

Assignment #2 – SNMP

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1. What is the average packet size? Explain how you derived this.

Interface	Total packets	Total Octets	Average Packet size	Total outputs packets	Total Input octets	Total Ouput octets	Total input packets	Packet size of input packets	Packet size of output packets
1	0	0	0	0	0	0	0	0	0
2	16692	1732000	103.7623	4430	1218297	513703	12262	99.35549	115.96
3	8807	1272868	144.5291	1097	1057815	215053	7710	137.2004	196.0374
6	7881	1113678	141.3118	1292	879895	233783	6589	133.54	180.9466
7	15696	1449428	92.34378	4333	942107	507321	11363	82.91006	117.0831
9	0	0	0	0	0	0	0	0	0
10	7684	751365	97.78306	7684	0	751365	0	0	97.78306
11	7684	751365	97.78306	7684	0	751365	0	0	97.78306

Average packets size= **103.7623** bytes per packet

Eg: Number of total pkts in interface 2 =1732000 & Number of total bytes in interface 2 =16692

Find the total packets and octets send through each interface and divide Number of octets by Number of packets to get packet size.

2. Are the packet sizes similar across all the links? Explain.

No. Each interface serves different purpose means some interface Ethernet & some are wlan interface. Wlan interface is usually bursty.

3. Which link has the "most bursty" traffic. By "bursty", I mean traffic with a lot of variability over time and a non-trivial number of packets or octets. Explain how you derive this.

Interface	COV of Output packets	COV of Input Packets
2	0.137543	0.104509
3	0.213267	0.137726
6	0.186467	0.15888
7	0.155751	0.111869
10	1.581126	0
11	1.549966	0

Find the total packets in each interface and calculate mean, standard deviation and hence

Coefficient of variation= SD/Mean

Interfaces 10 looks bursty as average coefficient of variation is 0.79. Also 10th & 11th interface is wlan interface which proves with experimental data.

- 1) I have used python script for collecting the SNMP data for each interfaces given across MIB's asked. Script itself will load the data into excel sheet. After data is collected, find the difference of between samples so that number of bytes/packets transferred for 10 mins are calculated. Then I have sorted according to interfaces and got the total across each interface. As each sample is taken after 10 mins, divide by 600 to get bytes transferred per second or packets transferred per second.

- 2) Code for fetching 11 SNMP samples every 10 mins and gathering in xls

```
import subprocess
import copy
from openpyxl import Workbook
import time

#MIB's are in order TotaloutUCastPkts, TotalinOctets, TotaloutOctets, TotalinUcastPkts, TotaloutNUCastPkts,
#TotalinNUcastPkts
miblist=[".1.3.6.1.2.1.2.2.1.17", ".1.3.6.1.2.1.2.2.1.10", ".1.3.6.1.2.1.2.2.1.16", ".1.3.6.1.2.1.2.2.1.11",
".1.3.6.1.2.1.2.2.1.18", ".1.3.6.1.2.1.2.2.1.12"]
iflist= {1,2,3,6,7,9,10,11}
cmd = ["/usr/bin/snmpget", "-v", "2c", "-c", "public", "128.138.207.5:7777"]
# will later add mib in for loop

#initializing workbook and creating sheets
wb = Workbook()
ws = wb.active

#start from row 2 as row1 has headings
rowid=2
try:
    for sampleid in range(1,11):
        for i in iflist:
            colid=1
            ws.cell(row=rowid, column=colid).value=sampleid
            colid=colid+1
            ws.cell(row=rowid, column=colid).value=i
            for mib in miblist:
                cmd1=copy.deepcopy(cmd)
                cmd1.append(mib+"."+str(i))
                output = subprocess.check_output(cmd1)
                output = output.split()
                colid=colid+1
                print "value is ", rowid, colid, output[-1], cmd1
                ws.cell(row=rowid, column=colid).value=output[-1]
            rowid=rowid+1
        wb.save('snmp data.xlsx')
        time.sleep(600)
        sampleid=sampleid+1
except CalledProcessError:
    print "Error calculating", output
```

3) The 10 samples data from the intervals you measured in tabular (e.g. excel) form

