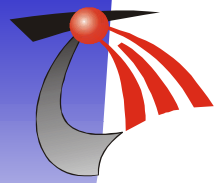

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THE INTERNET NEXT GENERATION PROJECT

http://ing.ctit.utwente.nl/

Aiko Pras
http://wwwhome.ctit.utwente.nl/~pras

Centre for Telematics and Information Technology (CTIT)
University of Twente (UT)
The Netherlands

PRESENTATION AT LORIA-INRIA LORRAINE, NANCY, FRANCE

05-6-2001

KEY FIGURES

START: 1-1-1999

DURATION: 4 YEARS

PARTNERS:

- **CTIT**
- **TELEMATICS INSTITUTE - CENTRAL ORGANIZATION**
- **ERICSSON EUROLAB NETHERLANDS**
- **KPN RESEARCH**

- **COSTS 2001: 2.5 MEURO (CTIT: 0.8 MEURO)**
- **FTE 2001: 21 (CTIT: 7.5)**

PROJECT GOALS

- **INCREASE DUTCH CONTRIBUTION TO THE INTERNATIONAL DEVELOPMENT OF NEW INTERNET TECHNOLOGIES**
  - **INTERNET-2, IETF, IRTF**

- **KNOWLEDGE CENTER WITHIN THE NETHERLANDS**
- **WEB SITE(S), TUTORIALS, ONLINE TRAINING MATERIAL, ANTC & ETB**

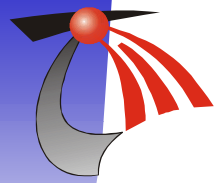
RESEARCH SUBJECT

- **PROVISION OF QUALITY OF SERVICE IN THE INTERNET**

- **IN CORE NETWORKS**
- **IN ACCESS NETWORKS**

- **INTRODUCE ACCOUNTING**

- **IMPROVE MANAGEMENT ARCHITECTURE**



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WU 1: DISSEMINATION

WEB SITE WITH INTERNET MANAGEMENT INFORMATION

TUTORIALS ON:

- **SNMPv3**
- **DISTRIBUTED MANAGEMENT**
- **INTSERV AND DIFFSERV**
- **MOBILE NETWORKING**

TRAINING MODULE ON INTERNET MANAGEMENT PROTOCOLS

EXAMPLE OF QUESTIONS

WHEN (DAY & TIME) WAS THE LAST RESET
OF (THE MANAGEMENT PORTION OF) THE HP LASERJET?

HOW MANY INTERFACES (EXCLUDING THE LOOPBACK)
HAS THE AGS+ ROUTER

WHAT IS THE SPEED (IN MBPS) OF THESE INTERFACES?

WHAT IS THE MAC ADDRESS OF THE INTERFACE
THAT RECEIVED MOST ERRORS?

WHAT IP ADDRESS BELONGS TO THAT INTERFACE?

Simple Web

The MIBs

Home

Internet
IETF-homepage
IETF-area
RFCs
MIBs
MIB Validation
Vendor MIBs
Links
Simple Times
FAQ
Standard orgs
Software
Events & Contacts
Bibliography

Site Search

Simple Times
(issue Sep. 2000)

TSS Mgt Group

IETF | IANA | MicroSoft

ACCOUNTING-CONTROL-MIB
ADSL-LINE-MIB
ADSL-TC-MIB
AGENTX-MIB
APPC-MIB
APPLETALK-MIB
APPLICATION-MIB
APPN-DLUR-MIB
APPN-MIB
APPN-TRAP-MIB
ATM-ACCOUNTING-INFORMATION-MIB
ATM-MIB
ATM-TC-MIB
BGP4-MIB
BRIDGE-MIB

- (•) HTML
- ( ) module
- ( ) original module
- ( ) SMIng
- ( ) XML (smi ng)
- ( ) XML (smi v2)
- ( ) RFC

Show

Legend

HTML: the left side of the screen presents the MIB navigation tree. You can click on nodes to expand / collapse the tree. The right side shows the definition of the selected MIB object.
Module: the MIB module, which might have been changed to remove possible errors.
Original module: the MIB module, as extracted from the RFC.
SMIng: MIBs in SMIng structure.
XML (smi ng): MIBs represented in SMIng structure, XML-encoded. This form is currently under discussion by the IRTF-NMRG.
XML (smi v2): MIBs represented in SMIv2 structure, XML-encoded.
RFC: the RFC the MIB module was extracted from.

