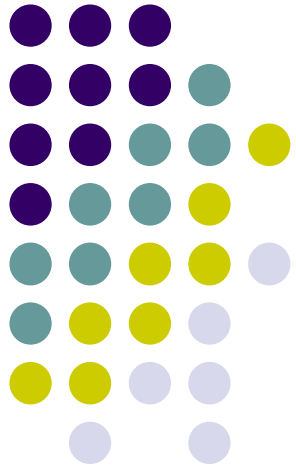
Standard MIBs

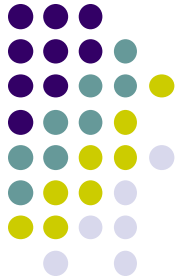
Lecture 2

Standard Management Groups in MIB-II

(supplementary: Chapter 3 of tutorial slides)



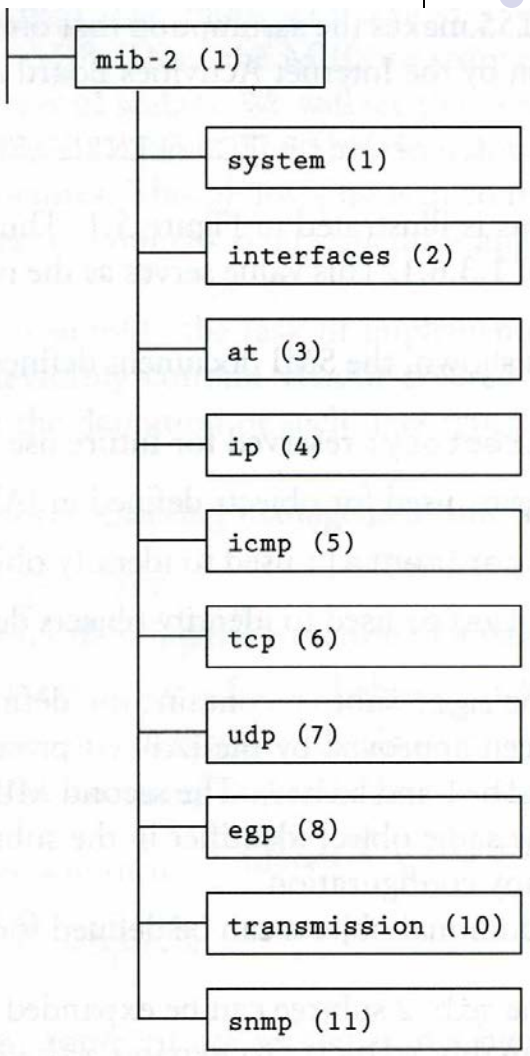
IETF MIBs



- 1212 Concise MIB definitions
- 1213 MIB-II
- 1316 Character Stream
- 1317 RS-232-like Hardware
- 1471 PPP
- 1513 RMON for Token Ring
- 1757 RMON
- 2021 RMON-II
- .....

