

Centre for  
Telematics and  
Information  
Technology



University of Twente  
*The Netherlands*

# MANAGING ATM NETWORKS

**Aiko Pras**

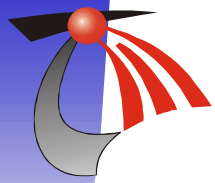
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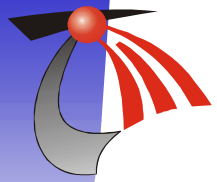
# ATM

## GUARANTEED QUALITY OF SERVICE

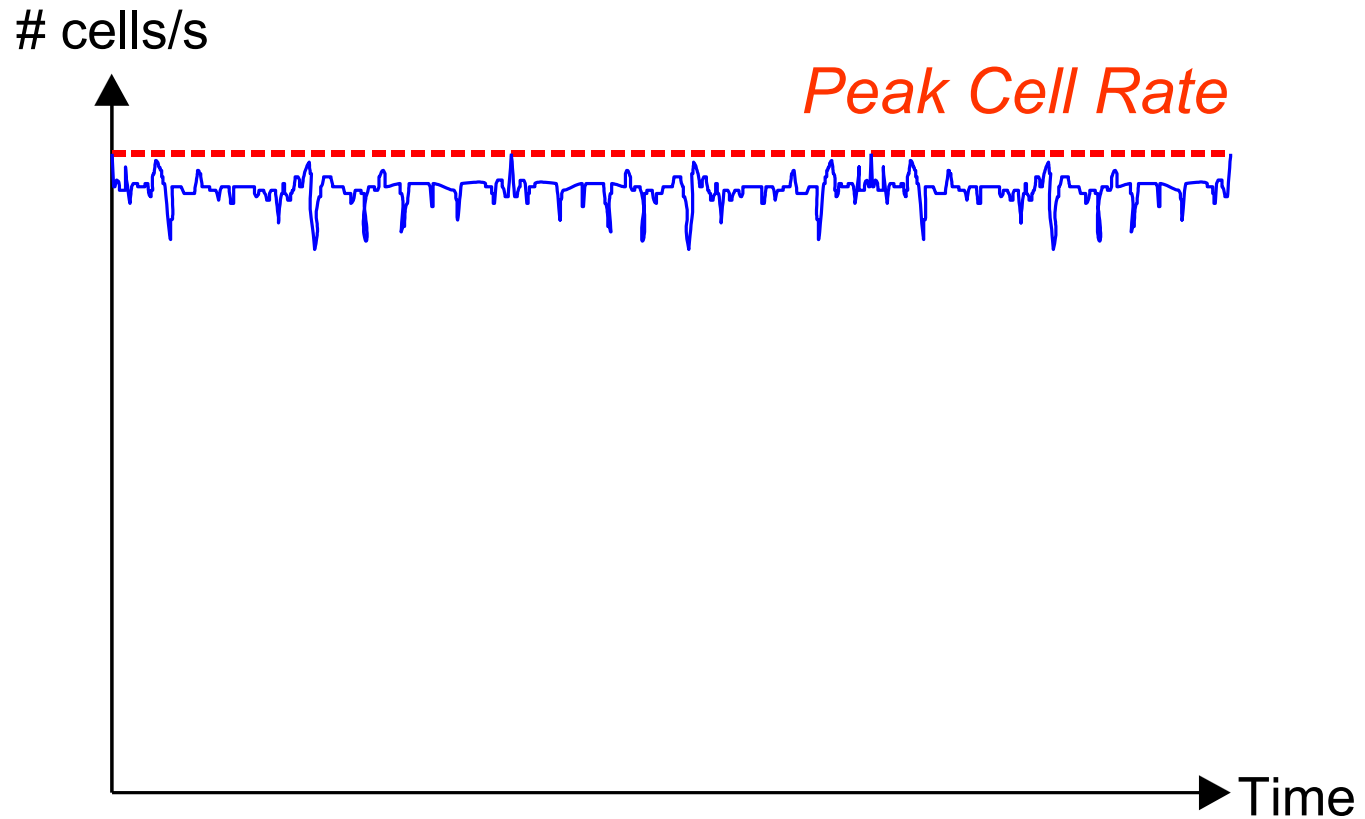
**PVC: PERMANENT VIRTUAL CONNECTION**

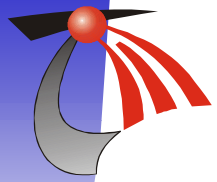
**SVC: SWITCHED VIRTUAL CONNECTION**

- **UNSPECIFIED BITRATE (UBR)**
- **CONTINUOUS BITRATE (CBR)**
  - **VARIABLE BITRATE (VBR)**
  - **AVAILABLE BITRATE (ABR)**