IF-MIB DEFINITIONS ::= BEGIN

Simple Web

Imports

Alternatives

Module Identity

OwnerString
InterfaceIndex
InterfaceIndexOrZero

- interfaces
  - ifNumber
  - ifTable
- ifMIBObjects
- ifConformance
- linkDown
- linkUp

END

ifTable	ObjectType
Syntax	SequenceOf IfEntry
MaxAccess	not-accessible
Status	current
Description	A list of interface entries. The number of entries is given by the value of ifNumber.
Fq Name	iso.org.dod.internet.mgmt.mib-2.interfaces.ifTable
::=	{ interfaces 2 } (1.3.6.1.2.1.2.2.)

Select device to test: HP LaserJet 4050 TN
Cabletron 2000 (router)
Cisco ags-plus (router)

IF-MIB DEFINITIONS ::= BEGIN

Simple Web

Imports

Alternatives

Module Identity

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END

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Select device to test: HP LaserJet 4050 TN
Cabletron 2000 (router) <===
Cisco ags-plus (router)

ifIndex	ifDescr	ifType	ifMtu	ifSpeed	ifPhysAd
1	Physical port: et.1.1	ethernetCsmacd(6)	1500	Gauge32: 10000000	0:e0:63:2b
2	Physical port: et.1.2	ethernetCsmacd(6)	1500	Gauge32: 0	0:e0:63:2b
3	Physical port: et.1.3	ethernetCsmacd(6)	1500	Gauge32: 10000000	0:e0:63:2b
4	Physical port: et.1.4	ethernetCsmacd(6)	1500	Gauge32: 100000000	0:e0:63:2b
5	Physical port: et.1.5	ethernetCsmacd(6)	1500	Gauge32: 0	0:e0:63:2b
6	Physical port: et.1.6	ethernetCsmacd(6)	1500	Gauge32: 0	0:e0:63:2b
7	Physical port: et.1.7	ethernetCsmacd(6)	1500	Gauge32: 0	0:e0:63:2b

File Edit View Go Communicator Help

Bookmarks Location: f/mibs/modules/html/ex/?module=IF-MIB&object=ifTable&deviceFullName=Cabletron%202000%20%28router%29&orientation=hor&noTypes=1 What's Related

Select device to test: HP LaserJet 4050 TN
Cabletron 2000 (router) <===
Cisco ags-plus (router)

ifIndex	ifDescr	ifType	ifMtu	ifSpeed	ifPhysAddress	ifAdminStatus	ifOperStatus	ifLastChange	ifInOctets	ifInUcas
1	Physical	ethernetCsmacd	1500	10000000	0:e0:63:2b:2e:e2	up	up	88:23:12:34.00	1531499409	7660569
2	Physical	ethernetCsmacd	1500	0	0:e0:63:2b:2e:e2	up	down	65:23:34:12.00	3007402828	3994203
3	Physical	ethernetCsmacd	1500	10000000	0:e0:63:2b:2e:e2	up	up	19:23:21:35.00	1620122291	2433505
4	Physical	ethernetCsmacd	1500	100000000	0:e0:63:2b:2e:e2	up	up	65:20:54:15.00	164427979	837965
5	Physical	ethernetCsmacd	1500	0	0:e0:63:2b:2e:e2	up	down	19:23:12:24.00	191075747	414008
6	Physical	ethernetCsmacd	1500	0	0:e0:63:2b:2e:e2	up	down	0:0:00:00.00	0	0
7	Physical	ethernetCsmacd	1500	0	0:e0:63:2b:2e:e2	up	down	0:0:00:00.00	0	0
8	Physical	ethernetCsmacd	1500	0	0:e0:63:2b:2e:e2	up	down	0:0:00:00.00	0	0
9	Physical	ethernetCsmacd	1500	10000000	0:e0:63:2b:2e:e2	up	up	17:0:59:30.00	6792528	75256
10	Physical	ethernetCsmacd	1500	10000000	0:e0:63:2b:2e:e2	up	up	17:0:59:58.00	6466776	70432
11	Physical	ethernetCsmacd	1500	0	0:e0:63:2b:2e:e2	up	down	0:0:00:00.00	0	0
12	Physical	ethernetCsmacd	1500	0	0:e0:63:2b:2e:e2	up	down	34:23:11:16.00	0	0
13	Physical	ethernetCsmacd	1500	0	0:e0:63:2b:2e:e2	up	down	0:0:00:00.00	0	0
14	Physical	ethernetCsmacd	1500	0	0:e0:63:2b:2e:e2	up	down	0:0:00:00.00	0	0
15	Physical	ethernetCsmacd	1500	0	0:e0:63:2b:2e:e2	up	down	0:0:00:00.00	0	0
16	Physical	ethernetCsmacd	1500	0	0:e0:63:2b:2e:e2	up	down	65:21:26:28.00	1728	0
17	VLAN:	l2vlan	0	0		up	lowerLayerDown	88:23:12:34.00	1728	0
18	IP	ipForward	1968	0	0:0:0:0:0:0	up	up	0:0:00:00.00	0	0
19	IP	ipForward	1500	0	0:e0:63:2b:2e:e3	down	down	0:0:00:00.00	0	0
20	VLAN:	l3ipvlan	0	0		up	up	88:23:12:34.00	1531501176	7660588
21	IP	ipForward	1500	0	0:e0:63:2b:2e:e2	up	up	88:23:12:34.00	1531501269	7660589
22	VLAN:	l3ipvlan	0	0		up	lowerLayerDown	65:23:34:12.00	3007402828	3994203
23	IP	ipForward	1500	0	0:e0:63:2b:2e:e2	up	lowerLayerDown	65:23:34:12.00	3007402828	3994203

