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Switch buffer size question (#p150823)

Tue Mar 22, 2011 12:45 pm

Can someone please explain the benefit of the increased buffer size of the 49xx switches over the 3750?

Thanks.

Re: Switch buffer size question (#p150826)

Tue Mar 22, 2011 12:48 pm

It can better handle bursts of traffic without dropping packets.

Re: Switch buffer size question (#p151118)

Thu Mar 24, 2011 12:50 am

I'm interested in this, as well. Can somebody provide some detail about the differences in buffer sizes between the two switch models?

Links to appropriate articles are welcome.

Switch buffer size question (#p151123)

Thu Mar 24, 2011 1:41 am

I'm also interested in this. Our company has a habit of using 3750s to connect to servers. If I had a compelling argument for them to change this model for future builds I'd like to know

Sent on the move...

Switch buffer size question (#p151133)

Thu Mar 24, 2011 3:10 am

Also very interested in this.

Sent from my iPhone using Tapatalk

Re: Switch buffer size question (#p151138)

Thu Mar 24, 2011 5:45 am

> **Fred wrote:**
> I'm interested in this, as well. Can somebody provide some detail about the differences
> in buffer sizes between the two switch models?

The 49xx has 16MB of shared buffer space:
http://www.cisco.com/en/US/prod/collate ... 46552.html
(http://www.cisco.com/en/US/prod/collateral/switches/ps5718/ps6021/ps6230/product_data_sheet0900aecd802

They won't publish the numbers for the smaller 2960/3560/3750, but it's available by NDA. It's on a per-asic basis, and it's small.

Re: Switch buffer size question (#p151158)

Thu Mar 24, 2011 7:57 am

How do you know if your switch is running low on buffer space (i.e.: is there a 'show' command)? How do you know how much you need for a given install?

Re: Switch buffer size question (#p151162)

Thu Mar 24, 2011 8:04 am

> **killabee wrote:**
> How do you know if your switch is running low on buffer space (i.e.: is there a 'show'
> command)? How do you know how much you need for a given install?

How much you need depends on your traffic.

Output buffer drops are a sign of inadequate space:

```
sh mls qos int gi 1/0/5 statistics
...
  output queues dropped:
 queue:    threshold1    threshold2    threshold3
-----------------------------------------------
 queue 0:        0            0            0
 queue 1:        0            0            0
 queue 2:        0            0            0
 queue 3:        0            0        27587337
```

A few different things can cause the drops, so you need to understand your traffic patterns, but it's where you start looking.

Switch buffer size question (#p151202)
Thu Mar 24, 2011 9:36 am

> **javentre wrote:**
>
> > **killabee wrote:**
> > How do you know if your switch is running low on buffer space (i.e.: is there a 'show' command)? How do you know how much you need for a given install?
>
> How much you need depends on your traffic.
>
> Output buffer drops are a sign of inadequate space:
>
> ```
> sh mls qos int gi 1/0/5 statistics
> ...
>   output queues dropped:
>  queue:      threshold1    threshold2    threshold3
> ---------------------------------------------------
>  queue 0:          0             0             0
>  queue 1:          0             0             0
>  queue 2:          0             0             0
>  queue 3:          0             0       27587337
> ```
>
> A few different things can cause the drops, so you need to understand your traffic patterns, but it's where you start looking.

This might seem like a silly question but how does a 16mb shared buffer relate to the throughput of the port / switch or rather how would you know that 16mb was a good sized buffer?

Sent from my iPhone using Tapatalk

Re: Switch buffer size question (#p151231)
Thu Mar 24, 2011 11:23 am

> **DanC wrote:**
> This might seem like a silly question but how does a 16mb shared buffer relate to the throughput of the port / switch or rather how would you know that 16mb was a good sized buffer?

It's not that cut and dry. If you have momentary bursts in traffic congesting an output interface, deeper buffers will help you ride out the burst without dropping packets. But if you have 2 1 gbps ports

constantly jamming traffic out another port, buffers won't help much there. You can also get in to issues when large amounts of traffic come in a port with a higher speed than the output port (10GE to 1GE).

My experience is that the 3560/3750 switches belong in wiring closets, servicing end users. They do that job well.

Buffers can be too deep, traffic can get delayed so long the protocols would have behaved better if it was just dropped. I don't see this problem in my enterprise with any Catalyst switch.