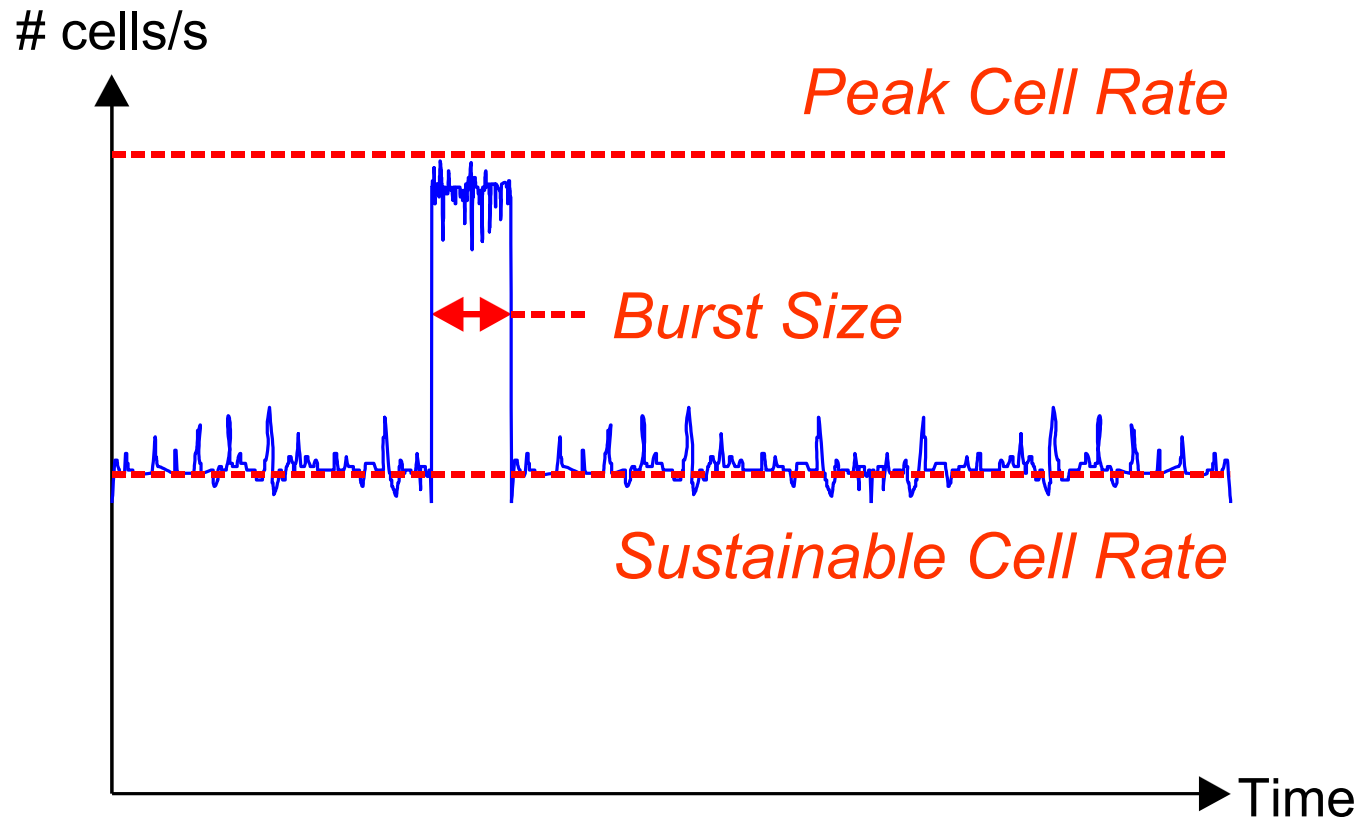


# CONTINUOUS BIT RATE



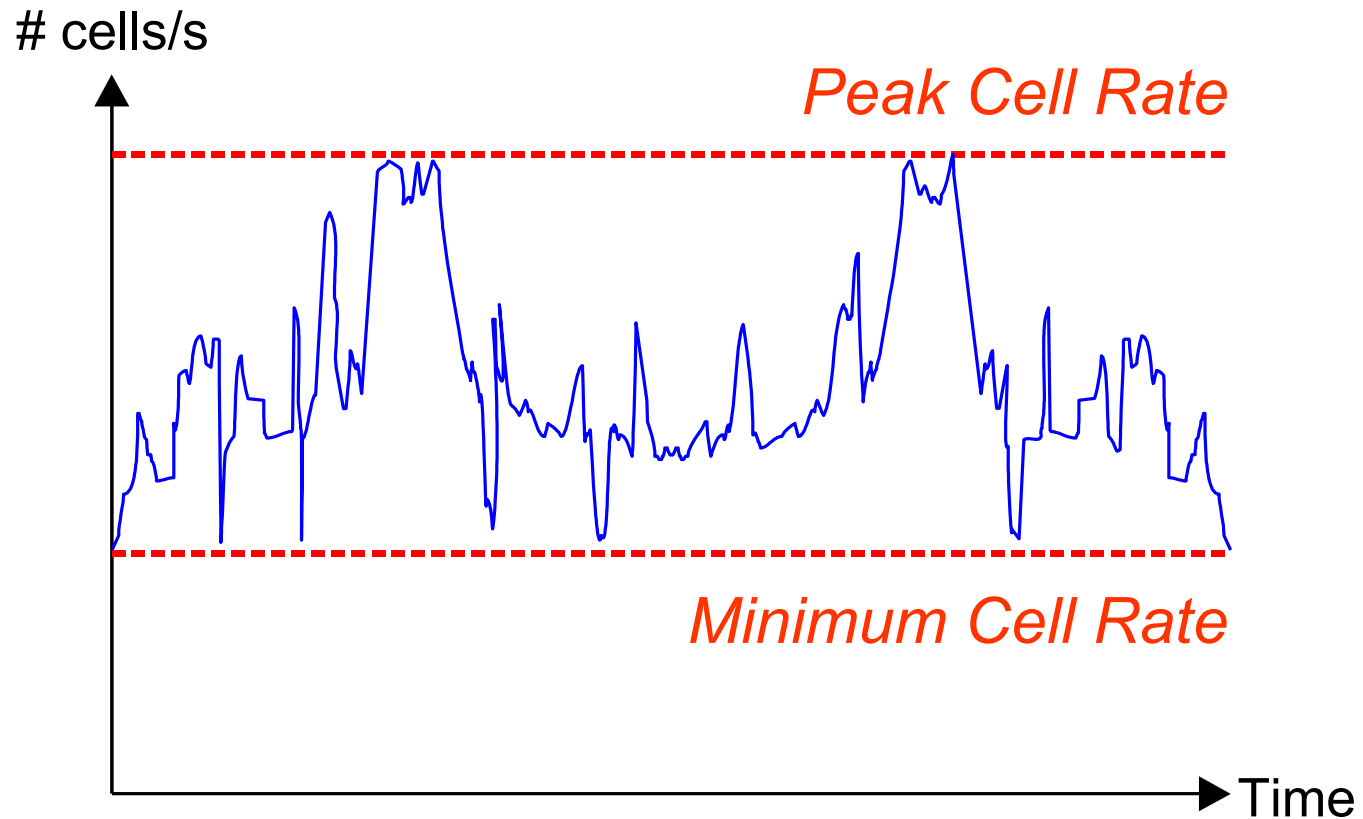


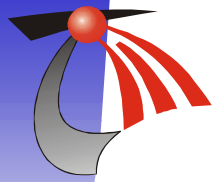
# VARIABLE BIT RATE





# AVAILABLE BIT RATE





# OTHER PARAMETER ISSUES

- **CELL LOSS PRIORITY**
  - **TAGGING**

THERE ARE 20 POSSIBLE PARAMETERS

**CONFIGURING ATM CONNECTIONS IS DIFFICULT!**



# WHO CONFIGURES THE CONNECTION

- **HUMAN USER**

E.G. UT-ATM TOOL

- **APPLICATION PROGRAMME**

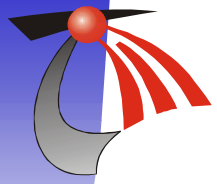
E.G. NetMeeting



# PROBLEMS

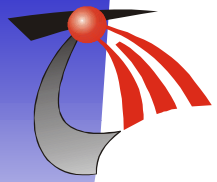
- **USER MAY NOT KNOW  
THE AMOUNT OF BANDWIDTH  
THAT IS BEING USED**
  