Document: Done

Simple Web

UT Demo MIB - Get (v1)

Home

SNMP v1
Get
GetNext
Set
SNMP v2c
SNMP v3

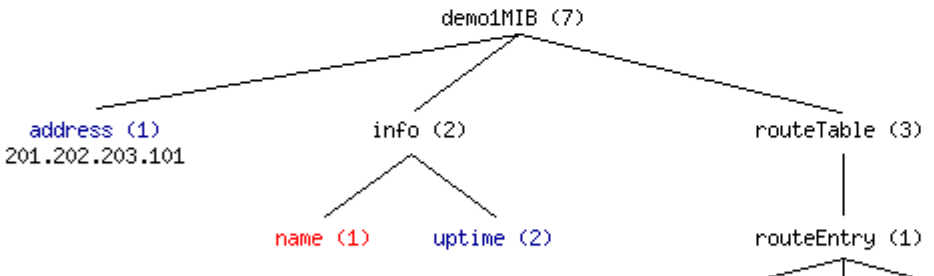
Site Search

Simple Times
(issue Sep. 2000)

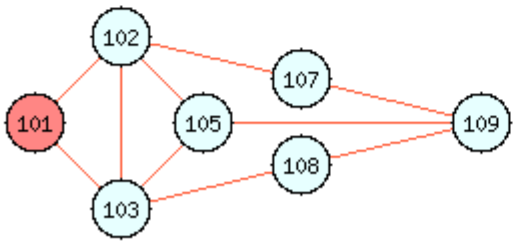
TSS Mgt Group

Object Id(s)	7.1.0
Object Value(s)	
Error Status	
Error Index	

Get



routeDest (1)	policy(2)	routeNext (3)
201.202.203.102	1	201.202.203.102
201.202.203.103	1	201.202.203.103
201.202.203.105	1	201.202.203.102
201.202.203.105	2	201.202.203.103
201.202.203.107	1	201.202.203.102
201.202.203.108	1	201.202.203.103
201.202.203.109	1	201.202.203.102



Last changed by
the SimpleWeb
May 16, 2001

File Edit View Go Communicator Help

Bookmarks Location: http://www.simpleweb.org/tutorials/demo/snmp/v3/get.html What's Related

