Project: i3303

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1.Tree

Make_routers_sensors(sensors_nb)
If sensors_nb=1 then child1=sensor
Else if sensors_nb=2 then child1 = sensor and child2=sensor
Else then
Child1 =router and child2=router
N=arrond(ln(sensors_nb))
If child1 then Make_routers_sensors((2^N)/2)
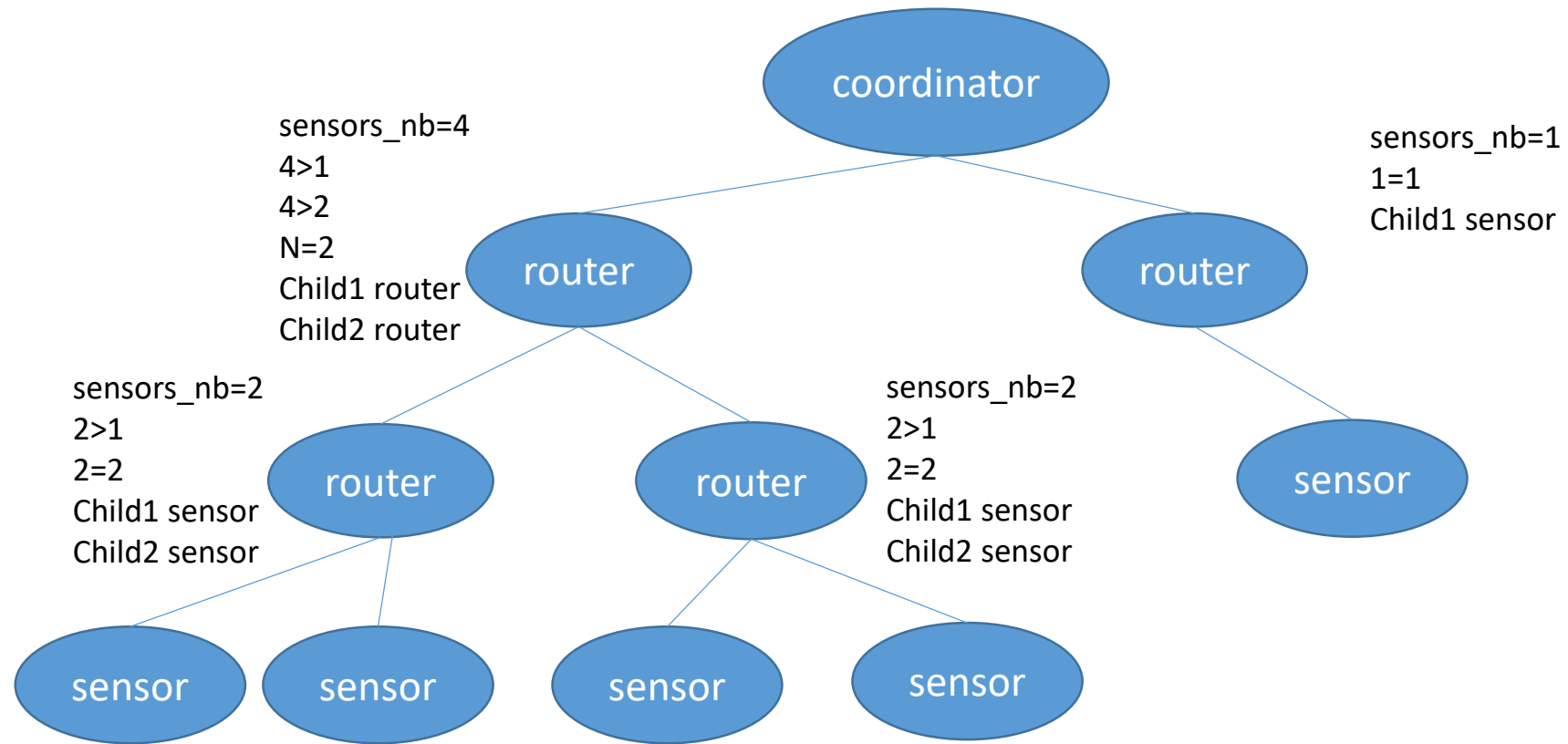If child2 then Make_routers_sensors(sensors_nb-(2^N)/2))