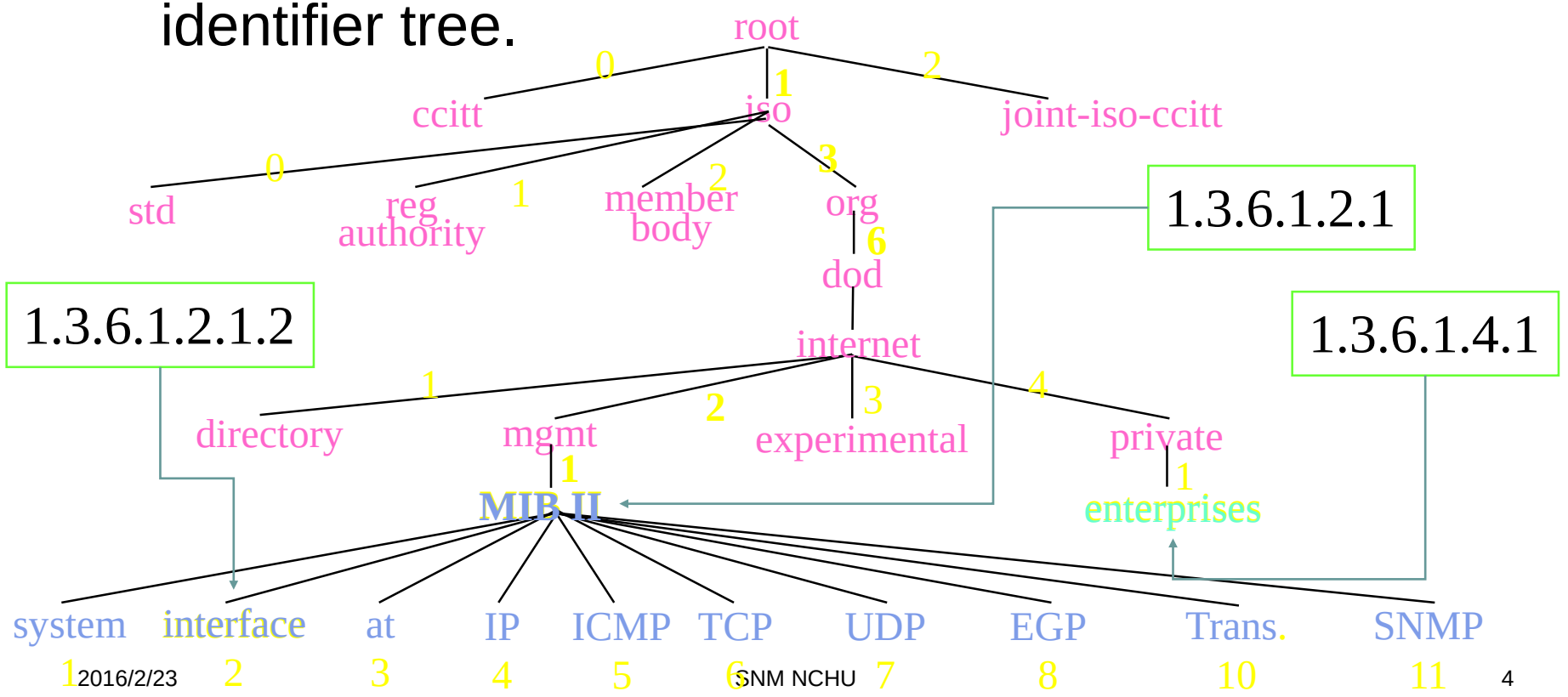
MIB-II Introduction (1)

- RFC1213
  - MIB-I (RFC 1156)
  - MIB-II is a superset of MIB-I with some additional objects and groups
  - 175 objects

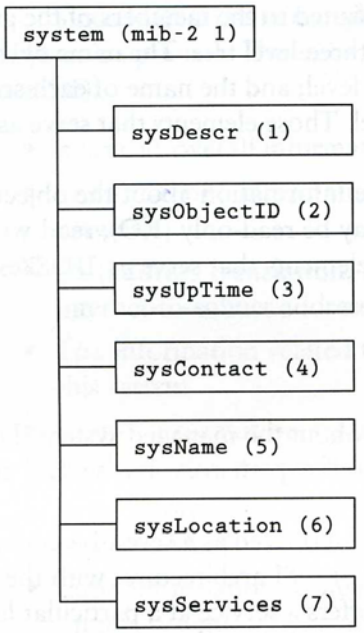


MIB-II Introduction (2)

- Object Identifier (OID):
  - Global identifier for a particular object type.
  - An OID consists of a sequence of integers, which specify the position of the object in the global object identifier tree.



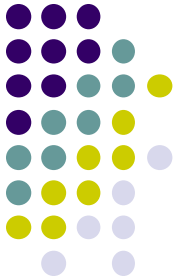
system group (1)



- 1.3.6.1.2.1
- sysServices
  - 1 physical (ex: repeater)
  - 2 datalink/subnetwork (ex: bridge)
  - 3 internet (ex: router)
  - 4 end-to-end (ex: IP hosts)
  - 7 applications (ex: mail relays)

Object	Syntax	Access	Description
sysDescr	DisplayString (SIZE (0 . . . 255))	RO	A description of the entity, such as hardware, operating system, etc.
sysObjectID	OBJECT IDENTIFIER	RO	The vendor's authoritative identification of the network management subsystem contained in the entity
sysUpTime	TimeTicks	RO	The time since the network management portion of the system was last reinitialized
sysContact	DisplayString (SIZE (0 . . . 255))	RW	The identification and contact information of the contact person for this managed node
sysName	DisplayString (SIZE (0 . . . 255))	RW	An administratively assigned name for this managed node
sysLocation	DisplayString (SIZE (0 . . . 255))	RW	The physical location of this node
sysServices	INTEGER (0 . . . 127)	RO	A value that indicates the set of services this entity primarily offers

system group (2)