Home

SNMP v1
SNMP v2c
SNMP v3
Get
GetNext
GetBulk
Set

Site Search

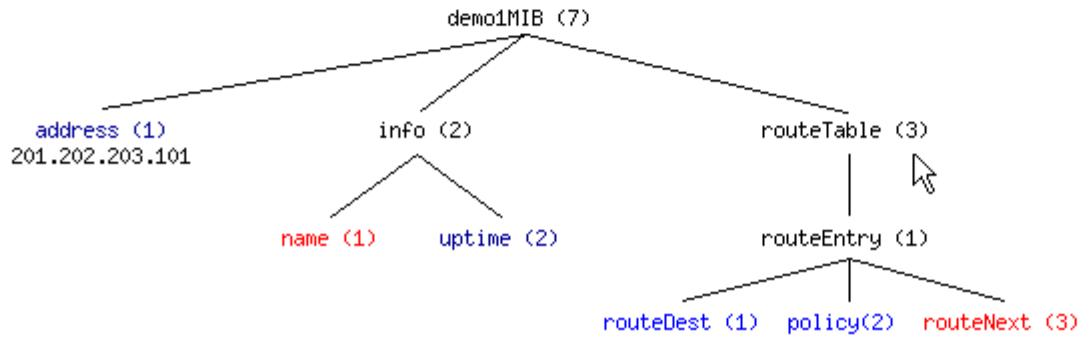
Simple Times
(issue Sep. 2000)

TSS Mgt Group

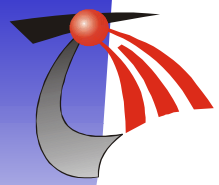
Lastchanged by the SimpleWeb
May 10, 2001

Security name	
Security level	○ no Auth, no Priv ○ Auth, no Priv ◉ Auth, Priv
Authentication	Protocol ○ MD5 ◉ SHA Pass phrase *(8 or more chars)*
Privacy	Protocol ◉ DES Pass phrase *(8 or more chars)*
Object Id(s)	7.1.0
Object Value(s)	
Error Status	
Error Index	

Get



Document: Done



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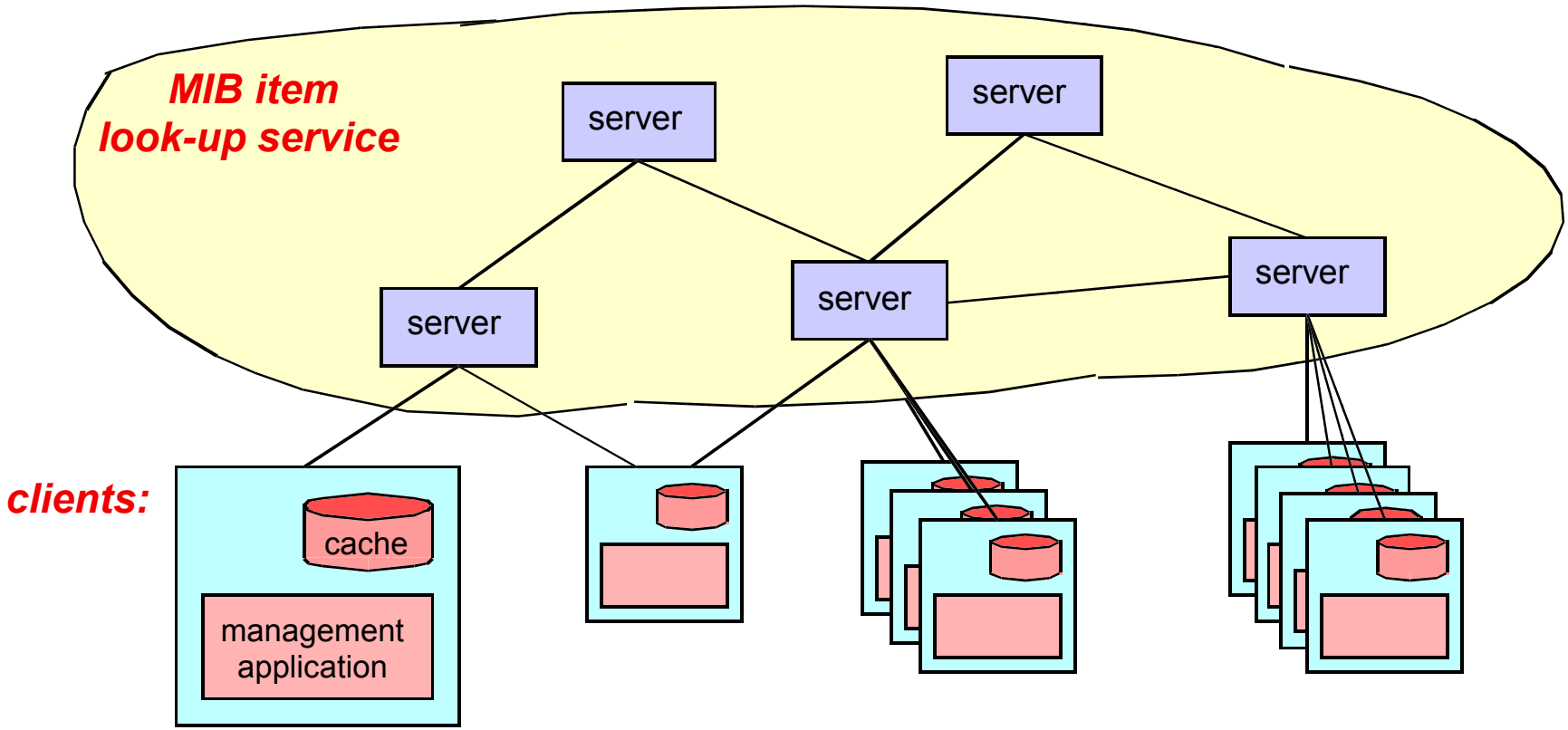
WORK UNIT 2

