WR characterization tools

Report over SPEC cards

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1 Introduction

In this document, it will be presented a series of tests were performed to characterize the response of the system. Programs are used **wr-sender** and **wr-receiver** that implement a protocol that sends bursts of data packets to determine certain system characteristics: bandwidth, packet loss and corruption. From the data obtained in the tests, we estimate the optimal parameters that best allow the estimation of system performance (number of packets per burst, packet size, number of bursts, delivery period).

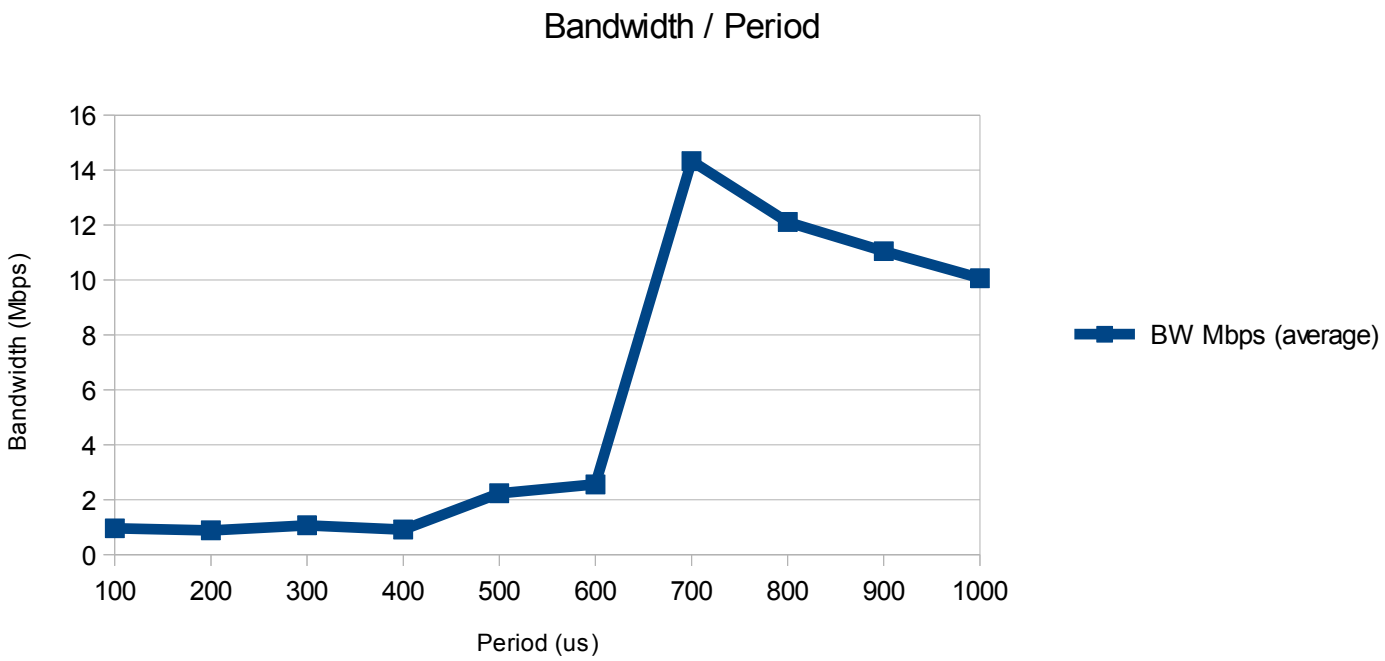
In the following sections, it will present the different tests and explain the results thereof.
Finally, in a concluding section, it will determine the optimal configuration of the various parameters.

