NAME

ng_checksum - reconstructing IP checksums node type

SYNOPSIS

#include <netgraph/ng_checksum.h>

DESCRIPTION

The **checksum** node can calculate, or prepare for calculation in hardware, IPv4 header, TCP and UDP checksums.

HOOKS

This node type has two hooks:

in   Packets received on this hook are processed according to settings specified in config and then forwarded to the *out* hook, if it exists and is connected. Otherwise they are reflected back to the *in* hook.

out Packets received on this hook are forwarded to the *in* hook without any changes.

CONTROL MESSAGES

This node type supports the generic control messages, plus the following:

NGM_CHECKSUM_SETDLT (**setdlt**)
   Sets the data link type on the *in* hook. Currently, supported types are **DLT_RAW** (raw IP datagrams) and **DLT_EN10MB** (Ethernet). DLT_ definitions can be found in the *<net/bpf.h>* header. Currently used values are **DLT_EN10MB** = 1 and **DLT_RAW** = 12.

NGM_CHECKSUM_GETDLT (**getdlt**)
   This control message obtains the data link type on the *in* hook.

NGM_CHECKSUM_SETCONFIG (**setconfig**)
   Sets the node configuration. The following *struct ng_checksum_config* must be supplied as an argument:

```
struct ng_checksum_config {
        uint64_t   csum_flags;
        uint64_t   csum_offload;
};
```

   The *csum_flags* can be set to any combination of CSUM_IP, CSUM_TCP, CSUM_UDP,

CSUM_TCP_IPV6 and CSUM_UDP_IPV6 (other values are ignored) for instructing the node to calculate the corresponding checksum.

The *csum_offload* value can be set to any combination of CSUM_IP, CSUM_TCP, CSUM_UDP, CSUM_TCP_IPV6 and CSUM_UDP_IPV6 (other values are ignored) for instructing the node what checksums should be requested from the hardware.

The node also takes into account any combination of CSUM_IP, CSUM_TCP, CSUM_UDP, CSUM_TCP_IPV6 and CSUM_UDP_IPV6 already flagged on the mbuf.

NGM_CHECKSUM_GETCONFIG (**getconfig**)
This control message obtains the current node configuration returned as a *struct ng_checksum_config*.

NGM_CHECKSUM_GET_STATS (**getstats**)
Returns node statistics as a *struct ng_checksum_stats*.

NGM_CHECKSUM_CLR_STATS (**clrstats**)
Clear the node statistics.

NGM_CHECKSUM_GETCLR_STATS (**getclrstats**)
This command is identical to NGM_CHECKSUM_GET_STATS, except that the statistics are also atomically cleared.

SHUTDOWN
This node shuts down upon receipt of a NGM_SHUTDOWN control message, or when all hooks have been disconnected.

EXAMPLES
ngctl(8) script:

```
/usr/sbin/ngctl -f- <<-SEQ
        msg checksum-1: setdlt 1
        msg checksum-1: setconfig { csum_flags=0 csum_offload=6 }
SEQ
```

Set the data link type to **DLT_EN10MB** (Ethernet), do not set additional checksum flags and request that the hardware calculate CSUM_IP_UDP|CSUM_IP_TCP.

SEE ALSO

netgraph(4), ng_patch(4), ngctl(8)

HISTORY

The **ng_checksum** node type was implemented in FreeBSD 10.2 and first submitted in FreeBSD 12.0.

AUTHORS

Dmitry Vagin <daemon.hammer@ya.ru>.