- system OBJECT IDENTIFIER ::= {mib-2 1}
  - sysServices --- summed integer

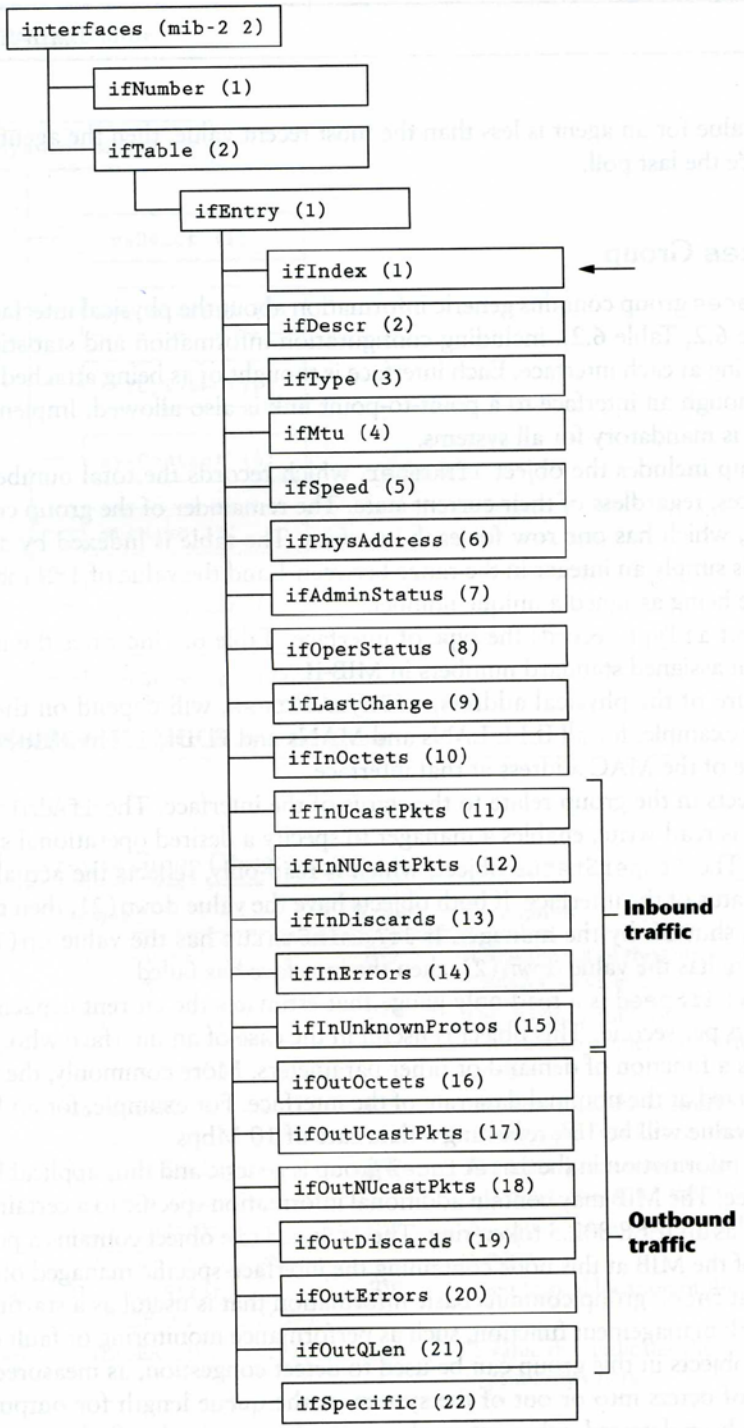
    for instance, a device supports services of layer 1, 2, and 3 has sysServices = 1+2+4=7

interfaces group (1)

- interfaces

OBJECT IDENTIFIER := {mib-2 2}

- 1.3.6.1.2.1.2



interfaces group (2)