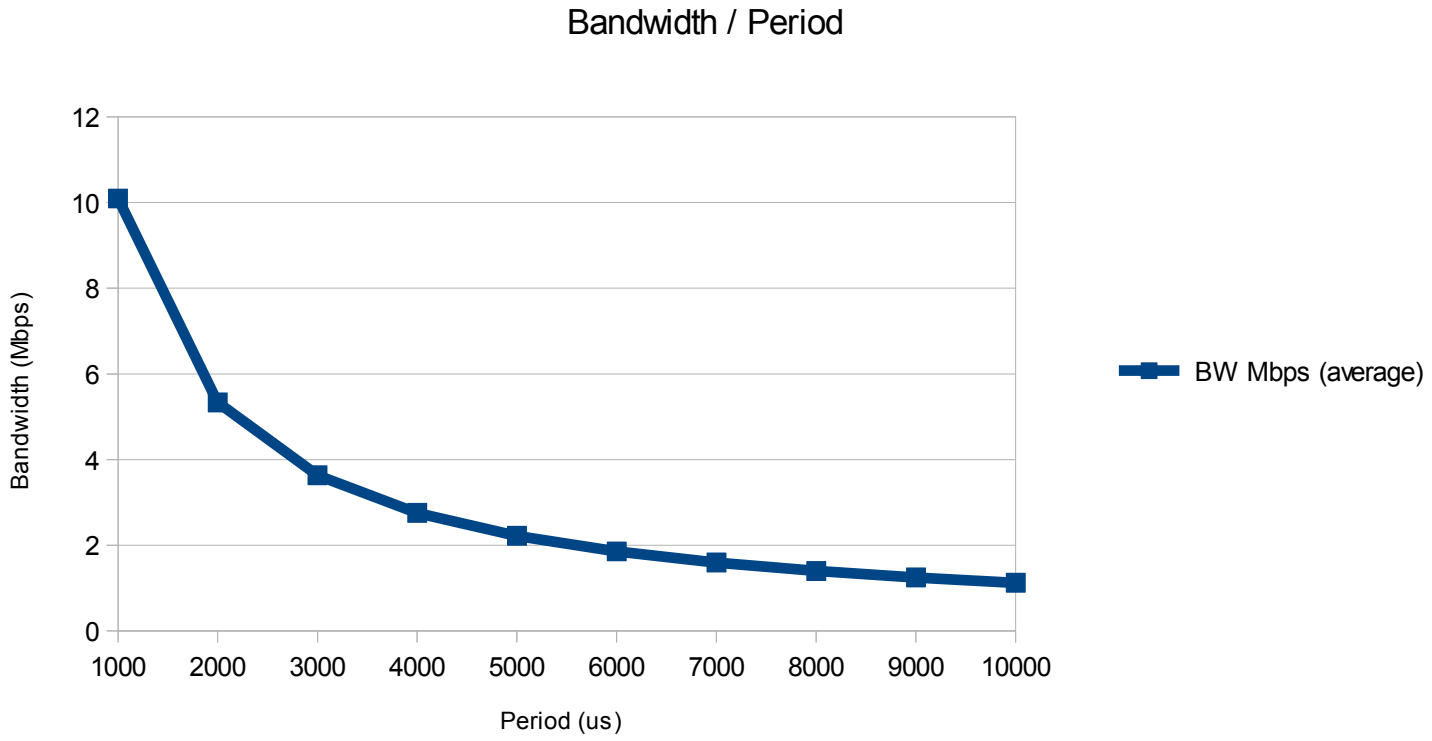
2 Test

This section details the different tests. Each considers the variation of a single parameter and find the value that reaches the most 'stable'.

