



The Simula RPR simulator written i Java

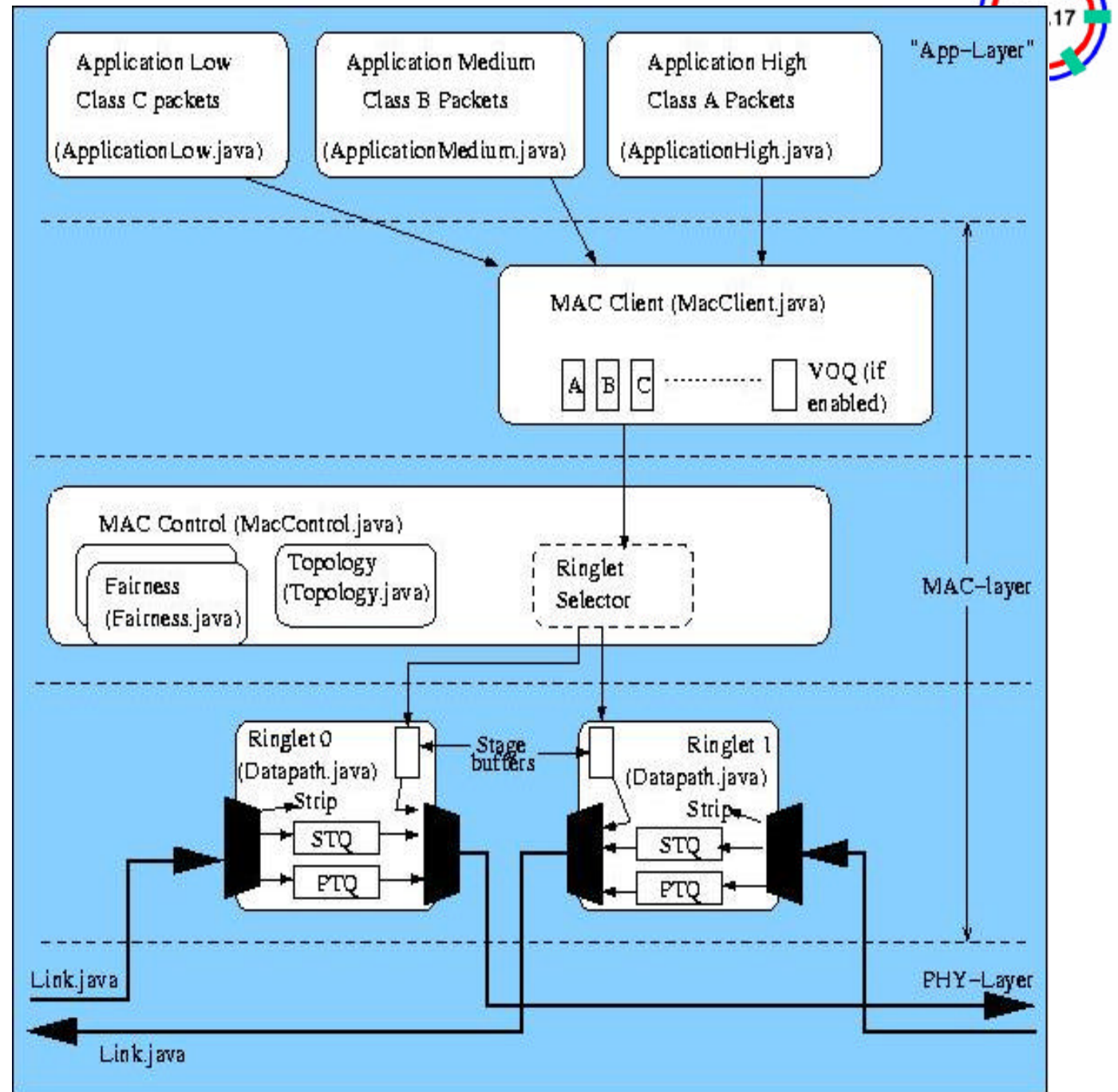
Now freely available for download in source code

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Simulator structure

The figure shows some of the Java classes and how they relate to a station structure