- **DENIAL OF SERVICE**



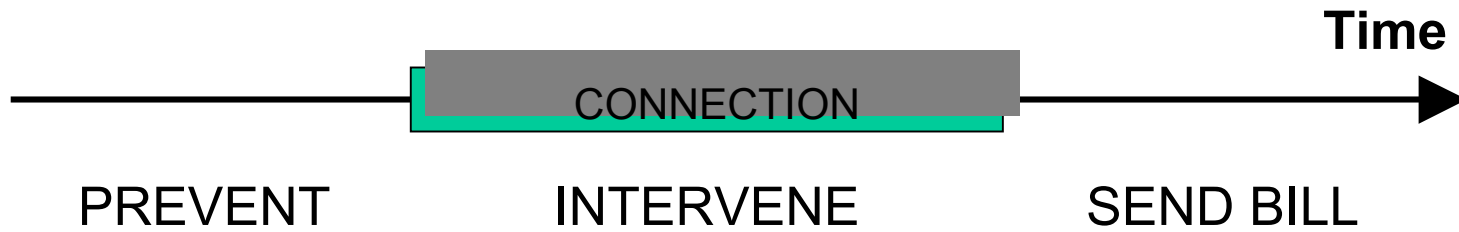


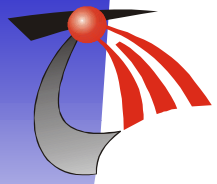
THERE MUST BE SOME FORM  
OF SUPERVISION!

