

## TRANSPUTER NETWORKS: CONFIGURATION LANGUAGE

*Three features of OCCAM 2 language are used to configure multiprocessor networks:*

PLACED PAR

PROCESSOR <number> <transputer.type>

PLACE <channel.name> AT <address>

*Observe that:*

- 1. The <transputer.type> information is used by the configurer to check that the code generated by the compiler was created with the compatible transputer in mind.*
- 2. The <number> of the transputer is immaterial for the configuration; it may be useful, though, in the diagnostic messages from the configurer, to identify the processor.*
- 3. The PLACE statement is used to associate OCCAM 2 channels with processor links. The links are mapped into memory and are referred to using their addresses. Currently, there are eight such links (four for input, four for output):*

```
VAL link0out IS 0:      VAL link0in IS 4:  
VAL link1out IS 1:      VAL link1in IS 5:  
VAL link2out IS 2:      VAL link2in IS 6:  
VAL link3out IS 3:      VAL link2in IS 7:
```

## TRANSPUTER NETWORKS: CONFIGURATION EXAMPLE

*REMINDER: Channels are used to provide unbuffered, unidirectional links between processes. These processes may run on different processors.*

*Consequently, a channel connecting two processes on different processors must be placed on an input link address of one processor and on an output link address of another processor.*

*EXAMPLE: Consider a network of four T414 transputers on the IMS B003 evaluation board.*

*We want to run four processes: one called `boss` and three other being parallel instantiations of the `work` code, running on different processors. Specifications:*

```
PROC boss (CHAN OF BOSSINFO hostin, hostout,  
           CHAN OF WORKINFO in, out)
```

```
PROC work (CHAN OF WORKINFO in, out)
```

*Having declared:*

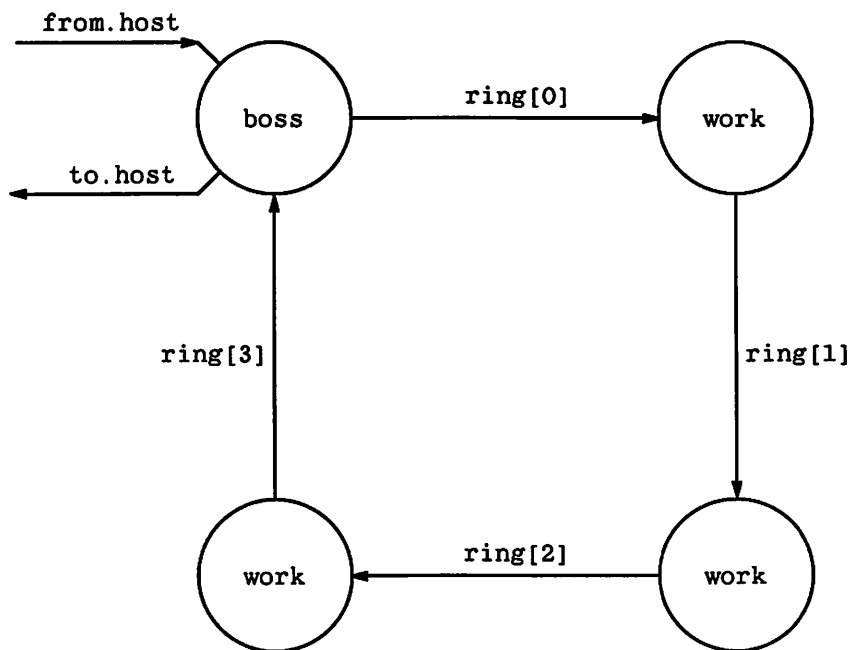
```
CHAN OF BOSSINFO from.host, to.host:  
[4]CHAN OF WORKINFO ring:
```