2.1 Variable delivery period

- **Sending period:** Parameter
- **Size of frame:** 1400
- **Number of packages:** 1000
- **Number of bursts:** 20



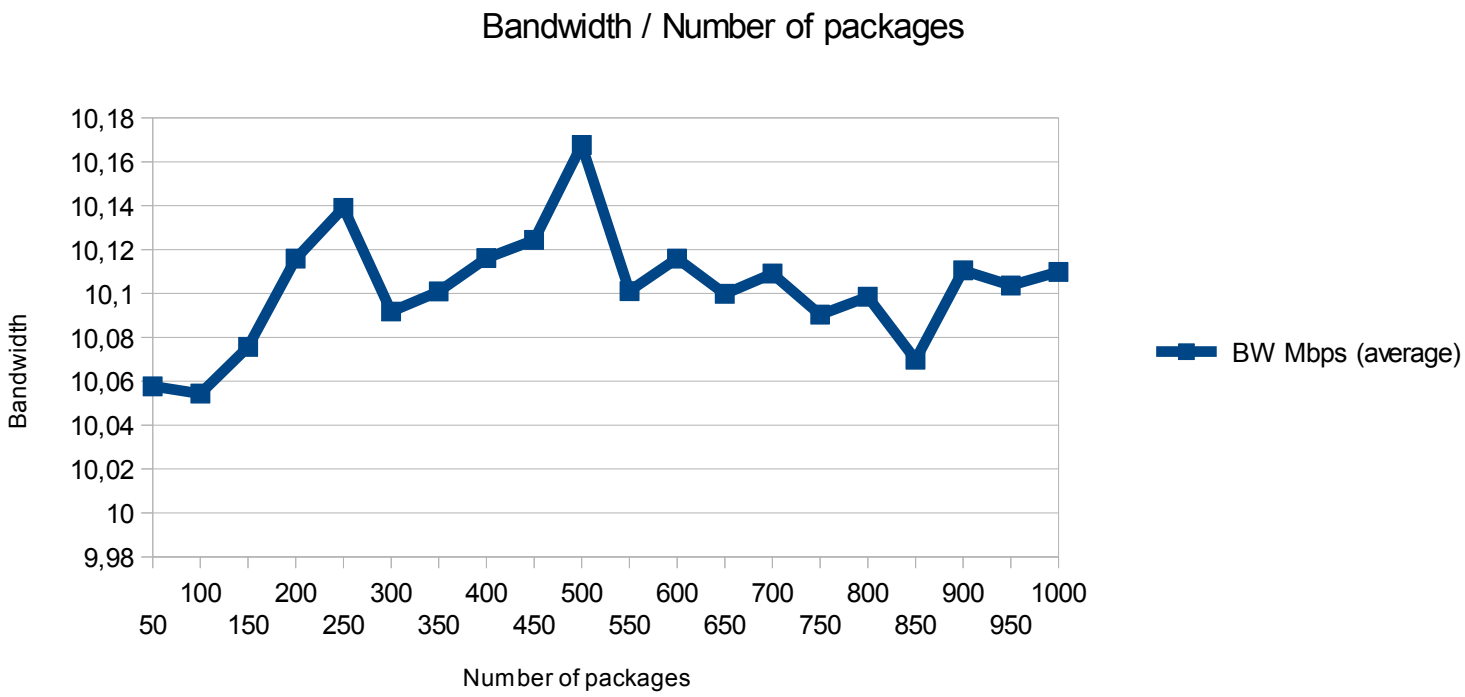

Bandwidth / Period
Bandwidth (Mbps)
12
10
8
6
4
2
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
Period (us)
BW Mbps (average)


Lost packages / Period
Lost packages
1000
900
800
700
600
500
400
300
200
100
0
100
200
300
400
500
600
700
800
900
1000
Period (us)
Lost packages (average)

The above graphs show that the larger the package, the greater the bandwidth achieved. This is logical if one considers that more bytes are sent in each shipment period. However, if delivery period decreases under 1 ms (or 0.7 ms), performance decreases too because many packages are lost.

