



Viewing Statistics

This chapter describes how to use the Statistics menu to monitor the performance of the Workgroup Bridge.

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Viewing the Statistics Menu

The Statistics menu provides easy access to a variety of statistical information regarding the bridge's performance. You can use the data to monitor the bridge and detect problems.

Navigation: Choose **Main > Statistics**

Statistics Menu		
Option	Value	Description
1	- Throughput	- Throughput statistics
2	- Radio	- Radio error statistics
3	- Ethernet	- Ethernet error statistics
4	- Status	- Display general status
5	- Map	- Show network map
6	- Watch	- Record history of a statistic
7	- History	- Display statistic history
8	- Nodes	- Node statistics
9	- ARP	- ARP table
01	- Display_time [10]	- Time to re-display screens

Enter an option number or name, "=" main menu, <ESC> previous menu
> █

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Viewing Throughput Statistics (Throughput)

The *Throughput* option displays a detailed summary of the radio data packets passing through your bridge.

Navigation: Choose **Main > Statistics > Throughput**

Cleared 17:47:16 ago					
Statistic		Recent Rate/S	Total	Ave Rate/S	Highest Rate/S
Radio Receive	Packets	0	38097	0	98
	Bytes	0	5559841	86	10635
	Filtered	0	0	0	0
	Errors	0	0	0	0
Radio Transmit	Packets	0	12801	0	147
	Multicasts	0	298	0	3
	Bytes	0	3948098	61	213410
	Errors	0	79	0	1
Ethernet Receive	Packets	0	6005	0	147
	Bytes	24	1871227	29	210504
	Filtered	0	4	0	0
	Errors	0	0	0	0
	Misses	0	0	0	0
Ethernet Transmit	Packets	0	10921	0	98
	Bytes	171	2483524	38	8051
	Errors	0	0	0	0

Enter space to redisplay, C[lear stats], q[uit] : █

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Interpreting Throughput Statistics

The following list describes the items appearing in the screen above:

- **Recent Rate/s:** displays the event rates, per second, averaged over the last 10 seconds.
- **Total:** displays the number of events that occurred since the statistics were last cleared.
- **Average Rate/s:** displays the average event rates, per second, since the statistics were last cleared.
- **Highest Rate/s:** displays the highest rate recorded since the statistics were last cleared.
- **Packets:** displays the number of packets transmitted or received.
- **Bytes:** displays the total number of data bytes in all the packets transmitted or received.
- **Filtered:** displays the number of packets that were discarded as a result of an address filter being set.
- **Errors:** displays the number of errors that did occur.
- **Multicasts:** displays the number of multicast packets transmitted.
- **Misses:** displays lost packets.
- **Enter space to redisplay, C[lear stats], q[uit]:** redispays statistics. To clear the statistics, type capital C. To exit the Statistics Menu, type q.

Viewing Error Statistics (Radio)

The *Radio* option displays a detailed summary of the radio transceiver errors that have occurred on the bridge.

Navigation: Choose **Main > Statistics > Radio**

RADIO ERROR STATISTICS			
Receive		Transmit	
Buffer full frames lost	0	Retries	0
Duplicate frames	0	Max retries / frame	0
CRC errors	6 +6	Excessive retries	0
Decrypt errors	0	Queue full discards	0
		Holdoffs	42 +42
		Holdoff timeouts	0
Enter space to redisplay, C[lear stats], q[uit] : █			

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Interpreting Radio Error Statistics

The following list describes the items appearing in the screen above:

- **Buffer full frames lost:** number of frames lost because of a lack of buffer space in the bridge.
- **Duplicate frames:** number of frames that were received more than once. This is usually because of a frame acknowledgment being lost.
- **CRC errors:** number of frames received with an invalid CRC. CRC errors are usually caused by interference from nearby radio traffic. Occasional CRC errors can also occur because of random noise when the receiver is idle.

- **Decrypt errors:** packets were received without errors but could not be decrypted with available encryption keys.
- **Retries:** cumulative count of the number of times a frame had to be retransmitted because an acknowledgment was not received.
- **Max retries / frame:** maximum number of times any one frame had to be retransmitted. Excessive retries may indicate a poor quality radio link.
- **Excessive retries:** number of times a packet has taken four or more retries before it was successfully transmitted.
- **Queue full discards:** number of times a packet was not transmitted because of too many retries to the same destination. Discards only occur if packets destined to this address are taking up more than their share of transmit buffers.
- **Holdoffs:** indicates that another node was transmitting when this node tried to start a transmit of its own. This is a usual occurrence but a high rate of holdoffs is an indication of a congested cell.
- **Holdoff timeouts:** indicates that a transmission was held off by other activity longer than the length of time it would take to transmit the longest allowed 802.11 packet. This is usually an indication of some sort of outside interference.