State tables = Java code

- The code of the simulator are the same as the state tables of the RPR spec.
- Hence it is extremely easy to change the simulator if one makes a change in the state tables
- Next page shows an example of this

Example: Aggressive rate adjustment

```
private void aggressiveAgingIntervalAction(){
    switch(table9_6State){
    case START:
        localCongested = FALSE;
        allowedRate = maxAllowedRate;
        table9_6State = UNCG;
        break;
    case UNCG:
        if (agingUpdateDone && isCongested()) {
            localCongested = TRUE;
            localFairRate = lpAddRate;
            normLocalFairRate = localFairRate / normCoef;
            setAllowedRateCongested(rcvdRate);
            agingUpdateDone = FALSE;
            table9_6State = CGST;
        } else if (agingUpdateDone){
            setAllowedRateCongested (rcvdRate);
            agingUpdateDone = FALSE;
            table9_6State= UNCG;
        }
        break;
    case CGST:
        if ( agingUpdateDone && (!isCongested())) {
            localCongested = FALSE;
            setAllowedRateCongested (rcvdRate);
            agingUpdateDone = FALSE;
            table9_6State=UNCG;
        } else if (agingUpdateDone){
            localFairRate = lpAddRate;
            normLocalFairRate = localFairRate / normCoef;
            setAllowedRateCongested (rcvdRate);
            agingUpdateDone = FALSE;
            table9_6State= CGST;
        }
        break;
    default:
        Const.error("table 9.6 aggressiveIntervalAction");
    }
}
```

Current state		Row	Next state	
state	condition		action	state
START	—	1	localCongested = FALSE; allowedRate = maxAllowedRate;	UNCG
UNCG	agingUpdateDone && IsCongested()	2	localCongested = TRUE; localFairRate = lpAddRate; normLocalFairRate = localFairRate / normCoef; SetAllowedRateCongested (rcvdRate); MA_CONTROL.indication(SINGLE_CHOKE_IND); agingUpdateDone = FALSE;	CGST
	agingUpdateDone	3	SetAllowedRateCongested(rcvdRate); MA_CONTROL.indication(SINGLE_CHOKE_IND); agingUpdateDone = FALSE;	UNCG
CGST	agingUpdateDone && !IsCongested()	4	localCongested = FALSE; SetAllowedRateCongested(rcvdRate); MA_CONTROL.indication(SINGLE_CHOKE_IND); agingUpdateDone = FALSE;	UNCG
	agingUpdateDone	5	localFairRate = lpAddRate; normLocalFairRate = localFairRate / normCoef; SetAllowedRateCongested(rcvdRate); MA_CONTROL.indication(SINGLE_CHOKE_IND); agingUpdateDone = FALSE;	CGST

Next page: a close up

Close up of example

UNCG	agingUpdateDone && IsCongested()	2	localCongested = TRUE; localFairRate = lpAddRate; normLocalFairRate = localFairRate / normCoef; SetAllowedRateCongested (rcvdRate); MA_CONTROL.indication(SINGLE_CHOKE_IND); agingUpdateDone = FALSE;	CGST
	agingUpdateDone	3	SetAllowedRateCongested(rcvdRate); MA_CONTROL.indication(SINGLE_CHOKE_IND); agingUpdateDone = FALSE;	UNCG

case UNCG:

```

if (agingUpdateDone && isCongested()) {
    localCongested = TRUE;
    localFairRate = lpAddRate;
    normLocalFairRate = localFairRate / normCoef;
    setAllowedRateCongested(rcvdRate);
    agingUpdateDone = FALSE;
    table9_6State = CGST;
} else if (agingUpdateDone){
    setAllowedRateCongested (rcvdRate);
    agingUpdateDone = FALSE;
    table9_6State= UNCG;
}
break;

```

Call structure in the simulator is the same as in the spec., e.g.

