THE INTERNET NEXT GENERATION PROJECT

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PRESENTATION AT LORIA-INRIA LORRAINE, NANCY, FRANCE
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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
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?
The MIBs

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-NMRC.

XML (smi v2): MIBs represented in SMiv2 structure, XML-encoded.

RFC: the RFC the MIB module was extracted from.
**IF-MIB DEFINITIONS ::= BEGIN**

**Imports**

**Module Identity**

**OwnerString**

**InterfacesIndex**

**InterfaceIndexZero**

**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 aqs-plus (router)
| ifIndex | ifDescr | ifType       | ifMtu | ifSpeed     | ifPhysAddress | ifAdminStatus | ifOperStatus | ifLastChange | ifInOctets | ifInUcastOctets |
|---------|---------|--------------|-------|-------------|---------------|---------------|--------------|--------------|------------|-------------|----------------|
TRAINING MODULE INTERNET MANAGEMENT VI

Security name
- no Auth, no Priv
- Auth, no Priv
- Auth, Priv

Security level
- MD5
- SHA

Authentication
- DES

Privacy
- MD5
- SHA

Object Id(s)
- 7.1.0

Object Value(s)
- demoMIB
  - address: 201.202.203.101
  - info (2)
    - name (1)
    - uptime (2)
  - routeTable (3)
    - routeEntry (1)
      - routeDest (1)
      - policy (2)
      - routeNext (3)
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

MIB item look-up service

clients:
- cache
- management application
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

Diagram:

- SMARTBITS
- DUT
- SNMP MANAGER
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

initial requirements

initial design

initial implementation

revised requirements

revised design

revised implementation

subset 2

revised requirements

revised design

revised implementation

subset 3

revised requirements

revised design

revised implementation

subset 4

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

client

accounting server

access router

client’s provider

server

accounting server

access router

server’s provider

Backbone provider(s)

normal data stream

1

2

3

4

5
TRAFFIC FLOW MEASUREMENTS
TRAFFIC FLOW MEASUREMENTS II