CHAPTER 3

Repeater MIB

The FastHub supports the following RFC-1516 groups:

- Basic Group: This mandatory group contains the objects that are applicable to all repeaters. It contains status, parameter, and control objects for the repeater as a whole, for the port groups within the repeater, and for the individual ports.
- Monitor Group: This optional group contains monitoring statistics for the repeater as a whole and for individual ports.
- Address Tracking Group: This optional group contains objects for tracking the media access control (MAC) addresses of the data terminal equipment (DTE) attached to the ports of the repeater.

Basic Group

rptrGroupCapacity (integer [1 to 1024])

This read-only MIB object displays the number of groups that can be contained within the repeater. Within each managed repeater, the groups are uniquely numbered in the range from 1 to rptrGroupCapacity.

Some groups might not be present in the repeater, in which case the actual number of groups present is less than rptrGroupCapacity. The number of groups present is never greater than rptrGroupCapacity.

Note In practice, rptrGroupCapacity is generally the number of modules, cards, or boards that can fit in the physical repeater enclosure, and the group numbers correspond to numbers marked on the physical enclosure.

Default Value: 8 (each FastHub unit contains up to two groups)

rptrOperStatus (integer)

This read-only MIB object displays the operational state of the repeater. Consult the rptrHealthText object for more specific information about the state of the repeater.

Valid Values:	other	(1)	undefined or unknown status
	ok	(2)	no known failures
	rptrFailure	(3)	repeater-related failure
	groupFailure	(4)	group-related failure
	portFailure	(5)	port-related failure
	generalFailure	(6)	failure, unspecified type
Default Value:	ok	(2)	

In the case of multiple failure types (such as repeater failure and port failure), the value of this attribute reflects the highest priority failure in the following order (listed highest priority first):

Valid Values:	rptrFailure	(3)	repeater-related failure
	groupFailure	(4)	group-related failure
	portFailure	(5)	port-related failure
	generalFailure	(6)	failure, unspecified type
Default Value:	ok	(2)	

rptrHealthText (DisplayString [0 to 255])

This read-only MIB object displays a text string that provides information relevant to the operational state of the repeater. You can use this string to obtain detailed information on current failures, including how they were detected, and instructions for problem resolution.

Default Value: Operational

rptrReset (integer)

Setting this read-write MIB object to reset (2) causes a transition to the START state of IEEE 802.3, Figure 9-2.

Setting this object to noReset (1) has no effect. The agent always returns the value noReset (1) when this object is read.

After receiving a request to set this variable to reset (2), the agent is allowed to delay the reset for a short period. For example, you can choose to delay the reset long enough to allow the SNMP response to be transmitted. In any event, the SNMP response must be transmitted.

This action does not reset the management counters defined in this manual nor does it affect the portAdminStatus parameters. This action includes the execution of a disruptive self-test with the following characteristics:

- The nature of the test is not specified.
- The test resets the repeater but does not affect management information about the repeater.
- The test does not inject packets onto any segment.
- Packets received during the test might or might not be transferred.
- The test does not interfere with management functions.

After performing this self-test, the agent updates the repeater health information (including rptrOperStatus and rptrHealthText) and sends a rptrHealth trap.

Valid Values:	noReset	(1)
	reset	(2)
Default Value:	noReset	(1)

rptrNonDisruptTest (integer)

Setting this read-write MIB object to selfTest (2) causes the repeater to perform an agent-specific, nondisruptive self-test with the following characteristics:

- The nature of the test is not specified.
- The test does not change the state of the repeater or management information about the repeater.
- The test does not inject packets onto any segment.
- The test does not prevent the relay of any packets.
- The test does not interfere with management functions.

After performing this test, the agent updates the repeater health information (including rptrOperStatus and rptrHealthText) and sends a rptrHealth trap.

Note This definition allows returning an *okay* result after doing a trivial test.

Setting this object to noSelfTest (1) has no effect. The agent always returns the value noSelfTest (1) when this object is read.

Valid Values:	noSelfTest	(1)
	selfTest	(2)
Default Value:	noSelfTest	(1)

rptrTotalPartitionedPorts (gauge)

This read-only MIB object displays the total number of ports in the repeater whose current state meets all three of the following criteria: rptrPortOperStatus does not have the value notPresent (3), rptrPortAdminStatus is enabled (1), and rptrPortAutoPartitionState is autoPartitioned (2).