NEW INTERNET MANAGEMENT ARCHITECTURES

- CUSTOMER SERVICE MANAGEMENT (CSM)
- MIB ITEM LOOK-UP SERVICE
- DIFFSERV MIB IMPLEMENTATION
- COMPARISON OF SNMP MIB IMPLEMENTATIONS

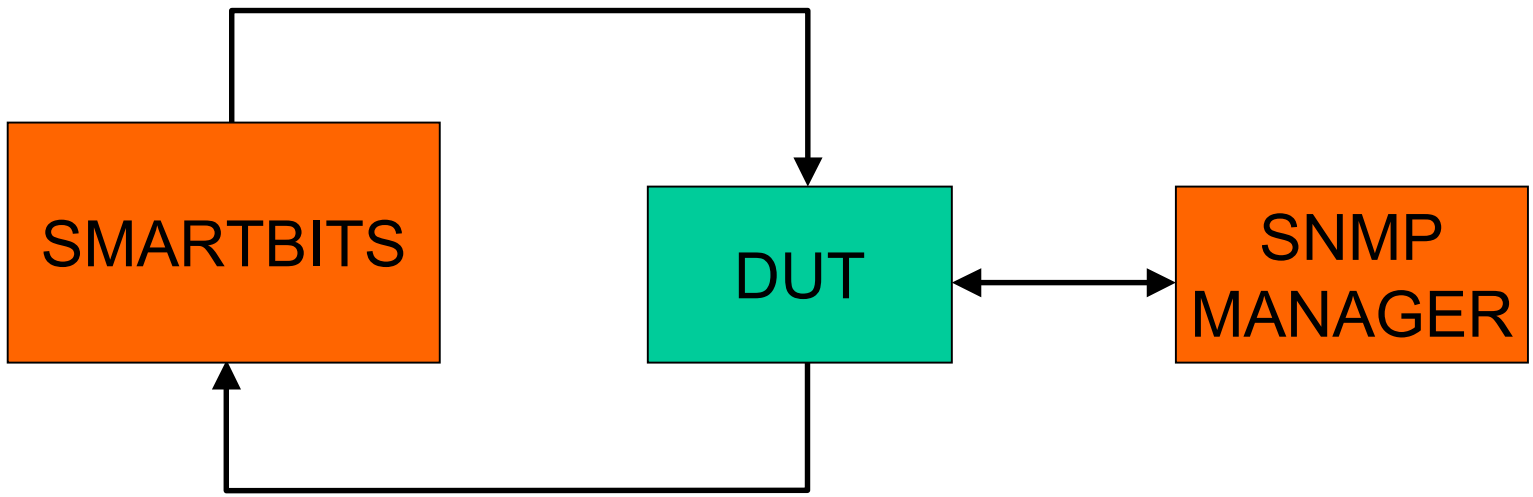
MIB ITEM LOOK-UP SERVICE



COMPARISON OF MIB IMPLEMENTATIONS

- TO INVESTIGATE IF CLI IS MORE “RELIABLE” THEN SNMP/MIBS

- TO GET A FEELING HOW “EASY” IT IS TO IMPLEMENT “SIMPLE” MANAGEMENT SOFTWARE



COMPARISON OF MIB IMPLEMENTATIONS II

- CABLETRON 2000
- CISCO 2600
- CISCO 7200
- CISCO AGS+
- CISCO LS1010
- ERICSSON AXI 520
- LINUX ROUTER
- MARCONI ESX 2400