2.2 Variable number of packages of burst

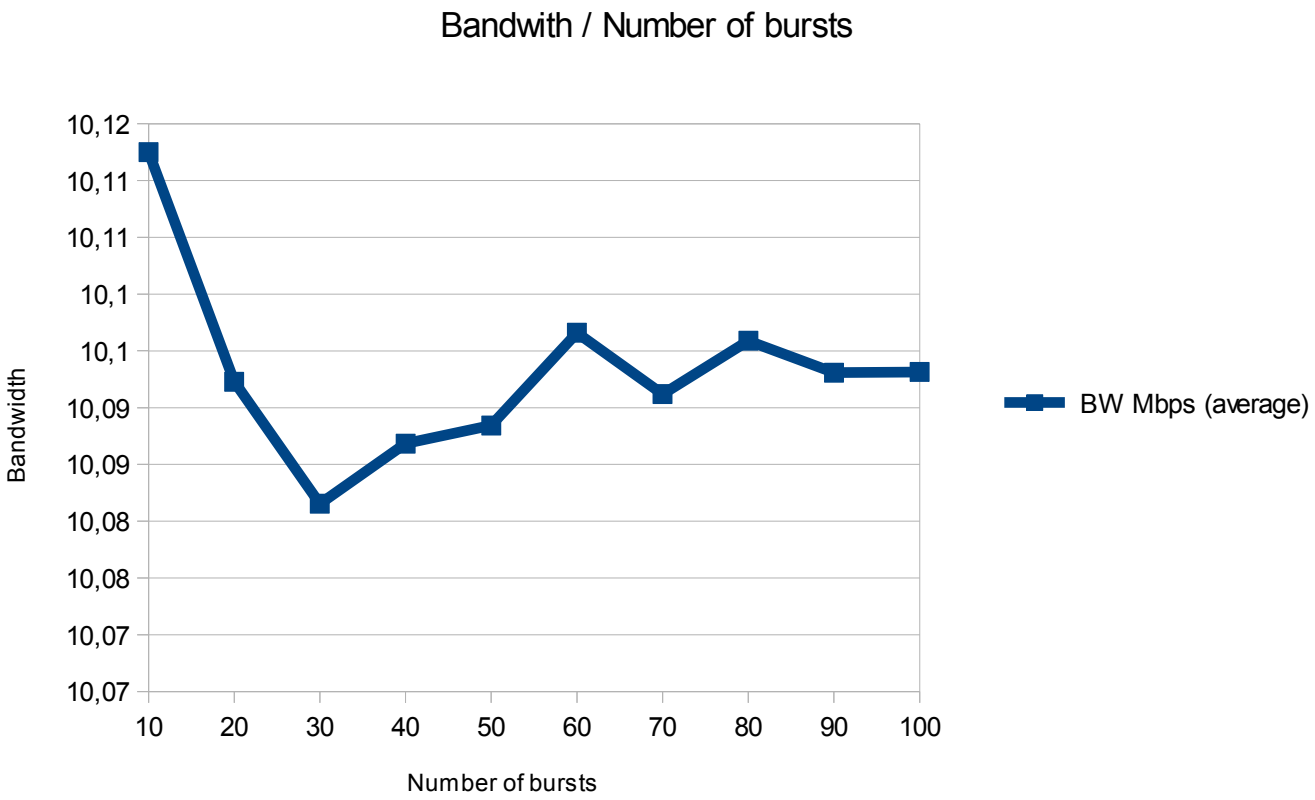
- **Sending period:** 1000
- **Size of frame:** 1400
- **Number of packages:** Parameter
- **Number of bursts:** 20



The number of packets sent in each burst also influences the quality of the measurement bandwidth. However, if many packets sent, it will increase the work load and hence the performance may deteriorate. In view of the previous figure, we can deduce that from 1000 packets is not improved estimate of bandwidth.

