

# BANDWIDTH METER FOR HYPER-V

## NEW FEATURES OF 2.0

- The Bandwidth Meter is an active application now, not just a passive observer. It can send email notifications if some bandwidth threshold reached, run scripts and do other things.
- IPv6 support.
- Improved configuration tool.
- New improved reporting (log parsing) tool.
- New reports look.
- New, significantly revised network packets parsing procedure. Works better with 1 Gbit connections now.
- The program saves data to its log files every 5 minutes (you can set any other interval from 5 to 60 minutes with 5 minutes step) now, it was once an hour in versions 1.x.
- Log files can be saved in any folder now.

## DESCRIPTION

Bandwidth Meter Hyper-V is a unique tool for Hyper-V bandwidth usage monitoring, counting and reporting.

What makes it unique? It provides a **bandwidth control on per virtual server basis for different protocols** (ARP, TCP, UDP, ICMP, IGMP). With this tool you can see the amount of data used (downloaded and uploaded) by each virtual server. Thus you can bill your customers for the bandwidth usage or just find out which servers cause a high network load.

## TRIAL AND REGISTRATION

The evaluation version of Bandwidth Meter for Hyper-V monitors traffic and encrypts log. It is possible to decrypt the logs with our online control panel. To avoid the encryption please either email us and ask to generate a trial key for you or purchase a license key and register the software.

To register the software please place your order at [www.HostsTools.com](http://www.HostsTools.com) and email us the IP address of your server, we will generate a license key bound to the IP.

## INSTALLATION

*Before you start the Hyper-V Bandwidth Meter installation or upgrade, please:*

- Be sure you have your license key saved somewhere!*
- Make a backup copy of its old files (if it is an upgrade)!*

### If it is an upgrade from 2.x

*We always publish updates for such cases at <http://www.HostsTools.com> Please check this website or email us. The usual upgrade process is:*

- 1. Download an update. The link can be found at HostsTools.com For example, if the upgrade is from 2.x.x to 2.3.1 the file is <http://www.hoststools.com/wp-content/uploads/hbm-2.3.1-update-from-2.x.x.zip>*
- 2. Backup the old files*
- 3. Stop BwHyperV Windows service*
- 4. Replace the files with their updated version*
- 5. Start BwHyperV Windows service*

### If it is an upgrade from 1.x:

*Uninstall the previous version (1.x) before 2.0 installation!*

*Use "Uninstall" from Start -> BwHyperV menu or Control Panel -> Programs and Features -> BwHyperV 1.0.x*

If you did not have 1.x at all (thus it is a "fresh" installation of 2.0 to a new server) or if you already uninstalled 1.x from your server (see above), please do the following:

The below mentioned steps must be done on the server you wish to be monitored. (The server should have Windows 2008 R2 64bit and Hyper-V installed.)

1. If you have WinPCap library installed, please go to 2., if not: Download and install WinPCap library. You can either take from <http://www.winpcap.org/> (version 4.1.2 or higher). To install this library just run its EXE file (e.g. WinPcap\_4\_1\_2.exe) and follow the installation wizard. Answer 'Ok'/'Yes' to all the wizard's questions and use the default settings.
2. Install Microsoft .NET Framework 4.0 if you do not have it installed on your server yet.
3. Download the Bandwidth Meter for Hyper-V installation package from <http://www.HostsTools.com> and run setup.exe file. Follow the installation wizard.
4. Now you have a new Windows service named **BWHYPERV200** (You can see it at 'Start -> Programs -> Administrative Tools -> Services'). Do not start it yet, you need to configure it first.

5. Click Windows Start button, open 'All Programs -> BwHyperV' menu and click '**CHANGE OPTIONS.INI**' shortcut.
6. Specify your Hyper-V network interface (Interface parameter). Then enter a license key if you have one.

*i. If no key specified, the program monitors traffic and encrypts log file. To register the software please place your order at [www.HostsTools.com](http://www.HostsTools.com) and email us, we will generate a license key. To try the software for free please email us and we will generate a trial key for you.*

7. Click 'Ok' button to save the settings. Then go to 'Start -> (Programs) -> Administrative Tools -> Services', select **BWHYPERV200** service and start or restart it.

## DATA

The Bandwidth Meter monitors all server connections and creates a log file of the following format:

**VS-NAME TIME INBOUND|OUTBOUND PROTOCOL:TOTAL**

The legend:

**VS-NAME** – a Virtual Server name.

**INBOUND|OUTBOUND** – traffic direction.

**TIME** – time when the data was saved. The program saves the data collected once per specified interval. When you configure the software you can set any interval from 5 to 60 minutes (with 5 minutes step).