I've been pretty happy with 67xx cards in the 6500s, the 24 and 48 port 1GE ports have 1.3 MB per port. I would really like a setup like this in a 1U box, but they don't make it.

Re: Switch buffer size question (#p151384)
Fri Mar 25, 2011 7:05 am

I'm currently feeling the pain of small buffer sizes on 3750's. If you think the "next gen" 3750X switches are better, think again. They're even smaller. Cisco has recommended we swap them out with 4948s, which have published buffers of 16MB.

Re: Switch buffer size question (#p151385)
Fri Mar 25, 2011 7:09 am

Big price difference?

Re: Switch buffer size question (#p151387)
Fri Mar 25, 2011 7:10 am

Pretty big, I believe.

Re: Switch buffer size question (#p151388)
Fri Mar 25, 2011 7:15 am

It depends on licensing requirements:

WS-C4948E = $10,495.00

WS-C3750X-48T-S = $11,500.00
WS-C3750X-48T-L = $8,900.00

Re: Switch buffer size question (#p151389)
Fri Mar 25, 2011 7:28 am

Not as bad as I thought.

Re: Switch buffer size question (#p151390)
Fri Mar 25, 2011 7:33 am

It's an easy decision if you need a 48 port switch. We don't use 3560/3750 switches in wiring closets, so I have very little use for them.

Just to be clear: 3560s/3750s don't belong anywhere near distribution, core, or data centers.

I'm not normally so adamant about things, but I've been bitten by this at many customers, and it's easily avoided for almost no difference in price. Not all 1GE/10GE switches are made equal. If you need POE and edge access features, the 3750 does that well. High Performance environments with potentially complex and bursty QoS make these devices perform poorly.

Re: Switch buffer size question (#p177835)

Good afternoon 😄

Regarding the next-gen switches, I have one of both, 3750 and 3750-X. When I issue a show interface of both switches it would seem the 3750-X has more buffers than the 3750 we bought a few years ago:

3750-X:
```
GigabitEthernet2/0/4 is up, line protocol is up (connected)
  Hardware is Gigabit Ethernet, address is 4055.39bd.3084 (bia 4055.39bd.3084)
  Description: 1G Trunk Port to CS-GS-C7000-01 Chassis Slot 4 Passsthru (iSCSI)
  MTU 9000 bytes, BW 1000000 Kbit, DLY 10 usec,
     reliability 255/255, txload 9/255, rxload 3/255
  Encapsulation ARPA, loopback not set
  Keepalive set (10 sec)
  Full-duplex, 1000Mb/s, media type is 10/100/1000BaseTX
  input flow-control is on, output flow-control is unsupported
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 21:43:41, output 00:00:40, output hang never
  Last clearing of "show interface" counters 00:58:43
  Input queue: 0/200/0/0 (size/max/drops/flushes); Total output drops: 372
  Queueing strategy: fifo
  Output queue: 0/200 (size/max)
  30 second input rate 14397000 bits/sec, 778 packets/sec
  30 second output rate 38199000 bits/sec, 1257 packets/sec
     1901464 packets input, 3520982204 bytes, 0 no buffer
     Received 459 broadcasts (44 multicasts)
     0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
     0 watchdog, 44 multicast, 0 pause input
     0 input packets with dribble condition detected
     3092726 packets output, 13162351857 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets
     0 babbles, 0 late collision, 0 deferred
     0 lost carrier, 0 no carrier, 0 PAUSE output
     0 output buffer failures, 0 output buffers swapped out
```

3750:
```
GigabitEthernet2/0/4 is administratively down, line protocol is down (disabled)
  Hardware is Gigabit Ethernet, address is 0024.5043.d084 (bia 0024.5043.d084)
  Description: 1G Po3 Trunk Member to CS-GS-Gebc2-03 - Port 24
  MTU 9000 bytes, BW 10000 Kbit, DLY 1000 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive set (10 sec)
  Auto-duplex, Auto-speed, media type is 10/100/1000BaseTX
  input flow-control is off, output flow-control is unsupported
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 11w0d, output 10w1d, output hang never
  Last clearing of "show interface" counters 25w3d
```

```
    Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 16462
    Queueing strategy: fifo
    Output queue: 0/0 (size/max)
    5 minute input rate 0 bits/sec, 0 packets/sec
    5 minute output rate 0 bits/sec, 0 packets/sec
        3414559971 packets input, 2466519424856 bytes, 0 no buffer
        Received 48480613 broadcasts (6899943 multicasts)
        0 runts, 0 giants, 0 throttles
        0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
        0 watchdog, 6899943 multicast, 0 pause input
        0 input packets with dribble condition detected
        3863557632 packets output, 1291263501153 bytes, 0 underruns
        0 output errors, 0 collisions, 1 interface resets
        0 babbles, 0 late collision, 0 deferred
        0 lost carrier, 0 no carrier, 0 PAUSE output
        0 output buffer failures, 0 output buffers swapped out
```