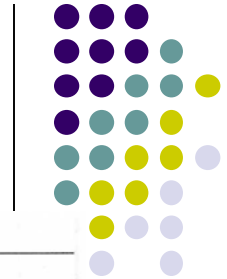


TABLE 6.2 interfaces Group Objects

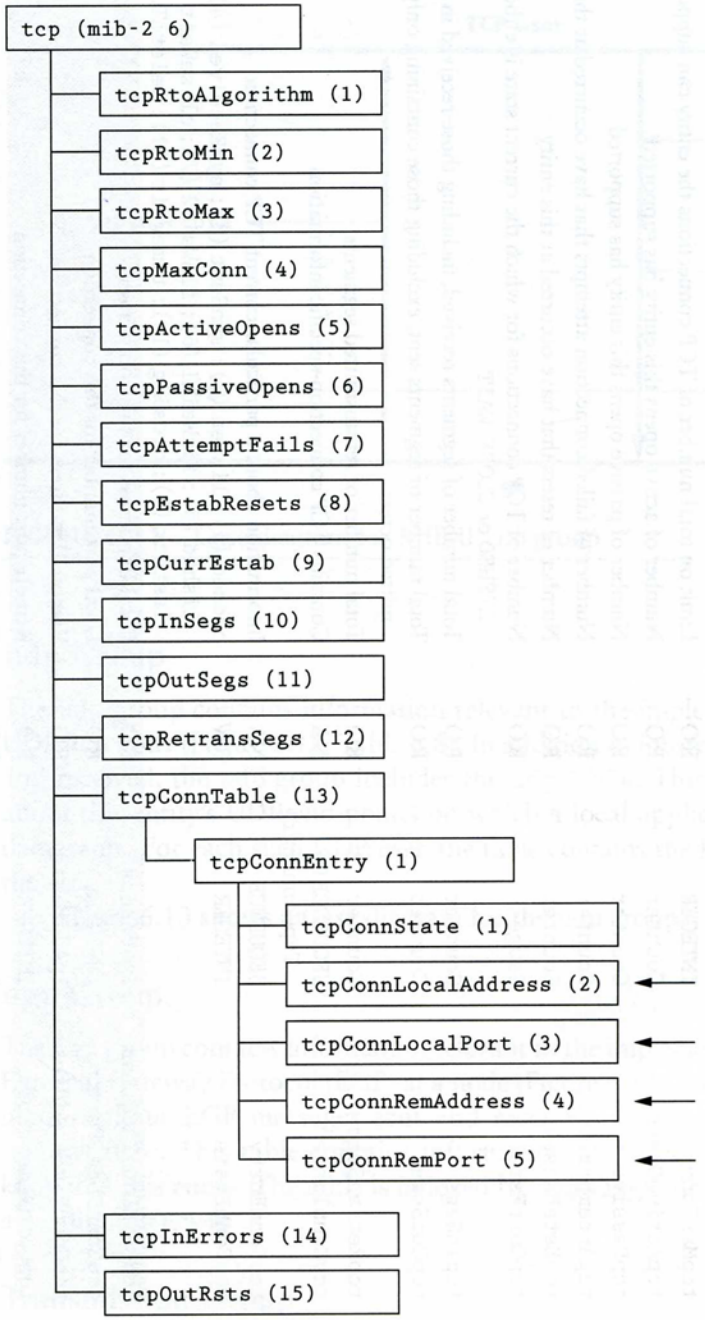
Object	Syntax	Access	Description
ifNumber	INTEGER	RO	The number of network interfaces
ifTable	SEQUENCE OF ifEntry	NA	A list of interface entries
ifEntry	SEQUENCE	NA	An interface entry containing objects at the subnetwork layer and below for a particular interface
ifIndex	INTEGER	RO	A unique value for each interface
ifDescr	DisplayString (SIZE (0 . . . 255))	RO	Information about the interface, including name of manufacturer, product name, and version of the hardware interface
ifType	INTEGER	RO	Type of interface, distinguished according to the physical/link protocol(s)
ifMtu	INTEGER	RO	The size of the largest protocol data unit, in octets, that can be sent/received on the interface
ifSpeed	Gauge	RO	An estimate of the interface's current data rate capacity
ifPhysAddress	PhysAddress	RO	The interface's address at the protocol layer immediately below the network layer
ifAdminStatus	INTEGER	RW	Desired interface state (up(1), down(2), testing(3))
ifOperStatus	INTEGER	RO	Current operational interface state (up(1), down(2), testing(3))
ifLastChange	TimeTicks	RO	Value of sysUpTime at the time the interface entered its current operational state
ifInOctets	Counter	RO	Total number of octets received on the interface, including framing characters
ifInUcastPkts	Counter	RO	Number of subnetwork-unicast packets delivered to a higher-layer protocol
ifInNUcastPkts	Counter	RO	Number of nonunicast packets delivered to a higher-layer protocol
ifInDiscards	Counter	RO	Number of inbound packets discarded, even though no errors had been detected, to prevent their being deliverable to a higher-layer protocol (e.g., buffer overflow)
ifInErrors	Counter	RO	Number of inbound packets that contained errors preventing them from being deliverable to a higher-layer protocol
ifInUnknownProtos	Counter	RO	Number of inbound packets that were discarded because of an unknown or unsupported protocol
ifOutOctets	Counter	RO	Total number of octets transmitted on the interface, including framing characters
ifOutUcastPkts	Counter	RO	Total number of packets that higher-level protocols requested be transmitted to a subnetwork-unicast address, including those that were discarded or otherwise not sent
ifOutNUcastPkts	Counter	RO	Total number of packets that higher-level protocols requested be transmitted to a nonunicast address, including those that were discarded or otherwise not sent
ifOutDiscards	Counter	RO	Number of outbound packets discarded even though no errors had been detected to prevent their being transmitted (e.g., buffer overflow)
ifOutErrors	Counter	RO	Number of outbound packets that could not be transmitted because of errors
ifOutQLen	Gauge	RO	Length of the output packet queue
ifSpecific	OBJECT IDENTIFIER	RO	Reference to MIB definitions specific to the particular media being used to realize the interface