**MANAGEMENT**

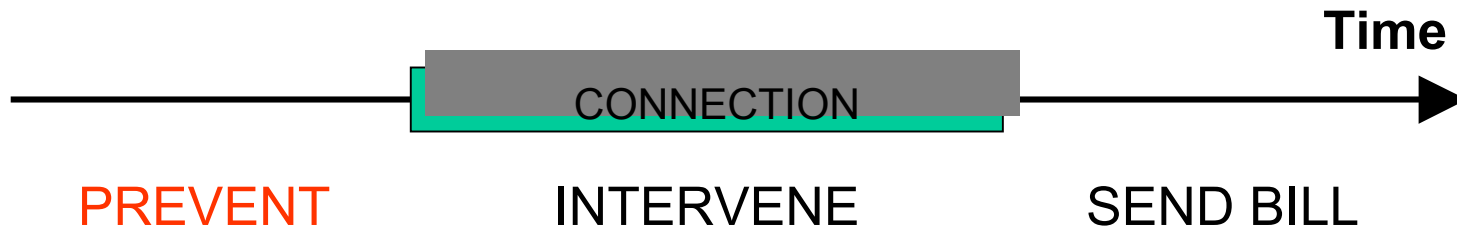


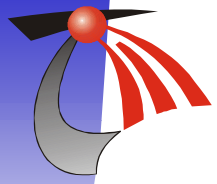
# MANAGEMENT



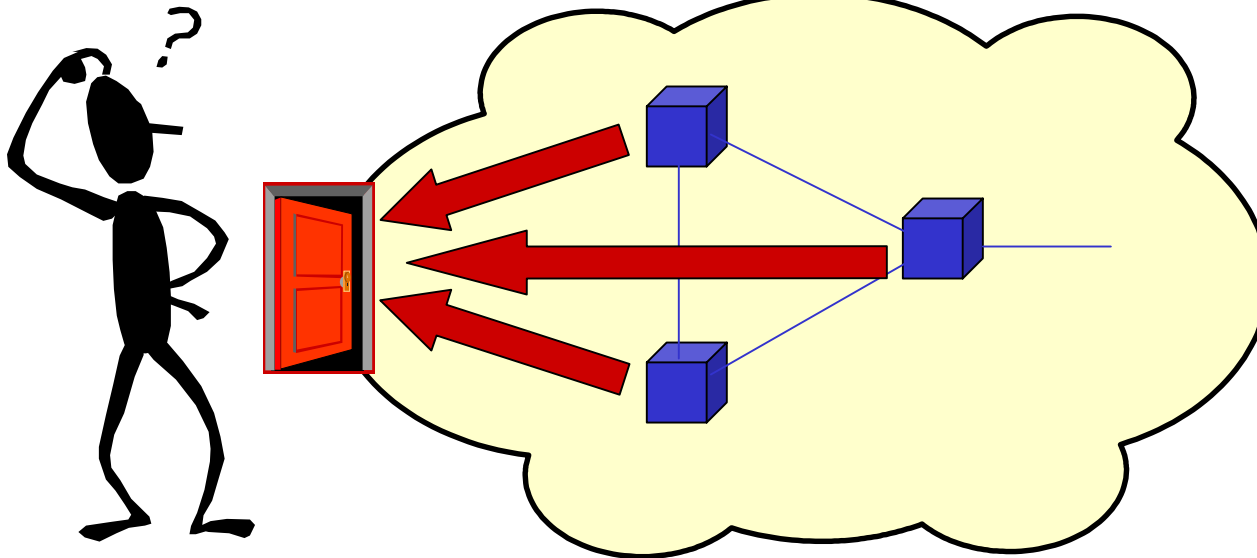


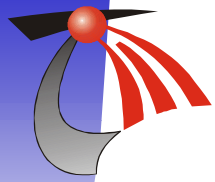
# MANAGEMENT





# CONNECTION ADMISSION CONTROL



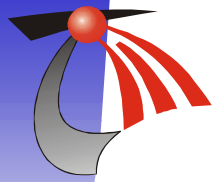


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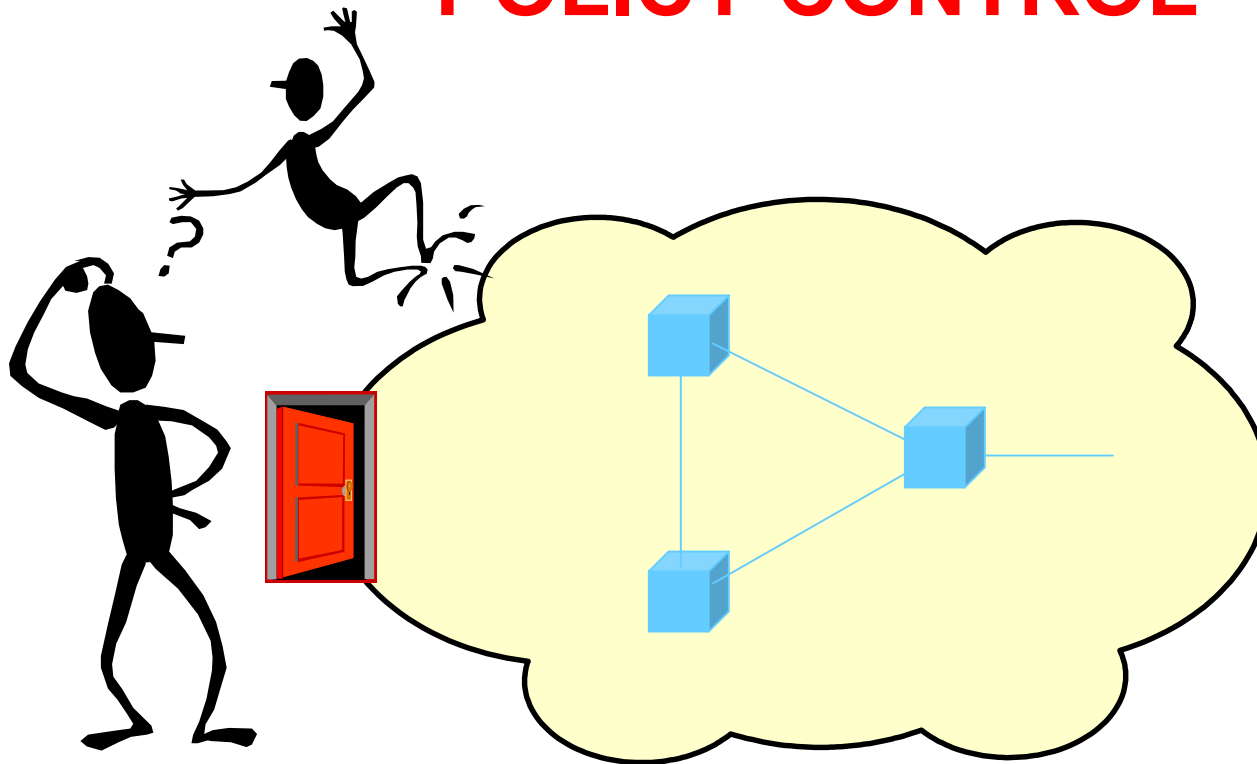
- **CAPACITY OF SWITCHES**
  - **CAPACITY OF LINES**

## **MULTIPLE LEVELS, E.G.:**

- **USE CURRENT PARAMETER VALUES**
- **USE STATISTICAL INFORMATION OVER LAST MINUTES**
  - **USE STATISTICAL INFORMATION OVER LAST DAYS**