WORK UNIT 5

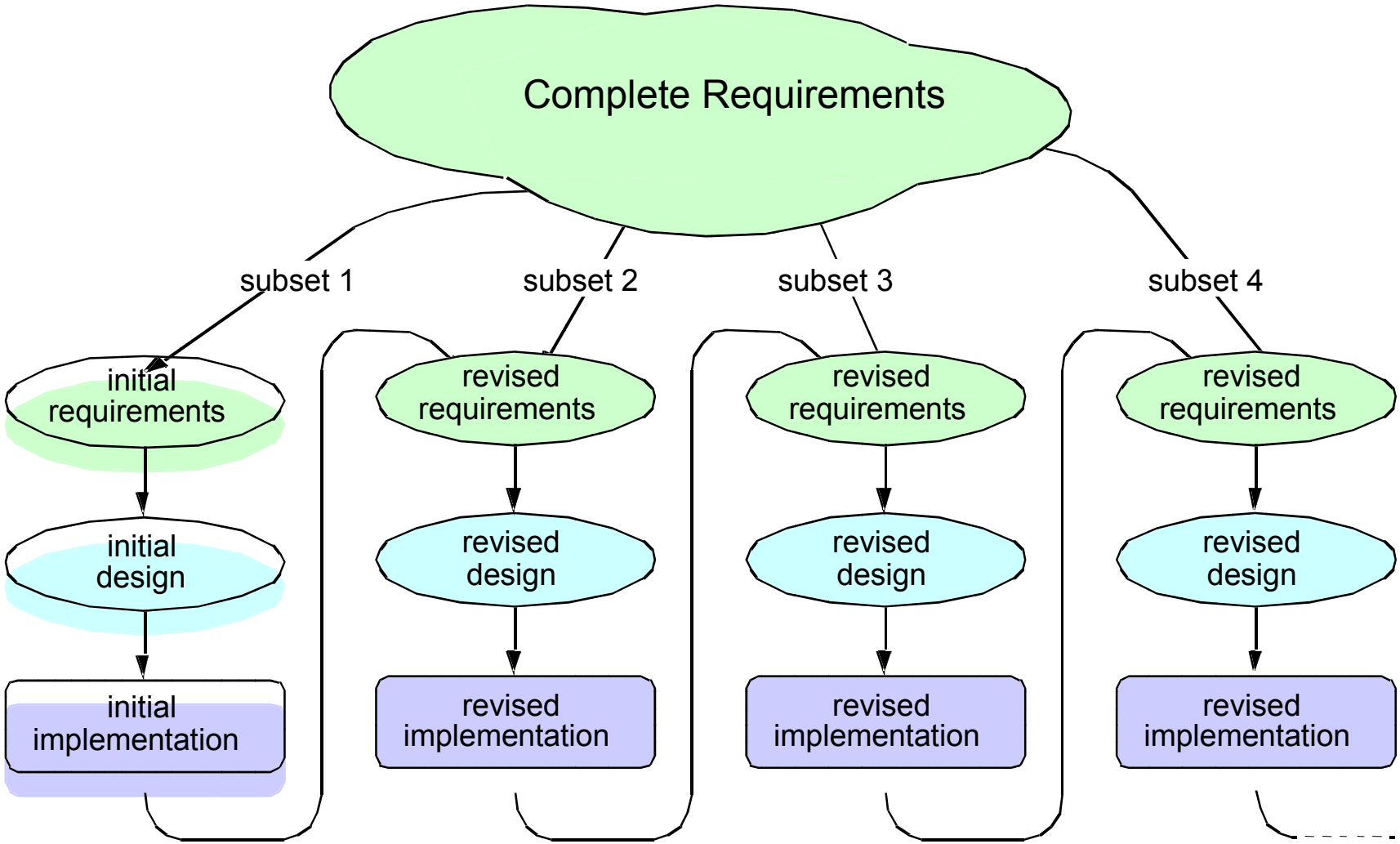
INTERNET ACCOUNTING

- **PROVIDER BASED ACCOUNTING (PBA)**

  Cyclic approach: mobility, security

- **MEASUREMENTS AND VISUALIZATION OF TRAFFIC FLOWS**

APPROACH


Complete Requirements
subset 1
subset 2
subset 3
subset 4
initial requirements
initial design
initial implementation
revised requirements
revised design
revised implementation
