# Designing of a 0-CFA

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**Résumé**

Control flow analysis consists in detecting where channels can be used in a mobile system. In particular 0-cfa is a flow insensitive version of this analysis. This week, we propose to design a 0-cfa for the $\pi$-calculus.

Formally, 0-control flow analysis (0-CFA) of a system consists in over-approximating the set of pairs $(x, y)$ such that the name of a channel that is opened by the restriction `(ν x)` may be associated to an instance of the variable `y` in one instance of a thread of the system.

For instance, in the process :

$$\texttt{(}\nu\ \texttt{x)(}\nu\ \texttt{a)(a!}^{1}\texttt{[x] | a?}^{2}\texttt{[y].P(y))}$$

the name of a channel created by the restriction `(ν a)` may flow in the instances of the variable $a$, the name of a channel created by the restriction `(ν x)` may flow in the instances of the variable `x` and `y`.

The most precise result for a 0-cfa on this example is the following :

$$\{(\texttt{a}, \texttt{a}), (\texttt{x}, \texttt{x}), (\texttt{x}, \texttt{y})\}$$

**Question 1** *Design a 0-cfa for the close systems of the $\pi$-calculus.*

**Question 2** *Which assumptions can be done, so as to improve the accuracy of the analysis, without restricting the set of processes which can be analysed.*

**Question 3** *Extend the analysis to the case of an open system, which can communicate with some other unknown threads.*