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# IPFIX receiver utility

## Introduction

IPFIX receiver is used for receiving an IPFIX (Netflow 10) stream from DPI devices and store the stream to a local file. The stored file can be processed as a text file any unix utilities.

## Installation and upgrade

1. use VAS Experts repository according to p.1 of the [DPI installation instruction](#).
2. install ipfixreceiver:

```
yum install -y ipfixreceiver
```

3. check changes in configuration files for installed version look at part "Important changes in version ..."

## Important changes in version 1.0.3 vs 1.0.2

1. changed configuration file in part of IP address transformation, since 1.0.3 version use decodeipv4, decodeipv6 in Export model to export IP in readable mode. Example:

```
source_ip4, decodeipv4
```

```
destination_ip4, decodeipv4
```

2. saving data now in separate process, important if DPI has more than 25 000 session per second, it can load upto 2 processor cores. In DEBUG logging added check records to controll save processing  
(a)cnt=NNNNN - send NNNNN buffer  
(b)cnt=YYYYY - saved YYYYY buffer.
3. buffer\_size parameter added - size of buffer to interchange between receiver and saver processes, use it in [dump] section, default value - 100000 records (for 20Gbe or 25 000 session per second). If the buffer size is not reached then 30sec timeout is used to push buffer into saver process.

## Supplied files

1. configuration expamples:

```
/etc/dpiui/ipfixreceiver.conf - clickstream example (http/https clickstream)  
/etc/dpiui/ipfixreceiverflow.conf - session example (netflow 10/IPFIX full session export)
```

```
/etc/dpiui/ipfixreceiversip.conf - meta information (sip connections)
example
```

2. programm files directory:

```
/usr/local/lib/ipfixreceiver.d/
```

3. additional files:

```
/etc/dpiui/port_proto.txt - for translation protocol number to text
protocol name
```

4. link to executable:

```
/usr/local/bin/ipfixreceiver -> link to
/usr/local/lib/ipfixreceiver.d/ipfixreceiver
```

## Additional OS settings

1. set iptables for receive external data

Ipfixreceiver is required to open ports that will be used to receive IPFIX streams (in configuration see section [connect])

For instance you are using TCP protocol, 1500 port and IP=212.12.11.10

```
[connect]
protocol=tcp
host=212.12.11.10
port=1500
```

For ipfixreceiver working in /etc/sysconfig/iptables you have to insert the next rule:

```
-A INPUT -p tcp -m state --state NEW -m tcp --dport 1500 -j ACCEPT
```

Do not forget that after changes iptables r - restart service is required:

```
service iptables restart
```

2. configure logrotate

Example for logrotate file /var/log/dpiuiflow.log, create in /etc/logrotate.d/ the file "flowlog" with the next content

```
/var/log/dpiui*.log {
    rotate 5
    missingok
    notifempty
    compress
    size 10M
    daily
    copytruncate
```

```
nocreate
postrotate
endscript
}
```

Using copytruncate is required, otherwise the log file will be recreated and log write to the file in stopped.

According to ipfixreceiver configuration in section [handler\_ipfixreceiverlogger] is setted the next:

```
args=('/var/log/dpiuiflow.log', 'a+')
```

3. configure remove old files. Example, removing old archive files (more then 31 days) with session records in gzip:

```
15 4 * * * /bin/find /var/dump/dpiui/ -name url_*.dump.gz -cmin +44640
-delete > /dev/null 2>&1
```

Change it to meet you requirements and put into the file /var/spool/cron/root.

## Execution parameters

ipfixreceiver utility has next parameters:

```
usage: ipfixreceiver start|stop|restart|status|-v [-f <config file>]
где
start    - start as service
stop     - stop service
state    - get state of service
restart  - restart service
-v       - version info
-f <config file> - config file name (required)
```

Example:

```
ipfixreceiver start -f /etc/dpiui/ipfixreceiverflow.conf
```

## Configuration

By default config file /etc/dpiui/ipfixreceiver.conf is used .

!::More information about config parameter you can find by link [Logging](#)

## Logging sections

1. loggers - define logging identifiers

2. handlers - define used logging workers
3. formatters - define used logging formats

## logger\_root

1. level - log level

Values:

```
CRITICAL - critical errors only, minimum log level
ERROR    - errors included
WARNING  - warnings included
INFO     - information included
DEBUG    - debug messages included
NOTSET   - all, maximum log level
```

Example:

```
level=DEBUG
```

2. handlers - used message handlers

Example:

```
handlers=ipfixreceiverlogger
```

## handler\_ipfixreceiverlogger

1. class - class of the message handler

Example:

```
class=FileHandler
```

2. level - log level

```
level=DEBUG
```

3. formatter - name of formatter that is used

```
formatter=ipfixreceiverlogger
```

4. args - handlers' parameters

```
args=('/var/log/dpiuiflow.log', 'a')
```

## formatter\_ipfixreceiverlogger

1. format - log message format description

Example:

```
format=%(asctime)s - %(name)s - %(levelname)s - %(message)s
here:
%(name)s      - logger name
%(levelname)s - level ('DEBUG', 'INFO', 'WARNING', 'ERROR',
'CRITICAL').
%(asctime)s   - daye, default - "2003-07-08 16:49:45,896" (with
milliseconds after comma).
%(message)s   - message
```