Exemple

sensors_nb=5
5>1
5>2
N=3
Child1 router
Child2 router

coordinator

sensors_nb=4
4>1
4>2
N=2
Child1 router
Child2 router

sensors_nb=1
1=1
Child1 sensor

router

router

sensors_nb=2
2>1
2=2
Child1 sensor
Child2 sensor

router

router

sensors_nb=2
2>1
2=2
Child1 sensor
Child2 sensor

sensor

sensor

sensor

sensor

sensor

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```
ali@ali-virtual-machine:~$ gcc project.c -o ppp
ali@ali-virtual-machine:~$ ./ppp
Use ^c to know the largest path
Use ^\ to stop a process for a limited time
Enter the number of sensors : 5
coordinator pid : 23884 started
router pid : 23886 started
router pid : 23885 started
sensor pid : 23887 started
router pid : 23889 started
router pid : 23888 started
sensor pid : 23892 started
sensor pid : 23893 started
sensor pid : 23890 started
sensor pid : 23891 started
```
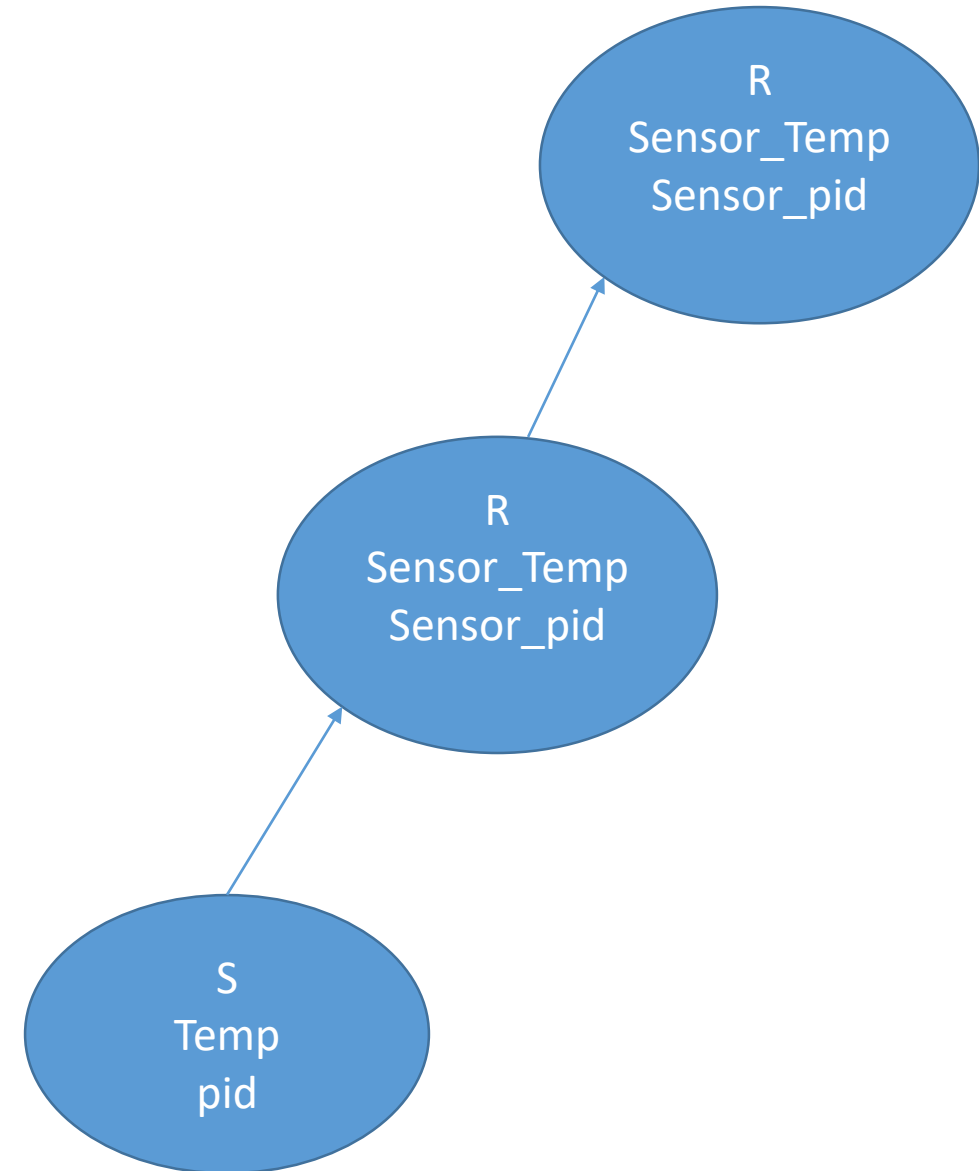
2.SENSOR and ROUTER

The sensor set alarm every time = rand(between(1,30))
to update the
