

Quality of Service MIBs

DiffServ MIB

Mikhail E. Gridnev

Agenda

- What is it all about?
- Management Information
- Protocols
- DiffServ Management Architecture
- Q&A

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Why?

- The goal is to remotely monitor and control network elements such as
 - Hosts
 - Routers
 - Switches
 - Gateways

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How?

- By passing Management Information (MI)
- Using Simple Network Management Protocol (SNMP)

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Management Information

- MI is a set of Management Objects (MO)
- Structure and identification of MOs is defined in the Structure of Management Information (SMI)
 - SMI, SMIv2
- MOs are organized into a virtual storage termed Management Information Base (MIB)
 - MIB-II, RMON MIB, DiffServ MIB

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Management Object

- Name (Object ID or OID)
 - iso.org.dod.internet.mgmt.mib-2.system.sysName
 - 1.3.6.1.2.1.1.5
- Type
 - Primitive
 - INTEGER, OCTET STRING, OID, NULL
 - Standard
 - IpAddress, Counter, Gauge, TimeTicks
 - User defined

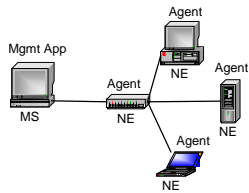
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SNMP

- A protocol for communicating Management Information



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SNMP Architecture

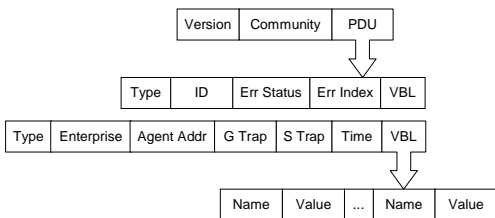
- Network Management Station
 - Executes Management Application to monitor and control network elements
- Network Element
 - Runs Management Agent to perform management functions requested by the management application

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SNMP Message Format



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SNMP Message Type

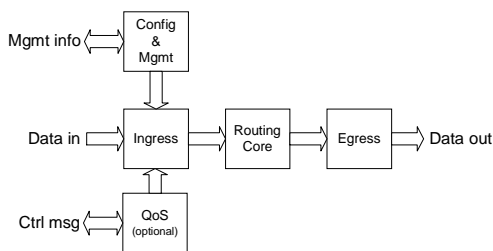
- Get Request
 - Read object value
- Get Next Request
 - Read the value of the object's immediate successor
- Set Request
 - Write object value
- Get Response
 - A response to Get, Get Next, or Set message
- Trap
 - A notification fired by the management agent

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DiffServ Conceptual Router



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DiffServ Router Management Model

- The model describes the behavior of the router's ingress/egress interfaces in terms of one or more Traffic Conditioning Blocks (TCB)
- TCB is a logical data path (DP) entity configured to perform a specific set of traffic conditioning functions

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Data Path

- DP is a conceptual path taken by packets within the router
- DP consists of interconnected Functional Data Path Elements (FDPE)

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Functional Data Path Element

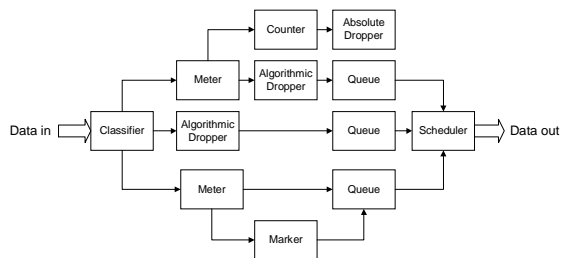
- FDPE is a basic building block of the conceptual router
 - Classifier
 - Meter
 - Absolute Dropper, Counter, Marker, MUX, NULL
 - Algorithmic Dropper
 - Queue
 - Scheduler

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TCB Example



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DiffServ MIB

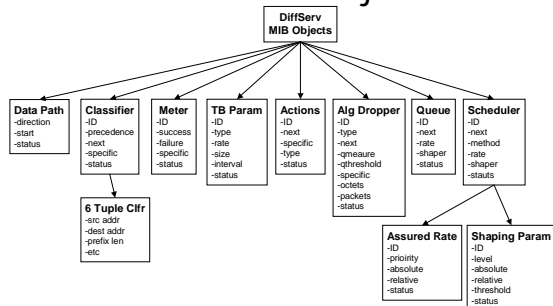
- DiffServ MIB closely follows the DiffServ Router Management Model
 - iso.org.dod.internet.mgmt.mib-2.diffServMIB (1.3.6.1.2.1.12345.1)
 - diffServMIBObjects
 - diffServMIBConformance

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diffServMIBObjects



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Review Questions

- What is an MIB?
- What is the purpose of the SNMP Management Agent?
- What is the basic building block of the DiffServ conceptual router?
- What is the difference between an Absolute Dropper and an Algorithmic one?
- How does one locate the first FDPE for a given interface of the DiffServ Router in the DiffServ MIB?

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Acronyms

- DP – Data Path
- FDPE – Functional Data Path Element
- MI – Management Information
- MO – Management Object
- MIB – Management Information Base
- MS – Management Station
- NE – Network Element
- OID – Object ID
- SMI – Structure of Management Information
- SNMP – Simple Network Management Protocol
- TCB – Traffic Conditioning Block
- TB – Token Bucket
- VBL – Variable Bindings List

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