NOMADIC PICT

Declarations

type T = T'
new c: T P
agent a = P and ... and a' = P' in Q
migrate to s P
def f[...] = P and ... and f'[...] = P' in Q

Processes

(p || q)
(D p)
()
Communication

\[ c!v \quad \text{output } v \text{ on channel } c \text{ in current agent} \]
\[ c?p = P \quad \text{input} \]
\[ c?p = P \quad \text{replicated input} \]
\[ \text{if } v \text{ then } P \text{ else } Q \quad \text{conditional} \]

iflocal \( \langle a \rangle c!v \) then \( P \) else \( Q \)
\( \text{test-and-send to agent } a \) on this site.

\( \langle a \rangle c!v \)
\( \text{send to agent } a \) on this site.

\( \langle a\leq s \rangle c!v \)
\( \text{send to agent } a \) on site \( s \).

wait \( c?p = P \) timeout \( t \rightarrow Q \)
\( \text{input with timeout (secs)} \)

terminate
\( \text{kill agent} \)

\( c\leq a!v \quad \text{location-independent output to channel } c \text{ at agent } a. \)
Nomadic Pict Example

getApplet?*[a s] →

agent b =
migrate to s →

(<aes>ackible

in 0

LOCATION-INDEPENDENT COMMUNICATION

<ae?>c!v

c?a!v
**Mobile Agent Example**

```python
new answer: "String
def spawn [s: Site prompt: String] =
    (agent b =
        (migrate to s
         answer@a! (sys.read prompt))
    in
        (())
    (spawn! [s1 "How are you?"]
     spawn! [s2 "when do we start?"]
     answer? & s = print! s
...
```

This code (part of agent a) spawns two agents at sites s1 and s2, and prints answers coming on its "answer" channel.
Reference Cell in Nomadic Pict

def replInt [s:Site r:RefInt] =
  (new set: [Agent Int Sig]
   new get: [Agent /Int]
   agent replIntAg =
     (new contents: ^Int
      run contents!0
      migrate to s
      (set ?& [a:Agent v:lit c:Sig] =
       contents?_. = (contents!v 1 c) ?a
       1 get ?& [a:Agent res:/Int] =
       contents?v = (contents!v 1 res@a!v))
     )r! [set = \[a:Agent v:lit c:Sig] =
       set e replIntAg ! [a v c]
     get = \[a:Agent res:\Int] = get e replIntAg (a and)\]
val cell1 = (reprInt 51)
val cell2 = (reprInt 52)

agent a =
(
  (cell2.set a 5);
  (prNL (int.toStr (cell1.get a)));
  (prNL (int.toStr (cell2.get a)));
  ()
)