Temp after add rand(between(-40,40)) to the average
Every 20 s
Sensor write in the msg pipe the avg and his id and
send signal to the up router to read from the pipe and
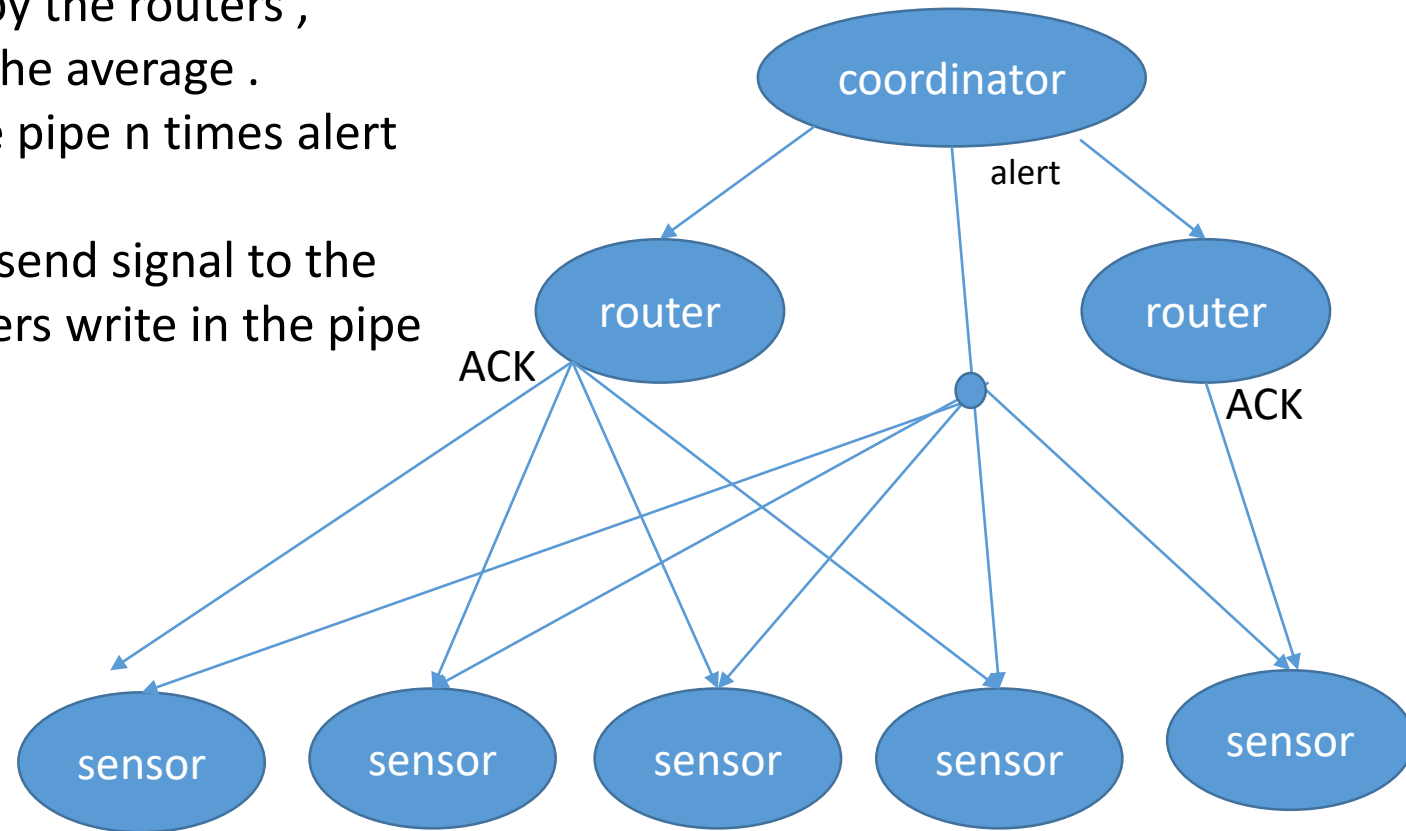wait to read the result from the result pipe
When the pipe receive the temp write in the msg pipe
and send signal to the up router to read from the msg
pipe.
Every attached router to sensor calculate the sending
time of each sensor if the time > 25 the router send
signal to stop the sensor and informe the coordinator

R
Sensor_Temp
Sensor_pid

R
Sensor_Temp
Sensor_pid

S
Temp
pid

3.COORDINATOR

The coordinator receive temp from each sensor by the routers ,
After n=sensors_nb temp received ,he calculate the average .
IF the (AVG > 30 or AVG<-30) then he write in the pipe n times alert
msg. the waiting sensor receive the msg.
ELSE... He write 2 times ACK msg in the pipe and send signal to the
child routers to read from the pipe then the routers write in the pipe
to the waiting sensors.