Initial Value: 0

rptrGroupTable

rptrGroupIndex (integer [1 to 1024])

This read-only MIB object displays the group within the repeater for which this entry contains information. This value is never greater than rptrGroupCapacity.

rptrGroupDescr (DisplayString [0 to 255])

This read-only MIB object displays a textual description of the group. It includes the full name and version identification of the group's hardware type and indicates how the group is differentiated from other types of groups in the repeater.

Note It is mandatory that this object contain only printable ASCII characters.

Default Values: Varies depending on the type of repeater and group.

rptrGroupObjectID (object identifier)

This read-only MIB object displays the vendor's authoritative identification of the group. This value can be allocated within the SMI enterprises subtree (1.3.6.1.4.1) and provides a straightforward and unambiguous means for determining what kind of group is being managed.

For example, this object could take the value 1.3.6.1.4.1.4242.1.2.14 if vendor “Flintstones, Inc.” was assigned the subtree 1.3.6.1.4.1.4242 and had assigned the identifier 1.3.6.1.4.1.4242.1.2.14 to its “Wilma Flintstone 6-Port FOIRL Plug-in Module.”

Default Value: Varies depending on the type of repeater and group.

rptrGroupOperStatus (integer)

This read-only MIB object displays the operational status of the group.

A status of notPresent (4) indicates that the group is temporarily or permanently physically or logically not a part of the repeater. It is an implementation-specific matter as to whether the agent effectively removes notPresent entries from the table.

An operational (2) status indicates that the group is functioning, and a malfunctioning (3) status indicates that the group is malfunctioning in some way.

Valid Values:	other	(1)
	operational	(2)
	malfunctioning	(3)
	notPresent	(4)

	underTest	(5)
	resetInProgress	(6)

Default Values: operational (2) or notPresent (4)

rptrGroupLastOperStatusChange (time tick)

This read-only MIB object displays the value of sysUpTime at the time that the value of the rptrGroupOperStatus object for this group last changed.

A value of zero indicates that the group operational status has not changed since the agent last restarted.

Initial Value: 0

rptrGroupPortCapacity (integer [1 to 1024])

This read-only MIB object displays the number of ports that can be contained within the group. Within each group, the ports are uniquely numbered in the range from 1 to rptrGroupPortCapacity.

Note In practice, this usually is the number of ports on a module, a card, or a board, and the port numbers correspond to numbers marked on the FastHub front panel.

Default Value: 16

rptrPortTable

rptrPortGroupIndex (integer [1 to 1024])

This read-only MIB object displays the group containing the port for which this entry contains information.

rptrPortIndex (integer [1 to 1024])

This read-only MIB object displays the port within the group for which this entry contains information. This value is never greater than rptrGroupPortCapacity for the associated group.

rptrPortAdminStatus (integer)

Setting this read-write MIB object to disabled (2) disables the port. A disabled port neither transmits nor receives. Once disabled, a port must be explicitly enabled to restore operation. A port that is disabled when power is lost or when a reset is exerted remains disabled when normal operation resumes.

The AdminStatus takes precedence over autopartition and functionally operates between the autopartition mechanism and the attachment unit interface (AUI)/physical media attachment (PMA).

Setting this object to enabled (1) enables the port and exerts a BEGIN on the port's autopartition state machine.

In effect, when a port is disabled, the value of rptrPortAutoPartitionState for that port is frozen until the port is enabled. When the port becomes enabled, the rptrPortAutoPartitionState becomes notAutoPartitioned (1), regardless of its predisabled state.

Valid Values:	enabled	(1)
	disabled	(2)
Default Value:	enabled	(1)

rptrPortAutoPartitionState (integer)

This read-only MIB object displays whether the port is currently partitioned by the repeater's autopartition protection.

The conditions that cause port partitioning are specified in Partition State Machine in IEEE 802.3, section 9.

Valid Values:	notAutoPartitioned	(1)

	autoPartitioned	(2)
Initial Value:	notAutoPartitioned	(1)

rptrPortOperStatus (integer)

This read-only MIB object displays the port's operational status. The notPresent (3) status indicates the port was physically removed (this might or might not be possible, depending on the type of port). The operational (1) status indicates that the port is enabled (see rptrPortAdminStatus) and working, even though it might be autopartitioned (see rptrPortAutoPartitionState).

If this object has the value operational (1) and rptrPortAdminStatus is set to disabled (2), this object's value soon changes to notOperational (2).

