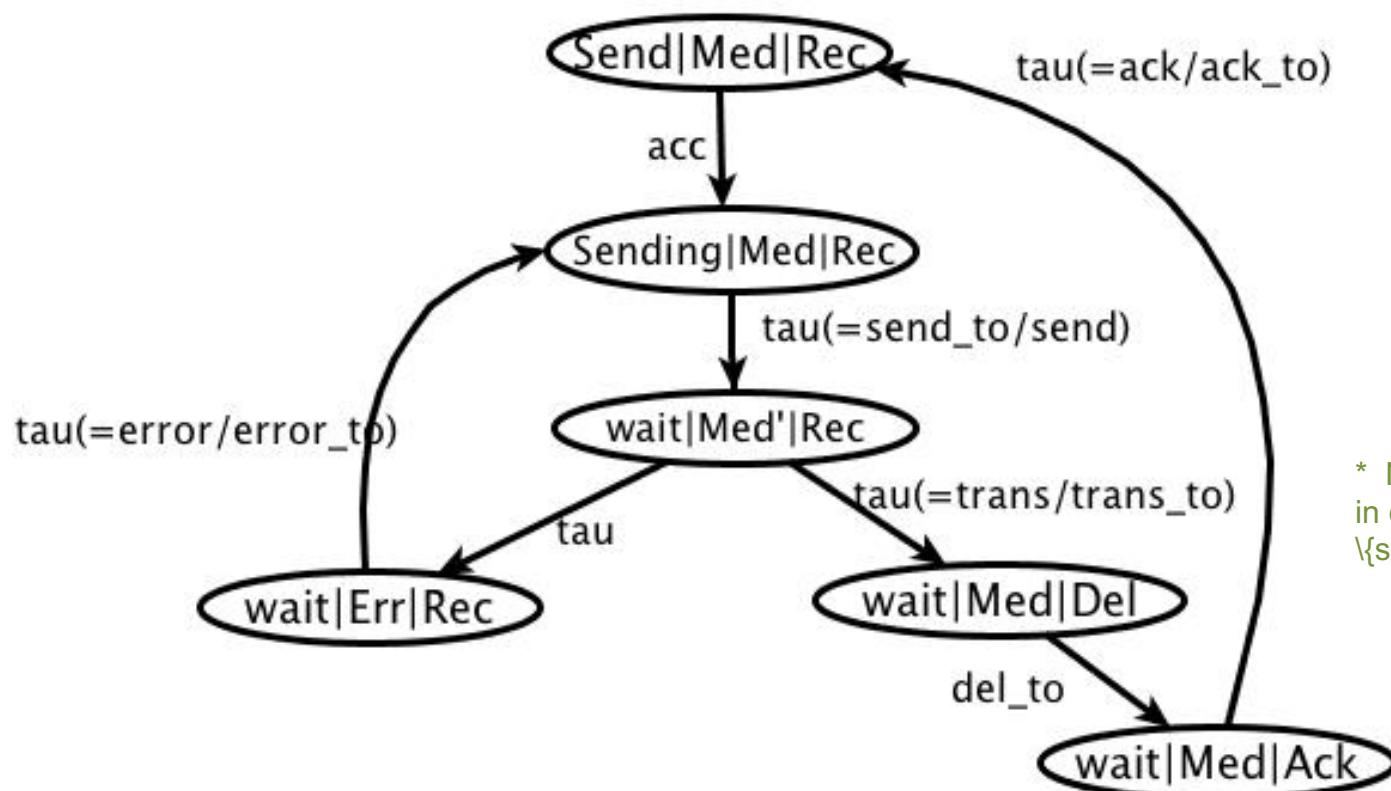
NOTA
in questo LTS la restrizione
 $\{\text{send}, \text{error}, \text{trans}, \text{ack}\}$ è omessa

Protocollo: specifica e implementazione

Spec = acc . del_to . Spec

Impl $\stackrel{\text{def}}{=} (\text{Send} \mid \text{Med} \mid \text{Rec}) \setminus \{\text{send}, \text{trans}, \text{ack}, \text{error}\}$