```
router pid : 23559 received temp : -0.500000 of 23565
router pid : 23559 sends temp : -0.500000 to 23558
coordinator pid : 23558 received temp : -0.500000 of 23565
router pid : 23561 received temp : 3.500000 of 23566
router pid : 23561 sends temp : 3.500000 to 23559
router pid : 23559 received temp : 3.500000 of 23566
router pid : 23559 sends temp : 3.500000 to 23558
coordinator pid : 23558 received temp : 3.500000 of 23566
sensor pid : 23566 sends temp=3.500000 to pid : 23561
sensor pid : 23567 updates his temp=1.500000
router pid : 23563 received temp : 1.500000 of 23567
router pid : 23563 sends temp : 1.500000 to 23559
sensor pid : 23567 sends temp=1.500000 to pid : 23563
router pid : 23559 received temp : 1.500000 of 23567
router pid : 23559 sends temp : 1.500000 to 23558
coordinator pid : 23558 received temp : 1.500000 of 23567
sensor pid : 23565 received ACK
sensor pid : 23562 received ACK
sensor pid : 23564 received ACK
sensor pid : 23566 received ACK
sensor pid : 23567 received ACK
sensor pid : 23567 updates his temp=-3.666667
sensor pid : 23566 updates his temp=11.666667
```

To know the Largest path of the TREE you can
use signal SIGINT.
When the coordinator receive the SIGINT he
print his id and send a signal to child1 and the
child1 send to his child1 until the sensor
receive the signal,he print his id.

To send msg between Routers we can use SIGINT, when the coordinator receive the SIGINT he asks to enter the pid of the sender router,he send a signal to this router, the router receive the signal and ask to enter the pid of receiver router and the msg,then the router send a signal to the received router to read from the pipe.

```
^C
Enter 1 to largest path
Enter 2 to send msgs between routers
2
Enter the pid of the router
23924
router 23924,Enter the pid of the receiver router
23924
router 23924,Enter the msg
helllo
router 23924 received : helllo
```

To stop a sensor for a limited time we can use the signal SIGQUIT.
When the coordinator receive the signal he asks to enter the pid of the sensor and the time.
Then he write in the pipe the time and send the signal to the sensor to read from the pipe and sleep(time).

```
^\Enter the pid of the sensor : 24004
Enter the time : 7
sensor 24004 stoped for 7 s
sensor pid : 24002 received ACK
sensor pid : 24000 received ACK
sensor pid : 24005 received ACK
sensor pid : 24003 received ACK
sensor 24004 resumed
sensor pid : 24004 received ACK
coordinator : sensor 24004 terminated
```

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