**PROTOCOL:TOTAL** – network protocol (ARP, TCP, UDP, ICMP, IGMP) and total data amount (in bytes) sent and received by this connection during the time interval.

The Bandwidth Meter log sample:

```
ServVDS 23:45 input arp:0 tcp:59347 udp:0 icmp:0 igmp:0
ServVDS 23:45 output arp:56 tcp:311 udp:63 icmp:12 igmp:0
ServVDS 23:50 input arp:0 tcp:0 udp:0 icmp:0 igmp:0
ServVDS 23:50 output arp:0 tcp:0 udp:1663 icmp:18016 igmp:0
```

*Note: **NONE** server mentioned in the log shows you the total traffic of unidentified connections. In some cases it is just impossible to detect the traffic owner and the program adds its value to **NONE** server.*

You can find the log files at C:\Program Files\BwHyperV\Logs\

The log file names have the following format: bwDDMMYY.log (D – day, M – month, Y – year).

## DATA ANALYSIS

There are 3 main ways to get the data from the log files and make some report or chart.

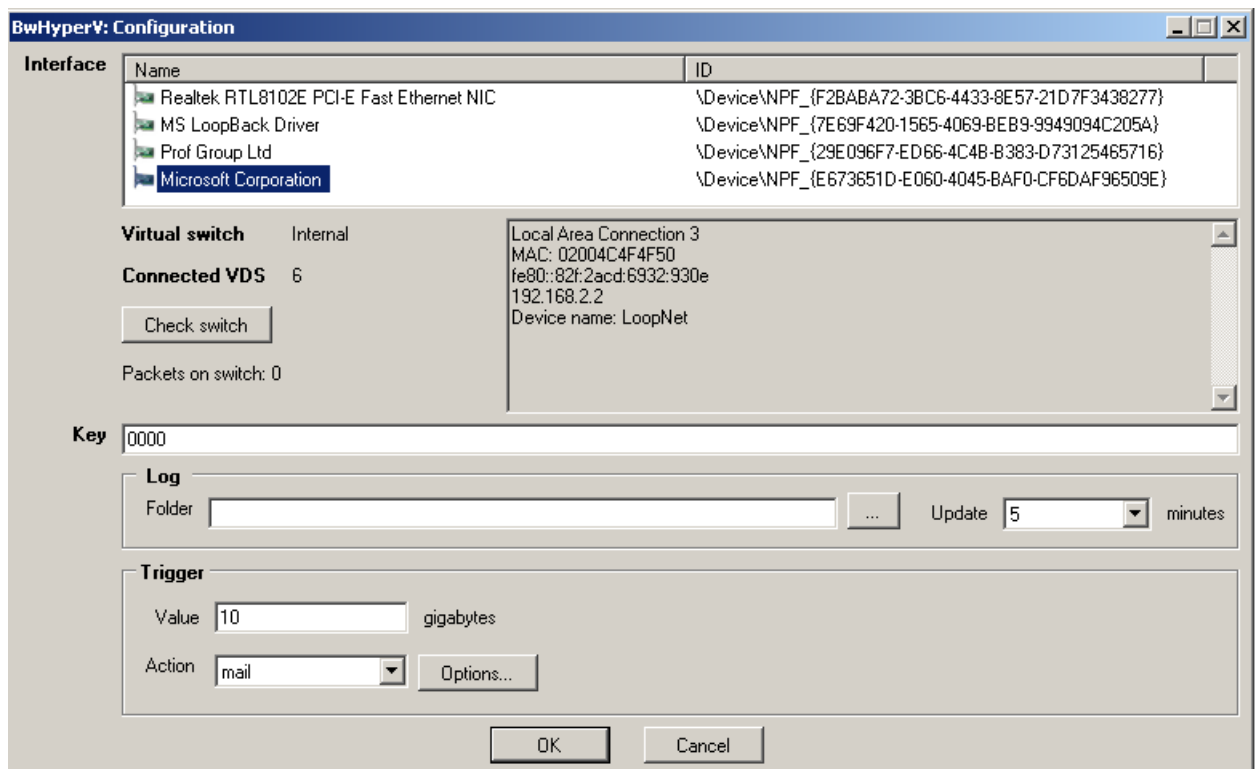
1. **Use our ParserCmd.EXE tool, this is the most comfortable way**  
(see “**REPORTING**” chapter below)
2. **Use Microsoft LogParser software.**
  - You can download the LogParser from  
<http://www.microsoft.com/downloads/details.aspx?FamilyID=890cd06b-abf8-4c25-91b2-f8d975cf8c07&displaylang=en>
3. **Use Microsoft Excel, Microsoft Access etc.** For example, import CSV files created by ParserCmd.EXE tool to MS Excel and make some chart.