Viewing Error Statistics (Ethernet)

The *Ethernet* option displays a detailed summary of the transmitter errors that have occurred on the bridge.

Navigation: Choose **Main > Statistics > Ethernet**

ETHERNET ERROR STATISTICS			
Receive		Transmit	
Buffer full frames lost	0	Excessive collisions	0
CRC errors	0	Deferrals	0
Collisions	0	Excessive deferrals	0
Frame alignment errors	0	No carrier sense present	0
Over-length frames	0	Carrier sense lost	0
Short frames	0	Out of window collisions	0
Overruns	0	Underruns	0
Misses	0	Bad length	0
Enter space to redisplay, C[lear stats], q[uit] : █			

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Interpreting Ethernet Error Statistics

The following list describes the items appearing in the screen above:

- **Buffer full frames lost:** number of frames lost because of a lack of buffer space in the bridge.
- **CRC errors:** number of frames received with an invalid CRC. Usually caused by interference from nearby radio traffic. Occasional CRC errors can also occur because of random noise when the receiver is idle.
- **Collisions:** number of times a collision occurred while the frame was being received. This would indicate a hardware problem with an Ethernet node on the infrastructure.

- **Frame alignment errors:** number of frames received whose size in bits was not a multiple of 8. Occasionally, extra bits of data are inadvertently attached to a transmitted packet causing a frame alignment error.
- **Over-length frames:** number of frames received that are longer than the configured maximum packet size.
- **Short frames:** number of frames received that are shorter than the allowed minimum packet size of 64 bytes.
- **Overruns:** number of times the hardware receive FIFO buffer overflowed. This should be a rare occurrence.
- **Misses:** number of Ethernet packets that were lost because of a lack of buffer space on the bridge.
- **Excessive Collisions:** number of times transmissions failed because of excessive collisions. Usually indicates the frame had to be continuously retried because of heavy traffic on the Ethernet infrastructure.
- **Deferrals:** number of times frames had to wait before transmitting because of activity on the cable.
- **Excessive deferrals:** number of times the frame failed to transmit because of excessive deferrals. This error usually indicates the frame had to be continuously retried because of heavy traffic on the Ethernet infrastructure.
- **No carrier sense present:** number of times the carrier was not present when a transmission was started. This error usually indicates a problem with a cable on the Ethernet infrastructure.
- **Carrier sense lost:** number of times the carrier was lost during a transmission. This error usually indicates a problem with a cable on the Ethernet infrastructure.
- **Out of window collisions:** number of times a collision occurred after the 64th byte of a frame was transmitted. Out of window collisions usually indicate a problem with a cable on the Ethernet infrastructure.
- **Underruns:** number of times the hardware transmit FIFO buffer became empty during a transmit. Underruns should be a rare occurrence.
- **Bad length:** number of times an attempt was made to transmit a packet larger than the specified maximum allowed.

Displaying Overall Status (Status)

The *Status* option displays the settings of the most important configuration parameters of the bridge as well as important run-time statistics. Use the display to verify correct configuration. The display is broken into sections describing:

- The radio
- Any LAN connections
- Any filtering being done
- Reasons for inability to associate with another device

All items in the display are self-explanatory or are explained in other sections of this guide.

Displaying the Network Map (Map)

The *Map* option causes the bridge to poll all of the other Cisco Aironet devices in the local infrastructure for information about the radio nodes associated to them. Nodes that are associated to parents are displayed one level from their parents.

The other Cisco Aironet devices in the infrastructure are polled once every 30 seconds. Because all radio nodes respond, running the displays constantly could generate a significant amount of traffic. You may want to consider not running the displays constantly.

Recording a Statistic History (Watch)

The *Watch* option records the values of a chosen statistic over time. After you select a statistic and a time interval, the bridge starts a timer. At each timer expiration, the bridge records the current value of the statistic. The last 20 samples are saved.

Follow these steps to record a statistic history.

Step 1 Choose **Main Menu > Statistics > Watch**. The following menu appears:

```

1. ra Radio
2. re Radio Error
3. et Ethernet
4. ee Ethernet Error

Enter category, one of [a number from 1 to 4, a short form]
: █

```

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Step 2 Type the applicable category number and press **Enter**.

For example, if you choose **1** to select *Radio*, the following menu appears:

```

          Receive          Radio          Transmit
1 rpa Packets           5 tpa Packets
2 rby Bytes             6 tmu Multicasts
3 rfi Filtered          7 tby Bytes
4 rer Errors            8 ter Errors

Enter one of [a index from 1 to 8, a short form] : █

```

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Step 3 Type the applicable statistic index number and press **Enter**. The following prompt appears:

```
Enter a sample time in seconds from 1 to 3600 :
```

Step 4 Type a time interval between samples and press **Enter**.