Valid Values:	operational	(1)
	notOperational	(2)
	notPresent	(3)
Initial Value:	operational	(1)

rptrPortConnectorType (integer)

This read-only MIB object specifies the type of connector the port is using.

Valid Values:	other	none of the following (unknown)
	rj45	common unshielded twisted-pair (UTP)
	bnc	thin coaxial (BNC)
	aui	thick coaxial (AUI)
	fiber-sc	multimode fiber-optic SC type

	fiber-st	multimode fiber-optic ST type
	empty	port not present

rptrPortLinkbeatStatus (integer)

This read-only MIB object displays the port's linkbeat status.

Valid Values:	linkbeat	(1)
	noLinkbeat	(2)
Initial Value:	noLinkbeat	(2)

rptrPortName ((DisplayString [0 to 60])

This read-only MIB object specifies the name of the port.

Initial Value: string of length 0

Monitor Group

rptrMonitorTransmitCollisions (counter)

This read-only MIB object is incremented every time the repeater state machine enters the TRANSMIT COLLISION state from any state other than ONE PORT LEFT (see IEEE 802.3, Figure 9-2).

The approximate minimum time for rollover of this counter is 16 hours.

Initial Value: 0

rptrMonitorGroupTable

rptrMonitorGroupIndex (integer [1 to 1024])

This read-only MIB object displays the group within the repeater for which this entry contains information.

rptrMonitorGroupTotalFrames (counter)

This read-only MIB object displays the total number of frames of valid frame length received on the ports in this group on which FCSError and CollisionEvent signals were not asserted. This counter is the summation of the values of the rptrMonitorPortReadableFrames counters for all the ports in the group.

This statistic provides one of the parameters necessary for obtaining the packet error rate. The approximate minimum time for rollover of this counter is 80 hours.

Initial Value: 0

rptrMonitorGroupTotalOctets (counter)

This read-only MIB object displays the total number of octets contained in the valid frames received on the ports in this group. This counter is the summation of the values of the rptrMonitorPortReadableOctets counters for all the ports in the group.

This statistic provides an indication of the total data transferred. The approximate minimum time for rollover is 58 minutes.

Initial Value: 0

rptrMonitorGroupTotalErrors (counter)

This read-only MIB object displays the total number of errors for the ports in this group. This counter is the summation of the values of the rptrMonitorPortTotalErrors counters for all the ports in the group.

Initial Value: 0

rptrMonitorPortTable

rptrMonitorPortGroupIndex (integer [1 to 1024])

This read-only MIB object displays the group containing the port for which this entry contains information.

rptrMonitorPortIndex (integer [1 to 1024])

This read-only MIB object displays the port within the group for which this entry contains information.

rptrMonitorPortReadableFrames (counter)

This read-only MIB object displays the number of frames of valid frame length received on this port. This counter increments by one for each frame received on this port with an OctetCount greater than or equal to minFrameSize and less than or equal to maxFrameSize (see IEEE 802.3, section 4.4.2.1) and for which the FCSError and CollisionEvent signals are not asserted.

This statistic provides one of the parameters necessary for obtaining the packet error rate. The approximate minimum time for rollover is 80 hours.

Initial Value: 0

rptrMonitorPortReadableOctets (counter)

This read-only MIB object displays the number of octets contained in valid frames received on this port. This counter is incremented by OctetCount for each frame received on this port that is determined to be a readable frame (that is, including FCS octets but excluding framing bits and dribble bits).

This statistic provides an indicator of the total data transferred. The approximate minimum time for rollover is 58 minutes.

Initial Value: 0

rptrMonitorPortFCSErrors (counter)

This read-only MIB object increments by one for each frame received on this port with the FCSError signal asserted, with the FramingError and CollisionEvent signals deasserted, and with an OctetCount greater than or equal to minFrameSize and less than or equal to maxFrameSize (see IEEE 802.3, section 4.4.2.1).

The approximate minimum time for rollover is 80 hours.

Initial Value: 0

rptrMonitorPortAlignmentErrors (counter)

This read-only MIB object increments by one for each frame received on this port with the FCSError and FramingError signals asserted, the CollisionEvent signal deasserted, and with an OctetCount greater than or equal to minFrameSize and less than or equal to maxFrameSize (see IEEE 802.3, section 4.4.2.1). If rptrMonitorPortAlignmentErrors increments, the rptrMonitorPortFCSErrors counter is not incremented for the same frame.

The approximate minimum time for rollover is 80 hours.