Spec e Impl sono ? debolmente Bisimili



* NOTA
in questa slide la restrizione
 $\setminus \{\text{send}, \text{error}, \text{trans}, \text{ack}\}$ è omessa

Protocollo: specifica e implementazione

Sì Spec e Impl sono debolmente Bisimili

Spec R Send|Med|Rec \ {send,error, trans, ack} *

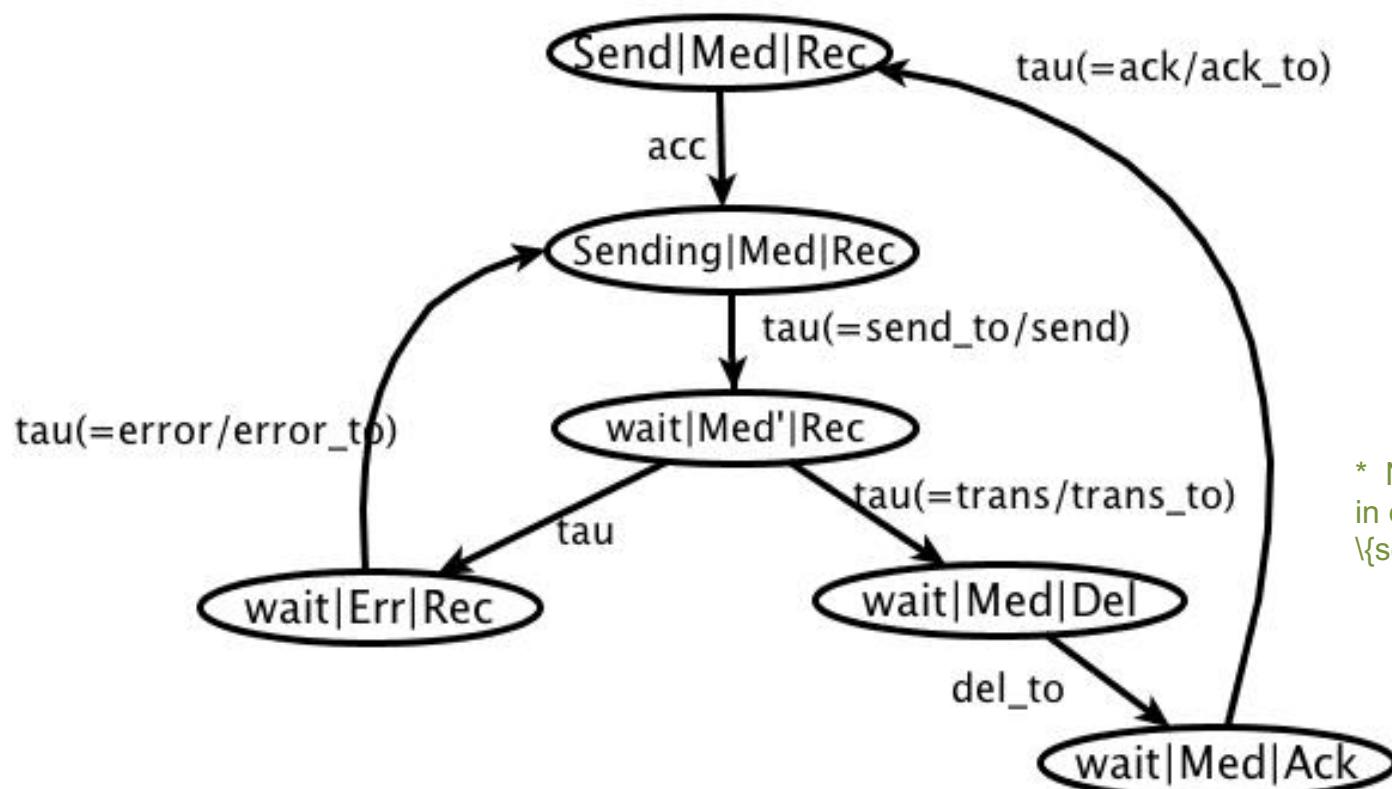
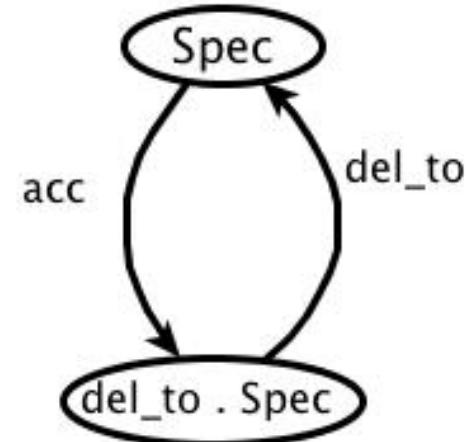
Spec R wait|Med|Ack