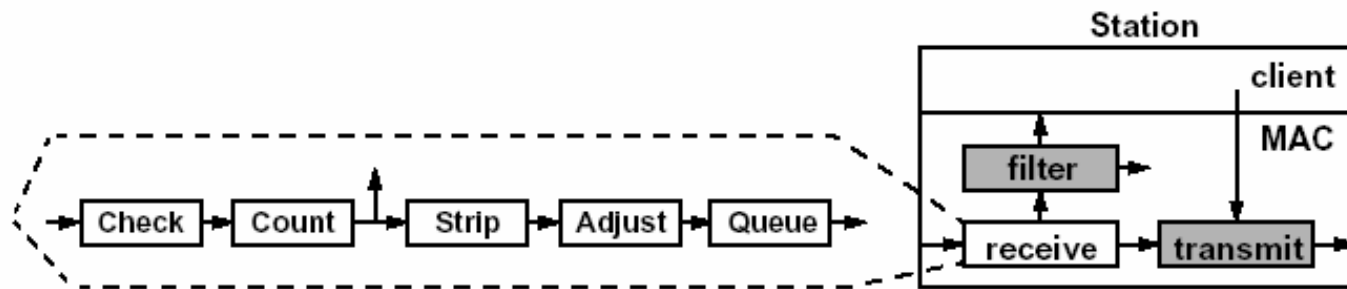


Figure 6.8—Receiver components

Java methods:

```
public void check() { ... }  
public void count() { ... }  
public void strip() { ... }  
etc.
```

Free for all use

- The Simula-RPR simulator can be used freely for all purposes
- Please acknowledge / reference Simula when you use it
- We want to know who is downloading and would appreciate to know who is using the simulator (send us an e-mail).

Where to find the Simula-RPR simulator

- The documentation can be found and browsed at <http://software.simula.no>.
 - Navigate or go to folder: `/nd/rpr`
- You'll need to register your name and e-mail address to download the simulator
 - *Your name and email will not be used to send you any other mail and will not be externally available.*
- You don't need to register for browsing the documentation and examples.
- Downloadable in zip, tar.gz or "per-file"

How to register:

- When you go to the Simula-RPR download page
 - for the first time:
 - Supply your name, email and choose a password to register.
 - You will immediately receive an email with a confirmation code
 - Enter the confirmation code to finalize your registration
 - Return to login page and log in to reach the software.
 - again:
 - Supply your email and password to log in to reach the software (if you have asked to be remembered).

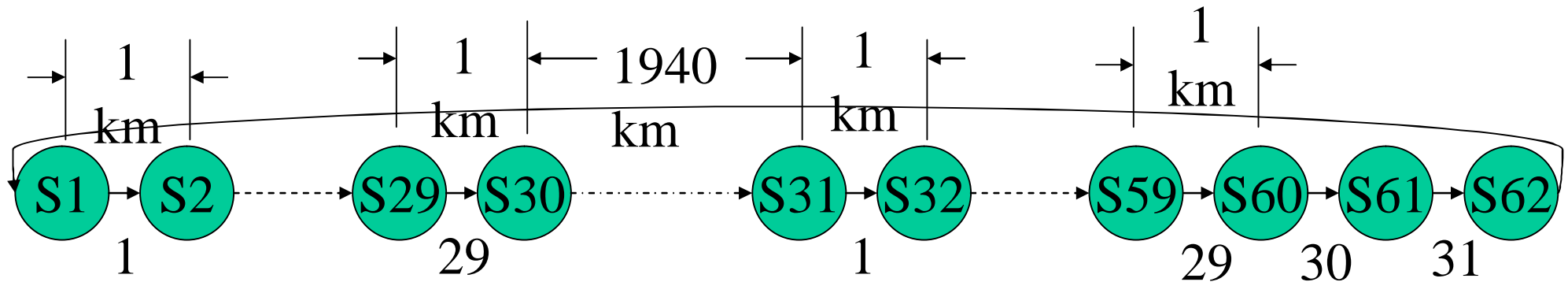
How to use the Simula-RPR simulator

- The webpage has a lot of examples of -
 - where you can find important code
 - making your own scenarios
- The different scenarios contain README files