## CONFIGURATION

Configuration tool allows to specify several options:

- Select a NIC (network interface) to be monitored.
- Specify log files parameters.
- Specify actions to be taken in case of traffic over usage (when some virtual machine reached its daily bandwidth limit).

This is a screenshot of the configuration tool window:



**Interface** – network interface list. Each NIC is connected either to Internal port of a Hyper-V Virtual Switch or to External port of that switch. It depends on your particular server configuration (hardware and software). In this list you should select an Interface used by virtual machines for

Internet connections. You can see multiple NIC's in the list, but should select one of them only. If you do not know which of them is the right one, just use "Check switch" button this way:

1. Be sure at least one of virtual machines on this Hyper-V server is running and there is some download or upload process. For example, you can open that virtual machine with Remote Desktop or Hyper-V console, start some FTP client and download some big file.
2. Select a network interface in the list and click "Check switch" button. The program will start monitoring traffic going via that particular interface.
3. Wait for around 5 seconds and look at "Packets on switch:" field. If it shows 0 (zero) there is no traffic on that interface at the moment. If there is a non-zero number, it is the right interface.

*It is important to wait for several seconds after clicking the "Check switch" button! The tool needs time to gather and analyze the traffic stats.*

**Key** – license key (either permanent or trial) for this software.

*Hyper-V Bandwidth Meter verifies its license key by sending it to HostsTools licensing server and receiving the answer from that server. Please allow incoming and outgoing connections via port 80 (HTTP) through the server firewall for BWHYPERV200 program. The program sends only its key, nothing else. And receives an answer (positive if the key is valid) from the licensing server. The licensing server URI is <http://keysys.dotnetpark.com>*

**Log:Folder** – specify some folder in this field and the log files will be saved in that folder. If the field is empty the program creates LOGS folder in its working directory and saves the log there.

**Log:Update** – how often the log files should be updated. Select any interval from 5 to 60 minutes (with 5 minutes step).

**Trigger:Value** – set some daily bandwidth usage limit (in Gigabytes) in this field. If some virtual machine will use more bandwidth the Bandwidth Meter will send an email notification, run a script or take some other action (see below).

**Trigger:Action** – what should be done if some virtual machine exceeds the daily bandwidth usage limit (specified in "Value" field). There are the following options:

**mail** – send an email;

**cmd** – process a command (start a program);

**url** – send a request to some URL.

This trigger also provides two variables:

**%VDS%** - virtual server name (Hyper-V virtual machine name which used lots of traffic) and

**%SIZE%** - how many Gigabytes were used by that virtual server this day.

Use "Options..." button to specify trigger action parameters (command line, mail etc.)

Examples:

Cmd: C:\Program Files\BwHyperV\alert\alert.bat %VDS% %SIZE%

Url: <http://my-server.com/vds-alert.aspx?name=%VDS%&size=%SIZE%>

Mail:

**BwHyperV: Mail options**

SMTP host: localhost      SMTP port: 25

SMTP user:      SMTP password:

To: alert@hoststools.com

From: trigger.bwhyperv@hoststools.com

Subject: Alert for [%VDS%] - bandwidth %SIZE% gigabytes

Body: Hi,  
Virtual server %VDS% use %SIZE% gigabytes.  
---  
Trigger on BwHyperV  
HostsTools.com

OK      Cancel

This windows (opened by “Options...” button) allows to specify mail notifications parameters:

**SMTP host** – the bandwidth meter will use this SMTP server to send email notifications

**SMTP port, SMTP user, SMTP password, FROM** – these parameters are obvious

**TO** – if you are the only server administrator just specify your email address. If it is a team or company, it might be a good idea to specify some mail group address (like server-admins@YourCompanyName.com).

**SUBJECT** – the notifications subject template

**BODY** – the notifications body template

In **SUBJECT** and **BODY** you can use %VDS% and %SIZE% parameters.