Initial Value: 0

rptrMonitorPortFrameTooLongs (counter)

This read-only MIB object increments by one for each frame received on this port with an OctetCount greater than maxFrameSize (see IEEE 802.3, section 4.4.2.1). If rptrMonitorPortFrameTooLongs increments, then neither the rptrMonitorPortAlignmentErrors or the rptrMonitorPortFCSErrors counter is incremented for the frame.

The approximate minimum time for rollover is 61 days.

Initial Value: 0

rptrMonitorPortShortEvents (counter)

This read-only MIB object increments by one for each CarrierEvent on this port with an ActivityDuration less than ShortEventMaxTime. ShortEventMaxTime is greater than 74 bit-times and less than 82 bit-times. ShortEventMaxTime tolerances provide for circuit losses between a conformance test point at the attachment unit interface (AUI) and the measurement point within the state machine.

Selecting the ShortEventMaxTime toward the lower end of the allowed tolerance range accommodates bit losses suffered through physical channel devices not budgeted for within this standard.

Note shortEvents might indicate externally generated noise hits that cause the repeater to transmit runts to its other ports or propagate a collision (that might be late) back to the transmitting DTE and damaged frames to the rest of the network.

The approximate minimum time for rollover is 16 hours.

Initial Value: 0

rptrMonitorPortRunts (counter)

This read-only MIB object increments by one for each CarrierEvent on this port that meets one of the following two conditions:

Only one test need be made if:

- The ActivityDuration is greater than ShortEventMaxTime and less than ValidPacketMinTime and the CollisionEvent signal is deasserted.
- The OctetCount is less than 64, the ActivityDuration is greater than ShortEventMaxTime, and the CollisionEvent signal is deasserted.
- ValidPacketMinTime is greater than or equal to 552 bit-times and less than 565 bit-times.

An event with a length greater than 74 bit-times but less than 82 bit-times increments either the shortEvents counter or the runts counter but not both. A CarrierEvent greater than or equal to 552 bit-times but less than 565 bit-times might or might not be counted as a runt. ValidPacketMinTime has tolerances included to provide for circuit losses between a conformance test point at the AUI and the measurement point within the state machine.

Runts usually indicate collision fragments, a normal network event. In certain situations associated with large diameter networks, a percentage of collision fragments can exceed ValidPacketMinTime.

The approximate minimum time for rollover is 16 hours.

Initial Value: 0

rptrMonitorPortCollisions (counter)

This read-only MIB object increments by one for any CarrierEvent signal on any port for which the CollisionEvent signal on this port is also asserted.

The approximate minimum time for rollover is 16 hours.

Initial Value: 0

rptrMonitorPortLateEvents (counter)

This read-only MIB object increments by one for each CarrierEvent on this port in which the CollIn(X) variable changes to the value SQE (see IEEE 802.3, section 9.6.6.2) while the ActivityDuration is greater than the LateEventThreshold. Such a CarrierEvent is counted twice, as both a collision and as a lateEvent.

The LateEventThreshold is greater than 480 bit-times and less than 565 bit-times. LateEventThreshold tolerances permit building a single threshold to serve as both the LateEventThreshold and ValidPacketMinTime threshold.

The approximate minimum time for rollover is 81 hours.

Initial Value: 0

rptrMonitorPortVeryLongEvents (counter)

This read-only MIB object increments by one for each CarrierEvent on this port with an ActivityDuration greater than the MAU Jabber Lockup Protection timer TW3 (see IEEE 802.3, sections 9.6.1 and 9.6.5). Other counters are incremented as appropriate.

Initial Value: 0

rptrMonitorPortDataRateMismatches (counter)

This read-only MIB object increments by one for each frame received on this port that meets all of the following conditions:

- The CollisionEvent signal is not asserted.
- The ActivityDuration is greater than ValidPacketMinTime.
- The frequency (data rate) is detectably mismatched from the local transmit frequency. The exact degree of mismatch is vendor-specific and defined by the vendor for conformance testing.

When this event occurs, other counters whose increment conditions were satisfied might or might not also increment, at your discretion. Whether or not the repeater was able to maintain data integrity is beyond the scope of this standard.

Initial Value: 0

rptrMonitorPortAutoPartitions (counter)

This read-only MIB object increments by one each time the repeater automatically partitions this port. For conditions that cause port partitioning in the partition state machine, see IEEE 802.3, section 9.