Interval	Interface	outUCastPkts	inOctets	outOctets	inUcastPkts	outNUCastPkts	inNUcastPkts
1	1	0	0	0	0	0	0
1	2	480	133357	57840	1204	0	0
1	3	141	103499	34230	744	0	0
1	6	162	86888	36236	642	0	0
1	7	470	104874	57180	1106	0	0
1	9	0	0	0	0	0	0
1	10	712	0	70980	0	0	0
1	11	711	0	70876	0	0	0
2	1	0	0	0	0	0	0
2	2	391	126272	44569	1463	0	0
2	3	78	122953	11240	918	0	0
2	6	98	102945	13160	802	0	0
2	7	394	96603	45067	1394	0	0
2	9	0	0	0	0	0	0
2	10	1040	0	96590	0	0	0
2	11	1040	0	96590	0	0	0
3	1	0	0	0	0	0	0
3	2	427	129823	49985	1246	0	0
3	3	126	134250	32358	1007	0	0
3	6	146	112526	34278	890	0	0
3	7	404	100873	48167	1132	0	0
3	9	0	0	0	0	0	0
3	10	812	0	78152	0	0	0
3	11	813	0	78256	0	0	0
4	1	0	0	0	0	0	0
4	2	363	102911	41947	1070	0	0
4	3	86	93656	11054	690	0	0
4	6	106	76886	12974	575	0	0
4	7	354	75861	41373	969	0	0
4	9	0	0	0	0	0	0
4	10	682	0	67777	0	0	0
4	11	683	0	67841	0	0	0
5	1	0	0	0	0	0	0
5	2	388	106744	48706	1090	0	0
5	3	100	102610	17580	713	0	0
5	6	118	87767	19538	616	0	0
5	7	447	89032	54575	1090	0	0
5	9	0	0	0	0	0	0
5	10	703	0	70362	0	0	0
5	11	702	0	70298	0	0	0
6	1	0	0	0	0	0	0
6	2	531	121543	59577	1226	0	0
6	3	97	98225	13704	715	0	0
6	6	114	79086	15116	587	0	0
6	7	453	86220	52434	1051	0	0
6	9	0	0	0	0	0	0
6	10	654	0	66566	0	0	0
6	11	654	0	66566	0	0	0
7	1	0	0	0	0	0	0
7	2	428	116632	47558	1194	0	0
7	3	122	95337	17247	701	0	0
7	6	143	79328	19253	599	0	0
7	7	418	87077	46898	1087	0	0
7	9	0	0	0	0	0	0
7	10	720	0	71038	0	0	0
7	11	719	0	70934	0	0	0
8	1	0	0	0	0	0	0
8	2	412	118606	51053	1097	0	0
8	3	111	103894	31063	729	0	0
8	6	131	86578	32983	614	0	0
8	7	402	95929	50393	1031	0	0
8	9	0	0	0	0	0	0
8	10	699	0	69269	0	0	0
8	11	700	0	69373	0	0	0
9	1	0	0	0	0	0	0
9	2	544	135858	60622	1281	0	0
9	3	146	104322	29770	782	0	0
9	6	166	86574	31690	673	0	0
9	7	599	111895	65761	1269	0	0
9	9	0	0	0	0	0	0
9	10	764	0	75173	0	0	0
9	11	764	0	75173	0	0	0
10	1	0	0	0	0	0	0
10	2	466	126551	51846	1391	0	0
10	3	90	99069	16807	711	0	0
10	6	108	81317	18555	591	0	0
10	7	392	93743	45473	1234	0	0
10	9	0	0	0	0	0	0
10	10	898	0	85458	0	0	0
10	11	898	0	85458	0	0	0

4) Derived values for each interface and for both input and output,

1. The total number of bytes transferred
2. The bytes/second transferred
3. The packets/second transferred

	INPUT	OUTPUT	Total	INPUT	OUTPUT	Total	INPUT	OUTPUT	Total
Interface	TotalBytes	TotalBytes	Bytes	bytes/sec	bytes/sec	bytes/sec	packets/sec	packets/sec	packets/sec
1	0	0	0	0	0	0	0	0	0
2	1218297	513703	1732000	2030.495	856.1717	2886.667	20.4367	7.383333	27.82
3	1057815	215053	1272868	1763.025	358.4217	2121.447	12.85	1.828333	14.67833
6	879895	233783	1113678	1466.492	389.6383	1856.13	10.9817	2.153333	13.135
7	942107	507321	1449428	1570.178	845.535	2415.713	18.9383	7.221667	26.16
9	0	0	0	0	0	0	0	0	0
10	0	751365	751365	0	1252.275	1252.275	0	12.80667	12.80667
11	0	751365	751365	0	1252.275	1252.275	0	12.80667	12.80667

5) For the provided data, you should attach your answer to the three questions above.

I am not sure if the 3 questions are from 4 or task2. So included answers for both.

The below data is calculated from [snmp-delta.csv](#) and [snmp-raw.csv](#)

	INPUT	OUTPUT	Total	INPUT	OUTPUT	Total	INPUT	OUTPUT	Total
Inter face	TotalByte	TotalByte	Bytes	bytes/s	bytes/s	bytes/s	packets/sec	packets/ sec	packets/s
1	0	0	0	0	0	0	0	0	0
2	2776493	1169827	3946320	4627.48	1949.71	6577.2	49.13	15.95	65.09
3	2051169	442544	2493713	3418.61	737.57	4156.18	24.905	3.47	28.37833
6	1708908	477872	2186780	2848.18	796.45	3644.6	21.34	4.08	25.43333
7	2183206	1157683	3340889	3638.67	1929.47	5568.14	46.52	15.65	62.17667
9	0	0	0	0	0	0	0	0	0
10	0	1833765	1833765	0	3056.27	3056.27	0	32.98	32.98833
11	0	1833765	1833765	0	3056.27	3056.27	0	32.98833	32.98833

a) What is the average packet size? Explain how you derived this

if	Totalout Pkts	TotalinOctets	TotaloutOctets	Totalin Pkts	Avg ouput size	Average Input size
1	0	0	0	0	0	0
2	9574	2776493	1169827	29480	122.187905	94.18225916
3	2084	2051169	442544	14943	212.353167	137.2662116
6	2452	1708908	477872	12808	194.890701	133.4250468
7	9390	2183206	1157683	27916	123.288924	78.20626164
9	0	0	0	0	0	0
10	19793	0	1833765	0	92.647148	0
11	19793	0	1833765	0	92.647148	0

Find the total packets and octets send through each interface and divide Number of octets by Number of packets to get packet size.

b) Are the packet sizes similar across all the links? Explain

No, the packet size for each link varies as interfaces are getting data of Ethernet, wifi, local area network connection.

c) Which link has the "most bursty" traffic. By "bursty", I mean traffic with a lot of variability over time and a non-trivial number of packets or octets. Explain how you derive this.

Interface	COV of Output packets	COV of Input Packets
2	0.576287	0.251133
3	0.200278	0.128231
6	0.174218	0.146488
7	0.589101	0.270815
10	0.302561	0
11	0.302818	0

Link7 is bursty as coefficient of variation is high. Also link 7 is br wlan which will be bursty as proved by data collected.

Find the total packets in each interface and calculate mean, standard deviation and hence Coefficient of variation= SD/Mean