del_to.Spec R Sending|Med|Rec

del_to.Spec R wait|Med'|Rec

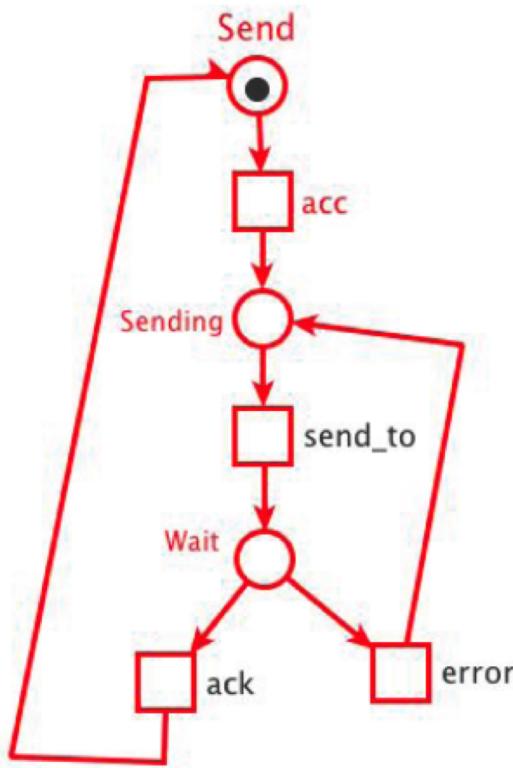
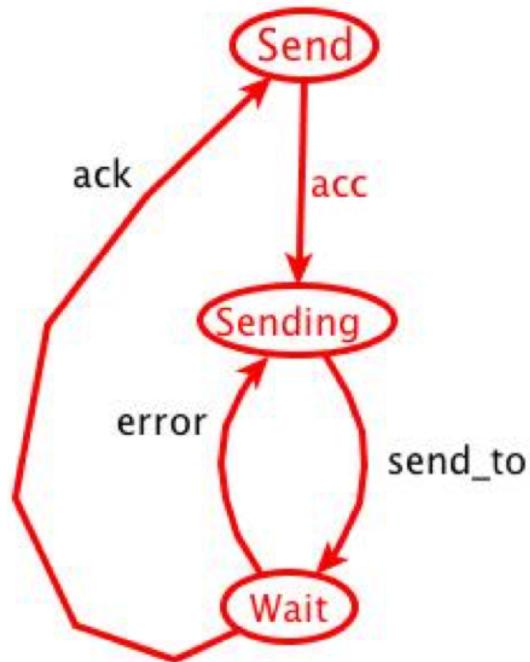
del_to.Spec R wait|Err|Rec