If you notice the output queue on both show interface's, the 3750-X has 200 as the limit. Now please correct me if I am wrong but this relates to the buffers mentioned above? Then the 3750-X can hold 200 packets in its output queue. Does this then mean that the other 3750 has zero output buffer space?

I also looked on our 4948 for the same info:

```
GigabitEthernet1/4 is up, line protocol is up (connected)
  Hardware is Gigabit Ethernet Port, address is 4055.39e6.c0c3 (bia 4055.39e6.c0c3)
  Description: 1G Trunk to CS-GS-C7000-01 Blade Chassis Passthru Module - Chassis
Slot 1 Port4
  MTU 9000 bytes, BW 1000000 Kbit, DLY 10 usec,
      reliability 255/255, txload 1/255, rxload 51/255
  Encapsulation ARPA, loopback not set
  Keepalive set (10 sec)
  Full-duplex, 1000Mb/s, link type is auto, media type is 10/100/1000-TX
  input flow-control is on, output flow-control is on
  Auto-MDIX on (operational: on)
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 21:51:51, output never, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/2000/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue: 0/40 (size/max)
  5 minute input rate 200036000 bits/sec, 16570 packets/sec
  5 minute output rate 1567000 bits/sec, 1925 packets/sec
      6461515379 packets input, 8359395407823 bytes, 0 no buffer
      Received 4746509 broadcasts (2540851 multicasts)
      0 runts, 0 giants, 0 throttles
      0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
      0 input packets with dribble condition detected
      5313353098 packets output, 2770081454230 bytes, 0 underruns
      0 output errors, 0 collisions, 0 interface resets
      0 babbles, 0 late collision, 0 deferred
```

```
      0 lost carrier, 0 no carrier
      0 output buffer failures, 0 output buffers swapped out
```

What I did also notice is that the 4948 has 2000 set for the input queue, and the 3750-X has 200 for both input and output.

Also am I correct that the shared buffer is across all ports. But the number allocated to the queue is per packets, meaning that if 10 packets are in any queue they are various sizes but will take a slot of buffer space, which will in turn mean that buffer space allocated is not equal?

Re: Switch buffer size question (#p177929)

Mon Sep 05, 2011 7:53 am

> **javentre wrote:**
> They won't publish the numbers for the smaller 2960/3560/3750, but it's available by NDA. It's on a per-asic basis, and it's small.

Well, there's this (about G and E models):

> Additionally, these platforms provide (minimally) 750 KB of receive buffers and (up to) 2 MB of transmit buffers for each set of 4 ports.

http://www.cisco.com/en/US/docs/solutions/Enterprise/Video/tpqoscampus.html#wp1062179

I'm always amazed at how the 3750 seems to be the go-to switch for every purpose at so many of my customers. People buy these things with no regard for the requirements of the job. Sometimes I see a $10,000 3750 doing the job that a $725 2960 could do. Other times I see 3750s failing to do the job of a 4900 or 6500.

Un-stacked 3750s are a common sight at my customers, but 3560s (3750 without a stacking port) are nowhere to be seen.

Re: Switch buffer size question (#p177930)

Mon Sep 05, 2011 8:25 am

I'm probably guilty of derailing this here, but the Arista response to Brad Reese on the Nexus 5k vs Arista 71xx series was pretty informative on buffer behaviour during different network behaviour. Might help a few other people get their head around why a shared buffer has its advantages:
http://bradreese.com/blog/4-23-2011.htm (http://bradreese.com/blog/4-23-2011.htm)

Re: Switch buffer size question (#p177932)

Mon Sep 05, 2011 8:36 am

Thank you for the link. Also excuse my mistakes above, an engineer here had "tuned" some buffers on our switches.

'

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