# POLICY CONTROL



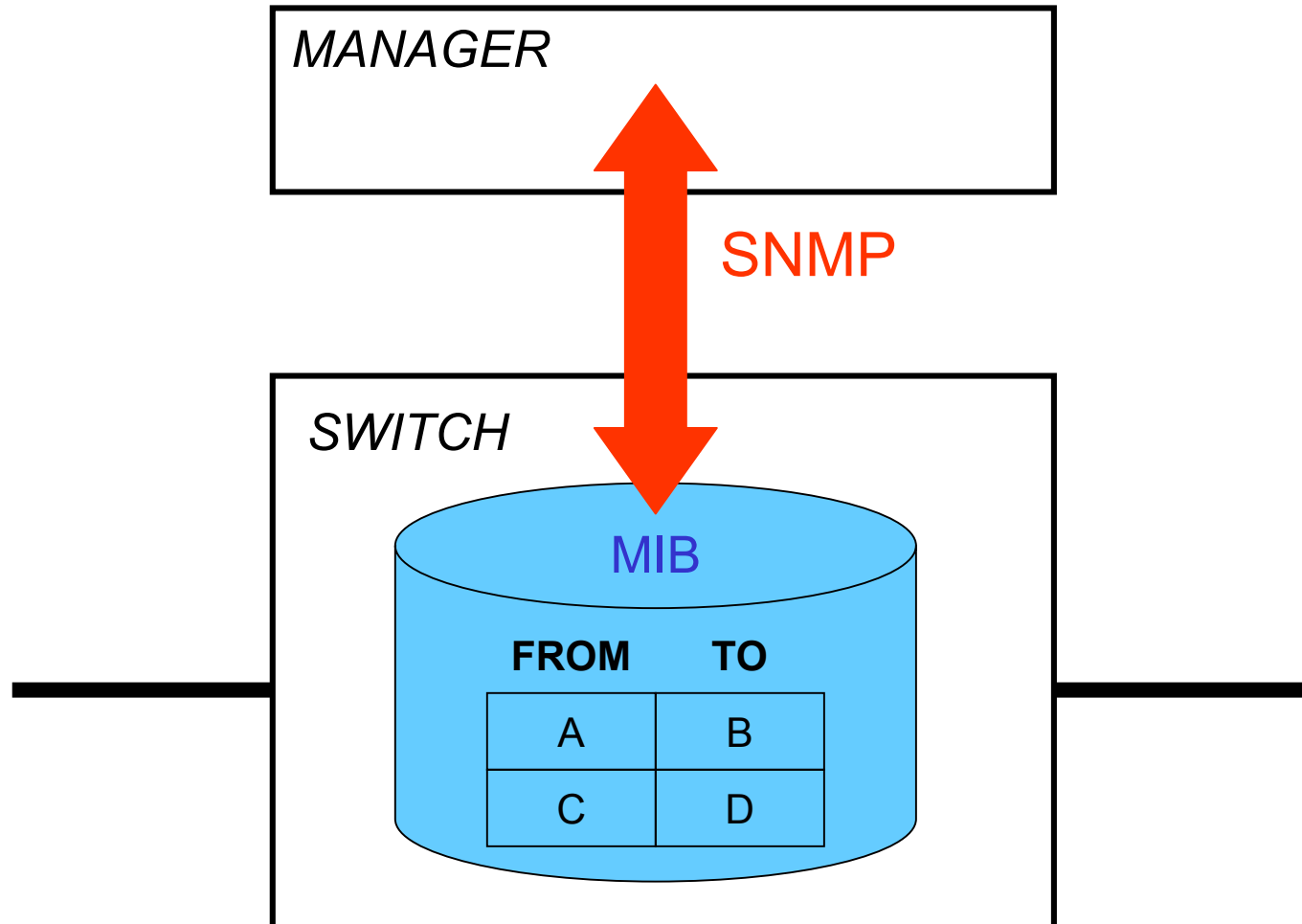


# MANAGEMENT





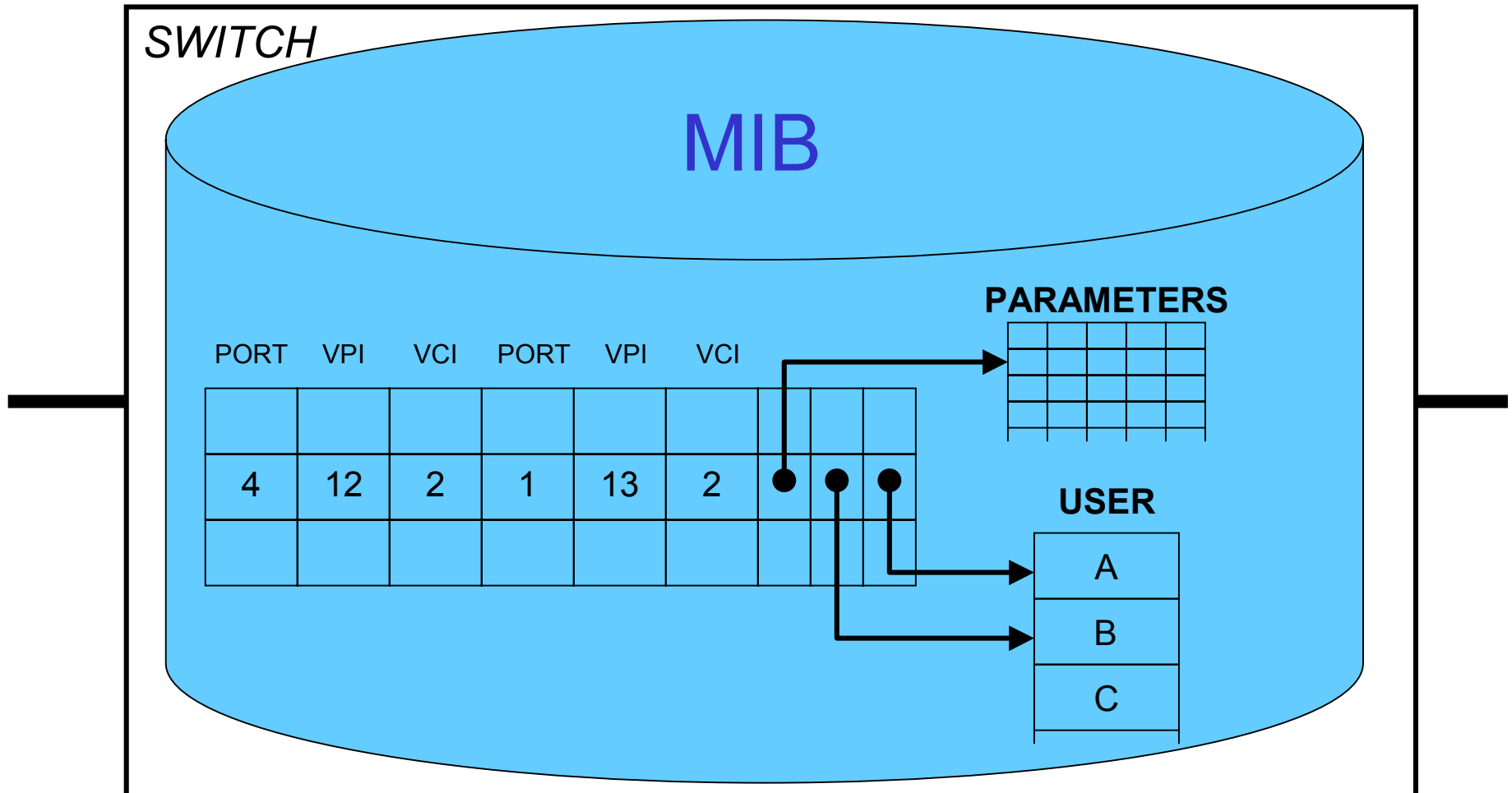
# ABORT EXISTING CONNECTIONS