Initial Value: 0

rptrMonitorPortTotalErrors (counter)

This read-only MIB object displays the total number of errors that have occurred on this port. This counter is the summation of the values of other error counters for this port, specifically:

rptrMonitorPortFCSErrors

rptrMonitorPortAlignmentErrors

rptrMonitorPortFrameTooLongs

rptrMonitorPortShortEvents

rptrMonitorPortLateEvents

rptrMonitorPortVeryLongEvents

rptrMonitorPortDataRateMismatches

Note This counter is the summation of information available through other objects. However, the regular retrieval of this object provides a means of tracking the overall health of a port.

Initial Value: 0

rptrMonitorPortIsolates (counter)

This read-only MIB object increments by one each time the repeater port automatically isolates because of false carrier events. The conditions causing a port to automatically isolate are defined by the transition from the “false carrier” state to the “link unstable” state of the carrier state integrity diagram.

Initial Value: 0

rptrMonitorPortSymbolErrors (counter)

This read-only MIB object displays a count of the number of times a valid length packet was received at the port and there was at least one occurrence of an invalid data symbol. It can increment only once per valid carrier event. A collision presence at any port on the repeater containing this port does not cause this attribute to increment.

Initial Value: 0

Address Tracking Group

rptrAddrTrackTable

rptrAddrTrackGroupIndex (integer [1 to 1024])

This read-only MIB object displays the group containing the port for which this entry contains information.

rptrAddrTrackPortIndex (integer [1 to 1024])

This read-only MIB object displays the port within the group for which this entry contains information.

rptrAddrTrackLastSourceAddress (MacAddress: status-deprecated)

This read-only MIB object displays the SourceAddress of the last readable frame (such as counted by rptrMonitorPortReadableFrames) received by this port.

This object has been deprecated because its value is undefined when no frames have been observed on this port. The replacement object is rptrAddrTrackNewLastSrcAddress.

Default Value: string of length 0

rptrAddrTrackSourceAddrChanges (counter)

This read-only MIB object increments by one each time the rptrAddrTrackLastSourceAddress attribute for this port changes.

This can indicate whether a link is connected to a single DTE or another multiuser segment.

The approximate minimum time for rollover is 81 hours.

Initial Value: 0

rptrAddrTrackNewLastSrcAddress (octet string [0 | 6])

This read-only MIB object displays the SourceAddress of the last readable frame (such as counted by rptrMonitorPortReadableFrames) received by this port. If no frames have been received by this port since the agent began monitoring the port activity, the agent returns a string of length zero.

Initial Value: string of length 0

Traps Used by Repeaters

rptrHealth

This trap conveys information related to the operational status of the repeater. This trap is sent either when the value of rptrOperStatus changes or when a non-disruptive test completes.

The rptrHealth trap must contain the rptrOperStatus object. The agent can (optionally) include the rptrHealthText object in the varBind list. See the rptrOperStatus and rptrHealthText objects for descriptions of the information that is sent.

The agent must throttle the generation of consecutive rptrHealth traps so that there is at least a 5-second gap between traps of this type. When traps are throttled, they are dropped, not queued for sending at a future time.

Note *Generating* a trap means sending to all configured recipients.

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rptrGroupChange

This trap is sent when a change occurs in the group structure of a repeater. This occurs only when a group is logically or physically removed from or added to a repeater. The varBind list contains the identifier of the group that was removed or added.

The agent must throttle the generation of consecutive rptrGroupChange traps for the same group, so there is at least a 5-second gap between traps of this type. When traps are throttled, they are dropped, not queued for sending at a future time.

Note *Generating* a trap means sending to all configured recipients.

rptrResetEvent

This trap conveys information related to the operational status of the repeater. This trap is sent on completion of a repeater reset action. A repeater reset action is defined as a transition to the START state of IEEE 802.3, Figure 9-2, when triggered by a management command (such as an SNMP Set on the rptrReset object).

The agent must throttle the generation of consecutive rptrResetEvent traps, so there is at least a 5-second gap between traps of this type. When traps are throttled, they are dropped, not queued for sending at a future time.

Note *Generating* a trap means sending to all configured recipients.

The rptrResetEvent trap is not sent when the agent restarts and sends an SNMP coldStart or warmStart trap. However, it is recommended that a repeater agent send the rptrOperStatus object as an optional object with its coldStart and warmStart trap protocol data units (PDUs).

The rptrOperStatus object must be included in the varBind list sent with this trap. The agent can (optionally) include the rptrHealthText object.