Example:

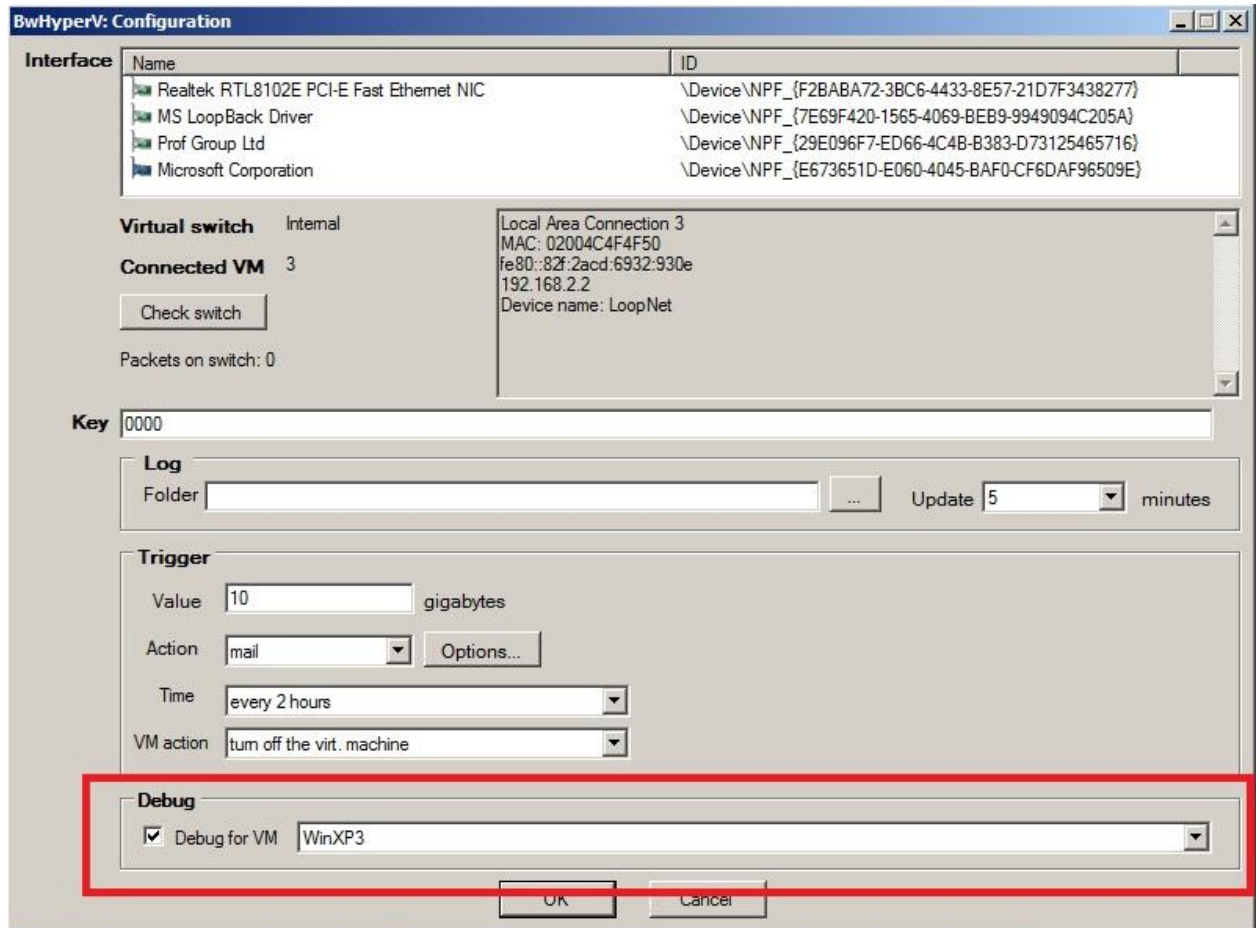
Let’s say you set 19GB daily limit in **Trigger:Value** field (see above). And there is some virtual machine named *SharePoint15*. If that server will use 20GB of bandwidth you’ll get a notification. If the subject template is:

*BANDWIDTH OVER USAGE! VM: %VDS%, Usage: %SIZE% GB*

the email notification subject will be:

*BANDWIDTH OVER USAGE! VM: SharePoint15, Usage: 20 GB*

## DEBUG (EXTENDED LOGGING)



Starting from version 2.3.1 there is a possibility to run the Hyper-V Bandwidth Meter in Debug (extended logging) mode. This mode can be turned on for one of the virtual machines at a time. The Hyper-V Bandwidth Meter will save the info about incoming/outgoing traffic from and to all the IP addresses, ports and MAC addresses. This is useful if you need to find more info about the traffic sources and/or if some virtual machine is under attack.