tcp group

- tcp

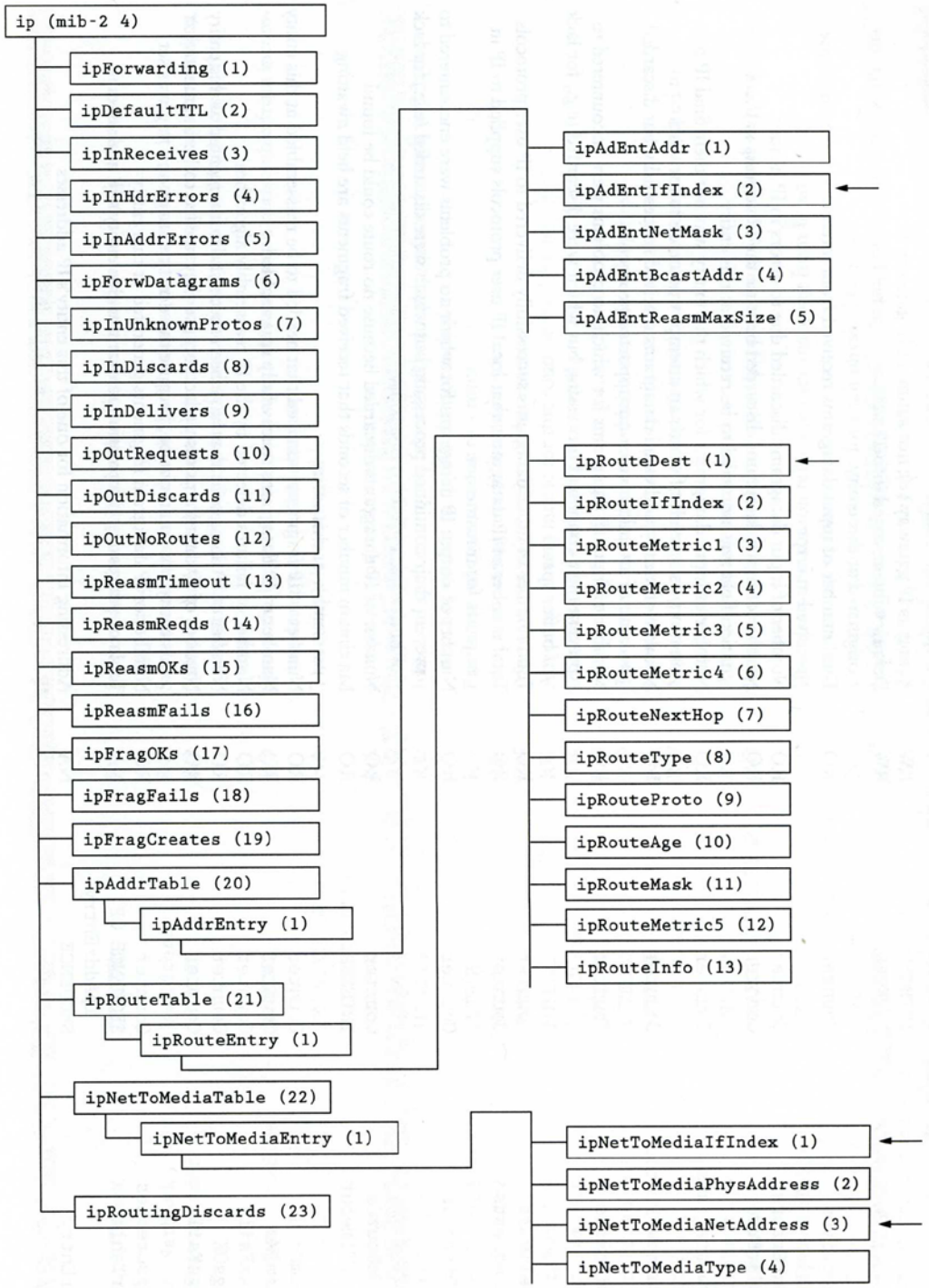
OBJECT IDENTIFIER ::= {mib-2 6}

- 1.3.6.1.2.1.6

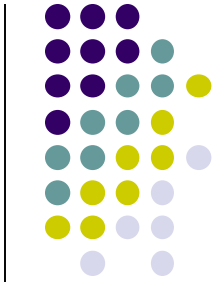


ip group

- 1.3.6.1.2.1.4
- ip OBJECT IDENTIFIER
  ::= {mib-2 4}

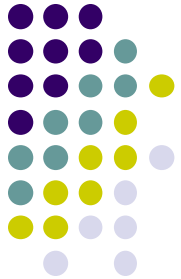


RELATION BETWEEN MIBs



INTERFACE STATISTICS	**MIB-II**
IP, TCP & UDP STATISTICS	**MIB-II**
SNMP STATISTICS	**MIB-II**
HOST JOB COUNTS	**HOST**
HOST FILE SYSTEM INFORMATION	**HOST**
LINK TESTING	**REPEATER BRIDGE**
NETWORK TRAFFIC STATISTICS	**REPEATER BRIDGE RMON**
TABLE WITH ALL MAC ADDRESSES	**REPEATER RMON**
STATISTICS PER HOST	**REPEATER RMON**
HISTORICAL STATISTICS	**RMON**
SPANNING TREE PERFORMANCE	**BRIDGE**
WIDE AREA LINK PERFORMANCE	**BRIDGE**
TRESHOLDS FOR ANY VARIABLE	**RMON**
CONFIGURABLE STATISTICS	**RMON**
TRAFFIC MATRIX WITH ALL NODES	**RMON**
‘HOST TOP N’ INFORMATION	**RMON**
PACKET / PROTOCOL ANALYSIS	**RMON**
DISTRIBUTED LOGGING	**RMON**

Hardware MIBs and Protocol MIBs



- Refer to SimpleWeb ***mib-intro.pdf*** for deatails
- Previous introduction is about MIB-II groups, please also refer to SimpleWeb ***mib-2.pdf*** for updated version.

system group => SNMPv2 MIB (RFC 3418)

interfaces group => IF-MIB (RFC 2863)

at group => deprecated

ip & icmp group => IP-MIB (RFC 2011)

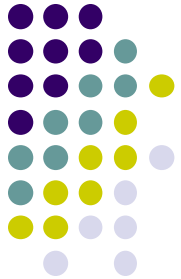
tcp group => TCP-MIB (RFC 2012)

udp group => UDP-MIB (RFC 2013)

egp group => OUTDATED

snmp group => SNMPv2MIB (RFC 3418)

Other MIBs



- Refer to SimpleWeb and RFCs for IF MIB, IP MIB, TCP MIB, UDP, MIB, HR MIB, …