2.3 Variable number of bursts

- **Sending period:** 1000
- **Size of frame:** 1400
- **Number of packages:** 1000
- **Number of bursts:** Parameter

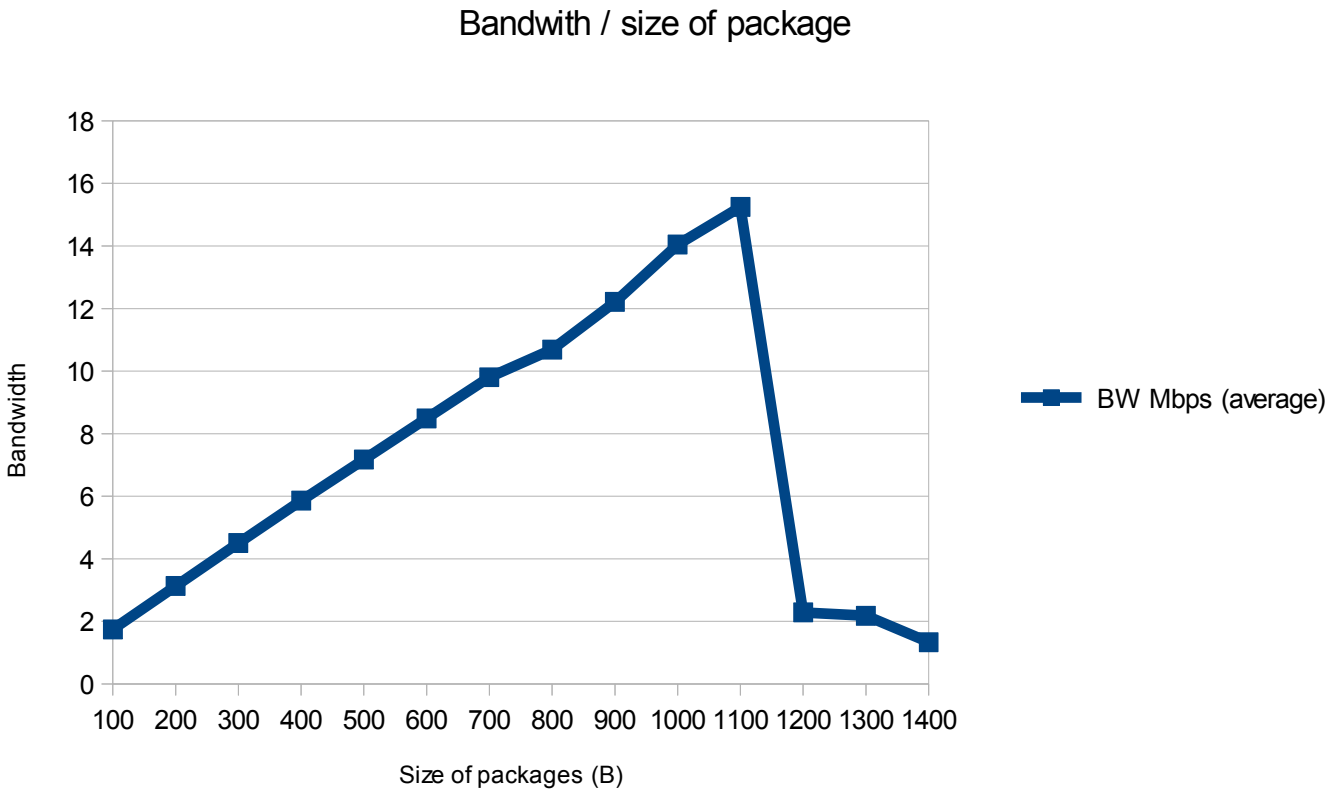


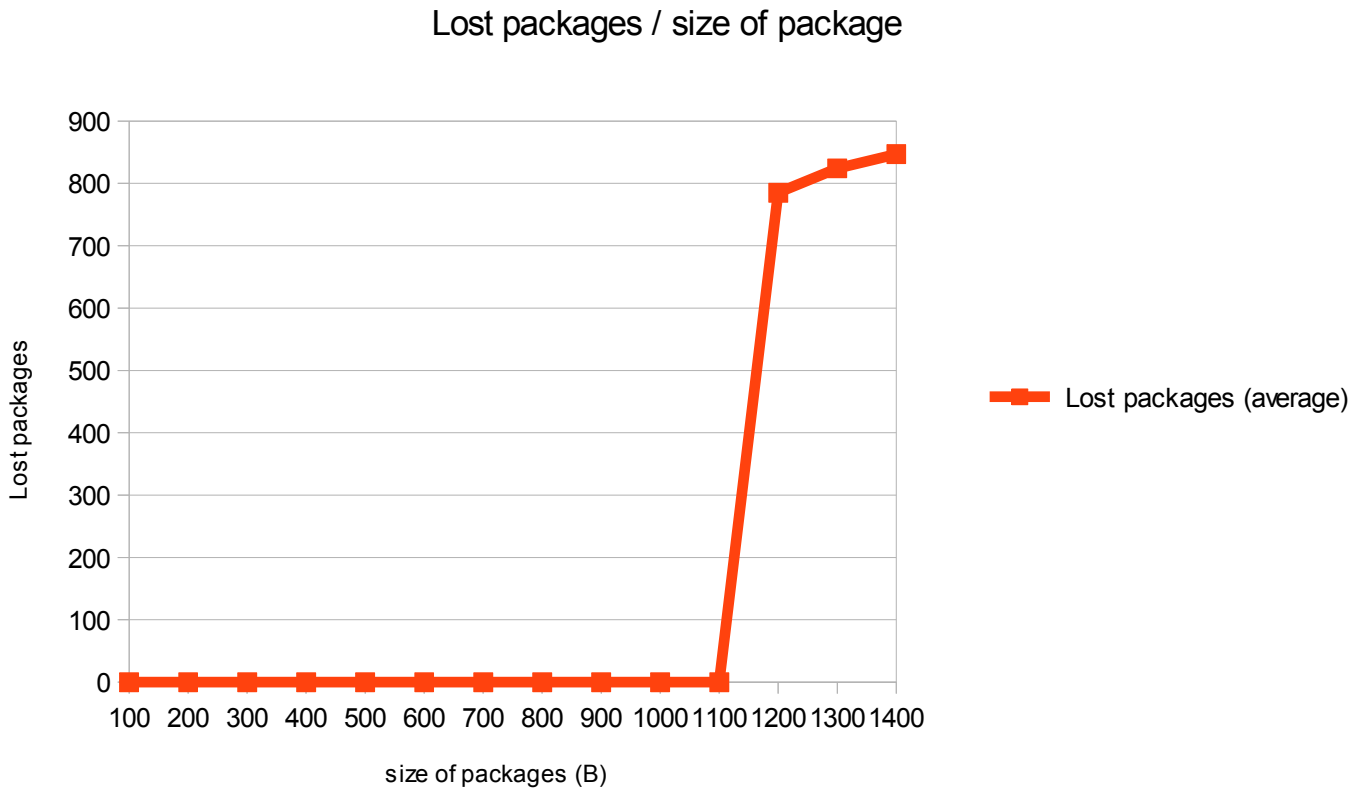
As shown in the graph above, number of bursts does not affect bandwitdh so much. We have choosen 20 to have more measures. If you configure more bursts, you can get a measure with more precision but you have to wait more time.

2.4 Variable size of package

2.4.1 Non-stable mode

- **Sending period:** 500
- **Size of frame:** Parameter
- **Number of packages:** 1000
- **Number of bursts:** 20