*In Debug mode the log files become huge and the Bandwidth Meter can use lots of RAM. Turn the Debug mode off when the investigation is done.*

If Debug mode is turned on the Bandwidth Meter generates additional log files (their names start with “dvm” and contain the date and monitored virtual machine name).

The extended logs look like this:

```
24/10/2012 16:54:25.5077,WinXP3,,UDP,00155D01211E,FFFFFFFFFFFFFF,192.168.2.10,192.168.2.255,138,138,209
24/10/2012 16:54:30.1381,WinXP3,,ARP,00155D01211E,FFFFFFFFFFFFFF,192.168.2.10,192.168.2.2,0,0,28
24/10/2012 16:54:30.1381,,WinXP3,ARP,02004C4F4F50,00155D01211E,192.168.2.2,192.168.2.10,0,0,28
24/10/2012 16:54:30.1385,WinXP3,,TCP,00155D01211E,02004C4F4F50,192.168.2.10,192.168.2.2,1064,21,28
```

The legend (comma separated columns in the logs):

Date, Source, Destination, Protocol, Source MAC address, Destination MAC address, Source IP, Destination IP, Source port, Destination port, Bytes sent (or received)

*Note: Debug mode is not working with trial keys. Only registered customers can use it.*

To enable Debug mode:

1. Turn **Debug** checkbox on.
2. Select virtual machine name in **Debug for VM** drop down list.
3. Click “Ok” button.
4. Restart **BwHyperV** Windows service.

To disable Debug mode:

1. Turn **Debug** checkbox off.
2. Click “Ok” button.
3. Restart **BwHyperV** Windows service.

*Note: Do not forget to restart BwHyperV Windows service.*

## REPORTING

With the Hyper-V Bandwidth Meter we provide a reporting utility – ParserCMD.exe This **command line** tool parses log files and creates bandwidth usage reports in different formats:

- HTML – reports in HTML format;
- CSV – comma-separated format. Easy to use with MS Excel or other applications, easy to parse with custom scripts;
- PNG – charts in PNG graphics file format.

The reporting tool can create separate “per virtual machine” reports as long as “total overview” report. The “total overview” report contains all the data in a single file while per virtual machine” report consists of multiple files (one per VM/VDS).

*ParserCMD.exe is a command line application and needs command line parameters.*

The reporting tool requires some command line parameters:

**ParserCmd.exe** -s=START\_DATE -e=END\_DATE [-f=html(default)|png|csv] [-h] [-r=all|separate] [-l=folder] [-a=folder-logs-bwhyperv]

Command line parameters:

- h - help text (parsercmd.exe without parameters also shows the help text)

**-s** - start date, log files from this date (inclusive) will be processed. Format: DD-MM-YYYY

**-e** - end date, log files to this date (inclusive) will be processed. Format: DD-MM-YYYY

**-f** - output format: =html - make a HTML report; =png - PNG report; =csv - CSV report

**-r** - create one report file (overview) or separate reports (one per VM/VDS): =all - one file, =separate - one file per VM/VDS. By default it is **-r=all**

**-l** - folder for reports (by default it is \reports folder)

**-a** - path to the bandwidth meter logs (by default it is \LOGS folder in ParserCMD dir or logs folder from OPTION.INI)

If **-a** parameter is not specified the program first looks at \LOGS folder in its current location, but if there is no \LOGS folder it reads option.ini file and takes the path (you specify it in Log:Folder field during the software configuration process) from there.

**-u** - unit: =kilo - kilobytes, =mega - megabytes, =giga – gigabytes

Dates format is DD-MM-YYYY, where: DD - day, MM - month, YYYY - year

Examples:

***ParserCmd.exe -s=01-12-2010 -e=31-12-2010***

Report in HTML file for December 2010, it is a “total overview” report, because **-r** parameter was not specified (**-r=all** used by default).

***ParserCmd.exe -s=25-01-2011 -e=14-05-2011 -f=png -r=separate***

Separate “per virtual machine” reports in PNG files for interval from 25-01-2011 to 14-05-2011

## TROUBLESHOOTING

In case of any errors, please:

- Make a screenshot of the error message window
- Describe your steps and the case
- Copy log files (\logs\svc\*.log , not \bw\*.log) and zip them
- Email the screenshot, zipped logs and description to [support@hoststools.com](mailto:support@hoststools.com)

Thank you.