**TRANSPUTER NETWORKS:  
CONFIGURATION EXAMPLE  
(Continued)**

*We want the following logical relationship between processes:*

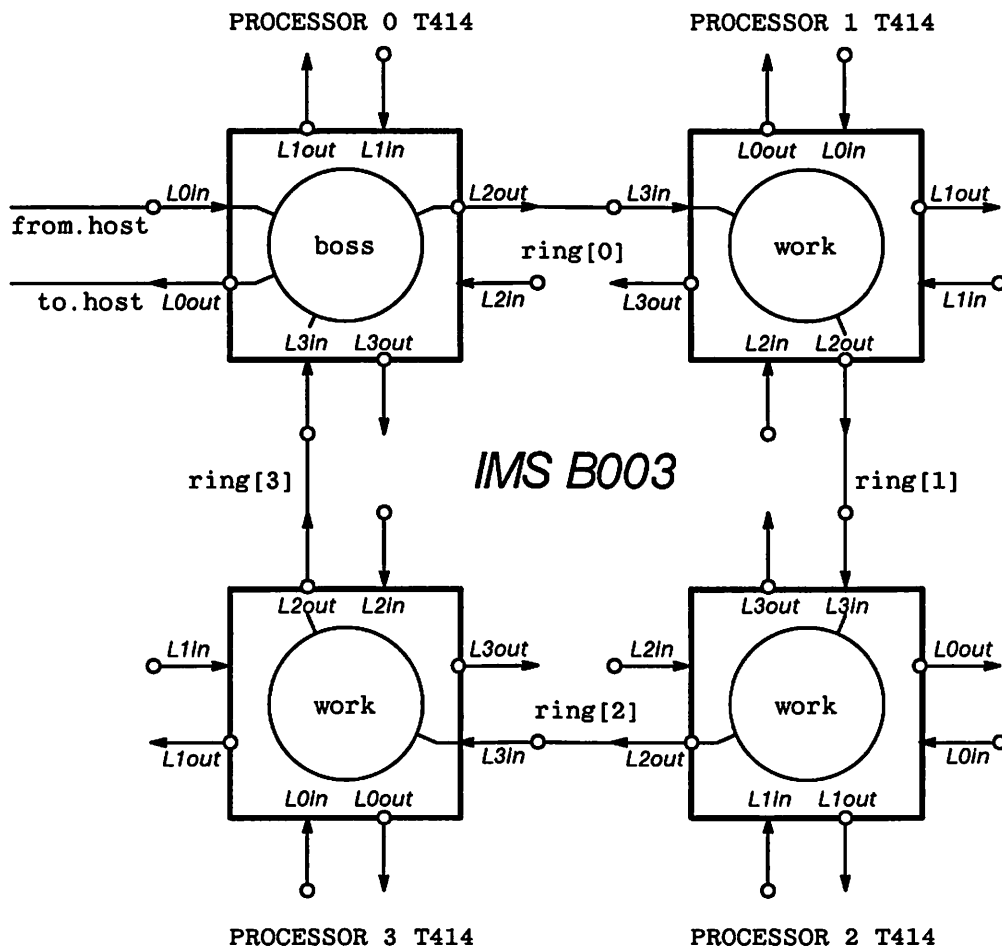
```
CHAN OF BOSSINFO from.host, to.host:  
[4]CHAN OF WORKINFO ring:  
PAR  
  boss(from.host, to.host, ring[0], ring[3])  
  PAR i = 1 FOR 3  
    work(ring[i - 1], ring[i])
```

*This relationship could be depicted as:*



**TRANSPUTER NETWORKS:  
CONFIGURATION EXAMPLE  
(Continued)**

*Allocation of a separate processor to the boss process and to each instance of the work process results in the following configuration:*



**TRANSPUTER NETWORKS:  
CONFIGURATION EXAMPLE  
(Continued)**

*The emerging code implementing the desired hardware configuration:*

```
CHAN OF BOSSINFO from.host, to.host:
[4]CHAN OF WORKINFO ring:

PLACED PAR
  PROCESSOR 0 T414
    PLACE from.host AT L0in:
    PLACE to.host   AT L0out:
    PLACE ring[0]   AT L2out:
    PLACE ring[3]   AT L3in:
    boss(from.host,to.host,ring[0],ring[3])

  PLACED PAR i = 1 FOR 3
    PROCESSOR i T414
      PLACE ring[i - 1] AT L3in:
      PLACE ring[i]     AT L2out:
      work(ring[i - 1],ring[i])
```

*NOTE: in conventional terms, the boss and work processes could be viewed as ordinary procedures, written in any language. OCCAM 2 allows calling and being called by 'alien' language programs.*