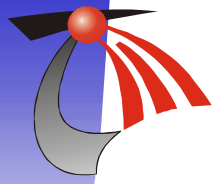






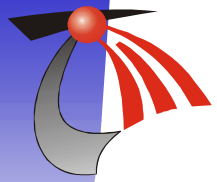
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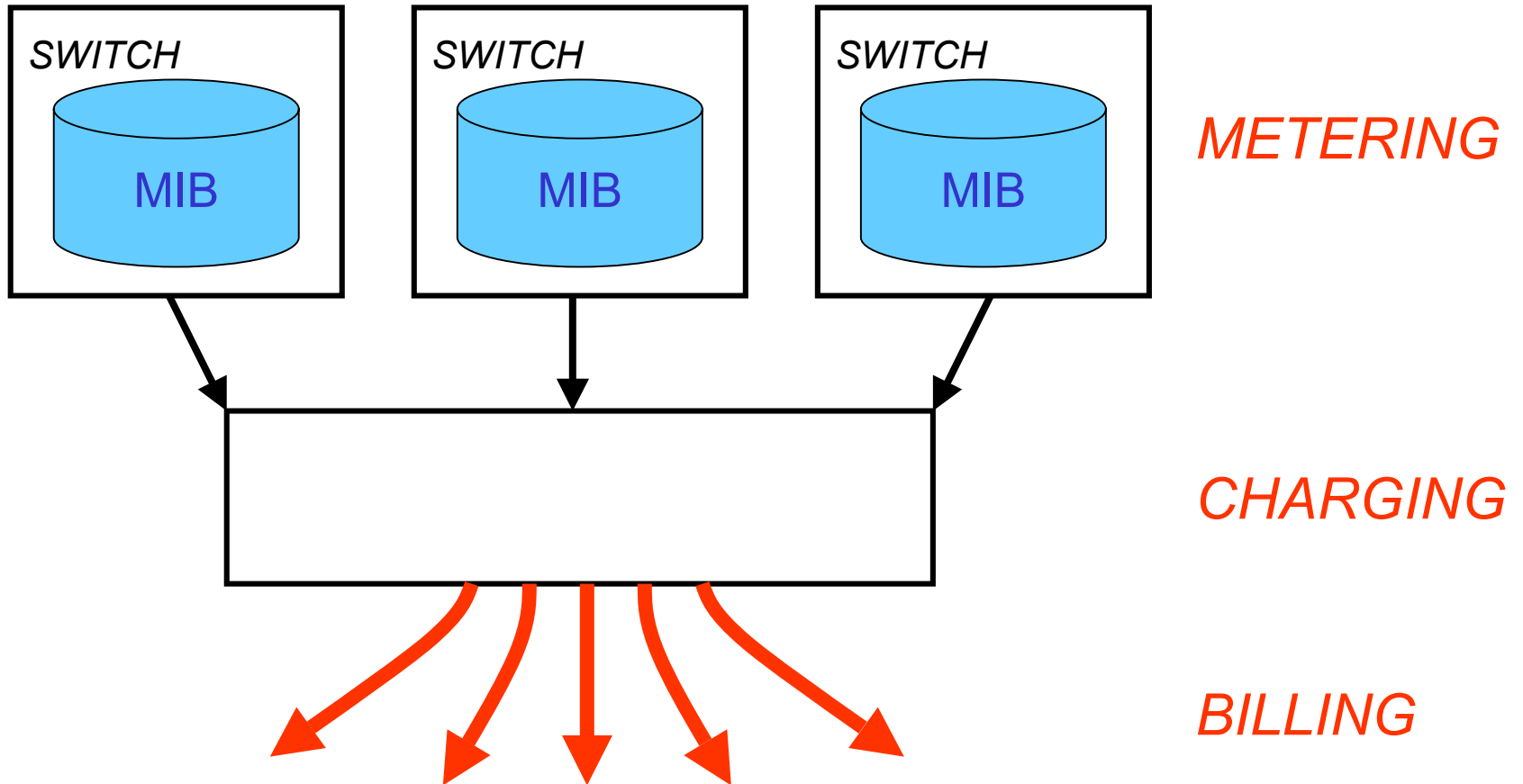