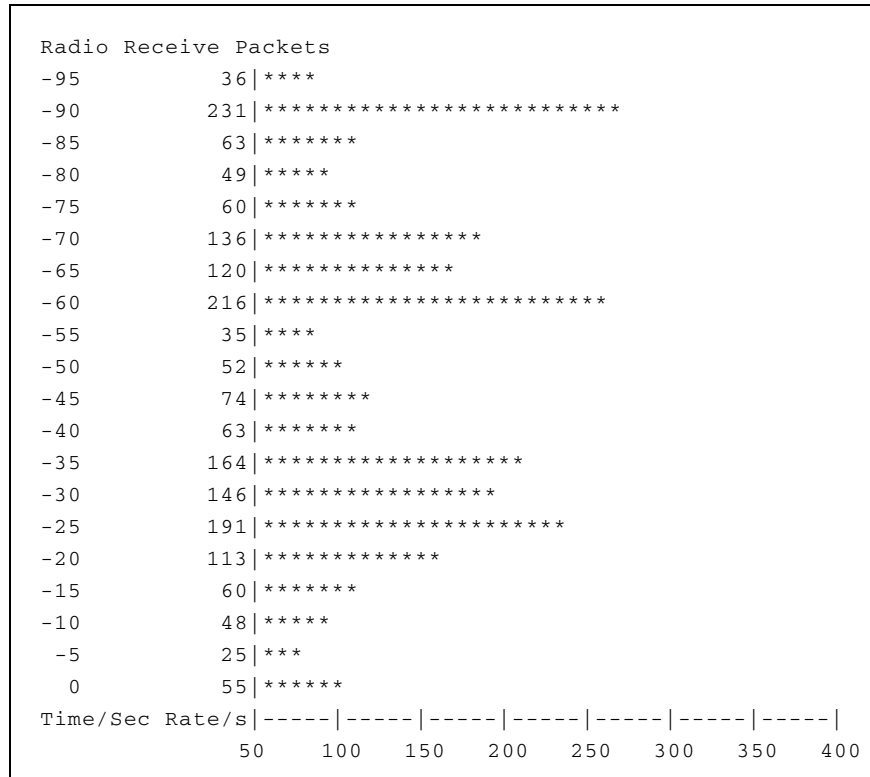
The longer the time you specify, the further back in time the samples are saved (up to 20 samples).

Displaying a Statistic History (History)

The *History* option displays the history of the statistic being recorded.

To display a statistic history, choose **Main > Statistics > History**.

Depending on your *watch* option selections, a display screen similar to the one below will appear.



Interpreting Statistic History

The following list describes the items appearing in the screen above:

- **Time/(sec)**: displays the number of seconds elapsed from the time the statistic sample was recorded.
- **Rate/s**: displays the actual value of the statistic. The chart's scale changes based on the largest value displayed.

Displaying Node Information (Nodes)

The *Nodes* option displays current information about the radio link between the bridge and its parent access point.

Navigation: Choose **Main > Statistics > Nodes**

RADIO NODE STATISTICS								
Id	Address	Signal	Tx Pkt	Tx Byte	Retry	Rx Pkt	Rx Byte	Rate
3	Cisco-264be0	48/87	2378	2026789	48	28936	3332211	11
Enter space to redisplay, C[lear stats], q[uit] : █								

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Interpreting Node Information Statistics

The following list describes the items appearing in the screen above:

- **Id:** displays node ID given to the bridge by its parent access point.
- **Address:** displays the address of the parent access point.
- **Signal:** displays the signal strength of the RF link.
- **Tx Pkt:** displays the number of packets transmitted.
- **Tx Byte:** displays the actual number of bytes transmitted.
- **Retry:** displays the number of transmitted packets that were resent.
- **Rx Pkt:** displays the number of packets received.
- **Rx Byte:** displays the actual number of bytes received.
- **Rate:** displays the current RF data rate in Mbps.

Displaying ARP Information (ARP)

The *ARP* (Address Resolution Protocol) option displays the ARP table of IP to MAC addresses. It also displays whether the node supports Ethernet Type II or IEEE 802.2 framing. The last column displays the time until the entry stales out.

Navigation: Choose **Main > Statistics > ARP**

INTERNET ADDRESS TABLE				
Internet Address	Network Address	ETHII	802.2	Time
010.000.005.088	000086088a65	Yes		0:11:20
Enter space to redisplay, q[uit] : █				

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Setting Screen Display Time (*Display_time*)

The *Display_time* option sets the time interval for the automatic redisplay of any screen that automatically refreshes. The default value is 10 seconds.