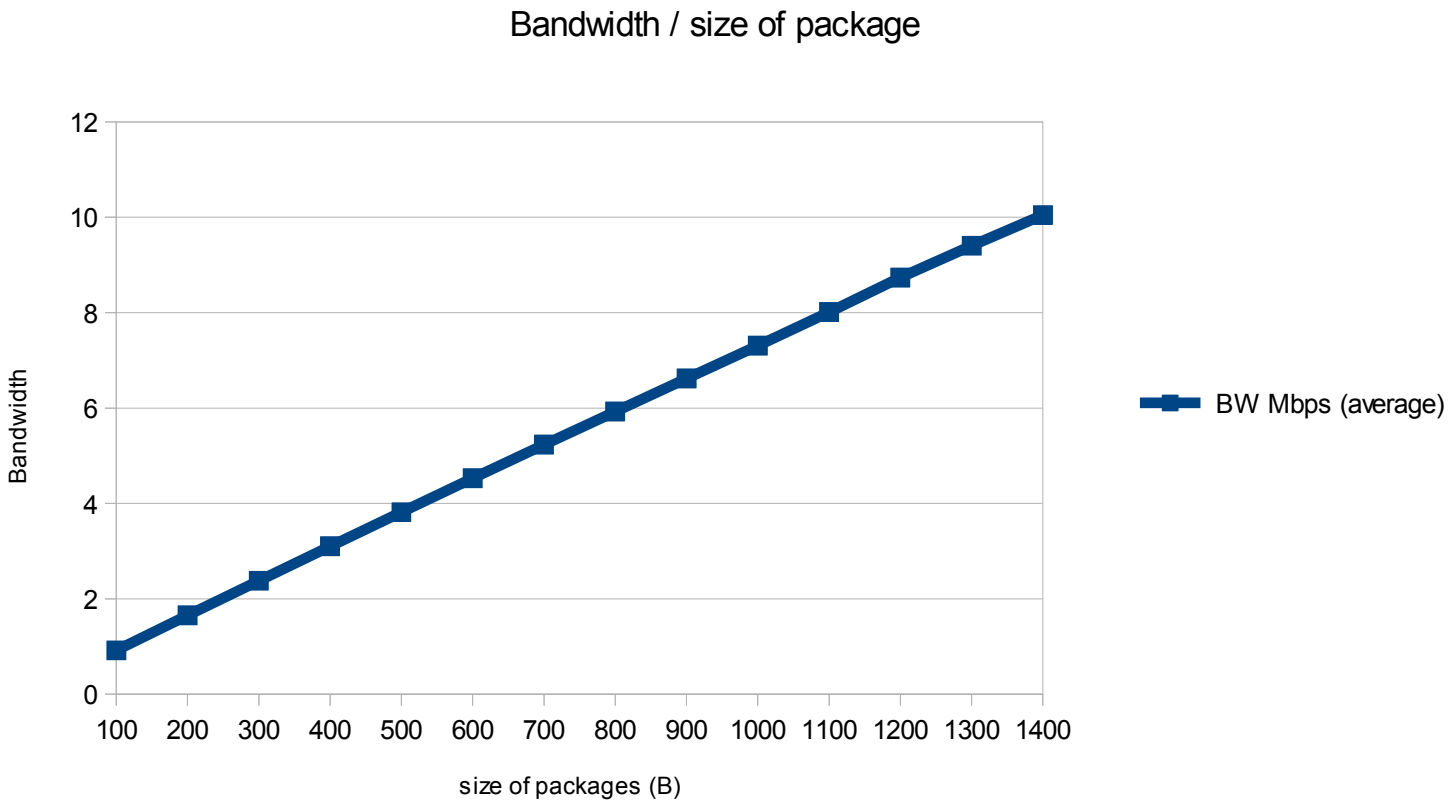




In this case, sending period is 0.5 ms. As show in 'Variable sending period' section, a period of less than 1 ms causes packet loss. This is a **non-stable** mode so if size of packages growes, lost packages too and performace decreases.

2.4.2 Stable mode

- **Sending period:** 1000
- **Size of frame:** Parameter
- **Number of packages:** 1000
- **Number of bursts:** 20



The sending period is 1 ms so this is a **stable** mode. The packet size also influences the bandwidth so that the larger, more performance is achieved.

3 Conclusions

Finally and in view of the previous experiments, the most optimal configuration for measuring the bandwidth on the computer under study is:

1. **Size:** 1400 B
2. **Number of packets per burst:** 1000
3. **Test blasts Number:** 20
4. **Delivery Period:** 1 ms