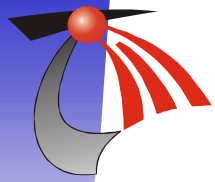
# MANAGEMENT





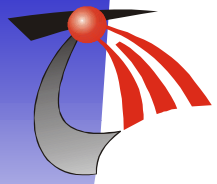
# ACCOUNTING





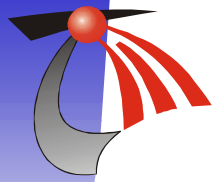
# METERING

- **WORKING DOCUMENTS WITHIN IETF**
- **IETF PROPOSALS NOT YET IMPLEMENTED**
  - **PROVIDER SPECIFIC SOLUTIONS**

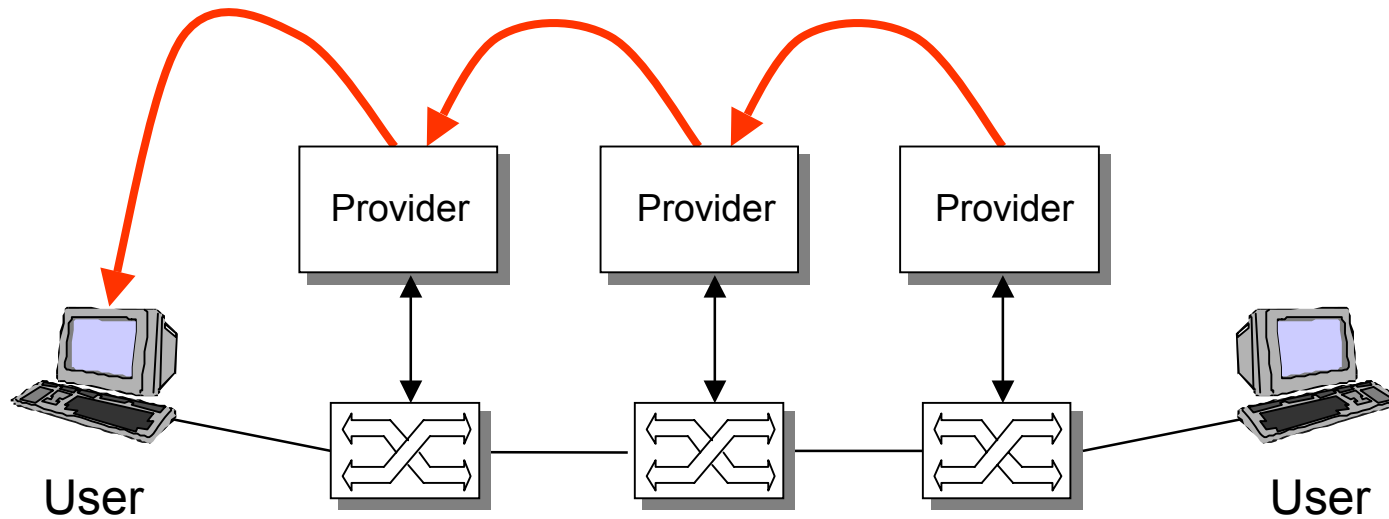


# CHARGING

## NO OPEN STANDARDS



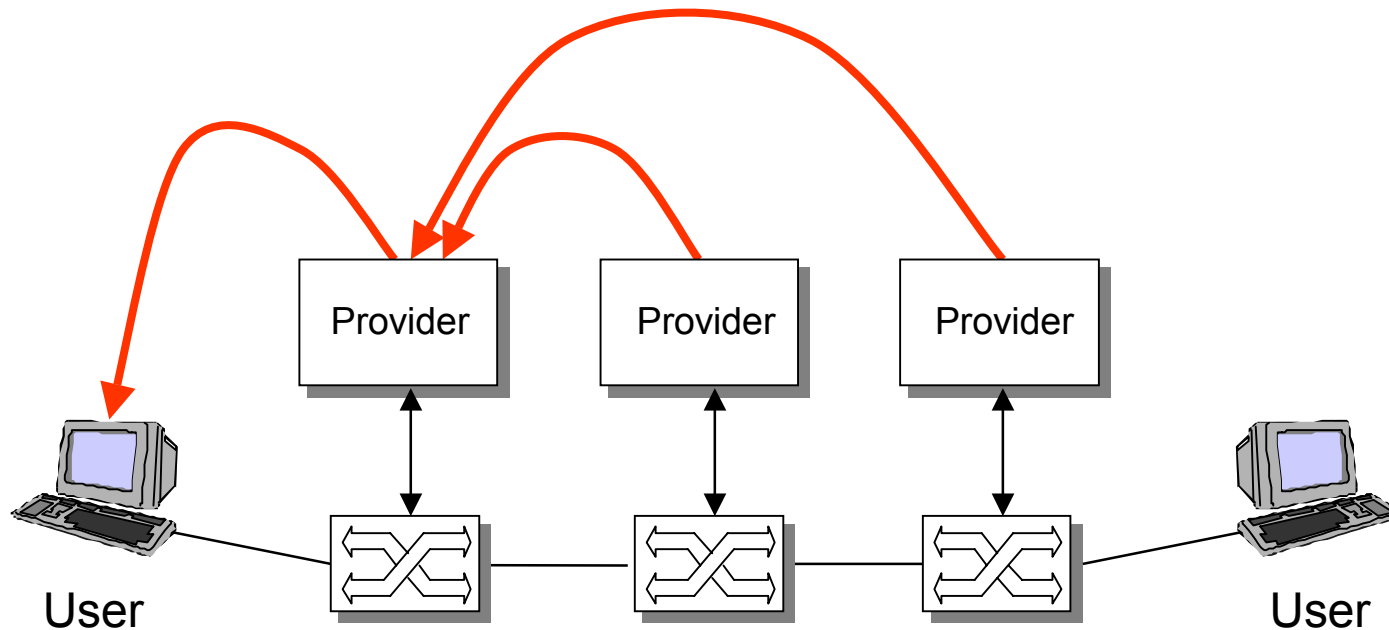
# BILLING SETTLEMENT WITH *PRECEDING* PROVIDER