del_to.Spec R wait|Med|Del



* NOTA
in questa slide la restrizione
\{send, error, trans, ack\} è omessa

Il protocollo di comunicazione modellato con le reti di Petri

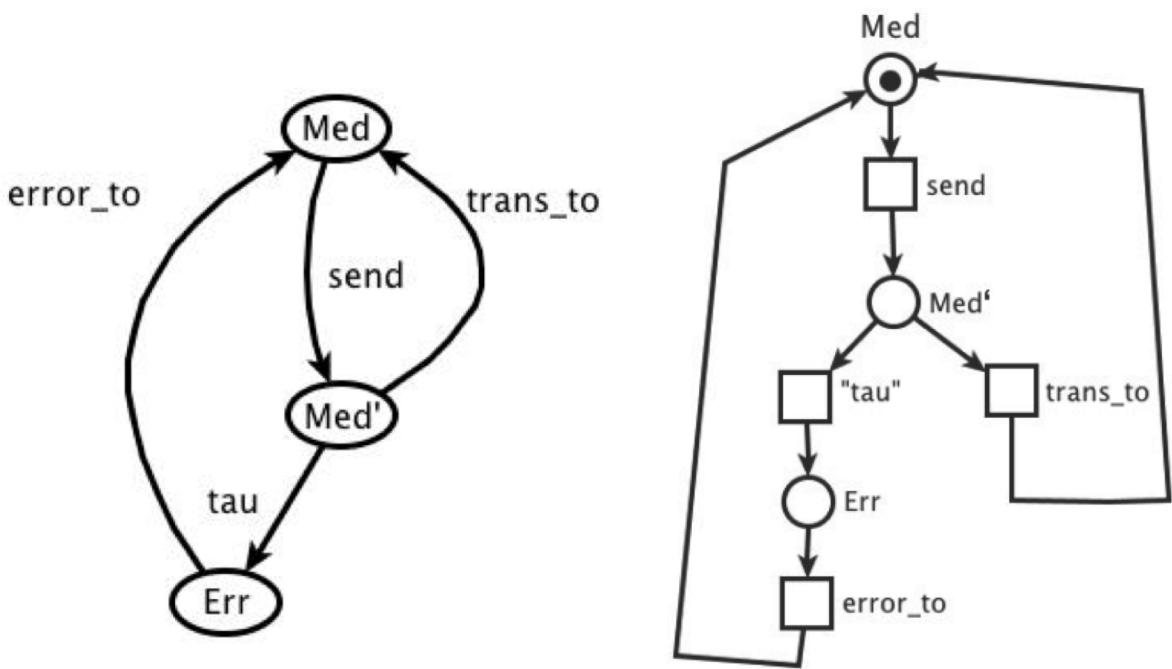


$$\text{Send} \stackrel{\text{def}}{=} \text{acc}.\text{Sending}$$

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Il protocollo di comunicazione modellato con le reti di Petri