2. datefmt - date format

Example:

```
datefmt='%m-%d %H:%M'
```

## connect

1. protocol - protocol(tcp or udp).

```
protocol=udp
```

2. host - IP or server name or 0.0.0.0 (to receive from all devices).

```
host=localhost
```

3. port - port number.

```
port=9996
```

## dump

1. rotate\_minutes - rotation period in minuties, after it temp file will be moved to dumpfiledir/<port>.url.dump and new tempfile will be created.

```
rotate_minutes=10
```

2. processcmd - command that will be executed to process new data file after rotation, parameter is full file name.

```
processcmd=gzip %s
```

3. dumpfiledir - directory where received data files will be stored.

```
dumpfiledir=/var/dump/dpiui/ipfixflow/
```

4. buffer\_size - size of buffer to interchange between receiver and saver processes, use it in [dump] section, default value - 100000 records (for 20Gbe or 25 000 seesion per second). If the buffer size is not reached then 30sec timeout is used to push buffer into saver process.

## InfoModel

the section describes IPFIX receiving template.

1. InfoElements - parameter with description of information model elements for IPFIX template

```
InfoElements =  octetDeltaCount,      0,    1,  UINT64, True
                packetDeltaCount,    0,    2,  UINT64, True
                protocolIdentifier,   0,    3,  UINT8
                session_id,          43823, 2000,  UINT64, True
here,
  session_id - field name according to IPFIX description table (see
according sections)
  43823 - enterprise number or general IPFIX protocol number
  1 - unique field name
  UINT64 - field type
  True - endian (True or empty).
```

Field types:

Type	Length	Type IPFIX
OCTET_ARRAY	VARLEN	octetArray
UINT8	1	unsigned8
UINT16	2	unsigned16
UINT32	4	unsigned32
UINT64	8	unsigned64
INT8	1	signed8
INT16	2	signed16
INT32	4	signed32
INT64	8	signed64
FLOAT32	4	float32
FLOAT64	8	float64
BOOL	1	boolean
MAC_ADDR	6	macAddress
STRING	VARLEN	string
SECONDS	4	dateTimeSeconds
MILLISECONDS	8	dateTimeMilliseconds
MICROSECONDS	8	dateTimeMicroseconds
NANOSECONDS	8	dateTimeNanoseconds
IP4ADDR	4	ipv4Address
IP6ADDR	16	ipv6Address

Field names and their description:

1. [Flow export template in IPFIX](#)
2. [Meta information export template](#)

additional information:



## ExportModel

определяет параметры модели для экспорта, зарезервировано для будущего использования.

1. Mode - тип используемого экспорта

```
Mode = File
```

## ExportModelFile

Описание модели экспорта File.

1. Delimiter разделитель полей в строке ( \t - табуляция, еще примеры - |,;)

```
Delimiter = \t
```

2. ExportElements - описание полей которые будут сохранены в файл.

```
ExportElements = timestamp, seconds, %%Y-%%m-%%d %%H:%%M:%%S.000+03  
                login  
                source_ip4  
                destination_ip4  
                host, decodehost  
                path, decodepath  
                referral, decodereferer  
                session_id
```

где поля в каждой строке:

имя - наименование поля из информационной модели [InfoModel] (login, session\_id и т.п.)

обработчик - процедура обработки поля перед выводом

seconds	- поле в секундах, ожидается формат
milliseconds	- поле в миллисекундах, микросекундах,
nanoseconds	ожидается формат
decodehost	- перекодировать из punycode в UTF-8
decodepath	- перекодировать из urlencoding в UTF-8
decodereferer	- перекодировать из (punycode,urlencoding) в UTF-8
decodeproto	- перекодировать идентификатор протокола в строку

формат - описание формата для seconds, milliseconds.

Пример: %%Y-%%m-%%d %%H:%%M:%%S.%%f+0300

Результат: 2016-05-25 13:13:35.621000+0300

# Проблемы и решения

1. как получить версию утилиты?  
Используйте следующие команды:

```
ipfixreceiver -v
```

```
yum info ipfixreceiver
```

2. можно ли на один порт отправлять IPFIX потоки с разных DPI?  
Да. Единственное в записываемом потоке их будет не различить.
3. как понять, что утилита работает?
  - а) проверьте, что порт из конфигурации прослушивается утилитой, например 1500:

```
netstat -nlp | grep 1500
```

- б) проверьте лог, нет ли ошибок
- с) Проверьте, что запись в промежуточный файл происходит, например для 9996 порта (директория для файлов - /var/dump/dpiui/ipfixurl):

```
tail -f /var/dump/dpiui/ipfixurl/9996.url.dump
```

4. все проверено, но приема сообщений нет?
  - а) забыли открыть порт в iptables.
  - б) инициализировали ipfixreceiver с неверным IP сервера.
5. с DPI идет большое количество сессий (более 2 млн сессий/мин), при включенном DEBUG режиме видно, что счетчик обмена буферами не успевает записать до получения следующего блока записей, что можно сделать?
  - а) удалите преобразование даты в строку, это уменьшит процессорное время на обработку и дополнительно получите уменьшение объема результирующего файла
  - б) удалите преобразование decodeipv4, не значительно, но так же получите ускорение записи файла
  - с) настройте buffer\_size при к-ве сес /сек более 30к совместно с п.д
  - д) увеличьте частоту процессора и объем памяти