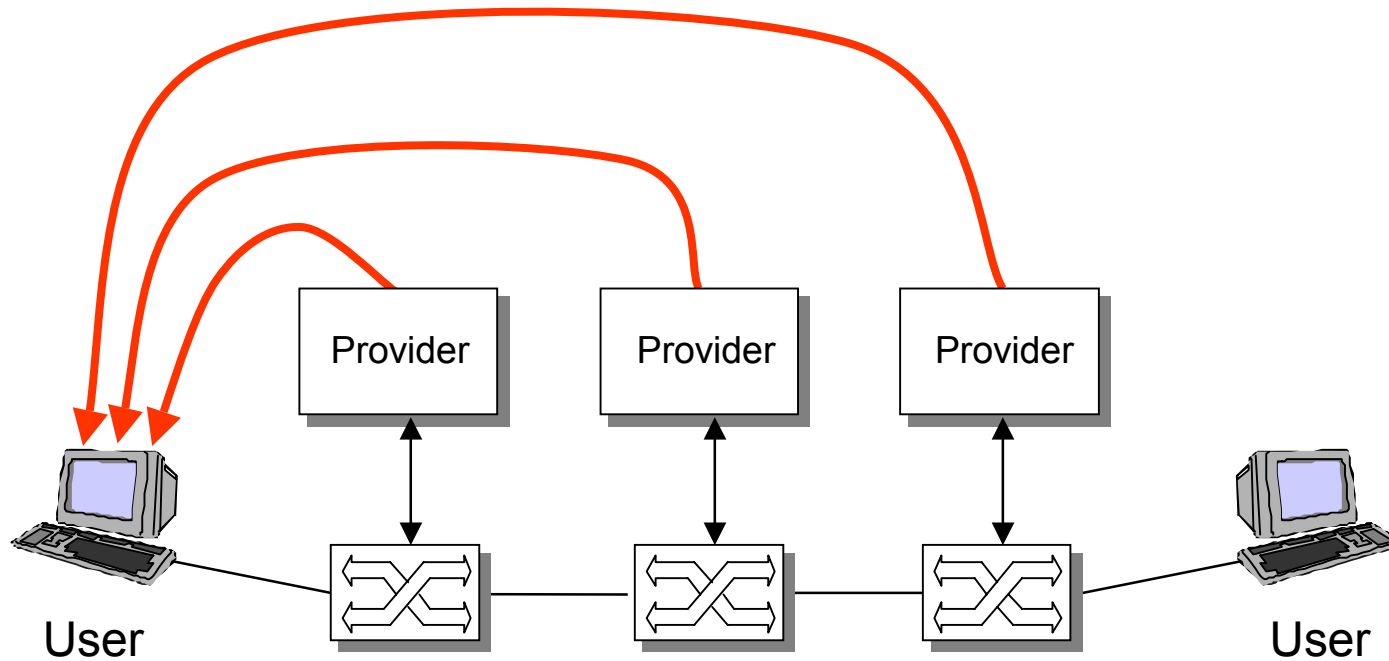
# BILLING

## SETTLEMENT WITH *ORIGINATING* PROVIDER

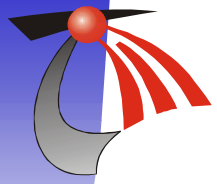




# BILLING SETTLEMENT WITH ORIGINATING *USER*

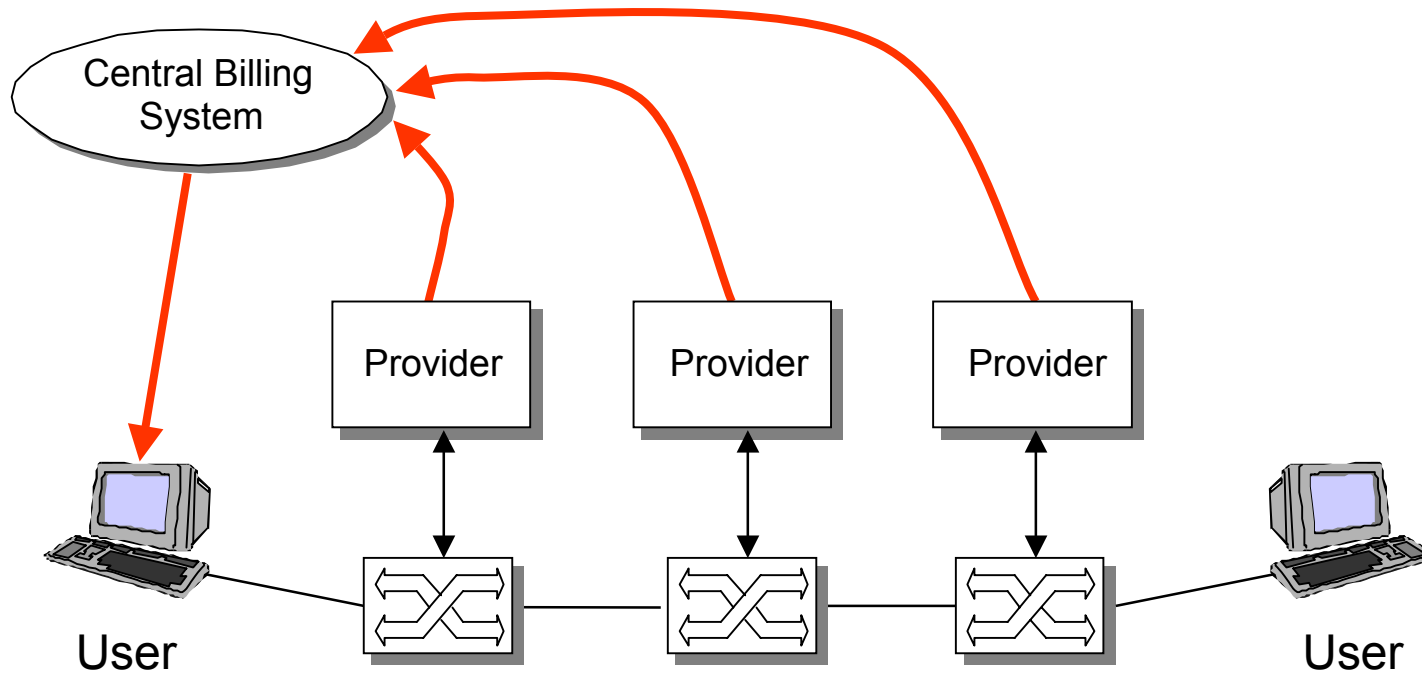


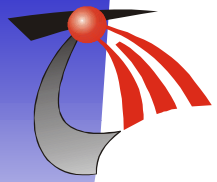




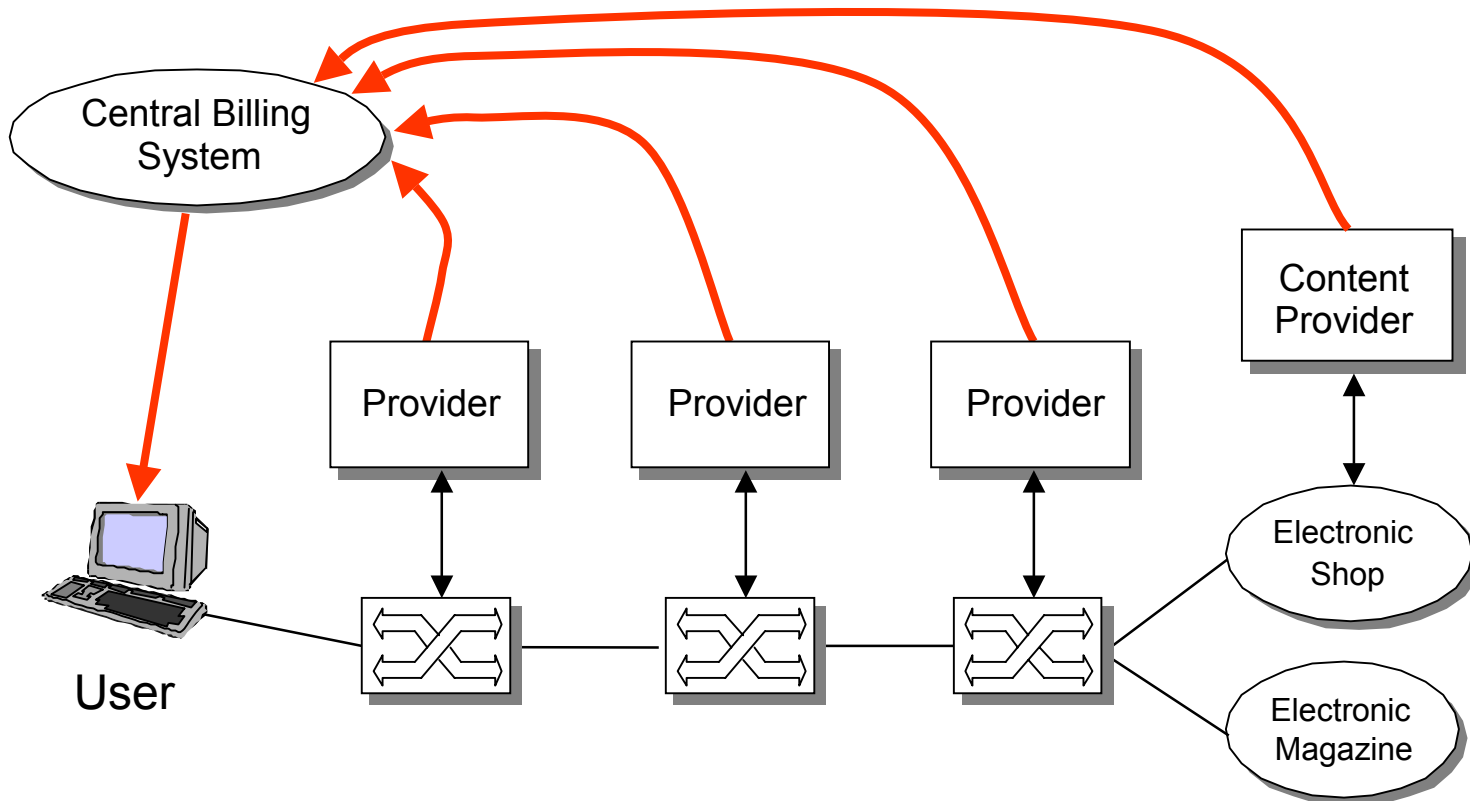
# BILLING

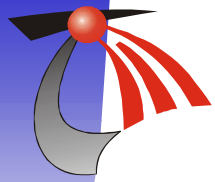
## CENTRAL BILLING SYSTEM





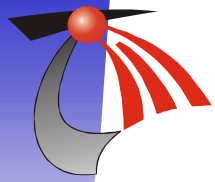
# BILLING CONTENT PROVIDERS





# SUMMARY

- **CONNECTION ADMISSION CONTROL: OK**
- **POLICY CONTROL: NOT AVAILABLE**
- **ABORTING CONNECTIONS: PRIMITIVE, BUT POSSIBLE**
- **USAGE METERING: NO STANDARD IMPLEMENTATIONS**
  - **CHARGING: NO STANDARDS**
  - **BILLING: MANY OPTIONS**



# CONCLUSIONS

- **ATM SVC MANAGEMENT HAS BEEN NEGLECTED**
  - **INTRODUCTION OF SVCs POSTPONED**
- **IPv6 / RSVP FACE SAME MANAGEMENT PROBLEMS**
  - **MORE RESEARCH IS NEEDED**