Other Simula-RPR simulator properties

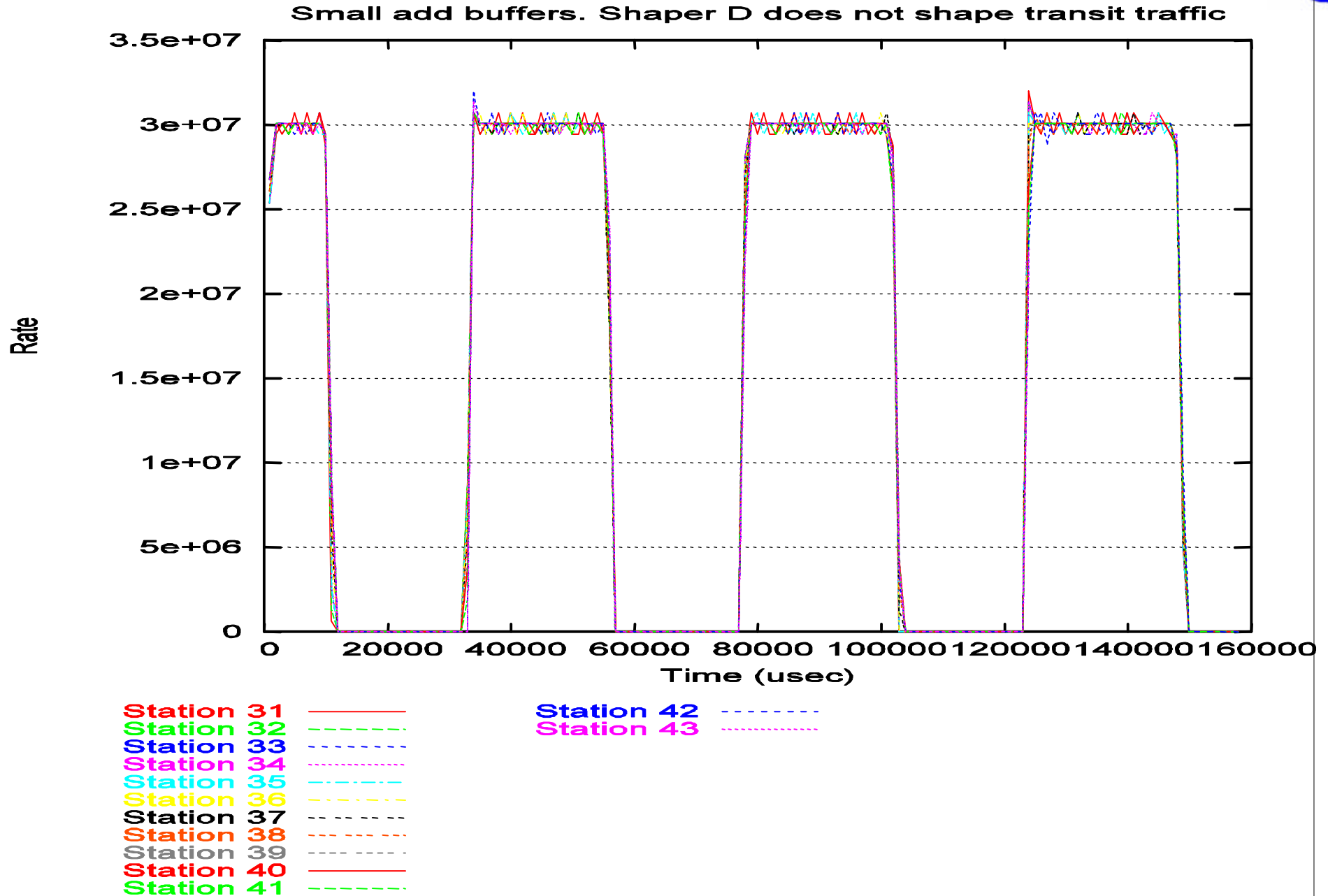
- The simulator writes flat text files that can be imported into a graphics tool (Gnuplot, Excel,...)
- The simulator is fast: On a new PC it takes about 1/2 hour to run the example scenario on the next page for one second of simulator time.

Example scenario



- 1000M lineRate
- Total distance: $1940 + 29 + 31 = 2000$
- S1 – S30 send C traffic to S62
- S30 – S61 send A traffic to S62
- The S30 – S31 link is 99% utilized.

Example result (Gnuplot)



Conclusion

- Have fun
- Send any comments, error reports, thanks, suggested improvements, etc. to steing@simula.no
- Thanks