revised requirements
revised design
revised implementation
revised requirements
revised design
revised implementation

DEFINITION OF THE PBA SERVICE

THE GOAL OF THE *PROVIDER BASED ACCOUNTING*

(PBA) SERVICE, IS TO ALLOW CUSTOMERS

TO PAY SMALL AMOUNTS TO THEIR OWN ISPs

FOR BILLABLE CONTENT

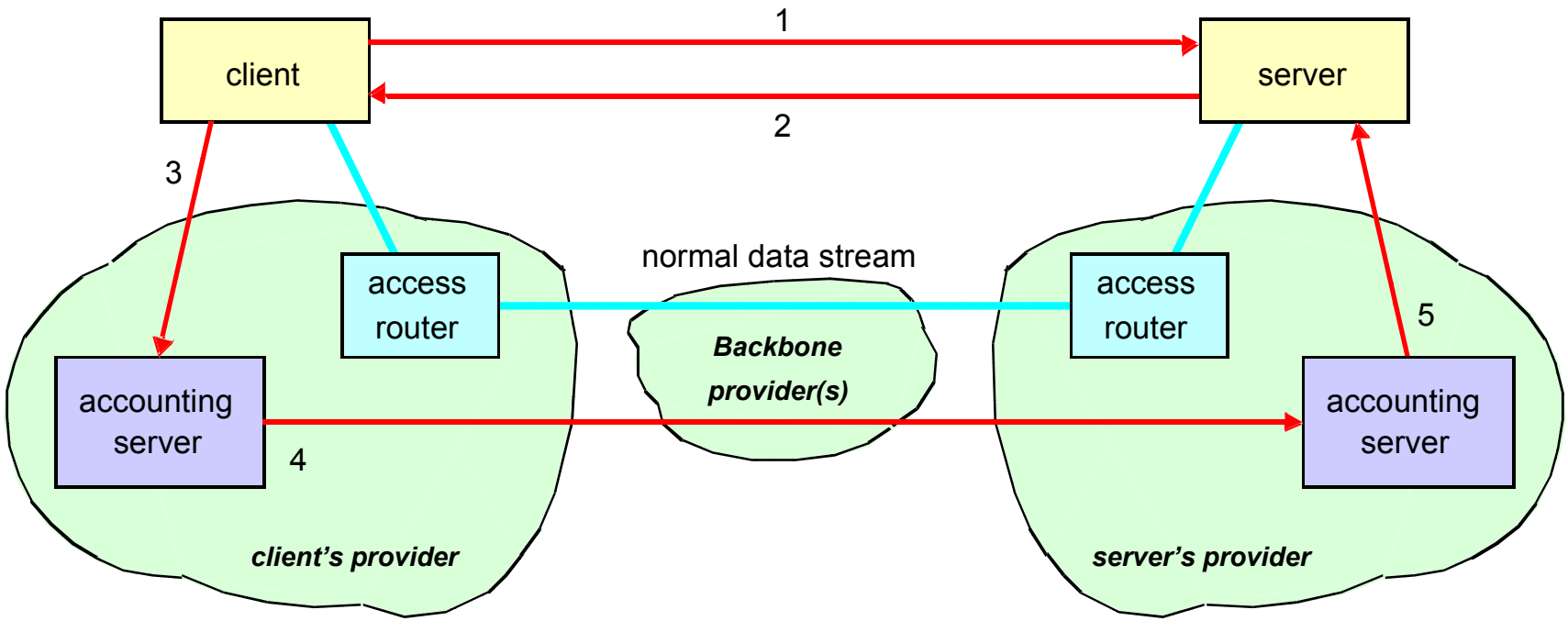
DELIVERED TO THEM FROM VARIOUS PROVIDERS,