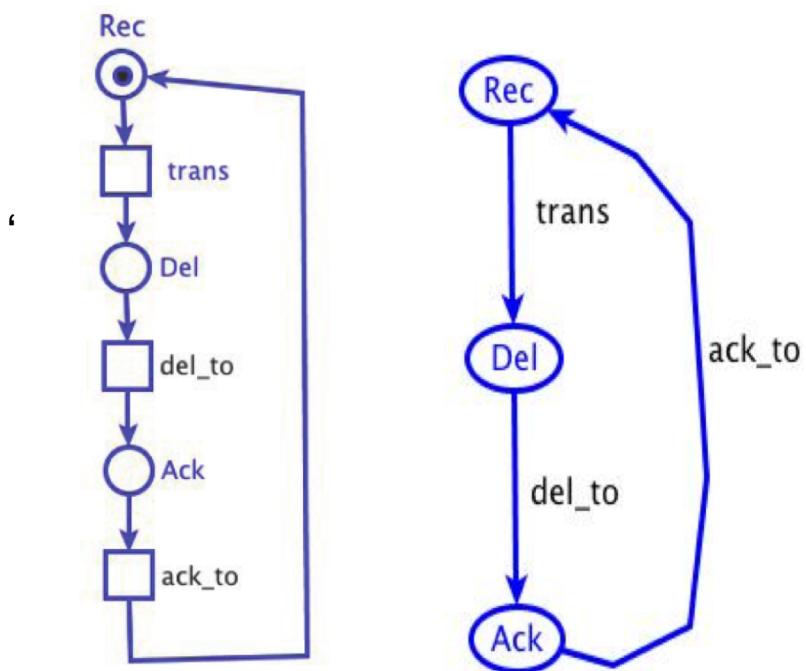


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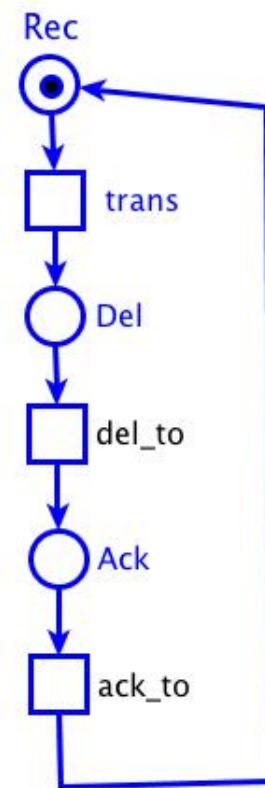
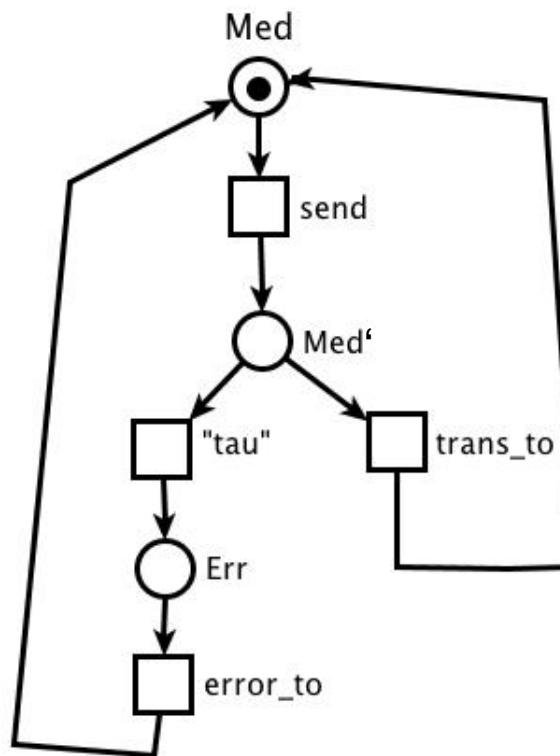
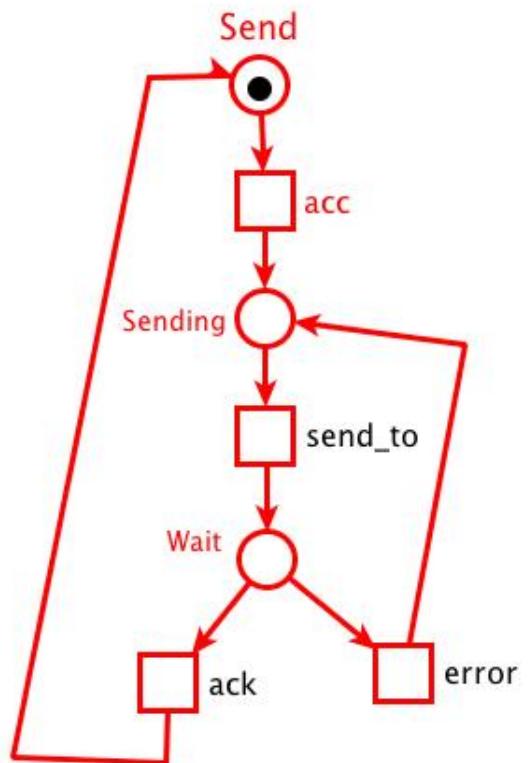
$$\text{Err} \stackrel{\text{def}}{=} \overline{\text{error}}.\text{Med}$$

Il protocollo di comunicazione modellato con le reti di Petri



$$\begin{aligned} \text{Rec} &\stackrel{\text{def}}{=} \text{trans}. \text{Del} \\ \text{Del} &\stackrel{\text{def}}{=} \overline{\text{del}}. \text{Ack} \\ \text{Ack} &\stackrel{\text{def}}{=} \overline{\text{ack}}. \text{Rec} \end{aligned}$$

Il protocollo di comunicazione modellato con le reti di Petri



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