WHILE THE CONTENT PROVIDERS

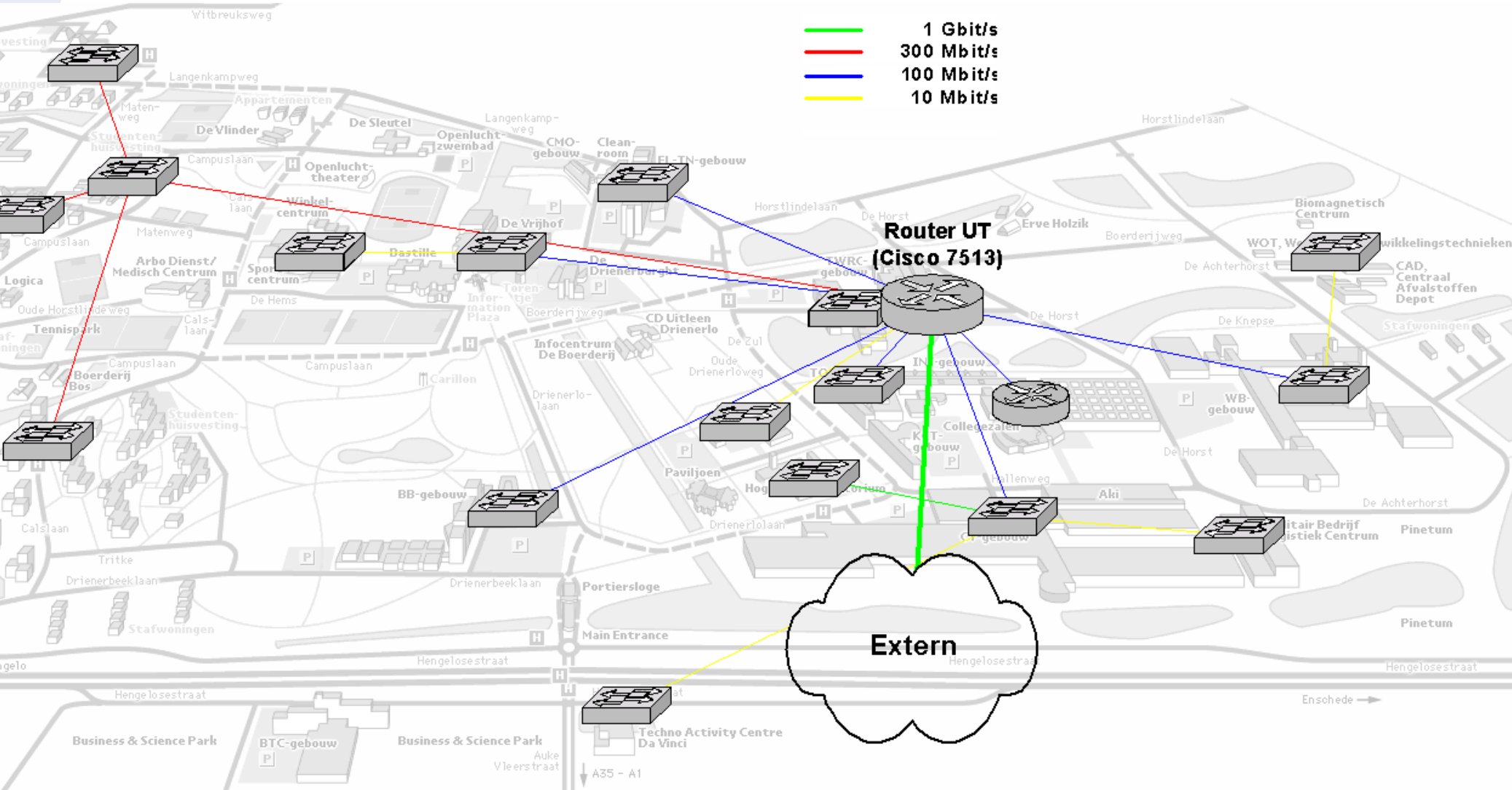
WILL RECEIVE THESE PAYMENTS

FROM THEIR OWN ISPs.

PBA ARCHITECTURE



TRAFFIC FLOW MEASUREMENTS



TRAFFIC FLOW MEASUREMENTS II